

Preparedness Manual

The prudent see danger and take refuge,
but the simple keep going and suffer for it.

Proverbs 27:12

If anyone does not provide for his relatives, and especially for his immediate family, he has denied the faith and is worse than an unbeliever.

REV. J, Feb. 11th, 2012

This manual has been prepared for
and is intended to be read
by members of all Christian faiths.

Please Note: The contents of this manual are intended to assist individuals and families in coping with emergency preparations. However, final decisions on preparation for actions taken during an emergency are the sole responsibility of individuals. No one knows your needs or can take care of you better than you can-nor does anyone else have that responsibility. Information and examples contained within this booklet are provided for illustration and advice only. Therefore, no liability is assumed by the Editor or any of the Authors for the use or misuse of any information or products contained in this publication.

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This manual is heavily based upon the LDS Preparedness Manual as compiled by Brother Christopher M. Parrett who gathered together the works of many different authors from the public domain of the Internet over the course of many years. I have merely edited and added to his compilation so that the manual is more generically direct toward those of all Christian faiths. Without Brother Parrett's work this manual would not have been possible.

Brother Parrett's work can be viewed and downloaded at:

<http://www.ldsavow.com/resources.html>

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Preface

The Lord Warns and Forewarns

The bible is full of instances in which the Lord warns and forewarns people of faith to prepare for a coming catastrophe, from Noah and the flood, to the children of Israel for their exodus to the book of Revelations, God has seen fit to warn us of coming events so that we might be able to prepare for them. Many are the times that he himself or his prophets, advised, counseled, exhorted, even commands, that we prepare for what is about to befall and take shelter while yet there is time. Just as there are many instances of God proving such warnings the bible is also full of the fate of those who did not heed and continued with their feasting and making merry, idly pass their days with thinking that they were the Masters of their own fate and above the plans and the policies of God and so by taking no heed of God's words, they took no action and sought no the shelter as directed and thus they perished.

The Lord holds us accountable for our actions

*"Then whosoever heareth the sound of the trumpet, and taketh not warning; if the sword come, and take him away, his blood shall be upon his own head. He heard the sound of the trumpet, and took not warning; his blood shall be upon him. But he that taketh warning shall deliver his soul. But if the watchman see the sword come, and blow not the trumpet, and the people be not warned; if the sword come, and take [any] person from among them, he is taken away in his iniquity; but his blood will I require at the watchman's hand." **Ezekiel 33:4***

The Lord has little mercy for those who heed not his word. An example is of this is when the Lord himself shut the door to the ark behind Noah when the floods came.

*"A male and a female of every animal went in as God had commanded Noah. Then the LORD closed the door behind them." **Genesis 7:16***

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*"The only thing harder than preparing ahead of time is having
to explain why you didn't." - Gabe Suarez*

THE PARABLE OF THE TEN VIRGINS.

Matthew 25

25:1 *"Then the kingdom of heaven shall be likened to ten virgins who took their lamps and went out to meet the bridegroom.*

25:2 *Now five of them were wise, and five were foolish.*

25:3 *Those who were foolish took their lamps and took no oil with them,*

25:4 *but the wise took oil in their vessels with their lamps.*

25:5 *But while the bridegroom was delayed, they all slumbered and slept.*

25:6 *And at midnight a cry was heard:
'Behold, the bridegroom is coming; go out to meet him!'*

25:7 *Then all those virgins arose and trimmed their lamps.*

25:8 *And the foolish said to the wise,
'Give us some of your oil, for our lamps are going out.'*

25:9 *But the wise answered, saying,
'No, lest there should not be enough for us and you;
but go rather to those who sell, and buy for yourselves.'*

25:10 *And while they went to buy, the bridegroom came,
And those who were ready went in with him to the wedding;
and the door was shut.*

25:11 *Afterward the other virgins came also, saying,
'Lord, Lord, open to us!'*

25:12 *But he answered and said,
'Assuredly, I say to you, **I do not know you.**'*

25:13 *Watch therefore,
for you know neither the day nor the hour in which the Son of Man is coming.*

Today I'm going to address another issue in the world of preparedness that tends to be quite controversial. This is the matter of where one should live in order to be better prepared. Addressing this issue properly will require more than one article as there are many components to consider. But for today, let's start with the most obvious one. Can you only be prepared if you live out in a rural area?

For starters, allow me to answer the question based on the strongest fundamental and then we can go from there. Personally, I am 100% certain that all of the warnings and admonitions in the scriptures to be educated and prepared are for the benefit ALL of God's children, not just those who can afford to live in an ideal area of their choosing. To believe such would require one to operate under the assumption that only those who can afford a rural resort prior to a catastrophic occurrence are worthy of the Lord to be safe. Um...that would be about ½ to 2% of our entire population in the U.S. Thus logic defies such a presumption. It's simply not the case. If it was, I'm certain we would read an abundance of scripture that would caution us from living in an urban or suburban environment. Sure we read of cities being abandoned on occasion (such as Sodom and Gomorrah as well as Jerusalem), but we also read of persons being directed to flee to other communities for their safety. Likewise, I believe that the logistical need to be prepared is applicable to everyone, regardless of where they live. This belief applies to those who live in the city or the country, but it also applies to whether someone lives in the South Africa, Armenia, or the Philippines.



Parable of the Ten Virgins art c/o rapturechrist.com

I also firmly believe that being prepared isn't all about the logistical aspects of having a certain amount of "stuff." That's clear in the Parable of the 10 Virgins. If preparedness was just about "stuff" then the 5 prepared virgins could have imparted of their oil to the other 5 unprepared virgins. I feel the most important part of being prepared is being obedient to the warnings given to us by God. I think that's, in part, why we have the account of Joseph in Egypt, Noah's ark, and the Parable of the 10 Virgins in the scriptures—to warn us to be prepared. These Biblical accounts also show us the unalterable consequences if one isn't prepared. Frankly, encouraging more folks to be obedient in being prepared is my first priority—although I do not speak with any God-given authority in doing so—simply a genuine concern for my fellowman. It's actually only my second priority to help folks be prepared properly and practically for whatever is to come.

By Kellene Bishop

DOES GOD HAVE AN EMERGENCY PREPAREDNESS PLAN?

Today, a strange paradox exists. What looks like the fulfillment of prophecy is everywhere; unrest in the Middle East, the rise of a European Superstate, the alignment of Gog and Magog, forming of a national ID and gateways through biotechnology that could unleash upon earth pestilence of biblical proportions. People from all three of the world's great religions see these developments as potential omens of an 'End Times' scenario leading to the Apocalypse.

Yet many believers in God, especially in America, are indifferent to the need to prepare for the unexpected.

An article by Mimi Hall in USA TODAY this week said, "Most Americans haven't taken steps to prepare for a natural disaster, terrorist attack or other emergency, according to a new study on preparedness, and only about a third have made plans with family members about how they would communicate with each other during a crisis."

Part of the reason for this may be that we are well off in the United States, and we trust in our bank accounts to sustain us. Unfortunately, money sitting in savings and investments are useless if you become stuck in a storm or other crisis.

Another disarming reason I witnessed during my 25 years of pastoring for why people of faith neglect preparedness has to do with an odd defeatism that says, "If current events are prophesied to happen, then there's nothing we can do about it anyway."

The notion that calamity is unavoidable if it is divinely predicted is even sanctioned by some expositors who miss the pattern for preparedness in the Bible. While it is true that famine was prophesied for Egypt, it is also a fact that God led Joseph to prepare for it, and, as a result, he saved his family and the nations around about.

Proverbs 22:3 tells us that a prudent person will foresee such difficulties and prepare for them, while a simpleton will go blindly on and suffer the consequences. This is good advice not only for religious folks, but also people of any persuasion.



A third and perhaps the greatest reason why some people, including religious people never plan for disaster, is that they view the need to prepare for the unexpected as too complicated and costly. They imagine the back yard being dug up for construction of a massive bomb shelter and the basement crammed with row after row of dry grains and large containers filled with backup water.

The truth is, survival preparation is modestly affordable. Under most circumstances, the ability for individuals to remain mobile for a

few days to a week or so by simply grabbing an inexpensive "survival bag" and heading out is more important than silos filled with long term storage foods.

Even when we envision a worse case scenario – such as a terrorist nuke or ICBM exchange –low-cost shelters, that can be built at home and combined with a minimal amount of Potassium Iodide, would help keep as much as 99 percent of the population alive according to one synopsis by the Department of Homeland Security. Designs for building such family shelters are available free online at places like www.SurvivorMall.com.

While having to try to endure radioactive fallout is a growing possibility, the fact is that most people are more likely to face disaster as a result of things like nature.

A few weeks ago a journalist became lost in a snowstorm in Oregon and died from the exposure to freezing temperatures. If his car had been equipped with a survival kit, he would have had an excellent chance of survival.

During Hurricane Katrina, one woman had an emergency supplies kit in her attic that kept her and her two cats alive for days until help arrived. Another man, a doctor who had read "Dare to Prepare" by Holly Deyo and followed its instructions, was prepared with equipment and supplies. His house became a gathering place for people displaced by the storm.

For reasons such as these, my wife and I recently provided each of our children with a "walk out" kit for the trunks of their cars. These emergency bags contain enough food, water, shelter, first aid, lighting and communication supplies to keep them alive for days in the case of a vehicle malfunction or other situation where they would need to abandon their car.

Many of the items vital for a good survival kit can be found at your local shopping center: an inexpensive poncho, a basic first aid assortment, nylon cord, canvas for temporary shelter, duck tape, a whistle. Other items are a bit trickier to find and may need to be acquired from one of many online emergency preparedness companies. These include five-year-shelf-life food bars, five-year-shelf-life water boxes or pouches, paper-thin thermal blankets designed by NASA to retain body heat, special hand-crank combination flashlights with radios and emergency signals built in, and so on. My personal favorite is the "Transformer 4 in 1 Radio Flashlight," which requires no maintenance, no batteries, no bulb replacements, and can even power your cell phone.

Pre-made emergency kits containing items such as those above can be acquired online at costs from \$30.00 and up, depending on the number of people and the number of days they are designed to sustain.

Why then, given how affordable disaster preparedness is, are so many people unprepared for an emergency?

Within "faith communities," part of the problem goes back to western dispensational fatalism that fails to see God's instructions about the future and the responsibility He gives concerning preparation. Church authorities may speak of the hidden shelter that

God provides His followers during a storm, yet often fail to see the believer's responsibility cast the throughout Bible where we are to care for our families and communities by readying for the unknown.

Some teachers also erroneously believe that emergency preparedness reflects a lack of faith in God.

The opposite is true. The Book of James measures faith by personal action, and Hebrews 11:7 describes true faith this way: "By faith Noah, being warned of God of things not seen as yet, moved with fear and prepared an ark to the saving of his house."

God told Noah that He would destroy the earth by a flood. He gave Noah instructions on how to be prepared so that he and his family could survive. Noah didn't know when the flood would come, only that it was prophesied, and he prepared for it. When the Flood arrived, he was ready. His faith in and obedience to God's word, his survival instincts, and ultimately his preparedness actions saved his family and preserved the human race.

The parallel between Noah and today is astounding. "As it was in the days of Noah," says Luke 17:26-27 concerning the last days. Noah's actions should define the modern believer's responsibility, including the need for spiritual and physical preparedness.

Of course there are other places in the Bible that provide lessons about preparedness, including principles in the Books of Psalms and Proverbs, the parable of the faithful and evil servants (Matthew 24:45-51) and the parable of the ten virgins (Matthew 25:1-13). But 1 Timothy 5:8 goes even further, saying that a person who does not provide for the survival of their relatives has denied the faith and is worse than an unbeliever.

Given these instructions and the belief held by many today that we are living in "the last days" or at a minimum a time of unusual earth changes, leaders of religious institutions urgently need to educate their followers about taking personal responsibility for preparedness in an age of growing uncertainty. Dramatic lessons over the last few years have proven that we cannot depend on government agencies such as FEMA to save us if we need them. In fact, a report last month found that five years after the Sept. 11 terror attacks, the government still isn't fully prepared to respond to a major public health emergency such as bioterrorism or a pandemic flu outbreak.

So what can one do to help people with disaster preparedness?

This is the good news. Hundreds of pages from reports and booklets on how to perform first aid, prepare temporary shelters, build bomb shelters, defend against terrorism and chemical contamination, shield against nuclear fallout, survive earthquakes, storms, floods, and dozens of other emergency situations are available free at places like www.SurvivorMall.com.

Spiritual leaders can download these booklets and reports, print them out and place them on a table in a church foyer, hand them to neighbors, give them out during classes, or better yet teach a class on preparedness and tie it in with the mandates of Scripture. If Nothing else everybody can forward this article to the people they know with a recommendation that they do what is right to protect themselves as well as those God

has placed under their care.

As a veteran of more than 30 years of church ministry, I call on pastors and other religious leaders to stand at the forefront of this issue and to make disaster preparedness some part of their ministry. This doesn't need to define what you or your fellowship is about, but this can and must

be part of the wise counsel you offer those you have responsibility for. You could literally save a believer's life!

Deuteronomy 30:19 says, "Today I have given you the choice between life and death, between blessings and curses. I call on heaven and earth to witness the choice you make. Oh, that you would choose life, that you and your descendants might live!"

Together as people of faith, we should face the future with confidence and take the lead in disaster preparedness

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The soul of the sluggard craves and gets nothing, while the soul of the diligent is richly supplied.

Proverbs 13:4

When you have finished setting aside a tenth of all your produce in the third year, the year of the tithe, you shall give it to the Levite, the alien, the fatherless and the widow, so that they may eat in your towns and be satisfied.

Then say to the LORD your God: "I have removed from my house the sacred portion and have given it to the Levite, the alien, the fatherless and the widow, according to all you commanded. I have not turned aside from your commands nor have I forgotten any of them.

Deuteronomy 26:12-13

Normalcy Bias – Why People are attached to Inaction

By Denis Korn



You life depends on being awake!

In the 36 years that I have been involved in the emergency preparedness industry one fundamental question always emerges – especially after a significant disaster – why are so many people in denial of a possible or impending disaster when to many others it seems self-evident?

Then the next questions emerge – why are so many unprepared and what prevents people from implementing the necessary actions to protect and provide for themselves, family or business? Is it a lack of information and initiative, funding, time, fear, lack of common sense or all of the above? Or perhaps there is something else.

The answer appears to be **Normalcy Bias**.

So what is normalcy bias and what can be done to address its effects? Business leaders, government agencies, security workers, firefighters and police, emergency management personnel and anyone involved in emergency/disaster preparedness want to know – *how can vulnerable citizens be motivated to take responsibility for their own safety and protection in the event of a significant emergency?*

A definition and explanation from Wikipedia:

— The **normalcy bias** refers to a mental state people enter when facing a disaster. It causes people to underestimate both the possibility of a disaster occurring and its possible effects. This often results in situations where people fail to adequately prepare for a disaster, and on a larger scale, the failure of the government to include the populace in its disaster preparations. The assumption that is made in the case of the normalcy bias is that since a disaster never has occurred then it never will occur. It also results in the inability of people to cope with a disaster once it occurs. People with a normalcy bias have difficulties reacting to something they have not experienced before. People also tend to interpret warnings in the most optimistic way possible, seizing on any ambiguities to infer a less serious situation.

The normalcy bias may be caused in part by the way the brain processes new data. Research suggests that even when the brain is calm, it takes 8–10 seconds to process

new information. Stress slows the process, and when the brain cannot find an acceptable response to a situation, it fixates on a single solution that may or may not be correct. An evolutionary reason for this response could be that paralysis gives an animal a better chance of surviving an attack; predators are less likely to eat prey that isn't struggling.

The normalcy bias often results in unnecessary deaths in disaster situations. The lack of preparation for disasters often leads to inadequate shelter, supplies, and evacuation plans. Even when all these things are in place, individuals with a normalcy bias often refuse to leave their homes. Studies have shown that more than 70% of people check with others before deciding to evacuate.

The normalcy bias also causes people to drastically underestimate the effects of the disaster. Therefore, they think that everything will be all right, while information from the radio, television, or neighbors gives them reason to believe there is a risk. This creates a cognitive dissonance that they then must work to eliminate. Some manage to eliminate it by refusing to believe new warnings coming in and refusing to evacuate (maintaining the normalcy bias), while others eliminate the dissonance by escaping the danger. The possibility that some may refuse to evacuate causes significant problems in disaster planning. —

Examples:

Normalcy bias can be expanded to include a wide variety of non-response/denial reactions to the events that occur in everyday life. This is especially prevalent given the uncertainties and fears of the social, economic, educational and governmental breakdowns in our contemporary culture. Having taught college critical thinking courses, I have studied and observed the inability of most folks to critically think through an important or serious situation – too few critically think, they react – or worst yet – they do nothing.

With so many natural and economic disasters happening currently we often witness the tragic results of normalcy bias. People unwilling to get out of harm's way – people unprepared to cope with the aftermath of a catastrophe – people totally dependent on the government, charity and others – fear, helplessness and misery.

We hear of people being warned of impending disasters such as hurricanes, floods and fires, yet there is needless suffering, death and injury because of inaction or of acting too late. I am always disappointed with people when it is reported that at the last minute so many stores are sold out of essential survival and preparedness supplies.

A primary attitude of one with normalcy bias is that the disaster or catastrophe is truly regrettable, and it will not happen to me but unfortunately it will happen to others. The person refuses to believe that they also are subject to misfortune and potential suffering. Tragedy always seems to happen to other folks.

The classic example in recent history is the unfortunate suffering and death of countless Jews during the Holocaust. During the rise of Nazi persecution, the majority of Jews could not or would accept the reality of the moment and inaction was devastating.

Those suffering from normalcy bias are unable and/or unwilling to accept the responsibility of acknowledging the reality surrounding them – and taking the appropriate and prudent action. They are in the hands of providence.

What to do?

If I had a simple answer to this question the world would probably be beating a path to my door. Overcoming normalcy bias, denial and lack of motivation is not only difficult, it requires a level of strength and determination that is counter to so much of the indoctrination of contemporary society – which fails to support personal responsibility and self-reliance.

I will however offer some suggestions to address this debilitating condition of normalcy bias – this is serious stuff – your life and the life of loved ones and associates may depend on understanding what it takes to act!

1. Acknowledge that you or another you care for experiences normalcy bias or denial. Become educated as to the effects this condition has on your life.
2. Understand that honesty is the cornerstone of emergency preparedness or contingency planning. Although it is difficult to confront the reality of the potential scenarios that might occur causing a catastrophe, denial will not make it all go away.
3. Seek the support and advice of knowledgeable, compassionate and responsible friends, colleagues and industry leaders.
4. Embrace the peace of mind that results from knowing you have taken the initiative to act on behalf of family, friends or employees if you manage a business.
5. Pray, reflect, or meditate about the value of being prepared for the consequences of unforeseen and probable emergencies or disasters, and critically think about the specific action steps to take.
6. Research and evaluate your options.
7. Remember that emergency and disaster preparedness planning requires addressing the physical, emotional and spiritual needs of those experiencing a traumatic and stressful event.
8. Utilize the guidelines, suggestions and information at [Learn To Prepare](#). Especially the strategy outlined in my article [Beginning and Improving Preparedness Planning](#).

9. [Attitude is Everything!](#) I want to encourage and support all of you who choose to move forward and be prepared and effective

***“There is no greater disaster than to underestimate danger.
Underestimation can be fatal.”***

OK, But What Do I Prepare For?

Before you can prepare, you must determine what you are preparing to survive and how each disaster threatens you, your safety and survival. That will give you the parameters necessary for the following steps.

This initial exercise isn't tough, it only takes a few minutes of thought. We suggest you jot notes or switch into your word processor while you work.

But first, it's important to realize that you cannot prepare for everything — only the army tries to do that, and we've yet to meet anyone with their resources. Captain Dave suggests you prepare only for those potential disasters that are likely to occur within the next five

years. Sure, you may wait seven years for the next earthquake, but remember the survivalists creed: *better safe than sorry*.

What's going to happen in the next five years? If we knew, our web page would look different. You'll have to extrapolate, evaluate trends, read the newspaper, conduct your own research. At the very least, take a few minutes and consider your location. Pull out a map and look what's within a two-mile, five-mile 10-mile and 25-mile radius of your home and place of work. Put on your pessimist hat and consider what might go wrong that could directly impact you. Decide if that's something you want to prepare for (see questions one and two, below).

For example, if you live a “safe” distance outside of a flood plain, your house might still gets flooded in the 100-year flood, should you prepare for it? We would, but it's your call. It's your ass on the line, so you have to decide.

That nuclear plant 20 miles away has an excellent safety record. Should a nuclear disaster be on your list? Again, you make the call.

Are you worried about a meteorite crashing into your house? Well, it has happened, but it's probably not worth preparing for.

Finally, if you've been afraid of something since you were a child — whether it's a raging fire or nuclear war — prepare for it. At the very least, you'll sleep better at nights knowing you have done all you can.

Here are some questions to ask yourself:

What natural disasters or extreme conditions am I (we) likely to face in the next five years?

Make a list and rank them in order of most to least likely to impact you. Your list might look like this:

Natural Disasters

Weather-related

Hurricanes
Tornadoes
High winds
Hail Severe
winter weather

Flash flooding
slides
Avalanche
Extreme High
Heat Drought

Heavy thunder
storms
Wildfire

Non Weather-related

Earthquake
Tidal Wave
/Tsunami
Volcano
eruption

Man-made Disasters

War
*(conventional,
biological,
chemical or
nuclear)*
Toxic material
emission or
spill
*(from a train,
semi-truck or
nearby plant)*
Riot or other
civil disorder
Nuclear plant
melt down or
other nuclear
disaster
Terrorism
Fire
Government
action against
you
Stock market crash Sever depression

Other

Plague or disease outbreak Comet strike or giant meteor

Personal Emergencies

Kidnapping Mugging, robbery or other criminal attack

Unemployment financial disaster

Death in family Home destroyed by fire

Random acts of violence

What are the ramifications of each item on my list.??

Now, take your list and create a second column. Put the ramifications of each disaster in the second column. What do we mean by ramification? How the disaster or emergency situation could affect you. Think this one through very carefully, as everyone's situation is different. For example, a family with children has different concerns than those without or singles.

Potential Disaster Ramifications

Thunder storm with electrical outage for 2 (average) to 48 hours (severe)

Food spoilage possible

Lack of air conditioning/furnace

Damage to house or car from nearby trees

Possible local flooding (see below)

Local transportation impaired by fallen trees, wires

Lightning damage/fire potential

Severe winter weather, Electrical power outage for 4hrs (average) to 72 hours (severe)

Would affect furnace operation

Exposure problems

Frozen pipes

Disruption of travel, transportation

Self or family members possibly stranded away from home

Possible food shortages and empty shelves at local markets

Nearby flash flooding Local transportation disrupted

Danger while traveling in car or by foot

Possible loss of some utilities

Nearby train derailment Possible leak or spill of chemicals

Short-term exposure problem

Long-term cancer concerns

Evacuation may be necessary

Riot or other civil disorder Disruption of commute (ala Los Angeles)

Stranded in car or office while family is at home and/or school

Danger of riot spreading to my neighborhood

Danger of local kids/low lives taking advantage of situation

Attack or threat to personal safety

Looting and rampaging by otherwise lawful citizens

Fire with potentially no response by authorities

Police are overwhelmed, cannot protect law-abiding citizens

Nuclear plant problems

Reactor vessel damage could result in release of radioactive chemicals to atmosphere

Evacuation necessary

Terrorism Threat to safety at work and during business travel

Disruption of commerce, travel

Less personal freedom, privacy as a result of government reaction to terrorism

Once you've created a chart like the one above, you know what situations you are most likely to face and can prepare your survival plan.

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Our Christian Duty to our Fellow Man

For many Christians their responsibilities to their fellow men weight heavy in their minds and the vision of a friend or neighbor coming to them for help with a staving child is a nightmare that they fear.

I have discussed this subject at length with fellow 'preppers' on various online preparedness groups that I frequent to and I have come to the conclusion that there is no 'one size fits all' answer.

For almost every scripture one quotes as to it being our Christian duty to do all we can to help our fellow man, one may quote another that distains the slothful and the ill-prepared.

In the end I believe it is up to each of us and the circumstances as to what and how much action we take. For a childless couple to give a neighbor a couple cans of powdered milk during a blizzard is not the same as a couple with children doing the same thing after an EMP attack.

To me the order of things should be God, my family and then my fellow man. I should never do anything that jeopardizes the relationship that come before.

As for me to ease my conscience and hopefully meet my duty as a Christian my own plan is to put away an extra 10% of 'preps' to use as tithe towards helping my fellows in an emergency. To me by setting aside that which God ask in tribute and then distribute it to those in need I have meet God's covenants and yet have not place my family in need or want.

I will add a warning to this solution and that is for you to be careful as to how you distribute this aid. In these days in which so many seem to deem that it is their 'right' to have their needs provided to them by others, the knowledge that you have prepared and have stores of food and goods could quickly cause others to 'demand' that you share.

When possible I urge you go through a trusted third-party to donate your extra stocks, your church or an organization such as the Salvation Army are two good choices. But try to remain anonymous with your assistance, for desperate times drive many to desperate deeds. There is a quote from one of my all time favorite TV shows Deep Space Nine which explains this so very well:

"Let me tell you something about humans, nephew: They're a wonderful, friendly people - as long as their bellies are full and their holosuits are working.

"But take away their creature comforts, deprive them of food, sleep, sonic showers, put their

lives in jeopardy over an extended period of time and those friendly, intelligent, wonderful people...will become as nasty and as violent as the most blood-thirsty Klingon."

Quark from: Star Trek Deep Space Nine, Episode: The Siege of AR-558 (#7.8)" (1998)

Or as **1 Timothy 5:8** says:

If anyone does not provide for his relatives, and especially for his immediate family, he has denied the faith and is worse than an unbeliever.

You should never commit an act of charity that in turns places your family's safety in jeopardy.

JR Cook 2/23/2010

Preparedness Test

1. Has your family rehearsed fire escape routes from your home? YES - NO
2. Does your family know what to do before, during, and after an earthquake or other emergency situation? YES-NO
3. Do you have heavy objects hanging over beds that can fall during an earthquake? YES - NO
4. Do you have access to an operational flashlight in every occupied bedroom?
(use of candles is not recommended unless you are sure there is no leaking gas) YES-NO
5. Do you keep shoes near your bed to protect your feet against broken glass? YES-NO
6. If a water line was ruptured during an earthquake, do you know how to shut off the main water line to your house? YES - NO
7. Can this water valve be turned off by hand without the use of a tool?
Do you have a tool if one is needed? YES-NO
8. Do you know where the main gas shut-off valve to your house is located? YES - NO
9. If you smell gas, do you know how and would you be able to shut off this valve? YES-NO
10. Gas valves usually cannot be turned off by hand. Is there a tool near your valve? YES - NO
11. Would you be able to safely restart your furnace when gas is safely available? YES - NO
12. Do you have working smoke alarms in the proper places to warn you of fire? YES - NO
13. In case of a minor fire, do you have a fire extinguisher that you know how to use? YES - NO
14. Do you have duplicate keys and copies of important insurance and other papers stored outside your home? YES - NO
15. Do you have a functional emergency radio to receive emergency information? YES - NO
16. If your family had to evacuate your home, have you identified a meeting place? YES – NO

**IF AN EMERGENCY LASTED FOR THREE DAYS (72 HOURS)
BEFORE HELP WAS AVAILABLE TO YOU AND YOUR
FAMILY.....**

- 17.** Would you have sufficient food? YES - NO
- 18.** Would you have the means to cook food without gas and electricity? YES - NO
- 19.** Would you have sufficient water for drinking, cooking, and sanitary needs? YES - NO
- 20.** Do you have access to a 72 hour evacuation kit? YES - *NO*
- 21.** Would you be able to carry or transport these kits? YES - *NO*
- 22.** Have you established an out-of-state contact? YES - *NO*
- 23.** Do you have a first aid kit in your home and in each car? YES - *NO*
- 24.** Do you have work gloves and some tools for minor rescue and clean up? YES - *NO*
- 25.** Do you have emergency cash on hand? (During emergencies banks and ATMs are closed) YES - *NO*
- 26.** Without electricity and gas do you have a way to heat at least part of your house? YES - *NO*
- 27.** If you need medications, do you have a month's supply on hand? YES - *NO*
- 28.** Do you have a plan for toilet facilities if there is an extended water shortage? YES - *NO*
- 29.** Do you have a supply of food, clothing, and fuel where appropriate?

For 6 months? YES - *NO*

For a year? YES - *NO*

These are all questions that need answers if you are to be safe in an emergency.

If you answered 'No' to any of them, it's now time to work on these are all questions that need answers if you are to be safe in an emergency.



Deluxe 96 Hour Kit

In emergency preparedness, a 72 hour kit is widely considered the first step in becoming prepared.

Sitting in a closet or some other area close to the front door, it can be grabbed in a moment's notice,

should you have to depart your home with little or no warning. Two days ago, only a block from my house, a neighbor's home caught fire at 3 AM. After getting everyone out, the fire hastily spread and quickly destroyed this family's home. Everything inside it was totally destroyed. What did they have left? Only the pajamas on their backs. They lost literally everything. They didn't even have shoes on their feet. They wish they'd had a good 96 hour kit. Fortunately, the whole community is pulling together for them. But not everyone is this lucky. Sometimes, whole communities are affected at the same time. This same tiny farming village back in 1978 had to be immediately evacuated for several days because of derailed and leaking butane cars. Before that, everyone here thought this was a place where disasters 'never happened.' Seventy-two hour kits would have been really handy then as well. It's not necessary that you live in a tornado or hurricane alley to need a 96 hour kit.

A deluxe "96" hour kit should contain all the essential things your family would need to take you through 4 days of being on your own. There's a reason behind the length of time the kit's contents should last. It generally takes the disaster relief agencies at least 3-4 days to move in and set up before offering assistance. Generally speaking, you're on your own during this time. Depending on how bad the situation is, it could even be longer. Whether you start with our kit or put one together yourself from scratch, it's important for your family's welfare to have one. In any type of disaster things will be bad. Not having the necessities to sustain your life and the lives of your family members could turn an otherwise manageable problem into a personal cataclysm you could never recover from. Prepare now for life's surprises.

First Aid

Personal First Aid Kit
Family First Aid Kit

Preventative Aid

Foot powder
Body powder,

Light, Heat, Fire making

Pack lantern
Spare lantern mantles
Flash light
Spare bulb, batteries
Candle lantern
Spare plumber's candles
Glow sticks
Match safe & matches
Magnesium block
Magnifying glass
Lighter
Spare flints

Navigation

Map case
Maps
Map measure
Pedometer
Compass
Altimeter
Global positioning system (GPS)

Tools and Repair

Leatherman.Gerber tool
Sven saw
Hatchet/Boys axe w/sheath
8 inch mill file
Spare parts: pack, stove, lantern
Tent/ Pack patch kit: ripstop tape
Copper wire, spool

Fishing Equipment

Pack rod case
Pack rod, spin -fly combination
Ultra lite spinning reel
Ultra lite fly reel
15 lb test Spiderwire monofilament
7DTF fly line
Fly line leaders, various lb test
Tackle boxes, small double sided (2)
Hooks, size 8, 10, 12
Fly assortment
Sinkers, split shot
Spinners
Spoons
Small plugs, poppers, bugs
Fanny Pack.

Cooking Equipment

Frying pan, folding
Cook set, nesting
Can opener, P-38
Eating utensil set
Book matches, water proof
Pack stove
Windscreen
Fuel bottles
Condiments
Salt & Pepper
Sugar
Flour
Honey
Milk, dry, instant

Personal Hygiene &

Toilet trowel
Toilet tissue, biodegradable
Feminine hygiene items
Shampoo
Comb and brush
Eye drops
Tooth brush & tooth paste
Shaving gear
Deodorant
Soap & soap dish
Bath towel

Personal

Camera, lenses, flash and film
Binoculars
Swiss Pocket knife
Sharpening stones and oil
Wallet
Extra house and car keys
Copy of important papers such as titles etc.
Handkerchief
Watch
Sun & prescription glasses
Pencil and note pad
Scriptures
Chigger powder
Mosquito repellent
Lip balm
Sun block
Body powder, medicated
Corn starch
Hand lotion

Emergency Gear

Signal flares, night
Signal smoke, day
Signal die, water
Signal mirror
Strobe light
Whistle
Space blanket
Hand warmers

Clothing Maintenance and Repair

Sewing Kit
Spare shoelaces
Biodegradable detergent
Woolite
Small scrub brush
Clothes pins
\$100 in small bills
\$10 in Quarters
Credit Cards
Debit Card
A few blank Checks

Communication

Pocket radio, battery/solar power
Cell phone ... or
Two way radio: CB, GMRS, FRS
Spare NiCad batteries
Solar battery charger

Bedding

Foam pad, closed cell
Sleeping bag Poly canteens, 1 quart
Sierra cup
Water purification tablets
Water purifier & extra filters
Water bag, nylon
Water bag liners, plastic
Solar still
Rubber surgical tubing
Air pillow

Clean Up

Scouring pads, soap filled
Sanitary tablets & dunking bag
Dish towel

Pack and Pack Frame

Pack
Frame
Clevis pins
Stuff bags
Compression straps
Plastic garbage bags
Twist ties Personal daily
rations
Energy bars, tablets
Trail snacks

Shelter

Tent
Tent fly
Tent poles
Tent pegs
Ground cloth
Ultra light weight tarp
Visk clamps
Nylon line, 50 ft. 2 ea

Clothing

Hiking boots
Trail sneakers
Socks
Underclothing
Thermal underwear
Shirts, short sleeve
Shirts, long sleeve
Shorts, hiking
Trousers, long
Belt and buckle
Sweater
Vest
Jacket
Parka
Poncho
Gloves, leather
Mittens, wool
Scarf
Balaclava
Bandanna, large
Hat
Moleskins
Swimsuit

By Glenn A. Anderson

A High-Mobility 72 Hour Kit

By Ward Dorrity

“You can ignore reality, but you cannot ignore the consequences of ignoring reality.” – Ayn Rand

The history of much of the last century was written in the blood of the victims of war, genocide, political upheaval and social unrest. More citizens have been killed by their own governments than all of the casualties of all of the wars ever fought. And the history of the twenty-first century is showing every sign of being worse than the last one in that regard. One of the lessons of recent history – lost on most Americans, unfortunately – is that our circumstances can change literally overnight. Consider Beirut, Sarajevo, the Islamic mass murders at the Twin Towers, and lately - the riots in Greece, Spain, Italy and London. These events were all harbingers of an abrupt, irrevocable and often brutal change in peoples’ lives.

It Can’t Happen Here? Think again. A Jewish tailor living in Prague could scarcely have understood what was happening to him when he and his family were rounded up by the National Socialists and packed into a cattle car – they were told that they were being ‘relocated for their own safety’. In the early 1970s, and in the span of 72 hours, the Khmer Rouge emptied every major city in Cambodia and before they were done, they had slaughtered over a third of the country – more than a *million* people - over the next few years. Sarajevo, host of the 1984 Olympics and formerly known as “the jewel of the Adriatic” fell into a flame-shot hell of barbarism with a rapidity that stunned its inhabitants. The so-called ‘siege of Sarajevo’ earned the dubious distinction of being the longest such siege in modern times – it lasted almost 4 *years*. Modern high-rise buildings became death traps as services failed and snipers picked off anyone who tried to leave in search of food, water or something to burn for warmth. Here in America, the Watts and Rodney King riots, and hurricane Katrina serve as examples of just how quickly our own civil order can vanish. The recent ‘flash mob’ robbery/assault phenomenon - where groups of blacks make use of social networks such as Twitter to organize and swarm retail establishments in order to overwhelm them and to loot them - are becoming increasingly bolder and more violent here in the good old USA. Lately, and in a more ominous turn of events, those same flash mobs have begun to target individual people for racially motivated robbery and mayhem. You can even see this on YouTube, where many of these incidents are published for ‘bragging rights’! And with few exceptions, nobody’s going to jail for it. “It can’t happen here,” you say? Don’t bet on it. It already has. This “low level ethnic conflict,” as it is now being called, is merely a stop along the way to something far, far worse.

Erosion of Trust and Social Cohesion and the One Hour Meltdown. We like to think of ourselves as fairly civilized. But the bonds that have held us together as a society, as a people, and as Americans have been systematically – and some might say *deliberately* - eroded over the past few generations. If you consider social capital

as composed of mutual trust and respect for the rule of law, then our account is seriously overdrawn. The Obama regime is already operating well outside the constraints of the Constitution and the rule of law and continues to do so with impunity. When such behavior becomes the norm for a state, bad things – *very* bad things usually happen.

Consider the following scenario: abruptly, and in the middle of a workday, a "bank holiday" is declared by the current regime. In today's context, a bank holiday declaration will most likely be the leading edge of a far broader and deep economic collapse - things are not likely to improve any time soon from that point on. For those who consider this unlikely or impossible, think again: it's been done. that at the beginning of the Great Depression of 1929, Americans had a great deal more social cohesion and were possessed of substantially more self-restraint back then. For all the hard times, the Great Depression era was relatively orderly. Now – not so much. And that has consequences.

You will do well to pay close attention to news feeds from now on – because, when you hear a declaration of a 'bank holiday,' you'll have about an hour. An hour for what, you might ask. The answer is: you'll have about an hour – perhaps less - before ordinary, everyday people around you flip right out and go crazy, some of them homicidally so. Here's one way that it might go down, and it will all happen in parallel. I've borrowed and expanded upon some of these concepts that another writer/blogger outlined in his essay, The One Hour Meltdown. The following 'bank holiday' scenario will have a grave and immediate impact on you and everyone else that you know.

1. Retail Businesses: This is the area that will likely have the most immediate effect on you. A declaration of a 'bank holiday' will effectively halt all electronic transfers of money. Since businesses will be unable to process even simple card- or check-based transactions, many retail establishments will have no choice but to shut down. They will attempt to lock their doors to prevent anyone else from entering. If possible, they will complete any transactions for customers already inside the building, but on a cash-only basis. Any customers wishing to pay by check or with a credit/debit card will be told that the system is down and that, sorry, their transaction can't be honored. Now – picture this happening in an establishment like Target, Wal-Mart or your local grocery store. Imagine the scene at the checkout lines: people with shopping carts full of stuff they want are suddenly told that, no - they can't have their stuff. To put it mildly, this will not be taken well. Let's face it – some of the frustrated clientele will NOT leave empty-handed and in an orderly fashion. Thus, the establishment can and will move from order to disorder in a matter of *minutes*. Once the first item is simply taken without paying for it, once the first

window is broken, once the first punch is thrown, all hell will break loose. The looting and the violence will start and spread like wildfire.

Even if the retail establishment has prepared for this eventuality – and rest assured that most of them have not – they will have little or no control over the ensuing chaos. For chaos there will be. It will take 5 or 10 minutes - perhaps even less - for

the implications of the retail shutdown to sink into the consciousness of everyone in the store. Again, cases where the frustrated clientele will leave in an orderly fashion will be few and far between. Your best option, *if* you are paying attention to what's happening around you, is to *vacate the premises as quickly as you possibly can*. Leave your shopping cart behind – it doesn't matter now, as it's far less important than your life. Speed, mobility and *decisive action* will be your only friends. Take purse or wallet and *immediately* slip out of the checkout line and head for the exits. If you're in the middle of the store, then hit the nearest exit, alarms be damned. Should

those doors already be locked, head out through the back and exit through the loading dock area. Trust me - this is the last place you'll want to be. Don't count on store employees, store security or local law enforcement to maintain order. The first two aren't paid enough to risk their lives, nor are they well-trained enough to deal with what's coming at them. Local law enforcement are going to have their hands full elsewhere and everywhere. Because whatever's happening in *your* location will be happening all over the place. In spades.

It won't take long for the mob mentality to take over. And some of these mobs will begin seeking vengeance on anyone or any establishment they feel has wronged them. Banks, and government buildings, courthouses or any perceived seat of authority will be the most obvious targets of opportunity. Anyone still inside those buildings will be in serious danger. Consider the recent events in Greece, where four Athens bank employees – one of them a pregnant woman – were beaten and then burned alive in their bank building. Why? Because there were riots in all major Greek cities over a *proposed* 'austerity program.'

Imagine that. But you don't have to imagine it, because it's true. So what about banks? If you think that they've got lots of cash, and that you can get some or all of yours, you would be wrong. And here's why:

2. Banks: Banks today don't have anywhere nearly enough currency on hand to sustain a bank run, much less the outcomes of a declaration of a 'bank holiday'. Unlike retail stores, most major financial institutions have contingency plans to shut down the instant they are told to do so – and yes, they will be *told* to do so in no uncertain terms by the Obama regime. Within minutes, and all across America, ATM machines will be offline, credit card and debit card terminals will become unresponsive. Banks and credit unions will close their vaults, lock their doors, and their personnel will be hastily dismissed from

the premises, except perhaps for some special security guards. Telephone inquiries to any of the financial institutions will be automatically answered by a computer with a pre-recorded message similar to the following: "Our system is currently experiencing an extremely high call volume and therefore we are unable to answer your call at this time. Please try again later when our call volume returns to normal." Bank web sites will become unresponsive and otherwise unavailable. Bottom line: *you will NOT have access to your money or to the contents of your safety deposit boxes. Period.* Neither will anyone else. Now is the time to ponder the implications of that last statement and to prepare accordingly. To put it bluntly, *if you're one of those people who live off their credit/debit cards, you*

are screwed. Again, if you happen to be on bank premises when the deal goes down, leave and *immediately* head home or to your pre-arranged rendezvous point. Because it'll get ugly even more quickly *inside* the bank. It'll take only 15-30 minutes before an angry mob begins to gather *outside* the bank. And that's no place for you.

3. Gas stations: Most people today don't remember the Mid-East oil crisis of the 1970s (thanks for the memories, Jimmy Carter), or the long lines that developed when gasoline and other fuels ran short. For the most part, though, we behaved ourselves. That will not be the case today. Most gas stations will close in fairly short order, and there will be a run on fuel. The stations that remain open will immediately shift to a cash-only, high-dollar basis, and you can just imagine how that'll affect those who live on their plastic cards. Thus, the scenes in the lines waiting to get to the now-closed pumps will quickly devolve into something...

unpleasant. *This why you must never, never let your gas tank go below half-full, and why you must always carry at least \$100 in cash.* That \$100 may only buy you five gallons in those

circumstances, but that's five gallons more than you'd have otherwise. But it's best not to be in that position in the first place. You need to be able to pass those gas stations by if you can.

4. Governments: The vast majority of our government leaders all over the world are relatively intelligent individuals – despite all evidence to the contrary. Perhaps it's more accurate to say that they are *cunning* individuals, which is not the same thing as intelligence. If nothing else, they are all possessed of a keen sense of self-interest and self-preservation. In any case, they completely understand the ramifications of a "bank holiday" in our electronically-based financial economy and what it might mean for their continued safety. They also hold ordinary people like you and me in complete and total contempt. Therefore, government offices will also be immediately shut down, and those in charge will empty their buildings and lock their doors. Any transaction in progress, including any trials or other legal proceedings, will halt and will be 'postponed until some future date'. High-level government officials, including judges and *especially* tax officials, will immediately begin to make their way to imagined places of safety.

5. Criminals: Anyone and everyone who has criminal tendencies will see civil disorder as a golden opportunity to improve their situation. More than likely, some of these criminals have already made detailed plans that include exactly which businesses they are going to hit first, second, third, and so on. We don't think that way – but they do. Any business with a reasonable level of cash-on-hand will be very high on every criminal's list. Every jewelry store and pawn shop that has any type of silver or gold coins or jewelry, or precious stones (diamonds, rubies, emeralds, etc.) will be very high on everyone's list, along with stores that sell firearms and ammunition. The warfare that breaks out at these establishments between competing criminals and/or gangs will be vicious and brutal beyond belief. You don't want to be anywhere near these places.

6. Normal People: The ethical and moral constraints binding regular folks will fall away fairly quickly – desperation and lack of understanding does odd things to people. *Especially* the unprepared ones who suddenly realize that they are well and truly screwed. It won't take long before some average people panic and begin to loot and to engage in the most desperate sort of mayhem. Grocery stores will be completely emptied from wall-to-wall, including the rear storage area within a few hours or less. Stores that sell firearms, ammunition, appliances, clothing, shoes, or anything else the average citizen thinks they need will be stripped in less than an hour. As targets of looting opportunity diminish, it won't take long for fighting to begin over the few remaining resources. Many who have lost their jobs, their vehicles, their homes, and their life savings *will now have nothing more to lose* by seeking some form of retribution against the society that they believe has taken everything away from them. Everyone who felt they got a raw deal from a traffic cop will be in a very unpleasant mood. Everyone who has had their property taxes increased at the same time their income AND the value of their home decreased will not be in a good mood. Everyone who has had their credit card interest rate increased at the same time their employer was reducing the number of hours they worked each week will not be in a good mood. Everyone who has been reduced from a two-family income down to a one-family income or less will not be in a good mood.

Everyone who lost their job because their employer went bankrupt will not be in a good mood. This will not be a good time to engage any of these folks in a conversation.

7. The Entitled Classes: There is no lack of people who have been just barely surviving in a situation where they were living hand-to-mouth on government welfare or the charity of the local community (unemployment checks, welfare checks, food stamps, food banks, etc.). You probably know some of these folks yourself. Most of them have made absolutely NO preparation for a calamity of the type that we have been discussing. They will not have any extended stores of provisions, fuel, water, etc. The instant it dawns on them that there will be no more government welfare or charity, then these individuals will have no hope for survival unless they are able to immediately acquire the food and other resources they need before it is all gone. This will be particularly true for what we have

come to know as the inner-city ‘entitled classes.’ Anyone who tries to stand in their way, or who tries to reason with them will find that their own life will become nasty, brutish and short. And once they’ve reduced their cities into wastelands and slaughterhouses, they’ll come boiling out of those urban areas and into the countryside looking for fresh ‘opportunities’ - that being you and yours and your carefully managed preparations. There will be only one way to deal with them. Best to have your neighborhood ‘unwelcoming committee’ on 24/7 watch. But that’s an entirely different subject.

Now what?

Time to think the unthinkable. If you have not previously thought about the above scenario, or if you are not intellectually and emotionally prepared to deal with it, then the chances are not very good for your long-term survival. Let me say that again: *If you have not previously thought about the above scenario, or if you are not intellectually and emotionally prepared to deal with it, then the chances are not very good for your long-term survival.* In other words, you are going to wind up dead - or worse (yes, there’s worse than dead) - and in fairly short order unless you are phenomenally lucky. Many of the above events will happen simultaneously during the first hour of the crisis. After that first hour has passed, then things will begin to get *really* nasty. Everyone will quickly realize there are not enough law enforcement personnel to protect everyone and everything. In fact, a sizeable percentage of law enforcement personnel will think of family first and the rest of us as a very distant second priority – if they even bother to think of us at all. Remember – most police hold us ‘civilians’ in contempt. Although the military will probably be ordered to protect specific high priority/high value establishments and resources, there will simply not be enough military personnel to protect individual civilians or businesses. In any case, you simply don’t want to be anywhere near these places and situations. You’ll have to be mentally and physically prepared to get away from them and fast. Have a safe place to go (preferably more than one) or a rendezvous with others for mutual support.

The Best Defense. Your best defense against catastrophe is to *PAY ATTENTION!* Take those iPod plugs out of your ears. Self-absorption in trivialities *will get you killed* at a time when immediate and decisive action is called for. No one has a crystal ball, but keeping a “weather eye” out for trouble is just pure common sense. Now, if all of this seems like too much trouble, then ask yourself a simple question: what’s your life worth? Or the lives of your loved ones? If you choose not to consider this question and its implications out of fear or out

of scorn for what you believe is unthinkable, or if it all seems like too much work, or if you’re simply in denial about the events happening around you, then you’ve sold your life and theirs cheap. And believe me, there will be many, many who will do just that. If you’re reading this, then you’ve taken the first step towards not being ‘that guy’. Don’t be ‘that guy’. Do you want to live? Decide now.

Get Out of Dodge!

So here's your picture: Everyone – and I mean everyone should have within reach a kit that will help them to leave wherever they are and proceed to a place of relative safety. DO NOT stick around to see what happens once things start to get dodgy. There will be no neutral spectators in this game. In fact, if you're watchful and prudent, you won't even show them your taillights before the party gets started. If you have planned well (and you *do* have a plan, don't you?), then you will have a fighting chance to make your way home or to your rally point. To accomplish that in relative comfort and safety, you'll need something more than a bag of Doritos and your car keys. You'll need a Get Out Of Dodge kit. This is at its most fundamental, a bag of food, water and gear that'll sustain you for three days 'in the field.' Most of the gear used to build these kits is off-the-shelf and relatively cheap. You'll be out about \$300 - \$500 for a complete kit, minus weapons and ammunition. Cheap

insurance, any way you look at it. Check out *Cabela's*, *CheaperThanDirt.com* and *SportsMansGuide.com* for the best deals.

So ask yourself: what are you going to do when

1. Civil unrest / breakdown occur.
2. Communications go down. The recent flash mob phenomenon just about guarantees that cell phone services will be shut down by the authorities.
3. Law and order becomes sporadic or non-existent. Remember: even in the best of times, when seconds count, the police are only minutes away.
4. You may have to fight to preserve your own life or protect others' lives in order to get where you're going.
5. You may have to abandon your vehicle in the face of mobs or roadblocks.
6. You may have to walk to a prearranged safe place or rendezvous/rally point.
7. You may need to move quickly and not 'camp out'. Rest, yes. Camp, no.
8. The weather may not be your friend – hot, cold, wet, snowy. Prepare accordingly.

What's *your* plan?

As I've said, you're going to have to get the hell out of Dodge, and quickly, too. *That's* what you're going to have to do. And to do that, you're going to have to be prepared with the means to sustain yourself for at least three days 'in the field'. Now, if you're lucky, you'll be able to quietly get up from your workplace, excuse yourself and drive home without incident. But don't plan on it.

Your 'Get Out Of Dodge' Kit – Where to Keep It

If you're a vehicle-based commuter, your car or truck will be your best place to keep your gear. The usual common-sense security considerations apply here. In any case, and regardless of your clothing choices, it's good to have a complete set in your gear bag or locker in your vehicle. You are almost always going to be relatively close to your vehicle, so it is good strategy to have all your gear in a waterproof case in your trunk or covered pickup truck bed.

If you use public transportation, your choices and operational plan become much more difficult – but not impossible. First of all, in the scenario we've outlined above – civil unrest, etc. – public transportation will either be down or will become very, very dangerous in very short order. So don't even think about using it. This also means that if you want to live through a scenario like this, you're going to have to get creative in terms finding a place at work to stash your gear. If you have a lockable office, then you've got some options. If you're a cubicle dweller, then you're going to have to disguise your kit as something else. Get your co-workers used to seeing you with a big gym bag, messenger bag or other carry-all of that sort. You may have to settle for just a messenger-style sling bag, and you may also have to settle for just a pistol inside it– but still, something is better than nothing. Start thinking in those terms if you haven't already.

Why Do it This Way?

This is a layered approach, with duplication of key items at every layer where practical. Strategy for this assumes that you may lose your backpack and/or your sling bag. Or that you may not have time to suit up, and that you can only grab your sling bag and/or backpack and weapons. Yes, I said *weapons*. How do you plan to deter thugs intent on robbing and killing you? Harsh language? The voice of sweet reason? Get real. Don't kid yourself. Some key points follow:

Be Good to Your Feet

When it comes to your feet, you must treat them as royalty. So think: *can I run, climb, fight and walk long distances with what I have on my feet right now*? If the answer is **no** to *any* of these questions, you may be – no, you **WILL BE** in for a world of hurt. In fact, under the scenario outlined above, you will probably be *dead* sooner rather than later. You've got to be able to move away from trouble as quickly as you can. Your every-day footwear should be a pair of decent hiking shoes or durable shoes in case you can't put your boots on in time. Boots with puncture-proof soles could save your life. You do have good, broken-in boots or durable footwear for the current season, don't you? If not, get some **NOW** and break 'em in.

A Word for Womenfolk

Yeah, I know – the shoe thing. But here's the cold, hard, immutable truth: in a bad situation, *those flip flops, Jimmy Choos or Manolo Blahniks will get you killed*. Why? Because you will not be able to do the things that you absolutely must be able to do when things get ugly: specifically, run, climb, fight and walk long distances in those cute, but now worse-than-useless shoes. Without question, *you will be a liability to yourself and to anyone you're with if you don't have sturdy, well broken-in footwear*. The term 'fashion victim' takes on a whole new meaning here, doesn't it? Don't be one.



Figure 1 - Men's Bates infantry boots - about \$80



Figure 2 - Women's Bates side-zip duty boots - about \$80

Protect Your Eyes.

If you're near an outbreak of civil disorder, the air will soon become filled with debris and other unpleasant things. As I mentioned earlier, gunfire will shatter glass and send it flying, and impact with masonry will spall shards and splinters of material everywhere. Get hit in your eyes with anything like that, and you'll be blind, perhaps permanently. If you can't see, you can't fight, flee or do much of anything that you'll need to do in order to stay alive. Ordinary glasses, if you wear them, offer better-than-nothing protection for your eyes, but not much else. So don't rely on them. It will be worth your while and your eyes – and perhaps your life – to acquire an inexpensive set of eye protection. It's a common industrial item, readily available. Better still, get a set of protective goggles like the ones used by our troops in Iraq - they are also less than \$20, and will accommodate most eyeglass wearers. See to live – live to see.



Figure 3 - GI Issue Sun, Wind and Dust Goggles – about \$20

Be Good to Your Hands

Most people don't think of this. You need good gloves in order to protect your hands. Here's why:

One of the by-products of civil unrest is rubble, broken glass and large quantities of other debris. All of which can turn your hands into hamburger in fairly short order when you come into contact with it. And you WILL come into contact with it. Why? Think about it – you're almost certainly to have to make your way through areas that have taken the brunt of destruction from a variety of sources. This means that you're going to have to climb, crawl, and go prone or otherwise come into contact with your environment. If you're in an urban area experiencing civil unrest, storefronts, office buildings and vehicle windshields will generate an astonishing amount of broken glass, jagged metal shards and other debris in fairly short order. Gunfire will spall sharp hand-shredding, foot-puncturing, eye-blinding shards of concrete, masonry and other debris everywhere. If heavy weapons come into play, this destruction and its accompanying rubble will be even greater and even more widespread.

The point of this is that good, durable gloves that allow you both dexterity and protection are absolutely essential, no matter what the season. Cost – about \$30-\$40 for a good set of Kevlar-constructed gloves. The ones shown in figure 4 are a bit more, as they also incorporate hardened knuckle protection.

Very cold weather calls for a warmer glove, but leaves you with the problem of weapons handling. Experiment until you find a glove that keeps your fingers warm but allows you enough freedom of movement and sensitivity to handle tools and weapons.

Knees and elbows next.



Figure 4 - BlackHawk Fury Comando HD Gloves – about \$60

These are warm weather gloves. Use a variant with Thinsulate Insulation for colder weather. Make sure that you can handle all of your gear, especially weapons, with gloves on.



Figure 5 - Frabill® Performance Task Gloves about \$36

A less expensive, but still highly functional pair of gloves. Don't compromise by going cheaper.

Be Good to Your Knees and Elbows.

Most of us never think of having to protect these indispensable parts of our anatomy. If you ever have to kneel, crawl or go prone in gravel, broken glass or riot debris, you'll be very sorry indeed if you don't have some sort of protection for your knees and elbows. The first time you spend some time firing a rifle in the prone position out in the field, you'll immediately understand the issue. Knee and elbow protectors are pretty inexpensive, and you should find those that will match the clothing you're wearing. And get them on immediately as part of your dress-out/load-out routine. You may not get a chance later. You'll have a huge edge where others won't. And in some circumstances, you could even make broken glass and other debris work in your favor to discourage unwanted company from following you.



Figure 6 - Tru-Spec Tactical Elbow Pads Nylon Polymer – about \$15

First layer – Combat Uniform or Inconspicuous Durable Clothing

You may or may not wish to put on BDUs (Battle Dress Uniform) depending upon the circumstances. If you're going to remain in an urban area (*very bad idea*), or wish to escape from one (*very good idea*), dark or gray inconspicuous clothing may be best. Even the latest digital Army camo can stand out if no one else is wearing it. You want to be as inconspicuous as you can be in whatever environment you find yourself. *The important thing is to have comfortable, durable clothing that can take some abuse and that you can wear for days.* For example, Carhartt makes very well-made double-fronted work jeans that wear very, very well, and come in colors that will blend a variety of environments. Usually about \$40. Irregulars can be had on sale for about \$10-\$15 less.



Figure 3 - Carhartt double front jeans

For another example, the Outback Trading Company Long Unlined Drover (or duster) is tough and durable with an oilskin shell. Wearable in all but the hottest weather and with a wool liner for colder weather, this will keep you dry, cut the wind and offer concealment for short rifles, shotguns and other weapons. The length will tend to keep your legs from getting soaked in windy, rainy weather. Available from Cabela's, it's gotten great reviews. Check it out. About \$130. Not cheap, but it is definitely worth the money.

Filson offers first-rate outdoor clothing. Their motto is, "Might as well have the best." And they're not kidding. Not cheap, either

Their Shelter Cloth Duster shown below can be configured with a hood and various weights of zip-in liners. It's the last outdoor coat you'll ever buy. www.filson.com

In general, dark clothing will serve you well in an urban environment. But don't go for dead black. Black stands out more than you might believe ninja stories notwithstanding. Flat grays, olive drabs and tan/khaki work pretty well. In fact, grayish clothing may be one of the best choices for an urban environment. Bright colors or otherwise shiny fabrics are right out – unless you want to look like a target.

Some tactical clothing manufacturers make inconspicuous pants with inserts for kneepads – well worth checking out. If you ever have to kneel on gravel, debris or broken glass – and you almost certainly will at some point in a civil unrest scenario - you'll be very glad you had this particular fashion accessory. Same goes for your elbows. Get protection for these important parts of your body.



Filson Shelter Cloth Duster coat – about \$350



Figure 8 - Outback Unlined drover coat.
About \$130.



Filson Tin Cloth Packer coat – extra-long - about \$320

I own this one - tough as nails and supremely comfortable .

For full-up combat dress, I prefer 80's era Swiss Alpenflage. This is what works for my area. Cheap and readily available (or used to be), works great for the inland Pacific NW environment. The important thing is to rig for your area and circumstances.

Again, I strongly recommend good, *well broken-in* boots with puncture-proof steel shank soles (for reasons we've already discussed) and a PASGT helmet with appropriate cover. A good helmet will save your life – without one you stand an excellent chance of becoming another piece of bio-degradable scenery. You can somewhat conceal the fact that you're wearing one by flipping the hood of your coat or poncho over it. There's plenty of PASGT gear on eBay if you don't have a local source. Avoid the stuff with bullet holes in it, though. Probably bad luck. So think it through and wear what will work for your environment and will help to reduce your profile.



Figure 12 - PASGT helmet without cover - around \$70-\$90 on eBay



Figure 9 - Alpenflage combat blouse



Figure 10 - Alpenflage combat pants



Figure 11 - Swiss Alpenflage. 80s era camo gear.

First Layer combat uniform contents

Your pockets and belt will hold the following essential items:

1. **Strike-anywhere matches.** Best to put them in a waterproof case. UCO Stormproof Matches are the best matches available for harsh conditions. Each match burns for about 15 seconds even if it is windy, rainy, or cold. The matches even burn underwater. Extra strikers are included.



Figure 13 – Strike anywhere matches

2. **Fire Starter.** BlastMatch with tinder of some sort. Yes, it's redundant, but you can't have too many ways to make a fire. WetFire Tinder is one of the best fire-starting materials available to help you get a blaze going even in a downpour! They extinguish instantly leaving no residue, odor, or smoke. 8 Cubes burn for 12 minutes each.



Figure 15 - Wetfire tinder



Figure 14 - Blastmatch fire starter

3. **Maps.** Topo maps or even Jeppesen charts (standard aviation charts) are very useful. Create a custom Google or Bing map of your E&E routes. If you do, then laminate them for durability and to make them waterproof. You DO have more than one escape route worked out, don't you?

- 4. Compass.** In a worst case scenario, you may not be able to rely upon a GPS device. Learn how to follow a compass bearing. With this knowledge, you can guide yourself through thickly forested areas, featureless winter landscapes, foggy and/or overgrown areas, etc. An orienteering class or two will put this knowledge in practical focus.



Figure 16 - Standard military compass

- 5. LED Flashlight and extra batteries.** Use what works best for you. Carry at least two. Most run on 3 AAA batteries. You should also consider the use of a headlamp. There are times when having both hands free AND having a light source directed at your work can literally be a life-saver.

The Streamlight Trident® Headlamp packs 3 different beam options including a powerful 300 mA Xenon bi-pin bulb for 18 lumens, 2 standard white LEDs and 1 safety green LED for low light work. This is the gold standard of headlamps and it's a lifesaver. About \$25 at www.sportsmansguide.com

- ☑ 300 mA xenon bi-pin bulb (18 lumens), plus 2 100,000-hour life LEDs (24 lumens) and 1 safety green LED
- ☑ 3-position lighting: xenon bulb, 1 safety green LED, 2 white LEDs
- ☑ Spot to flood focus
- ☑ Adjustable elastic head strap and rubber hard hat strap
- ☑ 90 degrees tilting head
- ☑ Durable compact ABS body
- ☑ Powered by 3 AAA alkaline batteries run up to 150 hrs (single LED)



Figure 17 - LED flashlights



Figure 18 - Streamlight Headlamp

6. **Energy bars.** Easy to consume on the go. Always have something like this in your pockets. Forget the low-fat stuff. You're going to need the calories, and this is no time to diet. Stuff 2-4 of these in your pockets. Wrap them in a zip-lock or two to protect them. The zip-locks themselves are useful items.



Figure 19 - Millennium Energy Bars - 400 calories each

7. **Extra Clothing Layer.** Refer to the Outback duster mentioned previously. Failing that, or if local weather conditions make such gear impractical, consider a poncho and/or a parka. You could even use a Mylar emergency blanket or even a 3 mil contractor's bag in a pinch. Naturally, this is all area / climate / season specific. A light poncho will fold up into one of your pockets. So will an extra pair of socks in a waterproof bag, and those could be a lifesaver because they may save your feet at some point. Remember – even at the height of summer, it can still get coolish-cold at night, especially in the northern tier of states and/or latitudes. If you stop to rest, you've got to keep warm.

8. **Gloves.** Save your hands. You need to be able to use your hands. This means protecting them from the elements and from hard use. Make sure your winter gloves will do what they are supposed to do AND allow you enough dexterity to use your weapons effectively. Lightweight gloves for summer, warm ones for winter.



Figure 20 – Frabill® Performance Task Gloves – warm weather only.

11. Individual First Aid Kit (IFAK). Carry basic first aid supplies such as sterile gauze and pads, Band-Aids, moleskin (always, always protect your feet), quickclot bandage, etc. Be sure to include some sort of eyewash like Visine. A small kit of the basics will fit in one of your pockets. You get the picture. **Be smart and take a first aid course** or two at your local community college – the knowledge you gain can literally be a life saver for you and others. A typical IFAK might contain:

- EMT shears (very important – should be in the top of the kit, as you’ll need them to cut away clothing to get to a wound)
- Tweezers
- Eye Patch Dressing
- 4” Israeli Battle Dressing – HIGHLY recommended
- Quickclot powder
- Water Purification Tablets
- Tube of SuperGlue (refresh often – gret for closing cuts)
- Disinfectant – betadyne or hydrogen peroxide
- Lip Balm
- Muslin for bandage, wrap or sling (2)
- Moleskin – lots of moleskin
- Assorted Adhesive Bandages (10)



Figure 25 - Individual First Aid Kit (IFAK)

12. Knife / multi-tool. Preferably one of each. An extra knife on a lanyard around your neck or clipped to an inner pocket is good insurance. You can’t have too many knives. Carry at least one knife heavy enough for fighting and light shelter construction.



Figure 26 - CRKT folder with clip



Figure 27 - Remington 1911 Multi Tool Black

13. A pair of heavy lineman's pliers/wire-cutters. This tool will handle situations that are beyond the capabilities of your multi-tool. Very useful for getting through obstacles like small chain link or wire fence. Can also be used to make obstacles and traps out of heavy gauge wire.



Figure 28 - Irwin 7" lineman's pliers/wire cutters

14. Water. Do not allow yourself to get dehydrated!
Adopt/adapt your water carrier for your circumstances. You should have a pouch or space for a Camelback-style water bladder. Best thing to do is to keep a gallon jug of fresh water in your kit so that you can fill your water bladder(s) or bottle(s) on the spot before you depart. You don't want to keep water in your canteen / water bladder for an extended length of time. So you can keep your main water supply fresh by dumping the jug once a week and refilling it with fresh.

- **Water purification.** Clean water is a must! But you won't always be able to count on having it handy and clean. One of the best products I've encountered is the Polar Pure water disinfectant system. Compact, effective and inexpensive. One unit will treat 2000 quarts of water. Available on Amazon.com. Get several. You won't be good for much if you're blowing your guts out of both ends. Caveat: the Polar Pure iodine-based system and others like it are of limited value against protozoa cysts. Cryptosporidium in particular is resistant to halogen treatments. You may need to pre-filter your water before you treat it – depends on your operating area.



Figure 29 -100 oz water bladder



15. Ammunition. At least one full rifle mag and one pistol mag. Dedicate a secure pocket for one of each of these. One is better than none. Most pistol rigs will have places for an extra magazine or two.

NOTE: There's a small emergency kit that works very well and can be modified for your own use. About \$60, it is waterproof and fits nicely in cargo pants or BDU pockets. This kit measures 6-1/2" x 3-7/8" x 1-5/8" and comes with the following items:

BlastMatch fire starter
WetFire tinder
StarFlash signal mirror
JetScream whistle
SaberCut saw
HardCache carrying **case**

I would be inclined to lose the mirror and the whistle, as you're not going to be interested in advertising your whereabouts in the sort of situations we're contemplating here. Substitute water purification tablets and more tinder or small first aid items for the mirror and the whistle. Add a Smith's PP1 pocket sharpener for less than \$10.

My version of this kit has the following items packed in the HardCache carrying case:

- BlastMatch fire starter
- WetFire tinder
- Trioxane bar
- Small gerber knife
- Small LED flashlight (single AA battery)
- SaberCut saw
- Mylar emergency blanket

A word about the SabreCut saw: It sells for about \$25 and is essentially a chain saw in your pocket. Check out Amazon.com for user reviews. It's truly amazing how well this works.

Nice package for a single cargo pocket. If you can afford it, add one to your sling bag, too.

You can get it here:

<http://www.cheaperthandirt.com/CAMP224-1.html>



Figure 30 - Compact emergency survival kit



Figure 31 - Smiths PP1 pocket sharpener

Extras if you've got the pockets or the inclination:

1. **Small radio w/extra batteries.** Why carry a radio? Because your cell phone may become unusable in fairly short order. Or worse, it may serve as a means for people who are not your friends to locate you. Look for a 22+ mile range GMRS/NOAA weather combo. If you've made arrangements with others to meet up, that type of radio can be invaluable. Be secure about using one, though. Learn its use and its useable range in advance. Practice.
2. **25-50 ft of parachute cord.** Whatever and wherever it fits. Very, very useful. That cord, some branches and your poncho or a couple of 3 mil contractors' bags can construct a decent impromptu shelter. Which could be a life-saver for you or someone else.



Figure 31 - Midland GMRS radio set - about \$60

I've left off fishing kit and items like that because you're probably not going to have the time for fishing and in any case, you have room for that sort of thing in either your sling bag or your small backpack if you really must have it.

Practice and test. Finally, when you've got that all together, field test it. See how fast you can get it all on, boots and helmet included. Speed counts, and in a tense situation, your training here will definitely pay off. Do it again and again. Then do it at least once a week. Walk, trot, run and see what rattles. Quiet the rattles. Then roll down an embankment, throw yourself down flat, tumble if you're capable and see what you've got left. Fix what you have to. Walk, trot, run. Still quiet? Still have everything? Good.

Break in Your Boots! I'll say this again - you've got to be kind to your feet. The time you are obliged to take a 40 mile trek home is NOT the time to break in your boots, or to find out where the problem areas are. Break them in *with all the gear you're going to carry*. And carry moleskin for blisters. Lots of moleskin.

Second Layer – Sling Bag

The sling bags / messenger bags offered by places like *Cheaper Than Dirt* and *Sportsman's Guide* are great. They're light, easily snatched up, relatively inconspicuous and the contents will afford you an extra day or two of operation in the field. Plenty of MOLLE webbing attachments for your customization pleasure, but *don't* overload it or bulk it out.

The premise is that even if you don't have time to suit up, you can still grab your weapons and sling bag and make a decent go of it. Yet you want stuff handy if you must fight. I wear mine on the left, since I'm a right- hander. The one I use also has a waist strap to keep it from flapping in the breeze – I consider that essential.

To a certain extent, I replicate the items listed for in the bag and the list below reflects that. But it differs in some details and sports a few additions. Ammo, for instance. I hang a 3 mag pouch hanging on the exterior front strap for my AR carbine, and there's more ammo and an extra full rifle and pistol magazine in the bag. Again, you're not looking to camp out – you want to keep moving towards your destination. Rest, but don't set up housekeeping. Even if this is all you can grab, then you have greatly improved your odds.



Figure 32 - Messenger bag with MOLLE attachment base

Second Layer Sling Bag Contents

1. **Strike-anywhere matches** in a waterproof case.
2. **Fire Starter. BlastMatch** with tinder of some sort.
3. **Maps.** Same as above
4. **Compass.** Yep, another one.
5. **LED Flashlight and extra batteries.** Where practical, your radio, flashlight and any other electronic device you might carry *will all use the same batteries*. Still, you're probably going to wind up with a combination of AAA and AA batteries.
6. **MRE** of your choice. A good *hot* meal (some familiar with MREs may dispute even the possibility) can make a big difference to your outlook. Even the (ugh) omelet ones. Make sure that your MRE comes with a heater. Not all of them do.
7. **Energy bar(s).** Something to eat on the go. Forget diet stuff – you're eating to live, and you're going to be burning a lot of calories while on the move.
8. **Extra Clothing Layer.** Same as above. Don't forget those socks!
9. **Extra pair of season-appropriate, durable gloves.** If you need them, you'll be *very* sorry if you don't have them.
10. **Contractor's bag(s).** Throw in a couple of these 3 mil bags if you have room and they don't take much. Makes a great emergency shelter and/or an impromptu poncho. Lots of other uses.
11. **Sunglasses AND regular glasses.** For those of us who need glasses, the investment in an extra pair of each could be a life-saver. The messenger bag version of the sling bag accommodates glasses in hard cases nicely. In any case, make sure that you have some sort of eye protection.
12. **Binoculars.** No need to explain why you might want this. Compact, decent quality and easy to get to. Hang 'em in their case on your sling bag strap.
13. **First Aid Kit.** Carry additional first aid items as mentioned above. A compact IFAK will do nicely.
14. **Knife / multi-tool.** Preferably one of each. Again. You can't have too many knives.
15. **Empty Water container.** You can fill it later. It'll add to the one on/in your backpack or on your belt.
16. **Water purification system.** Polar Pure as above. Now, you're up to two of them. Lose one, you've still got one.
17. **Rifle / pistol mag.** Full, and one of each. They'll be inside the pack along with as much extra ammo on strippers as you deem fit or have room for. Don't overload it, though.
18. **Rifle ammo on strippers.** 5.56 mm doesn't take up that much room and you can probably carry an

extra 2 or 3 magazines worth. Remember to include a couple of extra stripper guides. Wear one around your neck; keep the other in a zipper compartment in the bag.

19. **Rifle mag pouch.** Hang this in an easy-to-get-to place on the outside of the bag. Most will hold three AR-style mags. The fundamental thought here is that you should carry as much ammo as you comfortably can. You'll burn through it quickly in a firefight.

Again, practice and test. Same as above. Still have everything? Still quiet? Good.

Third Layer – Small Backpack

Cheaper Than Dirt and *Sportsman's Guide* offer some nice compact backpacks. I like the so-called Level III assault pack. It's big enough to hold more of what you need for an extra two or three days in the field, expands your available food and ammo, provides for a change of socks, underwear and t-shirt, insect repellent, a small folding shovel and a hydration pack. A small camping stove like the foldable pocket cooker shown here - \$13 from <http://www.sportsmansguide.com/>:



Figure 34 - folding pocket cooker

Very compact, burns any fuel, although trioxane bars or military fuel tabs don't give off smoke. Combined with a small mess kit and a tin cup, you can produce hot food and drink very quickly. Well worth the carry weight.

Depending upon what you feel like stuffing in there, you can add a small waterproof bag with a towel and some baby wipes. Yes, baby wipes. Ask any of our troops who have been in the field overseas and they'll tell you that they're indispensable for staying clean in tough environments. Getting clean is a real morale booster – don't overlook



Figure 33 - Level III Assault Pack

it. But don't go for a big fat backpack that'll hold everything including the kitchen sink. You want to stay light on your feet and to be able to move fast. Can't do that with a big monkey on your back.

Again, practice and test. Same as above. Still have everything? Still quiet?

Weaponry

When things get dicey, don't assume that you're going to just drive off or stroll home without incident. A rifle, a pistol and a good fighting knife (that is, a knife that you actually know how to fight with) are essentials. The sane among us know that the last thing you want to do is to get into a firefight – or any kind of fight for that matter. But if you do, you want to have a chance to prevail. Again, *carry ONLY what you know how to use*. Otherwise it's likely to be taken away and used against you. You don't want that.

This will be no time for on-the-job training. If you don't have the skills AND the mind set to *kill* your opponents without hesitation, take a practical martial arts class of some sort (NOT tai chi, dammit – try Krav Maga or Kung Fu San Soo) and get thee to an Appleseed event *taco pronto* to learn how to shoot like a rifleman. www.appleseedinfo.org. Follow that with a practical self-defense pistol course.

But none of this is worth a damn *if you aren't prepared to use it*. And it's not just a matter of skill. It's your willingness to incapacitate and kill your opponent as quickly as you can. Short, brutal and nasty. Do you want to live? Decide now. If the answer is 'yes,' then you've got a chance. If the answer is 'no,' then you won't be going home.

As for weapons, everyone's got an opinion – so I'll just tell you what I pack and why.

1. **Rifle.** M4 carbine or equivalent. Decent ones are round \$750 in 'plain Jane' configurations. Light, accurate within reason and you can carry *lots* of 5.56mm ammo. I carry many loaded magazines – one in the rifle with another taped to it, three in a quick-access pouch on the sling bag, one inside it and two more in the backpack. Plus more ammo on strippers for a total load-out of 420 rounds. My rifle's in a soft padded case with a sling, so I can carry it in a slightly more inconspicuous fashion during the initial part of my journey out of my semi-industrial work area. You can customize this rifle to your heart's content. My recommendation: keep it simple. It's more important to learn to shoot like a rifleman and to maintain the skills than to play with accessories or to drop big bucks on fancy optics that will either approximate or exceed the value of the rifle. The Appleseed program (www.appleseedinfo.org) will be the best weekend you and your rifle will ever spend. And it may - no, it *will* - save your life.



Figure 35- my AR15 carbine with sling

2. **Pistol.** Glock mod 20 (10mm) with one 15 round mag in the pistol, two in the carry rig, one in the sling bag and two more in the backpack. This is a full-sized hard-hitting pistol, a real fight-stopper. I won't debate choice of caliber here - it's been done to death in too many other places. What you should do is to carry the biggest, hardest-hitting caliber you can handle with skill. Here's a hint: any caliber starting with a '4' is usually a good bet. Here's the deal: you're not going to be firing warning shots; you are going to KILL the son of a bitch who's trying to harm you. Anyway, if you're down to your pistol, then you've got other things to worry about besides calibers. Lots of good pistols out there. Find one. Learn it. Love it. Master it.



Figure 36 - 1911 45 auto and Glock model 20 10mm

3. **Tomahawk OR Stanley FUBAR forcible entry tool.** One 'hawk MOLLE'd to my backpack front strap. Personally, I like tomahawks. Very nasty weapon for a close-quarters fight. If you're facing more than one opponent, the sudden and terrible damage you can visit on the first opponent is instantly instructional to the others and may end the fight right there. Learn it, love it, and kill with it if you have to. Or use it to make a nice temporary shelter. Works either way.

The tomahawk show here has the advantage of being very light and fast, qualities that go a long way towards making it a superior fighting tool. Just as with a knife, you will seldom achieve an instant kill with one of these, especially in a straight-up fight, but you can deliver sufficiently painful and serious wounds to your opponent that will buy you valuable time to finish the job.

If you're not skilled with the tomahawk, there are very useful alternatives. We're talking here about the **Stanley FUBAR forcible entry tool**. The Stanley FUBAR Forcible Entry tool is, like the tomahawk, a dual-purpose tool. They're about \$70-\$80 bucks and are extremely versatile – and very nasty as a weapon in practiced hands. Look it up and get one if you're not a 'hawk aficionado. It's not too hard to think of situations where a good demo tool could be a life-saver. For example, if you're strong and determined, you can in short order use the 18" the Stanley FUBAR to smash through sheetrock, wrench 2x4 studs apart and out of the way – and presto – you've just made yourself an impromptu exit or entrance. A wall is only a wall until it has a hole in it.



Figure 38 – SOG Fusion Tomahawk – about \$35

Figure 39 - Stanley FUBAR Forcible Entry Tool – about \$80



4. **Fighting knife.** A Cold Steel tanto MOLLE'd to my sling bag. Set up for a right hand draw if that's all I want to use or a left hand draw if I've got the 'hawk in my right hand. Mine's over 35 years old, well used and well loved. Here's the thing about knife fighting – knife wounds are seldom *instantly* fatal. That's a key qualification. If you're close enough to stab or cut your opponent, then they're close enough to do the same thing to you. I've been taught to use a knife to deliver a quick and surprise strike that inflicts great pain or otherwise interferes with my opponent's vision. This distraction simply buys time to either get away or arrange something more permanent for my enemy. Don't like to think that way? Better start now and get used to it. If you want to live, that is.



Figure 40 - Cold Steel Tanto Recon

5. **Miscellaneous small knives.** Everywhere. You can't have too many knives.

Tools For Your Vehicle

If you're lucky enough to be able to drive away in advance of whatever unpleasantness begins to develop, there are some items that you might want to keep in your vehicle. Just in case. What we're talking about here are basic pioneering tools – pick, shovel, 6' pry bar – and a few other things that will smooth your path and get you past most common barricades. Be creative in the use of your tools, but also be sensible. Always use the right tool for the job at hand.

Here's the deal – ordinarily, you wouldn't carry all of this around in your vehicle. Although, if you live in a rural area and/or snow country, none of this will come as a surprise. You'll already have most, if not all of it aboard as a matter of course. But if you've got your nose to the wind, you'll get the sense that trouble's on the horizon – and that calls for a higher level of preparedness and anticipation of trouble. Trust your gut on this. You may already have snow chains, a basic mechanic's tool set and a highway safety kit in your car, but we're talking about going well beyond that for special circumstances. Make use of wooden boxes or heavy-duty plastic cases to contain and organize your

tools, chains and spare batteries. Cover items with heavy contractor's bags to keep them dry. Lightly oil exposed metal shovel blades, etc. Inspect everything regularly. Take care of your tools and they'll take care of you. More importantly, it's a good habit of mind that generalizes to other areas. An old saying goes something like this: "90% of life is maintenance."

Note that a lot of what's in the following list can be had for pennies on the dollar at garage sales or swap meets

1. **Pick.** Nothing fancy here. Just a good old-fashioned digging instrument. Gets through stuff shovels won't.
2. **Shovel.** Again, nothing fancy. Also carry an aluminum grain scoop in the winter time if you're in a snowy area. Makes a great snow shovel.
3. **5' pry bar / breaker bar,** 17 - 18 lbs. Tamp on one end, wedge on the other. Great for prying things open or other sundry demolition tasks. One good whack with the wedge end will blast open most small locks. Also a nasty weapon if you're strong enough to wield it. When it comes to locks securing gates or fences, think ahead – if you come to a chained gate and you must remove the lock, carry a spare lock or two to re-secure the gate after you're through. Hang the re-secured lock and chain just the way you found it. Be sure to remove the opened lock from the scene. This may buy you some additional time and discourage pursuit.
4. **Sledge hammer.** Too many uses to detail here. Be creative. Even a small three pound short sledge can be a very useful companion tool.
5. **Chisel.** Throw in one of these while you're at it. Put that three pound short sledge behind a good chisel and very little will stand in your way.
6. **Sawzall.** The king of demolition tools. This should be an 18v-24v battery-powered Sawzall reciprocating saw with at least one spare battery pack. Make sure that you have an assortment of spare blades suitable for differing materials in the case that it comes in. If you have to pick one blade, go the metal cutter. It'll work on wood, too, just not as well as once designed for wood. Practice with it on different materials to get a feel for how it works. There are very few problems that can't be solved with a Sawzall.
7. **Medium drill / rotohammer.** More powerful than a regular drill. Obvious uses. Indispensable if and when you need one. Battery powered - should also be an 18v-24v unit, preferably with an extra battery of the same type used by your Sawzall.
8. **Chainsaw.** If you've got room for one and/or if you live in a rural area. Make sure you have at least a chain guard for it, if not a complete case. Carry a small container with bar oil, preferably one with a nozzle or spout. Same for fuel for the saw. Got a tree across the road? Here's your answer. Make sure that you've dealt with whoever might be waiting behind it first if there aren't too many of them. Always size up an obstacle like that first before you tackle it.
9. **Chains.** One pair each of a 6' set and a 12' set with heavy duty hooks on each end. Learn how to quickly 'set a chain' in a choker loop if you don't know how. Allows you to use your vehicle as a force-multiplier for all sorts of interesting and useful things.

10. **Pins and shackles.** A few of these can be a real problem solver when used with your chains.

11. **Come along.** Have at least one. Use this with your chains to secure an item or to apply pressure. If you've used one, you know what I'm talking about. If you haven't then a new world will open up to you.

12. **2' x 4' roll of chain link fence.** A couple of these can be lifesavers. If you get stuck in sand, snow or mud, one or two of these can give your wheels enough purchase to get out. I know, because I've used them for just that purpose.

Your Vehicle

As a final thought, consider what you're driving. Can it take a beating? Are you willing to *let* it take a beating if it means your life or your loved ones' lives? You people who drive these little eco-fart mobiles will live – if only for a few minutes - to regret it. A sturdy, *well-maintained* 4WD vehicle is far more likely to get you out of trouble than one of those underpowered Smart Car cheese boxes. Fuel economy and eco-consciousness should always take a back seat to survivability – and that's what we're talking about there. Don't hesitate to think of your vehicle as a *tool* – a tool for removing obstacles. Or as a tool for dealing with people with bad intent. Some considerations:

1. High ground clearance – for obvious reasons.
2. Sturdy mud and snow-rated tires *in good condition* – forget the fancy wheels.
3. Cargo capacity – for the kit we just outlined above. Preferably covered and lockable.
4. 4 wheel drive with a really deep 4-low. Pay the extra for one with a limited-slip differential.
5. Sizeable gas tank.
6. Cattle guard bumper extensions

Also: don't be a fool when it comes to protection from gunfire. Everyday vehicles offer you *none*. Let me repeat that: **NONE!** Hand gun projectiles and especially rifle projectiles will basically zip right through a car door or body – and you, too if you're unfortunate enough to be inside at the time. Your engine block will afford you some protection, but your opponents won't be aiming for the engine – they'll be aiming at whoever's behind that windshield.

What's good?

A lot of this is personal taste. Jeep, Subaru, most pickups, Hummers, etc. What do I drive? A well-maintained Chevy Avalanche 1500 with a Z71 package.

Survival Priorities: The Rule of Three



Image by CarbonNYC

While I took issue with the conclusions drawn from the facts employed in a recent article titled ‘The Coming Food Armageddon’, the truth is you could find yourself and your loved ones in a struggle for survival at any time. For what it’s worth, not only am I a big booster of ‘prepping’, I have a realistic strategy if the SHTF and my outdoor skills are better than most, although that’s not really saying much given our predominantly urban population. And if you are interested in such things, there are tremendous resources available to you to help you prepare for whatever it is that you want to prepare for. The Survival Mom (<http://thesurvivalmom.com/>) is a great resource for one. Ready Nutrition (<http://www.readynutrition.com/>) is another.

But prepping is not what I want to talk to you about. I want to talk to you about Survival. And I’m not going to offer you any strategies, tactics or supply sources. Rather, I just want you to get your head into a slightly different place than it probably is right now. For some of you, this might be a remedial review. You may be military, firefighter, law enforcement, rescue worker or just plain folk with an inordinate amount of common sense. Regardless, it never hurts to revisit the basics.

And all of the basics can be summed-up in “The Rule of Three” which says, absent sudden death (such as an accident) or terminal illness, your survival is generally contingent upon you not exceeding:

- 3 minutes without breathing (drowning, asphyxiation)
- 3 hours without shelter in an extreme environment (exposure)
- 3 days without water (dehydration)
- 3 weeks without food (starvation)

We'll leave accident avoidance and healthy lifestyle choices for another discussion and just focus on the ramifications of the Rule of Three. However, this essay is offered merely to encourage you in proactively conducting your own ongoing risk assessment.

Nothing in this essay is intended nor is to be construed as advice, professional or otherwise. Any information contained in this essay is not to be relied upon. You're going to have to go find it out for yourself!

Starvation

Most 'preppers' are stocking food. You will note that starvation is the slowest form of death among the Rule of Three. You would likely have three weeks before you starve. Your level of physical exertion has an impact on the body's caloric requirements. Personally, I might survive starvation for five or six weeks if I stay in repose as I'm carrying a lot of extra weight (just in case!). Don't call me obese. Call me prepped! Keep in mind, too, that your survival strategy must consider the likelihood of you being separated from your food supply in an emergency. When that happens, stay calm, focus on any immediate threats or hazards and remember that you have three weeks to implement Food Plan B or Plan C. You do have a Food Plan B and Plan C, don't you?

Dehydration

Dehydration occurs much more quickly than starvation. As such, water supply is much more critical to address in an emergency. Consider that in a temperate climate and without exertion, the human body requires approximately 2.5 liters of fluids per day. In extreme heat this requirement goes up significantly. Diarrhea can lead to rapid, catastrophic dehydration as well. Given that water is far bulkier to store and/or transport than food, and that dehydration is potentially a far more pressing concern than starvation, your ability to procure water in an emergency should supplant food in your ranking of Survival priorities. Stated simply, water is far more important than food. What is your base plan for water? What is your mobile plan for water?

Exposure

Exposure occurs far more rapidly than dehydration. Hot or cold, you could find yourself unable to function in less than three hours. Immersion in cold water, such as breaking through ice, could reduce your time to act down to mere minutes. So what's your shelter strategy when you're away from base? Here in TheNorth, we've already had temps below minus 40 this winter. February is typically our coldest month where I've personally experienced minus 52 F actual. If you have an accident on a slick road late at night in such conditions, you will likely not be waking up ever again unless you have prepared for such an eventuality. Exposure kills in hours, or less. Countering exposure is your number two priority for survival in any emergency situation. Yet most preppers are not thinking about exposure while stocking their pantries. Prepare for exposure.

Asphyxiation

Asphyxiation kills in three minutes. This is the emergency situation that gives you the least amount of time to react for your survival. This is your Priority One Survival issue. An interior fire is the most common cause of asphyxiation. How many of you have a home escape plan in the event of a fire? I thought so. Make one. It's free. It takes minutes.

And it might save your life. Unless you've been in a burning building, I guarantee that you cannot imagine how blinding the smoke is nor how quickly a structure can become fully engulfed. If you have children, periodic rehearsal of the escape plan is mandatory. In the unthinkable event of a fire, panic is inevitable. Rehearsal helps to moderate the flight reaction, which might otherwise lead to death. Also, test your smoke detectors. Notwithstanding my disclaimer above, check them regularly. I mean it! Our friends out West can attest to the power, speed and terror of a large scale wildfire.

Most of us assume such an occurrence will provide adequate forewarning, thereby allowing avoidance. While normally that's true, you wouldn't be prepping if you only planned for 'typical' events. The Peshtigo, WS Fire of 1871 is an example of a wildfire that 'upgraded' to firestorm. While obviously a confluence of enabling conditions is required in order for a firestorm to occur, be assured that this could occur in most parts of the country. While the development of those enabling conditions will be obvious (i.e. extreme drought) to anyone on the lookout, once commenced, the firestorm expands far too quickly to allow for evacuation. 1.5 million acres burned that day.

While fire is a common cause, there are other causes of asphyxiation worth your consideration:

Carbon monoxide poisoning – usually from a combustion source in the home. This has also occurred in vehicles stranded in snowstorms. Vehicles were run for heat.

Accumulating snow shrouded the tailpipe resulting in vehicle exhaust entering the passenger compartment.

Other poisonous fumes – tanker trucks, rail cars and chemical & other industrial plants often have hazardous materials that, in an emergency situation, could cause you grave bodily harm if exposed.

Smothering- confined space entrapment, such as a building collapse (snow or volcanic ash loads on roofs, earthquakes, etc). Consider also avalanches, landslides and mudslides.

Drowning – while common sense on and around bodies of water is presumed, consider also flash floods, tsunamis, the aforementioned breaking ice, catastrophic dam failure, bridge failure while crossing. Flash floods are relatively common and often deadly. While a tsunami is much less common, consider the scale of the 2004 Indian Ocean tsunami before you dismiss its' likelihood. If you live in a coastal region, it would only take one to bring all of your pantry efforts to naught.

All of these events are sudden, unexpected and leave you minutes or less to choose a course of action. Taking the proper action may save your life.

Perils, Perils Everywhere

As you continually assess and prioritize your survival risks, take into account those risks specific to the area where you happen to be. Weather patterns for example. Hurricanes in coastal regions, tornados on the plains and thunderstorms or blizzards in the mountains are all hazards to be anticipated and prepped for. Also, consider geologic perils.

Earthquakes, volcanoes and rapidly moving lahars are hazards to be aware of and plan

for, even if you are merely passing through.

Therefore, if you are inclined to take a proactive approach in preparing for what economists might refer to as ‘outlier occurrences’, then it behooves you to prioritize your risks and review appropriate responses to them in a rational fashion. The scenarios resulting in your death most quickly should command your immediate attention. When you have sufficiently addressed those, by all means move down your list. We all believe in the Boy Scout motto of “Be Prepared”. However oftentimes it’s the obvious peril that gets overlooked.

Author TomOfTheNorth is a Volunteer Firefighter with a small rural FD in northeastern MN, where he is also Vice President of the Department and President of the Department’s meager pension association.

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3 Minutes Without Breathing

And the Lord God formed a man from the dust of the ground, and breathed into his nostrils the breath of life, and the man became a living soul.

Genesis 2:7

Install and test smoke alarms in your home. Most victims of fire succumb to the smoke and toxic gases and not to burns. Fire produces poisonous gases that can spread rapidly and far from the fire itself to claim victims who are asleep and not even aware of the fire. Even if residents awaken, the effects of exposure to these gases can cloud their thinking and slow their reactions so that they cannot make their escape. This is why it is so crucial for you and your family to have sufficient warning so that you can all escape before your ability to think and move is impaired. In addition, more than half of fatal fires in homes occur when people are asleep ' this represents only a third of a 24-hour day. Therefore, any fire protection system must be able to protect people who are asleep in their bedrooms when fire starts. If you have battery powered detectors make sure you replace batteries yearly as recommended by the U.S. Fire Administration.

Carbon monoxide (CO) is a deadly, colorless, odorless, poisonous gas. It is produced by the incomplete burning of various fuels, including coal, wood, charcoal, oil, kerosene, propane, and natural gas. Products and equipment powered by internal combustion engine-powered equipment such as portable generators, cars, lawn mowers, and power washers also produce CO. You will often read of people being sickened or dying of carbon monoxide poisoning during times of emergencies. Often these accidents are the results of use of portable fuel-burning camping equipment inside a home, garage, vehicle or tent that is not specifically designed for use in an enclosed space or failure to follow manufacturers instructions for safe use in an enclosed area. The burning of charcoal inside a home, garage, vehicle, or tent can also lead to CO poisoning. Another common cause of carbon monoxide asphyxiation is from prolonged confinement in a running motor vehicle.

It is important to remember that you can be overcome by carbon monoxide poisoning if you do not have enough ventilation in your vehicle. Whether you are running your vehicle at intermittent times or burning one of the coffee can heaters, you still need to crack at least one of your windows for fresh air. You should only run your vehicle for no more than ten minutes every hour. You also need to make sure the exhaust pipe of your vehicle is free of snow or mud.

Moving water is very dangerous. Just 6" of fast moving water can knock you off your feet. Cars, including heavy trucks, can get swept away in less than 2-feet of swift water. Never drive through moving water. Nationwide, 70% of all flood-related fatalities are in vehicles. With so many of today's vehicles coming with electrical controlled power windows and doors you should consider keeping an emergency auto-glass breaking tool in your vehicle. A vehicle's submergence in water will quickly short out the electric controls which unlock doors and power open windows, leaving you trapped inside. These tools are especially designed to quickly and easily break auto glass allowing you to escape.

There are any number of other emergencies which can occur which pose the threat of asphyxiation and/or drowning including flash floods, mud slides, tsunamis, gas leaks (residential, commercial), inclosed use of chemical solvents, mixtures of common clean agents (the mixing of common chlorine bleach and household ammonia will cause a reaction that creates chlorine gas, chloramine and other noxious fumes. Accidental or deliberate mixing of bleach with fluids containing ammonia causes severe damage to the lungs.). Always consider those which seem the most likely to occur in your area and try to create a plan accordingly.

Cardiopulmonary resuscitation (CPR): First aid

Being trained in CPR and Rescue Breathing can in many of these instances literally be the difference in life or death.

Cardiopulmonary resuscitation (CPR) is a lifesaving technique useful in many emergencies, including heart attack or near drowning, in which someone's breathing or heartbeat has stopped. Ideally, CPR involves two elements: chest compressions combined with mouth-to-mouth rescue breathing.

However, what you as a bystander should do in an emergency situation really depends on your knowledge and comfort level.

The bottom line is that it's far better to do something than to do nothing at all if you're fearful that your knowledge or abilities aren't 100 percent complete. Remember, the difference between your doing something and doing nothing could be someone's life. Here's advice from the American Heart Association:

- **Untrained.** If you're not trained in CPR, then provide hands-only CPR. That means uninterrupted chest compressions of about 100 a minute until paramedics arrive (described in more detail below). You don't need to try rescue breathing.
- **Trained, and ready to go.** If you're well trained, and confident in your ability, then you can opt for one of two approaches: 1. Alternate between 30 chest compressions and two rescue breaths. 2. Just do chest compressions. (Details described below.)
- **Trained, but rusty.** If you've previously received CPR training, but you're not confident in your abilities, then just do chest compressions at a rate of about 100 a minute. (Details described below.)

The above advice applies only to adults needing CPR, not to children.

CPR can keep oxygenated blood flowing to the brain and other vital organs until more definitive medical treatment can restore a normal heart rhythm. When the heart stops, the absence of oxygenated blood can cause irreparable brain damage in only a few minutes. A person may die within eight to 10 minutes. To learn CPR properly, take an accredited first-aid training course, including CPR and how to use an automatic external defibrillator (AED).

Before you begin

Before starting CPR, check:

- Is the person conscious or unconscious?
- If the person appears unconscious, tap or shake his or her shoulder and ask loudly, "Are you OK?"
- If the person doesn't respond and two people are available, one should call 911 or the local emergency number and one should begin CPR. If you are alone and have immediate access to a telephone, call 911 before beginning CPR — unless you think the person has become unresponsive because of suffocation (such as from drowning). In this special case, begin CPR for one minute and then call 911.
- If an AED is immediately available, deliver one shock if instructed by the device, then begin CPR.

Remember the ABCs

Think ABC — airway, breathing and circulation — to remember the steps explained below. Move quickly through airway and breathing to begin chest compressions.

Airway: Clear the airway

Put the person on his or her back on a firm surface.

Kneel next to the person's neck and shoulders.

Open the person's airway using the head-tilt, chin-lift maneuver. Put your palm on the person's forehead and gently tilt the head back. Then with the other hand, gently lift the chin forward to open the airway.

Check for normal breathing, taking no more than five or 10 seconds. Look for chest motion, listen for normal breath sounds, and feel for the person's breath on your cheek and ear. Gasping is not considered to be normal breathing. If the person isn't breathing normally and you are trained in CPR, begin mouth-to-mouth breathing. If you believe the person is unconscious from a heart attack and you haven't been trained in emergency procedures, skip mouth-to-mouth rescue breathing and proceed directly to chest compressions.

Breathing: Breathe for the person

Rescue breathing can be mouth-to-mouth breathing or mouth-to-nose breathing if the mouth is seriously injured or can't be opened.

With the airway open (using the head-tilt, chin-lift maneuver), pinch the nostrils shut for mouth-to-mouth breathing and cover the person's mouth with yours, making a seal.

Prepare to give two rescue breaths. Give the first rescue breath — lasting one second — and watch to see if the chest rises. If it does rise, give the second breath. If the chest doesn't rise, repeat the head-tilt, chin-lift maneuver and then give the second breath.

Begin chest compressions to restore circulation.

Circulation: Restore blood circulation with chest compressions

Place the heel of one hand over the center of the person's chest, between the nipples. Place your other hand on top of the first hand. Keep your elbows straight and position your shoulders directly above your hands.

Use your upper body weight (not just your arms) as you push straight down on (compress) the chest 2 inches (approximately 5 centimeters). Push hard at a rate of 100 compressions a minute. After 30 compressions, tilt the head back and lift the chin up to open the airway. Prepare to give two rescue breaths. Pinch the nose shut and breathe into the mouth for one second. If the chest rises, give a second rescue breath. If the chest doesn't rise, repeat the head-tilt, chin-lift maneuver and then give the second rescue breath. That's one cycle. If someone else is available, ask that person to give two breaths after you do 30 compressions. If you're not trained in CPR and feel comfortable performing only chest compressions, skip rescue breathing and continue chest compressions at a rate of 100 compressions a minute until medical personnel arrive.

If the person has not begun moving after five cycles (about two minutes) and an automatic external defibrillator (AED) is available, apply it and follow the prompts.

Administer one shock, then resume CPR — starting with chest compressions — for two more minutes before administering a second shock. If you're not trained to use an AED, a 911 operator may be able to guide you in its use. Use pediatric pads, if available, for children ages 1 to 8. Do not use an AED for babies younger than age 1. If an AED isn't available, go to step 5 below. Continue CPR until there are signs of movement or until emergency medical personnel take over.

To perform CPR on a child

The procedure for giving CPR to a child age 1 through 8 is essentially the same as that for an adult. The differences are as follows:

- If you're alone, perform five cycles of compressions and breaths on the child — this should take about two minutes — before calling 911 or your local emergency number or using an AED.
 - Breathe more gently.
 - After five cycles (about two minutes) of CPR, if there is no response and an AED is available, apply it and follow the prompts. Use pediatric pads if available. If pediatric pads aren't available, use adult pads.
- Continue until the child moves or help arrives.

To perform CPR on a baby

Most cardiac arrests in babies occur from lack of oxygen, such as from drowning or choking. If you know the baby has an airway obstruction, perform first aid for choking. If you don't know why the baby isn't breathing, perform CPR.

To begin, examine the situation. Stroke the baby and watch for a response, such as movement, but don't shake the baby.

If there's no response, follow the ABC procedures below and time the call for help as follows:

- If you're the only rescuer and CPR is needed, do CPR for two minutes — about five cycles — before calling 911 or your local emergency number.
- If another person is available, have that person call for help immediately while you attend to the baby.

Airway: Clear the airway

Place the baby on his or her back on a firm, flat surface, such as a table. The floor or ground also will do. Gently tip the head back by lifting the chin with one hand and pushing down on the forehead with the other hand. In no more than 10 seconds, put your ear near the baby's mouth and check for breathing: Look for chest motion, listen for breath sounds, and feel for breath on your cheek and ear. If the infant isn't breathing, begin mouth-to-mouth rescue breathing immediately. Compressions-only CPR doesn't work for infants.

Breathing: Breathe for the infant

Cover the baby's mouth and nose with your mouth.

Prepare to give two rescue breaths. Use the strength of your cheeks to deliver gentle puffs of air (instead of deep breaths from your lungs) to slowly breathe into the baby's mouth one time, taking one second for the breath. Watch to see if the baby's chest rises. If it

does, give a second rescue breath. If the chest does not rise, repeat the head-tilt, chin-lift maneuver and then give the second breath.

If the baby's chest still doesn't rise, examine the mouth to make sure no foreign material is inside. If the object is seen, sweep it out with your finger. If the airway seems blocked, perform first aid for a choking baby.

Begin chest compressions to restore blood circulation.

Circulation: Restore blood circulation

Imagine a horizontal line drawn between the baby's nipples. Place two fingers of one hand just below this line, in the center of the chest.

Gently compress the chest to about one-third to one-half the depth of the chest.

Count aloud as you pump in a fairly rapid rhythm. You should pump at a rate of 100 compressions a minute.

Give two breaths after every 30 chest compressions.

Perform CPR for about two minutes before calling for help unless someone else can make the call while you attend to the baby.

Continue CPR until you see signs of life or until medical personnel arrive.

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***Compiler's Note:** The American heart Association now recommends that you start with chest compression first and then do breaths as it is the chest compression which are the most important part of and lead to the best chances of recovery.*

Medical Kits for Self-Reliant Families

By Jackie Clay

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There may be a time, as close as tomorrow, when your loved ones need medication or medical treatment and there is no drug store open or doctor available. This may be as simple a situation as a head cold coming on during a weekend night, or more drastic, such as nothing available after a civil or natural disaster.

Family Medical Kits

Here at home, we've always had a medical kit. Several, in fact. One is quite large, made up of a poly box, originally designed as a field box for trap and skeet shooters. This

"drug store on wheels" is a well-packed medical utility box that will handle nearly everything from a cold to severe lacerations. This one we carry when traveling in remote locations.

But while it is loaded with most medical needs, far surpassing a first-aid "kit," it is heavy, weighing over 30 pounds, and it is not something we carry for short trips, pack in our canoe, or carry on horseback.

An intermediate kit is lighter and fits into a flat, moderate-sized fishing tackle box. While this does not contain such a wide variety of medical supplies and medications, it is a very well thought out first-aid-and then some-medical kit. This is light enough to pack in the



canoe (if we don't foresee many lengthy portages, when every ounce counts), with camp supplies on a horse packing trip, or small enough to take up little room in the truck. Besides this kit, we also carry a small first aid kit under the seat of the truck and Suburban, containing bandages, antibiotic ointment, burn medication, sterile gauze, tweezers, aspirin, sterile eye wash, and cold tablets for ourselves and our eight- year-old son, David. In the glove box is a smaller snap-open plastic box with Bob's oral diabetes medication, my blood pressure pills, and a few aspirin. This has come in handy many times when someone forgot to take prescribed daily medication or a headache suddenly popped up. As the glove box does get hot during the summer, this small stash of meds is rotated routinely to make sure the strength does not fade.

Learning to use your kit

No matter how comprehensive your medical kit is it can be useless or even harmful if you do not know how to use it safely. You don't have to have extensive medical treatment to handle most emergencies that occur in real life. Most of ours consist of splinters, minor cuts and scrapes, sprains, and an occasional head cold or the flu. While these are scarcely life-threatening, they are uncomfortable and the afflicted party sure appreciates quick, competent aid.

Our family is lucky; I have spent a lifetime as a veterinary field technician riding on calls and acting as an assistant on everything from broken legs to pneumonia. Bob is a Certified Nurses Assistant (CNA) with additional military medical training in Vietnam. But you'd be surprised at how much free medical training is out there for you to pick up. Many communities provide first-aid classes, including invaluable cardiopulmonary resuscitation (CPR) training.

During these classes, ask questions to boot up the amount of knowledge you receive.

Attend volunteer firemen's training sessions, as available (again, ask around). Ask your veterinarian if you could accompany him/her on calls one or more days a week free in exchange for the knowledge you gain. Yep, I know, they're animals, not people, but basically, a mammal is a mammal, especially when it comes to shock, wounds, and common illnesses such as pneumonia.

Pick up a good first-aid manual (which should be in your large medical kit at all times) and a book or two from a preparedness company which details medical treatment when no doctor or dentist is available. Then read these manuals carefully. I know they're not great reading, but they can save someone's life. Share the reading with your spouse or older children, and even practice at home. It can be interesting, learning to suture gaping wounds on a piece of that chicken you're having for dinner. After it's butchered and ready to cook, of course. I'm not that morbid.

Real life medical treatment basics

While some survival first aid manuals assume your family's injuries will need treatment for nuclear blast and gaping wounds, in reality most will be of a much more mundane level no matter where you are, from arctic tundra to urban sprawl. They will consist of minor cuts, scrapes, slivers, blisters, the flu, colds, a fish hook in the skin, etc. We have lived for years in very remote locations and, although the worst injury any of us sustained was Bob's green stick fracture of his leg in a snowmobile accident, the most painful was my severely sprained ankle, suffered when I missed a step going downstairs in our farmhouse in "civilization."

Let's look at some real-life possibilities and what to do about them, assuming that there is no doctor or hospital available. Remember that if trained medical help is available, one should always consider this course first as many conditions can be made worse by incorrect diagnosis and treatment.

Hypothermia

Believe it or not, hypothermia (the condition where the body temperature is lowered below normal) kills more people in survival/stress situations than does gunfire, wild animal attacks, poisonous reptiles and spiders, wounds, or drowning.



The large medical kit is portable. We carry it on all remote trips.

Hypothermia has many causes, from shock following an accident to remaining outside in cold weather without adequate clothing or shelter to getting dunked in icy water—even for short periods of time. It is definitely something to watch for in any survival situation.

Identifying hypothermia can be a problem with the uninitiated, as it comes on slowly and the person still can walk and talk. But by paying careful attention, one can usually notice body shaking, paleness, and a

tendency toward poor judgement and/or speech that doesn't make sense.

Taking the victim's temperature, you will quickly see that it is subnormal.

Hypothermia must be treated vigorously and immediately. Warmth is the key. As the body has lost its ability to warm itself, simply putting a blanket around the person is not enough. Build a warm fire. If the victim is wet, get them into warm dry clothes quickly. Warm a blanket or sleeping bag, then wrap it around them while they sit or lie in front of the fire. If they are not too bad, a drink of warm coffee or tea often helps. But do not give anything to eat or drink to a victim that is dazed or unconscious.

If nothing else is available, have one or more persons crawl into a sleeping bag or blankets to provide bodily warmth to the victim. Then keep the person warm and dry until they are fully recovered. You don't have to be a mountaineer to suffer hypothermia. I have had several encounters: falling through thin ice while crossing a beaver dam, getting stuck out in an unexpected blizzard in June, and getting drenched in the rain while making a mile and a half canoe portage in Minnesota's Boundary Waters. Hypothermia can be just plain uncomfortably miserable, but it can also kill.

Wounds

Most wounds that folks suffer in a survival situation are relatively minor, and though they may be uncomfortable and even bleeding, they are not usually life-threatening. The thing is not to panic. A little blood looks like a lot, especially when it is on yourself or a loved one.

If the wound is combined with possible other injuries, such as following a tumble down a rocky slope, you have to first assess the possible damage.

Could there be a broken bone? A concussion? Internal injuries?

Don't panic. However, if you suspect such complications, do not move the injured party unless absolutely necessary, and then do it with great care.

Talk to the victim. He can usually tell you a lot about where he hurts and how much pain he is in. If the only injury seems to be the wound, reassure the victim and begin treatment.

Check the wound. Is it visibly dirty? Is the blood simply flowing from the wound or is it spurting? In survival situations, more people die from infected wounds than bleeding to death.

If the wound is relatively minor and the bleeding is minimal, you'll want to gently clean it before any attempt is made to bandage it. Nothing causes infection more than bandaging an unclean wound, even if it contains no visible dirt. Remember that deadly staph organisms are commonly found on human skin.

A good way to clean most wounds is to gently bathe the area with mild soap and water. Mop away from the wound, as one would sweep a floor, instead of scrubbing back and forth. The latter only moves bacteria around rather than removing it from the area. Rinse or soak the area well, removing any debris carefully with sterile tweezers.

When the area is clean, pat it dry with sterile gauze or air-dry it, then apply Betadine or antibiotic salve. We use Betadine for deeper wounds, and antibiotic salve for lesser injuries. Minor wounds seldom require bandaging, healing quicker by air exposure. Deeper wounds and ones in areas where they will be constantly irritated by clothing or work should be bandaged. A simple adhesive strip usually does the trick.

If the wound is bleeding quite a bit, simply applying pressure to the area with a sterile gauze pad will usually stop it within a few minutes. Where tourniquets were once advised, it has been found that more damage was done by the tourniquet than the bleeding would have caused in most instances. The application of firm pressure directly to the wound is very effective. After the severe bleeding has been stopped, gently clean the wound, but do not destroy the clot that has formed or bleeding will probably resume. Should you be dealing with a more severe wound, covering it with a Betadine soaked (but not wet) sterile gauze, then a plain sterile gauze square, then adhesive tape is usually sufficient. If the edges of the wound gape or there is a flap of skin hanging down, either gently match the edges with butterfly adhesive strips or suture them, if you have the experience. Remember that most wounds will heal fine without suturing, especially with a little help from gentle butterfly adhesive strips. Sutures that are too tightly drawn will cause pain and scarring.

Never bandage a wound tightly with gauze bandage or anything else. This will restrict circulation and can cause pain and severe problems and even gangrene.

In the following days, keep the wound clean and dry. Change the dressing as needed, usually twice a day, leaving the dressing off and the area open to fresh air and sunlight as much as possible. This will greatly reduce the healing time and reduce chances of infection. Bacteria love damp, dark, warm areas, including a wound which is bandaged.

Watch for ugly redness or a fever in the patient, which would indicate infection in the wound. In this case, keep the area soaked in Betadine and give the patient antibiotics for 10 days, even if they seem better within a day or two. Immersing the infected wound in a hot Epsom salts solution also helps reduce pain and swelling along with cleansing the area.

Simple pain and swelling from the injury can be alleviated by plain aspirin, taken orally. Do not give aspirin immediately following an injury if there is a possibility of internal injuries, as aspirin may enhance hemorrhage. Do not give aspirin to young children. Use Ibuprofen instead.

Colds and flu

These common conditions are bad enough when things are fine, but are downright miserable in a survival situation. And remember that stress helps these overcome your body.

At the first sign of a cold or the flu, do those things your grandmother told you: keep warm and dry, rest, and drink plenty of fluids. Then add vitamin C and zinc lozenges, and most folks can overcome that mean cold or flu in a few days. If you need to alleviate symptoms, such as fever, runny nose, or coughing, take a cold/flu medication that covers your symptoms. By now, you probably know what works best for you and your children. The key is to have the medication on hand.

If the cold or flu lasts for longer than 10 days or seems to get worse, it may have turned into bronchitis or pneumonia, and antibiotics are necessary. Remember that home treatment is only for when no doctor or hospital is available.

Sprains

Believe it or not, sprains are one of the most common injuries in a survival situation. And often one of the most painful. The sprain can arise from walking over debris, logs, rocks, and even urban curbs. It can come from a fall or even an ankle turning over. (Your family will experience less sprains if they wear good, sturdy footwear, not flats or sandals. Ankle support is very important.)

When a sprain is new, immerse the affected part in cold water or apply ice packs to reduce pain and inflammation. I've found that when I take two plain aspirin immediately



Our medical kit comes in handy in daily life, from cuts to colds.

following such an injury that it greatly reduces both pain and inflammation later on. If possible, rest the sprain, keeping it immobile and elevated for as long as reasonably possible. I continue taking the aspirin to keep down the inflammation. If you must move about, gently wrap the area with an elastic bandage to support it. Do not wrap area tightly or you will restrict circulation and make the pain much worse. Use a cane or crutches if the sprain is in a foot, ankle, or knee to reduce the amount of weight put on the injury. If the sprain is in the hand, wrist, elbow, or shoulder, keeping the arm in a sling will greatly reduce the pain and help it heal.

After a day, begin using hot Epsom salts soaks or packs to reduce the swelling and pain. And remember, the more you use a sprained joint, the longer it will take to heal and it may not ever heal completely if you persist using it before it heals. Rest is the key.

Slivers and spines

Getting a sliver or sticker of some kind is awfully common, especially in a survival situation, when one may be building a wood fire or foraging for food. Most of the time you can simply get hold of it and pull it out and be no worse for wear. But sometimes it is in too deep and painful and seemingly impossible to remove.

For relatively minor, but painful slivers, I use a sterile hypodermic needle, choosing the gauge (diameter/size) to fit the sliver size. Most smaller slivers are removed very easily with a 20-gauge needle. Now I use a hypodermic needle for several reasons, as opposed to using a sewing needle.

First, and most important, they are hollow. This allows one to slip them into the sliver track with little pain, as less bulk is pressing on that tender skin. They are also sharp, which lets me carefully pick away the skin layer above the sliver which has no feeling because there are no nerves, until the sliver is exposed and can be either snagged with the needle and drawn out or picked up with a pair of sterile tweezers and removed.

With larger slivers, I use an 18-gauge needle, which does the same thing but is a bit stronger. When the sliver is very painful, using a local anesthetic, such as oral medication or antibiotic ointment containing an anesthetic on the area about 10 minutes before the procedure, helps a lot.

The main thing is to keep the sliver aligned with its track, and not to pry it upright in removal, which is extremely painful.

Once the sliver is out, a little alcohol or Betadine will disinfect the area and let it heal quickly.

I've discovered a great treatment for small stickers and cactus thorns which break off when you try to remove them from tender skin. Should you or a family member fall into a cactus or other plant with fine stickers, simply coat the area with Shoe-Goo or Sportsman's-Goo, which is a clear silicone-type produce. Just a thin coat is fine. In about fifteen minutes it will be dry, and you can just peel it off, complete with all of the painful stickers.

Of course, there are many other possible injuries and illnesses. With a little advance preparation and study, you'll be surprised at what you can glide smoothly through. There is seldom any benefit to panic; a positive mental outlook can save lives.

SUGGESTIONS FOR YOUR MEDICAL KIT (LARGE)

ITEMS	USES
thermometer	detecting fever
aspirin/Tylenol	fever/pain
zinc lozenges	head off colds/flu
cough/throat lozenges	comfort with colds
antifungal medication	fungus infections of the skin
antibiotic ointment	heal cuts/abrasions
eye medication	infections/irritations
oral expectorant	clear lungs, reduce coughing
burn medication, such as Burn Free	reduce severity and pain from burns
oral electrolytes	treats dehydration
rolls of 2" sterile gauze	covers wounds, control bleeding
several packs of 2" sterile pads	covers wounds, gauze controls bleeding, holds medication in place
rolls of elastic leg wrap	supports sprains, holds meds in place, controls bleeding, protects legs
rolls of sterile cotton	cleaning area, controls bleeding, etc.
alcohol, soap, Betadine	cleaning, disinfecting, wound healing
oral antidiarrheals	treating moderate diarrhea
any family daily meds	maintaining health
oral antibiotics/sulfas	treating systemic or local infection
injectable antibiotics/sulfas	treating systemic or local infection

injectable epinephrine	shock, as in drug allergy
injectable antihistamine	allergies; bee sting
surgical instruments, such as forceps, needle holder, scalpel w/ blades, scissors, etc.	facilitate minor injury
assorted sizes suture material; absorbable	allows suturing of gaping wounds
stethoscope	monitoring vital signs
sterile needles and syringes	giving injections
sterile IV kit (if experienced)	makes IV injections possible for severe dehydration
IV electrolytes	severe dehydration, shock
first-aid manual	instructions

Of course, your family's personal medical kits (small, medium, and large) will probably contain different items, depending on your foreseeable needs, medical experience, and preferences. And you will probably think of many more items that would be provident to carry, especially in your large kit. There are no hard and fast rules, only suggestions. The main thing is to be prepared — and confident.

Compiler's Note: This list is just a suggestion and most everyone can add more items. That said I would like to add the following to the list.

1. Sewing Needles (for removing splinters)
2. Zinc Capsules
3. Blood Clotting Agent (Powder and Pads such as Quikclot)
4. Diphenhydramine Liquid (Such as Benadryl)
5. Vitamin A and D Cream (Such as A&D Ointment)

The Large M17 Medic Bag

I would also like to recommend for those just starting to take a look at buying a Large M17 Medic Bay Kit. This is an excellent kit that will give you most of the basics and can be easily purchased on line at a reasonable price.

The Large M17 Medic Bag contains over 320 items!



Large M17 Medic Bag Kit

GI Style Issue kit. Over 320 items. (CONTENTS MAY VARY).

Size 16" X 10" X 13.5" NYLON BAG WITH ALICE PACK STRAPS

Typical Kit includes:

Contains 320 items, including:

- 5 Skin and Eye Wash
- 1 Skin Probe
- 1 Hand Sanitizer
- 1 Scalpel handle #3
- 1 Hand Soap
- 2 Scalpel Blades
- 1 Calamine Lotion, 6oz.
- 1 Pen Light
- 1 Burn Spray
- 2 Suture Sets
- 1 SAM / Universal Splint
- 1 EFA - First Aid Book
- 4 Multitrauma dressing
- 6 Safety Pins
- 2 BleedStop Bandages
- 2 Pill Bottles
- 4 Bandage Gauzes, 2"x5yds.
- 6 Pairs Latex Examination Gloves
- 2 Elastic Bandages, 6"
- 14 Pain Relievers
- 12 Elastic Bandages, 2"
- 1 Tourniquet

4 Sterile Pads, 4"x4"
2 Irrigation Syringes
10 Sterile Pads, 2"x2"
4 First Aid Cream Packages
10 Abdominal Pads, 5"x9"
4 Triple Antibiotic Packages
2 Eye Pads
2 Burn Aid Packages
2 Triangular Bandage
5 Tape, Rolls, Adhesive, 1"
100 Bandage Strips, 1"x3"
15 Alcohol Wipes
5 Butterfly Strips
15 Iodine Wipes
10 Bandage Strips, 2"x3"
15 Antiseptic BZK Wipes
10 Knuckle Bandages
15 Clean Wipes
3 Instant Ice Packs
6 After Bite Wipes
1 Stethoscope
2 Ammonia Inhalants
1 Lip Treatment
1 CPR Mask
1 EMT Shears, 7.25"
2 Airways
2 Stainless Steel Hemostats
2 Tongue Depressors
1 Pair of Tweezers
1 Box of 100 Cotton Tips
1 Petroleum Jelly

Antibiotics and Their Use in Collapse Medicine(tm),Part 1

By Dr. Bones



Hey Prepper Nation,

One of the most common questions that I am asked from prospective survival medics is “What antibiotics should I stockpile and how do I use them?” There isn’t a 60 second answer to this. Actually, there isn’t a 60 MINUTE answer to this, but anyone that is interested in preserving the health of their loved ones in a collapse will have to learn what antibiotics will work in a particular situation.

It’s important to start off by saying that you will not want to indiscriminately use antibiotics for every minor ailment that comes along. In a collapse, the medic is also a quartermaster; you will want to wisely dispense that limited and, yes, precious supply of life-saving drugs.

Liberal use of antibiotics is a poor strategy for a few reasons:

- Overuse can foster the spread of resistant bacteria. Antibiotics routinely given to turkeys recently caused a resistant strain of Salmonella that put over 100 people in the hospital. 36 million birds were destroyed.
- Potential allergic reactions may occur that could lead to anaphylactic shock (see a recent article on this topic).
- Making a diagnosis may be more difficult if you give antibiotics before you’re sure what medical problem you’re actually dealing with. The antibiotics might temporarily “mask” a symptom, which could cost you valuable time in determining the correct treatment.
- You can see that judicious use of antibiotics, under your close supervision, is necessary to fully utilize their benefits. Discourage your group members from using these drugs without first consulting you.

There are many antibiotics, but what antibiotics accessible to the average person would be good additions to your medical storage? Here are some common antibiotics (most available in veterinary form without a prescription) that you will want in your medical arsenal and

their veterinary equivalent:

- **Amoxicillin** 250mg AND 500mg (FISH-MOX, FISH-MOX FORTE)
- **Ciprofloxacin** 250mg and 500mg(FISH-FLOX, FISH-FLOX FORTE)
- **Cephalexin** 250mg and 500mg (FISH-FLEX, FISH-FLEX FORTE)
- **Metronidazole** 250mg (FISH-ZOLE)
- **Doxycycline** 100mg (BIRD-BIOTIC)
- **Ampicillin** 250mg and 500mg (FISH-CILLIN, FISH-CILLIN FORTE)
- **Sulfamethoxazole** 400mg/**Trimethoprin** 80mg (BIRD-SULFA)

There are various others that you can choose, but the selections above will give you the opportunity to treat many illnesses and have enough variety so that even those with Penicillin allergies will have options. Cephalexin, although not in the same drug family, has been quoted as having a 10% cross-reactivity rate with Penicillin.

Amoxicillin (Aquarium version: FISH-MOX, FISH-MOX FORTE, AQUA-MOX): comes in 250mg and 500mg doses, usually taken 3 times a day. Amoxicillin is the most popular antibiotic prescribed to children, usually in liquid form. More versatile and better absorbed than the older Penicillins, Amoxicillin may be used for the following diseases:

- Anthrax (Prevention or treatment of Cutaneous transmission)
- Chlamydia Infection (sexually transmitted)
- Urinary Tract Infection (bladder/kidney infections)
- Helicobacter pylori Infection (causes peptic ulcer)
- Lyme Disease (transmitted by ticks)
- Otitis Media (middle ear infection)
- Pneumonia (lung infection)
- Sinusitis
- Skin or Soft Tissue Infection (cellulitis, boils)
- Actinomycosis (causes abscesses in humans and livestock)
- Bronchitis
- Tonsillitis/Pharyngitis (Strep throat)

This is a lot of information, but how do you approach determining what dose and frequency would be appropriate for what individual? Let's take an example: Otitis Media is a common ear infection, especially in children. Amoxicillin is often the "drug of choice" for this condition.

First, you would want to determine that your patient is not allergic to Amoxicillin. The most common form of allergy would appear as a rash, but diarrhea, itchiness, and even respiratory difficulty could also manifest. If your patient is allergic, another antibiotic such as Sulfamethoxazole/Trimethoprin or Cephalexin could be a "second-line" solution.

Once you have identified Amoxicillin as your choice to treat your patient's ear infection, you will want to determine the dosage. As Otitis Media often occurs in children, you might have to break a tablet in half or open the capsule to separate out a portion that would be appropriate. For Amoxicillin, you would give 20-50mg per kilogram of body weight (20-30mg/kg for infants less than four months old). This would be useful if you have to give the drug to a toddler less than 30 pounds. A common child's dosage would be 250mg and a common maximum dosage for adults would be 500 mg. Take this orally 3 times a day for 10 to 14 days (twice a day for infants). Luckily, these dosages are exactly how the commercially-made medications come.

If your child is too small to swallow a pill whole, you could make a mixture with water (called a "suspension"). To make a liquid, crush a tablet or empty a capsule into a small glass of water and drink it; then, fill the glass again and drink that (particles may adhere to the walls of the glass). You can add some flavoring to make it more palatable. Do not crush or make a liquid out of time-released capsules of any medication, you will wind up losing some of the gradual release effect and perhaps get too much into your system at once. These medications should be plainly marked "Time-Released".

Anytime you, as a medic, place a person on a new medication or supplement, they should be carefully watched for signs of allergy. If they develop a rash, itching, diarrhea, or other untoward symptoms, you should discontinue your treatment and look for other options.

You will probably see improvement within 3 days, but don't be tempted to stop the antibiotic therapy until you're done with the entire 10-14 days. Sometimes, you'll kill most of the bacteria but some colonies may persist and multiply if you prematurely end the treatment. In a collapse, however, you might be down to your last few pills and have to make some tough decisions.

For official recommendations regarding the use of Amoxicillin to treat the other illnesses listed, consider investing in a book called the Physician's Desk Reference. It will have all this information (and more) on just about any medication manufactured today. Listed are indications, dosages, side effects, risks, and even how the drug works in the body. Online sources such as drugs.com or rxlist.com are also useful, but you are going to want a hard copy for your library. You never know when we might not have a functioning internet.

Antibiotics And Their Use In Collapse Medicine(tm), Part 2

by Dr. Bones



Hey Prepper Nation,

One of the most common questions that I am asked from prospective survival medics is “What antibiotics should I stockpile and how do I use them?” There isn’t a short answer to this. Actually, there isn’t even a long answer to this, but anyone that is interested in preserving the health of their loved ones in a collapse will have to learn what antibiotics will work in a particular situation. This is part 2 of a series on the most important antibiotics to have in a collapse situation and how to use them.

One thing that I didn’t mention in my last article is that antibiotics only work against bacteria. The common cold, influenza, and other infections caused by viruses. Don’t waste your precious supplies treating illnesses for which they will have no effect.

Last time we discussed Amoxicillin, certainly an important antibiotic for many purposes. What if you’re allergic to medications in the Penicillin family, however? Consider Ciprofloxacin (aquarium equivalent: FISH-FLOX). Ciprofloxacin is an antibiotic in the fluoroquinolone family. It kills bacteria by inhibiting the reproduction of DNA and bacterial proteins. This drug usually comes in 250mg and 500mg doses.

Ciprofloxacin (brand name Cipro) can be used for the following conditions:

- Bladder or other urinary infections, especially in females
- Prostate infections
- Some types of lower respiratory infections, such as pneumonia
- Acute sinusitis
- Skin infections (such as cellulitis)
- Bone and joint infections
- Infectious diarrhea
- Typhoid fever caused by Salmonella
- Inhalational Anthrax

In most cases, you should give 500mg twice a day for 7-14 days, with the exception of

bone and joint infections (4-6 weeks) and Anthrax (60 days). You can get away with 250mg doses for 3 days for most mild urinary infections. Generally, you would want to continue the medication for 2 days after improvement is noted. Ciprofloxacin has not been approved for use in pregnancy. Among other side effects, Cipro has been reported to occasionally cause weakness in muscles and tendons. Look other risks and side effects up at drugs.com or rxlist.com.

Cipro may also cause joint and muscle complications in children, so it is restricted in pediatric use to the following:

- Urinary tract infections and pyelonephritis due to E. coli (the most common type)
- Inhalational anthrax

In children, the dosage is measured by multiplying 10mg by the weight in kilograms (1 kg = 2.2 lbs.) and the maximum dose should not exceed 400mg total twice a day, even if the child weighs more than 100 pounds. Ciprofloxacin should be taken with 8 ounces of water.

Another useful antibiotic in a collapse would be Doxycycline (veterinary equivalent: Bird-Biotic). Doxycycline is a member of the Tetracycline family, and is also acceptable in patients allergic to Penicillin. It inhibits the production of bacterial protein, which prevents reproduction. Doxycycline is marketed under various names, such as Vibramycin and Vibra-Tabs.

Indications for Doxycycline include the following:

- E. Coli, Shigella and Enterobacter infections (some diarrheal disease)
- Chlamydia (sexually transmitted disease)
- Lyme disease
- Rocky Mountain spotted fever
- Anthrax
- Cholera
- Plague (Yersinia)
- Gum disease (severe gingivitis, periodontitis)
- Folliculitis (boils)
- Acne and other inflammatory skin diseases, such as hidradenitis (armpits and groins)
- Some lower respiratory tract (pneumonia) and urinary tract infections
- Upper respiratory infections caused by Strep
- Methicillin-resistant Staph (MRSA) infections
- Malaria (prevention)
- Some parasitic worm infections (kills bacteria in their gut needed to survive)

In the case of Rocky Mountain spotted fever, doxycycline is indicated even for use in children for this illness. Otherwise, doxycycline is not indicated for use in children under the age of eight years. It has not been approved for use during pregnancy.

Although antibiotics may be helpful in diarrheal disease, always start with hydration and symptomatic relief. Prolonged diarrhea, high fevers, and bleeding are reasons to consider their use. The risk is that one of the side effects of antibiotics is....diarrhea!

The recommended Doxycycline dosage for most types of bacterial infections in adults is 100 mg to 200 mg per day for 7-14 days. For chronic (long-term) or more serious infections, treatment can be carried out for a longer time. Children will receive 1-2mg per pound of body weight per day. For Anthrax, the treatment should be prolonged to 60 days. To prevent malaria, adults should use 100mg per day.

A working knowledge of antibiotic use is important for anyone that will serve as the medic for their survival group. Antibiotics are a weapon in your medical arsenal; use them wisely and frugally.

I'll discuss more medications in my next article.

Antibiotics And Their Use in Collapse Medicine(tm), Part 3

By Dr. Bones



Hey Preppers,

Anyone that is interested in preserving the health of their loved ones in a collapse will have to learn what antibiotics will work in a particular situation. I have found, thanks to comments on the medicine sub-forum that we moderate at survivalcache.com, that two additional antibiotics are available in aquatic equivalents. As such, I've chosen to discuss them in this part of the series. They are:

Clindamycin 150 mg. and Azithromycin 250mg.

Azithromycin is a member of the macrolide (Erythromycin) family. It works by stopping the growth and multiplication of bacteria. it is used to treat various types of:

- Bronchitis
- Pneumonia
- Ear infections
- Skin infections
- Some throat infections
- Sinusitis
- Tonsillitis
- Typhoid fever
- Lyme disease (early)
- Chlamydia and Gonorrhea
- Whooping cough

Azithromycin is taken 250mg or 500mg once daily for a relatively short course of treatment (usually five days). The first dose is often a "double dose," twice as much as the remainder of the doses given. For acute bacterial sinusitis, azithromycin may be taken once daily for three days. If you are taking the 500mg dosage and have side effects such as nausea and vomiting, diarrhea, or dizziness, drop down to the lower dosage. Azithromycin is not known to cause problems in pregnant patients (pregnancy category B).

Clindamycin is part of the family of drugs called lincomycin antibiotics. It, like Azithromycin, works by slowing or stopping the growth of bacteria. It works best on bacteria that are anaerobic, which means that they thrive in the absence of oxygen. It can be used to treat:

- Acne
- Dental infections
- Soft tissue (skin, etc.)
- Peritonitis (inflammation of the abdomen)
- Pneumonia and lung abscesses
- Uterine infections (such as after miscarriage or childbirth)
- Blood infections
- Pelvic infections
- MRSA (Methicillin-resistant Staph. Aureus infections)
- Parasitic infections (Malaria, Toxoplasmosis)
- Anthrax

Clindamycin is given in 150mg or 300mg doses every 6 hours with a glass of water. Clindamycin should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis. Discontinue the medication if you develop diarrhea during treatment, as sometimes a very serious colitis (infection of the intestine) can develop. This drug is, like Azithromycin, pregnancy category B, which means that no ill effects have been determined in animal studies. With most drugs, testing cannot be done ethically on pregnant humans, so very few drugs are willing to say that any medicine is completely safe during pregnancy.

Both Clindamycin and Azithromycin are acceptable for use in patients with Penicillin allergies. This is not to say that you might not have a different allergy to one or the other, however.

Don't forget to consider natural alternatives which also have antibiotic-like effects, such as garlic and honey. These substances can be used on many infections with good results. See Nurse Amy's article on natural burn remedies for an example on how to use honey for treatment. Use the search engine function on the upper left of this blog to find it.

Keeping your loved ones healthy in a collapse will require some knowledge on stockpiled medicines, their uses, mechanism of action, risks, side effects, and other information. The survival medic should have references such as the Physician's Desk Reference (comes out yearly), which has all of this information for just about every drug manufactured today. With this knowledge, you'll succeed if everything else fails.

Antibiotics And Their Use in Collapse Medicine(tm), Part 4

By Dr. Bones



Hey Preppers,

Anyone that is interested in preserving the health of their loved ones in a collapse will have to learn what antibiotics will work in a particular situation. It's not enough to have

a supply of the medication; you have to know how and when to use it. Even more importantly, it's important to know when NOT to use it. This is part 4 and the final part, for now, of the series.

In part 1, I listed the antibiotics that I would recommend in times of trouble, and their veterinary equivalents. They are:

Amoxicillin 250mg AND 500mg (FISH-MOX, FISH-MOX FORTE)
Ciprofloxacin 250mg and 500mg(FISH-FLOX, FISH-FLOX FORTE)
Cephalexin 250mg and 500mg (FISH-FLEX, FISH-FLEX FORTE)
Metronidazole 250mg (FISH-ZOLE)
Doxycycline 100mg (BIRD-BIOTIC)
Ampicillin 250mg and 500mg (FISH-CILLIN, FISH-CILLIN FORTE)
Sulfamethoxazole 400mg/**Trimethoprim** 80mg (BIRD-SULFA)

For your reference, Part 1 discussed Amoxicillin, which is somewhat similar to both Cephalexin and Ampicillin in its indications, dosage, usage, and risk of allergy. Part 2 discussed Ciprofloxacin and Doxycycline. Part 3 discussed **Azithromycin** and **Clindamycin**, two antibiotics that were not on the original list but were recently found to be available on some aquarium medication websites.

Today we'll discuss the last two on the list: Metronidazole 250mg and Sulfamethoxazole 400mg/Trimethoprim 80mg.

Metronidazole is an antibiotic in the nitroimidazole family that is used primarily to treat infection with anaerobic bacteria and protozoa. “Anaerobes” are bacteria that do not depend on oxygen to live. Protozoa have been defined as single-cell organisms with animal-like behavior. In other words, they can propel themselves from place to place by the means of a flagellum; a tail-like “hair” they whip around which allows them to move. Only some protozoans are like this; some do not move at all, and it’s probable that some new terminology will come out someday that explains this group more efficiently.

Metronidazole works by blocking some of the functions within bacteria and protozoa, thus, resulting in their death. It is probably better known by the brand name “Flagyl” and usually comes in 250mg and 500mg tablets. Metronidazole is used in the treatment of:

Bacterial

- Diverticulitis (intestinal infection in older individuals)
- Peritonitis (infection due to ruptured appendix, etc.)
- Some pneumonias
- Diabetic foot ulcer infections
- Meningitis (infection of the central nervous system)

- Bone and joint infections
- Colitis due to Clostridia bacterial species (sometimes caused by taking Clindamycin!)
- Endocarditis (heart infection)
- Bacterial vaginosis (common vaginal infection)
- Pelvic inflammatory disease (“female” infection which can lead to abscesses) - used in combination with other antibiotics
- Uterine infections (especially after childbirth and miscarriage)
- Dental infections (sometimes in combination with amoxicillin)
- H. pylori infections (causes peptic ulcers)
- Some skin infections

Protozoal

- Amoebiasis: dysentery caused by Entamoeba species (contaminated water/food)
- Giardiasis: infection of the small intestine caused by Giardia Species (contaminated water/food)
- Trichomoniasis: vaginal infection caused by Trichomonas species which can be sexually transmitted

Amoebiasis and Giardiasis can be caught from drinking what appears to be the purest mountain stream water. Never fail to sterilize all water, regardless of source, before drinking it.

Treatment of the highly varied groups of illness above varies; here are the dosages and frequency of administration of Metronidazole for several:

Amoebic dysentery: 750 mg orally 3 times daily for 5-10 days. For children, give 35 to 50 mg/kg/day orally in 3 divided doses for 10 days (no more than adult dosage, of course, regardless of weight).

Anaerobic infections (various): 7.5 mg/kg orally every 6 hours not to exceed 4 grams daily

Clostridia infections: 250-500 mg orally 4 times daily or 500-750 orally 3 times daily

Giardia: 250 mg orally three times daily for 5 days. For children give 15 mg/kg/day orally in 3 divided doses (no more than adult dosage regardless of weight)

Helicobacter pylori: 500-750mg twice daily for several days in combination with other drugs like Prilosec (Omeprazole)

Pelvic inflammatory disease (PID): 500 mg orally twice daily for 14 days in combination with other drugs, perhaps doxycycline or azithromycin

Bacterial Vaginosis: 500mg twice daily for 7 days. •

Trichomoniasis: 2 g single dose (4 500mg tablets at once) or 1 g twice total

Like all antibiotics, Metronidazole has side effects which you can review by picking up a Physician's Desk Reference or going to drugs.com or rxlist.com. One particular side effect has to do with alcohol: drinking alcohol on Metronidazole will very likely make you vomit. Metronidazole should not be used in pregnancy.

Sulfamethoxazole 400mg/Trimethoprim 80mg is a combination of medications in the Sulfonamide family. This drug is well-known as its brand names Bactrim and Septra. Our British friends may recognize it by the name Co-Trimoxazole. Sulfamethoxazole acts as a false-substrate inhibitor of an important bacterial enzyme. Trimethoprim interferes with the production of folic acid in bacteria, which is necessary to produce DNA. The two antibiotics together are stronger in their effect than alone, at least in laboratory studies.

Sulfamethoxazole 400mg/Trimethoprim 80mg is effective in the treatment of the following:

- Some upper and lower respiratory infections (chronic bronchitis and pneumonia)
- Kidney and bladder infections
- Ear infections
- intestinal infections caused by E. Coli and Shigella bacteria
- skin and wound infections,
- Traveler's diarrhea
- Acne

The usual dosage is one tablet every 12 hours for most of the above conditions in adults for 10 days (less in traveler's diarrhea). The recommended dose for pediatric patients with urinary tract infections or acute otitis media is 8 mg/kg trimethoprim and 40 mg/kg sulfamethoxazole per 24 hours, given in two divided doses every 12 hours for 10 days. This medication is contraindicated in infants 2 months old or younger. In rat studies, the use of this drug was seen to cause cleft palate anomalies.

Sulfamethoxazole 400mg/Trimethoprim 80mg is well known to cause allergic reactions in some individuals. This frequency is almost as common as seen in Penicillin allergies. Some countries have reported a significant rate of resistance to this antibiotic.

Armed with your Physician's Desk Reference and the rest of your medical library, you'll be able to use the antibiotics in this series of articles effectively to keep your family healthy in the event of societal collapse. Don't, however, practice medicine in the here

and now; it's illegal without a license. Remember that the medical strategies and information we provide here and in other medical preparedness sites are only for information purposes, and do not constitute the practice of medicine or actual medical advice. The practice of holistic medicine involves physically seeing and examining your patient, and online diagnosis and treatment is not only unethical, but foolhardy.

Drowning Doesn't Look Like Drowning

by Mario

The new captain jumped from the cockpit, fully dressed, and sprinted through the water. A former lifeguard, he kept his eyes on his victim as he headed straight for the owners who were swimming between their anchored sportfisher and the beach. "I think he thinks you're drowning," the husband said to his wife. They had been splashing each other and she had screamed but now they were just standing, neck-deep on the sand bar. "We're fine, what is he doing?" she asked, a little annoyed. "We're fine!" the husband yelled, waving him off, but his captain kept swimming hard. "Move!" he barked as he sprinted between the stunned owners.

Directly behind them, not ten feet away, their nine-year-old daughter was drowning. Safely above the surface in the arms of the captain, she burst into tears, "Daddy!"

How did this captain know, from fifty feet away, what the father couldn't recognize from just ten? Drowning is not the violent, splashing, call for help that most people expect. The captain was trained to recognize drowning by experts and years of experience. The father, on the other hand, had learned what drowning looks like by watching television. If you spend time on or near the water (hint: that's all of us) then you should make sure that you and your crew knows what to look for whenever people enter the water. Until she cried a tearful, "Daddy," she hadn't made a sound. As a former Coast Guard rescue swimmer, I wasn't surprised at all by this story. Drowning is almost always a deceptively quiet event. The waving, splashing, and yelling that dramatic conditioning (television) prepares us to look for, is rarely seen in real life.

The Instinctive Drowning Response – so named by Francesco A. Pia, Ph.D., is what people do to avoid actual or perceived suffocation in the water. And it does not look like most people expect. There is very little splashing, no waving, and no yelling or calls for help of any kind. To get an idea of just how quiet and undramatic from the surface drowning can be, consider this: It is the number two cause of accidental death in children, age 15 and under (just behind vehicle accidents) – of the approximately 750 children who will drown next year, about 375 of them will do so within 25 yards of a parent or other adult. In ten percent of those drownings, the adult will actually watch them do it, having no idea it is happening (source: CDC). Drowning does not look like

drowning – Dr. Pia, in an article in the Coast Guard’s On Scene Magazine, described the instinctive drowning response like this:

1. Except in rare circumstances, drowning people are physiologically unable to call out for help. The respiratory system was designed for breathing. Speech is the secondary or overlaid function. Breathing must be fulfilled, before speech occurs.
2. Drowning people’s mouths alternately sink below and reappear above the surface of the water. The mouths of drowning people are not above the surface of the water long enough for them to exhale, inhale, and call out for help. When the drowning people’s mouths are above the surface, they exhale and inhale quickly as their mouths start to sink below the surface of the water.
3. Drowning people cannot wave for help. Nature instinctively forces them to extend their arms laterally and press down on the water’s surface. Pressing down on the surface of the water, permits drowning people to leverage their bodies so they can lift their mouths out of the water to breathe.
4. Throughout the Instinctive Drowning Response, drowning people cannot voluntarily control their arm movements. Physiologically, drowning people who are struggling on the surface of the water cannot stop drowning and perform voluntary movements such as waving for help, moving toward a rescuer, or reaching out for a piece of rescue equipment.
5. From beginning to end of the Instinctive Drowning Response people’s bodies remain upright in the water, with no evidence of a supporting kick. Unless rescued by a trained lifeguard, these drowning people can only struggle on the surface of the water from 20 to 60 seconds before submersion occurs.

This doesn’t mean that a person that is yelling for help and thrashing isn’t in real trouble – they are experiencing aquatic distress. Not always present before the instinctive drowning response, aquatic distress doesn’t last long – but unlike true drowning, these victims can still assist in their own rescue. They can grab lifelines, throw rings, etc.

Look for these other signs of drowning when persons are in the water:

- Head low in the water, mouth at water level
- Head tilted back with mouth open
- Eyes glassy and empty, unable to focus
- Eyes closed
- Hair over forehead or eyes
- Not using legs – Vertical
- Hyperventilating or gasping

- Trying to swim in a particular direction but not making headway
- Trying to roll over on the back
- Ladder climb, rarely out of the water.

So if a crew member falls overboard and every looks O.K. – don’t be too sure. Sometimes the most common indication that someone is drowning is that they don’t look like they’re drowning. They may just look like they are treading water and looking up at the deck. One way to be sure? Ask them: “Are you alright?” If they can answer at all – they probably are. If they return a blank stare – you may have less than 30 seconds to get to them. And parents: children playing in the water make noise. When they get quiet, you get to them and find out why.

Survival Fire Safety

By Mr. F

In our preparations, we’ve all made an in depth survival plan. We have stocks of food items and a means to hunt or grow more. We know where we’ll get water and how to treat it and have solutions for cooking, heating and lighting. Perhaps some will operate gasoline or propane-run electric generators and some may distill alcohol or use wood gasification for fuel. We also have adequate supplies of medications, vitamins and first-aid items. We’ve thought of everything, planned for any contingency. Right?

What about Fire Safety? Our plans mostly or entirely rely on fire for cooking, heating and lighting. Do you have working fire extinguishers or another plan to deal with a fire if one erupts? If you are planning to use a generator it needs to be properly wired to prevent fire. And what about your fuel storage? Is it a hazard? After all, if services have deteriorated to this point, the local fire department isn’t coming either.

Of all aspects of our daily life, Fire Safety is most commonly overlooked. The second step to mitigating any safety hazard, after removing the process entirely if possible, is to engineer out the hazard. Today, this is done for us in the form of model building codes, UL listings and other industry standards. Not surprisingly, it isn’t forefront in our minds. But when [SHTF](#), we’ll be trading our electric lights for kerosene lamps and candles, electric ranges for camp stoves and wood fires. Many things will be home-built or improvised from available resources. Have we already, or will we, engineer in those safeguards?

The Science of Fire

To understand fire potential, and extinguishment, it is important to understand the dynamics of a fire. Some of you may recall learning about the “Fire Triangle” in school. The theory being that combustion occurs when all three components (*oxygen, fuel and heat*) are present, and removing one or more will extinguish the fire. While this is a

simplistic approach, it makes an appropriate foundation to start with.

First off, this means that the fuel and oxygen components must attain proper geometric distribution or fuel to oxygen mixing. This usually requires that the fuel, though it may be in a liquid or solid form, must be heated until it vaporizes. This is where heat comes into play. “Flammable” means that it will vaporize at temperatures below 105 degrees F and generally includes liquids such as gasoline, alcohol, propane, etc. “Combustible” refers to fuels which vaporize at temperatures greater than 105 degrees F, thus requiring more heat input for the combustion process to occur. This is also why it is harder to start a campfire in the dead of a Canadian winter than summer in west Texas.

As a fire burns, the combustion reaction produces large amounts of energy in the form of heat. This in turn becomes the heat necessary to sustain and/or grow the fire. The hotter the fire, the more fuel that becomes available and the more rapid the fire’s growth. The only limitation now is the available air. It is important to note, however, that not all fuels need to be in vapor form. Fine dust particles, when airborne in high enough quantity, can attain the proper mixing with oxygen to burn quite rapidly. This is important for anyone with bulk storage of grains, coal, sawdust and even dusty hay.

The oxygen, or oxidizing agent, in the context to which we are concerned with comes from “standard” atmospheric air – roughly 20% oxygen, 79% nitrogen, etc. As the fire burns, hot combustion gases expand and rise in a superheated plume. As these gases rise, fresh air is drawn into the fire at the base, heated, consumed in the fire and again released upward. This is what is referred to as convection currents and one reason why you aim a fire extinguisher at the base of the fire. Also note, however, that in some instances such as with gunpowder, no outside oxygen is required for combustion. Some chemicals, such as nitrates, contain sufficient quantities of oxygen within the molecules, and are easily released during the combustion process. These burn rapidly and are difficult to control.

Okay, a fire just broke out! Now what do we do? First, we need to know what classification of fire it is (that is to say what materials are involved). This is important so we can determine the proper method of extinguishment.

Class A Fires involve “ordinary” combustibles such as wood, paper, cloth, etc. This is the most common fire you can expect and will most likely occur from a campfire that got out of control, a lantern getting knocked over, a lit candle or some other similar incident. A little care can go a long way here.

Water is going to be the best means to put out a Class A fire but it’s likely to be a precious commodity. Snow is another excellent media since it is also very effective

at blanketing the fire. If it is small, you can also try smothering it with a blanket or jacket but make sure there is no flammable liquid involved (guarantee you’ll set the blanket or jacket on fire if there is). In the case of a small to medium fire outdoors, sand or soil shoveled onto the fire is also effective. However, sometimes it may be best to simply let

the fire burn itself out while you prevent it from spreading.

Chimney Fires can creep up unwittingly. Unburned volatiles called *creosote* are given off primarily due to green/wet wood, low temperature fires and insufficient airflow. This creosote builds up until it either blocks the flue or is ignited by a hot fire. If a fire occurs, immediately close all inlet vents on the stove to smother the fire. If it is an open fireplace, extinguish the fire below then carefully try to close the damper if you can. Do not attempt to cover the chimney but do try to water down the roof if possible. There is otherwise very little that can be done for a chimney fire. Water sprayed into the flue will likely crack the flue liner. Even the extreme temperature generated is likely to cause damage to the chimney. Damaged flues and chimneys drastically increase the likelihood of a structure fire. It is best to take every precaution to avoid a chimney fire. [JWR **Adds:** Chimneys should be cleaned *at least* once per year!]

Class B Fires involve generally flammable liquids such as gasoline, kerosene, paraffin, alcohol, etc. These pose a great risk because they ignite easily and spread quickly. Accumulated vapors can ignited with the smallest spark, even static electricity. If you encounter a flammable liquid pool fire, do not use water. Remember, most of the flammable liquids we will be using are hydrocarbon based and float on water. Application of the water will cause ripples in the fuel, causing a flare up as well as spreading the fire. Flammable liquid fire must be extinguished by smothering. This is best accomplished by dry chemical or foam fire extinguishers though small fires in containers may be carefully covered.

Now let's say you are refueling a hot generator and it flashes over. You now have flames coming out of the fuel tank as well as the gas can. **Get away!** It is important to keep your distance as explosion or eruption is possible. This is a bad situation and there is little you're going to be able to do. A pressurized hose could be used to cool surfaces but at the risk of overflowing the tank or can, thus spreading the fire. In the event of a leaking propane line that catches fire, shut off the gas at the source if it can be done safely. It is unlikely that anything else you try will be successful and even if it is, you'll be releasing raw fuel that is likely to re-ignite.

Probably one of the most common and dangerous fires in this class is the grease fire. This generally occurs from superheating animal fats or vegetable oil and also applies to paraffin. Again, do not use water. Find something to cover it with, such as the lid to a pot if you are cooking. The next step is to do nothing. That's right, don't touch it. Let me repeat that. **Do not touch it.** Don't even think about it. You see, as oil, grease or paraffin burns, its' auto-ignition temperature decreases. That means that if any air is introduced, it **will** flash over again unless it has cooled sufficiently.

Class C Fires involve energized electrical components such as wiring, motors, generators, etc.

In this case, the ignition source is the electricity and the fuel is usually the wiring. The first step in this situation is to kill the electricity – trip the disconnect, turn off the ignition, shut down the generator, what have you. Now it is simply a Class A or Class B fire. **DO NOT** use water around live electricity.

Class D Fires involve metals, such as sodium, magnesium, aluminum, etc. These may be found in some fire starters and flares as well as around metal grinding and cutting. It is possible for two metals, along with a catalyst, to ignite. Such fires burn rapidly and extremely hot. However unlikely it is that you will encounter such a fire in a survival situation, this is one you can't affect without specialized firefighting equipment.

Fire Extinguishers are an indispensable safety item for every household. Each extinguisher will be labeled for the class of fire and fire size it is capable of being used on. There are several styles available so familiarize yourself with how yours operates before it is needed. There are also a number of different extinguishing agents so choose wisely. Water and water based foams will freeze and the powders used in dry chemical types wreak havoc with electronics. Do your homework. They also require some regular maintenance. For instance, dry chemical powders need to be “fluffed” every so often to keep them from caking. This can be accomplished by turning it upside down and hitting the bottom with a rubber mallet. And also check to make sure the bottle is free of rust or other mechanical damage. I recall one incident in which a woman intended to operate a fire extinguisher on a small fire. However, the bottle was severely rusted and when she “charged” it by firing off the supplied air cartridge, the top blew off and killed her. Also, with the exception of the old “Indian fire pumps”, it's unlikely you'll be able to refill them.

Doubtless, the most fearful fire of all is one that upon your person. In the event that your clothes become involved, don't run. **STOP, DROP and ROLL** to smother the fire. If you see someone else on fire, this is where your time on the high school football team comes in handy. Grab a blanket, preferably wool, and tackle them (albeit gently). The goal is to get them on the ground and covered with the blanket, smothering the fire. Depending on the circumstances and clothing involved, there will likely be some first aid required.

Up in Smoke

Aside from the inherent dangers of fire itself, combustion by-products may pose an even greater hazard. In complete combustion of organic materials, where adequate free air exists for the fire, carbon dioxide and water are produced. Carbon Dioxide (CO₂) is a colorless, odorless gas which, being heavier than air, collects in low areas. An increase of only 2-3% CO₂ in the air we breathe can result in impaired memory, loss of fine motor skills and weakness. Higher concentrations can cause unconsciousness and death. If you find someone a victim of CO₂ exposure, ventilate the area. Do not go rushing in and become a victim too (you won't do them or yourself any good like that). Remove the

victim to an area with fresh clean air. In some cases, the victim may require further medical treatment by trained personnel.

If the fire is starved for oxygen, then carbon monoxide (CO) is produced. Again, CO is a colorless, odorless gas, but it is even more dangerous. Generally, CO exposure causes a feeling of sleepiness in the victim, but also nausea, headaches and vertigo. Once the victim becomes unconscious, death soon follows. The complicating factor here is that CO molecules bond to hemoglobin, the oxygen carriers in the bloodstream, preventing oxygen from getting to the cells. Simply getting the victim to fresh air will *not* adequately purge CO from the system. Treatment for CO exposure usually requires 100% oxygen or hyperbaric treatment.

When inorganic materials such as plastic, paint, glue, particle board, wire insulation and other man-made materials burn, there is virtually no limit to the volatile and toxic chemicals that are released. These can result in serious illness and death very quickly and will almost certainly require medical treatment you cannot provide at your survival retreat.

An Ounce of Prevention

While we want to be prepared to deal with a fire if one starts, our best bet is to “engineer out” the hazard and prevent a fire altogether. Make sure that lanterns, lamps and candles are placed on a flat, stable surface. Candles should be in a proper holder or on a porcelain or tin plate with sides to catch melted wax. An empty tuna can works well for this. Ensure that all combustibles are kept away and be mindful of shirt sleeves and loose clothing when working with or around such items. Also, be careful around children and animals (remember Mrs. O’Leary’s cow).

As I said before, chimney fires are best avoided and regular maintenance is the key to preventing them. This starts with regular cleanings. If you are burned strictly for heat in cold months, this means at least one cleaning before the burn season and possibly more during the season. If you will be burning regularly for cooking, you’ll probably be using a smaller fire, thus creating more creosote. Burning hot and staying away from “green” wood or wood heavy with resins such as pines will drastically help reduce buildup.

There are various products on the market which claim to help with creosote buildup. These products are simply burned periodically in the fire. However, while these would likely help, they are certainly no replacement for proper cleaning. Make sure you have a brush or two of the proper shape and size for each flue. In a pinch, a bundle of chain on a rope will work for small flues.

Even as I write this, I received a call from a woman who just had a chimney fire last night. Today she is trying to make repairs so that it is again safe to burn. Metal chimneys are expensive but easily replaced if you have spare parts.

However, damage to masonry chimneys is much more difficult to repair. Take extra care with flammable liquids. When stored, ensure that they are in approved containers with good seals. On his 1911-12 journey to the South Pole, Robert Scott left caches of food and fuel. On the return trip, he found that many of the fuel cans were empty, having leaked at the seals. The lack of fuel eventually led to their deaths.

Flammable liquids should be stored out of sunlight and in a well ventilated area. And for God's sake don't use anything with a flame around flammable liquids. Even a flashlight is a potential ignition source. If you need to have something for light, get a small flashlight with a

Class 1, Div.1 rating. I use ones from Pelican and UA.

Also avoid using gasoline and the like for starting fires. The accumulation of fumes can have deadly results. A good alternative is to use gel starting fluid for pellet stoves. The gel is less volatile and won't flash or explode like gasoline will.

Also be very mindful of the clothing you wear around or when starting a fire. Nylon, rayon and the multitudes of synthetic fibers used in clothing today are extremely dangerous. They ignite easily and melt even easier thus increasing the need for medical attention. Natural fibers such as cotton and wool are best.

When possible, buy instead of building anything that uses a flame. This includes lanterns, stoves, burners, incubators, brooders and heaters. There are also several manufacturers of fire resistance coatings that can be applied to almost anything.

Be careful with outdoor fires, especially when windy. The last thing you want to do is start a fire that burns your house or shelter down with your supplies in it. Remember the rule of 3's? You can survive 3 hours without shelter, 3 days without food.

Don't use stoves or flames inside of tents unless both the tent and the stove are intended for such a purpose. If you are planning to use a wood framed structure for your survival shelter, you may want to think about fire resistance. A number of manufacturers offer concrete fiberboard siding that is fire proof as well as water, weather and insect proof. There are also a number of options for roof coverings such as metal, clay and cement fiberboard.

Unless you are competent in electrical wiring, make sure to have everything checked out by a licensed electrician. If you plan to use an electric generator, use the proper connections and transfer switches. Don't try to jury rig this - the shock and fire potentials here are extremely high. Smokey Bear always said "Only you can prevent forest fires". This is essentially true in a survival situation too. Many of us will be living in somewhat primitive conditions compared to what we are used to. We need to be vigilant at every moment. Think Safe, Be Safe.

3 Hours without Shelter

*It will be a shelter and shade from the heat of the day, and a refuge and hiding place from the storm and rain. **Isaiah 4:6***

*For You have been a defense for the helpless, A defense for the needy in his distress, A refuge from the storm, a shade from the heat; For the breath of the ruthless Is like a rain storm against a wall. **Isaiah 25:4***

Lack of Shelter

The major concern caused by the lack of shelter is that of hypothermia. There are any number of natural and man made disasters that can render your home unlivable. Without a back-up heat source losing power/heat to your home in a snow storm can lead to temperatures quickly falling into the range where hypothermia can be a concern, every year a number of elderly die in their homes of hypothermia due to utility shutoffs and broken heating systems. In some cases your home could be flooded or so severely damaged to make it unsafe, especially in the case of a major earthquake (i.e.Haiti 2010) they may not be enough or even any safe and suitable buildings left in your area to even act as temporary shelters. This could quickly leave you and you family out to the mercy of the elements. You need to plan accordingly.

Hypothermia And You...

"Come, on finish that pasta or we'll all end up with hypothermia..." Yep, it's that time of year again, the nights are closing in, temperatures are dropping etc, ad nauseum. But what exactly is hypothermia, how do you spot it, what should you do if you get it and how should you avoid it in the first place?

What is hypothermia?

Pay attention now, hypothermia, also known as 'exposure' is technically when your core body temperature drops below the normal 35 degrees centigrade, your normal body temperature is 37C. It happens when the amount of heat you're losing can't be replaced by your body, so your body temperature falls. The results are serious and can be fatal, one text book lists a drop of 4C as causing disorientation, 7C leaves you in a coma and a drop of 10C can be fatal.

So in very simple terms, it's a fall in body temperature cause because you're losing more

heat than you can produce. It's not just feeling 'a bit cold', though that can be the start of it.

Spotting the symptoms

Assuming you're not walking around with a thermometer permanently up your butt, you need to be aware of possible signs that you, or your mates are going hypothermic. Bear in mind that it's not always easy to spot, particularly early on, but watch out for:

- clumsiness - might look like drunkenness
- disorientation
- sudden bursts of energy
- exhaustion

Classically a quick test is to ask the suspected victim to do some quick mental arithmetic as a check on their mental function. Exhaustion and hypothermia go hand in hand by the way, if you're very tired, your metabolism slows, you don't kick out enough body heat and you become hypothermic...

Treating Hypothermia

Stop and take stock. It's essential that you don't push on regardless unless safety is very, very near. If the symptoms are mild, putting the casualty in some sort of shelter, adding dry, warm clothes and, in particular, a hat, and feeding them warm hot drinks and food may be enough.

- If things don't improve, put the casualty in a sleeping bag and insulate them from the cold ground with a sleeping mat.
- Recent research suggests that body to body warming can actually be counter-productive since pooled acidic blood in the muscles is warmed too quickly, reaches the heart and can cause cardiac arrest.
- Heat packs placed at the victim's armpits and groin are a better way of raising the core body temperature without risking shock as are a warm drink or soup if the victim is conscious.
- Do not give the victim alcohol or coffee since both can cause heat loss.
- Do not allow the victim to fall asleep.
- Treat the victim gently, in severe cases of hypothermia, rough handling can cause a chilled heart

muscle to arrest.

- Even when the victim has apparently recovered, they mustn't be allowed to continue the hike. Instead, call or fetch help and, if possible, get them evacuated from the hill so they can receive professional treatment.
-

Avoiding Hypothermia

The best solution to hypothermia is to avoid it in the first place, which is doubly important when you're on your own, since disorientation makes the condition hard to spot.

Wear correct and sufficient clothing. Wind chill and damp are both your enemy since both accelerate heat loss from the body, so wind and water-proof clothing and insulation layers are crucial.

- Cover your head - you lose a lot of heat through your noggin, while the body will restrict blood flow to, say, your feet, your brain needs a blood supply to function, so the stuff is always flowing up there. A warm, windproof hat will make a big difference. Carry a spare too, it's stupid dying because you dropped your hat...
 - Eat high energy foods regularly as you go - your body is like an engine and if you don't fuel it, it'll stop running and stop producing heat.
 - Don't be over ambitious - tired walkers and climbers are far more likely to get hypothermia, so be realistic about your day - if it's cold and wet or very windy, consider shortening your route or maybe cancelling altogether. If you're a little unfit, don't push yourself too hard.
-

Kit To Carry

Particularly if you're part of a group, carrying the right kit can make the difference between life and death. If you're backpacking, then you'll have most of what you need to survive already so...

- Your brain - no joke, pressing on regardless is what kills many hypothermia victims. Having the presence of mind to realise that you have a problem and need to deal with it is crucial, but difficult.
- Spare warm clothing and a sleeping bag / down jacket can be crucial in minimising heat loss in the victim. Bear in mind that other members of the group will also need warm

clothing once you stop. Hats are crucial.

- An emergency shelter or bivvy bag - crucial to getting the victim out of the wind. Group survival shelters are excellent and can also be used for sheltered lunch stops and allow you to pool body heat.
- A sleeping or bivvy mat - ideally you want to insulate the casualty from cold ground, if you don't have these, improvise using a pack and / or spare clothing.
- Stove, drinks and food. A lightweight stove and some soup or hot drinks are a good move and you should always carry emergency, high energy food as a back-up measure.
- Heat pads - exothermic warming pads are a better way of warming a casualty than body contact. Well worth adding to a group kit list.
- We're not saying that you have to carry all of these in winter, but they could make the difference between a minor scare and a fatality, so, particularly if you're part of a group, think about sharing the above out between you.

And Finally...

Hypothermia's not just for winter, it's perfectly possible to cop it in spring or autumn, or even in summer, so let's be careful out there. *By Jon Doran outdoorsmagic.com 8/11/04*

EMERGENCY SHELTER

In survival as in all aspects of life, it is easier to be organized if we prioritize. The priorities, in order, are shelter, water, heat, food, signal, and utility. You can live 4-6 weeks without food; 3-5 days without water; but hypothermia will kill you in 30 minutes. Therefore shelter is the first priority! Shelter may be defined as anything that protects the human element from nature's elements. I will not discuss clothing here, other than to say that a good coat can't be beat, and it is easier to survive in the summer with winter clothes than in the winter with summer clothes.

What You Need

A free-standing dome or A-frame tent is the only realistic option for a mobile shelter in a short-term emergency preparedness kit. There are several things to be aware of in selecting a tent. Construction should be of good quality, breathable materials. The rain fly should extend from the apex of the tent almost to the ground. A small rain fly like those found on many discount shelf specials is unsuitable, because it means the tent walls are made mostly of waterproof material. The human body passes 1-2 quarts of water vapor daily and if you are in a waterproof tent for an extended period of time that water vapor will condense on the walls. It is for this very reason that tube tents should be avoided like the plague.

A heavy-duty space blanket is recommended to put under the tent in order to protect the tent floor. It is much easier and cheaper to replace a \$12 space blanket than a \$100 tent. Avoid

the pocket space blanket—another plague! Their usefulness is limited and they breed a false sense of security. A sleeping bag is the most critical piece of survival equipment you can possess, especially in winter. Fires are only 50% effective. You cook your front side while your buns freeze, or you toast your buns and your nose freezes—you just can't win! In a sleeping bag, however, you can efficiently maintain body heat.

A good sleeping bag will have the capability to form a hood. It will have a sizable draft tube along the length of the zipper to prevent snags. Another important feature is the ability to zip two bags together to share body heat or to put a child between parents. Select a synthetic insulation rather than down. Qualofill, Polarguard and some of the new materials recently released are excellent. The advantage of synthetic insulation is that when the bag gets wet, it can be wrung out and will still you warm. When down gets wet, the insulation value drops to nearly nothing. Emergency survival situations rarely occur on warm sunny days, and you can just about bet it will be on a dark, rainy or snowy night when the world comes apart.

An absolute must in a temperate climate is a sleeping pad. Ground cold can suck the heat right out of your body, through your sleeping bag. A closed-cell foam pad will

provide the insulation required, but will give little if any comfort. An air mattress of the type you take to the beach or swimming pool will freeze your whole persona during the winter. For true comfort an air mattress such as Thermarest is expensive but worth every cent. For economy, a simple 3/4-length closed cell foam pad is all that you need. Avoid open-cell pads because they soak up water just like a sponge.

Put a 'Shelter Box' in your Emergency Preparedness Plans

Even if you plan to ride out every crisis in the comfort of your home, you should prepare to evacuate anyway. When SHTF (Stuff Hits The Fan) it is not usually evenly distributed...Not one of us is immune to the possibility of natural or manmade disasters forcing us to flee our homes or our favorite crisis hideyholes.

Do you have a tent in your emergency bugout kit?

Some of you may be thinking along these lines in the event of an emergency evacuation, *"I don't need a tent, I'll be in a motel/relative or friend's house/etc."* or *"I can sleep in my car, if I need to."* If this is you talking, then please consider that best laid plans can go wrong. You may have to abandon your vehicle for some reason or another...or face way too many miles of no motel vacancies...houses can burn down...you get the idea.

The paramount rules for survival anytime, anywhere involves shelter, water and food. Naturally, when preparing for emergencies, we always think of food and water...but ***how prepared are you for emergency shelter***

If you have not already done so, put a low cost 'shelter box' in your emergency preparedness plans. Make your own custom kit to suit your group. Here's the general idea:

<http://www.shelterbox.ca/what-shelterbox.html>

The price and weight is a bear, so...

Here's my spin...a combination Shelter Box and 'bugout' bag. The following items can be packed into one or two large sturdy and waterproof boxes (or large bags). Waterproofing is essential, in the event of rain. Use plastic bags inside of the containers, if needed. A well stocked Shelter Box should at least include the following items.

This is an outline of a very basic kit. My personal kit contains more gear than this, and other folks may have more or less than what is outlined here. A supply list as long as your leg can be overwhelming to those who are just starting out in their preparedness ventures, or to those who simply can't afford to buy a lot. Here is a short and sweet version of the basics:

1. **Expedient dry shelter** such as a tent (or several heavy duty tarps and rope if you can't afford a tent right now). Instead of including one large/medium tent to shelter your whole group, I would include two medium (or smaller) tents. Bad things can happen to your one shelter. Better to have a backup, even if it will be a bit cramped.

2. Bedding and clothing for every person:

A. Thermal blankets and thermal sleeping bags, if you can afford it.

B. Even if it is summertime (or wintertime) when you pack your shelter box, and the next season is far from your mind...don't forget to include a coat and a summer/winter change of clothing and shoes for each person.

3. One heavy duty plastic tarp for each person, to serve as a ground cover beneath bedding. Include an inexpensive mylar blanket for every person to bolster up insulation where needed. In summer, the same mylar blanket can be used on top of a tarp shelter to divert the sun's hot rays and to help cool the area beneath the tarp...

4. **Light** - Include an inexpensive solar powered battery charger and rechargeable batteries for several LED flashlights. I like to get a few of the same kind of flashlight (and other gear), so I can cannibalize one for parts, if needed.

5. **Clean water and several ways and means of purification.** Collapsible water containers.

6. **Heat / cooking** - Two lightweight stoves: one multi-fuel stove and one twig-burning stove. Here are some options/ideas: <http://www.modernoutpost.com/gear/camping-stoves.html> Include several ways of making fire.

7. **Cooking aids** - 2 cooking pots, cooking spoon, sharp, tough knives, small knife sharpener, folded heavy duty aluminum foil, etc. Include one set of utensils and a bowl for each person. Lightweight mugs if you have room. (A bowl can do multi-duty in a pinch, if needed to save space on plates and mugs).

8. **Food** - Lightweight instant foods that require no refrigeration or extensive cooking. Include dried fruits, nuts, jerky, tasty energy bars, etc.

9. **Tools** - hammer, axe, saw, heavy duty plastic bags of varying sizes, quality duct tape (the 'Gorilla' brand tape is the best!), folding shovel, rope, tent stakes, bungee cords, etc. etc.

10. **Health and special needs:** fever and diarrhea reducing meds, personal medications, basic first aid gear. Your favorite insecticide, and mosquito nets if your area calls for it. If you have babies, include the basics for their survival. Pets...decide ahead of time what their emergency plans will involve and plan accordingly.

11. **Communications** - Radio, cell phone, windup battery chargers. Phone numbers.

12. **Sanity savers** - Just to mention a few...

A. A copy or the originals of your important papers. You know what they are.

B. A list of details about your employment/educational history. Not many think to include this in their emergency kit, but it is a sanity saver in the event you cannot return home right away, and may need to apply for temporary or permanent work elsewhere.

Urban Shelter



Materials:

- * Refrigerator cardboard box
- * Styrofoam found within the same box and dumpster.
- * Duct tape
- * Box cutter
- * Tape measure
- * Marker

If the circumstances force us to build the shelter outside, we should protect the shelter from moisture. We could use multiple layers of trash or any available plastic. (trash bag, tarp, poncho, carpet, sheet metal, wood, rugs) The refrigerator box can be replaced with boxes from big screen TVs or whatever is available. Most families have boxes in their attic. Local furniture stores are usually happy to let people take away their trash. Call and ask for permission. A local furniture and hardware stores will give you cardboard.

We built the shelter as a triangle, in order to minimize the walls we would have to insulate. Do not forget, a smaller shelter is easier to warm up with body heat. If we wanted to squeeze two people in the shelter, we could choose a rectangular configuration. I guess we can call our shelter, an urban emergency survival A-frame or urban A-frame shelter.





We use the tape to stabilize the shelter and begin the measurements to close off the ends of the shelter. This is where the cutting device and pen/marker comes into play.





We mark the cardboard, so we can cut the ends properly.





We close up one end of the cardboard a-frame shelter and begin insulating using the Styrofoam and duct tape.





Since heat flows naturally from a warmer to a cooler space, we are adding insulation so we can lessen the effect of conduction with the cold concrete. We also minimize convection by trapping air inside the box shelter. We have multiple layers trapping the air and the Styrofoam insulation to get us off the ground. In a wilderness a frame, we use leaves or pine boughs to create the air trapping effect, and insulate us from the cold ground.



Once we finish the insulation, we build a door so we can shut it behind us. If the shelter was to be used multiple days outside, we could cover it with multiple layers of cardboard

and items such as rugs, carpet, plastic, trash bags anything that would help waterproof the shelter.





Almost finished. We want to insulate the door as much as possible. This will be our number one source of heat loss.



*Note: making the shelter completely airtight is pretty difficult. It would seem this does not need to be mentioned but think safety! **YOU SHOULD NOT MAKE THE SHELTER COMPLETELY AIR TIGHT !** The law of threes, you cannot live much over three minutes without oxygen. Use common sense please!*



We add the finishing touches to the insulation. Getting inside the shelter with a light source outside, will help find any holes. The wind should help find drafts.

This is just one example of cold weather urban shelters. There is no way we could cover all the possible shelters in the scope of this article. Properly tested urban survival techniques would take a large book to cover. What starts to happen with time and experience is we begin to see everyday items as survival materials.

Again, other options of inside the home shelters can be made using your furniture and cushions. A futon mattress can be rolled into a improvised sleeping bag. Several bed mattresses can be structured to build a shelter. Use sheets, blankets, rugs, curtains, and extra clothing to build a shelter within your home. If your home has been destroyed, often debris can be used to build a shelter. Plastic sheets, trash bags, cardboard, wood can be used to build modified a-frame, lean-to type shelters.

*Partial reprint from: **practicalsurvivor.com***

Another type of Urban Shelter is the *Mattress Shelter*

How To Make Improvised Mattress Shelters:

Cold-weather survival skills should be part of everyone's knowledge base. Knowing how to make a debris hut, snow cave, or igloo, can save your life in a winter emergency, and it is easy to find instructions for constructing these shelters in survival manuals, or on the internet.

These types of shelter work well in the outdoors, but for urban winter survival scenarios,

you can use man-made materials to construct cold-weather shelters, which I like to call mattress shelters.

Mattress Shelters:

A mattress shelter is the urban equivalent of a debris hut. It is a warm shelter built indoors, using mattresses, any other bedding that is available, and similar items, such as pillows and couch cushions. Sadly, people die from exposure (hypothermia) every winter, during blizzards and power outages, and many of them could have used shelters like these to survive, if they knew how to make them. City-dwellers who live in large apartment buildings can't usually heat them with wood stoves, but they can make these shelters, using materials from their apartments.

The basic idea is to make a well-insulated shelter space where you and your family can sleep and rest, when you are in an extreme cold-weather situation where utilities are not available, and where making a fire for heat is not practical, such as in an apartment building. There are several types of mattress shelters, and which kind you make will depend on how many people need shelter, and how much material is available to make them with. They should all be made on top of a regular bed, to keep you above floor level, as the air at floor level will be the coldest air in the room (20 degrees colder, or more). You can also improvise a similar elevated platform, using available materials, such as planks set on crates, or doors set on chairs, etc.. If the building you are sheltering in has broken windows, letting cold wind inside, you can block them off using doors removed from closets, or from any other unoccupied rooms.

Mattress Pad Shelter:

Check the beds in your building, and if you find one with a foam mattress pad, you have the simplest form of mattress shelter already available to use. You just get in between the regular mattress and the foam pad, and the extra insulation of the foam pad above you will help trap your body heat. This "foam pad" mattress shelter will keep one or two adults warm, depending on the size of the mattress. King size mattresses can hold three adults, or two adults and one or two children. Any available bedding can be used to add more insulation, if needed. The pad can be placed on top of normal bedding, and more than one mattress pad can be used, if available. Memory foam mattress toppers are the best, if you have a choice, but use whatever is available to get warm first, and then upgrade your gear as much as possible. (Foam pads have a number of other uses, so collect all that you can, when survival scrounging.)

Sandwich Shelter:

The next type of mattress shelter is made starting with one bed, and then placing a second mattress on top of it. The second mattress is elevated 18 to 24 inches (or so) above the bed, using a line of objects down each side, so that you and your family can fit between the upper and lower mattress, like the meat in a sandwich. The objects used to elevate the

upper mattress can be anything with insulating value, such as couch cushions, pillows, rolled-up blankets, etc. You can use cardboard boxes that have been stuffed with crumpled newspapers, if nothing better is available. Dresser drawers will work, especially if they are filled with clothes or books.

Blankets or pillows should be placed between the boxes or drawers and the shelter's occupants, and the shelter should be enclosed on all four sides, leaving only a small entry and exit opening, that can be blocked off with pillows, to trap more body heat.

A-Frame Shelter:

The next type of mattress shelter is made starting with one bed, and then placing two more mattresses on top of it, so that they form an A-shaped shelter.

The mattresses are tied in place using cordage, to keep the A shape stable.

The cordage can be anything available, such as rope, or extension cords cut from appliances, or strips of bed sheets. One end of the A-shaped shelter is blocked with blankets or pillows, then you get inside, and finally the other end is blocked off as well. This mattress shelter design creates enough space that you can sit up inside.

Blankets can be used to seal drafts in mattress shelters. Heavy wool blankets can also be made into warm improvised coats, called capotes. See the info below on improvised clothing, for instructions on making capotes. Don't use air mattresses for shelters (they don't insulate well enough) but the mattresses in sleeper sofas work ok.

Cube Shelter:

The next larger type of mattress shelter is made starting with one bed again, and then four more mattresses are used to enclose it on all four sides, leaving a small gap for entry and exit. Another place with cordage. A mattress shelter of this type will hold three or four people, and occupant's body heat keep it comfortable, once the entry is blocked off with blankets or pillows. This design allows you to sit up, and do things (like change clothes) inside the shelter. If you have larger numbers of people in your group, you can make larger mattress shelters, or several of the smaller ones already described. Larger mattress shelters are made by tying several bed-frames together, placing mattresses around these beds to form walls, and then adding more mattresses on top, to roof off the shelter. Rope is used to hold the mattresses in place, and some support planks may have to be added, to hold up the mattresses on the roof. The body heat from several people may force you to leave ventilation gaps, in these larger shelters. If the roof of your building was damaged and is leaking, the mattress shelters can be covered with tarps or plastic sheeting (such as shower curtains), to keep the shelter area dry. Other items that have insulation value can be used to make mattress shelters, if actual mattresses are not available. Examples include quilted mover's pads, and gym pads, or wrestling mats. These items can also be used to improvise cold-weather clothing, when nothing better is available. If you find yourself trapped in an extreme cold-weather survival situation, use whatever materials you have available to construct a mattress shelter, when building a fire is not an option.

Once you have shelter, then you can make improvised cold-weather clothing, for going outside to gather food, fuel, or supplies.

Reprint from: www.shtfmilitia.com

As these articles show shelter may often quickly and easily be built out of materials at hand, a few basic supplies and your ingenuity. For longer term shelter please review:

<http://www.earthbagbuilding.com/projects/sandbagshelters.htm>

http://www.habitat.org/disaster/active_programs/Haiti_emergency_shelter_kits.aspx

<http://www.greenhomebuilding.com/emergencyshester.htm>

Step by Step Earthbag Construction

by Dr. Owen Geiger

To illustrate just how easy earthbag building can be, this article shows each main step of construction for building vertical earthbag walls. Follow these steps and you and half-dozen friends can build the walls of a 625 square foot (58m²) house in about 5-10 days.

Videos on my YouTube channel demonstrate the process.

The following instructions assume you have cleared and leveled the site, removed topsoil, positioned fill soil around the building site to minimize work, dug a trench to stable subsoil, put about 12" of gravel in the trench, and added corner guides and stringlines.



1. Tools and materials (listed left to right): woven polypropylene bags (about 18" x 30"), bucket chute (4-gallon bucket with bottom cut off), 4 or 5 heavy duty 2-gallon cement buckets, stringline, metal chisel and scrap steel for cutting barbed wire (or bolt cutters), hammer, sheetmetal slider (about 13" x 16"), 15 gauge galvanized wire, knife, wire cutters, tape measure, 4-point barbed wire, corner guide, grub hoe or grape hoe, level, tampers, bundle 500 bags, shovel.



2. Fill the bags: use 2-gallon cement buckets to measure the fill material. Use the same number of buckets for each bag. Fill bags approximately 90% full, leaving just enough to sew the bags closed. This technique ensures a.) each bag is filled to capacity to save bags, and b.) each bag is the same size, which helps keep walls level. Bag stands are not needed.



3. Sew or stitch the bags closed: fold the bag end over; use 15 gauge wire about 9" long with one end cut at a sharp angle; make one stitch on one side and bend the end over; make a stitch in the center and pull the corner over; make a stitch in the other corner and

pull the corner over; poke the remaining wire into the earthbag. This technique facilitates handling, prevents spills and enables bags to be filled to capacity.



4. Lower courses: place gravel-filled bags (double bagged) working from the corners and openings to the center. It helps to tilt the first two bags against each other. Align bags to stringline; tamp the bags solid and level after the course is complete, working from the center of the bags outward. Always put tops of bags (the ends you've sewn closed) butted against other bags (never facing outward on corners or ends). Maintain a running bond as in masonry.



5. Add barbed wire: use two strands of 4-point barbed wire in-between each course of bags; bricks or stones temporarily hold the barbed wire in place.



6. Use a sheetmetal slider to place additional courses so bags do not snag on the barbed wire; fill the bags on the slider; sew the end closed; tilt the bag into position and push it against the previous bag; after the bag is aligned, hold the end of the bag (it helps to lift it slightly) and jerk the slider out. Continue with gravel-filled bags until you are safely above grade to avoid risk of moisture damage.



7. Repeat the process using earth-filled bags, but with a few minor changes: turn bags inside out to avoid protruding corners; use lightly moistened soil; tamp the contents slightly after each bucket load is added; pre-tamp each bag after it is aligned in position. This last step lengthens each bag to ensure good overlap.

8. Make custom-sized bags to fill odd-sized spaces: measure the opening; fill the bag to the approximate level; cut off excess bag material; fold each side of the end toward the center and tuck under the bag; place the bag in the wall.



9. Tamping: Tamp earthbags solid and level after each course is complete. Tamp the high points first. Then evenly tamp the entire wall several times as you continually move the tamper. This last step avoids creating low spots.

Notes for 'speed builders':

Here's a recap of important points, along with a few other comments to maximize production.

-

First of all, get 'clean' (mostly free of rocks, roots, and large clay chunks) sandy-clay soil delivered to the site and dumped in piles around the building.

To minimize handling, fill the bags in place on the wall.

- Gravel could be shoveled from the truck directly into the rubble trench foundation.
- Work in teams -- say, two teams for a small house -- and try a little friendly competition.
- Bag size is important. Even a slightly larger bag than 18" x 30" uses more materials and requires extra work. Bags much less than 18" wide will be unstable for 8' high vertical walls.
- Refine your technique for making custom-sized bags - they tend to be a real time killer. One idea is to hold a partially filled bag next to where it will go and eyeball how much soil to use.
Add more than you think because it will compress quite a bit.

Let go of perfectionism. There's a middle ground between high-precision work, such as masonry, and careless work. Use reasonable care and no one will notice minor imperfections after the plaster goes on. And if you want, it's relatively easy to tweak and flatten the wall with a tamper before plastering if the wall hasn't dried. (But don't be careless. We've seen some very poorly built walls.)

- There's no need to tamp the bags excessively, just tamp until they're solid. One minute per bag should be plenty, maybe go two minutes if you're slow and tired. There's a change in tone when they become solidly compacted.

Owen Geiger, Ph.D. is a TLS Correspondent, Mother Earth News Green Home Adviser and the Director of the Geiger Research Institute of Sustainable Building. www.grisb.org

3 Days without Water

All the congregation of the people of Israel moved on from the wilderness of Sin by stages, according to the commandment of the LORD, and camped at Rephidim, but there was no water for the people to drink. Therefore the people quarreled with Moses and said, "Give us water to drink." And Moses said to them, "Why do you quarrel with me? Why do you test the LORD?" But the people thirsted there for water, and the people grumbled against Moses and said, "Why did you bring us up out of Egypt, to kill us and our children and our livestock with thirst?" So Moses cried to the LORD, "What shall I do with this people? They are almost ready to stone me." And the LORD said to Moses, "Pass on before the people, taking with you some of the elders of Israel, and take in your hand the staff with which you struck the Nile, and go. Behold, I will stand before you there on the rock at Horeb, and you shall strike the rock, and water shall come out of it, and the people will drink." And Moses did so, in the sight of the elders of Israel. And he called the name of the place Massah and Meribah, because of the quarreling of the people of Israel, and because they tested the LORD by saying, "Is the LORD among us or not?"

Exodus 17:1-7

Backcountry Water Treatment Part 1: Proper Hydration

Prevent Dehydration with Proper Hydration

Dehydration is a serious concern during outdoor activities. It can happen in summer or winter, on a day hike or several days into a 50-miler, even on a canoe or kayak trip.

Vigorous activity, excessive sun exposure, forgotten water breaks, higher altitudes (where humidity levels are lower), and medical conditions are a few factors that can affect your hydration level.

Some of the consequences of dehydration are loss of energy and motivation, irritability, headaches, difficulty sleeping, fainting, and, at high altitude, an increased likelihood of altitude sickness, hypothermia, and frostbite. In extreme cases, dehydration can lead to delirium and even death.

Essentially, if you're losing more fluids than you're taking in, dehydration is the result. So it's important to stay sufficiently hydrated while hiking, backpacking, or climbing. However, water sources in the backcountry, or even at the trailhead, are not normally assured of being safe for consumption. So learning how to treat backcountry water is essential to ensure safe water supplies and proper hydration.

Dehydration Signs and Symptoms

The rule for judging whether someone is becoming dehydrated is the phrase "**Clear and Copious.**" This means that one's urine should not have a strong color and that urination

should be fairly frequent. If your urine is not clear like gin to pale yellow, you are dehydrated. Dark yellow indicates serious dehydration.

It takes time for the body to absorb fluids, so you must **drink early and often**. Make sure everyone, youths and adults, is drinking plenty of water. “Saving” your water for later can result in dehydration instead. Trip leaders and other adults should make sure to not neglect their own hydration needs.

Thirst is not necessarily an indicator of dehydration. The body’s thirst signal starts when you are 2 to 5 percent dehydrated, according to Dr. Eric Weiss. That person who is acting crankier than usual may be dehydrated, so take frequent water breaks (every 20 to 30 minutes). Consider using a hydration reservoir; its easy access means you never need to stop for a drink.

Rate of Moisture Loss

Some of us, especially those brought up in desert regions, were taught to “conserve our water,” saving the small amounts available as long as possible; we were told we could quell the thirsty feeling by holding a small round pebble in our mouths and sucking on it. The problem with these misconceptions, is that we lose moisture in our breath and by sweating. For example, during eight hours of sleep about one liter of moisture is lost through breathing and another liter is lost through perspiration. The rate is even faster when exercising vigorously.

A good way to find your personal rate of moisture loss during exercise is the same as that used in professional and international competitions—weigh yourself before, during, and after an exercise session. It is, of course, impractical to weigh yourself during a hike, but you can weigh yourself before and after a training hike. Each pound you lose during exercise is a pint (half liter) of water lost. Be sure to account for any water and fluids you take in during the hike. In ultra-marathons and other endurance competitions, competitors are usually pulled from the event if they lose more than 5 percent of their body weight.

How Much Water?

The basic rule for avoiding dehydration is to drink plenty of fluids, but this doesn’t mean just any fluid. Diuretics (such as caffeine, alcohol, and a number of medicines, including Diamox commonly taken for altitude sickness) promote dehydration. The body does not absorb highly sugared or carbonated beverages as rapidly, which means that soft drinks are less efficient at quenching thirst than plain water. And some adults down a few malt beverages at the end of a hot day believing that they are rehydrating, but research shows quite the opposite.

The best way to keep hydrated or to rehydrate is with plain water or water with one of the specially developed rehydration mixes added.

Someone exercising hard may lose more than a liter (quart) of water an hour. So a good guideline for vigorous activities at altitude is a minimum of **4 liters a day, up to as much as 8 liters**. For example, this might mean consuming a liter at breakfast (including hot drinks and fluids in cereal and fruit), one liter between breakfast and lunch (take frequent water breaks), a half-liter with lunch, a liter between lunch and supper (more water

breaks), and a final liter at supper (including in the form of soups, hot drinks, and the main course). Many people find that staying well-hydrated is key to a good night's sleep. Remember that caffeine is a diuretic, so coffee, tea, and chocolate are not as effective as non-caffeinated drinks. *-by Bill Straka*

Backcountry Water Treatment Part 2: Keeping Your Water

Supply Safe In Camp

Whenever and wherever you camp, you must make sure your water supply is not contaminated, as well as take great care not to contaminate the water supply. To prevent contamination, separate your water source from the areas for bodily relief and washing dishes or yourself by at least 100 feet (or as specified by the land manager).

Designate a clean water source area and a separate latrine area when you set up camp. If there is a latrine or outhouse available, make this the designated latrine area. Emphasize to everyone in your party (adults and youth) that they must use the designated latrine area, and must not just step outside the tent during the night or first thing in the morning. When designating the latrine area, keep in mind that other people may be using the area in the future. In winter, consider the impact when the snow melts.

In Winter

It is tempting to think that snow, especially in winter, is uncontaminated, but this is not necessarily true. Avoid yellow or brown snow, but also keep in mind that animals roam the snowfields and can contaminate the snow, just as humans do. Purify the water, just as in summer. If you are melting snow, continue heating it up to the boiling point. While it's obvious when thinking about it, the shovel or scoop used for gathering snow to melt into water should be different from the shovel used for the latrine or other purposes.

In Wilderness Areas

In an increasing number of wilderness areas, camping and backpacking groups are required to carry out all human waste. This can be accomplished by using one of the commercial waste bags (RestStop or WAG Bags, for example) or by using doubled plastic garbage bags.

In the latter example, one garbage bag is used as a liner, either for a bucket carried in for that purpose (some groups carry a toilet seat for the can) or for a hole dug for that purpose. The

person changing the liner bag should wear disposable gloves (the same type of surgical gloves everyone should have in their first aid kits), tightly close and tie-wrap the liner bag, and place it inside a second bag, which is also tightly closed and tie-wrapped. The now-contaminated gloves are disposed of in the new liner bag. A handful of cat litter can help reduce odor and will make the operation less unpleasant for the designee.

In winter, waste matter usually freezes quickly. To reduce volume, reserve the bags for fecal matter and have people urinate a short distance away. The bags can be emptied into a latrine or a dumpster at the trailhead (check with the local land managers for their

standardized practices).

During a Natural Disaster

It is also important to be aware of the potential contamination of water supplies during natural disasters, such as earthquakes in California, floods in the Midwest, and hurricanes in the Gulf States. While this does not relate directly to camping, knowledge and practice in dealing with water supplies in the backcountry can help with preparedness for natural disasters or other interruptions of normal water supplies.

Clean Hands

Cleanliness is more difficult in the backcountry. It is important that the cook always has clean hands, as should everyone when eating (especially finger foods like sandwiches). Certainly, the person on latrine duty should not also be the cook. And when rotating duties, do not have the latrine person's next task involve food preparation. If possible, the latrine person should thoroughly wash his or her hands with soap and water.

Do not wash your hands in *any* stream, lake, or spring. That is your water supply and that of other parties and the local wildlife. You can carry a folding basin for this purpose; do the washing at least 100 feet from water sources. Alternatively, use the sterilizing solutions or gels, such as Pure Touch and Purell, found in many drug, grocery, and camping stores.

Clean Dishes

Rinsing soap off dishes, especially aluminum pots, requires enough hot water that the extra fuel to be carried becomes a significant factor. Part of the solution to having clean dishes is to prepare foods that produce minimal mess. Much of the mess can be cleaned off dishes and cooking utensils by scrubbing with snow and following with a hot water rinse (remember to pack out all food waste!). Also, remember to dispose of any soapy wash or rinse water in an ecologically sound manner, at least 100 feet from water sources. You can also clean dishes as much as possible at the end of each meal, then sterilize dishes, cups, spoons, etc. in boiling water just before use in the water to be used for cooking.

by Bill Straka

Backcountry Water Treatment Part 3: What is in Backcountry Water?

There are two major groups of contaminants found in water that can cause serious illness (potentially ruining a trip), and one aesthetic ingredient that makes water unattractive (and affects methods for removing the other two groups of contaminants).

The first two groups are biological contaminants and chemical contaminants. The aesthetic group is material suspended in the water that may not cause illness itself, but looks unattractive and can interfere with removal of the first two.

First, it should be noted that extensive testing of water in U.S. and Canadian areas popular for backpacking and canoeing, in all seasons, indicates that whether there is contamination and how dangerous it is varies widely from place to place, even within a given area. For example, studies in the Sierra have found front-country streams (at the trailhead) that have virtually no contamination, while some streams far from the trailhead and not frequented by humans or pack animals have a high concentration of biological contaminants. Some backcountry users take no precautions and do not get sick, while others diligently use filters and chemical purifiers and get extremely sick.

The most common thread for those who come down with digestive problems appears to be, not contaminated water, but carelessness in basic sanitation, particularly diligent washing and sterilizing of hands when handling food.

The situation is different in Third World countries. In tropical climates, especially, the abundance of wildlife living in potential water sources and the poor sanitation practices of local populations mean that there are many varieties of bacteria, viruses, and parasites that are unknown in colder climes, and against which those of us who live in North America have developed no resistance.

Biological Contaminants: Parasites, Bacteria, Viruses

The biological contaminants are generally grouped into parasites (or protozoa), bacteria, and viruses. Protozoa are the largest at about 1 micron, bacteria measure approximately 0.5 to 2 microns, and viruses measure around 0.02 - 0.3 microns.

The most infamous villain of backcountry water is the dreaded giardiasis, caused by the parasite giardia lamblia. Giardiasis was known among the pioneers and trappers as “beaver fever,” since it was often associated with beaver ponds. This emphasizes the fact that biological contaminants in water come not only from human activity, but also from animals that live in the wilderness, as well as pack animals and domesticated animals that graze in such areas (sheep, goats, and cattle, among others). Some plant materials (certain algae in particular) can produce physical symptoms.

In areas where sanitation practices are poor, sewage seepage and runoff often include the organisms that cause cholera, hepatitis, and other diseases, along with a large variety of viruses.

Illness from biota can appear quickly, though most frequently; it takes several days for bacteria, viruses, and parasites to reproduce sufficiently to produce nausea, headaches, vomiting, and diarrhea. This delay in the appearance of symptoms often leads people to believe that they got away with drinking untreated water, and that the symptoms are due to something else not associated with their weekend trip.

Chemical Contaminants

Chemical contaminants can come from man-made or natural sources. Most common are man-made sources such as industrial and agricultural runoff. There are many “backcountry” areas that are affected by such runoff into water sources. For example, mining operations took place throughout much of the Sierra Nevada and Rocky Mountains, resulting in seepage of heavy metal compounds and chemicals used in leeching operations. There was extensive mercury mining in the Santa Cruz Mountains until the 1960s. In the Almaden Valley, many streams are posted to warn fishermen not to eat any fish, because of the high concentrations of mercury in the fish in those streams. You should be aware of your water sources before going into any area, so you can prepare accordingly. Illness due to chemical contamination may be rapid, but more often is a very long-term problem. Heavy metals, such as mercury or selenium (found in areas of agricultural runoff), sometimes take several years of continual use of the contaminated water to show up. In some cases the available water may be highly **saline**. This includes ocean sailing trips or trips to offshore islands where your party is dropped off and later picked up. This article does not cover desalination. Critters do not pay attention to where they relieve themselves).

Basic sanitation—diligent washing and sterilizing hands when handling food—is as important as treating water.

by Bill Straka

Backcountry Water Treatment Part 4: Methods for Making Water Safe

Short of transporting all your water from civilization and municipal water supplies, there are three general methods for treating your water for drinking and cooking, and two more recent additions:

Boiling

Filtering

Chemical Treatment

Ultraviolet Radiation

PUR Clean Drinking Water Kit

Chart: Which Treatment Methods Remove What

Boiling

Although sterilization by heating is referred to as “boiling,” it is not necessary to actually bring water to a full rolling boil or to boil for 5 to 10 minutes, as is often stated. Raising the temperature of water to 155°F (70°C) is sufficient to kill most biota encountered by backpackers. This is also the temperature required for pasteurizing milk.

The temperature at which water boils decreases with altitude. However, the boiling temperature is higher than 155°F (70°C) at all altitudes that you would camp at (even on Mt. Everest with a boiling point of approximately 167°F / 75°C). Since few people carry

a thermometer capable of measuring water temperature on a backpack, the most practical approach is to heat water until it starts bubbling.

Note: the Environmental Protection Agency (EPA) and the Centers for Disease Control and Prevention (CDC) both recommend boiling water for one minute. If you are above 6,562 feet (2,000 meters), the recommended boiling time increases to three minutes.

Advantages of Boiling:

Boiling kills most microorganisms.

Boiling is the most practical and simplest approach to sterilizing water for meals, since you have to raise the water to boiling for most backpacking foods anyway.

In winter, when you often must melt snow or ice, you usually will raise the water to boiling, as well.

Disadvantages of Boiling:

Boiling does not remove silt, glacial flour, or volcanic ash, though it will sometimes reduce turbidity from plant material in the water.

Boiling does not remove chemical contamination, though it can drive off some of the sulfur compounds.

Boiling requires burning fuel. Since you generally will be carrying your stove fuel with you, this means carrying extra weight.

Filtering

Filters depend primarily on forcing water through a medium with tiny holes to physically remove microbes and matter. Anything larger than the hole size is blocked, so a filter's effectiveness depends on its "pore" size. Most filters available for backpackers remove all parasites and bacteria, plus some viruses. They remove most of the particles that cause

turbidity. However, few filters for backpackers remove the smallest viruses.

Filters sold as "purifiers" (First Need, for example) use a chemical purifier to kill viruses, usually an iodine resin. Purifiers must prove inactivation of all three biological contaminants (protozoa, bacteria, and viruses) to meet the EPA Guide Standard for Testing Microbiological Purifiers.

There are filters, known as "reverse-osmosis filters," available for desalination. However, their size makes them impractical for backpacking, though usable for ocean-going sailboats and other larger vessels.

Backpacking filters may work via a pump (a manual pump forces the water through the filter element), "straw" (your suction pulls the water through the filter), or gravity. Ease of use and the speed of filtering are considerations when selecting a filter.

Advantages of Filtering:

Most filters are effective against bacteria and parasites.

Some filters remove larger viruses.

Filters remove some turbidity.

Filters are usually convenient and fast.

Disadvantages of Filtering:

In areas where viral contamination is present (Third World countries, for example), additional purification by boiling or chemical treatment is still required.

Few filters remove chemical contamination; those that do remove only a limited range of chemical contaminants (usually with an activated carbon element).

Fine particles like silt, glacial flour, and volcanic ash will clog any filter, requiring field maintenance (backflushing, cleaning with a brush made for the purpose, or replacement of the

filter element). Many filters have pre-filters available to reduce the amount of material that will cause clogging – use them. Settling can also help.

If the filter freezes with even a tiny amount of water in the element, the element can crack, rendering the filter useless.

The moving parts of pump filters can break, rendering the pump useless.

Pumping can be tiring.

Proper Use of Filters:

Always store the intake hose separately from the rest of the pump.

Use the covers for the inlet and outlet to prevent contaminating the filter element on the outlet side.

Protect the filter from freezing.

Clean the filter regularly according to the manufacturer's specifications.

Use a bucket, pan, fold-up basin, or other container as the source of the water for the pump, rather than pumping directly out of the stream or lake (at least 100 feet from the water source). This is both for avoiding the watering area for local animals and to reduce the amount of suspended material entering the screen on the pickup and into the pre-filter.

If possible, let water stand overnight to allow suspended material to settle out.

Chemical Treatment: Iodine and Chlorine

The chemical treatment approach uses one of two halogens (chlorine or iodine) to kill

biota. This is the method most used by municipal water supplies around the world. The backpacker's approach is to use a small amount of the halogen, rather than the massive treatment plant used by your local water company. The halogen may be applied in one of two forms – a tablet that is dissolved in the water to be treated or in a solution of the halogen in water. Both iodine and chlorine are very effective against the most common pathogens, but they require sufficient time to act. Like all chemical reactions, the time required increases as the temperature decreases.

Iodine

Iodine is most commonly used in the form of tablets, such as Potable Aqua water purification tablets. One or two tablets are added to each liter of water, with the time required being about 30 minutes for “room temperature” water (always follow the manufacturer's instructions).

Alternatively, a small amount of a saturated solution made from iodine crystals is added to the water to be treated. The most common form of this treatment is Polar Pure. With Polar Pure, the crystals are in a bottle that has a “trap” in the mouth of the bottle to ensure that only the saturated solution of iodine in water and no crystals gets into your drinking water. One capful of the solution is measured out and poured into your one-liter water bottle. Then the Polar Pure bottle is refilled to allow a saturated solution to be formed for the next treatment.

Advantages of Iodine

Chemical treatments, like iodine, are very effective against most common pathogens.

Iodine is faster than chlorine, approximately 30 minutes versus up to 4 hours.

Disadvantages of Iodine

Does not kill the parasite cryptosporidium.

Chemical treatments do not remove chemical contaminants or turbidity.

Requires time to work (approximately 30 minutes); Temperatures below 70°F (20°C) and turbid water require increasingly longer times.

Some people react badly to iodine, particularly people with thyroid problems.

The medical community recommends that continuous usage of iodine-treated water last no more than 3 to 4 weeks.

Many people find the iodine taste objectionable (mixing in some citric acid in the form of lemon juice or tablets will kill the taste, but be sure to wait until sterilization has had plenty of time to take place).

Chlorine

Aquamira water treatment drops use chlorine. Chlorine is most commonly used in the form of chlorine dioxide tablets or drops, such as in Aquamira, Katadyn Micropur, and Potable Aqua Chlorine Dioxide. It can also be used in the form of laundry bleach (be sure it is pure hypochlorous acid and not mixed with perfumes or other chemicals) or a solution generated from rock salt, such as done by MSR's MIOX purifier.

While chlorine will kill most bacteria and parasites in a few minutes, a much longer time is required to kill the cysts of giardia and cryptosporidium, as well as many viruses. Typically 4 hours or more is the recommended time for room temperature water (70°F/20°C), with an increase for colder water, such as from mountain streams (always follow the manufacturer's instructions).

Chlorine can be used indefinitely, unlike iodine. It's what you drink in most city water systems. On the other hand, one of the joys of fresh stream water is its clean taste with no chemical smell or taste. The much longer time required for chlorine treatment is also a problem. The solution is to carry two water bottles, which are alternately refilled and the chlorine added at each water source. That way, you have a full bottle available when you empty the other.

Chemical treatments do not remove chemical contamination, and in fact can react with certain agricultural runoff. This is unlikely to be a significant problem for the backcountry traveler, however. Chemical treatment also does not remove turbidity. Turbid water requires longer treatment times or an increased amount of the halogen.

Advantages of Chlorine:

Chemical treatments are very effective against most common pathogens, and chlorine kills most bacteria and parasites in minutes.

Chlorine can be used indefinitely.

Disadvantages of Chlorine:

Chemical treatments do not remove chemical contaminants or turbidity.

Requires time to work, up to 4 hours, for full treatment; Temperatures below 70°F (20°C) and turbid water require increasingly longer times.

Ultraviolet Radiation

A recent addition to the quiver of techniques for purifying water in the field is ultraviolet (UV) radiation. The most widely available device for doing this is the SteriPen. This is a battery-operated device that is stirred in the water (preferably a one-liter water bottle with a wide mouth) for a short period of time (couple of minutes).

To prepare for purification, fill a bottle with water, press a button on the SteriPen according to the directions (single push for one liter), then insert the pen into the water. When the contacts on the side of the pen are immersed, the light will light up. Stir the

water until the light extinguishes, and the water is sterilized. The UV radiation is extremely effective against biological contaminants.

However, like the other treatments mentioned above, UV radiation does not remove chemical contaminants or turbidity. The water should be fairly clear (it need not be crystal clear), so the water should be allowed to settle or a filter used to remove most of the sediment (a coffee filter is sufficient, according to the last word I had from the SteriPen people). If the water appears slightly milky from glacial flour or volcanic ash, you may want to run a second treatment. We used this approach on Kilimanjaro with the water taken from streams on the mountain.

A disadvantage of the SteriPen is that it requires batteries. However, one of the optional packages includes a carrying case with a solar charger in the lid. This requires 8 to 10 hours to recharge a pair of batteries. Since a charge will suffice for 10 liters or so of water (a couple day's worth), this is adequate. You can carry two or three sets of the batteries as backups, although the batteries (both primary and rechargeable) are lithium-based, hence subject to the TSA restrictions on carrying no more than two spare batteries in your carry-on baggage and none in your checked baggage.

Advantages of UV Radiation:

Effective against biological contaminants—parasites, bacteria, and viruses.

Fast and convenient.

Disadvantages of UV Radiation: Does not remove chemical contamination nor reduce turbidity.

Water should be fairly clear, though it does not have to be perfectly clear.

Requires batteries, but a solar charger is available.

PUR Water Treatment Kit

PUR, a Swiss division of Proctor and Gamble, developed a water treatment kit for use in Third World countries a couple of years ago. They have now made the PUR Clean Drinking Water Kit available in North America. This kit will purify water, removing biological and many chemical contaminants, along with suspended particulates.

The complete kit includes two 10-liter containers (one for the untreated water to be treated, the other for the treated water to be decanted into), a stirring tool, a cotton cloth filter to remove the flocculus with the trapped contaminants, packets of the treatment chemical, and a packet opening tool. The first container is filled with the water to be treated. The premeasured chemical packet, containing iron sulphate and calcium hypochlorite, is poured into the water and the stirring tool is used to stir the water to mix the chemical thoroughly. The container is then closed and let stand for 10 minutes. The iron sulphate forms a flocculus (similar in appearance to fluffy cotton), which settles to the bottom, carrying most of the biological contaminants, silt and other suspended particulates, and most chemical contaminants (including heavy metal compounds) to the

bottom. After 10 minutes, the water is carefully decanted through the cloth filter into the second container, which is allowed to sit for an additional 10 minutes, during which the remaining pathogens (viruses) are killed by the calcium hypochlorite acting as the purifying agent. At this point the water is pure enough to pass international standards for drinking water.

The two major problems with the PUR kit are that it is currently somewhat difficult to obtain, and that the packets are pre-measured for 10 liters. You cannot use a partial packet for a smaller amount of water (the powder does not necessarily have the components uniformly mixed throughout the packet, so you must empty the complete packet into the water). While this is ok for a group (or, in Third World communities, for a family group), this is inconvenient for the individual backpacker or a small group of backpackers. However, the cost is very small, less than the cost per liter of most of the other methods described.

The big advantage is that this is the only method available for water contaminated heavily with suspended particulates, many chemical contaminants, and virtually all biological contaminants. It would work well for larger backcountry groups, as well as in case of a natural or man-made disaster that interrupts municipal water supplies. It will not desalinate water.

Advantages of PUR Clean Drinking Water Kit:

Removes biological, particulate, and some chemical contamination.

Particularly good for Third World and highly contaminated water sources, and during natural or man-made disasters.

Inexpensive.

Simple procedure.

Treats 10 liters at a time, so is best for large groups.

Disadvantages of PUR Clean Drinking Water Kit:

Treats 10 liters at a time—no smaller, no larger—so inconvenient for most backpackers.

Takes 20 minutes total time for treatment.

Chart: Which Treatment Methods Remove What

	Protozoa/Parasites	Bacteria	Viruses	Chemical Contaminants	Aesthetic Contaminants
Boiling	Yes	Yes	Yes	No	No
<u>Filters</u>	Yes	Yes	Remove some larger viruses, not smallest	A few remove a limited range of chemical contaminants	Removes some turbidity
<u>Purifiers</u>	Yes	Yes	Yes	No	No
<u>Chemical: Iodine</u>	Not cryptosporidium	Yes	Yes	No	No
<u>Chemical: Chlorine</u>	Yes	Yes	Yes	No	No
UV Radiation (SteriPen)	Yes	Yes	Yes	No	No
<u>PUR Water Treatment Kit</u>	Yes	Yes	Yes	Some	Yes

The information above is for general interest only. Always consult each manufacturer's specific product information for effectiveness of your treatment method against specific pathogens and contaminants.

The Bottom Line

As noted previously in [“Part 3: What is in Backcountry Water.”](#) the strong evidence is that for backcountry travelers in the United States and Canada, the major source of digestive tract illness is not waterborne pathogens or other contamination, but poor sanitation. The best prevention is paying diligent attention to simple sanitation measures:

Wash your hands frequently, particularly after relieving yourself. Use soap and water and/or Purell or another alcohol-based purifier.

Wash and sterilize your hands before eating, particularly finger foods (sandwiches, bars, trail mix, etc.)

All individuals preparing or serving food for the group must wash and sterilize their hands, and should consider using gloves of the type now mandated for restaurant workers. All dishes and utensils should be washed before meal preparation and serving. Sterilizing by dunking in boiling water is one of the easiest and quickest ways to assure sterile utensils.

It is all too easy to be careless and neglect simple sanitation while hiking, backpacking, and climbing. But, by treating your backcountry water, staying hydrated, and practicing proper hygiene, you'll help ensure that you, and everyone in your group, has a great trip

Water Treatment/Water Storage

Quantity

A water ration of as little as a pint per day has allowed life raft survivors to live for weeks, but a more realistic figure is 1 gallon per person per day for survival. 4 gallons per person/day will allow personal hygiene, washing of dishes, counter tops, etc. 5 to 12 gallons per day would be needed for a conventional toilet, or 1/2 to two gallons for a pour flush latrine. For short-term emergencies, it will probably be more practical to store paper plates and utensils, and minimize food preparation, than to attempt to store more water. In addition to stored water, there is quite a bit of water trapped in the piping of the average home. If the municipal water system was not contaminated before you shut the water off to your house, this water is still fit for consumption without treatment. To collect this water, open the lowest faucet in the system, and allow air into the system from a second faucet. Depending on the diameter of the piping, you may want to open every other faucet, to make sure all of the water is drained. This procedure will usually only drain the cold water side, the hot-water side will have to be drained from the water heater. Again, open all of the faucets to let air into the system, and be prepared to collect any water that comes out when the first faucet is opened. Toilet tanks (not the bowls) represent another source of water if a toilet bowl cleaner is not used in the tank. Some people have plumbed old water heaters or other tanks in line with their cold water supply to add an always rotated source of water. Two cautions are in order:

(1) make sure the tanks can handle the pressure (50 psi min.), and (2) if the tanks are in series with the house plumbing, this method is susceptible to contamination of the municipal water system. The system can be fed off the water lines with a shutoff valve (and a second drain line), preventing the water from being contaminated as long as the valve was closed at the time of contamination. Water can only be realistically stored for short-term emergencies, after that some emergency supply of water needs to be developed

Water Collection

Wells

Water can only be moved by suction for an equivalent head of about 20'. After this cavitation occurs, that is the water boils off in tiny bubbles in the vacuum created by the pump rather than being lifted by the pump. At best no water is pumped, at worst the pump is destroyed. Well pumps in wells deeper than this work on one of the following principles:

1) The pump can be submerged in the well; this is usually the case for deep well pumps. Submersible pumps are available for depths up 1000 feet.

2) The pump can be located at the surface of the well, and two pipes go down the well: one carrying water down, and one returning it. A jet fixture called an ejector on the bottom of the two hoses causes well water to be lifted up the well with the returning pumped water. These pumps must have an efficient foot valve as there is no way for them to self-prime. These are commonly used in shallow wells, but can go as deep as 350 feet. Some pumps use the annular space between one pipe and the well casing as the between one pipe and the well casing as the second pipe this requires a packer (seal) at the ejector and at the top of the casing.

3) The pump cylinder can be located in the well, and the power source located above the well. This is the method used by windmills and most hand pumps. A few hand pumps pump the water from very shallow wells using an aboveground pump and suction line. A variety of primitive, but ingenious, pump designs also exist. One uses a chain with buckets to lift the water up. Another design uses a continuous loop rope dropping in the well and returning up a small diameter pipe. Sealing washers are located along the rope, such that water is pulled up the pipe with the rope. An ancient Chinese design used knots, but modern designs designed for village level maintenance in Africa use rubber washers made from tires, and will work to a much greater depth.

Obviously a bucket can be lowered down the well if the well is big enough, but this won't work with a modern drilled well. A better idea for a drilled well is to use a 2' length or so of galvanized pipe with end caps of a diameter that will fit in the well casing. The upper cap is drilled for a screw eye, and a small hole for ventilation. The lower end is drilled with a hole about half the diameter of the pipe, and on the inside a piece of rigid plastic or rubber is used as a flapper valve. This will allow water to enter the pipe, but not exit it. The whole assembly is lowered in the well casing, the weight of the pipe will cause it to fill with water, and it can then be lifted to the surface. The top pipe cap is there mostly to prevent the pipe from catching as it is lifted.

Springs

Springs or artesian wells are ideal sources of water. Like a conventional well, the water should be tested for pathogens, VOCs (Volatile Organic Compounds such as fuel oil or benzene), pesticides and any other contaminants found in your area. If the source is a spring it is very important to seal it in a spring box to prevent the water from becoming contaminated as it reaches the surface. It is also important to divert surface runoff around

the spring box. As with a well, you will want to periodically treat the spring box with chlorine, particularly if the spring is slow moving. The spring may also be used for keeping food cool if a spring-house is built. If this is the case, it is still recommended to build a spring box inside the house to obtain potable water.

Surface water

Most US residents served by municipal water systems supplied with surface water, and many residents of underdeveloped countries rely on surface water. While surface water will almost always need to be treated, a lot of the risk can be reduced by properly

collecting the water. Ideal sources of water are fast flowing creeks and rivers which don't have large sources of pollution in their watershed. With the small amounts of water needed by a family or small group, the most practical way to collect the water is through an infiltration gallery or well. Either method reduces the turbidity of the collected water making it easy for later treatment. chemical or thermal damage, or in the case of UV treatment, absorbing the UV light itself. Organic compounds Water can be contaminated by a number of organic compound such as chloroform, gasoline, pesticides, and herbicides. These contaminants must be identified in a lab test. It is unlikely ground water will suddenly become contaminated unless a quantity of chemicals is allowed to enter a well or penetrating the aquifer. One exception is when the aquifer is located in limestone. Not only will water flow faster through limestone, but the rock is prone to forming vertical channels or sinkholes that will rapidly allow contamination from surface water. Surface water may show great swings in chemical levels due to differences in rainfall, seasonal crop cultivation, and industrial effluent levels

Water Purification

Heavy Metals

Heavy metals are only a problem in certain areas of the country. The best way to identify their presence is by a lab test of the water or by speaking with your county health department. Unless you are down stream of mining trailings or a factory, the problem will probably affect the whole county or region. Heavy metals are unlikely to be present in sufficient levels to cause problems with short-term use.

Turbidity

Turbidity refers to suspended solids, i.e. muddy water, is very turbid. Turbidity is undesirable for 3 reasons:

- 1) aesthetic considerations
- 2) solids may contain heavy metals, pathogens or other contaminants,
- 3) turbidity decreases the effectiveness of water treatment techniques by shielding pathogens from chemical or thermal damage, or in the case of UV treatment, absorbing the UV light itself.

Organic compounds

Water can be contaminated by a number of organic compound such as chloroform, gasoline, pesticides, and herbicides. These contaminants must be identified in a lab test. It is unlikely ground water will suddenly become contaminated unless a quantity of chemicals is allowed to enter a well or penetrating the aquifer. *One exception is when the aquifer is located in limestone.* Not only will water flow faster through limestone, but the rock is prone to forming vertical channels or sinkholes that will rapidly allow contamination from surface water. Surface water may show great swings in chemical levels due to differences in rainfall, seasonal crop cultivation, and industrial effluent levels.

Pathogens

Protozoa

Protozoa cysts are the largest pathogens in drinking water, and are responsible for many of the waterborne disease cases in the US. Protozoa cysts range in size from 2 to 15 μm (a micron is one millionth of a meter), but can squeeze through smaller openings. In order to insure cyst filtration, filters with an absolute pore size of 1 μm or less should be used. The two most common protozoa pathogens are *Giardia lamblia* (*Giardia*) and *Cryptosporidium* (*Crypto*). Both organisms have caused numerous deaths in recent years in the US, the deaths occurring in the young and elderly, and the sick and immune compromised. Many deaths were a result of more than one of these conditions. Neither disease is likely to be fatal to a healthy adult, even if untreated. For example in Milwaukee in April of 1993, of 400,000 who were diagnosed with *Crypto*, only 54 deaths were linked to the outbreak, 84% of whom were AIDS patients. Outside of the US and other developed countries, protozoa are responsible for many cases of amoebic dysentery, but so far this has not been a problem in the US, due to better wastewater treatment. This could change during a survival situation. Tests have found *Giardia* and/or *Crypto* in up to 5% of vertical wells and 26% of springs in the US.

Bacteria

Bacteria are smaller than protozoa and are responsible for many diseases such as typhoid fever, cholera, diarrhea, and dysentery. Pathogenic bacteria range in size from 0.2 to 0.6 μm , and a 0.2 μm filter is necessary to prevent transmission. Contamination of water supplies by bacteria is blamed for the cholera epidemics which devastate undeveloped countries from time to time. Even in the US, *E. coli* is frequently found to contaminate water supplies. Fortunately *E. coli* is relatively harmless as pathogens go, and the problem isn't so much with *E. coli* found, but the fear that other bacteria may have contaminated the water as well. Never the less, dehydration from diarrhea caused by *E. coli* has resulted in fatalities.

Viruses

Viruses are the 2nd most problematic pathogen, behind protozoa. As with protozoa, most waterborne viral diseases don't present a lethal hazard to a healthy adult. Waterborne pathogenic viruses range in size from 0.020-0.030 μm , and are too small to be filtered out by a mechanical filter. All waterborne enteric viruses affecting humans occur solely in humans, thus animal waste doesn't present much of a viral threat. At the present viruses don't present a major hazard to people drinking surface water in the US, but this could change in a survival situation as the level of human sanitation is reduced. Viruses do tend to show up even in remote areas, so case can be made for eliminating them now.

Physical Treatment

Heat Treatment

Boiling is one guaranteed way to purify water of all pathogens. Most experts feel that if the water reaches a rolling boil it is safe. A few still hold out for maintaining the boiling for some length of time, commonly 5 or 10 minutes, plus an extra minute for every 1000 feet of elevation. If one wishes to do this, a pressure cooker would allow the water to be kept at boiling without losing the heat to evaporation. One reason for the long period of boiling may be to inactivate bacterial spores (which can survive boiling), but these spores are unlikely to be waterborne pathogens.

African aid agencies figure *it takes 1 kg of wood to boil 1 liter of water*. Hardwoods and efficient stoves would improve on this. Water can also be treated at below boiling temperatures, if contact time is increased. A commercial unit has been developed that treats 500 gals of water per day at an estimated cost of \$1/1000 gallons for the energy. The process is similar to milk pasteurization, and holds the water at 161° F for 15 seconds. Heat exchangers recover most of the energy used to warm the water. Solar pasteurizers have also been built that would heat three gallons of water to 65° C and hold the temperature for an hour. A higher temperature could be reached if the device was rotated east to west during the day to follow the sunlight. Regardless of the method, heat treatment does not leave any form of residual to keep the water free of pathogens in storage.

Reverse Osmosis

Reverse osmosis forces water, under pressure, through a membrane that is impermeable to most contaminants. The most common use is aboard boats to produce fresh water from salt water. *The membrane is somewhat better at rejecting salts than it is at rejecting non-ionized weak acids and bases and smaller organic molecules (molecular weight below 200)*. In the latter category are undissociated weak organic acids, amines, phenols, chlorinated hydrocarbons, low molecular weight alcohols. *Larger organic molecules, and all pathogens are rejected*. Of course it is possible to have a imperfection in the membrane that could allow molecules or whole pathogens to pass through.

Using reverse osmosis to desalinate seawater requires considerable pressure (1000 psi) to operate, and for a long time only electric models were available. Competing for a contract to build a hand powered model for the Navy, Recovery Engineering designed a model that could operate by hand, using the waste water (90 percent of the water is waste water, only 10% passes through the filter) to pressurize the back side of the piston. The design was later acquired by PUR. While there is little question that the devices work well, the considerable effort required to operate one has been questioned by some survival experts such as Michael Greenwald, himself a survivor of a shipwreck. On the other hand the people who have actually used them on a life raft credit the availability of water from their PUR watermaker for their survival. PUR manual watermakers are available in two models: The Survivor 06 (\$500) produces 2 pints per hour, and the Survivor 35 (\$1350) produces 1.4 gal/hr. The latter model is also available as the Power Survivor 35 (\$1700), which produces the same water volume from 4 Amps of 12 VDC, and can be disconnected and used as a hand held unit. A number of manufactures, including PUR,

make DC powered models for shipboard use. PUR recommends replacing the O rings every 600 hours on its handheld units, and a kit is available to do this. Estimates for membrane life vary, but units designed for production use may last a year or more. *Every precaution should be taken to prevent petroleum products from contacting the membrane as they will damage or destroy the membrane.* The prefilter must also be regularly changed, and the membrane may need to be treated with a biocide occasionally. Reverse osmosis filter are also available that will use normal municipal or private water pressure to remove contaminants from water, as long as they aren't present in the levels found in sea water. The water produced by reverse osmosis, like distilled water, will be close to pure H₂O. Therefore mineral intake may need to be increased to compensate for the normal mineral content of water in much of the world.

Distillation

Distillation is the evaporation and condensation of water to purify water. *Distillation has two disadvantages: 1) A large energy input is required and 2) If simple distillation is used, chemical contaminants with boiling points below water will be condensed along with the water.* Distillation is most commonly used to remove dissolved minerals and salts from water. The simplest form of a distillation is a solar still. A solar still uses solar radiation to evaporate water below the boiling point, and the cooler ambient air to condense the vapor. The water can be extracted from the soil, vegetation piled in the still, or contaminated water (such as radiator fluid or salt water) can be added to the still. While per still output is low, they are an important technique if water is in short supply. Other forms of distillation require a concentrated heat source to boil water which is then condensed. Simple stills use a coiling coil to return this heat to the environment. These can be improvised with a boiler and tight fitting lid and some copper tubing (Avoid using lead soldered tubing if possible). FEMA suggests that, in an emergency, a hand towel can be used to collect steam above a container of boiling water. More efficient distillations plants use a vapor compression cycle where the water is boiled off at atmospheric pressure, the steam is compressed, and the condenser condenses the steam above the boiling point of the water in the boiler, returning the heat of fusion to the boiling water. The hot condensed water is run through a second heat exchanger which heats up the water feeding into the boiler. These plants normally use an internal combustion engine to run the compressor. Waste heat from the engine, including the exhaust, is used to start the process and make up any heat loss. This is the method used in most commercial and military desalinization plants. Inflatable solar stills are available from marine supply stores, but avoid the WW2 surplus models, as those who have used them have had a extremely high failure rate. Even new inflatable solar stills may only produce from 30-16 oz under actual conditions, compared to a rating of 48 oz/day under optimum conditions. Jade Mountain also offers the following portable models in travel cases:

Traveler (WC106) 1 gpd, 23 lb., 24x26x10 folded \$
695

Base Camp (WC107) 2 gpd, 51 lb., 48x48x4 folded \$
895

Microfilters

Microfilters are small-scale filters designed to remove cysts, suspended solids, protozoa, and in some cases bacteria from water. Most filters use a ceramic or fiber element that can be cleaned to restore performance as the units are used. Most units and almost all made for camping use a hand pump to force the water through the filter. Others use gravity, either by placing the water to be filtered above the filter (e.g. the Katadyn drip filter), or by placing the filter in the water, and running a siphon hose to a collection vessel located below the filter (e.g. Katadyn siphon filter). Microfilters are the only method, other than boiling, to remove Cryptosporidia. Microfilters do not remove viruses, which many experts do not consider to be a problem in North America. Despite this the Katadyn microfilter has seen considerable use around the world by NATO-member militaries, WHO, UNHCR, and other aid organizations. Microfilters share a problem with charcoal filter in having bacteria grow on the filter medium. Some handle this by impregnating the filter element with silver such as the Katadyn, others advise against storage of a filter element after it has been used. The Sweetwater Guardian suggests using a freezer for short-term storage.

Many microfilters may include silt prefilters, activated charcoal stages, or an iodine resin. Most filters come with a stainless steel prefilter, but other purchased or improvised filters can be added to reduce the loading on the main filter element. *Allowing time for solids to settle, and/ or prefiltering with a coffee filter will also extend filter life.* Iodine matrix filters will kill viruses that will pass through the filter, and if a charcoal stage is used it will remove much of the iodine from the water. Charcoal filters will also remove other dissolved natural or manmade contaminants. Both the iodine and the charcoal stages do not indicate when they reach their useful life, which is much shorter than the filter element. If you are depending on the stage for filtering the water you will have to keep up with how much water passes through it.

New designs seem to be coming out every month. The best selling brands seem to be the PUR, and Sweetwater Guardian. The Katadyn doesn't sell as well to outdoor enthusiasts due to its high cost, but for years it was state of the art for water purification and still has a loyal following, especially among professionals in relief work. Below is the data on a few of the more common units, for an excellent field test of some common units, see the December 96 issue of Backpacker magazine.

Note that the first price is for the filter, the second for the replacement filter. The weight is from manufacturer's literature if it was not listed in the Backpacker article. Filter life is from manufacturer's literature and should be taken with a grain of salt.

[Alan's note: These prices are now several years out of date. You'll need to investigate current pricing]

Basic Designs Ceramic Filter Pump (\$29/\$15, 8 oz.)

Cheap flimsy filter, claimed to filter up to 500 gallons with a 0.9 µm ceramic filter. Not EPA rated, may not have passed independent lab tests, prone to damage, filter element must be submerged in water.

General Ecology- First Need Deluxe (\$70/\$30, 20oz)

This filter uses a structured matrix micro strainer, though General Ecology won't reveal what the structure is. It has survived independent lab tests, and filters particles to 4 µm, while actually removing viruses (the only filter capable of doing this) through electrostatic attraction. The filter cartridges can't be cleaned (other than by back flushing), but are good for 100 gallons. Pump design isn't the best. Other models are available from the manufacturer.

Katadyn PF (\$295/\$145, 22.7 oz).

The original microfilter using a 0.2 µm silver impregnated ceramic candle. An extremely thick filter allows it to be cleaned many times for up to 14,000 gallons capacity. While the Katadyn seems well made, one reader of this list reported breaking the candle, and Backpacker Magazine broke the case during a field test. The pump, while probably indestructible, is somewhat slow and hard to use, requiring 20 lbs. of force on a small handle. The PF also lacks an output hose as the Katadyn engineers felt it would be a source of contamination.

Katadyn Combi (\$185/\$75 (ceramic)/\$19 (carbon), 29 oz)

A cheaper version of the PF incorporating both ceramic and carbon stages. Much faster filter than the PF.

Katadyn Minifilter (\$139/\$59, 8.3 oz)

A smaller and cheaper version of the PF, easier to pump, but generally not well received. Good for 200 gallons.

Katadyn Expedition (\$680/\$77, 13 lb.)

Similar filter to the PF (exact same cartridge as the Drip Filter Below), but designed for much higher production, stainless steel case with spade type D handle, produces 0.75 gpm. Filter good for 26,000 gallons.

Katadyn Drip Style Filter (\$240, \$77, 12.5 lb.)

Filter elements similar to those in the PF are mounted vertically in top 3 gallon plastic bucket, water drips through filters into second 3 gallon bucket with faucet. 1 qt, per hour with the 2 filters included, a third filter can be added to increase rate 50%. Each filter good for 13,000 gallons. The mounting hardware for the filters is available for \$10 to allow you to make your own filter of what ever size is needed. Each mounting kit requires a ½" hole in the bottom of the raw water container.

Katadyn Siphon Filter (\$92, 2 lb.)

Similar design to PF filter element, but a siphon hose replaces the pump, filters 1-2 quarts per hour (allow 1 hour for the filter to "prime" itself via capillary action), but multiple filters can be used in the same container. Collection vessel must be lower than raw water container. Good for 13,000 gallons.

MSR Miniworks (\$59/\$30, 14 oz)

MSR's smaller filter, using a 0.3 µm ceramic element. Pump is well designed, and easy to use. Main drawback is that the clean water discharge is from the bottom of the filter, and no hose is provided. While the bottom is threaded for a Nalgene bottle, it is a pain in the butt to fill a canteen or 2 liter bottle. Claimed to filter 100 gallons, Backpacker Magazine feels this may be one of the few filters without a grossly inflated rating.

MSR Waterworks (\$140/\$30/\$30, 17 oz)

MSR's first filter with a 0.2 µ ceramic and membrane stage and a carbon stage. Other wise similar to the Miniworks.

PUR Pioneer (\$30/\$4, 8 oz)

Newly introduced low-end microfilter. 0.5 µm, 1 lpm filter rate, 12 gallon capacity

PUR Hiker (\$50/\$20, 12 oz)

PUR's microfilter only design, filters to .5 µm. Well liked, as are the other PUR filters. Very compact. 200 gallon capacity

PUR Scout (\$70/\$35/\$15, 12 oz)

Combines a iodine resin stage, a 1.0 µm filter, and a activated charcoal filter. 200 gallon capacity

PUR Explorer (\$130/\$45, 22 oz)

PUR's top of the line model. Bulky, but well made, with a high output (1.4 lpm, faster than any of the hand held models listed and one of the easiest to pump) Has a 1.0 µm filter plus a iodine resin stage, 300 gallon capacity

Sweetwater Walkabout (\$35/\$13, 8.5 oz.)

Sweetwater's low end filter, 0.2 µm, .7 lpm, 100 gal capacity

Sweetwater Guardian (\$60/\$20, 11 oz)

Uses a glass fiber and carbon filter, filters to .2 µm, claimed to last for 200 gallons. An iodine resin stage can be added that will kill viruses, and will last for 90 gallons. Pump is well designed, but it takes a few seconds to pull a captive pin to fold for storage.

Available in white or OD.

Timberline Eagle (\$20/\$13, 8 oz)

At 1 µm, this filter only does protozoa, but is much easier to pump, lighter, and cheaper. Filter is attached to pump, and must rest (but doesn't have to be submerged) in water to be purified.

Looks flimsy, but seems to hold up. Claimed to last for 100 gallons. It is also possible to build your own microfilter using *diatomaceous earth*, sold for swimming pool filters (DE). Usually pressure is required to achieve a reasonable flow rate. A DE filter will remove turbidity as well as pathogens larger than 1 um.

[Alan's note: This type of diatomaceous earth is NOT the type you want for food storage. Don't get them confused.]

Slow Sand Filter

Slow sand filters pass water slowly through a bed of sand. Pathogens and turbidity are removed by natural die-off, biological action, and filtering. Typically the filter will consist of 24 inches of sand, then a gravel layer in which the drain pipe is embedded. The gravel doesn't touch the walls of the filter so that water can't run quickly down the wall

of the filter and into the gravel. Building the walls with a rough surface also helps. A typical loading rate for the filter is 0.2 meters/hour day (the same as $.2 \text{ m}^3/\text{m}^2$ of surface area). The filter can be cleaned several times before the sand has to be replaced.

Slow sand filter construction information:

Slow sand filters should only be used for continuous water treatment. If a continuous supply of raw water can't be insured (say using a holding tank), then another method should be chosen. It is also important for the water to have as low turbidity (suspended solids) as possible. Turbidity can be reduced by changing the method of collection (for example, building an infiltration gallery, rather than taking water directly from a creek), allowing time for the material to settle out (using a raw water tank), prefiltering or flocculation (adding a chemical such as alum to cause the suspended material to floc together.)

The SSF filter itself is a large box, at least 1.5 meters high. The walls should be as rough as possible to reduce the tendency for water to run down the walls of the filter, bypassing the sand. The bottom layer of the filter is a gravel bed in which a slotted pipe is placed to drain off the filtered water. The slots or the gravel should be no closer than 20 cm to the walls, again to prevent the water from bypassing the sand.

The sand for a SSF needs to be clean and uniform, and of the correct size. The sand can be cleaned in clean running water, even if it is in a creek. The ideal specs on sand are effective size (sieve size through which 10% of the sand passes) between 0.15 and 0.35 mm, uniformity coefficient (ratio of sieve sizes through which 60% pass and through which 10% pass) of less than 3, Maximum size of 3 mm, and minimum size of 0.1 mm.

The sand is added to a SSF to a minimum depth of 0.6 meters. Additional thickness will allow more cleanings before the sand must be replaced. 0.3 to 0.5 meters of extra sand will allow the filter to work for 3-4 years. An improved design uses a *geotextile* layer on top of the sand to reduce the frequency of cleaning. The outlet of a SSF must be above the sand level, and below the water level. The water must be maintained at a constant level to insure an even flow rate throughout the filter. The flow rate can be increased by lowering the outlet pipe, or increasing the water level. One common idea for maintaining the water level is to use a elevated raw water tank or pump, and a ball valve from a toilet.

While the SSF will begin to work at once, optimum treatment for pathogens will take a week or more. During this time the water should be chlorinated if at all possible (iodine can be substituted). After the filter has stabilized, the water should be safe to drink, but chlorinating of the output is still a good idea, particularly to prevent recontamination.

As the flow rate slows down the filter will have to be cleaned by draining and removing the top few inches of sand. If a geotextile filter is used, only the top ½" may have to be removed. As the filter is refilled, it will take a few days for the biological processes to reestablish themselves.

Activated Charcoal Filter

Activated charcoal filters water through adsorption, chemicals and some heavy metals are attracted to the surface of the charcoal, and are attached to it. Charcoal filters will filter some pathogens though they will quickly use up the filter adsorptive ability, and can even contribute to contamination as the charcoal provides an excellent breeding ground for bacteria and algae. Some charcoal filters are available impregnated with silver to prevent this, though current research concludes that the bacteria growing on the filter are harmless, even if the water wasn't disinfected before contacting the filter. The only filter I know of that uses only activated charcoal, and doesn't require pressurized water is the Water Washer (\$59). Available from the Survival Center.

Activated charcoal can be used in conjunction with chemical treatment. The chemical (iodine or chlorine) will kill the pathogens, while the carbon filter will remove the treatment chemicals. In this case, as the filter reaches its capacity, a distinctive chlorine or iodine taste will be noted.

Activated charcoal can be made at home, though the product will be of varying quality compared to commercial products. Either purchased or homemade charcoal can be recycled by burning off the molecules adsorbed by the carbon (This won't work with heavy metals of course.)

The more activated charcoal in a filter, the longer it will last. The bed of carbon must be deep enough for adequate contact with the water. Production designs use granulated activated charcoal (effective size or 0.6 to 0.9 mm for maximum flow rate. Home or field models can also use a compressed carbon block or powdered activated charcoal (effective size 0.01) to increase contact area. Powdered charcoal can also be mixed with water and filtered out later. As far as life of the filter is concerned, carbon block filters will last the longest for a given size, simply due to their greater mass of carbon. A source of pressure is usually needed with carbon block filters to achieve a reasonable flow rate.

Sol-Air Water Treatment

If sufficient dissolved oxygen is available, sunlight will cause the temporary formation of reactive forms of oxygen such as hydrogen peroxide and oxygen free radicals. This form of water treatment is called *solar photooxidative disinfection* or sol-air water treatment. Sol-Air water treatment has been shown to dramatically reduce the level of fecal coliform bacteria. There is some evidence that other bacteria and viruses may be affected also. While not as reliable as other methods, it does offer a low-tech solution in emergencies. Sol-Air treatment requires bright sunlight, and has been shown to be effective when ever the sun causes a distinct shadow to be cast. Exposure to 4.5 hours of bright sunlight has been shown to cause a thousand fold reduction in fecal coliforms in lab tests.

In order for Sol-Air to be effective, oxygen must be present. Experiments have shown that shaking a bottle filled 3/4 with air will restore oxygen levels to near saturation. As the treatment continues, some of the oxygen will come out of solution, while other oxygen will be consumed by the killed pathogens, so the shaking should be repeated every few

hours. Data shows that maximum activity occurs when the water temperature is above 50° C (122° F), so this method may be unsuitable in colder climates unless special solar collectors are used.

Either glass or plastic bottles may be used. Plastic bottles will allow short wave ultraviolet radiation to pass, increasing the rate of microbial inactivation, but may yellow with age, reducing light transmission, and may leach plasticizers into the water at the elevated temperatures that will occur. The leaching of plasticizers can be reduced by using bottles of PET (polyethylene terephthalate) rather than PVC. Glass bottles on the other hand are more durable. Research has used bottles with 2 liters of capacity, but if the water is free of turbidity, larger containers can be used. Plastic bags, or some sort of flat glass container represent the ideal container as this maximizes the solar energy received per ounce of water.

Bottles should be filled 3/4 full in the early morning with water as free of turbidity as possible.

After capping the bottles should be shaken vigorously for a few minutes then placed upright in the sun, where they will not be shaded later in the day. The shaking should be repeated at least three times during the day. At the end of the day the water should be reasonably freed of bacteria, though it is most practical to let the water cool for consumption the following day. Each day a new batch should be treated due to the lack of a residual disinfectant. After consumption of the water the bottle should be air dried to prevent algae growth with continual use.

Improvised Mechanical Filter

If the materials aren't available to build a slow sand filter, or some other means of water treatment is preferred, it may still be advantageous to mechanically filter the water before treating it with chemicals or passing through a microfilter. Generally the idea is to allow the water to flow as slowly as possible through a bed of sand. In a municipal water treatment plant this is called a rapid sand filter. The particular design below is included, because the designer, a research engineer at Oak Ridge National Laboratories, found it particularly effective at removing fallout from water. The filter will do little or nothing to remove pathogens, though removing suspended solids allows other water treatment methods to work more effectively.

Expedient water filter, from *Nuclear War*

Survival Skills, Cresson Kearny, ORNL

- 1) Perforate the bottom of a 5 gallon bucket, or similar container with a dozen nail holes even spread over a 4" diameter circle in the center of the container.
- 2) Place a 1.5" layer of small stones or pebbles in the bottom of the can. If pebbles aren't available, marbles, clean bottle caps, twisted coat hangers or clean twigs can be used.
- 3) Cover the pebbles with one thickness of terrycloth towel, burlap sackcloth, or other porous cloth. Curl the cloth in a roughly circular shape about three inches larger than the diameter of the can.

4) Take soil containing some clay (pure clay isn't porous enough, pure sand is too porous) from at least 4" below the surface of the ground (nearly all fallout particles remain near the surface except after disposition on sand or gravel.)

5) Pulverize the soil, then gently press it in layers over the cloth that covers the pebbles, so that the cloth is held snugly against the walls of the can. The soil should be 6-7" thick.

6) Completely cover the surface of the soil layer with one thickness of fabric as porous as a bath towel. This is to keep the soil from being eroded as water is being poured into the filter. A dozen small stones placed on the cloth near it's edges will secure it adequately.

7) Support the filter on rocks or sticks placed across the top of a container that is larger than the filter can (such as a dishpan) The contaminated water should be poured into the filter can, preferably after allowing it to settle as described below. The filtered water should be disinfected by some method. If the 6 or 7 inches of filtering soil is a sandy clay loam, the filter will initially deliver about 6 quarts/hour. If the filter is any faster than this then the fabric layer needs to be removed and the soil compressed more. The filtering rate will drop over time as the filter begins to clog up. When this happens the top 1/2" of soil can be removed to increase the filtering rate. After 50 or so quarts, the filter will need to be rebuilt with fresh soil.

As with any filter, optimum performance will be achieved if sediment in the water will be allowed to settle out before passing the water through the filter.

If the water is contaminated with fallout, clay can be added to help the fallout particles to settle out. The procedure is as follows:

Fill a bucket or other deep container 3/4 full with contaminated water.

Dig pulverized clay or clayey soil from a depth of four or more inches below ground surface and stir it into the water.

Use about 1 inch of dry clay or clay soil for every 4" depth of water. Stir until practically all of the clay particles are suspended in the water.

Let the clay settle for at least 6 hours. This will carry the fallout particles to the bottom and cover them.

Carefully dip out or siphon the clear water and disinfect it.

Chemical Treatment

Chlorine: Chlorine is familiar to most Americans as it is used to treat virtually all municipal water systems in the United States. For a long time chlorine, in the form of Halazone tablets, was used to purify small batches of water for campers and military troops. Later questions emerged about the effectiveness of Halazone, and in 1989, Abbot labs pulled it off the market. If Halazone tablets are encountered outside the US, the nominal shelf life is 6 months and the dosage is 2 tabs per liter. Until recently, there was no chlorine product designed for wilderness/survival use available in the US. Chlorine has a number of problems when used for field treatment of water. When chlorine reacts

with organic material, it attaches itself to nitrogen containing compounds (ammonium ions and amino acids), leaving less free chlorine to continue disinfection. Carcinogenic trihalomethanes are also produced, though this is only a problem with longterm exposure. Trihalomethanes can also be filtered out with a charcoal filter, though it is more efficient to use the same filter to remove organics before the water is chlorinated. *Unless free chlorine is measured, disinfection can not be guaranteed with moderate doses of chlorine.*

One solution is superchlorination, the addition of far more chlorine than is needed. This must again be filtered through activated charcoal to remove the large amounts of chlorine, or hydrogen peroxide can be added to drive the chlorine off. Either way there is no residual chlorine left to prevent recontamination. This isn't a problem if the water is to be used at once.

Chlorine is sensitive to both the pH and temperature of the treated water. Temperature slows the reaction for any chemical treatment, but chlorine treatment is particularly susceptible to variations in the pH as at lower pHs, hypochlorous acid is formed, while at higher pHs, it will tend to dissociate into hydrogen and chlorite ions, which are less effective as a disinfectant. As a result, chlorine effectiveness drops off when the pH is greater than 8.

Chlorine, like iodine, will not kill Cryptosporidia.

Methods of chlorine treatment:

Bleach: Ordinary household bleach (such as Clorox) in the US contains 5.25% sodium hypochlorite (NaOCL) and can be used to purify water if it contains no other active ingredients, scents, or colorings. Bleach is far from an ideal source due to its bulkiness

(only 5% active ingredient), and the instability over time of the chlorine content in bleach. Chlorine loss is farther increased by agitation or exposure to air. One source claims chlorine loss from a 5% solution at 10% over 6 months if stored at 70° F. Nevertheless, this may be the only chemical means available to purify water, and it is far better than nothing. Normal dosage is 8 drops (0.4 ml) per gallon. Allow the treated water to sit for 30 min., and if there isn't a slight chlorine smell, retreat. *Note:* USP standard medicine droppers are designed to dispense 0.045-0.055 ml per drop. Use of other solvents or some chemicals can change this. The dropper can be calibrated against a graduated cylinder for greater accuracy.

Some small treatment plants in Africa produce their own sodium hypochlorite on site from the electrolysis of brine. Power demands range from 1.7 to 4 kWh per lb. of NaOCL. 2 to 3.5 lbs. of salt are needed for each pound of NaOCL. These units are fairly simple and are made in both the US and the UK. Another system, designed for China, where the suitable raw materials were mined or manufactured locally, used a reaction between salt, manganese dioxide, and sulfuric acid to produce chlorine gas. The gas was

then allowed to react with slaked lime to produce a bleaching powder that could then be used to treat water. A heat source is required to speed the reaction up.

AquaCure: Designed for the South African military, these tablets contain chlorine and alum. The alum causes the suspended solids to flocculate and the chlorine adds 8 PPM chlorine. This is a great way to treat turbid water, though it will leave a lot of chlorine in clear water (The one tablet/liter could be halved for clear water.)

The US distributor for Aqua Cure is:

Safesport Manufacturing, Box 11811, Denver, CO 80211 1 800 433 6506

Bleaching Powder (Chlorinated Lime): Can also be purchased and used as a purification means if nothing else is available. Bleaching powder is 33-37% chlorine when produced, but losses its chlorine rapidly, particularly when exposed to air, light or moisture.

Calcium Hypochlorite: Also known as High Test Hypochlorite (HTH). Supplied in crystal form, it is nearly 70% available chlorine. One product, the Sanitizer (formally the Sierra Water Purifier) uses these crystals to superchlorinate the water to insure pathogens were killed off, then hydrogen peroxide is added to drive off the residual chlorine. This is the most effective method of field chlorine treatment. The US military and most aid agencies also use HTH to treat their water, though a test kit, rather than superchlorination, is used to insure enough chlorine is added. This is preferable for largescale systems as the residual chlorine will prevent recontamination.

Usually bulk water treatment plants first dilute to HTH to make a 1% working solution at the rate of 14g HTH per liter of water. *While testing to determine exact chlorine needs* are preferable, the solution can be used at the dose rate of 8 drops/gallon, or for larger quantities, 1 part of 1% solution to 10,000 parts clear water. Either of these doses will result in 1 PPM chlorine and may need to be increased if the water wasn't already filtered

by other means.

When test kits are available, the WHO standard is a residual chlorine level of 0.2 to 0.5 mg/l after a 30 min. contact time. The may require as much as 5 mg/l of chlorine to be added to the raw water.

Iodine: Iodine's use as a water purification method emerged after WW2, when the US military was looking for a replacement for Halazone tablets. Iodine was found to be in many ways superior to chlorine for use in treating small batches of water. Iodine is less sensitive to the pH and organic content of water, and is effective in lower doses. Some individuals are allergic to iodine, and there is some question about long term use of iodine. The safety of longterm exposure to low levels of iodine was proven when inmates of three Florida prisons were given water disinfected with 0.5 to 1.0 PPM iodine for 15 years. No effects on the health or thyroid function of previously healthy inmates was observed. Of 101 infants born to prisoners drinking the water for 122- 270 days, none showed detectable thyroid enlargement. However 4 individuals with preexisting cases of

hyperthyroidism became more symptomatic while consuming the water.

Nevertheless experts are reluctant to recommend iodine for long term use. Average American iodine intake is estimated at 0.24 to 0.74 mg/day, higher than the RDA of 0.4 mg/day. Due to a recent National Academy of Science recommendation that iodine consumption be reduced to the RDA, the EPA discourages the use of iodized salt in areas where iodine is used to treat drinking water.

Iodine is normally used in doses of 8 PPM to treat clear water for a 10 minute contact time. The effectiveness of this dose has been shown in numerous studies. Cloudy water needs twice as much iodine or twice as much contact time. In cold water (Below 41° F or 5° C) the dose or time must also be doubled. In any case doubling the treatment time will allow the use of half as much iodine

These doses are calculated to remove all pathogens (other than cryptosporida) from the water. Of these, giardia cysts are the hardest to kill, and are what requires the high level of iodine. If the cysts are filtered out with a microfilter (any model will do since the cysts are 6 µm), only 0.5 PPM is needed to treat the resulting water.

Water treated with iodine can have any objectionable taste removed by treating the water with vitamin C (ascorbic acid), *but it must be added after the water has stood for the correct treatment time*. Flavored beverages containing vitamin C will accomplish the same thing. Sodium thiosulfate can also be used to combine with free iodine, and either of these chemicals will also help remove the taste of chlorine as well. Usually elemental iodine can't be tasted below 1 PPM, and below 2 PPM the taste isn't objectionable. Iodine ions have an even higher taste threshold of 5 PPM. Note that removing the iodine taste does not reduce the dose of iodine ingested by the body.

Sources of Iodine:

Tincture of Iodine: USP tincture of iodine contains 2% iodine and 2.4% sodium iodide dissolved in 50% ethyl alcohol. For water purification use, the sodium iodide has no purification effect, but contributes to the total iodine dose. Thus it is not a preferred source of iodine, but can be used if other sources are not available. 0.4 cc's (or 8 drops) of USP tincture (2% iodine) added to a liter of water will give the 8 mg/l (same as 8 PPM). If the iodine tincture isn't compounded to USP specs, then you will have to calculate an equal dose based on the iodine concentration. **Lugol's solution:** Contains 5% iodine and 10% potassium iodide. 0.15 cc (3 drops) can be added per liter of water, but 3 times more iodine is consumed compared to sources without iodide.

Betadyne (povidone iodine): Some have recommended 8 drops of 10% povidone iodine per liter of water as a water treatment method, claiming that at low concentrations povidone iodine can be regarded as a solution of iodine. One study indicated that at 1:10,000 dilution (2 drops/liter), there was 2 PPM iodine, while another study resulted in conflicting results. However, at 8 drops/liter, there is little doubt that there is an

antimicrobial effect. The manufacturer hasn't spent the money on testing this product against EPA standard tests, but in other countries it has been sold for use in field water treatment.

Kahn-Vassher solution: By adding a sufficient amount of iodine crystals to a small bottle, an almost unlimited supply of saturated iodine solution can be produced. As long as crystals remain in the bottle, the solution is saturated. Concentration of the iodine is dependent of temperature, either condition at ambient temperature can be assumed, or commercial models such as Polar Pure incorporate a liquid crystal thermometer to determine dose.

One criticism of this method is the chance of decanting iodine crystals into the water being treated. This isn't that much of a problem as iodine is very weakly toxic, but the Polar Pure incorporates a collar into the neck of the bottle to help prevent this. Another disadvantage to this method is that the saturated iodine solution must be kept in glass bottles, and is subject to freezing, but this is hardly an insurmountable problem. Freezing, of course, doesn't affect the crystals.

This is the method I use, but I do use the commercial Polar Pure bottle, and refill it as necessary with USP crystals. During a crisis, or extended camping trips I would microfilter the water first, so a much lower dose of iodine is needed. With the Polar Pure bottle, dosage information is provided. Otherwise a 1 oz bottle can be used to carry the solution. The bottle is filled with water after use. At the next use, 1/2 of the supernate (15 cc) is poured off into a liter of water. At 68° F, this will yield a dose of 9 mg/l. To use this method with a microfilter to get a 0.5 PPM concentration, either large batches of water need to be treated (1/2 oz to 4.5 gallons would be 0.5 PPM), or a TB syringe or medicine dropper can be used to measure doses. A USP medicine dropper should give 20 drops per ml. Iodine can also be dissolved in alcohol to make a solution of known concentration. I am not aware of any commercial products, but a pharmacy could compound one for you, or you could do it your self. One suggested formula is 8g iodine/100 cc ethyl alcohol which yields enough solution to disinfect 250 gallons of water. At the rate of 0.1 cc (2 drops)/liter to give a concentration of 8 mg/l.

Tetraglycine hydroperiodide (e.g. Potable Aqua): This is the form of iodine used by the US military for field treatment of water in canteen sized batches. Usual dose in one tablet per quart of water to give a concentration of 8 mg/l. Two tablets are used in cloudy or cold water or contact time is doubled. *The major downside of this product is that the product will loose its iodine rapidly when exposed to the air.* According to the manufacturer, they have a near indefinite life when sealed in the original bottle, but probably should be discarded within a few months of opening. The tablets will change color from gun metal gray to brown as they lose the iodine, and you should see a brown tint to the water after treating.

Iodine Resin Filter: Some commercial microfilters incorporate an iodine resin stage to kill viruses and bacteria, with out putting as much iodine in the water as if it had been added to the raw water. A few products rely exclusively on an iodine resin stage. Downside of these filters are their fragile nature, dependency of effectiveness on flow rate

and the inability to identify when they need to be discarded. If you are going to use one where the water is known to be contaminated with viruses, then one of the better known brands such as the PUR or Sweetwater Viraguard is recommended. More than one pass through the filter may be necessary in cold weather.

Resins do have the advantage of producing less iodine in the water for the same antimicrobial effect as for the most part, they only release iodine when contacted by a microbe. The downside is that physical contact between the microbe and the resin is needed.

Silver: Silver has been suggested by some for water treatment and may still be available outside the US. Its use is currently out of favor due to the EPA's establishment of a 50 ppb MCL (Maximum Contaminate Level) limit on silver in drinking water. This limit is set to avoid *argyrosis*, a cosmetic blue/gray staining of the skin, eyes, and mucous membranes. As the disease requires a net accumulation of 1 g of silver in the body, one expert calculated that you could drink water treated at 50 ppb for 27 years before accumulating 1 g. Silver has only been proven to be effective against bacteria and protozoan cysts, though it is quite likely also effective against viruses.

Silver can be used in the form of a silver salt, commonly silver nitrate, a colloidal suspension, or a bed of metallic silver. Electrolysis can also be used to add metallic silver to a solution.

Some evidence has suggested that silver deposited on carbon block filters can kill pathogens without adding as much silver to the water. Katadyn markets a silver based water treatment product called Micropur. The manufacturer recommends a 2 hr contact time at a dose of 1 tab per liter and states the product is "For the disinfection and storage of clear water. Reliably kills bacterial agents of enteric diseases, but not worm eggs, ameba, or viruses. Neutral to taste... insure protection against reinfection for 1-6 months."; The following forms are available:

Micropur Tablets

MT1 1 tablets/qt 25 gal MT2 1
tablet/5qts 62.5 gal

Micropur Fluid

MF 75 10 drops/gal 75 gals MF250
10 drops/gal 250 gals

Micropur Crystal

MC250 1 packet/gal 250 gal MC
2500 1 spoon/25 gal 2500 gal
MC12500 1 spoon/250 gal 12500 gal

Potassium Permanganate: Potassium Permanganate is no longer commonly used in the developed world to kill pathogens. It is much weaker than the alternatives, more expensive, and leaves an objectionable pink or brown color. If it must be used, 1 gram per liter would probably be sufficient against bacteria and viruses (no data is available on its effectiveness against protozoan cysts).

Hydrogen Peroxide: Hydrogen Peroxide can be used to purify water if nothing else is available. Studies have shown of 99 percent inactivation of poliovirus in 6 hr with 0.3 percent hydrogen peroxide and a 99% inactivation of rhinovirus with a 1.5% solution in 24 minutes. Hydrogen Peroxide is more effective against bacteria, though Fe^{+2} or Cu^{+2} needs to be present as a catalyst to get a reasonable concentration-time product.

Coagulation/Flocculation agents: While flocculation doesn't kill pathogens, it will reduce their levels along with removing particles that could shield the pathogens from chemical or thermal destruction, and organic matter that could tie up chlorine added for purification. 60-98% of coliform bacteria, 65-99% of viruses, and 60-90% of giardia will be removed from the water, along with organic matter and heavy metals.

Some of the advantages of coagulation/flocculation can be obtained by allowing the particles to settle out of the water with time (sedimentation), but it will take a while for them to do so.

Adding coagulation chemicals such as alum will increase the rate at which the suspended particles settle out by combining many smaller particles into larger floc which will settle out faster. The usual dose for alum is 10-30 mg/liter of water. This dose must be rapidly mixed with the water, then the water must be agitated for 5 minutes to encourage the particles to form flocs. After this at least 30 minutes of settling time is needed for the flocs to fall to the bottom, and then the clear water above the flocs may be poured off. Most of the flocculation agent is removed with the floc, nevertheless some question the safety of using alum due to the toxicity of the aluminum in it. There is little to no scientific evidence to back this up. Virtually all municipal plants in the US dose the water with alum.

In bulk water treatment, the alum dose can be varied until the ideal dose is found. The needed dose varies with the pH of the water and the size of the particles. Increase turbidity makes the flocs easier to produce not harder, due to the increased number of collisions between particles.

Treatments requiring electricity:

Ozone: Ozone is used extensively in Europe to purify water. Ozone, a molecule composed of 3 atoms of oxygen rather than two, is formed by exposing air or oxygen to a high voltage electric arc. Ozone is much more effective as a disinfectant than chlorine, but no residual levels of disinfectant exist after ozone turns back into O_2 . (one source

quotes a half life of only 120 minutes in distilled water at 20° C). Ozone is expected to see increased use in the US as a way to avoid the production of trihalomethanes. While ozone does break down organic molecules, sometimes this can be a disadvantage as ozone treatment can produce higher levels of smaller molecules that provide an energy source for microorganisms. If no residual disinfectant is present (as would happen if ozone were used as the only treatment method), these microorganisms will cause the water quality to deteriorate in storage.

Ozone also changes the surface charges of dissolved organics and colloidally suspended particles. This causes microflocculation of the dissolved organics and coagulation of the colloidal particles.

UV light: Ultraviolet light has been known to kill pathogens for a long time. A low pressure mercury bulb emits between 30 to 90 % of its energy at a wave length of 253.7 nm, right in the middle of the UV band. If water is exposed to enough light, pathogens will be killed. The problem is that some pathogens are hundreds of times less sensitive to UV light than others. The least sensitive pathogens to UV are protozoan cysts. Several studies show that Giardia will not be destroyed by many commercial UV treatment units. Fortunately these are the easiest pathogens to filter out with a mechanical filter.

The efficacy of UV treatment is very dependent on the turbidity of the water. The more opaque the water is, the less light that will be transmitted through it. The treatment units must be run at the designed flow rate to insure sufficient exposure, as well as insure turbulent flow rather than plug flow.

Another problem with UV treatment is that the damage done to the pathogens with UV light can be reversed if the water is exposed to visible light (specifically 330-500 nm) through a process known as photoreactivation.

UV treatment, like ozone or mechanical filtering leaves no residual component in the water to insure its continued disinfection. Any purchased UV filter should be checked to insure it at least complies with the 1966 HEW standard of 16 mW.s/cm² with a maximum water depth of 7.5 cm. ANSI/NSF require 38 mWs/cm² for primary water treatment systems. This level was chosen to give better than 3 log (99.9%) inactivation of Bacillus subtilis. This level is of little use against Giardia, and of no use against Crypto.

The US EPA explored UV light for small scale water treatment plants and found it compared unfavorably with chlorine due to 1) higher costs, 2) lower reliability, and 3) lack of a residual disinfectant.

Questionable or Dangerous methods of water treatment

Aerobic 07: Also sold as Aerobic Oxygen. The company refuses to release the disinfectant. It may be chlorine dioxide, a well known, if somewhat unstable, disinfectant.

The company has shown company sponsored tests showing effectiveness against viruses and bacteria (but not against Giardia). No independent testing has been performed, nor has anybody provided concentration-time data for the product.

Survival Straw: This product claims to destroy and eliminate impurities including bacteria, protozoa, fungi, chemicals and heavy metals using a matrix of metal alloy. The manufacturer claims the product's media meets EPA and FDA specs, which is no indication of the filter's effectiveness. The filter violates a number of laws of physics since it claims that it destroys heavy metals and pathogens without filtering them.

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Home Made Berkey Water Filter

By: Daire

I have a large family and our current home does not afford us much space for water storage. While we are able to store some, our contingency water plan centers around the two stormwater holding ponds near our home. However, this water is standing water that mainly is supplied by runoff from the parking lots of our townhouse complex. So, thorough filtering is required to remove the variety of contaminants that are likely present in the water.

The best option for this situation is the proven Berkey water filter. Berkey filters are gravity filters that use cleanable micro-permeable ceramic filter elements. These filters are extremely effective, long-lasting and require no electricity. The only drawback is that they are expensive, and money saved is money that can be spent on other preps. You can save about \$175-200 or more by making your own.

This article will guide you through the construction of a filter equivalent in performance to the Imperial Berkey that sells for about \$300. My total cost was \$122

Gather the necessary components. You will need the following:

- two 5-gallon food grade buckets (got mine from Lowes for \$5 each)
- two lids for the buckets (got mine from Lowes for \$1.50 each)

a pair of Black Berkey filter elements (ordered mine on Ebay for \$99 which included free shipping and a free Sport Berkey filtered bottle) a food grade spigot (the kind used for large coffee pots or water coolers is perfect, ordered mine from jamesfilter.com for \$10)



Drill two 1/2" holes in the bottom of the upper bucket and two matching holes in the lid of the lower bucket.



Drill a 3/4" hole in the side of the lower bucket toward the bottom. Make sure that the hole is up just far enough for the spigot to clear when the filter is sitting on a flat surface



Assemble the lower bucket by installing the spigot and the lid with holes.



Install the filter elements in the upper bucket through the holes in the bottom.



Assemble the filter by placing the upper bucket on the lower. Be sure to line up the holes so the tubes extend through the lid of the lower bucket. Place the remaining lid on top.



To use the filter, fill the upper bucket with water and wait. If you are starting with dry elements, it will take quite a while before the water starts dripping into the lower bucket. It takes up to several hours for the clean water to drain into the lower bucket. This process can be sped up considerably by frequently topping off the water in the upper bucket. This maintains maximum pressure on the elements.

Notes:

I had no scientific way to test the water quality; however, the filtered water was clear, had no odor, and tasted similar to distilled. The specifications of the Black Berkey elements can be found here: http://berkeywater.com/BerkeyLight/BB_Purification_Elements.html

There are a number of ways to make this even cheaper: Use free buckets from a grocery store bakery or restaurant. I have found the same type of spigot for \$5 since making this one. Super Sterasyl elements can be substituted for the Black Berkey elements. They cost about \$84 a pair.

The filter can be made considerably larger by using any two stacking containers suitable for water, trash cans or 30-gallon water barrels for instance. The flow rate can also be increased by adding more filter elements.

The filtered solids remain on the outside of the filter elements and will eventually interfere with the rate of flow. Therefore, it is important to prefilter through a dense cloth (we use cloth diapers) if your source water is particularly cloudy. The elements can be scrubbed clean with a plastic scouring pad. The Black Berkey elements last for about 3000 gallons each (6000 gallons for the pair).

Three Weeks without Food

During the seven plentiful years the earth produced abundantly, and he gathered up all the food of these seven years, which occurred in the land of Egypt, and put the food in the cities. He put in every city the food from the fields around it. And Joseph stored up grain in great abundance, like the sand of the sea, until he ceased to measure it, for it could not be measured.

Genesis 41:47-49

In the house of the wise are stores of choice food and oil, but a foolish man devours all he has.

Proverbs 21:20

Store or Starve

A beginner's guide to food storage

Go to the ant, thou sluggard; consider her ways, and be wise.

~ Proverbs 6:6

I want people to store food not only for their sake, but for mine as well. I don't want to decide which of my kids have to go hungry when you and your unprepared kin come knocking on my door. Contrary to progressive-collectivist thinking, every individual who takes care of themselves and their families benefits society by not becoming a burden. So take responsibility now and start today. Don't expect the Feds to come by to hand you your ration of government-issued cheese. You could be in for a long wait. Wait too long, and you may end up with a green-stained mouth from eating grass, like the poor Irish during the potato famine in the mid 1800's. Or seriously reevaluate your aversion to cannibalism. Compared to those desperate methods, dumpster diving comes off as luxury cuisine.

An adult needs a minimum 2500 calories a day. More if you are physically active. This translates to about two pounds of food, plus a gallon of potable ("drinkable") water. To get started, follow this cardinal rule; **Store what you eat, and eat what you store.** Do not expect to suddenly acquire a taste for powdered eggs or a jalapeno-spiced chili MRE in a long-term disaster. If you have children, they will be even more reluctant to eat such stuff. The next rule is not go into debt by spending thousands of dollars for pre-packaged foodstuffs. It kinda defeats the purpose if you have to eat your food supply because you have no money left after buying it.

Begin building your food storage by buying 2–3 extra items every time you shop at the grocery store. A few cans here, some bags and boxes there, and it will begin to add up. Look for sales, two-for-one specials, and coupon items. Set aside some space, and put the oldest stuff in front, and the newest in back. Rotate from back to front as you use it. If you have food items that are going to expire soon that you don't have time to eat, donate them to a local food pantry for Karma points. There. You now have established a simple but effective short term food storage system. Everything from here on will expand upon it.

The next step is to create a larger, stable environment to preserve your food supply over the long haul. Regardless if you live in a country mansion or a studio apartment, you need the following conditions to preserve food:

- Keep it airtight
- Keep it cool
- Keep it dark
- Keep it dry
- Keep it protected

Now back to the oxygen problem. As long as the can does not have a tell-tale bulge, signaling spoiled contents, canned goods are viable for many years past their expiration dates, notwithstanding a loss in nutritional value. Dry food packed in paper, cardboard boxes, or plastic are subject to oxygen spoilage over time. One solution is to repackage dry food items using food grade Mylar bags. These bags are an inexpensive method for those on a budget to customize their food storage to their personal needs and taste. Mylar is an excellent air and moisture barrier. It is said one can jump on a filled sealed bag and

it won't pop. But they need protection against punctures and gnawing vermin—hence they need to be stored in a protective container, like those mentioned above. The recommended base foods for long-term storage are wheat, oats, legumes, pasta, honey/sugar, and salt. These will easily last 20-30 years if packed and stored properly. Flour and dry milk are more finicky, and have a shelf life of only 5–10 years. If you or members of your family suffer from Celiac disease, and cannot consume gluten type foods such as wheat, substitute white rice instead. I do not recommend brown rice for long-term storage, as it contains oils that break down over time that causes it to spoil. Supplement your long term food with canned goods, MRE's and others sundries. The eventual goal is to build a diverse storage of food for health, variety, and if necessary, portability.

Items needed for packaging food:

Food grade Mylar bags. I recommend minimum 4.5mil thick bags in one-gallon size. These will hold about 4–6 lbs, depending on the bulk of the food products. Besides commercial vendors, the Church of Jesus Christ of Latter Day Saints also sells them online, along with other preparedness supplies. Their bags are 7mil thick. However, they only sell them in bulk, so 250 bags for \$94 is probably more bags than you need. The church also has food canneries throughout the US that sells these in smaller quality. One can purchase pre-packaged food or bring their own food to seal at cost at these centers.

500cc Oxygen absorber packets. It takes two of these for each one gallon, 11" x 13" or similar sized Mylar bags full of food. These packets come in a sealed bag with all the oxygen sucked out. If the bag is not flat, but puffy with air, the oxygen packets have been compromised. You will need a glass jar with a metal (not plastic) lid to store them after you open the bag. Or you can seal them in a Mylar bag. Ordinary plastic bags are no good for storing oxygen packets – they provide a poor air barrier. Oxygen packets will start to feel warm when activated by exposure to air. Take them out only when you have everything else all set to bag and seal. Make sure to close the lid to preserve the others. 5-gram silica gel desiccant. These absorb any residue moisture that may reside in your food, to prevent mold. I've talked to the people at our local LDS cannery, and they and others who have stored food for years have experienced no problems *not* using desiccant packets. Everything I've read online suggest you should put them in. Your call. I purchase mine on eBay for around 25 cents each.

Sealer. This is a very expensive piece of equipment. I like to use the one at our local church. Contact the local Bishop or a Mormon friend to arrange a time to use one. It comes with a foot pedal, making it easier to seal bags. An alternative is using a hot iron set on wool or cotton (Not the wife's!) with a 2 x 4 piece of wood. Some find they can use conventional food sealers. But do your homework well, as it is for good reason that Mylar bags require industrial strength sealers compared to off-the-shelf food sealers.

Directions for sealing bags:

1. If using the LDS Church sealer, check that the settings are at Sealing: 3, Congealing: 6, Recycle: 2. Turn on the sealer and let it warm up for two minutes.

2. (Optional) Place two 5-gram silica gel packets at the bottom of the Mylar bag.
3. Pour flour, rice, grain, etc. in bag. This can be done single-handedly, but from experience, it is *so* much easier to have someone help holding the Mylar bag, as it is very slick and does not have a flat bottom to keep it upright. Flour and dry milk can be a pain because it "poufs" everywhere when pored in the bag. When it does, use a damp paper towel to clean up the inside of the top of the bags where it will be sealed together. Then apply a dry towel to remove any moisture. At this point, firmly bang the bag several times against the table to help settle the contents and reduce airspace between the food elements.
4. Place two 500cc oxygen packets on top of food. Be sure to keep the unused oxy packets sealed in an airtight container, so they will stay fresh.
5. Hold and pull tight both ends of the open bag, place in the sealer. Let the filled part of the bag drop down, to prevent food from coming up to opening and preventing a perfect seal. Hit the foot pedal. The seal bar will come down for 2–3 seconds to set the seal. I like to add a second seal to each bag for good measure. Check the seal by attempting to peel the opening apart. If the seal is secure, you won't be able too. Also push on the bag and watch if any air leaks out. None should. For using an iron, place the Mylar bag opening on the 2 x 4, and press down. Some prefer to put a towel between the iron and the Mylar, but I've never scorched a bag yet.
6. Use a permanent marker to write the on bag the date, the weight, and the description on the bagged food. I like to include the brand name of the food, in case I have any problems with it, or is recalled by the FDA. For some things like powdered milk, I tape the mixing instructions on the bag.

Mylar bags may be cut in half or smaller to store smaller portions. Filled Mylar bags are very stiff and rigid. The bagged food will be a bit awkward to store in round containers like buckets and trashcans. Stack fragile food like pasta on top of the heavier, bulkier bagged foods. Large Mylar bags from vendors are available to store quantities up to 30 lbs in 5-gallon plastic buckets. Put one in, and fill up with the dry food product of your choice. Some recommend using dry ice on top of the food before sealing to displace oxygen in the bucket. I could not find any dry ice in my area, so put ten oxygen packets on top instead. Seal with a hot iron by pressing the Mylar against a 2 x 4 piece. Trim any excess from the sealed top edge of the bag with scissors to secure the Mylar bag into the bucket.

This YouTube video: <http://www.youtube.com/watch?v=fk9b0dAtJ80> gives excellent demonstration. Cover with a lid. I prefer Gamma screw-top lids on my buckets. They cost from \$7–10 each, but are so much easier than popping and hammering lids off and on every time.

Other food storage methods include canning, both traditional glass jars and #10 metal cans. The latter can be done at a local LDS cannery center. Dehydrating food is another valuable storage method.

A few more suggestions with building your food storage. Include fun foods to help break

the monotony and uplift morale, such as hard candy, chocolate, powdered drinks, and dried fruit.

Pick up some recipes on cooking the food you store, to add variety to your diet. When possible, supplement your food storage meals with garden vegetables, home grown sprouts, or ordinary dandelion leaves. Be careful of depending on a diet of MRE's. While they are portable and convenient for traveling, they are short on fiber, and can be hard on the digestive system, especially with children and the elderly. They also negatively affect those who are gluten intolerant. On storing water, bottled water is okay if you are going to bug out, but for hunkering down, you need to think much bigger. For the cost of two cartons of bottled water, you can purchase a five-gallon water container. These are more practical if you need to go out and get your water replenished. Add half teaspoon of bleach per five gallons to keep it safe. Be sure to use only *regular* bleach, and not those with special or extra additives. If in doubt, boil it.

Whether a global disaster strikes or one becomes unemployed, food storage is the best insurance one can have in uncertain times. You will garner a better dividend on your food storage than any other investment. There's more to improve upon than mentioned here, such as progressing to the next level from food *storage* to food *production*. But you have

enough info to get started. So no more excuses. Get working on your food storage today. And don't forget THE CAN OPENER.

By Ron Shirtz

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Food Storage

*"...and he will have his eyes fixed on the signs of the times,
and that day will not overtake him unawares." - JD 7:189.*

We do seem to be undergoing a **quickenning of the times** and that may be an important indication for each of us to evaluate our personal and family storage needs again. As members of the Church we have been counseled for many many years to prepare and keep on hand at least a **one-year supply of food**. In the early days of our church the Saints were admonished to have a **7 year** food supply. Then, for many years there was a time when a two-year supply was recommended, (and it undoubtedly would be a good idea for each of us to still keep a two-year supply if at all possible as this will allow us to share with others). But in the meantime it is imperative that we heed the current counsel to **obtain and maintain at least a one-year minimum emergency food supply**.

According to figures gathered by one of the food storage manufacturing firms, less than 6% of the members of the Church have an adequate emergency program. *Where do you fit into this figure?*

Let's enjoy life as much as we can - but let's also **be prepared**. As we have recently seen,

an unexpected disaster or loss of income can strike every *s-o-o* quickly.

“When the emergency is upon us, the time of preparation has passed.”

Our food supply is fragile

Grocery stores don't stock weeks of food anymore. Most keep only 72 hours of food on the shelves. They re-stock based on just-in-time delivery of food supplies. If the trucks stop rolling in your part of the country during a crisis, the store shelves will be emptied almost immediately.

In fact, expect a shortage of mainstay items like milk and bread to occur similar to what happens before an approaching hurricane hits. Those who are aware of the problem but who haven't already made preparations will engage in a last-minute rush to buy a few extra supplies.

Transportation is the key to food

Without transportation, farmers can't get their crops to the wholesalers or food processing facilities. Food is heavy, generally speaking, and it requires trucks and trains to move it around — a literal ARMY of trucks and trains, weaving their way from city to city, optimized and prioritized by computers. If the computers freeze, the whole transportation infrastructure will shut down. Transportation also depends heavily on fuel, which means the oil-producing countries in the Middle East have to be able to produce the oil that gets refined into diesel fuel here in America. So, in other words, **your food supply depends on Saudi Arabia being alive and well.** Do you trust the people in charge in Saudi Arabia, Iraq, Iran, and Kuwait with your life? If you don't **make preparations now**, you're trusting them by default.

Cities depend entirely on rural land

Did you know cities would be ghost towns without the supporting imports of food from the country? We should all thank the farmers a little more, because they literally keep us all alive. Cities are like concrete islands. You might think a city is self-sustaining until you really think about it, but underneath it all, that city is a ghost town without the people in the country supporting it.

You may already know that city people and country people have very different views on politics and life in general. Country people tend to be more religious and more conservative. City people tend to be more liberal. So there's more than a little animosity between country people and city people. When a crisis hits, and the country people find they are without electricity and fuel, they will still survive, for the most part, because they're used to surviving. But do you think they will really put “saving city people” high on their list of priorities? I don't think so. Any food that's harvested from the fields will be kept and stored by the farmers themselves. They will NOT be shipping this stuff to the cities unless they have excess goods and can find a transportation method that still works

(and has fuel). Unfortunately, if some emergency powers acts are signed into place by the President, the Federal Emergency Management Association will have the legal power to actually confiscate and redistribute food. This makes it all the more likely that farmers will harvest it and HIDE IT in order to keep it. And that means even less food making it to the cities. Bottom line? Cities where food can't be delivered will eventually be gutted, looted, evacuated and likely burned to the ground.

You need to start stocking food

You can do a lot if you start early. Unfortunately, “early” might have been yesterday. Now we’re way past early, and you need a reasonable plan to get food supplies that will store well and don’t cost too much. You’ve probably already realized that buying up extra cans of soup at the grocery store is a really stupid way to spend your preparedness money. You need a better plan. Every \$10 you spend at the store might feed a person for a few days. You need more leverage, where you can spend \$10 and feed a person for a few weeks.

Buy extra, use FIFO

Go ahead and buy more food than normal when you’re out shopping, and set it aside. Use the “first in, first out” rule to eat your older supplies first. Keep rotating your supplies so you never abandon food “way in the back.”

Buy ingredients, not prepared foods

Ingredients such as salt, honey, oatmeal and wheat will last a lot longer than prepared foods like TV dinners, cereals, and food mixes. Naturally, as you purchase food ingredients, you’ll want to practice actually using them! And remember the basics. For example, if you purchase a bag of wheat, how exactly do you plan to make flour out of it? I’ve personally seen plans in a survival book that described throwing some wheat in a coffee can and pounding it into flour with a blunt stick. You can make a few cups of flour after ten or fifteen minutes of noisemaking.

by Chris Parrett

One Year Supply Guide

Suggested Amounts of Basic Foods for Home Storage-Per Adult for One Year			
Basic Food Storage		Extras	
Grains	300 lbs.	Fruits	185 lbs. Family Totals
Legumes	60 lbs.	(Veg) Vegetables	185 lbs. Family Totals
Powdered Milk	16 lbs.	(CE) Cooking Essentials	8 lbs. Per Person
Cooking Oil	25 lbs.	Meats/Meat Substitutes	20 lbs. Per Person
Sugar or Honey	60 lbs.	(Aux.) Auxiliary Foods	-
Salt	8 lbs.	(Cond.) Spices/Condiments	-
Water (2 wks.)	14 gallons	* Quantities are <u>estimates</u> and should be adjusted to individual needs & likes.	

Food Storage Item	Amount	Shelf Life	Storage
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GRAINS:	300 lbs.+	*Keep all grains away from weevil & rodents!	
Cereal	5 lbs./5 boxes cereal	2-3 years	Dry & weevil proof
Cornmeal	10 lbs.	30 years+*	*See below
Flour	75 lbs./ 3 bags(25lb.)	8-10 years	Dry & weevil proof
Mixes (pancake, muffin, etc.)	10 lbs.	2 years	Dry & weevil proof
Oats	20 lbs./ 7 (48oz.)bag	30 years+*	*See below
Pasta	40 lbs./40 bags(1lb.)	30 years+*	*See below
Rice	40 lbs./ 2 bags(20lb.)	30 years+*	*See below
Wheat	100 lbs./4 bags(25lb)	30 years+*	*See below
*According to the LDS church website, www.providentliving.com it states: "Properly packaged, low moisture foods stored at room temperature or cooler (75 F or lower) remain nutritious and edible MUCH longer than previously thought according to findings of recent scientific studies. Estimated shelf life for many products has increased to 30 years or more." See website for more detailed information.			

LEGUMES/BEANS:	60 lbs.	*If beans are DRIED , they will last over 30 years!	
Black Beans	10 lbs./10 cans	Canned/ 2 years	Cool, dry place
Chili	5 lbs./5 cans	Canned/ 2 years	Cool, dry place
Kidney Beans	10 lbs./10 cans	Canned/ 2 years	Cool, dry place
Lentils	5 lb. bag	30 years+	Cool, dry place
Pinto Beans	15 lb. bag/15 cans	Canned/ 2 years	Cool, dry place
Pork n' Beans	5 lbs./5 cans	Canned/ 2 years	Cool, dry place
Refried Beans	10 lbs./10 cans	Canned/ 2 years	Cool, dry place

MILK/DAIRY:	16 lbs.		
Evaporated Milk	2 lbs./ 3 (12oz.) cans	2 years	Cool, dry place
Other	1 lb.	Expirations	Cool, dry place
Powdered Milk	12 lbs.	20 years+	*See Above Statement
Sweetened Condensed	1lb./2 cans	2 years	Cool, dry place

SUGAR:	60 lbs.		
Brown Sugar	6 lbs./ 3 (32oz.)bags	2 years+	Tightly sealed & dry
Corn Syrup	1 lb.	2 years+	Sealed

Honey	3 lbs.	Indefinite	Cool, tightly sealed, dark
Jam/Jellies	3 lbs./3 jars	2 years	Cool, tightly sealed, dark
Jello	1 lb./6 (3oz.) boxes	18 months	Cool & very dry
Maple Syrup	3 lbs./2 bottles	2 years	Cool, dry place
Molasses	1 lb.	2 years	Cool, dry place
Powdered Sugar	6 lbs./ 3 (32oz.)bags	2 years+	Tightly sealed & dry
Pudding	1 lb./6 (3oz.) boxes	18 months	Cool, dry place
White Granulated Sugar	35 lbs.	Indefinite	Tightly sealed & dry

OILS/FATS:		25 lbs.	
Butter	2 lbs./2 (1lb.) boxes	1 year in the freezer	Freezer
Cooking Oil (Veg., Canola, etc.)	5 lbs./1.5 (48oz.) oils	2-3 years	Cool, dry place
Margarine	2 lbs./2 (1lb.) boxes	1 year in the freezer	Freezer
Mayonaise	4 lbs./2 (32oz.) Jars	1-2 years/expiration date	Sealed, dark & cool
Olive Oil	3 lbs./ 1 (48oz.)	1-2 years	Sealed, dark & cool
Peanut Butter	4 lbs./4 (18oz.) jars	4 years	Sealed, dark & cool
Salad Dressing	2 lbs./ 2 (19oz.) jars	1 year	Sealed, dark & cool
Shortening	3 lbs./ 1 (48oz.) tub	2-3 years	Cool, dry place

SALT:		8 lbs.	
Salt	8 lbs.	Indefinite	Sealed & BONE dry

WATER:		28 gallons (2 week supply)	
Drinking	14 gallons +	1 year	No contact w/ cement.
Washing/Cleaning	14 gallons +	1 year	No contact w/ cement.

MEATS/SUBSTITUTES: 20 lbs.			
Canned Chicken	2 lbs./5 cans (6oz.)	2 years	Cool, dry place
Canned Tuna	5 lbs./13 cans (6oz.)	2 years	Cool, dry place
Canned Turkey	1 lb./2 cans (6oz.)	2 years	Cool, dry place
Chicken Noodle Soup/Meat soups	2 lbs./2 cans (15oz.)	2 years	Cool, dry place
Clams	.5 lbs./2 cans (4oz.)	2 years	Cool, dry place
Spam	1 lb./2 cans (8oz.)	2 years	Cool, dry place
Stew	2 lbs./ 2 cans	2 years	Cool, dry place
Vienna Sausages	.5 lbs./2 cans (4oz.)	2 years	Cool, dry place
TVP	1 lb.	20 years	Cool, dry place
Fresh Meat/1 month supply/Freezer:			
Bacon	1 lb.+	1 year/freezer	Freezer bags/containers
Beef/Roast	1 lb.+	1 year/freezer	Freezer bags/containers
Chicken	1 lb.+	1 year/freezer	Freezer bags/containers
Pork	1 lb.+	1 year/freezer	Freezer bags/containers
Sausage	1 lb.+	1 year/freezer	Freezer bags/containers
Seafood	1 lb.+	1 year/freezer	Freezer bags/containers

FRUITS: 185 lbs. (Totals for the ENTIRE family)			
Applesauce	36 lbs./ 36 cans	2 years	Cool, dry place
Dry Fruit (raisins, coconut, apples)	17 lbs./ 17 1lb. Bags	2 years	Cool, dry place
Fruit Cocktail	12 lbs./ 12 cans	2 years	Cool, dry place
Mandarin Oranges	36 lbs./52cans(11oz)	2 years	Cool, dry place
Peaches	24 lbs./ 24 cans	2 years	Cool, dry place
Pears	24 lbs./ 24 cans	2 years	Cool, dry place
Pineapple	36 lbs./45cans(20oz)	2 years	Cool, dry place

VEGETABLES: 185 lbs. (Totals for the ENTIRE family)			
*If vegetables are dried and packaged properly they will last anywhere from 18-24 months, or longer.			
Beets	1 lb./ 1 can	2 years	Cool, dry place
Carrots	5 lbs./ 5 cans/or dried	2 years	Cool, dry place
Corn	24 lbs./ 24 cans	2 years	Cool, dry place
Green Beans	24 lbs./ 24 cans	2 years	Cool, dry place
Green Chilies	3 lbs./ 12 cans(4oz)	2 years	Cool, dry place
Instant Potatoes	30 lbs.	30 years+*	*See Above Statement
Mixed Vegetables	5 lbs/5 cans (15oz.)	2 years	Cool, dry place
Mushrooms	1 lb./ 4 cans (8oz.)	2 years	Cool, dry place
Onions	5 lbs.	18-24 months	Cool, dry place
Peas	6 lbs./ 6 cans (15oz.)	2 years	Cool, dry place
Pickles	6 lbs. / 4 jars (24oz.)	2 years	Cool, dry place
Pumpkin	10 lbs./ 5 cans(29oz)	2 years	Cool, dry place
Salsa	6 lbs./ 6 jars (16oz.)	2 years	Cool, dry place
Spaghetti Sauce	30 lbs./19 jars(26oz.)	2-3 years if in glass jar	Cool, dry place
Tomato Paste	2.5 lbs./7 cans (6oz.)	2 years	Cool, dry place
Tomato Sauce	2.5 lbs./7 cans (6oz.)	2 years	Cool, dry place
Tomato Soup	6 lbs./ 6 cans (15oz.)	2 years	Cool, dry place
Tomatoes	27 lbs/27 cans(15oz)	2 years	Cool, dry place
Yams	1 lb./ 1 can (15oz)	2 years	Cool, dry place

COOKING ESSENTIALS: 6 lbs.			
Baking Powder	2 lbs./ 3 cans(10oz.)	3 years	Sealed & BONE dry
Baking Soda	1 lb./ 1 box (16oz.)	3 years	Sealed & BONE dry
Cocoa	1 lb./ 2 cans (8oz.)	3 years	Sealed & cool
Vanilla	As desired	3 years	Cool, dry place
Vinegar	2 quarts/.5 gallon	2 years+	Sealed
Yeast	2 lbs./ 2 pkgs. (16oz)	1 year in the freezer	Freezer or cool place

AUXILIARY FOODS:		
Brownie & Cookie Mixes	1 year	Dry & Weevil proofed
Cake Mixes	1 year	Dry & Weevil proofed
Casserole Mixes	1 year	Dry & Weevil proofed
Crackers	1 year	Dry & Weevil proofed
Marshmallows	1 year	Cool, dry place
Pie Fillings	2 years	Cool, dry place
Spices	3 years+	Dry & Weevil proofed
Vitamins & Minerals	1 year+	Cool, dark, dry place
Chocolate Chips	18 months	Cool, dry place

CONDIMENTS:		
BBQ Sauce	2 years	Tightly sealed, Dry
Ketchup	2 years	Tightly sealed, Dry
Mustard	2 years	Tightly sealed, Dry
Specialty Mustards	2 years	Tightly sealed, Dry

By Dealstomeals.com

Do you REALLY have a year's supply?

Just how big is a Year's Supply of food? As explained on the previous page, our Church is suggesting the following minimums for each adult:

- 400 lbs.** Grains (17.5oz / day)
- 60 lbs.** Beans (2.6oz / day)
- 10 quarts** Cooking oil (0.87oz / day)
- 60 lbs.** Honey (2.63oz / day)
- 8 lbs.** Salt (0.35oz / day)
- 16 lbs** Powdered milk (0.70oz / day)
- 14 gallons** of drinking water (for 2 weeks)

So, just how much is this?

Two 5 gallon buckets will hold about 75lbs of wheat, rice or other grains. This means you need *11 buckets of grain* for each person in your family. If you store all your grains in #10 cans...

Wheat, Rice, Corn, etc..

You would need 64 cans or 10.5 cases per person.

Pasta

You would need 32 cans or 5.25 cases per person.

Rolled oats

These are lighter but bulkier, so they require more storage containers and space.

You would need 124 cans or 21 cases person.

Beans

A 25 lb bag of beans will about fit in a single 5 gallon bucket, with a little space over, so 2 buckets would hold a one person supply, or 12 -13 # 10 cans or about 2 cases.

Daily Food

Dividing 400lbs by 365days, equals out to 1.09589lbs, or just over 1 lb of grain, per person, per day. That is approximately 2 cups of unground grain to cover your breakfast lunch and dinner.

Dividing 60lbs by 365, this works out to 0.16 lbs of beans per day, or 2.6 oz—approximately 3/4 cup. The other foods listed would also need to be used in limited amounts.

This is not much food, folks. Get the basics, then immediately begin to add more kinds of grain, soup mix, canned and/or dehydrated vegetables and fruit, etc to add variety and provide more than the minimal survival diet. As an example, the minimum recommended amount of grain, when ground and prepared will yield about 6 small biscuits or a plateful of pancakes. Its enough to keep you alive, but a far cry from being satisfied and not hungry.

by Chris Parrett

Monthly Food Storage Purchasing Calendar

Compiled by Andrea Chapman

If you are just starting out, this calendar can be used any year. Just start with the current month's items. We have tried to keep the costs down to between \$25 and \$35 per week. This might seem rather costly, but if you want to build a good food storage in only one year, it will cost you more each week than if you spread out acquiring it over several years. Be certain to buy only items your family will use, and rotate and use the items in your storage throughout the year. Milk is an expensive item and prices keep soaring, so you might need to invest in a bit higher food storage bill to buy it right now.

* The items in the first few months are basic essentials and are the most important to purchase and store.

It is vital to get WATER - STORAGE . If you don't have water, you will not be able to use many of the foods you have that are dehydrated or require water to cook.

Many times in natural disasters, the electricity goes down and you will not be able to access your water. Sometimes the water is contaminated from flooding and cross-contamination from sewage. You will need water, at very least, you will need 3 days worth.

January

Week #1 1 case canned fruit

2 #10 cans instant potatoes

Week #2

3 #10 cans dry milk

Week #3

3 #10 cans dry milk

Week #4

9 pounds yeast

Week #5

Anything you have missed from above

February

Week #1

Water Storage Containers-buy either 55 gallon drums, 5 gallon water containers (available at all emergency preparedness stores and some super markets) and spigot, or start to save water in pop bottles and plastic juice containers. Also purchase 100 lbs. hard white wheat and three plastic storage buckets with tight fitting lids. Check out the local mills in your area for best prices.

Week #2 25 lbs of **sugar** or 20 lbs of **honey**

5 lbs **salt** per person

bucket opener

Week #3

4 #10 cans **shortening** or 4 - 48 oz bottles **oil**

2 #10 cans of **dry instant milk**

Week #4

2 case **canned beans** (like refried pinto, black, kidney, white, pink etc.) or

25 lbs **dry beans** (preferable) and bucket to store them in.

50 lbs dried **corn or popcorn**

(about \$10.00 from a mill or food storage company) and a bucket to store it in.

(Can be ground into cornmeal as well as for popcorn.)

(All grains and beans can be put into #10 cans at the LDS cannery.)

(If not, the buckets work well.)

March

(please note that many of these items are repeats because we want to be SURE you have enough of the essentials!)

Week #1 Enough **water** containers for 14 gallons per person in the family.

(This was mentioned last month-but we want to be sure you have this)

(Water is your most important item!)

If you didn't get enough containers last month, you can get them this month.

White Rice, at least 15 pounds per person in the family and if possible buckets to store it.

(Brown Rice goes rancid faster.)

Week #2 2 jars **mayonnaise**

1 gallon **oil**

2 tubs **shortening**

Week #3 25 pounds **sugar**

1- 25 pound bag of **legumes** (pinto, lentils, white, pink etc.)

Week #4 **Salt** 5 more lbs

2 bottles of **bleach**

1 #10 can or 1 box of **dry milk**.

Week #5 Check your list for the last 8 weeks and purchase any items you fell short on.

These items are essential ones and you will need to be sure you have enough.

April

Week #1 100 pounds **wheat**

10 lbs. **brown sugar**

Week #2 2 #10 size cans **dried fruit** or 1 case **canned fruit**

1 pound **yeast**

Week #3 1 case **tuna or salmon**

2 #10 cans **milk**

3 lbs **sprouting seeds**

1 80 oz can Rumsford baking powder

Week #4 2 large jars **peanut butter** or

1 #10 can **peanut butter powder** (last longer)

2 cans **dried whole egg** (keep in a cool dry place)

May

Week #1 2 to 3 bottles of **multi-vitamins**

2 #10 cans of **rolled oats**

(if #10 cans are not available in your area, buy the largest packages available)

(in your local store, and also purchase a small bucket to store it in.)

Week #2 100 lbs. of **wheat**

3 buckets

Week #3 #10 can **margarine powder** - or shortening if marg. powder is unavailable

2 #10 cans **rolled oats**

(or equivalent, and a storage bucket)

Week #4 4 #10 cans **instant potatoes**

1 bottle **black pepper**

June

Week #1 2 cans dry milk, 2 boxes of Rennet

(used for making cottage cheese and other dairy products from dry milk.)

1 bottle lemon juice,
1 bottle vinegar. (also used in making dairy products from dry milk)
Week #2 100 lbs wheat
25 lbs. white flour
Week #3 Baking soda (try to buy in bulk in places like Sam's Club or Cosco) Buy about 10 lbs.
25 lbs. or legumes (choose those you are willing to eat.
Remember you can sprout legumes and almost quadruple the nutritional value of them.
Buy one large box Knox or other gelatin to be used in place of eggs in baking.
Week #4 Tomato products (try to buy them by the case in normal size cans. Spaghetti sauce, tomato sauce, and whole and chopped tomatoes. Buy a combination of flavored and not flavored tomatoes.
Buy paste if you can get a good deal on it. It is less expensive to add water to paste to make sauce than it is just to buy sauce sometimes. *Buy three cases if possible.*)
Week #5 Be on the look out for garden seeds that are NON- Hybrid.
That way you can use the seeds from the plants you grow to grow a garden the next season.
A good price for them is about \$18-20 per can with about 10 varieties per can.

July

Week #1 200# wheat
(buckets to store it in if needed)
[keep filling pop bottles, Gallon syrup containers, etc. with water - basically no cost to this)
Week #2 20 lbs. Peanut butter
[keep filling those water containers]
Week #3 4 #10 cans shortening
2 # 10 cans dry milk [keep filling water containers - make this a habit - when you empty something worthy of water storage, wash it and fill it right away]
Week #4 6 #10 cans dry milk [more water!]

August

Week #1 25# rice
25# sugar
1 # 10 can instant potatoes
5 lbs. salt
Week #2 1 case tuna or salmon or other meat
2 # 10 cans dry milk
Week #3 2 #10 cans dry milk
2 cans shortening
1 #10 can instant potatoes

Week #4 Note* In late August and early September, many stores have sales on canned fruits and vegetables.

Ask your local store when these sales will be, and switch the weeks of this calendar as needed.

2 cases fruit

5 lbs. salt

Week #5 2 cases canned fruit

1 case misc. vegetables (green beans, peas, carrots, etc.)

September

Week # 1 5 - 12 cases canned fruit

1 case misc. vegetables

Week # 2 2 cases canned fruit

2 cans shortening

Week #3 2 cases fruit

1 case vegetables

Week #4 2 cans shortening

25# rice buckets to store rice if it did not come in #10 cans

October

Week #1 100 lbs. wheat and 3 buckets

Week #2 1 case tuna or other meat

Week #3 25 lbs. Sugar

2 large cans fruit juice powder

Week #4 3 #10 cans dry milk

Week #5 9 #10 cans potato flakes

November

Week #1 4 large jars peanut butter

Week #2 1 case canned fruit

15 pounds rice

Week #3 7 #10 cans shortening

Week #4 50 pounds rice and buckets to store

December

Week #1 100 lbs. wheat and 3 buckets

Week #2 1 large can fruit juice powder

3 large jars peanut butter

Week #3 3 #10 cans dry milk

Week #4 50 pounds of rice, oats, or barley
buckets to store

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The Seven Major Mistakes in Food Storage

By Vickie Tate

A month or two ago I met a cute little gal who was talking to me about her newly begun food storage. “You know,” she began, “I’ve dreaded doing my food storage for years, it seems so blah, but the way national events are going my husband and I decided we couldn’t put it off anymore. And, do you know, it really hasn’t been hard. We just bought 20 bags of wheat, my husband found a place to get 60 pound cans of honey, and now all we have to do is get a couple of cases of powdered milk. Could you tell me where to get the milk?” After I suggested several distributors, I asked, “Do you know how to cook with your wheat?” “Oh,” she laughed, “if we ever need it I’ll learn how. My kids only like white bread and I don’t have a wheat grinder.” She had just made every major mistake in storing food (other than not storing anything at all.) But she’s not alone. Through 14 years of helping people prepare, I found most people’s storage starts out looking just like hers. So what’s wrong with this storage plan? **There are seven serious problems that may occur trying to live on these basics:**

1.) VARIETY -

Most people don’t have enough variety in their storage. 95% of the people I’ve worked with only stored the 4 basic items we mentioned earlier: *wheat, milk, honey, and salt*. Statistics show most of us won’t survive on such a diet for several reasons.

- a.) **Many people are allergic to wheat** and may not be aware of it until they are eating it meal after meal.
- b.) **Wheat is too harsh for young children.** They can tolerate it in small amounts but not as their main staple.
- c.) **We get tired of eating the same foods** over and over and many times prefer not to eat than to sample that particular food again. This is called *appetite fatigue*. Young children and older people are particularly susceptible to it. Store *less* wheat than is generally suggest and put the difference into a variety of other grains, particularly ones your family likes to eat. Also store a variety of beans. This will add variety of color, texture and flavor. **Variety is the key to a successful storage program.** It is essential that you *store flavorings* such as tomato, bouillon, cheese, and onion. Also, *include a good supply of the spices* you like to cook with. These flavorings and spices allow you to do many creative things with your grains and beans. Without them you are severely limited. One of the best suggestions I can give you is **buy a good food storage cookbook**. Go through it and see what your family would really eat. Notice the ingredients as you do it. This will help you more than anything else to know what items to store.

2.) EXTENDED STAPLES -

Few people get beyond storing the four basic items, but it is extremely important that you do so. *Never put all your eggs in one basket*. Store dehydrated and/or freeze-dried

foods as well as home canned and store bought canned goods. Make sure you add cooking oil, shortening, baking powder, soda, yeast and powdered eggs. You can't cook even the most basic recipes without these items. Because of limited space I won't list all the items that should be included in a well-balanced storage program. They are all included in the *The New Cookin With Home Storage* cookbook, as well as information on how much to store, and where to purchase it.

3.) VITAMINS -

Vitamins are important, especially if you have children, since children do not store body reserves of nutrients as adults do. *A good quality multi-vitamin and vitamin C* are the most vital. Others may be added as your budget permits.

4.) QUICK AND EASY AND PSYCHOLOGICAL FOODS -

Quick and easy foods help you through times when you are psychologically or physically unable to prepare your basic storage items. No cook foods such as freeze-dried are wonderful since they require little preparation. MRE's (Meals Ready to Eat), such as many preparedness outlets carry, canned goods, etc. are also very good. Psychological Foods are the goodies - Jello, pudding, candy, etc. - you should add to your storage. These may sound frivolous, but through the years I've talked with many people who have lived entirely on their storage for extended periods of time. Nearly all of them say these were the most helpful items in their storage to normalize their situations and make it more bearable. These are especially important if you have children.

5.) BALANCE -

Time and time again I've seen families buy all of their wheat, then buy all of another item, and so on. Don't do that. It's important to **keep well-balanced as you build your storage.** Buy several items, rather than a large quantity of one item. If something happens and you have to live on your present storage, you'll fare much better having a one month supply of a variety of items than a year's supply of two to three items.

6.) CONTAINERS -

Always store your bulk foods in food storage containers. I have seen literally tons and tons of food thrown away because they were left in sacks, where they became highly susceptible to moisture, insects and rodents. If you are using plastic buckets make sure they are lined with a food grade plastic liner available from companies that carry packaging supplies. **Never use trash can liners** as these are treated with pesticides. Don't stack them too high. In an earthquake they may topple, the lids pop open, or they may crack. A better container is the #10 tin can which most preparedness companies use when they package their foods.

7.) USE YOUR STORAGE -

In all the years I've worked with preparedness one of the biggest problems I've seen is people storing food and not knowing what to do with it. It's vital that you and your family become familiar with the things you are storing. You need to know how to prepare these

foods. This is not something you want to learn under stress. Your family needs to be used to eating these foods. A stressful period is not a good time to totally change your diet. Get a food storage cookbook and learn to use these foods! It's easy to solve these food storage problems once you know what they are. The lady I talked about at the first of the article left realizing what she had stored was a good beginning, but not enough. As she said, "It's better to find out the mistakes I've made now while there's still time to make corrections." This makes a lot more sense.

If you're one who needs to make some adjustments, that's okay. Look at these suggestions and add the things you're missing. It's easy to take a basic storage and add the essentials to make it liveable, but it needs to be done. As I did the research for my cookbook I wanted to include recipes that gave help to families no matter what they had stored. As I put the material together it was fascinating to discover what the pioneers ate is the type of things we store. But if you have stored only the 4 basics, there's very, very little you can do with it. By adding even just a few things it greatly increases your options, and the prospect of your family surviving on it. As I studied how the pioneers lived and ate, my whole feeling for food changed. I realized our storage is what most of the world has always lived on. If it's put together the right way we'll be returning to good basic living with a few goodies thrown in.

CANNED FLUID MILKS AND CREAMS

Preserved liquid milk comes in a number of forms, none of which are very similar to each other. The most common are as follows:

CANNED MILKS: These are commonly called UHT milks (Ultra High Temperature) for the packaging technique used to preserve them. They come in the same varieties as fresh liquid milks: Whole, 2%, 1% and skim. I've even found whipping cream in UHT packaging (Grand Chef - Parmalat), though this may be offered only in the commercial and restaurant trade. In the U.S. they all have vitamin D added. The lesser fat content milks do not keep as long as whole milk and their use by dates are correspondingly shorter term. This milk is packaged in aseptic laminated paper cartons. It has the same composition as fresh milk of the same type, and can be stored at room temperature because of the special pasteurizing process used. The milk has a boiled flavor, but less so than evaporated milk. The dates are usually for approximately six months. The milk is still usable past its date, but the flavor soon begins to go stale and the cream separates. With a six-month shelf life this type of canned milk naturally requires a much faster rotation cycle than other types. Several companies sell flavored milks (chocolate, etc.) in this packaging, usually in the smaller single-serving sizes. UHT milk makes excellent yogurt, losing the boiled flavor.

EVAPORATED MILK: Made from fresh, unpasteurized milk using a vacuum-heating process that removes 60% of the water, the concentrate is heated, homogenized, and in the States, vitamin D is added. It is then sealed in cans and heated again to sterilize the

contents. Some brands may have other nutrients and/or chemical stabilizers added so read can labels closely. A mixture of one part water and one part evaporated milk will have about the same nutritional value as an equal amount of fresh milk. It does not taste like fresh milk but many do not find the flavor to be disagreeable. Both whole and skim milk varieties are available with the higher fat content type having the best storage life. The typical recommended storage time is six months. There is generally no date or use by code on evaporated milk. Some grocers along with health food stores carry canned, evaporated goat's milk, in a similar concentration.

SWEETENED CONDENSED MILK: A less processed product than evaporated milk. It starts with pasteurized milk combined with a sugar solution. The water is then extracted until the mixture is less than half its original weight. It is not heated because the high sugar content prevents spoilage. It's very rich as well: 8 oz contains 980 calories. Obviously with a greatly reduced water content and a high sugar level it won't taste like fresh milk but it does have many uses in cooking. Some use condensed milk to cream their coffee. This type too is available in whole and skim varieties. A fairly new entry into the sweetened condensed milk field is Dulce de Leche a popular dessert item in Latin America. It's basically sweetened condensed milk that has been heated to the point that the sugar begins to brown which produces a rich tasting caramel dessert. In the past you had to make it yourself, but now it can be purchased ready made in the can. I have seen it in the canned/dry milk areas or the Hispanic/ethnic foods areas of many grocery stores here in Florida.

Although it is often hard to find, the condensed milk can label should have a stamped date code which indicates the date by which it should be consumed. Condensed milk may thicken and darken as it ages, but it is still edible.

CANNED CREAM: So far as I have found here in the U.S. only the Nestlé company produces canned creams, both being imports. One is "Media Crema" produced in Mexico with a pull-top can and the other is "Table Cream" produced in Australia in a standard (as in use an opener) can. There is a slight difference in preservatives and thickeners, but basically both are a shelf stable light cream which can be used in any way that you would use fresh light cream. I haven't yet determined a shelf-life for these products, but it seems to be in excess of two years in any decent storage environment. Like the Dulce de Leche above I found them either in the dry/canned milk areas or the Hispanic/ethnic areas of my local grocery stores. Would be worth looking or asking for in your local markets.

BUTTER

Butter can be found in several forms each with their particular strengths and weaknesses.

BUTTER POWDER: Probably the easiest to find of the shelf-stable butters the powder is a moisture free product consisting of butter fat condensed on milk solids generally with added antioxidants. It can be reconstituted by mixing with water to make a spread similar to whipped butter, but it cannot be used for frying or other applications requiring high

heat that would burn the milk solids. Most butter powders have something of a milky taste due to the additional milk solids necessary to create the powder, but many do not find this objectionable. Because it is a powder (lots of surface area) with a high fat content it needs good packaging to keep it at its best. Vacuum sealing and/or oxygen absorbers will work well if you are doing your own packaging.

CLARIFIED BUTTER (GHEE): Another form of butter suitable for storage programs is clarified butter or ghee as it is known in India. This is fresh, unsalted butter gently heated to drive off the moisture with the remaining fat poured off of the butter solids. It can be purchased commercially but most choose to make it themselves. As it's essentially pure butterfat with no water there is little to spoil so will keep for years in a glass jar protected from oxygen, heat, and light. A good source of fat calories and useful in cooking, but maybe not something you'd want to spread on a biscuit.

CANNED BUTTER: For those whom only the real thing will do it's now possible to find shelf stable real butter. It seems mostly to be sold in those nations where home refrigeration is not as common as it is here in the U.S. As a rule I do not single out suppliers for any given product but at the time of this writing (11/2003) the only U.S. importer of shelf stable canned butter I've been able to find is Bruce Hopkin's Internet Grocer ([http:// www.internet-grocer.com](http://www.internet-grocer.com)). His product is Red Feather brand canned butter from New Zealand. It is salted though not as heavily as most salted butter in the U.S. The manufacturer claims an eighteen month shelf-stable storage life though they do advise keeping it in a cool, dry place. Like all butter it will liquefy if allowed to warm too much. Each can contains twelve ounces (equivalent to about three sticks of butter) and once opened should be handled like any other butter.

CHEESE

There are a number of shelf-stable cheese products that are suited for storage programs. Each of them have particular strengths or weaknesses for given uses. The basic forms storage cheeses can take are:

CANNED CHEESE: Actually, it's "Pasteurized Processed Cheddar Cheese Product" but it's the closest thing to a shelf-stable real cheese that I've yet found. It's another one of those products produced for use in countries where home refrigeration is scarcer than it is here in the U.S. The only brand available in the States that I know of at this time is made by Kraft's Australian division whose product most resembles a mild white cheddar or perhaps an American cheese. The only U.S. source for this cheese that I have found thus far is again Bruce Hopkin's Internet Grocer (<http://www.internetgrocer.com>). It comes in an eight ounce can and the manufacturer claims it will keep "indefinitely" at any reasonable storage temperature.

DRIED GRATED CHEESES: These are the familiar grated dry Parmesan and Romano cheeses, possibly others as well. They're generally a coarse dry powder, low or nonfat, and often with a fair amount of salt. Kept dry, cool, and dark they'll keep as they come

from the store for several years though to get the maximum possible shelf life you should vacuum seal them in glass. Usually fairly expensive for the amount you get but as they're also strongly flavored a little will go a long way.

SAUCES AND SOUPS: These are products such as Cheez Whiz, Campbell's Cheddar Cheese Soup, chip dips and related. They're not really cheese, but a mixture of cheese, milk, flour, and other ingredients. Depending on what your end uses may be they can provide a cheese flavor, calories, and a degree of protein, fat, and calcium. In any decent storage conditions they'll keep for several years at least. Aerosol cheese is an abomination that will not be discussed here.

POWDERED CHEESE: Used in products such as boxed macaroni and cheese, au gratin potatoes, snacks, and the like, this is basically cheese that has had its moisture removed leaving behind mostly protein, fat, a fair amount of calcium and various flavoring and coloring compounds (naturally occurring or added) along with a fair amount of salt. It can't really be melted, but it can add a nice cheese flavor where a real cheese texture is not needed. There are also cheese powder blends, typically a mixture of cheese powder, food starch, whey, milk solids and other noncheese ingredients. It has less fat than true cheese powder, about the same protein, but less calcium. You can make it yourself with dry milk and cornstarch so there's little point in not getting real cheese powder. Cheese powder will keep for many years in sealed metal cans kept at cool temperatures. You'll probably have to get it from restaurant foods suppliers or order it from storage foods dealers. It's high fat content means that it needs low-oxygen packaging.

EGGS

The noble fruit of the hen, eggs play an important role in the kitchen arts. Unfortunately, outside of regular runs to the store to buy fresh eggs or keeping your own hens (which is what I do) they're problematical to store. There are two basic ways to keep eggs for those times when fresh eggs may be hard to come by. One is to preserve them in the shell, a process which must be done at home as there are no commercial sources of preserved shell eggs that I know of. The second is to buy dry, or powdered, eggs. I may address home shell egg preservation in a future FAQ update but for now I will concentrate on dry eggs which anyone can buy.

DRY EGGS

Dry eggs are generally available in four different forms – whole eggs, egg whites, egg yolks, and as a mix for making scrambled eggs and omelets. Which you should buy depends on how you expect to use them. As a general rule I find dry eggs reconstitute more easily when mixed with warm (not hot) water. Mixing the dry powder with other dry ingredients before adding liquids also increases the ease by which they can be reconstituted. Allowing the eggs to sit a few minutes before using improves water adsorption.

WHOLE EGGS: This is everything but the shell and the water. Usually found in the form of a somewhat clumpy, eggy smelling yellow powder. Typically one tablespoon of whole egg powder mixed with two tablespoons of water will equal one large fresh egg. Can be used to make most anything you'd make with fresh eggs though personally I prefer to use them in baking rather than as scrambled eggs or omelets. Whole egg powder is commonly used in baking mixes of all kinds, but I've never seen plain powdered eggs for sale in any grocery. Fortunately, they're easy to come by from mail order suppliers. A #10 can of powdered eggs is quite a lot so give some thought as to how fast you might use them and either order smaller cans, repackage an opened can into smaller containers, or plan on eating eggs often.

EGG WHITES: Nearly pure protein, egg white powder can add a high-protein boost to anything you put it in. The powder itself is whitish in color and not as clumpy as whole egg powder. When properly reconstituted it will whip into meringue like fresh egg whites and can be used in producing angel food and sponge cakes. Dry egg whites are often found in the baking section of many supermarkets. The brand name I have seen is "Just Whites" by Deb El. Powdered egg whites are also available from many mail order suppliers.

EGGYOLKS: High protein, high fat, and a source of lecithin (a natural emulsifier). Egg yolk powder can add richness and flavor to any number of foods, used to make custards, sauces, noodles, even mayonnaise. Not generally as easy to find as whole eggs and whites, but can be mail ordered. Being pure yolks this powder has a high fat content and must be appropriately packaged to achieve a good shelf life.

EGG MIX OR SCRAMBLING MIX: Typically a mix of whole egg powder, nonfat milk powder, oil, and salt. Used for making scrambled eggs, omelets, or general egg cookery. This mix does offer a degree of convenience but you can easily make it yourself and save the trouble of having to store it as a separate product.

STORING DRY EGGS

All dry egg products are exceedingly sensitive to moisture and will go off quickly if allowed to become the least bit damp. Whole eggs, egg yolks, and egg mix have high fat contents which make them very sensitive to oxygen. I highly recommend vacuum sealing in glass jars or using oxygen absorbers in conjunction with some other form of high barrier property packaging to keep these products at their best. If you bought quality products, packaged them well in oxygen free packaging, and put them away in a good storage environment then whole eggs, egg yolks, and egg mix should be able to achieve at least a three year shelf life, possibly more. Egg whites will easily achieve five years. Naturally, if you're packaging your eggs in any sort of transparent or translucent packaging then they should be stored in a dark place.

SUGAR, HONEY AND OTHER SWEETENERS

There are a wide number of sugars to be found for purposes of sweetening foods. Fructose is the primary sugar in fruit and honey; maltose is one of the sugars in malted grains; pimentose is found in olives, and sucrose is what we know as granulated or table sugar. Sucrose is a highly refined product made primarily from sugar cane though sugar beets still contribute a fair amount of the world supply. Modern table sugar is now so highly refined as to be virtually 100% pure and nearly indestructible if protected from moisture. Powdered sugar and brown sugar are simple variations on granulated sugar and share its long life.

Liquid sweeteners do not have quite the longevity of dry sugars. Honey, cane syrup, molasses, corn syrup and maple syrup may crystallize or mold during long storage. These syrups are chemically not as simple as table sugar and therefore lose flavor and otherwise break down over time.

GRANULATED SUGARS:

Buying refined sugar is a simple matter. Select a brand you know you can trust, be certain the package is clean, dry and has no insect infestation. There's little that can go wrong with it.

GRANULATED: Granulated sugar does not spoil, but if it gets damp it will grow lumpy or turn into a sugar rock. If it does, it can be pulverized into smaller pieces and used. Granulated sugar can be found in varying textures, coarser or finer. "Castor/caster sugar" is a finer granulation than what is commonly sold as table sugar in the U.S. and is more closely equivalent to our super fine or berry sugar.

POWDERED, CONFECTIONERS, ICING: All names refer to the same kind of sugar, that is white granulated sugar very finely ground. For commercial use there is a range of textures from coarse to ultra-fine. For home consumption, what is generally found is either Very Fine (6X) or Ultra-Fine (10X), but this can vary from nation to nation. Not all manufacturers will indicate the grind on the package. Sugar refiners usually add a small amount of cornstarch to prevent caking which will make it undesirable for use in sugar syrups or solutions where clarity is needed. Powdered sugar is as inert as granulated sugar, but it is even more hygroscopic and will adsorb any moisture present. If it soaks up more than a little it will cake and become hard. It's difficult to reclaim hardened powdered sugar, but it can still be used like granulated sugar where clarity in solution (syrups) is not important.

BROWN, LIGHT & DARK: In the United States brown sugar is generally refined white sugar that has had a bit of molasses or sugar syrup and caramel coloring added to it. Dark brown sugar has more molasses which gives it a stronger flavor, a darker color and makes it damp. Light brown sugar has less molasses which gives it a milder flavor, a blonder color and is slightly dryer than the dark variety. Light brown sugar can be made by

combining one fourth to one third white sugar to the remainder dark brown sugar and blend thoroughly. Both varieties need to be protected from drying out, or they will become hard and difficult to deal with. Nor do you want to allow them to become damper than what they already are. There are dry granulated and liquid brown sugars available, but they don't have the same cooking qualities as ordinary brown sugars. They also don't dry out and harden quite so readily either.

RAW, NATURAL, TURBINADO & OTHERS: In recent years, refiners have realized there is a market for less processed forms of cane sugar in the U.S. so have begun to sell these under various names and packaging. None of them are actually raw sugar as it is illegal to sell in the States due to the high impurities level in the truly raw product. All will have been processed to some degree, perhaps to remove the sticky surface molasses or to lighten the color, but will not have been subjected to the full refining and whitening processes of ordinary white table sugar. This leaves some of the natural hue and a strength of flavor that deepens with the color. All of these less refined sugars may be stored and handled like brown sugar.

Outside of the United States it is possible to buy cane sugars from the truly raw product with all of the detritus remaining from the cane juice extraction process up through various stages of refinement much like we have here in the United States. Many can be found with names such as “muscavado”, “jaggery” (usually a raw palm or date sugar), “demerara”, “succanat,” and others. Colors will range from quite dark to blonde and may or may not be sticky with molasses. Generally the darker the color the stronger the flavor will be. In spite of any impurities they can be stored like brown sugar since their sugar content is high enough to inhibit most microbial growth. Recently I have found demerara sugar for sale here in the U.S.

STORING GRANULATED SUGARS

All granulated sugars have basically the same storage requirements. They need to be kept in air tight, insect and moisture proof containers. For powdered, and granulated sugar you might want to consider using some desiccant in the storage container if your local climate is damp. Since brown sugars and raw sugars are supposed to be moist, they do not need desiccants. Shelf life is indefinite if kept dry, but anything you intend to eat really should be rotated occasionally. Time has a way of affecting even the most durable of foods. I've used brown sugar that was six years old at the time it was removed from storage and, other than the molasses settling somewhat toward the bottom, it was fine. A friend to whom I gave a bucket of the brown sugar finished it off three years later which was nine years after it was packaged and it, too, was fine.

HONEY

Honey may be the oldest sweetener known to man- its use predates recorded history. Remains of honey have been found in the Egyptian pyramids. This product of honeybees

is typically sweeter than granulated sugar by a factor of 25%-40% depending upon the specific flowers from which the bees gathered their nectar. This means a smaller amount of honey can give the same amount of sweetening as sugar. The source flowers also dictate the flavor and the color as well. Honey color can range from very dark (nearly black) to almost colorless. As a general rule, the lighter the color and the more delicate the flavor, the greater the price the honey will bring. As you might expect, since honey is sweeter than table sugar, it also has more calories as well — an average of twenty two per teaspoon compared to granulated sugar's sixteen. There are also trivial amounts of minerals and vitamins in the bee product while white sugar has none. Honey is not a direct substitute for table sugar however, its use in recipes may call for a bit of alteration to make them to turn out right. Although the chance is remote, raw honey may also contain minute quantities of *Clostridium botulinum* spores so should not be fed to children under one year of age.

PLEASE READ THE POST FROM GERI GUIDETTI CONCERNING THIS BELOW.

Raw honey is OK for older children and adults.

Honey comes in a number of forms in the retail market and all with somewhat different storage characteristics:

WHOLE-COMB: This is the bee product straight from the hive. It is the most unprocessed form of honey, being large pieces of waxy comb floating in raw honey. The comb itself will contain many unopened honey cells.

RAW: This is unheated honey that has been removed from the comb. It may contain bits of wax and other small particles.

FILTERED: This is raw honey that has been warmed slightly to make it easier to filter out small particles and impurities. Other than being somewhat cleaner than raw honey it is essentially the same. Most of the trace amounts of nutrients remain intact.

LIQUID/PURE: This is honey that has been heated to higher temperatures to allow for easier filtering and to kill any microorganisms. Usually lighter in color, this form is milder in flavor, resists crystallization and generally clearer. It stores the best of the various forms of honey. Much of the trace amounts of vitamins, however, are lost.

SPUN, CRYSTALLIZED or CREAMED: This honey has had some of its moisture content removed to make a creamy spread. It is the most processed form of honey. It keeps quite well. Also available in various flavors.

BUYING HONEY

Much of the honey sold in supermarkets has been blended from a variety of different honeys and some may have even had other sweeteners added as well. Like anything involving humans, buying honey can be a tricky business. It pays to deal with individuals and brands you know you can trust. In the United States you should buy products labeled U.S. GRADE A or U.S. FANCY if buying in retail outlets. However, be aware there are no federal labeling laws governing the sale of honey, so only honey labeled pure is entirely honey and not blended with other sweeteners. Honey grading is a matter of voluntary compliance which means some producers may be lax in their practices. Some may also use words like “organic”, “raw”, “uncooked” and “unfiltered” on their labels, possibly to mislead. Fortunately, most honey producers are quite honest in their product labeling so if you’re not certain of who to deal with, it is worthwhile to ask around to find out who produces a good product.

Honey may also contain trace amounts of drugs used in treating various bee ailments, including antibiotics. If this is a concern to you, then it would be wise to investigate with your local honey producer what they may have used.

STORING HONEY

Honey is much easier to store than to select and buy. Pure honey won’t mold, but may crystallize over time. Exposure to air and moisture may cause color to darken, flavor to intensify and may speed crystallization as well. Comb honey doesn’t store as well liquid honey so you should not expect it to last as long.

Storage temperature is not as important for honey, but it should not be allowed to freeze or exposed to high temperatures if possible. Either can cause crystallization and heat may cause flavor to strengthen undesirably.

Filtered liquid honey will last the longest in storage. Storage containers should be opaque, airtight, moisture and odorproof. Like any other stored food, honey should be rotated through the storage cycle and replaced with fresh product.

If crystallization does occur, honey can be reliquified by placing the container in a larger container of hot water until it has melted. Avoid adding water to honey you intend to keep in storage or it may ferment.

Avoid storing honey near heat sources or petroleum products (including gasoline/diesel engines), chemicals or any other odor-producing products which may infuse through plastic packaging.

RAW HONEY AND BOTULISM

From: Geri Guidetti arkinst@concentric.net

Duane Miles wrote:

If I recall correctly, honey contains very, very small amounts of the bacteria that cause botulism. For adults, this seldom causes problems. Our immune system is capable of

dealing with small numbers of even nasty bacteria, they do it all the time. The problem is when we get large numbers of bacteria, or when our immune system is damaged or not yet developed. That is where the problem with honey comes in. Some people used to use honey to sweeten milk or other foods for infants. Infants immune systems sometimes cannot handle the bacteria that cause botulism, and, of course, those infants became seriously ill. So pediatricians now advise strongly against using honey for children under a certain age.

Yes, raw honey can contain the temperature resistant spores of *Clostridium botulinum*, the bacterium that causes botulism. The organism is a strict anaerobe, meaning that it only grows in the absence of molecular oxygen. The problem with infants and honey is that the small, intestinal tract of an infant apparently is sufficiently anaerobic to allow the spores to germinate into actively growing *C. botulinum* organisms. Essentially, the infant serves the same role as a sealed, airtight, contaminated can of beans as far as the organisms are concerned. There in the infant's body the bacteria secrete the dangerous toxin that causes the symptoms of botulism. There have been quite a few documented infant deaths due to honey. As I recall, the studies identifying honey as the source were done in the '80s. Most pediatricians recommend no honey for the first year. It is probably best to check with your own for even later updates...Geri Guidetti, The Ark Institute.

EDITOR'S NOTE: The advice not to give raw honey or foods containing raw honey to infants under one year of age still stands. Do please understand, though, that honey is not the only means by which infants can suffer from botulism, in many of which cases no certain source of contagion could ever be determined. The actual chances of any infant being stricken is very, very small and keeping the child's colon open, active and healthy can reduce it still more. Breast-fed children seem to be more resistant as well.

HONEY OUTGASSING

Q: My can of honey is bulging. Is it safe to use?

A: Honey can react with the can lining to release a gas especially when stored over a long period of time. Honey's high sugar content prevents bacteria growth. If there is no sign of mold growth, it is safe to eat. **FREQUENTLY ASKED FOOD QUESTIONS, FN250**

CANE SYRUPS

CANE SYRUP: Seldom found in supermarkets pure cane syrup is a sweet symbol of the U.S. Deep South. Produced by boiling down the extracted juice of the sugarcane in much the same fashion as sorghum and maple syrups are produced. The best syrup is clear with a dark amber color and a smooth intense flavor. Cane syrup usually has to be purchased from roadside stands, living history recreations, farm festivals, or state and county fairs. Some syrup makers will add small quantities of lemon juice or corn syrup to deter crystallization. Flavored cane syrups can sometimes be found, but are usually a sign of inferior syrup.

MOLASSES: A by-product of sugar refining, molasses is generally composed of sugars such as glucose that are resistant to crystallization, browning reaction products resulting from the syrup reduction process, and small amounts of minerals. Flavor can vary between brands, but is usually strong and the color dark and opaque. Sulfured molasses can sometimes be found but its intense flavor is unappealing to most. Brands labeled as ‘blackstrap molasses’ are intensely flavored.

SORGHUM SYRUP: This is produced in the same manner as cane syrup, but sweet sorghum cane, rather than sugar cane, is used. Sorghum tends to have a thinner, slightly sourer taste than cane syrup. Good syrup should be a clear dark amber with a smooth flavor. It can sometimes be found in the supermarket, but more often is found in the same types of places as genuine sugar cane syrup.

TREACLE: This sweetener comes in varying colors from a rather dark version, similar to, but not quite the same as blackstrap molasses, to paler versions more similar to golden syrup. If you cannot find it in your store’s syrup area check in their imported foods section. All of the above syrups are generally dark with a rich, heavy flavor.

GOLDEN SYRUP: This syrup is both lighter and paler in color than any of the above four, more similar to what we would call a table syrup here in the U.S. Can usually be found in the same areas as treacle above.

TABLE SYRUP: There are many table syrups sold in supermarkets, some with flavorings of one sort or another such as maple, various fruits, butter, etc. A close examination of the ingredients list will reveal mixtures usually of cane syrup, cane sugar syrup or corn syrup along with preservatives, colorings and other additives. Table syrup usually has a much less pronounced flavor than molasses, cane or sorghum syrup or the darker treacles. Any syrup containing corn syrup should be stored as corn syrup.

STORING CANE SYRUPS

All of the above syrups, except for those having corn syrup in their makeup, have the same storage characteristics. They can be stored on the shelf for about two years and up to a year after opening. Once they are opened, they are best kept in the refrigerator to retard mold growth. If mold growth does occur, the syrup should be discarded. The outside of the bottle should be cleaned of drips after each use. Some pure cane and sorghum syrups may crystallize in storage, but this causes no harm and they can be reliquified using the same method as for honey. Molasses or other sugar refining by-products won’t usually crystallize, but will dry into an unmanageable tar unless kept sealed.

CORN SYRUP

Corn syrup is a liquid sweetener made by breaking down cornstarch into its constituent sugars through an enzyme reaction. Available in both a light and a dark form, the darker

variety has a flavor similar to molasses and contains refiners syrup (a by-product of sugar refining). Both types often contain flavorings and preservatives. It is commonly used in baking and candy making because it does not crystallize when heated. Corn syrup is common in the U.S., but less so elsewhere.

Corn syrup stores poorly compared to other sweeteners and because of this it often has a best if used by date on the bottle. It should be stored in its original bottle, tightly capped, in a cool, dry place. New unopened bottles can be expected to keep about six months past the date on the label and sometimes longer. After opening, keep the corn syrup four to six months. These syrups are prone to mold and to fermentation so be on the lookout for bubbling or a mold haze. If these present themselves, throw the syrup out. You should wipe off any drips from the bottle after every use.

MAPLE SYRUP

Maple syrup is produced by boiling down the sap of the maple tree (and a lot of it too) collected at certain times in the early Spring until it reaches a syrup consistency. This is slightly sweeter than table sugar and is judged by much the same criteria as honey: Lightness of color, clarity and taste. Making the syrup is energy and labor intensive so pure maple is generally expensive. Maple flavored pancake syrups are usually mixtures of corn and cane sugar syrups with either natural or artificial flavorings and should be kept and stored as corn syrups. New unopened bottles of maple syrup may be kept on a cool, dark, shelf for up to two years. The sweetener may darken and the flavor get stronger, but it is still usable. After the bottle has been opened, it should be refrigerated. It will last about a year. Be careful to look out for mold growth. If mold occurs, discard the syrup.

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FATS AND OILS

All oils are fats, but not all fats are oils. They are similar to each other in their chemical makeup, but what makes one an oil and another a fat is the percentage of hydrogen saturation in the fatty acids of which they are composed. The fats which are available to us for culinary purposes are actually mixtures of differing fatty acids so for practical purposes we'll say saturated fats are solid at room temperature (70°F, 21° C) and the unsaturated fats we call oils are liquid at room temperature. For dietary and nutrition purposes fats are generally classified as saturated, monounsaturated and polyunsaturated, which is a further refinement of the amount of saturation of the particular compositions of fatty acids in the fats.

BUYING AND STORING OILS AND FATS

There is a problem with storing oils and fats for the long term and that is they want to go rancid. Rancid fats have been implicated in increased rates of heart disease,

arteriosclerosis and are carcinogenic (cancer causing) so are best avoided whenever possible.

Oxygen is eight times more soluble in fat than in water and it is the oxidation resulting from this exposure that is the primary cause of rancidity. The less saturated a fat is, the faster it will go off. This may not, at first, be readily apparent because vegetable oils have to become several times more rancid than animal fats before our noses can easily detect it. An extreme example of rancidity is the linseed oil (flaxseed) that we use as a wood finish and a base for oil paints. In a matter of hours the oil oxidizes into a solid polymer. This is very desirable for wood and paint, very undesirable for food.

Because of this difficulty in storing fats and oils for any long period of time many books and articles on the subject of food storage make only passing mention of them, if they say anything at all. This is unfortunate because fat contains *nine* calories to the gram compared to the *four* calories contained by either carbohydrates or protein. This makes fat a valuable source of concentrated calories that could be of real importance if faced with a diet consisting largely of unrefined grains and legumes. For small children, infants, nursing mothers, and the elderly, they may not be able to consume the volume of food that would be necessary in the course of a day to get all of the calories they would need to avoid weight loss and possible malnutrition.

Additionally, fats play an important role in our perception of taste and texture and their absence would make many foods more difficult to prepare and consume.

Furthermore, a small amount of dietary fat is necessary for our bodies to properly absorb fat soluble vitamins like A,D,E and K.

Long term storage of fats may be problematical, but it is not impossible. There are some general rules you can follow to get the most life out of your stored cooking oils and fats.

#1 - Exposure to oxygen, light and heat are the greatest factors to rancidity. If you can, refrigerate your stored oil, particularly after it's been opened. If possible, buy your oils in opaque, airtight containers. If you purchase it in plastic, particularly clear plastic, then transfer it to a gas impermeable glass or metal container that can be sealed airtight. If you have a means of doing so, vacuum sealing the storage container is an excellent idea as it removes most of the air remaining inside, taking much of the oxygen with it. Transparent glass and plastic containers should be stored in the dark, such as in a box or cabinet. Regardless of the storage container, it should be stored at as cool a temperature as possible and rotated as fast as is practical. All other considerations being equal, oils and fats with preservatives will have a greater shelf life than those without, provided they are fresh when purchased.

#2 - Unless they have been specially treated, most unopened cooking oils have a shelf life of about a year to a year and a half, depending upon the above conditions. Some specialty oils such as sesame and flax seed have shorter usable lives. If you don't use a lot, try to not buy your fats in big containers. This way you won't be exposing a large quantity to the air after opening, to grow old and possibly rancid, before you can use it all up. Once

opened, it is an excellent idea to refrigerate cooking fats. If it turns cloudy or solid, the fat is still perfectly usable and will return to its normal liquid, clear state after it has warmed to room temperature. Left at room temperatures, opened bottles of cooking oils can begin to rancid in anywhere from a week to a couple of months, though it may take several more months to reach such a point of rancidity that it can be noticeably smelled.

#3 - Although darker colored oils have more flavor than paler colored, the agents that contribute to that flavor and color also contribute to faster rancidity. For maximum shelf life buy paler colored oils.

EXTENDING SHELF LIFE BY ADDING ANTIOXIDANTS

I take no position on doing this, but if obtaining the maximum possible shelf life in your cooking fats is important to you, it is possible to add antioxidant preservatives to the fat you have purchased. Used in conjunction with a gas impermeable container, either opaque in color or stored in a dark place, and cool storage temperatures (70° F 21°C or less) then shelf life can be extended to about five years, possibly longer. The antioxidant in question is Butylated HydroxyToluene (BHT). It is often used in the food industry to slow the development of off-flavors, odors and color changes caused by oxidation, mostly in foods with significant fat contents. BHT is on the U.S. Food and Drug Administration's Generally Recognized As Safe (GRAS) list as a common preservative. The FDA limits the use of BHT to 0.02% or 200 parts per million (ppm) of the oil or fat content of a food product. The directions that I give below will be for the FDA limit. BHT is available over the counter in the retail trade, typically found in health or natural foods stores or vitamin and nutritional supplement from various suppliers on the Internet.

To get the best results you will need the freshest oil you can find. Purchasing from a large, busy supermarket will usually suffice. You'll also need containers that are gas impermeable such as glass jars, or metal cans. There may be plastic containers with high gas barrier properties that will also serve, but I cannot knowledgeably say about this. It is important that your containers be food grade, clean, dry and dust-free. In keeping with the FDA's GRAS guidelines you want to add 5.3mg of BHT crystals per fluid ounce of oil or fat. If you're using a scale calibrated in grains, such as a reloading powder scale, you may use the following table.

HT in grains OIL BHT in milligrams

0.1 grain	1 fl oz	5.3 mg
0.7 grain	8 fl oz (1 cup)	42.4 mg
1.3 grain	16 fl oz (1 pint)	84.8 mg
2.6 grain	32 fl oz (1 quart)	169.6 mg
5.2 grain	64 fl oz (1/2 gal)	339.2 mg
10.3 grain	128 fl oz (1 gallon)	678.4 mg

NOTE: *The grain weight measurements have been rounded up to the nearest tenth grain since most powder scales will not accurately measure less than one-tenth of a grain.*

IMPORTANT NOTE: *If you are using a reloading powder scale, be sure the balance pan is clean and the balance has been calibrated recently with a reliable set of check weights.*

Remove the BHT crystals from their gelatin capsules and weigh them, if you're going to. Once you have the appropriate amount, add the crystals to a pint or so of the oil, shaking vigorously. It may take several hours for the preservative to dissolve completely. Bringing the oil up to a warm, NOT HOT, temperature will speed the process. Once completely dissolved, pour the antioxidant laden oil into the rest of the oil and mix thoroughly. Once mixed, the oil can then be poured into its storage containers leaving approximately 1/2 inch of headspace. If you have a vacuum sealer the jars or cans may be vacuum sealed to remove most of the oxygen laden air from the container, otherwise just seal the lid. Store in a cool place and if using transparent jars, be certain to put them in a larger container such as a box to keep the contents in the dark. Don't forget to label and date the jars.

Before I close out this section on fats and oils, please allow me to reemphasize that no amount of preservatives that can be added to your stored fats will substitute for proper storage and rotation. *Don't sit on your oil supply for years without rotating it. A little bit rancid is a little bit poisonous. 'Nuff said.*

COOKING ADJUNCTS

Baking powder is a combination of an acid and an alkali with starch added to keep the other two ingredients stable and dry. The powder reacts with liquid by foaming and the resulting bubbles of carbon dioxide can aerate and raise dough. Almost all baking powder now on the market is double acting, meaning it has one acid that bubbles at room temperature and another acid which only reacts at oven temperatures. Unless a recipe specifies otherwise, this is the type to use.

Don't expose baking powder to steam, humid air, wet spoons, or other moisture. Store in a tightly lidded container for no more than a year. Even when kept bone dry it will eventually loses its potency. To test its strength, measure 1 tsp powder into 1/3 cup hot water. The mixture should fizz and bubble furiously. If it doesn't, throw it out.

For those folks concerned with aluminum in the diet, the Rumford brand has none and there may be others.

BAKING SODA

This gritty powder is sodium bicarbonate also known as sodium acid bicarbonate (NaHCO_3), a mild alkali. When combined with an acid ingredient such as buttermilk it is used in baking to leaven quick breads and other baked foods working in the same manner as baking powder. It can also be used to make hominy. When combined with an acid ingredient, the bicarbonate reacts to give off carbon dioxide bubbles which causes the baked good to rise. If kept well sealed in an air and moisture-proof container its storage life is indefinite. If kept in the cardboard box it usually comes in, it will keep for about eighteen months. Do keep in mind that baking soda is a wonderful odor absorber. If you don't want your baked goods tasting of whatever smells it absorbed then keeping it in an airtight container is a good idea.

HERBS AND SPICES

It is difficult to give exact instructions on how best to store culinary herbs and spices because there are dozens of different seeds, leaves, roots, barks, etc., we call an herb or a spice. There are, however, some general rules that may be followed to best preserve their flavors. All spices, particularly dried, are especially sensitive to heat, air, moisture, and light. Room temperature is satisfactory for storage but refrigeration or freezing is even better. What ever you do they should be kept away from heat sources. It is common for the household spice cabinet or shelf to be located over the stove, but this is really about the worst possible place to keep herbs and spices even if it is convenient. Dark opaque glass is best for storage, but failing that, keeping a tightly sealed glass container in a dark place is next best. The cellophane packets some products come in won't do. Tightly sealed metal containers will work as well. Even dense plastic will do, but glass is best. Where possible, buy spices whole. Whole nutmegs will keep their flavor far longer than ground nutmeg, the same for other seeds and roots. You'll have to use a grater, grinder or whatever, but the difference in flavor is worth it. If you buy spices in bulk containers (which is certainly cheaper) consider transferring some into smaller containers and keeping the larger one tightly sealed in a cool, dark place. This will prevent unwanted light and air from continually getting in and playing havoc. My large jars of reserve spices are kept in vacuum sealed jars with smaller jars of ready spices kept in the kitchen. There are many mail order or online suppliers of bulk herbs and spices. My personal favorite is Penzey's (<http://www.penzeys.com>). Their products have been consistently excellent with good prices. It's worth investigating some of these companies as they can really take the sting out of purchasing large quantities.

SALT

Storage life for salt is indefinite. So long as you do not let it become contaminated with dirt or whatever, it will never go bad. Over time, iodized salt may turn yellow, but this is harmless and can still be used. Salt is rather hygroscopic and will adsorb moisture from the air if not sealed in an airtight container. If it does cake up, it can be dried in the oven and then pulverized again with no harm done. All salt, however, is not the same. Salt comes in a number of different varieties, and very little of what is produced in the U.S. is

intended for use in food. The rest of it, about 98%, has other uses. Therefore, it is important to be certain the salt you have is intended for human consumption. Once you are satisfied it is, you should then determine its appropriateness for the tasks to which you might want to set it to. Below is a list of some of the available salts:

TABLE SALT: This is by far the most widely known type of salt. It comes in two varieties; iodized and non-iodized. There is an ingredient added to adsorb moisture so the salt will stay free flowing in damp weather. This non-caking agent does not dissolve in water and can cause cloudiness in solutions if sufficiently large quantities are used. In canning this won't cause a problem since little per jar is used. For pickling, though, it would be noticeable. If you are storing salt for this purpose, you should be sure to choose plain pickling salt, or other food grade pure salt such as kosher salt. In the iodized varieties, the iodine can cause discoloration or darkening of pickled foods. For folks in areas that are historically iodine deficient a store of iodized salt for table consumption should be kept.

CANNING SALT: This is pure salt and nothing but salt. It can usually be found in the canning supplies section of most grocery stores. This is the preferred salt for most food preservation or storage uses. It is generally about the same grain size as table salt.

KOSHER SALT: This salt is not really, in itself, kosher, but is used in “kashering” meat to make the flesh kosher for eating. This involves first soaking the meat then rubbing it with the salt to draw out the blood which is not-kosher and is subsequently washed off along with the salt. The cleansed meat is then kosher. What makes it of interest for food storage and preservation is that it is generally pure salt suitable for canning, pickling and meat curing. It is of a larger grain size than table or canning salt, and usually rolled to flake the grains for easier dissolving. Frequently it is slightly cheaper than canning salt and usually easier to find in urban/suburban areas.

***NOTE:** Not all brands of kosher salt are exactly alike. Diamond Crystal Kosher Salt is the only brand that I'm aware of that is not flaked, but still in its unaltered crystal form. The Morton brand of Coarse Kosher Salt has “yellow prussiate of soda” added as an anti-caking agent but unlike other anti-caking agents it does not cause cloudiness in solution. Morton even gives a kosher dill pickle recipe on the box.*

Whether flaked or in its unaltered crystal form, kosher salt takes up more volume for an equivalent amount of mass than does canning salt. If it is important to get a precise amount of salt in your pickling or curing recipe you may want to weigh the salt to get the correct amount.

SEA SALT: This type of salt comes in about as many different varieties as coffee and from many different places around the world. The “gourmet” versions can be rather expensive. In general, the types sold in grocery stores, natural food markets and gourmet shops have been purified enough to use in food. It's not suitable for food preservation,

though, because the mineral content it contains (other than the sodium chloride) may cause discoloration of the food.

ROCK or ICE CREAM SALT: This salt comes in large chunky crystals and is intended primarily for use in home ice cream churns to lower the temperature of the ice filled water in which the churn sits. It's also sometimes used in icing down beer kegs or watermelons. It is used in food preservation by some, but none of the brands I have been able to find label it as food grade nor do they specifically mention its use in foods so I would not use it for this purpose.

SOLAR SALT: This is also sometimes confusingly called "sea salt". It is not, however, the same thing as the sea salt found in food stores. Most importantly, it is not food grade. It's main purpose is for use in water softeners. The reason it is called "solar" and sometimes "sea salt" is that it is produced by evaporation of sea water in large ponds in various arid areas of the world. This salt type is not purified and still contains the desiccated remains of whatever aquatic life might have been trapped in it. Those organic remains might react with the proteins in the foods you are attempting to preserve and cause it to spoil.

HALITE: For those of us fortunate enough to live where it is warm, halite is the salt that is used on roads to melt snow and ice. It, too, is not food grade and should not be used in food preservation. This form of salt is also frequently called rock salt, like the rock salt above, but neither are suitable for food use.

SALT SUBSTITUTES: These are other kinds of metal salts such as potassium chloride used to substitute for the ordinary sodium chloride (NaCl) salt we are familiar with. They have their uses, but should not be used in foods undergoing a heated preservation processing, as they can cause the product to taste bad. Even the heat from normal cooking is sometimes sufficient to cause this.

VINEGAR

There is vinegar and then there is vinegar and it is not all alike. The active ingredient in all vinegars is *acetic acid*, but how the sour stuff was made can vary widely. The most common vinegar is *white distilled* which is actually diluted distilled acetic acid and not true vinegar at all. It keeps pretty much indefinitely if tightly sealed in a plastic or glass bottle with a plastic cap. The enamel coated metal caps always seem to get eaten by the acid over time. It is usually about 5-6% acetic acid and for pickling it is the type most often called for.

The next most common is *apple cider vinegar* which is available in two varieties. A *cider flavored* distilled acetic acid type and a *true cider vinegar* fermented from hard cider. Either will store indefinitely at room temperature until a sediment begins to appear on the bottom. Non-distilled vinegar will sometimes develop a cloudy substance. This is called a

mother of vinegar and it is harmless. As long as the liquid does not begin to smell foul it can be filtered out through cheesecloth or a coffee filter and rebottled in a clean container. The mother can even be used to make more vinegar. If it begins to smell bad, however, it's gone over and should be tossed out.

The more exotic *wine*, *balsamic*, *malt*, *rice* and other vinegars can be stored like cider vinegar. Age and exposure to light and air, however, eventually begin to take their toll on their delicate flavors. Tightly capped in a cool, dark cabinet or refrigerator is best for their storage.

YEAST

Yeast is just not a product you can stow away and forget about until you need it in a few years. After all, this single celled microscopic fungus is a living organism so if it's not alive at the time you need it, you'll get no action. When we incorporate yeast into our bread dough, beer wort or fruit juice it begins to ferment madly (we hope) and produce several by-products. If you're baking, the by-product you want is carbon dioxide which is trapped by the dough and subsequently causes it to rise. In brewing or vintning what is wanted is the ethyl alcohol and, if the drink is to be carbonated, the carbon dioxide as well.

Almost all yeasts used for these purposes are in the same genus (*Saccharomyces* or sugar fungi), but several different species or strains within species have evolved and some are more suitable for a particular task than others. It's entirely possible to use grocery store bread yeast to brew beer or ferment wine, but the flavor may leave a great deal to be desired. It's also possible to use yeast from ale brewing to make bread. From my limited experience with trying it myself the results were pretty much indistinguishable from bread yeast.

Types of Baking Yeasts

Leaving aside the brewing and vintning yeasts that are outside the scope of this FAQ I am going to concentrate on bread yeast. It comes in two generally available forms; *compressed* or *fresh yeast* and *dried yeast* which is further broken down into *active dry yeast* and *rapid acting* also known as *rapid rise* or *bread machine yeasts*. Although both of the dry yeasts are in the same species they come from different genetic strains with different performance characteristics and are processed somewhat differently from each other.

COMPRESSED (FRESH) YEAST: Compressed yeast is only partly dried (about 70% moisture), requires refrigeration and keeps even better in a deep freezer. If kept in an air- and moisture-tight container to prevent desiccation this type of yeast will keep for a year in the freezer (0°F, -17°C or less), but only about two weeks in the refrigerator. Unless your kitchen is quite chilly it will not keep on the shelf. It should not have a mottled color or a sour odor. Compressed Yeast is generally available in 0.6-ounce and 2-ounce foil-

wrapped cakes. For traditional baking, dissolve compressed yeast in warm (90°-95°F, 32°-35°C) liquids. A 0.6-ounce cake will leaven up to 4 cups of flour (about a pound). A 2-ounce cake will leaven about 12 cups or roughly three pounds of flour.

ACTIVE DRY YEAST: A granular powder with about an 8% moisture content, active dry yeast can be found in either single use foil packets or vacuum packed foil covered one pound 'bricks'. In general bread making active dry yeast is typically dissolved in water (105°-115°F, 40°-46°C) along with an equal amount of sugar to give it time to resuscitate and actively begin growing before being mixed into the dry ingredients. Bread machines, however, are often different in this regard and you should follow the directions your particular machine's manufacturer gives. Mine calls for putting the dry yeast atop the other dry ingredients completely out of contact with the liquid ingredients until the machine mixes them together. One envelope (roughly 2 ¼ teaspoons) is sufficient to leaven about four cups or roughly one pound of flour.

RAPID ACTING & BREAD MACHINE YEAST: A more finely granulated powder with a lower moisture content than standard active dry yeast the rapid acting version is designed to raise bread as much as fifty percent faster. This lends it to the 'quick' or 'rapid' cycles of many bread machines that eliminate one rise cycle of the bread dough to facilitate faster production. This form of yeast is also generally mixed with a small amount of ascorbic acid which acts as a dough conditioner to give improved rise performance. Rapid Acting yeasts often perform poorly in recipes calling for long fermentation periods. Because of its finer granulation it does not need to be dissolved in liquid first and should be added to the dry ingredients instead. In the case of bread machines follow the manufacturer's directions. One envelope (roughly 2 ¼ teaspoons) is sufficient to leaven about four cups or roughly one pound of flour.

Interchanging Yeast Types

Can fresh, active dry, and rapid acting yeasts be used interchangeably?

Yes, to a certain extent. To substitute Rapid Acting yeasts for Active Dry yeasts reduce the amount of Rapid Acting used by 25% from the amount of Active Dry the recipe calls for then add the dry yeast to the dry ingredients before mixing.

To substitute Active Dry for Rapid Acting increase the amount of Active Dry by 25% over what the recipe calls for of Rapid Acting yeast and dissolve in warm water (105°-115°F, 40°-46°C) with an equal amount of sugar before mixing in with the dry ingredients.

Once 0.6 ounce cake of fresh, compressed yeast is roughly equivalent to one pack of active dry yeast (2 1/4 teaspoons) or to about 1 3/4 teaspoons of Rapid Acting yeast.

NOTE: Substituting one yeast type for another can be done, but will oft times require a bit of tweaking. If at all possible use the yeast type specified in the recipe. If you can't be prepared to make adjustments where necessary.

PROOFING YEAST: Although it's generally not necessary anymore if you are concerned that your yeast may be dead due to age or poor storage conditions any type of yeast can be tested for viability by *proofing*. This is nothing more than mixing a small amount of the yeast with an equal amount of sugar in warm water 105°-115°F, 40°-46°C for dried; 90°-95°F, 32°-35°C for fresh. Within about five to ten minutes active yeast will become bubbly and begin to expand (at normal room temperature). Yeast which only slowly becomes active can still be used, but you will have to use more. If there is no activity at all, the yeast is dead and should be tossed. If you've stored your yeast in half-way decent conditions, or better yet in the freezer, proofing will usually not be necessary.

NOTE: Rapid Acting yeast loses its fast rising capabilities if dissolved in liquid for proofing, and will require two complete rises like standard active dry yeast.

STORING YEAST: All of the dry yeasts will last for months on the shelf, until the expiration date which should be clearly stamped on the package. If packaged in an air/moisture tight container and kept in the freezer it may last for several years though one year is the general recommendation most often found among various authorities. I'm presently 1998 that is still going strong. (12/2003) using yeast stored in my refrigerator freezer in a tightly sealed canning jar with a "Best Used By" date of June, The larger packs of yeast should be transferred to an air and moisture tight container after opening. A canning jar with a decent lid will suffice. There is another means of providing leavening for breads besides buying yeast from a grocery store and that is by using a sourdough starter. I'm not going to address it here, but I will point out that it has a Usenet newsgroup all its own (*rec.food.sourdough*) which has several FAQ's devoted to it. You can find addresses for these FAQs in the Resources section. Drop in and read for awhile and you'll learn more than you thought you could ever want to know.

INFANT FORMUAL

While not universal, it's safe to say that most folks interested in food storage are planning for families, real or as yet hypothetical. Many of these families include children (or hope to) under the age of two. Very young children such as this have nutritional requirements that are different from adults and require somewhat different preparations than adults or even older children.

If at all possible, it's best for children up to the age of six months to be breast fed by their mothers and up to the age of one year breast milk should contribute a significant portion of the child's nutritional intake. Indeed, breast feeding can supplement a child's diet in an important way until age two. Even the American Academy of Pediatrics now recognizes and recommends this. There are those who nurse even longer, but I mention this only as an observation, not necessarily as a recommendation. For the preparedness-minded breast feeding makes particularly good sense as mama can consume a far wider range of storable

foods than a baby can, and she can produce from those foods a nutrition source perfectly suited to her child.

To promote this end here is the contact information for the largest and best known breast feeding support group.

La Leche League International

1400 N. Meacham Road

Schaumburg, IL (USA) 60173-4808

Phone (847) 519-7730 or 1-800-LALACHE (US) Fax (847) 519-0035

E-mail: LLLHQ@lilli.org Web: <http://www.lalecheleague.org>

They can help you to find local chapters of the League in your area and point out useful books and sources of information. When our daughter was born my wife has attended a number of our local chapter's meetings and borrowed books with which to educate ourselves. Also in this same line, there is a useful document put out by the World Health Organization titled How to Breastfeed During an Emergency. It apparently is no longer hosted on any WHO sites so I have taken the liberty of hosting it myself at:

http://athagan.members.atlantic.net/PFSFAQ/Breastfeeding_in_an_emergency.html

It would be an excellent idea to print out a few copies and put them away. You never know who you might come across who'll desperately need such information should there come a Fall.

ALTERNATIVES TO BREASTFEEDING

If breastfeeding should not be a viable option you'll need to find another source of infant nutrition. I STRONGLY RECOMMEND AGAINST USING HOME-MADE INFANT FORMULAS AS A SOLE SOURCE OF NUTRITION FOR A BABY. If you know you're going to have a nursing infant on your hands, if and when the balloon should go up, you should take steps in advance of the crisis to put away a suitable food supply for the child. Young children have nutritional needs that are different from those of adults or even older children. Lacking human breast milk, you should put by a store of commercially made infant formula. Evaporated milk, dry milk, sweetened condensed milk, goat's milk and all the rest can be an important *supplement* for children over the age of six months, particularly over one year of age. For children under six months of age these products simply do not contain sufficient amounts of the appropriate nutrients to provide adequate nutrition when used as the sole source of sustenance.

As for soy milk, there are considerable important differences in soy nutritional content compared to cow's milk which is to say nothing of human milk. Soy milk alone is simply not nutritious enough to serve as a sole source of nutrition for children under the age of six months and should not be used as more than a *supplement* for children over six months of age. This does not apply to commercially made *soy protein infant formula* which is a very different product than soy milk.

SELECTING AND FEEDING AN INFANT FORMULA

If the child you're concerned with is already on the scene then you probably already know which formula you need to put away. Unless instructed against doing so by your doctor, my only suggestion here is to make sure the formula has iron in it. The problems of iron in formulas from the nineteen fifties and sixties have long ago been solved and young children very much need this nutrient. If you feel the need to store formula in advance for a child not yet on the scene (or who is only a contingency to plan against) I suggest storing one of the *cow's milk based lactose-free formulas*. Two brand names that will work well are "Lactofree" from Mead Johnson and "Similac Lactose Free" from Ross Laboratories. Lactose is the sugar found in milk and an inability to properly digest lactose is the most common source of infant formula feeding problems. Of course, there is the remote chance the child could have a true allergy to cow's milk protein, but the child could be allergic to soy protein too. It's been known to happen for a child to be allergic to both at the same time. There is no absolute certainty in preparedness, but you can plan for the most likely problems which is why I suggest storing lactose free cow's milk formula.

Unless you store only disposable bottles and "ready to feed" formula, don't forget that both reconstituting formula from dry powder or liquid concentrates and washing feeding equipment requires the use of clean, safe drinking water. You'll need to carefully examine your water storage in this regard.

STORING INFANT FORMULAS AND BABY FOODS

Storing infant formula and baby food is easy. Infant foods are one of the few areas in which the (US) Federal government regulates shelf life labeling. All containers of infant formula and baby food should have a clear "best used by" or similar date somewhere on the container which is generally longer than a child will require such food. Unopened containers of formula should be stored the same way you would keep dry milk, in a dark, cool, dry place and used before the date on the container is reached. Opened containers of dry formula powder should be used within one month of opening and the contents should be kept bone dry, cool and in the dark.

If it hasn't been needed by the time the expiration date begins to near it's an excellent idea to donate the infant formula to a nursing infant or organization like a food bank that can put it to use before it expires. There's too much valuable high quality nutrition in infant formula to allow it to go to waste.

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Growing and Using Sprouts

Sprouts are great to eat for everyday living and especially so in an emergency situation. Typical foods set aside for storage are traditionally low or nonexistent in vitamin C and

many of the B vitamins. Yet it is exciting to know the seeds from those same storage foods can be sprouted to give a rich source of these important nutrients. Sprouts are an excellent source of vitamin C and also contain many good B vitamins. And you probably won't find a less expensive way to get these vitamins than from low calorie sprouts. Green leafy sprouts are also a good source of vitamin A. Sprouts are a good source of fiber, protein, and contain enzymes that aid digestion. In addition, sprouting destroys the seed's natural preservative enzymes that inhibit digestion.

Different kinds of seeds you can sprout: (This list gives the popularly sprouted seeds and is not all inclusive as you can sprout almost any kind of seed.)

Generally eaten raw:

Alfalfa, radish, mung bean, sunflower, clover, cabbage.

Generally cooked:

Kidney, Pinto and other miscellaneous beans.

Eaten raw or cooked:

Lentils, Soy beans, green peas and wheat. (In addition, all the sprouts that are generally eaten raw can be easily cooked.) Alfalfa: Alfalfa, one of the most popular sprouts, is a good source of vitamins A, B, C, D, E, F, and K and is rich in many minerals, as well as many enzymes needed for digestion.

Radish sprouts are high in vitamin C and potassium and have a rich flavor.

Wheat is high in Vitamins B, C, and E and has three times the vitamin E of dry wheat. Wheat also has many minerals.

Mung Beans: These sprouts should be sprouted under pressure to produce long and juicy sprouts. Mung bean sprouts are an excellent source of protein, vitamin C, A and E, along with many minerals.

Green Pea sprouts are rich in many of the B vitamins and vitamin C. Green pea sprouts make a rich addition to any green salad.

Soybeans: An extremely rich source of protein and vitamins A, B, C and E. Soybeans are rich in minerals and lecithin. They can be sprouted under pressure like mung beans.

Kidney beans, pinto beans and miscellaneous beans: They are a good source of vitamin C, many of the B vitamins and many minerals. Sprouting these beans also changes their indigestible carbohydrates to digestible carbohydrates thereby greatly reducing the intestinal gas they otherwise cause.

Lentils: Rich in protein, vitamin C and the B vitamins. They have a mild ground pepper flavor.

Buckwheat: Makes a great salad green. High in vitamins A, B, C and D.

Sunflower: Rich in vitamins B, D, and E, many minerals, and Linoleic Acid, the W6 EFA.

DO NOT EAT tomato, peppers or potato sprouts as they are poisonous.

Growing Sprouts:

Sprouts are easy to produce and require no special equipment or knowledge. All that is required to produce sprouts is seeds, moisture, warmth, darkness and maybe 10 minutes of your time every day. Methods vary from high tech production to something as simple as quart jar or a cloth covered pan. Perhaps the simplest method is to take your seeds, place them in a quart jar, and cover them with water to start the process.

Seed amounts to use per quart jar:

1/2 Cup Seeds: Wheat, All Beans, Rye, Oats, Rice, Sunflower, Lentil, Hulled Buckwheat, and Garbanzo Beans. **2 Tablespoons:** Alfalfa, radish, clover, cabbage.

Be aware that seeds soak up 2 or 3 times their dry volume in water. After they have absorbed all the water they are going to absorb (2-12 hours depending on the size of the seed), drain the water off, rinse them, and put them in a dark, warm place, with the bottle upside down and tipped up against a corner so water can drip out. Of course you need to put something under the and out of the jar. You can use a thin cloth, a nylon stocking, or anything you have that's handy. Fasten it down around the opening of the jar using an elastic or bottle ring. After the seeds have stopped draining, if you are sprouting very small seeds like alfalfa, cabbage or radish seeds, roll the bottle, coating the outer wall of the bottle with seeds. Leave the bottle on it's side in the dark. Room temperature is best for growing sprouts, around 70 degrees F. Rinse the seeds twice a day, being sure to drain them well. (***Do not neglect to rinse them. They will sour and be useless.***) Within two days your seeds should begin sprouting.

For sprouts you are going to cook, let the sprout grow only as long as the seed. For sprouts you will eat raw (except wheat) let them grow up to 2-3 inches. Expose mature alfalfa, wheatgrass, buckwheat or sunflower sprouts to indirect sunlight for 4-5 hours. As they turn dark green their vitamin A content dramatically increases. (This is an important step, for if you don't, your sprouts will have only about 1 percent of this vitamin's RDA. Don't expose bean sprouts to sunlight as this will give them an unpleasant bitter taste.) When your sprouts have grown to the desired length, rinse them again, then put them in a

sealed container with something to absorb the water on the bottom and store them in the refrigerator.

Sprouting mung beans under pressure

Place soaked beans in a small colander inside another container. Place several layers of burlap over the top of the seeds, then place a 3-5 pound bag of marbles or small stones on top of this. Water every two or three hours to ensure adequate moisture (this prevents the root systems from over developing in their search for water). Keep them in the dark at all times or they will turn bitter as they begin to green. When they are 2 to 3 inches long, remove them from the colander and refrigerate.

Using your sprouts

After sprouts reach their peak, they immediately begin to lose their vitamin C. Because of this, don't attempt to store sprouts longer than a week. Only grow small quantities of sprouts that can be used in a short period of time. If you plan on getting many of your vitamins from sprouts, it would be a good idea to have one or two small batches of sprouts growing all the time.

Cook sprouted beans using the same recipes you normally use. Sprouted beans cook in 2/3rds the time of unsprouted beans. Heat kills a percentage of the vitamins and enzymes gained by sprouting, so simmer or steam slowly depending on your recipe, and don't cook longer than necessary.

You can sprout a mixture of seeds to make great green salads all by themselves. You can also use raw sprouts in just about anything:

Blended in drinks.
Added to bean or lettuce salads.
Mixed with already cooked breakfast cereals.
Wrapped in tortilla or taco shells and smothered in your favorite sauce.
Added to soups and stews just before eating.
Sprout filled Won Tons.
Put into sandwiches.

Raw sprouts are so versatile that they can also be thrown into just about anything then cooked, such as:

Breads and biscuits.
Soups.
Pancakes.
Eggs and omelets.
Oatmeal or cracked wheat.

Sauces.
Mexican or Chinese foods.
Potato Patties.
Casseroles.
Dips.
Meatloaf.
Any vegetable.
Stir fried all by themselves.
Even desserts. Really, the sky's the limit.

When cooking sprouts, it is better to steam or stir fry them than to boil them and discard the water. You only lose 20-30 percent of the vitamin C compared to 60 percent.

How much sprouting seed you should store and tips on purchasing.

It is suggested that if you plan to get all your vitamins from sprouts alone, that you store up to 125 lbs of a variety of seeds per year per person. If you have other sources for your vitamins, it is suggested you have 30 lbs of seeds set aside for sprouts to be eaten raw, and 30 lbs of sprouts intended to be cooked per year per person.

Many specialty companies exist that deal exclusively in sprout seed. Usually these seeds cost several times more than other seeds of the same type. One study shows that mung beans sold exclusively for sprouting cost 4.5 times more than regular mung beans. Yet 99 percent of the time the cheaper seed will sprout and grow as quickly as the more expensive seed. It is the web page author's opinion that it is a waste of money to buy 'sprouting seed' over regular seed. Before purchasing a large amount of storage seed intended for sprouting, purchase a small amount and test it to see if it sprouts well.

Do not attempt to store your sprouting seed for more than 5 years unless it is stored in a cool (at least 60-65 degrees F) dry place. If you are storing large seed, it may be packed in the absence of oxygen. Seed may last up to 15 years stored in this way. As your seeds get old they will take longer to sprout, and you will progressively get more seeds that won't sprout. The key again is rotate, rotate, rotate.

Use several different kinds of sprouts to find what you like before purchasing a large quantity of seed. Do not purchase seeds intended for anything except human consumption. Many seeds processed by farmers and gardeners for planting have been **treated with fungicide and or insecticide** agents and are very **poisonous**. These seeds are usually, but not always dyed red. If in doubt, ask.

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Pros and Cons of Freeze-Dried, Dehydrated, MRE, Food Bars, & Basic Commodities.

Pros

Cons

Freeze-Dried / Instant

Very low moisture
Very lightweight
Long shelf life
Reconstitutes quickly
Retains original shape, texture,
color after reconstitution
Best way to dry meat items

Most expensive food storage option
Most items require water to prepare
Items are bulkier than if dehydrated

Dehydrated (most items)

Low moisture
Some items take a long time to reconstitute
Some items loose taste after reconstitution
Dehydration process can affect nutritionan
value
Not easily spoiled

Requires water to prepare

Some items have poor visual appeal

MRE (Meals Ready to Eat)

Taste of MREs considered poor by some
Requires no water to prepare
Can be heated for hot meal by many
methods

Familiar foods available

Requires no preperation
Artificial additives added in many recipes
Expensive considering actual food received
Many entrees more like sauces & require
additional quality carbohydrates for a filling
No mixing or blending
Entrees alone will not supply adequate
nutritional value
Because of foil pouch, they are

susceptible to puncture
Can be heavy if larger quantities need to be transported

Emergency food bars

Compact – convenient	Limited nutritional value
Low cost meal	Not a satisfying substitute for a hot meal
5 year shelf life	Not adequate for prolonged use
Can take exposure to high heat	

Grains, Beans, Basic Commodities

Very familiar	Not generally appropriate for shorter emergencies
term Low cost Very heavy weight	Requires large quantities of water to prepare
Long storage life	More time consuming to prepare
and fuel Traditional basic foods	Time is required to adapt to basic oriented diet
Good nutritional value	
Many sproutable seeds, grains, and beans increase comodity nutritional value	
For higher calorie requirements a fairly large quantity of nutritional value grains/beans must be consumed when eaten exclusively.	

MREs: MEALS, READY TO EAT

This category includes more than the modern day military rations known by the above acronym, but also their civilian equivalents which are marketed by two of the major U.S. military MRE contractors, and a number of other products in the civilian market that fit better into this category than any other. Over the last several years the number of self-contained meals available in either the new style flexible pouches or old fashioned metal cans has greatly increased. I can't cover them all in detail so for this section I will cover only those meals that also include some form of self-contained heating device to warm the food to serving temperature. This allows one to have a hot meal yet needing no equipment other than a spoon to eat with. Whether you buy self-heating meals or supply the heat yourself to non-self heating meals you should investigate the offerings your local grocer may now be carrying. They have great potential for those situations where cooking food would be difficult or impossible.

U.S. MILITARY MREs

The Meal, Ready to Eat (MRE) is the current U.S. military field ration for those times when troops are out of contact with their regular mess facilities. In the early 1980's they

replaced the older C & K-rations that had honorably served since the Second World War. These new rations represented a major leap forward in food preservation technology by disposing of the heavy, unwieldy metal can and replacing it with the much lighter, flexible “retort pouch.” These pouches are beefier cousins of the aluminized Mylar bag used in long-term food storage and are basically constructed the same way. A thick outer layer of tough polyester film, a thin middle layer of aluminum foil for its excellent gas barrier properties, and an inner layer of food safe polypropylene film to allow heat sealing. Food is placed in the pouch then specially heat processed for preservation which renders it microbiologically shelf-stable, fully cooked, and ready to eat.

What’s in an MRE?

From the Defense Logistics Agency Subsistence web site

(<http://www.dscpl.dla.mil/subs/rations/meals/mres.htm>) we find this:

The twenty-four different varieties of meals can be seen in the menu table. Components are selected to complement each entrée as well as provide necessary nutrition. The components vary among menus and include both Mexican and white rice, fruits, bakery items, crackers, spreads, beverages, snacks, candy, hot sauce, and chowmein noodles for the pork chow mein entrée. The fruits may be applesauce, pears, peaches, pineapple, or strawberry. The bakery items include a fudge brownie, cookies, fruit bars, a toaster pastry, and pound cake in flavors of lemon, vanilla, orange, pineapple, and chocolate mint. Each meal also contains an accessory packet. The contents of one MRE meal bag provides an average of 1250 kilocalories (13 % protein, 36 % fat, and 51 % carbohydrates). It also provides 1/3 of the Military Recommended Daily Allowance of vitamins and minerals determined essential by the Surgeon General of the United States.

All of which is then placed inside of a heavy plastic pouch and sealed. Being field rations they had to be designed to take considerable punishment in packs, air drops, and other forms of abuse remaining safely intact until consumed. By and large they do just that.

All of this sounds rather attractive to the person interested in emergency preparedness and they are. So much so, in fact, that several years ago the U.S. military finally said “enough!” to the continuing losses of their rations to the civilian market and banned any further civilian sale. All new MRE complete ration packs now bear the words “U.S. Government Property. Commercial Resale Is Unlawful.”

This did slow the loss rate somewhat, but anyone that wants the real thing can still get them from military personnel they may know, at gun shows, some military surplus shops, or via E-Bay. Whether you should do this is up to you, but I will give a couple of cautions here:

#1 – Being a back channel acquisition chances are you have no way of knowing the storage history of what you’re buying. Maybe it’s been sitting in some nice cool

warehouse since it was produced or maybe it bounced around in the back of a deuce-and-a-half in the Nevada desert for a month last summer. If you don't know where it's been how can you estimate how much useful shelf life it may have left?

#2 – Make sure what you're buying really is a military MRE or MRE component. Some of the civilian commercial products can look remarkable similar, but are not quite the same. Know what you're looking at and make it clear with the person you're buying from that you want genuine military issue (if that's what you want).

MRE Heaters: These devices will either come with your MRE at the time of purchase or they can be bought separately. They contain a small amount of salt, magnesium, and iron and when you add a small amount of water they undergo a flameless chemical reaction that will heat an 8 oz MRE entrée by roughly 100° Fahrenheit (37°C) in about ten minutes. As water is what starts the reaction it is imperative the heaters be kept dry until used. If stored in an area of high humidity the heaters can undergo a slow reaction leading to degraded performance later or even complete failure over time. As a part of the chemical reaction the heaters release small amounts of hydrogen gas which is generally harmless but large numbers of heaters in a damp, sealed storage area could conceivably present a danger. This is unlikely unless you're storing many cases of heaters. In such an event keep them in an air tight storage container with some desiccant.

While any MRE can be eaten cold these heaters can certainly improve the palatability of the food. Lacking a heater you can simply boil the individual retort pouches in water for a few minutes, lay them in the sun to warm, or tuck them in your shirt. The one thing you should not do is expose them to direct flame.

For more detailed information on U.S. military, civilian, some foreign military MREs, and other rations please see the excellent MRE Info website at <http://www.mreinfo.com/index.html>

U.S. MILITARY MRE SHELF LIFE

Much discussion has gone into how long one should keep MREs on hand before rotating them out of stock. In this regard they're no different than any other type of preserved food. The longer you keep them on hand the more unpalatable and non-nutritious they will become with heat playing a large role in shortening their useful lifespan.

The short answer to the shelf-life question (from <http://www.dscpl.dla.mil/subs/rations/meals/mres.htm>) is simply "The shelf life of the MRE is three (3) years at 80 degrees F. However, the shelf life can be extended through the use of cold storage facilities prior to distribution." Of course, that's at 80° Fahrenheit (27°C). What if your storage temperature is different? Then you need the storage life chart that was developed by the U.S. Army's NATIC Research Laboratories which basically says that at a given storage temperature an MRE will remain palatable for so many months as illustrated below:

Storage Temperature Shelf Life

120° F (49°C) 1 month
110° F (43°C) 5 months
100° F (37°C) 22 months
90° F (32°C) 55 months
80° F (27°C) 76 months
70° F (21°C) 100 months
60° F (15°C) 130 months +

Note: As with any other stored food, time and temperature have a cumulative effect. For example storage at 100° F. for 11 months moved to 70°F(21°C) would lose one half of the 70°F. storage.

A complete shelf-life chart for all U.S. military rations may be found here:

<http://www.dscpl.dla.mil/subs/subsbo/qapubs/table.pdf>

U.S. CIVILIAN MREs (WORNICK, SOPAKCO, OTHERS?)

Except for contract overruns on individual components actual military MREs, especially complete MRE ration packs, are not legal for sale on the civilian market. Recognizing there was a civilian market for such rations both Wornick and Sopakco through its Crown Point, limited, subsidiary brought out similar products for commercial sale. Their complete civilian ration packs are not precisely the same as their military cousins, but the individual components are usually produced on the same production lines.

Because there are no legal restrictions on their sale these civilian MREs are easier to find and are generally available in three basic forms –individual components, complete ration packs, and multi-serving tray packs meant for group feeding. Exact menus vary over time, usually being a subset of whatever the companies are producing for the military at the time of their production so I'm not going to try to address specific menus.

Some of the typical differences between military and civilian MREs are:

Menu choice. Military MREs presently have twenty four different menu choices. Their civilian equivalents are currently limited to twelve.

Ration heaters. These are standard with military MREs, but you may have to pay extra to get them with the civilian equivalents.

Total amount of food. Many of the civilian offerings contain less total food than military MREs, typically in the form of fewer side items. One notable difference is that fewer of the civilian rations contain the little Tabasco packets than their military counterparts.

The spoon. The spoons in the civilian packets are not the same as in the military rations. The civilian spoon is white plastic while the military spoon is brown and of a longer length which makes it easier to get to the bottom of the pouches without getting food on your fingers. This strikes me as particularly chintzy on the manufacturer's part.

For more detailed information on U.S. military, civilian, and some foreign military MREs, and other rations please see the excellent MRE Info website at:

<http://www.mreinfo.com/index.html>

U.S. CIVILIAN MRE SHELF LIVES

One would think that the shelf lives of U.S. military and civilian MREs would be the same, but are they? If you look at the manufacturer's websites for what they say about their civilian equivalent rations we find:

Crown Point, Ltd (SOPAKCO)

From <http://www.crownpt.com/Q&As.htm>

How long will these products last?

SOPAKCO Packaging uses an estimated shelf life figure of "3-5 years, plus or minus" for its MREtype pouched food products. Actual shelf life may vary from this estimate. A key factor effecting actual shelf life is the temperature of the storage environment. Storage at temperatures higher than 85F (85 degrees Fahrenheit) may shorten the shelf life of MRE-type food products. On the other hand, lowering the storage temperature will help extend the products' shelf life. This effect is common to most processed food products.

The shelf life figures given below for MRE's are based on studies conducted by the U.S. Army's NATIC Research Laboratories. This study was conducted by NATIC without participation of the MRE manufacturers. As such, SOPAKCO Packaging cannot verify the test procedures used by the NATIC labs, nor do we adopt these shelf life figures as a guarantee of any sort. The data is useful, though, as a general indication of the effects of storage temperatures on the shelf life of MRE-type food products.

*Temperature (Fahrenheit): 100° 90° 85° 80° 75°
70° 60°*

Storage Life in Months: 22 55 60 76 88 100 130+

The above storage data and time periods were based on "acceptable taste" measures, which is a subjective standard that may vary among each individual. Test participants were asked to indicate which products they were presented would be rated to still be of "acceptable taste".

Responses were noted, and average values were calculated to yield the data above. The above data does not indicate the maximum useful life of MRE food products. The NATIC

study noted that nutritional value and product safety value of the products often extended far beyond these time points.

Again, SOPAKCO Packaging in no way adopts the NATIC shelf life figures as any form of express or implied guarantee of the actual shelf life of its MRE food products. This information is provided as a general indication of the effects of storage temperature on MRE-type packaged foods.

Long Life Food Depot (The Wornick Company's civilian sales agent)

From <http://www7.mailordercentral.com/longlifefood/Faq.asp#heaterpouches>

How long do MRE products last - what is their Shelf Life

We guarantee our MRE products to last 5 years from the date of sale, in a room temperature environment (70 deg. F), no matter what the production date. Of course, the production date is visible on all our entrees and on most side dishes, desserts, and other components. The production date is a four digit number(date code) on each item, example "2156." In this example the 2 represents the year 2002 (a "3" would represent 2003, etc.), the 156 represents the 156th day of the year. See the top of the individual box or look on pouch for the Date Code.

At this time nearly all of our MRE products were manufactured between 2002 and 2003 and have always been kept in a climatecontrolled warehouse to ensure freshness. The official MRE Shelf Life Chart, created by the Army's Natick Research Lab, gives the whole picture and explains why we are prepared to guarantee our products for 5 years from date of sale. It is clear that the wholesomeness of the products extends well beyond 5 years. To see this chart and a more complete discussion of MRE Shelf Life , click here. Which takes you to the text below

<http://www.longlifefood.com/mre.html#Shelflife>

MRE Shelf Life:

A main concern in the development and testing of rations for our armed forces has always been SHELF LIFE. An amazing amount of research has been done in the development of the retort pouch and the MRE to determine the exact length of time and the exact conditions under which it is safe to store the entrees and the side dishes. The main thing we have to work with is the shelf life chart (shown below) compiled by the Army's Natick Research labs. This gives a very good overview and summary of all the findings gathered from all the testing of MRE products. However, it leaves many questions unanswered. Here are additional facts and observations we have gathered about MRE shelf life:

1) The shelf life ratings shown in the chart below were determined by taste panels, panels of "average" people, mostly office personnel at the Natick labs. Their opinions were combined to determine when a particular component or, in this case, the entire MRE ration, was no longer acceptable.

2) The shelf life determinations were made solely on the basis of taste, as it was discovered that acceptable nutritional content and basic product safety would extend way beyond the point where taste degradation would occur. This means that MREs would be safe and give a high degree of food value long after the official expiration of the products as determined by taste.

3) MRE pouches have been tested and redesigned where necessary according to standards much more strict than for commercial food. They must be able to stand up to abuse tests such as obstacle course traversals in field clothing pockets, storage outdoors anywhere in the world, shipping under extremely rough circumstances, 100% survival of parachute drops, 75% survival of freefall air drops, severe repetitive vibration (1 hour at 1 G vibration), 7,920 individual pouch drops from 20 inches, and individual pouches being subjected to a static load of 200 lbs for 3 minutes.

4) Freezing an MRE retort pouch does not destroy the food inside, but repeated freezing increases the chances that the stretching and stressing of the pouch will cause a break in a layer of the laminated pouch. These pouches are made to withstand 1,000 flexes, but repetitive freezing does increase the failure rate by a small fraction of a percent.

MRE Storage Life Chart A graphic of the chart I have reproduced above.

As we can see both company's refer to the NATIC shelf-life chart then give qualifiers *"The NATIC study noted that nutritional value and product safety value of the products often extended far beyond these time points."* and *"This means that MREs would be safe and give a high degree of food value long after the official expiration of the products as determined by taste."* Neither state how much or what kinds of nutrition would remain once the food goes beyond it's recommended shelf life, but it can be safely assumed the most sensitive nutrients (notably vitamins A and C among others) will have significantly declined. Old food is not likely to be attractive food, nor will it give long term nutrition, but if it's all you've got it'll still be safe to eat it.

BRITISH/CANADIAN MREs

These are basically MREs little different in form than the American made product but made by companies in these respective nations. Shelf-life is the same. Menu choices reflect British/Canadian tastes, of course. Company contact information can be found in the Suppliers Section. One minor difference seems to be with the Hot Pack company of U.K./Canada in that they claim their ration heaters are somewhat larger than the ones packaged with U.S. MREs

From the company's web site:

Will defrost ice or snow for drinking water. Will heat 300 g (10.6 oz.) of food or water from room temperature to 80°C (178°F) in 12 minutes. Will provide a source of heat for up to forty five minutes after activation.

Is sometimes reusable for a limited heat cycle (dependent on how much of the heating element was exhausted in the first cycle).

The chemical reaction is totally safe. When water is added to the heater, the mixture bubbling away inside the sleeve (magnesium hydroxide) is a pharmaceutical chemical used by doctors to treat stomach acidity.

Food grade ingredients are used in the manufacturing of the heater. Once activated, the heater will keep hot for approximately 45 minutes. It can be used as a body warmer or to heat a drink after heating the meal.

OTHER SELF-HEATING READY TO EAT TYPE PRODUCTS

As one might expect once the bugs were worked out of retort pouch and flameless ration heater technologies the manufacturing companies that produce them would try them on the civilian market. This has been a little slow in coming, mostly because in the modern day ‘fresh is best and refrigeration is cheap’ world their market segment is somewhat small, but they are arriving. At the time of this writing there are several products now available, some of them quite new.

HEATERMEALS

HeaterMeals are a type of MRE in casual clothing. Like the rations above they are a retort pouch preserved meal with its own built in heater. The heater itself is the same technology as the MRE heaters (the company makes them for the military), but a little different in form, to include having its own self-contained water to start the heating reaction. The meals themselves aren’t packaged with the idea of rough handling in mind, but they’ll keep well on the shelf.

The meals themselves come in two basic forms:

An entrée pack with the heater, seasoning packet and cutlery

A complete meal pack with the heater, entrée, seasoning packet, cutlery, side items like fruit, snack, and dessert, and a bottle of water to drink.

If you’re not having to use them under rough field conditions they represent a self-heating, completely self contained meal.

These meals can be ordered from the manufacturer, a number of dealers which are listed on the company website, or you can often find them at truck stops, some supermarkets, sporting goods stores, and other such businesses.

Shelf life info for HeaterMeals was found at:

<http://www.heatermeals.com/faq.html#shelflife>

What is the shelf-life of HeaterMeals and HeaterMeals Plus Meals?

HeaterMeals are a high quality canned food, so storage is easy. HeaterMeals Dinner entrees do not require refrigeration, and are shelf-stable for approximately 2 years. HeaterMeals entrees come with a “Please use by” date stamped on each box. This date is two years after we package the meals, as this is the optimum time to eat your HeaterMeals.

The HeaterMeals Breakfast “Pancakes, Syrup & Sausage Links” and all HeaterMeals Plus meals have a one year shelf-life. HeaterMeals dinner entrees are designed to safely store (at 80 degrees Fahrenheit) for at least two years; three years or more, if stored at a temperature of 60°F or cooler. The shelf-life of HeaterMeals can be even longer; and the unique packaging of the entree and water pouch permits freezing for unlimited storage.

HOT CANS – UNITED KINGDOM

In the United Kingdom there is another entry in the selfheating meal field. This is the Hot Can from Hot Can UK, Limited. It’s an interesting blend of old and different new tech in that the food itself is contained in a run-of-the-mill pop-top metal can, but the food can is contained in a sealed larger can filled with calcium oxide (quicklime) and a separate water capsule. When needed the self-contained water capsule is pierced with the provided tool allowing moisture to seep into the dry quicklime below and the food can pop-top is removed. In twelve to fifteen minutes the can will have heated to 65°-70° Celsius and remains at that temperature for roughly forty five minutes which means once you’ve finished the food inside you can quickly rinse the can and heat something else, perhaps a beverage.

There are a variety of meals available from the company, each weighing about 400 grams (roughly 14 ozs). Shelf life is “*Three years from manufacturing date, or as indicated on printed bottom end of can.*” The heater itself releases no harmful or dangerous gasses and if for some reason you should break one open and spill some of the quicklime on yourself it can simply be washed off again with water.

Company contact information can be found in the Suppliers Section. Hot Cans are probably also available through retail dealers in the U.K. and elsewhere.

ALPINEAIRE INSTANT – SELF HEATING MEALS

New on the market from AlpineAire is their entry into the self-heating meal arena. Uses the same retort and flameless heater technology as MREs but in different packaging. Snap the bottom of the package and in eight minutes your entrée is hot and ready to go. As I write this there are only two entrees with more coming in the near future. They’re rather pricey at a suggested retail of \$8.95 for a mere 240 calories worth of vegetarian food. Still, it’s a start and with time they may both lower the price and increase the menu choices.

Alpineaire advises an eighteen month shelf life for this particular product line. They may be ordered directly from AlpineAire or through their many stocking dealers.

MOUNTAIN HOUSE MOUNTAIN OVEN

Mountain House isn't really offering a true Meal, Ready to Eat since you still have to add water to their freeze dried/dehydrated food, but I'm including it here since it's close. Basically, what they're offering is their own version of a flameless ration heater and some new packaging of a few of their entrees that allows the pouches to be put into their heaters to be warmed. They call their heater a "Mountain Oven" though they really don't bake anything, just warms things up.

To use their heater you dissolve one of the furnished salt tablets in a plastic bottle that comes in the kit. Place a "heat activation pad" in the bottom of the insulated over pouch then pour the salt water on it. Open up the food pouch, pour in the required amount of water then put the pouch inside the insulated bag and zip it closed (the outer bag is vented). Twenty minutes later the food should be about 100° F. (38°C) hotter than when you started.

Each Mountain Oven kit is good for five uses. At a suggested retail of \$11.99 per kit that's about \$2.40 per use which makes it rather pricey compared to the ordinary MRE heaters already on the market which can usually be purchased for about a buck apiece or less. Still, like the AlpineAire entry it's a start and with time they may come down in price and perhaps be easier to use as well.

The Mountain Oven kits can be ordered from Mountain House directly or purchased from one of their many dealers as they are distributed.

RATION BARS

U.S. Coast Guard approved lifeboat ration bars are not common storage foods. Nevertheless they have a specific use important enough to warrant inclusion in personal preparedness programs.

As many involved with emergency preparedness discover, finding foods capable of being stored for long periods of time under harsh conditions that will remain both palatable and nutritious is a real undertaking. This is especially a problem with vehicle emergency kits where interior temperatures in the Spring, Summer, or Fall may exceed 120°F (50°C) for hours at a time each day. Very little in the way of anything usefully edible will survive such sustained temperatures for long before it breaks down, becomes unpalatable, with most or all of its nutrients damaged or destroyed.

This is a problem not only for those of us trying to build vehicle emergency kits but also for mariners needing to provision life boats that might be exposed to anything from desert temperatures to arctic climates. In reaction to this and a number of other marine emergency preparedness needs most of the world's maritime nations met to develop

the Safety Of Life At Sea (SOLAS) conventions, one of which concerns itself with emergency provisions for lifeboats. In the United States responsibility for implementing the SOLAS regulations falls to the U.S. Coast Guard and they have developed guidelines by which manufacturers must abide in order to become Coast Guard approved suppliers of life boat rations.

Among the guideline requirements are:

- Lifeboat rations must be capable of withstanding long periods of high temperatures or sub freezing weather without significant deterioration;
- must not increase bodily water needs with high protein or salt levels yet provide sufficient calories to keep the body from burning its fat reserves which also increases bodily water needs;
- be compact in size and lightweight;
- be sufficiently palatable that injured or ill passengers would be able to eat them;
- not constipate nor cause diarrhea;
- use packaging that is sufficiently durable to withstand rough conditions.

Those manufacturers that meet these guidelines can submit their products for approval to be placed on the *U.S. Coast Guard Equipment List 160.046 - Emergency Provisions for Merchant Vessels* which may be found here: <http://www.uscg.mil/hq/g-m/mse/equiplists/160046.pdf>

Each of these companies produces lifeboat rations. In the U.S. the two most commonly available product lines are the Mainstay Emergency Food Ration and the Datrex Red (or White) or Blue ration.

The Mainstay rations are lemon flavored and available in 1200, 2400, and 3600 calorie packages.

The Datrex rations are coconut flavored and available in 2400 (red or white ration) or 3600 (blue ration) calorie packages. As per regulations both have a five year shelf life. Each package from either company has been tabletized and subpackaged to make it easier to serve them out in controlled portions.

Both are primarily composed of complex carbohydrates, fairly low protein, enriched with extra vitamins and minerals then vacuum sealed in heavy aluminized plastic pouches similar to military MREs. Flavors are noted above, textures are similar to a fairly dense pound cake. I've sampled both and while I wouldn't care to eat them for a week straight

for the relative few days a vehicle or similar emergency kit is intended to get you through they'll get the job done and not turn into something nasty after a few months of hot weather. In the cool times of the year when vehicle interiors do not climb into oven temperature ranges food options increase considerably with some form of military or civilian equivalent MRE being well suited to the task. Something to consider if you're building emergency kits or bug-out bags.

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STORAGE CONTAINERS

WHAT IS FOOD GRADE PACKAGING?

Q: OK, I'm ready to start my storage program. What should I put the food in?

A: You should use food grade packaging for storing anything you intend to eat. A food grade container is one that will not transfer noxious or toxic substances into the food it is holding. If you are uncertain whether a package type is food grade you can contact the manufacturer. Ask if that particular container is (US) FDA approved meaning that it is safe for food use. When inquiring be sure to specify the characteristics of the food you are storing; wet, dry, strongly acidic or alkaline, alcoholic or a high fat content. A container

that is approved for one of the above types of food may not be approved for another.

The major functions of a food storage container are to:

#1. Protect its contents from outside environmental influences such as moisture, and oxygen, but possibly also heat or cold, light, insects and/or rodents as well.

#2. Prevent damage during handling and shipping.

#3. Establish and/or maintain microbiological stability. The container should not allow microorganisms such as fungi and bacteria from outside the container to come into contact with its contents. This is of critical importance to wet-pack foods such as canned vegetables, fruits and meats.

#4. Withstand the temperatures and pressures it will be exposed to. This is necessary if the contents are to be pasteurized or sterilized, either immediately before or after filling. It must not have any structural failures nor release any noxious or toxic breakdown chemicals into the food it contains. This is the reason why purpose built canning jars are recommended for home canning and mayonnaise jars aren't. The former are made heavier to withstand high temperatures and handling whereas the latter are not and have an increased risk of breakage if used for that purpose.

Virtually all containers used in home food preservation involving exposure to high temperatures are made of glass or metal, with the exception of some specialized “heat & seal” type of plastic bags. Glass can be used with any food type providing it is clean and in sound condition but the lids, particularly the liner inside the lid, may not be so you’ll need to investigate suitability.

Metal cans are more specialized. They must be intended for food use and must also have a lining or coating of the inside that is suitable for the pH level of the food it will be in contact with. If the foods are not subjected to some form of heat processing before or after packaging your selection of container types for home use is a great deal larger. Virtually any kind of clean, sound glass jar can be used and many types of new metal containers. Several sorts of plastics have become popular. These various kinds of plastics are each suited for different purposes, making selection a more complex task.

WHERE DO I FIND FOOD GRADE CONTAINERS?

Food grade packaging is everywhere. Every time you go into the grocery store you are surrounded by it. Many well known companies such as Tupperware and Rubbermaid manufacture and sell empty packaging for the express purpose of containing repackaged foods. The kinds of containers you are interested in and the types of foods you want to put in those containers will dictate where you need to look for a particular packaging system. For food storage purposes most folks are usually interested in five and six gallon plastic pails, certain recycled plastic containers such as soda or juice bottles, glass jars from half pint to gallon sizes, metal containers such as the institutional sized #10 cans, and Mylar or other high barrier property plastic bags. Those are the containers most often used, but virtually anything that can protect foods from outside environmental influences, safely contain something you’re going to later eat and have a volume capacity large enough to be worthwhile may be used.

A number of food storage retailers such as those listed in the Resources section sell plastic buckets, Mylar bags and a few even sell new #10 cans with lids. It may also be possible to purchase #10 cans through the LDS Family Canneries and dealers such as *Lehman’s Hardware*, *Cumberland General Store* or *Home Canning Specialty and Supply*. On the local scene, plastic five gallon buckets are widely available, but only if you purchase them through a company catering to a food related trade will you likely be able to tell if they’re safe to keep food in. If you can locate a customer service number for the manufacturer of a container that interests you call them and ask. Many times manufacturers will make products that are FDA approved and sell them as general purpose containers, but you need to ask to be sure.

Packaging supply houses have large FDA approved packaging lines. Several such companies are listed in the Resources section and a bit of detective work will certainly turn up more. Some require minimum orders and others don’t. The cost of shipping the containers will probably play a major role in your decision making. If you are going to package a great deal of food all at once, perhaps for a group, some of the companies that

require minimum purchases may save you a fair amount of money and supply packaging you might otherwise have a difficult time finding. Some time spent searching the *Thomas Register*, available both online (<http://www.thomasregister.com>) and in library reference sections, might turn up some valuable leads.

For glass jars, don't overlook flea markets, yard sales, thrift shops and similar places. Canning jars can sometimes be had for very little. Delicatessens, sub shops and restaurants of all sorts can be a source of one gallon glass jars formerly containing pickles, peppers, etc. If the lids are still in good condition, they are well suited to bulk storage and can be reused over and over.

When I need new buckets I go to a neighboring town to buy them from a beekeeping supply house which sells them for bulk honey storage. A bit of looking will turn up other potential sources as well. Metal cans, by and large, are not reusable for food storage, but some companies might be able to sell you new cans. The traditional single use #10 can is only the beginning of what might be available with a little looking. Gallon sized or larger cans with double friction lids (like paint comes in) make excellent storage containers and some companies make them food safe. One gallon and larger cans with wide diameter screw caps are available from some companies as well. You might have seen some of these holding edible oils, soy sauce, honey and other liquid food. If they come with a cap that will seal air tight they would be well suited for bulk storage of grains and legumes, particularly if they come in a four to six gallon size.

Pick up your local phone book, log on to your favorite search engine or head to your local public library and explore the possibilities. Make it clear that what you want must be FDA approved and be up front about how many you need or can deal with. If one company won't deal with you, try another. You'll eventually get what you want.

PLASTIC PACKAGING

Before we can discuss plastic packaging it is necessary to understand what is the substance we call "plastic." Plastics are produced from basic polymers called "resins", each of which have differing physical properties. Additives may be blended in for color or to modify particular properties such as moldability, structural rigidity, resistance to light or heat or oxidation. Additionally, it is common for several different kinds of plastic to be laminated together each performing a particular desired task. One might offer structural rigidity and the other might be more impermeable to the transfer of gasses and odors. When bonded together a rigid, gas impermeable package can be made.

Whether that package is safe for food use will depend on the exact nature of the additives blended into the plastic. Some of them, notably *plasticizers* and *dyes*, can migrate from the packaging material into the food it's containing. This may be exacerbated by the food it's in contact with especially if it is high in fat, strongly acidic, or alcoholic in nature. Time and temperature may also play a prominent role in the migration of plastic additives into food. For this reason, the (US) FDA assesses the safety of packaging materials for

food contact and conducts toxicological studies to establish safety standards. Only plastics that are FDA approved for a particular food type should be used for direct contact with that food.

Being FDA approved, however, may not be all of the story. It must still be determined whether the particular plastic in question has the physical properties that would make it desirable for your purpose.

As mentioned above each base resin has somewhat differing physical properties that may be modified with additives or combined by laminating with another plastic or even completely unrelated materials such as metal foils. An example of this is “Mylar”, a type of polyester film. By itself, it has moderate barrier resistance to moisture and oxygen. When laminated together with aluminum foil it has very high resistance and makes an excellent material for creating long term food storage packaging. One or more other kinds of plastic with low melting points and good flow characteristics are typically so that the aluminized Mylar can be fashioned into bags or sealed across container openings. The combined materials have properties that make them useful for long term storage that each separately do not have.

The most common plastic that raises suitability questions is *High Density PolyEthylene* (HDPE). It's used in a wide array of packaging and is the material from which most plastic five and six gallon buckets are made. It has a moderate rigidity, a good resistance to fats, oils, moisture and impacts, a fair resistance to acids, but is a relatively poor barrier to oxygen.

Whether it is suitable for your purpose depends on how sensitive to oxygen your product is and how long you need it to stay in optimal condition. Foods such as whole grains are not particularly delicate in nature and will easily keep for years in nothing more than a tightly sealed HDPE bucket. Most legumes are the same way, but those that have high fat contents such as peanuts and soybeans are more sensitive to O₂. Other foods such as dry milk powder might only go a year before deleterious changes are noticed. If that milk were sealed in an air-tight aluminized Mylar bag with the oxygen inside removed, the milk would keep for much longer. Better still would be to seal the milk in a metal can or glass jar. HDPE alone can be used for long term storage with one or more of the following precautions to keep a high food quality: The food should either be put on a shorter rotation cycle than packaging also using a second gas barrier such as Mylar; be periodically opened and re-purged or fresh absorbers should be inserted.

Another common plastic used in food storage is *polyethylene terephthalate* commonly known as PETE or PET plastic. Used to make soda, juice, and some water bottles among other products it is available for recycling into food storage containers in nearly every home. Properly cleaned and with intact screw-on lids PETE plastic containers will serve for keeping nearly any kind of food providing the containers are stored in a dark location. PETE has good barrier properties against oxygen and moisture and when used in

combination with oxygen absorbers presents a complete dry-pack canning system in itself. About the only drawbacks to PETE plastics are that they are nearly always transparent to light, container volumes typically are limited to a gallon or less, and when used in conjunction with oxygen absorbers the sides will flex sufficiently to make stacking difficult though you could simply lay them on their sides.

There are other plastics and plastic laminates with good oxygen and moisture barrier properties that are suited for long term food storage, but they are not as easy to find, though some used containers might be available for reuse.

HOW DO I GET THE ODOR OUT OF PICKLE BUCKETS?

I've had fairly good luck doing it in the following way. As vinegar is the primary smell in pickles and it's acidic in nature, we use a base to counteract it. First we scrubbed the bucket well, inside and out, with dish detergent, most any sort will do. Then we filled the buckets with hot water and dissolved a cup of baking soda in each. Stir well, get the bucket as full as you can and put the top on. Put the bucket in the sun to keep it warm so the plastic pores stay open as much as possible. In a couple of days come back and empty the buckets. Rinse them out, fill with warm water again and add about a cup of bleach and reseal. Put back in the sun for another couple of days. Empty out and let dry with the tops off. We completely eliminated the vinegar smell this way. It might be possible to cut the time down a lot, but we haven't experimented that much.

METAL CANS

Metal cans and glass jars being heat resistant, can both be used for heat processed, wet-pack foods and for nonheat treated dry pack canning. Relative to glass jars though, metal cans have several disadvantages for the do-it-yourselfer. They are hard to come by, and they need specialized equipment to seal them that can be difficult to locate. The greatest flaw which makes them unpopular for home canning is they can only be used once. As the commercial canning industry is not interested in reusing the containers, metal cans make great sense for their purposes. The cans are both cheaper (for them) and lighter than glass jars. This adds to the economy of scale that makes canned foods as cheap as they are in the grocery store.

For home canning, glass jars are better because even the smallest of towns will usually have at least one business that carries pressure and boiling water canners along with jars, rings and lids. With metal cans a sealer is also necessary which usually has to be ordered from the manufacturer or a mail-order distributor. A few of which are listed in the

Resources section.

Tin cans are not really made of tin. They're actually steel cans with a tin coating on the inside and outside. Some kinds of strongly colored acidic foods will fade from long exposure to tin so an enamel liner called "R-enamel" is used to forestall this. Certain

other kinds of food that are high in sulfur or that are close to neutral in pH will also discolor from prolonged contact with tin. For those foods, cans with “C-enamel” are used.

The excellent food preservation book, *Putting Food By* Chapter 6 (see reference list) has a section on the use of metal cans for wet packed foods as does the *Ball Blue Book*.

Probably the most common use of metal containers is the #10 cans such as are used by the LDS Family Canneries discussed below. This is not the only way metal containers may be used though. It will probably take a bit of searching, but there are various food grade metal containers available of sufficient volume to make them useful for food storage. They usually have double friction lids similar to paint cans or screw caps like jars that can achieve an air-tight seal. If you can find them with a sufficient volume capacity they can be of real use for storing bulky foods such as grains, legumes and sugar. Smaller cans of a gallon or less would be useful for storing items like dry milks. If properly sealed, metal cans have a far higher barrier resistance to gasses such as oxygen, CO₂, and nitrogen than any plastic.

Although they can hardly be considered portable the use of clean metal drums (not garbage or trash cans), either themselves food grade or used with food grade liners, is also a possibility. A fifty five gallon drum of grain will weigh several hundred pounds, but may make for a much easier storage solution than multiple buckets. The advantage of using such a large container is that a great amount of a single product can be kept in a smaller amount of space and fumigating or purging the storage atmosphere would be simpler. The disadvantages are the difficulties of moving it and rotating the stock in the drum. If using oxygen absorbers make sure the drum you want to use is capable of making an air-tight seal, otherwise you should stick with carbon dioxide fumigation.

POOLING RESOURCES: THE CHURCH OF JESUS CHRIST OF LATTER DAY SAINTS — THE MORMONS

Although the purchase of a can sealer and metal cans for home use is not generally economically feasible for most people there is one method by which it can be made practical. This is by pooling community resources to purchase the equipment and supplies. It may even not be necessary to form your own community to do this. If you live in the right area your local Latter Day Saints church may have facilities they will allow you to use. They may even have suitable food products to sell you. This is an offshoot of the church’s welfare programs and is done in their Family Canneries also known as Home Storage Centers. Rather than using plastic buckets they have gone over to using metal cans and aluminized Mylar bags churchwide for dry-pack canning. By sharing the cost of the equipment and purchasing the cans in bulk quantities, they are able to enjoy the advantages of metal cans and professional equipment over plastic containers while minimizing the disadvantages of cost.

Any food products you want to have sealed in cans or pouches will need to fall within the LDS cannery guidelines of suitability for that type of packaging. This is for reasons of

spoilage control as many types of foods aren't suitable for simply being sealed into a container without further processing. If you purchase food products from them, they will already be within those guidelines.

Once you have your foodstuffs on hand, either supplying your own or by purchasing them from the cannery you're ready to package them. It is here that using some forethought concerning your packaging system can save you much time and aggravation.

IMPORTANT NOTE: Please keep in mind that the individuals responsible for the family canneries are all volunteers with demands on their time from many areas. Be courteous when speaking with them and, if there are facilities for use, flexible in making arrangements to use them. You will, of course, have to pay for the supplies that you use, cans and lids at the least, and any food products you get from them. As a general rule they cannot put your food in storage for you. Be ready to pay for your purchases in advance. They do not take credit cards and probably cannot make change so take a check with you.

The following is a list of suggestions to make the most efficient use of your access time:

#1 - Make your appointment well in advance. Possibly you may be able to go with another church member if you cannot go for yourself alone. Many people may be trying to make use of the canneries so making advanced reservations is a must.

#2 - Have enough people to set up an assembly line type operation. Make sure each of your people knows what they need to do and how to do it. At least four people for any serious amount of food is a good number. Ask the cannery volunteer to go over the process with you and your crew.

#3 - Make sure you have enough muscular helpers to do the heavy lifting so you don't yourself out or hurt your back. Some of the supplies you will be working with, such as wheat, come in 50 pound bags and a box of #10 cans or pouches full of sugar or other weighty food is heavy.

#4 - Make labels in advance for any foods you bring with you to pack that the cannery does not carry. This will save time and possibly much confusion after the cans or pouches are filled. Once sealed one anonymous looking can or pouch looks like another.

#5 - Take out only as many as oxygen absorbers as you will use in fifteen minutes. They use most of their adsorptive capacity within two to three hours depending on temperature and humidity so you don't want to waste any by soaking up the oxygen in the room. The ones you don't use right away should be tightly sealed in a gas proof container.

#6 - Save powdery food items such as dry milk powder, pudding mixes, grain flours and meals till last. They can be messy to can and this will keep them out of your other foods. Dust masks may not be a bad idea.

#7 - Leave time to clean up after yourself. The cannery is doing you the courtesy of allowing you to use their equipment and selling you the supplies at cost. You should return the favor by leaving the place *at least* as clean as you found it. If they give you a set amount of time to work in then *finished or not* honor that time slot. Others may be waiting to use the equipment too.

#8 - Always keep in the back of your mind how much volume and weight your vehicle can haul. You'd hate to find you had canned more than you could carry home.

PREVENTING EXTERIOR CORROSION OF CANNED GOODS

Some areas have difficulty storing metal canned goods for long periods of time. This is usually caused by high humidity or exposure to salt in a marine environment. If this is a problem, it is possible to extend the life of metal cans by coating their outsides. I've seen this used on boats here in Florida, especially when loading for a long trip. There are at least five methods that can be used to do this, but for cans that require a can opener only the paraffin or mineral oil methods should be used.

PARAFFIN METHOD: Using a double boiler, paraffin is melted and brushed on the clean, unrusted cans. Be certain to get a good coat on all seams, particularly the joints. If the can is small enough, it can be dipped directly into the wax. Care must be taken to not cause the labels to separate from the cans. Do not leave in long enough for the can contents to warm.

MINERAL OIL METHOD: Use only food grade or drug store (medicinal) mineral oil. Wipe down the outside of each can with only enough oil to leave a barely visible sheen. Paper labels will have to be removed to wipe underneath with the contents written on the outside beforehand with a marker or leave the under label areas uncoated. Even with a barely visible sheen of oil the cans will tend to attract dust so you will need to wipe off the can tops before opening.

PASTE WAX METHOD: Combine 2-3 oz. of paste or jelly wax with a quart of mineral spirits. Warm the mixture **CAREFULLY** in its container by immersing it in a larger container of hot water. **DO NOT HEAT OVER AN OPEN FLAME!** Stir the wax/spirits thoroughly until it is well mixed and dissolved. Paint the cans with a brush in the same manner as above. Place the cans on a wire rack until dry. B: A light coating of ordinary spray silicone may be used to deter rust. Spray lightly, allow to dry, wipe gently with a clean cloth to remove excess silicone.

CLEAR COATING: A clear type of spray or brush on coating such as Rustoleum may be applied. This is best suited for larger resealable cans, but will keep them protected from corrosion for years.

GLASS JARS

Compared to metal cans, glass jars are very stable, although they obviously don't take being banged around well. Fortunately the cardboard boxes most jars come in are well designed to cushion them from shocks. The box also has the added bonus of keeping damaging light away from food.

The major advantage of glass jars is they are reusable. For wet-pack canning the lids should be replaced, but the rings can be reused until they finally rust away or become too dented to use. For dry pack canning even the lids may be reused nearly indefinitely if you're careful in removing them. In my personal experience I've grown to prefer Ball lids rather than Kerr, especially for vacuum sealed dry pack canning. The red sealing compound Ball uses seems to more reliably achieve a seal than the gray compound Kerr uses.

When you get right down to the bottom line, it is seldom practical strictly in terms of dollars and cents to wet-pack your own food in jars. When you count the cost of your equipment, including the jars, rings, lids and all the rest, along with a not inconsiderable amount of your personal time, the cost of purchasing or growing your produce, you'll almost always come out ahead to buy food canned for you by the commercial canning industry. That said, forget about the strict bottom line and examine more closely why you want to put up your own food. For many, gardening is a pleasure and they have to have something to do with the food they've grown! There's also the fact that for many, you simply cannot buy the quality of the food you can put up for yourself. The canning industry tries to appeal to a broad spectrum of the general public while you can put up food to your own family's specific tastes. Home canning is not so much about saving money as it is about satisfaction. You get what you pay for.

If home canning appeals to you, please allow me to point you toward the [rec.food.preserving FAQ](#) where much good information about methods and techniques may be found. Dry-pack canning using glass jars, on the other hand, may well make a great deal of economic sense. It is usually far cheaper per pound to purchase dry foods in bulk quantities, but often unsuitable to store it that way. Breaking the food down into smaller units allows for easier handling and exposes a smaller quantity to oxygen and moisture before it can be eaten. Of course, packaging used for doing this can be made of many different materials, but glass is often the easiest and most convenient to acquire and use. Used containers are often free or of little cost. One source of gallon sized glass jars are sandwich shops and restaurants that use pickles, peppers and other sandwich condiments. There are also half-gallon canning jars, though they are sometimes difficult to find. Both Ball and Kerr make these jars and I have a local Ace hardware order mine.

MYLAR BAGS

The word “Mylar” is a trademark of the DuPont corporation for a special type of polyester film. Typically made in thin sheets, it has a high tensile strength and is used in a wide variety of industrial settings.

In food storage, particularly for the long term, it is commonly found as a laminate with Mylar as the top layer, a very thin aluminum foil in the middle and one or more other types of plastic films on the bottom acting as sealant plies. This laminate combination possesses a high resistance to the passage of oxygen, carbon dioxide, nitrogen, other gasses, water vapor, and light which is what makes it valuable for our purposes. Unfortunately, it has a poor puncture resistance so must be used as an interior liner for more puncture resistant containers rather than as a standalone package.

Food grade aluminized Mylar complies with US FDA requirements and is safe to be in contact with all food types except alcoholic.

For food use, Mylar is most commonly available as pre-made bags of various sizes. Flat sheets or rolls of the material might also be found from which bags could be fashioned as well.

When Mylar bags are used by the storage food industry they are generally for products sealed in plastic buckets. The reason for doing this is the High Density PolyEthylene (HDPE) from which the pails are made is somewhat porous to gasses. This means that small molecules, such as oxygen (O₂), can slowly pass through the plastic and come into contact with the food inside. The problem is further compounded if oxygen absorbers are used, as the result of their absorbing action is to lower the air pressure inside the container unless it has first been carefully flushed with an inert gas such as nitrogen. How fast this migration activity will occur is a function of the specific plastic formulation, its wall thickness and the air pressure inside the container. In order to gain the maximum possible shelf life a second gas barrier, the Mylar bag, is used inside the pail.

Whether the use of these bags is necessary for your home packaged storage foods depends on how oxygen sensitive the food item is and how long you want it to stay at its best. If the container is made of a gas impervious material such as metal or glass then a second gas barrier inside is not needed. If it is HDPE or a plastic with similar properties and you want to get the longest possible storage life (say 10+ yrs for grain) then Mylar is a good idea. If you're going to use the grain in four to five years or less then it is not needed. Provided the oxygen has been purged from the container in the first place, either with a proper flushing technique, or by absorption, there will not have been sufficient O₂ infiltration to seriously impact the food. Particularly oxygen sensitive foods such as dry milk powders that are to be kept in plastic containers for more than two years would

benefit from the use of Mylar. Naturally, storage temperature and moisture content is going to play a major role as well.

There is also the question of the seal integrity of the outer container. If you are using thin walled plastic buckets in conjunction with oxygen absorbers the resulting drop in air pressure inside the pail may cause the walls to buckle. If this should occur, there would be a risk of losing seal integrity, particularly if the buckets are stacked two or more deep. If the food was packed in Mylar bags with the absorbers inside this would keep the vacuum from seriously stressing the container walls. Better still would be not to have the problem at all by either using containers of sufficient wall thickness or flushing with inert gas before sealing. Heavy wall thickness is one reason why the six gallon Super Pails have become so widespread. It should be noted that Mylar is not strongly resistant to insect penetration and not resistant at all to rodents. If mice chew through your buckets, they'll go right through the bags.

HOW DO I USE MYLAR BAGS?

Sealing food in Mylar bags is a straight-forward affair, but it may take a bit of practice to get it right, so purchase one or two more bags than you think you'll need in case you don't immediately get the hang of it.

#1 - The bags typically sold by storage food dealers look rather large when you compare them to the five or six gallons buckets they are commonly used in. That extra material is necessary though if you are to have enough bag material left over after filling to be able to work with. Unless you are sure of what you are doing, don't trim off any material until after the sealing operation is completed.

#2 - Place the bag inside the outer container and fill with the food product. Resist filling it all the way to the top. You need at least an inch or so below the bucket rim left open to get the lid to seat completely. If you'll be using desiccants and oxygen absorbers together place the desiccant on the bottom of the bag before filling.

#3 - When the pail seems to be full, gently thump it on the floor a few times to pack the product and reduce air pockets. Add any makeup food necessary to bring level back to where it should be.

#4 - Take the bag by the corners and pull out any slack in the material so that all sides can be pulled together evenly. Place your oxygen absorbers inside if you are going to use them. Now place a board over the top of the bucket and fold the bag end down over it keeping it straight and even. Place a piece of thin cotton fabric such as sheet or t-shirt material over the edge of the bag mouth. Using a clothes iron set on the cotton, wool or high setting run it over the cloth-covered Mylar about a half-inch from the edge for about twenty seconds or so until it seals. You'll probably have to do the bag in sections. Temperature settings on irons vary so experimenting on a leftover strip to find the right setting is a good idea.

#5 - When you've done the entire bag allow it to cool then try to pull the mouth of the bag open. If moderate pressure doesn't open it, fold the bag down into the pail until you feel the trapped air pillowing up against the material and wait to see if it deflates. If it stays buoyant, your seal is good. You can seal on the bucket lid at this point or take the further step to vacuum or gas flush the bag.

Once a seal has been obtained the bags can be left as-is, vacuum sealed or gas flushed. To obtain the most efficient oxygen removal the bags can be first drawn down with a vacuum pump and then purged using an inert gas.

Vacuum Sealing Mylar Bags

Once you have obtained a good seal on the bag, pulling a vacuum on the contents is straight forward. First you'll need something to make a vacuum with. This can be either a regular vacuum pump, a vacuum sealer such as the Tilia Food Saver or even the suction end of your household vacuum cleaner. The end to be inserted into the bag will need to be of fairly small diameter in order to keep the hole in the Mylar from being any larger than necessary. This means that if you use a vacuum cleaner you'll need to fashion some form of reduction fitting. One such that I've seen is a plastic film canister with a hole drilled in the bottom and a piece of plastic tubing epoxied in place.

Cut a hole into the Mylar bag on a corner, making the opening only just large enough to admit the vacuum probe. Insert the nozzle and using a sponge, or something similar, push down on the material over the probe to make a seal. Now draw down a vacuum on the bag. When it's drawn down as much as possible, run a hot iron diagonally across the cut corner resealing the bag.

Gas Flushing Mylar Bags

Flushing with inert gas works essentially like vacuum sealing except that you're putting more gas into the bag rather than taking it out. You'll want to keep the entry hole small, but don't make a seal around it as above. Beyond that, follow the directions as given in *Section III.B.2 - CO₂ and Nitrogen*. When you feel that the bag has been sufficiently flushed, run the iron across the corner as above to seal.

Flushing with dry ice can also be done, but it is important to wait until the frozen carbon dioxide has completely sublimated into gas before making the final seal otherwise the bag will burst like an overfilled balloon.

REUSING OR RECYCLING PACKAGING

In an effort to save money or because new packaging may be hard to come by, it is common for many people to want to re-use previously used containers. There is nothing wrong with this, but it is sometimes more complicated than using new containers would be. Here are some general rules if you have an interest in doing this.

#1. Do not use containers that have previously contained products other than food. There are two risks this can expose you to. The first is that the particular package type may not have been tested for food use and may allow the transfer of chemicals from the packaging into your food. The second is that all plastics are porous to some degree. Small amounts of the previous contents may have been absorbed by the packaging material only to be released into your food, particularly if it is wet, oily or alcoholic.

#2. Previously used containers should only be used with foods of a similar nature and exposed to similar processes. This means that if a container previously held a material high in fat, such as cooking oil, then it should not be used to store a strong acid such as vinegar. Nor should a container be exposed to extreme conditions, such as heat, if the original use of the package did not subject it to that treatment. An exception to this is glass which is covered below. Generally speaking, dry, non-oily, non-acidic or alkaline, non-alcoholic foods may be safely contained in any food safe container. An example of this is keeping grains and legumes in HDPE buckets formerly containing pickles.

#3. Glass may be used to store any food provided it is in sound condition and has only been used To store food previously. The lid or cap, however, that seals the jar is subject to the cautions given above. Glass jars not specifically made for home canning, either boiling water bath or pressure canning, have a significant risk of breakage if used for that purpose.

#4. Porous packaging materials such as paper, cardboard and Styrofoam should not be reused. Their open texture can trap food particles and are difficult to adequately clean. Packaging formerly holding raw meats, seafoods, or egg products are particularly at risk.

#5. Containers previously holding odorous foods may trap those odors and transfer them to foods later stored. Pickle flavored milk leaves a lot to be desired. Foods such as dry milk powders, fats and oils, flours and meals will absorb any odors seeping from your container material. Be sure to get the smell out before you fill them.

CARBON DIOXIDE AND NITROGEN

Carbon dioxide (CO₂) and nitrogen (N₂) are commonly used in packaging both fresh and shelf-stable foods, in order to extend their shelf lives. Fresh foods are outside the scope of this work so attention shall be focused on those foods suitable for use in storage programs.

The most common use of these gasses is for excluding oxygen (O₂) from the atmosphere contained inside of a storage container (called head gas). When head gas oxygen levels can be dropped below 2% the amount of undesirable oxidation reactions in stored foods can be greatly decreased resulting in longer shelf lives. Actually achieving this is not a simple matter when limited to the equipment and facilities typically available in the

home. Still, with careful technique and proper packaging materials it is possible to achieve useful results.

In order for either gas to be used most effectively it should be contained inside of packaging with high barrier properties to prevent outward diffusion over time or allowing oxygen to infuse in. Examples of this kind of packaging are aluminized Mylar or other high barrier property plastics, metal cans or glass jars. Buckets made of HDPE plastic are relatively poor gas barriers and will, over time, allow oxygen to infuse into the container. In order for foods to be kept for their maximum shelf lives the containers would need to be re-purged every three to four years. Foods that are particularly oxygen sensitive, such as dry milk powders, should not be stored in HDPE without a secondary gas barrier. It is possible to use HDPE buckets alone when gas purging if a shorter rotation period is used. An example would be using wheat in four to five years instead of the eight to ten that would be achievable if a high barrier container were used.

Purging efficiency can be greatly improved when used with a vacuum device. By first drawing down the head gas of the container and then flooding with the purging gas much more oxygen can be removed. Repeating the process once more will improve removal efficiency even more. If a true vacuum pump is not available, the suction end of a home vacuum cleaner can be made to serve and still achieve useful results. With careful technique, oxygen levels can be dropped to between 0.5-2%. Finely textured materials such as grain flours and meals, dry milk powders, dry eggs, and similar textured foods will purge poorly and are better packaged with oxygen absorbers. Instructions for vacuum usage are given in *A.5.1 Using Mylar Bags*. Instructions for gas purging are given below in *B.1 Dry Ice* and *B.2 Compressed Nitrogen*.

A less common, but important use for carbon dioxide is fumigation. This is killing or retarding insect life contained in a product. Many chemical fumigants are available to do this but are not thought desirable by many who have foodstuffs they want to put into storage. CO₂ is not as certain as the more toxic fumigants, but it can be made to work and will not leave potentially harmful residues behind. It is possible for nitrogen to work in a similar manner, but it must be in a head gas concentration of 99%+ whereas carbon dioxide can be effective over time at levels as low as 3%. The precise amount of time necessary for the gas to do its work will vary according to the specific insect species and its growth stage along with the temperature and humidity level of the product being fumigated. In general, the more active the growth stage and the warmer the temperature the more effective CO₂ is in killing weevil infestations. The gas also exhibits bacterial and fungal inhibiting properties, but for our purposes this will be of little moment since all foods should be too dry to support such growth in the first place.

The procedure for fumigating foodstuffs with carbon dioxide is precisely the same as the one used in purging oxygen from storage containers mentioned below. The only change is that for the fastest effectiveness the sealed container should be left in a warm place for a week or so before moving it into its final storage location. The gas is still effective at

cooler temperatures, but because insect life is slowed by lower temperatures the carbon dioxide takes longer to complete its mission.

NOTE: Both Mitsubishi Gas-Chemical, maker of the Ageless line of oxygen absorbers, and Multisorb, manufacturer of the FreshPax D 750 absorbers, state the their products should not be used in a high carbon dioxide environment. There are absorbers that will work well in high carbon dioxide atmospheres but they require an external moisture source which would make them difficult to use for our purposes.

Dry Ice

Using dry ice to displace oxygen from food storage containers is straightforward. To get the best results it is recommended that all foodstuffs and packaging materials be put in a warm location for a few hours before beginning the purging process. The reason for this is that the cold CO₂ sublimating from the dry ice will be denser than the warmer, lighter oxygen containing air. The cold gas will tend to stay on the bottom, gradually filling the container and pushing the warm air out the top.

When you first pick up your dry ice from the supplier, put it in a moisture proof container so that air humidity will be less able to condense and freeze on it. The sublimating gas will prevent you from achieving a tight seal, but you can slow down the water ice accumulation.

Gather your containers and any interior packaging materials. Break off a piece of dry ice of sufficient size for the volume to be purged. One pound of dry ice will produce about 8.3 cubic feet of carbon dioxide gas so approximately two ounces per five gallon bucket will do. Wipe off any accumulated water frost which should look whiter than the somewhat bluish frozen gas. Wrap in a paper towel to keep foodstuffs out of direct contact. Place in the bottom of the container that will actually contain the food, i.e. the bag. Fill the package with the food product, shaking and vibrating while doing so to achieve the maximum packing density.

If a vacuum process is not to be used then place the lid on the container, but do not fully seal. If a liner bag is being used then gather the top together or heat seal and cut off a small corner. This is to allow the air being purged to escape as it is pushed upward by the

expanding gas from the dry ice. Do not move or shake the container while the ice is sublimating so as to minimize turbulence and mixing. After about two hours feel the bottom of the container immediately below where you put the ice. If it's not still icy cold complete the seal. Check the container every fifteen minutes or so to be sure that a pressure build up is not occurring. A small amount of positive pressure is OK, but do not allow the container to bulge.

If a vacuum process is used then cut off a corner of the bag and insert the probe or place the container in the vacuum chamber. Draw a vacuum and when it has reached the desired point shut it off, but do not allow air back inside. When the dry ice has finished sublimating seal the container. If a slightly larger piece of dry ice is used this process may be repeated once more to improve oxygen removal. Watch for pressure signs as above.

NOTE: It is natural for some grains and legumes to adsorb carbon dioxide when stored in an atmosphere with high levels of the gas. This will result in a drop in head space air pressure much like using oxygen absorbers will cause as they absorb oxygen. Precautions should be taken in thin walled containers against buckling and possible loss of seal integrity. When the food products are removed from the container they will release the adsorbed CO₂ and suffer no harm.

WARNING: Dry ice is extremely cold (about -110° degrees F.) and can cause burns to the skin with prolonged contact. Because of this you should wear gloves whenever handling it. Also, dry ice evaporates into carbon dioxide gas, which is why we want it. CO₂ is not inherently dangerous, we breath it out with every breath we exhale, but you should make sure the area where you are packing your storage containers is adequately ventilated so the escaping gas will not build to a level dangerous enough to asphyxiate you. If you must pack your containers in a coat closet, leave the door open <grin>.

IMPORTANT NOTE: Because dry ice is very cold, if there is much moisture (humidity) in the air trapped in the container with your food, it will condense. Try to pack your containers on a day when the relative humidity is low or in an area with low humidity, such as in an air-conditioned house. Use of a desiccant package when using dry ice to purge storage containers may be a good idea.

DRY ICE SUPPLIERS

Dry ice may be found at ice houses, welding supply shops, some ice cream stores, meat packers or you could look in your local phone book under the headings “ice”, “dry ice” or “gasses”. If you are still unable to locate a source, contact your local hospital and ask to speak to the laboratory manager. Ask where the hospital gets the dry ice they use to ship biological specimens. You may be able to use the same source.

You may also want to check out Dry Ice Info.com (<http://www.dryiceinfo.com>) and click on the directory link to find a dry ice retailer in your area. While you're there check out some of the other uses for dry ice on the site. It's an interesting place.

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OXYGEN ABSORBERS

WHAT IS AN OXYGEN ABSORBER?

Oxygen absorbers are a relatively recent food storage tool whose arrival has been a real boon to the person wanting to put up oxygen sensitive dry foods at home. The packets absorb free oxygen from the air around them and chemically bind it by oxidizing finely divided iron into iron oxide. This removes oxygen from being available for other purposes such as oxidative rancidity and respiration by insects, fungi or aerobic bacteria. The practical upshot of all this is that by removing the free oxygen from your storage containers, you can extend the storage life of the foods inside. Not all foods are particularly oxygen sensitive but for those that are the absorbers truly simplify getting the job done. The absorbers themselves have only a relatively short life span, roughly about six months from the time they were manufactured for the types that do not need an external moisture source. They don't suddenly become ineffective all at once, it's just at that point you will begin to notice (if you can measure it) that the absorbers no longer soak up as much as they would when they were new. Better to use them while they're fresh.

HOW ARE OXYGEN ABSORBERS USED?

In order to make the best use of your absorbers you need to know three things:

#1 – Is the food I want to put by particularly oxygen sensitive for the time I want to keep it in storage? Whole grains that have not been polished or hulled such as wheat, corn, and rye are not especially oxygen sensitive. If you intend to use them up in five years or so, there's no great advantage to using oxygen absorbers, unless used to deter weevil infestations. The same for most beans and peas. Processed or high fat grains and legumes such as oats, barley, brown rice, soybeans, peanuts and split peas would benefit from their use if they are to be kept for more than a year. Whole grain products such as whole wheat flour and rolled oats would as well. Refined grain products such as white rice, white flour, degerminated cornmeal will keep fine for a year or so, possibly longer, without oxygen absorbers if kept dry and protected from weevils. Dry milk, dry eggs, dry meats, and many kinds of dehydrated foods and any kind of freeze dried foods would benefit from oxygen absorbers. Foods with an easily transferable fat content should not be used with oxygen absorbers, nor should they be used with foods that are high in moisture or with free liquids in the storage container. These should be preserved using pressure or boiling water bath canning as appropriate.

#2 – Will the packaging I want to use seal airtight and is the packaging material itself a good gas barrier? Obviously if the container won't seal air tight you're wasting your time trying to use oxygen absorbers but the barrier properties of a container stump many folks. Canning jars with good lids, properly sealed #10 (or other size) cans, properly sealed Mylar bags, PETE plastics with appropriate lids or caps, military surplus ammo cans with good gaskets, and many other types of packaging will seal air-tight and provide good barrier properties against oxygen infusing through the packaging material. Nonlaminated flexible plastic packaging (bags, sheets, etc.), HDPE plastic buckets and any kind of nonlaminated paper or cardboard container have poor gas barrier properties. "Poor" is a relative term, though, and if you're going to use the food up in two or three years, even

oxygen sensitive foods can be kept in unlined HDPE buckets if you use an appropriately sized absorber and make sure the bucket is well sealed. You'll be using the food before sufficient oxygen has been able to infuse through the walls of the container to make a significant impact.

#3 – What is the volume of the container and how much air volume remains after I've filled it with food? This is important to know if you want to make the most efficient use of your absorbers and be certain your food is adequately protected. Taking the question in two parts, here is how to determine the answer:

A. Absorber capacity is rated by the amount of oxygen in milliliters that each will absorb so you'll need to know what the volume of your container is in milliliters. The table below gives conversions between common U.S. container sizes and their milliliter equivalents.

Pint jar (16 fl oz) 475 milliliters
Quart jar (32 fl oz) 950 milliliters
Half-gallon jar (64 fl oz) 1,900 milliliters
#10 can (112 fl oz) 3,300 milliliters
One gallon jar (128 fl oz) 3,800 milliliters
Five gallon pail (640 fl oz) 19,000 milliliters
Six gallon pail (768 fl oz) 22,800 milliliters
Fifty-five gallon drum (7,040 fl oz) 208,175 milliliters

Fluid ounces x 29.57 = milliliters = cubic centimeters

Now multiply the volume of your container times the 21% (0.21) of the atmosphere that oxygen constitutes and you'll come up with the volume of oxygen, in milliliters, that your container holds when it's empty.

An example: A quart jar (32 ozs) is approximately 950 milliliters in volume. Multiply 950 x 0.21 (21%) and you get 199.5 milliliters of oxygen in an empty quart jar. This leads to the second half of the above question.

B. Determining remaining air volume in a container that has been filled can be difficult.

Foods vary widely in their density and porosity from flour, which will pack tightly to elbow macaroni which is mostly air even if you pack it to just short of crushing. The following are three rough and ready rules that can be used and will work.

i> Foods that have a lot of open space between the food particles (called *intersitial space*) such as macaroni, pasta, instant dry milk, instant potato flakes, many coarsely chunky dehydrated foods, cold cereals, etc. should use *one half* the container volume as the

remaining air space. Using the example above with the quart jar, there would be approximately 100 milliliters of oxygen remaining.

ii> Foods that pack more densely such as non-instant milk, dry eggs, flours and meals, grains with small kernels, dehydrated foods with fine particles and the like should use *one-third* the container volume as the remaining air space. Using the example above, there would be 66 milliliters of oxygen remaining.

iii> Alternatively, you could do what many of the commercial storage food packagers do and use the *entire container volume*. This is not as efficient as more closely determining remaining air volume but it does add certainty that your absorbers will soak up all available free oxygen and still leave some capacity to deal with any microscopic leaks or infusion through the packaging material.

NOTES: #1 — Both Multisorb and Mitsubishi corporations advise that their oxygen absorbers should not be used in a high carbon dioxide environment. This is apparently for reasons that the absorbers will also absorb carbon dioxide as well as oxygen and may run out of capacity before all of the oxygen in the container has been absorbed. **#2** — If you do choose to use oxygen absorbers in packing your food give some consideration to the sturdiness of your containers. In doing its job the absorber is going to be removing the 21% of the atmosphere that oxygen constitutes. Since nothing is replacing the absorbed gas this will leave the storage container with a lower atmospheric pressure inside than outside. If the container is sufficiently sturdy this pressure differential will be of little consequence. For containers with thinner walls the pressure drop could cause them partially collapse or buckle, particularly if other containers are stacked upon them. Should this occur the entire stack could fall causing one or more to burst. Metal cans and glass jars should have no problems, but some plastic buckets made of HDPE have relatively thin walls which can buckle when the internal air pressure drops. To deter this, a liner bag of Mylar or other high gas barrier plastic should be used. Heavier walled buckets won't need a liner unless you're trying to achieve the maximum possible shelf life. Seal the absorbers inside of the liner bag so that the pressure drop will not stress the walls of the container. Other containers should probably be tested or first flushed with an inert gas (N₂) before the absorber is sealed in.

#3 — If the pack of absorbers you need to open contains more than you are going to use in fifteen minutes or so, you should minimize exposure of the remaining packets. This can be done by heat sealing the bag they came in with an iron after expelling as much air as possible or better yet by vacuum sealing the bag. You can also put the remaining absorbers in as small a jar or metal can as they will fit in and closing with an air tight lid.

#4 — The chemical reaction that absorbs the oxygen releases minor amounts of heat. This heat release is trivial in an individual packet but if they are piled one atop another as you're using them they can warm each other and speed the absorptive reaction. This costs

you capacity lost to open room air so it's best to spread the packets in immediate use out on a tray so they lay atop each other.

#5 — If absorbers are sealed in a package with desiccants some thought should be given to how low the relative humidity will become. Silica gel will reduce humidity to approximately 40% which should not interfere with the absorbers oxidation reaction. Other desiccants, however, are capable of reducing relative humidity to very low levels. This might adversely affect your absorber's ability to carry out its mission by removing moisture from the absorber package that is necessary to sustain the oxidation reaction. If you do use desiccants and oxygen absorbers in the same package, place the desiccant on the bottom, fill the package and then place the oxygen absorber on top of the food before sealing.

MOISTURE IN PACKAGING AND FOOD STORAGE

WHY MOISTURE IS IMPORTANT

Moisture in inappropriate amounts and places is damaging to food. Because of this, much effort is put into reducing the water content of dry foods in order to prolong their shelf lives. Once it is reduced to the desired level the product can then be packaged for storage. Unfortunately, merely reducing moisture content is not always sufficient. Environmental conditions can play a role as well. There are four mechanisms by which environmental conditions may cause a moisture problem in your food storage:

- 1.** - The air trapped in the container with the food may have held sufficient humidity to raise the moisture content of the food to undesirable levels.
- 2.** - Even if the water vapor content wasn't too high, a falling temperature level may cause the trapped humidity to reach its dew point causing water to be squeezed out of the air to condense on your food much the same way as dew forms on your lawn on cool mornings after a warm, humid night. This can be a particular problem if the condensation is localized— say, only the portion of the food next to the walls of the container – resulting in excessive moisture in that local area even though the contents as a whole would be at a satisfactorily low moisture level.
- 3.** - The seal of the container may not be sufficiently tight enough to prevent moisture laden air from leaking in.
- 4.** - The packaging material itself may be porous to water vapor to one degree or another. All paper, wood and cardboard has this fault. Depending upon their particular physical properties some plastics do as well. Metal and glass containers have excellent barrier

properties though their seals may not. The solution for moisture problems is multi-faceted.

5 - Make sure the product to be stored is at an appropriate water content for that particular foodstuff. Beans and grains store well at a 10% moisture level, but milk powders, dried eggs and dehydrated or freeze dried foods should be lower for best results. As a general rule, nearly any dry food will store well at moisture contents between 3%-10% with the lower the better. Don't get carried away with this though. Extreme low moisture levels (below 3%) can make some foods difficult or impossible to reconstitute and damage the viability of seeds. Ideally, the dry foodstuffs you have on hand will have no more than a 10% moisture content. If they do not then you will need to reduce moisture to a level appropriate for the kind of food you are storing.

One of the following methods might be of use in lowering moisture content.

A - The least involved is to wait until the driest time of year for your location making sure there is plenty of free air circulation around the food product. If this doesn't suit, then turn your air conditioning on a little high. Bring in your buckets, lids, and the storage food. Let everything sit in a well-ventilated place where it's going to get plenty of cool, dry air from the A/C (avoid anywhere near the kitchen or bathroom areas, as they put out a lot of moisture). Stir the food frequently to maximize moisture loss. A few days of cool, constant air flow and low humidity ought to dry things out. Due to its odor absorptive nature, I would not do this with any dried milk products or other powdered foods, flours or meals. This method works best with coarse particles such as grain, legumes and dried foods.

B - Warm, dry air can also be used to lower moisture content and works well if you have large quantities of grains and legumes. This is similar to what is used on farms for drying harvested grain. You'll need a source of forced, warm, *not hot*, air. Place the grain in a drum or barrel and blow the heat from the bottom so that the warm and the moisture it will carry can exit from the top. It's important to not let the bottom product get too hot. You should also monitor the top, center of the drum to be certain the product there is not getting damp from the moisture escaping other areas. Stirring occasionally may be necessary. I've seen this done with an old, drum style vacuum cleaner that put off fairly warm exhaust air and it worked pretty well. Do be sure to clean the vacuum thoroughly so you don't blow the grain full of dust.

C - If the above methods won't do or you have powdery foods to dry, you can put the food and a large quantity of desiccant (see below) in a storage container. The desiccant should be in its own container placed on top of the food and the container lid sealed on. After about a week, unseal and check the desiccant. If it's saturated, change it out with dry desiccant and reseal. Continue to do this until the contents are sufficiently dry. If it doesn't become saturated the first time, change it anyway before sealing the bucket permanently to deter saturation in storage.

If your food products are sufficiently dry you can pack them in storage containers using the packaging method of your choice and have a reasonable expectation of your food staying in good condition. Whether you will need to use a desiccant will be dependent upon the conditions discussed below.

2 - Try to package your goods in a dry atmosphere and do not allow extreme temperature swings in storage areas. Warm temperatures and a high relative humidity when a container is sealed means the air trapped inside the container will have a high dew point. This will lead to condensation should storage temperatures fall below that dew point. An example of this would be a container sealed on a day that was 70° F and 40% relative humidity. At that temperature the relative humidity would be quite reasonable for all but the most moisture sensitive food. However, should the temperature fall to 44° F the capacity of the air to hold water vapor would have dropped to the point that it could not contain what was sealed in at 77° F and the excess would be squeezed out to condense on the food, i.e. – it will grow moister. Possibly the food will be able to adsorb this moisture without harm and then again, it may not.

3 - Use appropriate packaging materials and make certain it is sealed correctly. If you are going to consume them in four to five years, storing grains, beans and peas in unlined HDPE buckets at normal humidities is fine. If you want to keep them at their best for many years beyond that, the plastic the pail is made of is too porous to water vapor for best results and should have an interior liner of a material with better barrier properties. Dry milk powders should not be kept for more than a year in unlined HDPE, but can be kept for much longer in #10 metal cans, glass jars or Mylar bags. Naturally, even the most highly resistant packaging material is useless if its seal isn't good so be sure you use good technique when making closures.

Lastly, you may wish to consider using a desiccant if good humidity control at the time of packing is difficult or if the storage area is in a high humidity environment or if the packaging material does not have sufficiently high barrier properties.

NOTE: There has been some confusion in the past over the appropriate use of desiccants in food storage which I would like to address here. Any desiccants you may seal in your storage containers (if you use them) are not for lowering the moisture content of the foods therein, but for moderating any shifts in moisture levels caused by those factors I mention above. If the food you want to put up is too high in moisture for good storage this needs to be dealt with BEFORE you seal the packaging. An example of what I'm trying to communicate here would be 10lbs of wheat with a 15% moisture content. That's too high for safe storage and needs to be lowered, preferably to 10% or less. To lower the moisture content of that grain to 10% you need to remove the 5% excess. 5% of 10lbs is eight ounces of water. Good dry silica gel (one of the most common desiccants) will hold 40% of its mass in moisture so to soak up that extra water you would need 20 ounces of silica gel – quite a large amount – all to remove that 5% excess moisture in ten pounds of grain.

Fifty pounds of grain at that same moisture level would require 100 ounces or *six and a quarter pounds of silica gel*. Clearly no practical amount of desiccant you can put inside your storage packaging will do for you what should have been done before the food was put by. Desiccants can be used for lowering food moisture content, but this will involve rotating packages of desiccant in and out of the foodstuff until the desired moisture content has been reached. Once the package is sealed any desiccant you leave inside should be there to control moisture fluctuations or to guard against moisture infiltration from the outside.

WHAT IS A DESICCANT?

A desiccant is a substance with strong *hygroscopic* properties, meaning it will soak up water vapor from the surrounding air. A number of different substances are capable of doing this, but only a relative few of them are of practical use and fewer still are going to be readily available to the average person. Before elaborating on the different types that might be useful for our purposes it's necessary to explain how to choose a desiccant. The U.S. military has done much of the best research on the use of desiccants in packaging and have largely set the standards by which they are judged. Each type of desiccant has temperature and humidity ranges where it performs best and particular physical and chemical characteristics that may need to be considered in relation to what you propose to do with them. The most applicable standard for home food storage defines a unit of desiccant as *the amount of desiccant that will adsorb at least 6 grams of water vapor at 40% relative humidity at 77° F (25° C)*.

Desiccant Needed to Adsorb 6 Grams of Water Vapor

Desiccant Type Mass (weight) of Desiccant Needed

Silica Gel 15 grams

Indicating Silica Gel 75 grams¹

Montmorillonite Clay 24 grams

Calcium Oxide (quicklime) 21.5 grams

Calcium Sulfate (gypsum, Drierite) 60 grams

Wood 43 grams

(1) See desiccant descriptions for clarification.

In order to maximize surface area to obtain optimal adsorption, desiccants are manufactured in granular or powder forms. This presents a problem of keeping the desiccant, which may not be safe for direct contact with food, out of the product while still allowing sufficient air flow for it to carry out its task. Manufacturers call this “dusting” and deal with it by packaging the adsorbent in materials such as uncoated Tyvek, a spunbonded high-density polyethylene material produced by the Dupont corporation. Unfortunately, I have not yet been able to locate a retail source of uncoated Tyvek, just the coated variety such as is used in postal envelopes. Second

best, and what I use, is two or more layers of coffee filter paper securely sealed over the mouth of the container holding the desiccant. I've also made "cartridges" of filter paper for use in narrow necked containers such as two-liter bottles. For this I used ordinary white glue. Getting a good seal all the way around requires some care in execution. Brown Kraft (butcher paper) may be used as well.

For coarse granular materials tightly woven fabrics might serve the purpose providing the seams are tightly stitched.

TYPES OF DESICCANTS SILICA GEL

The most commonly known and used desiccant is silica gel which is a form of silica dioxide (SiO₂), a naturally occurring mineral. It will work from below freezing to past the boiling point of water, but performs best at room temperatures (70-90° F) and high humidity (60-90%). Its performance begins to drop off over 100° F, but will continue to work until approximately 220° F. It will lower the relative humidity in a container to around 40% at any temperature in its range until it is saturated. Silica gel will absorb up to 40% of its weight in moisture. Some forms are approved by the FDA for direct food use (check with your supplier to be sure). It recharges easily (see below in the indicating silica gel text) and does not swell in size as it adsorbs moisture.

INDICATING SILICA GEL

In the retail trade, the most common form of silica gel is indicating silica gel composed of small white crystals looking much like granulated sugar with pink or blue colored crystals scattered throughout. This is ordinary silica gel with the colored specks being coated with cobalt chloride, a heavy metal salt. When the gel has absorbed approximately eight percent of its weight in water the colored crystals will turn from blue to pink making an easy visual indicator of whether the gel has become saturated with moisture. *Because cobalt is a heavy metal, **indicating silica gel** is not food safe and should be kept from spilling into anything edible.*

The indicating silica gel will still adsorb up to 40% of its weight in water vapor like the non-indicating type will but once it has gone past the 8% level and the crystals have turned pink there is no way to tell how close it is to saturation. This isn't necessarily a problem, you'll just have to treat like the other non-indicating desiccants and either weigh it to determine adsorption or use a *humidity indicator card*. These cards are made to show various humidity ranges and can be had from many desiccant and packaging suppliers.

When saturated, both varieties of silica gel can be dried out and used again. This is done by heating the crystals in an oven at a temperature of no more than 300° F (149° C) for approximately three hours approximately three hours or until the crystals turn blue.

Dehydrating the desiccant may also be accomplished by heating in a microwave oven. Using a 900 watt oven heat the crystals for three minute intervals until the color change occurs. The exact amount of time necessary will depend upon the oven wattage.

Spreading the desiccant in a broad pan in a shallow layer will speed the process. Heating to 325° F (149°C) or more, or using a microwave oven over 900 watts can damage the gel and render it unable to adsorb moisture.

If your desiccant is packaged in Tyvek, do not heat above 250° F (121° C) or you could damage the material. This leaves a fairly narrow temperature window since silica gel will not begin to desorb moisture below 220° F (104° C). It's a good idea to use a reliable oven thermometer to check your oven temperature as the thermostats in home ovens are often off by more than twenty five degrees. Start with the packets in a cold oven and raise the temperature to 245° F (118° C), keeping it there for twenty four hours. Spread the packets so they are not touching and keep them at least 16 inches from any heating elements or flames so that radiant heat does not damage the packaging. Tyvek should not be microwaved.

HOW DO I USE DESICCANTS?

Before you get to this point you should have already used the charts above and determined how much of the particular desiccant you're interested in you need for the size of the storage containers you'll be using. Once you know that you're ready to put them it into use.

Although they perform different functions, desiccants and oxygen absorbers are used in a similar fashion. They both begin to adsorb their respective targets as soon as they are exposed to them so you want to only keep out in the open air as much desiccant as you are going to use up in fifteen minutes or so. If you'll be using oxygen absorbers in the same package, place the desiccant on the bottom of the package and the oxygen absorber on the top. This is to keep the desiccants from robbing needed moisture from your oxygen absorbers which will hinder their operation.

If your desiccant is pre-packaged, that's all there is to it, put it in the package and seal it up. If you have purchased bulk desiccant you'll first need to make your own containers.

I use indicating silica gel for practically everything. My usual procedure is to save or scrounge clear plastic pill bottles, such as aspirin bottles or small plastic jars. Fill the bottle with the desiccant (remember to dry the gel first) and then use a double thickness of coffee filter paper carefully and securely tied around the neck of the bottle to keep any from leaking out (remember the indicating type of silica gel is not food safe). The paper is permeable to moisture, but it's tight enough not to let the crystals out. I use several winds of plain cotton string for this as both adhesive tapes and rubber bands have a way of going bad over time which might allow the cap to come off spilling the desiccant into the food.

For containers that have openings too narrow to use a desiccant container such as described above you can make desiccant packets with the same filter paper. The easiest way I've found is to wrap at least a double layer of paper around the barrel of a marker

pen and use a thin bead of white glue to seal. Slide the packet off the pen and allow to dry. When ready, fill with the necessary amount of desiccant. You can then fold the top over twice and tie with string or staple closed. Take care that the top is closed securely enough not to allow any desiccant to leak out. Virgin (not recycled) brown Kraft paper can be used to make the packets with as well.

The above method will also work other desiccants, subject to whatever precautions the individual type may have.

IMPORTANT NOTE: *The indicating form of silica gel (has small blue or pink specks in it) is not edible so you want to use care when putting together your desiccant package to insure that it does not spill into your food.*

WHERE DO I FIND DESICCANTS?

I buy indicating silica gel at Wal-Mart in their dry flower section where it is sold in one and five pound cans for flower drying. I've seen it sold the same way in crafts stores and other department type stores that carry flower arranging supplies. You can also buy it from many other businesses already prepackaged in one form or another to be used as an adsorbent. All of the desiccant that I've found packaged this way has been rather expensive (to me) so shop carefully. There are a number of Internet sources available which will probably provide your best route for finding what you want.

Businesses carrying packaging supplies sometimes also sell desiccants. Some businesses commonly receive packets or bags of desiccants packaged along with the products they receive. I've seen montmorillonite clay in bags as large as a pound shipped with pianos coming in from Japan. Small packets of silica gel seem to be packed in nearly everything. Naturally, any salvaged or recycled desiccant should be of a type appropriate for use with the product you want to package.

It is possible to make your own desiccants using gypsum from drywall and maybe Plaster of Paris. Calcium oxide can also be produced from limestone (calcium carbonate) or slaked or pickling lime (calcium hydroxide) by roasting to drive off the adsorbed water and carbon dioxide. I don't have any clear instructions, as of yet, on how to go about this. Please do keep in mind that calcium oxide (quicklime) is caustic in nature and is hazardous if handled incorrectly.

DIATOMACEOUS EARTH WHAT IS DIATOMACEOUS EARTH?

Diatomaceous earth is a naturally occurring substance partially comprised of the fossilized remains of diatoms. Diatoms are microscopic sized hard shelled creatures found in both marine and fresh waters. The diatom shells are covered in sharp spines that make them dangerous to exoskeleton insects, but not to animals with internal skeletons. The spines of the diatom skeletons pierce the soft body tissues of insects between their hard exoskeleton plates and it is through these numerous microscopic wounds that the insect loses bodily moisture to the point of desiccating and dying. Creatures with internal

skeletons such as humans, cattle and pets have means of resisting such damage and are not harmed. Thus, it is possible to mix a small amount of DE into your stored grains and beans to deter insect infestations without having to remove the dust again before you consume them. *Diatomaceous earth works in a purely physical, not chemical, manner thus has no chemical toxicity.*

As neat as this sounds, in the limited number of controlled studies that I have been able to find it seems that DE is not as effective in controlling food storage insects as properly used freezing techniques, fumigation with carbon dioxide (dry ice) or sealing in air-tight containers with oxygen absorbers. This is primarily for reasons that most of the insects that cause a problem in grain storage are hard-shelled weevils which have only a limited amount of soft tissue exposure. I now mostly use DE for controlling ants and roaches in areas where I feed my animals and bedding areas. Still, some folks want to use DE in their food storage so the following information is provided.

WHERE DO I FIND D.E. AND WHAT TYPE SHOULD I BUY?

IMPORTANT NOTE: There are two kinds of diatomaceous earth to be found on the market and only one of them is suitable for use as an insecticide in your stored grains.

The type you DO NOT WANT FOR FOOD USE is sold by swimming pool suppliers as a filtering agent. DE to be used for filtering has been subjected to a heat treatment that dramatically increases it's crystalline silicate content which makes it unsuitable for use with your foodstuffs. The diatomaceous earth that is needed for use in food storage has not been heat treated and has a crystalline silica content of no more than 1-1.5%. It is commonly sold in hardware and garden stores as an "organic pesticide" and is available from a number of storage food dealers. A few of these suppliers are listed in the Resources section.

I have always purchased my DE from my local hardware store and have had no concerns about its safety. However, a number of correspondents have reported to me that their local suppliers keep their DE in the same area as their chemical pesticides. This causes some concern about possible contamination and I no longer recommend using DE from these sources. Since the actual amount of DE (by weight) that is necessary to protect grains is fairly small I recommend ordering yours from suppliers who will guarantee their product is *food grade* as stipulated by the US FDA. This will insure you receive a product that has no deleterious contaminants and is safe to use.

HOW DO I USE D.E. IN FOOD STORAGE?

To use, you should mix thoroughly one cup (8 fl ozs) of DE to every forty pounds of grain, grain products or legumes. This works out to approximately one cup of DE to every five gallon bucket of food you want to treat. You need to make certain that every kernel is coated so it is better to do the mixing in small batches where you can insure more even

coating. Both the grain and the DE should be quite dry when doing the mixing otherwise you'll get an uneven distribution.

WARNING: DE is a powdery dust which you need to take steps to keep out of your lungs and eyes. A paint or hardware store filter mask and a pair of goggles will do the job. It's a good idea to do the actual mixing outside in a slight breeze otherwise you'll get DE all over everything. Even whole wheat flour dust can cause lung irritation if you breathe in a sufficient amount. Being inactive and usually covered in a hard shell, DE works poorly on insect eggs or pupae. It has more effectiveness on larvae and adult insects with a fair amount of soft tissue exposure.

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SPOILAGE

INSECT INFESTATIONS PESTS OF STORED GRAINS, LEGUMES AND DRY FOODSTUFFS

Insect infestations can occur in a wide variety of foodstuffs such as flours, meals, pastas, dried fruits or vegetables, nuts, sweets, whole grains, beans, sugars, TVP, jerky, bird seed and pet foods.

Naturally, the best way to deal with an insect infestation is not to have one in the first place. Try to purchase your goods from suppliers who are clean and who turn over their inventory quickly so the products you purchase will be less likely to have bugs.

When you buy foodstuffs examine them closely to be sure they are insect free. Check for any packaging or use by dates to insure their freshness. Don't shake the package, most adult insects will be found in the top couple of inches of the product and shaking the package will mix them into the contents disguising their appearance. If the package does turn out to be infested, return it for replacement.

If not already packaged for storage when you buy them transfer your foods into air- and moisture-tight containers so they cannot be invaded after you have brought them home. With sufficient time, some adult and larval insect forms can penetrate paper, cardboard and thin plastic packaging. Storage containers should be glass, metal, or heavy plastic with tight fitting lids. As with everything in food storage, you should use older packages before newer ones and opened packages before unopened ones.

Storage areas should be kept clean. Don't allow grain, flour, beans, bits of pasta or other food particles to accumulate on shelves or floors. Cracks and crevices should be sealed or otherwise blocked. Except for sticky spills, vacuuming is the best method of cleaning as soap and water can wash food particles into cracks.

Insects may also get their start in chairs, sofas and carpets where food is dropped and not cleaned up. Don't forget to replace the filter bag on the vacuum as some insects can survive and reproduce in the bag.

Bags of dry pet food and bird seed can harbor insect infestation. Decorative foodstuffs such as ears of colorful Indian corn, colored beans and hard squashes can carry insects that may infest your edible food. Even poison baits can harbor flour beetles.

CONTROL OF INSECT INFESTATIONS

Should you find that in spite of buying fresh products and using careful packaging techniques you have an insect infestation, you can try some of the following steps:

- 1.** If the food is too heavily infested to try to save it should be disposed of as soon as possible. Remove from the kitchen or food storage area immediately so as to not infest other foods.
- 2.** Large bugs can be sifted or winnowed out if the food's not too heavily infested and you want to try to save it. Then treat by placing into a deep freezer at 0° F (-18° C) for three to seven days depending upon the size of the package. Refrigerator freezers usually do not freeze low enough to effectively kill all of the life stages of insects, but if left there, will slow their development. If freezing is not workable then the product could be spread on baking sheets and heated to 150° F for fifteen to twenty minutes, cooled and repackaged. This will shorten shelf life so heat treated foods should be consumed shortly thereafter.
- 3.** The surface areas where the food containers are stored can be treated with an insecticide. This is not a replacement for clean storage habits and good containers, but is rather a supplement. This will not control insect infestations already in your stored foods. Spray the shelf surface with 0.5% chlorpyrifos (Dursban), 1% propoxur (Baygon), 0.5 percent diazinon, or 0.25 percent resmethrin. You can find any of these in the hardware store in ready to apply packages. If a sprayer isn't feasible then they can be applied with a paint brush. Allow the solution to dry thoroughly. Cover the shelves with clean, untreated shelf paper then put properly packaged foods back on shelves. **READ THE PRODUCT LABEL FOR SAFETY INFORMATION CONCERNING CHILDREN AND PETS.**

Household bleach, Lysol and other sterilizers will not control insect infestation, though they can be used for mold, mildew and algae.

You may continue to find some insects after the cleanup is finished. This could be for several reasons. It may be they escaped from the packages they were infesting and did not get cleaned up. There may be more packages infested than were originally found or, there may be hiding places in the storage area that need attention. Once you have carefully eliminated all food sources, the bugs should disappear in a few weeks.

MOLDS IN FOOD

Molds are fungi like mushrooms and yeast. Also like mushrooms, they reproduce by releasing spores into the air that land on everything, including your food and food storage containers. If those spores begin to grow, they create thin threads that spread through their growing medium. These threads are the roots of the mold fungus, called *mycelium*. The stalk of a mold fungus is the portion above or on the surface of the food. It produces the spores and gives the mold its color. We've all seen examples of this when we discover a dish of something or other left too long in the refrigerator only to become covered in a mold fuzz.

Molds can grow anywhere they have a growing medium (their food), sufficient moisture and warmth. Some can even grow at refrigerator temperatures, albeit more slowly than they would if it were warmer. These fungi can also withstand more salt and sugar than bacteria, which is why you sometimes find mold in jellies and jams with their high sugar content and on dry cured products like ham or bacon with their high salt content.

In the past, a slight amount of mold was commonly felt to be harmless and the food consumed anyway. For molds that were intentionally introduced, such as the mold in bleu cheese, this is fine. For the unintentional molds, it could possibly be a serious error in judgment. These unwanted molds could be producing toxic substances called *mycotoxins* which can be very bad indeed. Mycotoxins are produced around the root or mycelium of molds and these mold roots can penetrate deeply into the food. Mycotoxins can survive for a long time and most are not destroyed by cooking. The molds probably best known for this dangerous spoilage are the various *Aspergillus* species which produces a mycotoxin known as *aflatoxin*, but there are other dangerous fungi as well, such as the *Fusarium* molds. Both of the above affect grains and some legumes. See *B.3 Molds In Grains and Legumes*.

IMPORTANT NOTE: In wet pack foods such as your home canned goodies, molds can do something else as well, possibly with lethal consequences. If they find their way into wet pack acid foods canned by the boiling water bath method, whether by reasons of improper procedure or contamination after the fact, they can consume the natural acids present in the food. The effect of this is to raise the pH of the food in the container, perhaps to the point that it becomes possible for spores of *Clostridium botulinum*, better known as *botulism*, to become active and reproduce. For this reason, moldy wet pack foods should be *safely* discarded. This most deadly kind of food poisoning has an entry of its own in the bacterial spoilage section. Molds in low acid foods canned by the pressure canning method are equally dangerous and should also be discarded in a safe manner.

MINIMIZING MOLDS

You can do a number of things to minimize unwanted mold growth in your kitchen, food storage areas and refrigerators. If your kitchen is at all like mine, it is the refrigerator that

is going to collect the most fungal growth. This can be dealt with by washing the inside every couple of months with a tablespoon of baking soda dissolved in a quart of warm water. Rinse clean and allow to dry. The black mildew that grows on the rubber door gaskets and other places can be dealt with by wiping down with a solution of three tablespoons of household bleach in a quart of water. I generally use a soft bristle brush for this. A really bad case will not bleach back to a white color, at least it won't for me, but will instead turn pink or red after the bleach has carried out its disinfection mission.

The rest of the kitchen can be kept mold free by keeping the area clean, dry, and spraying occasionally with a product such as Lysol. Patches of mold can be eliminated with the bleach solution used on the refrigerator doors.

Try not to purchase more fresh food than you'll be able to eat in a short period of time. This will keep you from having to deal with the moldy remains that didn't get eaten. If food does go moldy, don't sniff it. This is a good way to give yourself respiratory difficulties if you are at all susceptible to mold allergies. Moldy food should be disposed in such a manner that your animals and children won't be able to get into it. Mycotoxins are every bit as bad for your animals as they are for you.

Obviously, you don't have to throw out everything that shows a spot of mold on it. Some foods can be safely dealt with and still partially saved if they show signs of fungal growth. Below is a set of guideline from M. Susan Brewer, Ph.D., R.D., a specialist in food safety. Her articles and works are found in many state university extension services publications lists. *If the food shows even a tiny mold spot, follow these guidelines:*

1. Hard or firm foods with tiny mold spots can be trimmed; cut away the area around the mold (at least an inch) and rewrap in clean wrap. Make sure that knife does not touch the mold.

TRIM:

Hard Cheese (Cheddar, Swiss, etc.)
Bell Peppers, Carrots, Cabbage
Broccoli, Cauliflower, Brussels Sprouts
Garlic, Onions
Potatoes, Turnips
Zucchini
Apples, Pears

2. Soft foods such as cheese slices, cream cheese, sour cream and yogurt should be thrown away.

TOSS:

Soft Cheeses, (Mozzarella, Brie, etc.)
Sour Cream, Yogurt, Cottage cheese

Bacon, Hot dogs, Sliced lunch meats
Meat pies
Opened canned ham
Most left-over food
Bread, Cakes, rolls, flour, pastry
Peanut butter
Juices, berries
Jam, Jellies, Syrups
Cucumbers, Tomatoes
Spinach, Lettuce, other leafy vegetables
Bananas, Peaches, Melons
Corn-on-the-cob
Stored nuts, whole grains, rice

MOLDS IN CANNED GOODS

If good equipment and proper technique are used, it is unlikely goods. If you do have such, there was either a flaw in the procedure used, or something affected the jar or can after the fact to break its seal. In any event, once the food has molded, it is past saving and should be discarded in such a way that children and animals will not be able to get into it. The most likely home canned products to show mold growth are jams and jellies sealed with paraffin wax.

There are a number of points in the canning process where this can occur:

- (1) In the time after the jar is taken out of its boiling water bath, but before it is filled.
- (2) In the time between when the jar is filled and covered with the melted wax.
- (3) When the wax cools, if it pulls away from the side of the jar, leaving an opening for the mold to get in.
- (4) If bubbles form in the paraffin, which break and leave holes.

For these reasons most canning authorities no longer recommend using this technique. If you must do so, the jars should be boiled for at least 10 minutes before the jelly is poured. The filled and wax capped jars should then be covered with some sort of protective lid. The book, *Putting Food By* has excellent instructions on this or see the applicable section of the *rec.food.preserving FAQ*.

MOLDS IN GRAINS AND LEGUMES

It has long been known that eating moldy grain is bad for your health with the ugly consequences of eating ergotinfected rye being a well known example. It has only been about thirty years, though, that intensive study has been carried out on other species of grain fungi and their respective mycotoxins. Fortunately, for those of us in the U.S., the USDA and the various state departments of agriculture go to a great deal of trouble to

detect grain and legumes infected with these toxic fungi. In some of the less developed countries, the citizenry are not so lucky. It is good to have something of an understanding of what one should do to prevent mold growth in ones stored grains and to have an idea of what to look for and ask about when purchasing grains and legumes.

The one fungal group that has caused the most commotion in recent history are the various *Aspergillus* species of molds. Under certain conditions with certain grains, legumes, and to a lesser extent, nuts, they can produce a mycotoxin called *aflatoxin*. This is a serious problem in some parts of the world, most especially in peanuts, occasionally in corn. I am not aware of any documented deaths in the United States from aflatoxicity, but other nations have not been so fortunate. What makes aflatoxin worrisome in this country is that it is also a potent carcinogen (cancer causing agent).

In addition to the *Aspergillus* molds, there is also a large family of molds known as *Fusarium* which can produce mycotoxins of their own, none of which do you want to be eating directly or feeding to your food animals where you will get the toxins back indirectly when the animal is slaughtered and eaten.

The Federal and state governments continuously monitor food and forage crops entering the marketplace. Those products found to be contaminated with mold or mycotoxins are not allowed to be sold for food. Once purchased however, the responsibility is yours to keep your food safe from mold growth. If you have already found mold growth in your whole grains, meals, flours or other grain products, they should be discarded. Most mycotoxins are not broken down or destroyed by cooking temperatures and there is no safe way to salvage grain that has molded.

PREVENTING MOLD GROWTH IN STORED GRAINS AND LEGUMES

The easiest method to prevent mold growth in your stored grains and legumes is to keep them too dry for mold to grow. The *Aspergillus* and *Fusarium* molds require moisture contents of 18% and above to reproduce. This is subject to some variability, but in all grains and soybeans, they must have a moisture content of that level. If you are storing raw (not roasted) peanuts, in the shell or shelled, you want to get the moisture content to less than 8% as peanuts are particularly susceptible to mold growth. The recommended moisture content for all other grain and legume storage is no more than 10%. Please see part *Grains and Legumes* for a method to determine moisture content. At 10% moisture, there is simply too little water for fungi to grow.

BACTERIAL SPOILAGE

Like the fungi, bacteria are everywhere, in the water, soil, air, on you, your food and your food storage containers. Fortunately, the vast majority of the bacteria we encounter are relatively harmless or even benign and only a few represent a danger to us and our stored foods.

Bacteria can be much more difficult to kill than molds and insects. Some are capable of continued growth at temperatures that would kill other spoilage organisms. When conditions are such that they are unable to grow, some bacteria can go dormant and form spores. These spores can be quite hardy, even to the point of surviving boiling water temperatures. In order to grow, bacteria must have water, some species needing as little as a 20% moisture. For properly packaged dry grains, legumes, powdered milk and other low moisture foodstuffs bacterial spoilage will never be a problem as their moisture levels should be too scant to support growth.

WARNING: It is in wet pack canned goods (where the container has free liquid in it) and fresh foods we must be the most concerned about spoilage bacteria. It is here that a little bad luck and a moment's inattention to what you are doing could kill or seriously injure you or some other person who eats the foods you've put by. In both home-canned and commercially-canned goods, IF THE CAN IS BULGING, LEAKING, SMELLS BAD, OR SPEWS LIQUID WHEN YOU OPEN IT THEN THROW IT OUT! But, throw it out safely so that children and animals cannot get into it.

BOTULISM

Clostridium botulinum is one of the oldest life forms on this planet dating from a time before the Earth had an abundant oxygen atmosphere. Like the gangrene bacteria, it is an anaerobic organism meaning it lives and grows only in the absence of free oxygen. When conditions are not suitable for growth the bacteria can form durable seed like spores which are commonly found in the soil. This means that *C. botulinum* can be brought into your life on raw produce, tools, hands or anything else that came into contact with dirt. To further complicate matters, botulinum spores are extremely heat hardy. The bacteria itself can be killed by a short exposure to boiling water (212° F AT SEA LEVEL PRESSURE), but its spores can not. To kill them, the food product and container must be exposed to temperatures of 240° F (AGAIN AT SEA LEVEL PRESSURE) for a long enough period of time to allow all of the food in each container to come completely up to the proper temperature. Only a pressure-canner can reach the necessary temperature.

It's not the bacteria or its spores which are directly deadly, but the toxin the bacteria creates when it grows and reproduces. In its pure form, botulism toxin is so potent that a mere teaspoon would be enough to provide a fatal dose to hundreds of thousands of people. It is this lethality that is why every responsible book on home canning, food preservation, and food storage hammers constantly on the need for care in technique and method and why spoilage must be taken seriously.

Like any other life form *Clostridium botulinum* must have suitable conditions for its growth to become a danger. One of the most important of these is water - the botulism bacterium needs moisture in the 35% range to grow making it a danger only in improperly processed high moisture foods. Another requirement is suitable pH, which is the measure of acidity or alkalinity in a substance and is measured on a scale of 1-14. Anything above 7 is considered alkaline and everything below 7 is considered acid. If the

acidity of your wet pack food is BELOW pH4.6 then *C. botulinum* is unable to grow. Keep in mind that in foods pH is not necessarily stable and could possibly change if other spoilors like mold are able to grow. If the product should change to a lesser acidity than pH4.6 your previously botulinum proof food may start allowing the lethal spoiler to grow (see *molds in canned goods*). This is why it is vital to use proper technique, even for acid foods like tomatoes. It has been found that when this pH shift occurs allowing *C. botulinum* to become active producing its lethal toxin the bacterium also produces minute amounts of acid which can lower the pH of the poisoned food back into what should have been the safe zone had the pH not jumped up and allowed the bacteria to grow. Again and again — use good technique and pay attention to what you are doing.

Unlike fungal mycotoxins Botulinum toxin can be destroyed by boiling food briskly in an open vessel for fifteen minutes. Because of this, if your canned food shows any safety problems you should follow this procedure. If the food shows even the slightest mold growth, keep in mind that mycotoxins are not for the most part broken down by heat and dispose of the food safely. I won't go into the hows of home canning here. For that I strongly recommend that you read the *rec.food.preserving FAQ*, the *Ball Blue Book* or most especially the book *Putting Food By* for in depth information on this subject.

ENZYMATIC ACTION IN FOOD SPOILAGE

Every living organism uses enzymes of many sorts in its bodily functions as part of its normal life cycle. Enzymes are used in creating life. After death, enzymes play a role in the decomposition of once living tissue. The enzymes in a tomato help it to ripen and enzymes produced by the tomato and whatever fungal and bacterial spoilors are on it cause it to decay.

Fortunately, slowing down or stopping the action of a food's enzymes is much easier than slowing or stopping some of the bacterial spoilors mentioned above. Enzymes are most active in a temperature range between 85-120° F and begin to be destroyed when the temperature goes above 140° F. Cold also slows down the action of enzymes, which is why fresh tomatoes last longer in the refrigerator than they do on the kitchen table. Most enzymatic action also requires moisture to occur. In foods stored at 10% moisture or less, there is not enough moisture for most enzymes to be active.

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RECOMMENDED FOOD STORAGE TIMES At 70° F.

Food	Keep the Product	Storage Tips
Baking powder	Till can date	Sealed & bone dry
Baking soda	2 years	Sealed & dry
9 months	Sealed, cool, dry, weevil proofed	
Bouillon, cubes or granules	2 years	Sealed, cool and dry
Cake mixes,		
Regular	9 months	Sealed,cool, dry,

Angel food	1 year	weevil proofed Sealed, cool, dry, weevil proofed
Canned food,		
Metal can, Non-Acidic	2 years	Cool & Dry
Metal Can, Acidic	12-18months	Cool & Dry
Glass jars	2-3 years	Dark, Cool & Dry
Chocolate, semi-sweet or unsweetened, bars or chips	18 months	Cool and dark
Chocolate syrup	2 years	Cool & tightly sealed
Cocoa, powder or mixes	8 months	Sealed and cool
Coffee creamers, powdered	9 months	Sealed and cool
Cornmeal	1 year	Keep dry & weevil proofed
Cornstarch	18 months	Keep dry
Crackers	3 months	Keep dry & weevil proofed
Flour,		
Refined white	8-12 months	Dry & weevil proofed
Whole wheat	4-6 weeks	Refrigerate/freeze for longer shelf life
Frostings,		
Canned	3 months	Cool
Mix	8 months	Dry and cool
Fruits, dried	6-12 months	Cool, sealed, weevil proofed
Gelatin, all types	18 months	Protect from moisture
Grains, whole		
Hominy, hominy grits,	2 years	Dry and weevil proofed
masa harina	1 year	Dry and weevil proofed
Honey	2 years	Cool, tightly sealed, dark
Jellies, jams, preserves	2 years	Dark, cool, tightly sealed.
Molasses & syrups	2 years	Tightly sealed
Mayonnaise	6 months	Cool & dark
Milk,		
Condensed or evaporated	1 year	Turn over every 2 months
Non-fat dry	6 months	Bone dry and cool
Nuts,		
Vacuum canned	1 year	Cool and Dark
3 months		Cool and dark – better refrigerated
In shell	4 months	Cool, dry & dark, better refrigerated or frozen
Pancake mix	6-9 months	Dry and weevil proofed
Pastas (macaroni, noodles, etc)	2 years	Dry and weevil proofed
Peanut butter	6-9 months	Sealed, cool, dark

Peas and beans, dry (not soybeans)	2 years	Dry and weevil proofed
Potatoes, instant	6-12 months	Dry and weevil proofed
Pudding mixes	1 year	Cool and very dry
Rice, White	2+ years	Dry and weevil proofed
Brown	3-6 months	Dry & weevil proofed, better refrigerated or frozen
Flavored or herb	6 months	Sealed, dry and weevil proofed
Salad dressings	10-12 months	Sealed, dark, cool. Better refrigerated
Salad oils	6 months	Sealed, dark, cool. Better refrigerated
Sauce and gravy mixes	6-12 months	Cool and dry
Shortening, solid	1 year	Cool, dark, tightly sealed.
Soup mixes	1 year	Cool, dry, and weevil proofed
Sugar, Brown	2 years	Tightly sealed, Dry.
Confectioners	18 months	Tightly sealed, Dry.
Granulated	2+years	Dry
Syrups (corn syrup based)	8-12 months	Sealed and cool
Vegetables, dried	1 year	Cool, dark, dry, weevil proofed
Vinegar	2+ years	Sealed

Storage Life of Dehydrated Foods

Determining the storage life of foods is at best an inexact science as there are so many variables. These range from the condition your food was in when you first purchased it and includes many other factors. This page was written with input by Mr. Stephen Portela who has over 30 years of professional food storage experience. This information should be used as a general guide only, and should not be followed “as the gospel truth” because your results may be different.

Four Factors that effect food storage:

Factor #1: The Temperature: Temperature has more to do with how long well dried foods store than anything else. The USDA states, *“Each 5.6 C. (10.08F) drop in temperature doubles the storage life of the seeds.”* Obviously, there is a limit as to how far this statement can be taken. However I expect it basically holds true from room temperature down to freezing. No doubt, the inverse could also be considered true. *“Each*

5.6C. (10.08F) rise in temperature halves the storage life of seeds.” This theory holds true for non-garden seeds as well.

Storage Life Differences Depending on Temperature

<u>Constant Storage Temp in degress</u>	<u>Storage life in Years</u>
39.76	40
49.84	30
59.92	20
70.00	10
80.08	5
90.16	2.5
100.24	1.25

Note: the above chart is not for a specific food but shows the relationship between temperature and storage life.

Lets look at a couple of real life examples of good and poor food storage practices:

About a year ago we got an unopened paper bag of white flour which had been stored at 70 degrees F, in a dry climate. It had been sitting for 3 years in a closet. It made fine looking bread but had such an ‘old’ and bad flavor that it was difficult to eat. For another example, a couple of years ago in the Puget Sound area we were given a 4 gallon can of wheat that had been stored up high in a garage for about 30 years. This part of the country is not as hot as some places, yet in the summers the average garage still gets up into the 90’s. Even though wheat will store for 30+ years under good conditions, the bread from this particular wheat was very bad tasting and after a few batches we ended up throwing the wheat away (something I always dislike doing).

Counter these stories with several examples told by Mr. Stephen Portela, Walton Feed’s manager: He stores his long term food storage in his basement where the temperature hovers around 60 degrees F. The experts give brown rice a 6 month storage life because of all the oils in it that go rancid. Yet, Mr. Portela has been eating from a supply of brown rice that has been in his basement over 10 years. It is still wholesome! In another example, there is a family living near him who purchased a supply of food in #10 cans 30 years ago. Their basement hovers around 58 degrees F. After 28 years, Mr. Portela took a sample of many of these items to the Benson Institute at BYU to have it tested. The results can be seen at the bottom of Mr. Portela’s welcome page. You will see everything tested had a ‘good’ to ‘satisfactory’ rating except for the eggs which had a ‘minimum passing’ rating. After 28 years I think it is most interesting that it passed at all. Mr. Portela tells me as 30 years have now passed, their storage is still in very good condition.

The bottom line is even with the very best packaging methods, if you are planning on storing your food in a warm environment, it will only last a fraction of the time it would last if stored in a cool, dry place. You can expect good storage life if your storage

temperature is at 60 degrees F or below. Optimum storage temperature is at 40 degrees F or less. It is important you also find a place where the temperature remains constant. Frequent temperature changes shorten storage life. If you don't have a cool place for your food storage, plan on rotating your storage quickly enough to prevent food loss.

Factor #2: Product moisture content:

By looking at the USDA nutritional tables, dry beans, grains, and flours contain an average of 10% moisture. Although it is very difficult and unnecessary to remove all moisture from dry foods, it is imperative that any food be stored as dry as possible. Foods with excess moisture can spoil right in their containers. This is an important consideration when packing food with dry ice as moisture condenses and freezes on the outer surface of the dry ice. For long term storage, grains should have a moisture content of 10% or less. It is difficult to accurately measure this without special equipment. See the misc.survivalism faqs for a quick and easy way of getting a rough estimate of the water content in your foods. It is also important to know that you can not dehydrate foods at home that reach these levels. Food that is dried to a moisture level of 10% moisture crisply snap when bent. Those of you who dehydrate foods at home know dehydrated foods from your dehydrator are quite pliable when bent, especially fruits. These will not store well long term.

Factor #3: Atmosphere the product is stored in:

Foods packed in air don't store as well as in oxygen free gasses. This is because air contains oxygen which oxidizes many of the compounds in food. Bacteria, one of several agents which make food go rancid also needs oxygen to grow. Food storage companies have a couple of different processes for removing the oxygen:

- **Displacing the oxygen:** This is done by purging out all the air in the product with an inert gas. Nitrogen is almost always used because it is the most inert gas known. People doing their own packing occasionally use dry ice which gives off carbon dioxide gas, and probably works just as well.
- **Absorb the oxygen:** Oxygen absorber packets do just that. Air contains about 78% nitrogen and 21% oxygen, leaving about 1% for the other gasses. If the oxygen is absorbed, what remains is 99% pure nitrogen in a partial vacuum. If oxygen absorber packets are used, care must be taken to use a storage container that can stand some vacuum. If it's not air tight, air will be sucked into your container as the oxygen is absorbed, reintroducing more oxygen that must be absorbed.
- Before long, the oxygen absorbers will have absorbed all the oxygen they can. Obviously, your product won't be oxygen free under these circumstances.

- **Seeds store better in nitrogen.** On the other hand, seeds you plan on sprouting, such as garden seed, or seeds set aside for growing your own sprouts store better in air. For this reason Walton cans their garden seed packs in air. Oxygen absorbers also contain a minute amount of moisture to activate the absorber. Sometimes, with the heat generated by the absorber, they can cause sweating if you use glass bottles or tupperware type containers.

Factor #4: The container the product is stored in:

To get the best storage life out of your product it must have a hermetic (air tight) seal. Containers that do this well are:

- #10 Cans (Use only cans that are enamel lined, otherwise your food flavor will be tainted by the steel it comes in contact with. An enamel lined can also prevents the inside of the can from rusting.)
- Sealable food storage buckets
- Sealable food quality metal (lined) or plastic drums.

Whatever container you use, be sure it is food grade as your product can be tainted with whatever the container is made from. Plastic sacks are not good air tight containers, for even if they are sealed, the relatively thin plastic breathes, allowing air to pass through. Paper sacks are of course even worse.

There is some concern as to how good a seal is made by the lids on plastic buckets used by food storage companies. Manufacturer studies show an extremely small amount of air transfer. This amount is so small, however, that it can be considered a hermetic seal. It has also been found that the lids can be re-used several times without dramatically degrading the performance of the seal.

People who purchase products from food storage providers are often concerned about receiving their buckets bulging or with one side collapsed in. Collapsed buckets occasionally occur when ordering from Walton's as the elevation of their packing facility is above 6,000 feet. As the buckets are shipped to a lower elevation, the increased ambient air pressure can sometimes push in one side. If a side is popped in, it is a great indication that the bucket is indeed sealed. And this also holds true for buckets that might be under a slight amount of pressure. If either condition concerns you, crack the lid to equalize the air pressure. You can do this without seriously degrading the storageability of the product within the bucket. Remember to re-seal the lid after doing this.

Bulging cans:

Some bulging cans have been returned to Waltons. In almost every case, these cans held mixes that contained baking powder or soda. It is believed that occasionally the extremely small amount of moisture found in the product interacts over time with the baking powder or soda and creates a small amount of carbon dioxide gas. Oxyten absorbers can also react

with the baking powder causing the cans to buldge. These cans have been sent off for bacteria analysis and in each case came back negative.

Storage Life Notes About Specific Foods:

The Soft Grains

Barley Hulled or Pearled, Oat Groats, Rolled Oats, Quinoa Rye.

Soft Grains have softer outer shells which don't protect the seed interior as well as hard shelled seeds and therefore won't store as long. Hermetically sealed in the absence of oxygen, plan on a storage life of 8 years at a stable temperature of 70 degrees F. They should keep proportionately longer if stored at cooler temperatures.

The Hard Grains

Buckwheat, Corn, Dry Flax, Kamut, Millet, Durum wheat, Hard red wheat, Hard white wheat, Soft wheat, Special bake wheat, Spelt, Triticale.

The Hard Grains all store well because of their hard outer shell which is nature's near perfect container. Remove that container and the contents rapidly deteriorate. Wheat, probably nature's longest storing seed, has been known to be edible after scores of years when stored in a cool dry place. As a general rule for hard grains, hermetically sealed in the absence of oxygen, plan on a storage life of 15-20 years at a stable temperature of 70 degrees F. They should keep proportionately longer if stored at cooler temperatures.

Beans

Adzuki Beans, Blackeye Beans, Black Turtle Beans, Garbanzo Beans, Great Northern, Kidney Beans, Lentils, Lima Beans, Mung Beans, Pink Beans, Pinto Beans, Small Red Beans, Soy Beans.

As beans age they lose their oils, resist water absorption and won't swell. Worst case, they must be ground to be used. Storing beans in nitrogen helps prolong the loss of these oils as does cool temperatures. Hermetically sealed in the absence of oxygen, plan on a storage life of 8-10 years at a stable temperature of 70 degrees F. They should keep proportionately longer if stored 10-20 degree F cooler temperatures.

Dehydrated Vegetables

Broccoli, Cabbage, Carrots, Celery, Onions, Peppers, Potatoes.

Dehydrated vegetables store well if hermetically sealed in the absence of oxygen. Plan on a storage life of 8-10 years at a stable temperature of 70 degrees F. They should keep proportionately longer if stored at cooler temperatures.

Dehydrated Dairy Products

Cheese Powder, Cocoa Powder, Powdered Eggs, Butter/margarine Powder, Powdered Milk, Morning Moo, Whey Powder.

Dehydrated Dairy Products generally store very well if stored dry in hermetically sealed containers with the oxygen removed. Plan on a storage life of 5 to 10 years if stored at a stable temperature of 70 degrees F. They should keep, probably 5 years longer, if stored at cooler

temperatures. One exception is Morning Moo. As a new whey based product, it hasn't been tested for long term storage. Plan on rotating this product after 5 years. Our dairy powders (excluding our sour cream powder) contain no fat, an agent that markedly decreases the storage life of dairy products.

Flours and Other Products made from Cracked / Ground Seed.

All Purpose Flour, Bakers Flour, Unbleached Flour, White Flour, Whole Wheat Flour, Cornmeal, Mixes, Refried Beans, Cracked wheat, Germade, Gluten, Wheat flakes.

After seeds are broken open their outer shells can no longer protect the seed contents and seed nutrients start to degrade. Don't try to store unprotected flours longer than a year. Hermetically sealed in the absence of oxygen, plan on a storage life of 5 years at a stable temperature of 70 degrees F. They should keep proportionately longer if stored at cooler temperatures. Note: Granola is not a long storing food because of the nuts. They contain high concentrations of oil which go rancid over the short term. Expect granola to last about 6-9 months.

Pasta

Macaroni, Noodles, Ribbons, Spaghetti.

Pasta will store longer than flour if kept dry. Hermetically sealed in the absence of oxygen, plan on a storage life of 10 - 15 years at a stable temperature of 70 degrees F. Pasta should keep proportionately longer if stored at cooler temperatures.

Dehydrated Fruit

Fruit doesn't keep as well as many dehydrated items. Hermetically sealed in the absence of oxygen, plan on a storage life of 10-15 years at a stable temperature of 70 degrees F. They should keep proportionately longer if stored at cooler temperatures.

Honey, Salt and Sugar

Honey, Salt and Sugar should keep indefinitely if stored free of moisture. Watch out for additives in the honey. It is possible to buy honey with water and sugar added. This honey generally doesn't crystallize like pure 100% honey does when stored for a long time. If there are additives, there is no saying how long it will last.

Peanut Butter Powder

Peanut Butter Powder will not store as long as wheat flour. Hermetically sealed in the absence of oxygen, plan on a storage life of 4-5 years at a stable temperature of 70 degrees F. It should keep proportionately longer if stored at cooler temperatures.

Brown and White Rices

Brown and white rices store very differently. Brown rice is only expected to store for 6 months under average conditions. This is because of the essential fatty acids in brown rice. These oils quickly go rancid as they oxidize. It will store much longer if refrigerated. White rice has the outer shell removed along with those fats. Because of this, white rice isn't nearly as good for you, but will store longer. Hermetically sealed in the absence of oxygen, plan on a storage life for white rice of 8-10 years at a stable temperature of 70 degrees F. It should keep proportionately longer if stored at cooler temperatures. Stored in the absence of oxygen, brown rice will last longer than if it was stored in air. Plan on 1 to 2 years. It is very important to store brown rice as cool as possible, for if you can get the temperature down another ten degrees, it will double the storage life again.

Garden Seedor Sprouting Seed

All viable seeds are hibernating tiny living plants that only need moisture and warmth to sprout. And much like a chick in an egg, all the nutrients this little life needs to spring into existence is contained within it's shell. Like boiling an egg, heating a seed will kill that little life within it. However, unlike an egg, a seed can withstand cold temperatures. As seeds usually remain edible after the life within it dies, we must use different criteria when determining sproutable seed storage life. And again the big deciding factor is temperature. Plan on a storage life of 2 to 3 years at a stable temperature of 70 degrees F. They should keep proportionately longer if stored at cooler temperatures. And remember, you want to store all of these seeds in air. Packed in nitrogen, the viability of some seeds will last longer than others. This is still to a large degree an unexplored science, and therefore we recommend you store all the seeds you plan on sprouting in air. Alfalfa is a unique seed as it actually germinates better if the seed is 2 or 3 years old. Most any sample of alfalfa contains 'hard' seed and 'soft' seed. Soft seed germinates within two days while hard seed germinates in about a week. The problem is, by the time the soft seed sprouts are ready to harvest, the hard seed may not have germinated yet. As storage time draws on, the hard seed turns into soft seed. Older seed germinates closer together. Stored in cool conditions, alfalfa seed should have a good percentage of germination up until it is 8 years old.

Total Vegetable Protein

Total Vegetable Protein, made from soy beans, has an unusually long storage life. Hermetically sealed in the absence of oxygen, plan on a storage life of 15-20 years at a stable temperature of 70 degrees F. meat substitute should keep proportionately longer if stored at cooler temperatures.

Yeast

Yeast, a living organism, has a relatively short storage life. Keep yeast in the original metal foil storage containers. If the seal remains intact, yeast should last 2 years at 70 degrees F. However it is strongly recommended that you refrigerate it, which should give you a storage life of 5 years. Frozen yeast should store for a long time.

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Drying Fruits and Vegetables

Food drying is one of the oldest methods of preserving food for later use. It can either be an alternative to canning or freezing, or compliment these methods. Drying foods is simple, safe and easy to learn. With modern food dehydrators, fruit leathers, banana chips and beef jerky can all be dried year round at home.

How Drying Preserves Food

Drying removes the moisture from the food so bacteria, yeast and mold cannot grow and spoil the food. Drying also slows down the action of enzymes (naturally occurring substances which cause foods to ripen), but does not inactivate them.

Because drying removes moisture, the food becomes smaller and lighter in weight. When the food is ready for use, the water is added back, and the food returns to its original shape.

Foods can be dried in the sun, in an oven or in a food dehydrator by using the right combination of warm temperatures, low humidity and air current.

In drying, warm temperatures cause the moisture to evaporate. Low humidity allows moisture to move quickly from the food to the air. Air current speeds up drying by moving the surrounding moist air away from the food.

Drying Foods Out-of-Doors

Sun Drying

The high sugar and acid content of fruits make them safe to dry in the sun. Vegetables and meats are not recommended for sun drying. Vegetables are low in sugar and acid.

This increases the risks for food spoilage. Meats are high in protein making them ideal for microbial growth when heat and humidity cannot be controlled.

To dry in the sun, hot, dry, breezy days are best. A minimum temperature of 86°F is needed with higher temperatures being better. It takes several days to dry foods out-of-doors. Because the weather is uncontrollable, sun drying can be risky.

Also, the high humidity in the South is a problem. A humidity below 60 percent is best for sun drying. Often these ideal conditions are not available when fruit ripens.

Fruits dried in the sun are placed on trays made of screen or wooden dowels. Screens need to be safe for contact with food. The best screens are stainless steel, teflon coated fiberglass or plastic. Avoid screens made from "hardware cloth." This is galvanized metal cloth that is coated with cadmium or zinc. These materials can oxidize, leaving harmful residues on the food. Also avoid copper and aluminum screening. Copper destroys vitamin C and increases oxidation. Aluminum tends to discolor and corrode.



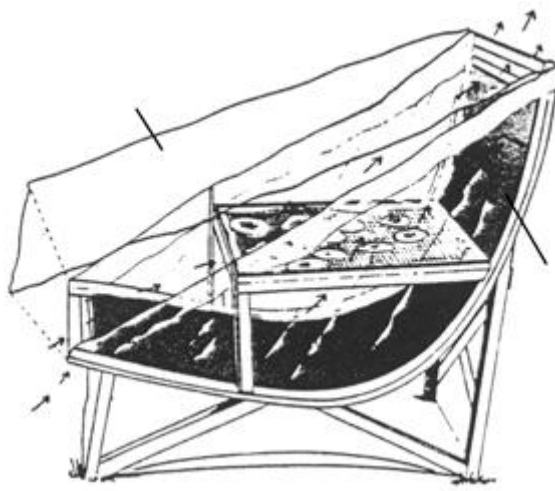
Outdoor Drying Rack

Most woods are fine for making trays. However, do not use green wood, pine, cedar, oak or redwood. These woods warp, stain the food or cause off-flavors in the food.

Place trays on blocks to allow for better air movement around the food. Because the ground may be moist, it is best to place the racks or screens on a concrete driveway or if possible over a sheet of aluminum or tin. The reflection of the sun on the metal increases the drying temperature. Cover the trays with cheesecloth to help protect the fruit from birds or insects. Fruits dried in the sun must be covered or brought under shelter at night. The cool night air condenses and could add moisture back to the food, thus slowing down the drying process.

Solar Drying

Recent efforts to improve on sun drying have led to solar drying. Solar drying also uses the sun as the heat source. A foil surface inside the dehydrator helps to increase the temperature. Ventilation speeds up the drying time. Shorter drying times reduce the risks of food spoilage or mold growth.



Homemade Solar Dryer

Pasteurization

Sun or solar dried fruits and vine dried beans need treatment to kill any insect and their eggs that might be on the food. Unless destroyed, the insects will eat the dried food. There are two recommended pasteurization methods:

1. **Freezer Method** - Seal the food in freezer-type plastic bags. Place the bags in a freezer set at 0°F or below and leave them at least 48 hours.
2. **Oven Method** - Place the food in a single layer on a tray or in a shallow pan. Place in an oven preheated to 160°F for 30 minutes.

After either of these treatments the dried fruit is ready to be conditioned and stored.

Drying Foods Indoors

Most foods can be dried indoors using modern dehydrators, convection ovens or conventional ovens. Microwave ovens are recommended only for drying herbs, because there is no way to create airflow in them.

Food Dehydrators

A food dehydrator is a small electrical appliance for drying food indoors. A food dehydrator has an electric element for heat and a fan and vents for air circulation. Dehydrators are efficiently designed to dry foods quickly at 140°F.

Food dehydrators are a relatively new item and are available from department stores, mail-order catalogs, natural food stores, seed catalogs and garden supply stores. Costs vary from \$40 to \$350 or above depending on features. Some models are expandable and additional trays can be purchased later. Twelve square feet of drying space dries about a half-bushel of produce.

Oven Drying

Everyone who has an oven has a dehydrator. By combining the factors of heat, low humidity and air flow, an oven can be used as a dehydrator.

An oven is ideal for occasional drying of meat jerkies, fruit leathers, banana chips or for preserving excess produce like celery or mushrooms. Because the oven is needed for every day cooking, it may not be satisfactory for preserving abundant garden produce.

Oven drying is slower than dehydrators because it does not have a built-in fan for the air movement. (However, some convection ovens do have a fan). It takes about two times longer to dry food in an oven than it does in a dehydrator. Thus, the oven is not as efficient as a dehydrator and uses more energy.

To Use Your Oven - First, check the dial and see if it can register as low as 140°F. If your oven does not go this low, then your food will cook instead of dry. Use a thermometer to check the temperature at the "warm" setting.

For air circulation, leave the oven door propped open two to six inches. Circulation can be improved by placing a fan outside the oven near the door. **CAUTION:** This is not a safe practice for a home with small children.

Because the door is left open, the temperature will vary. An oven thermometer placed near the food gives an accurate reading. Adjust the temperature dial to achieve the needed 140°F.

Drying trays should be narrow enough to clear the sides of the oven and should be 3 to 4 inches shorter than the oven from front to back. Cake cooling racks placed on top of cookie sheets work well for some foods. The oven racks, holding the trays, should be two to three inches apart for air circulation.

DRYING FRUITS

Dried fruits are unique, tasty and nutritious. Begin by washing the fruit and coring it, if needed. For drying, fruits can be cut in half or sliced. Some can be left whole. See the table "Drying Fruits at Home" later in this publication for specific directions for preparing each fruit.

Thin, uniform, peeled slices dry the fastest. The peel can be left on the fruit, but unpeeled fruit takes the longer to dry. Apples can be cored and sliced in rings, wedges, or chips. Bananas can be sliced in coins, chips or sticks.

Fruits dried whole take the longest to dry. Before drying, skins need to be "checked" or cracked to speed drying. To "check" the fruit place it in boiling water and then in cold water.

Because fruits contain sugar and are sticky, spray the drying trays with nonstick cooking spray before placing the fruit on the trays. After the fruit dries for one to two hours, lift each piece gently with a spatula and turn.

Pretreating the Fruit

Pretreatments prevent fruits from darkening. Many light-colored fruits, such as apples, darken rapidly when cut and exposed to air. If not pretreated, these fruits will continue to darken after they have dried.

For long-term storage of dried fruit, sulfuring or using a sulfite dip are the best pretreatments. However, sulfites found in the food after either of these treatments have been found to cause asthmatic reactions in a small portion of the asthmatic population. Thus, some people may want to use the alternative shorter-term pretreatments. If home dried foods are eaten within a short time, there may be little difference in the long- and short-term pretreatments.

Sulfuring - Sulfuring is an old method of pretreating fruits. Sublimed sulfur is ignited and burned in an enclosed box with the fruit. The sulfur fumes penetrate the fruit and act as a pretreatment by retarding spoilage and darkening of the fruit. Fruits must be sulfured out-of-doors where there is adequate air circulation. (For more information contact your county Extension office.)

Sulfite Dip - Sulfite dips can achieve the same long-term anti-darkening effect as sulfuring, but more quickly and easily. Either sodium bisulfite, sodium sulfite or sodium meta-bisulfite that are USP (food grade) or Reagent grade (pure) can be used. To locate these, check with your local drugstores or hobby shops, where wine-making supplies are sold.

Directions for Use - Dissolve 3/4 to 1 1/2 teaspoons sodium bisulfite per quart of water. (If using sodium sulfite, use 1 1/2 to 3 teaspoons. If using sodium metabisulfite, use 1 to 2 tablespoons.) Place the prepared fruit in the mixture and soak 5 minutes for slices, 15 minutes for halves. Remove fruit, rinse lightly under cold water and place on drying trays. Sulfited foods can be dried indoors or outdoors. (This solution can be used only once. Make a new one for the next batch.)

Ascorbic Acid - Ascorbic acid (vitamin C) mixed with water is a safe way to prevent fruit browning. However, its protection does not last as long as sulfuring or sulfiting. Ascorbic acid is available in the powdered or tablet form, from drugstores or grocery

stores. One teaspoon of powdered ascorbic acid is equal to 3000 mg of ascorbic acid in tablet form. (If you buy 500 mg tablets, this would be six tablets).

Directions for Use - Mix 1 teaspoon of powdered ascorbic acid (or 3000 mg of ascorbic acid tablets, crushed) in 2 cups water. Place the fruit in the solution for 3 to 5 minutes. Remove fruit, drain well and place on dryer trays. After this solution is used twice, add more acid.

Ascorbic Acid Mixtures - Ascorbic acid mixtures are a mixture of ascorbic acid and sugar sold for use on fresh fruits and in canning or freezing. It is more expensive and not as effective as using pure ascorbic acid.

Directions for Use - Mix 1 1/2 tablespoons of ascorbic acid mixture with one quart of water. Place the fruit in the mixture and soak 3 to 5 minutes. Drain the fruit well and place on dryer trays. After this solution is used twice, add more ascorbic acid mixture.

Fruit Juice Dip - A fruit juice that is high in vitamin C can also be used as a pretreatment, though it is not as effective as pure ascorbic acid. Juices high in vitamin C include orange, lemon, pineapple, grape and cranberry. Each juice adds its own color and flavor to the fruit.

Directions for Use - Place enough juice to cover fruit in a bowl. Add cut fruit. Soak 3 to 5 minutes, remove fruit, drain well and place on dryer trays. This solution may be used twice, before being replaced. (The used juice can be consumed.)

Honey Dip - Many store-bought dried fruits have been dipped in a honey solution. A similar dip can be made at home. Honey dipped fruit is much higher in calories.

Directions for Use - Mix 1/2 cup sugar with 1 1/2 cups boiling water. Cool to lukewarm

and add 1/2 cup honey. Place fruit in dip and soak 3 to 5 minutes. Remove, drain well and place on dryer trays.

Syrup Blanching - Blanching fruit in syrup helps it retain color fairly well during drying and storage. The resulting product is similar to candied fruit. Fruits that can be syrup blanched include apples, apricots, figs, nectarines, peaches, pears, plums and prunes.

Directions for Use - Combine 1 cup sugar, 1 cup light corn syrup and 2 cups water in a saucepot. Bring to a boil. Add 1 pound of prepared fruit and simmer 10 minutes. Remove heat and let fruit stand in hot syrup for 30 minutes. Lift fruit out of syrup, rinse lightly in cold water, drain on paper toweling and place on dryer trays.

Steam Blanching - Steam blanching also helps retain color and slow oxidation. However, the flavor and texture of the fruit is changed.

Directions - Place several inches of water in a large saucepot with a tight fitting lid. Heat to boiling. Place fruit not more than 2 inches deep, in a steamer pan or wire basket over boiling water. Cover tightly with lid and begin timing immediately. See below for blanching times. Check for even blanching half way through the blanching time. Some fruit may need to be stirred. When done, remove excess moisture using paper towels and place on dryer trays.

Drying the Prepared Fruit

Whichever drying method you choose-sun drying, solar drying, oven drying or dehydrator drying-be sure to place the fruit in a single layer on the drying trays. The pieces should not touch or overlap. Follow the directions for the drying method you choose and dry until the food tests dry. Approximate drying times are given below. Food dries much faster at the end of the drying period, so watch it closely.

Determining Dryness of Fruits

Since dried fruits are generally eaten without being rehydrated, they should not be dehydrated to the point of brittleness. Most fruits should have about 20 percent moisture content when dried.

To test for dryness, cut several cooled pieces in half. There should be no visible moisture and you should not be able to squeeze any moisture from the fruit. Some fruits may remain pliable, but are not sticky or tacky. If a piece is folded in half, it should not stick to itself. Berries should be dried until they rattle when shaken.

After drying, cool fruit 30 to 60 minutes before packaging. Packaging food warm can lead to sweating and moisture buildup. However, excessive delays in packaging could allow moisture to re-enter food. Remember, if you have dried fruit in the sun, it must be pasteurized before it is packaged.

Conditioning Fruits

When dried fruit is taken from the dehydrator or oven, the remaining moisture may not be distributed equally among the pieces because of their size or their location in the dehydrator. Conditioning is a process used to equalize the moisture and reduce the risk of mold growth.

To condition the fruit, take the dried fruit that has cooled and pack it loosely in plastic or glass jars. Seal the containers and let them stand for seven to ten days. The excess moisture in some pieces will be absorbed by the drier pieces. Shake the jars daily to separate the pieces and check the moisture condensation. If condensation develops in the jar, return the fruit to the dehydrator for more drying. After conditioning, package and store the fruit.

DRYING VEGETABLES

Vegetables can also be preserved by drying. Because they contain less acid than fruits, vegetables are dried until they are brittle. At this stage, only 10% moisture remains and no microorganism can grow.

Preparing Vegetables

To prepare vegetables for drying, wash in cool water to remove soil and chemical residues. Trim, peel, cut, slice or shred vegetables according to the directions for each vegetable in the chart below. Remove any fibrous or woody portions and core when necessary, removing all decayed and bruised areas. Keep pieces uniform in size so they will dry at the same rate. A food slicer or food processor can be used. Prepare only as many as can be dried at one time.

Pretreating Vegetables

Blanching is a necessary step in preparing vegetables for drying. By definition, blanching is the process of heating vegetables to a temperature high enough to destroy enzymes present in tissue. Blanching stops the enzyme action which could cause loss of color and flavor during drying and storage. It also shortens the drying and rehydration time by relaxing the tissue walls so moisture can escape and later re-enter more rapidly.

Vegetables can be water blanched or steam blanched. Water blanching usually results in a greater loss of nutrients, but it takes less time than steam blanching.

Water Blanching - Fill a large pot 2/3 full of water, cover and bring to a rolling boil. Place the vegetables in a wire basket or a colander and submerge them in the water. Cover and blanch according to directions. Begin timing when water returns to boiling. If it takes longer than one minute for the water to come back to boiling, too many vegetables were added. Reduce the Amount in the next batch.

Steam Blanching - Use a deep pot with a tight fitting lid and a wire basket, colander or sieve placed so the steam will circulate freely around the vegetables. Add water to the pot and bring to a rolling boil. Place the vegetables loosely in the basket no more than 2 inches deep. Place the basket of vegetables in the pot, making sure the water does not come in contact with the vegetables. Cover and steam according to the directions.

Cooling and Drying the Prepared Vegetables

After blanching, dip the vegetables briefly in cold water. When they feel only slightly hot to the touch, drain the vegetables by pouring them directly onto the drying tray held over the sink. Wipe the excess water from underneath the tray and arrange the vegetables in a single layer. Then place the tray immediately in the dehydrator or oven. The heat left in the vegetables from blanching will cause the drying process to begin more quickly. Watch the vegetables closely at the end of the drying period. They dry much more quickly at the end and could scorch.

Determining Dryness of Vegetables

Vegetables should be dried until they are brittle or "crisp." Some vegetables would actually shatter if hit with a hammer. At this stage, they should contain about 10 percent moisture. Because they are so dry, they do not need conditioning like fruits.

DRYING FRUIT LEATHER

Fruit leather is a tasty, chewy, dried fruit product. Fruit leathers are made by pouring puréed fruit onto a flat surface for drying. When dried, the fruit is pulled from the surface and rolled. It gets the name "leather" from the fact that when puréed fruit is dried, it is shiny and has the texture of leather.

Leather From Fresh Fruit

- * Select ripe or slightly overripe fruit.
- * Wash fresh fruit or berries in cool water. Remove peel, seeds and stem.
- * Cut fruit into chunks. Use 2 cups of fruit for each 13" x 15" inch fruit leather. Purée fruit until smooth.
- * Add 2 teaspoons of lemon juice or 1/8 teaspoon ascorbic acid (375 mg) for each 2 cups of light colored fruit to prevent darkening.
- * Optional: To sweeten, add corn syrup, honey or sugar. Corn syrup or honey is best for longer storage because it prevents crystals. Sugar is fine for immediate use or short storage. Use 1/4 to 1/2 cup sugar, corn syrup or honey for each 2 cups of fruit. Saccharin-based sweeteners could also be used to reduce tartness without adding calories. Aspartame sweeteners may lose sweetness during drying.

Leathers From Canned or Frozen Fruits

- * Home preserved or store bought canned or frozen fruit can be used.
- * Drain fruit, save liquid.
- * Use 1 pint of fruit for each 13" x 15" leather.
- * Purée fruit until smooth. If thick, add liquid.
- * Add 2 teaspoons of lemon juice or 1/8 teaspoon ascorbic acid (375 mg) for each 2 cups of light colored fruit to prevent darkening.
- * If desired, sweeten as directed above for leathers from fresh fruit.
- * Applesauce can be dried alone or added to any fresh fruit purée as an extender. It decreases tartness and makes leather smoother and more pliable.

Drying the Leather

For drying in the oven or sun, line cookie sheets with plastic wrap. In a dehydrator, use plastic wrap or the specially designed plastic sheets that come with the dehydrator. Pour the leather onto the lined cookie sheets or tray. Spread it evenly to a thickness of 1/8 inch.

Dry the fruit leather at 140° F until no indentation is left when you touch the center with your finger. This could take about 6 to 8 hours in the dehydrator, up to 18 hours in the

oven and 1 to 2 days in the sun. While still warm, peel from the plastic wrap. Cool and rewrap in plastic and store.

PACKING AND STORING DRIED FOODS

After foods are dried, cool them completely. Then package them in clean moisture-vapor-resistant containers. Glass jars, metal cans or freezer containers are good storage containers, if they have tight-fitting lids. Plastic freezer bags are acceptable, but they are not insect and rodent proof. Fruit that has been sulfured or sulfited should not touch metal. Place the fruit in a plastic bag before storing it in a metal can.

Dried food should be stored in a cool, dry, dark place. Most dried fruits can be stored for 1 year at 60° F, 6 months at 80° F. Dried vegetables have about half the shelf-life of fruits. Fruit leathers should keep for up to 1 month at room temperature. To store any

dried product longer, place it in the freezer.

USING DRIED FOODS

Dried fruits can be eaten as is or reconstituted. Dried vegetables must be reconstituted. Once reconstituted, dried fruits or vegetables are treated as fresh. Fruit leathers and meat jerky are eaten as is.

To reconstitute dried fruits or vegetables, add water to the fruit or vegetable and soak until the desired volume is restored. (See the chart on rehydrating dried food, for the amount of water to add and minimum soaking time.) Do not over-soak the food. Over-soaking produces loss of flavor and a mushy, water-logged texture.

For soups and stews, add the dehydrated vegetables, without rehydrating them. They will rehydrate as the soup or stew cooks. Also, leafy vegetables and tomatoes do not need soaking. Add enough water to cover and simmer until tender. CAUTION! If soaking takes more than 2 hours, refrigerate the product for the remainder of the time.

Rehydrating Dried Foods

Product	Water to Add to 1	Minimum Soaking
Cup Dried Food (Cups)	Time (Hours)	
Fruits*		
Apples	1 1/2	1/2
Pears	1 3/4	1 1/4
Peaches	2	1 1/4
Vegetables**		

Asparagus	2 1/4	1 1/2
Beans, lima	2 1/2	1 1/2
Beans, green snap	2 1/2	1
Beets	2 3/4	1 1/2
Carrots	2 1/4	1
Cabbage	3	1
Corn	2 1/4	1/2
Okra	3	1/2
Onions	2	3/4
Peas	2 1/2	1/2
Pumpkin	3	1
Squash	1 3/4	1
Spinach	1	1/2
Sweet Potatoes	1 1/2	1/2
Turnip Greens and other greens	1	3/4

* *Fruits – Water is at room temperature.*

** *Vegetables – Boiling water used.*

Drying Fruits at Home

<i>Pretreatment (Choose One)</i>					
Blanch Drying	Fruit Preparation	Times			
		Sulfur	Steam	Syrup	Other
		(hours)	(minutes)	(minutes)	Dehydrator*
					(hours)
Apples	Peel and core, cut into slices or rings about 1/8 inch thick -sulfite dip	3/4	3-5 min, 10 depending on texture	10 -ascorbic acid mixture -ascorbic acid solution -fruit juice dip	6-12
Apricots	Pit and halve. May slice if desired. -fruit juice dip -sulfite dip	2	3-4	10 -ascorbic acid mixture -ascorbic acid solution	24-36**
Bananas	Use solid yellow or slightly brown-flecked bananas. Avoid bruised or overripe bananas. Peel and slice 1/4-inch to 3/8-inch thick, crosswise or lengthwise.			-honey dip -ascorbic acid solution -ascorbic acid mixture -fruit juice dip -sulfite dip	8-10
Berries	<i>Firm:</i> Wash and drain berries with			-plunge into boiling	24-36

waxy coating (blueberries,
cranberries, currants, gooseberries,

water 15-30 seconds to
"check" skins. Stop cooking

huckleberries).

action by placing fruit in ice

water. Drain on paper towels.

Soft: Wash and drain. (boysenberries,
strawberries)

-No pretreatment necessary.

Cherries Stem, wash, drain and pit fully
ripe cherries. Cut in half, chop,
or leave whole.
-Pretreatment necessary.

10
(for sour cherries)

-Whole: dip in boiling water
30 seconds or more to check skins.
-Cut and pitted: No

24-36

Citrus Peel Peels of citron, grapefruit, kumquat,
lime, lemon, tangelo and tangerine can be dried.
Thick-skinned navel orange peel dries better than
thin-skinned Valencia peel. Wash thoroughly.
Remove outer 1/6 to 1/8 inch of peel. Avoid white
bitter pith.

-No pretreatment necessary.

8-12

Figs Select fully ripe fruit. Immature 1
fruit may sour before drying. Wash or (whole)
clean whole fruit with damp cloth.
Leave small fruit water whole,
otherwise cut in half.

-Whole: Dip in boiling water
30 seconds or more to check
skins. Plunge in ice water
to stop further cooking.
Drain on paper towels.

6-12**

Grapes

Seedless: Leave whole.

30 seconds or more to

With seeds: Cut in half and
remove seeds.

Drain on paper towels.

-Whole: Dip in boiling water

12-20

check skins. Plunge in ice
water to stop further cooking.

-Halves: no pretreatment necessary.

Drying Fruits at Home (continued)

<i>Pretreatment (Choose One)</i>						
Blanch Drying		Times				
Fruit	Preparation	Sulfur	Steam	Syrup	Other	Dehydrator*
		(hours)	(minutes)	(minutes)		(hours)
Nectarines and		2-3	8	10	-ascorbic acid solution	36-48**
Peaches	When sulfering,	(halves)			-ascorbic acid mixture	
	pit and halve;	1 (slice)			-fruit juice dip	

Pears Cut in half and core. Peeling preferred. May also slice or quarter. -sulfiting	5 (halves) 2 (slices)	6 minutes (halves)	10	-ascorbic acid solution -ascorbic acid mixture -fruit juice dip	24-36**
Persimmons Use firm fruit of long, soft varieties and fully ripe fruit of round drier varieties. Peel and slice using stainless steel knife.				-may syrup blanch	12-15**
Pineapple Use fully ripe, fresh pineapple. Wash, peel and remove thorny eyes. Slice lengthwise and remove core. Cut in 1/2-inch slices, crosswise.				No pretreatment necessary	24-36
Plums (Prunes) Leave whole or if sulfuring, halve the fruit. -Oven or dehydrator drying: rinse in hot tap water.	1			-Sun drying: (whole) dip in boiling water 30 seconds or more to check skins.	24-36**

* Because of variations in air circulation, drying times in conventional ovens could be up to twice as long.

Drying times for sun drying could range from 2 to 6 days, depending on temperature and humidity.

** Drying times are shorter for slices and other cuts of fruit.

Drying Vegetables at Home

Blanch Time		Drying Times			
Vegetable	Preparation	(minutes)	Steam (minutes)	Water (hours)	Dehydrator*
Artichokes-Globe	Cut hearts into 1/8-inch strips. Heat in boiling solution of 3/4 cups water and 1 tablespoon lemon juice.			6-8	4-6
Asparagus	Wash thoroughly. Cut large tips in half.		4-5	3 1/2 - 4 1/2	4-6
Beans, green	Wash thoroughly. Cut in short pieces or lengthwise. (May freeze for 30 to 40 minutes after blanching for better texture.)		2-2 1/2	2	8-14
Beets	Cook as usual. Cool; peel. Cut into		Already cooked no further		10-12

shoestring strips 1/8-inch thick.

blanching required.

Broccoli Trim, cut as for serving. Wash thoroughly. Quarter stalks lengthwise.	3-3 1/2	2	12-15
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Brussels Sprouts Cut in half lengthwise through stem.	6-7	4 1/2 - 5 1/2	12-18
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Cabbage Remove outer leaves; quarter and core. Cut into strips 1/8-inch thick.	2 1/2-3**	1 1/2-2	10-12
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Carrots Use only crisp, tender carrots. Wash thoroughly. Cut off roots and tops; preferably peel, cut in slices or strips 1/8-inch thick.	3-3 1/2	3 1/2	10-12
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Cauliflower Prepare as for serving.	4-5	3-4	12-15
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Celery Trim stalks. Wash stalks and leaves thoroughly. Slice stalks.	2	2	10-16
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Corn , cut Husk, trim and blanch until milk does not exude from kernel when cut. Cut the kernels from the cob after blanching.	2-2 1/2	1 1/2	6-10
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Eggplant Use the same directions as for summer squash	3 1/2	3	12-14
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Garlic Peel and finely chop garlic bulbs. No other pretreatment is needed. Odor is pungent.			6-8
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Greens (chard, kale, turnip, spinach) Use only young tender leaves. Wash and trim very thoroughly.	2-2 1/2**	1 1/2	8-10
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Horseradish Wash; remove small rootlets and stubs. None Peel or scrape roots. Grate.		NONE	4-10
--	--	------	------

Mushrooms Scrub thoroughly. Discard any tough, woody stalks. Cut tender stalks into short sections. Do not peel small mushrooms or "buttons." Peel large mushrooms, slice. (WARNING, see footnote***)		NONE	8-10
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Drying Vegetables at Home

Blanch Time

Drying Times

Vegetable	Preparation	Steam (minutes)	Water (hours)	Dehydrator*
Okra	Wash, trim, slice crosswise in 1/8- to 1/4-inch disks.	NONE		8-10
Onions	Wash, remove outer "paper shells." Remove tops and root ends, slice 1/8- to 1/4-inch thick.	NONE		3-9
Parsley	Wash thoroughly. Separate clusters. Discard long or tough stems.	NONE		1-2
Peas, Green Shell		3	2	8-10
Peppers and Pimientos	Wash, stem, core. Remove "partitions." Cut into disks about 3/8 by 3/8 inch.	NONE		8-12
Potatoes	Wash, peel. Cut into shoestring strips 1/4-inch thick, or cut in slices 1/8-inch thick.	6-8	5-6	8-12
Pumpkin and Hubbard Squash	Cut or break into pieces. Remove seeds and cavity pulp. Cut into 1-inch wide strips. Peel rind. Cut strips crosswise into pieces about 1/8-inch thick.	2 1/2-3	1	10-16
Squash: Summer	Wash, trim, cut into 1/4-inch slices.	2 1/2-3	1 1/2	10-12
Tomatoes	Steam or dip in boiling water to loosen skins. for stewing Chill in cold water. Peel. Cut into sections about 3/4-inch wide, or slice. Cut small pear or plum tomatoes in half.	3	1	10-18

* Drying times in a conventional oven could be up to twice as long, depending on air circulation.

** Steam until wilted.

*** **WARNING: The toxins in poisonous varieties of mushrooms are not destroyed by**

*University of Georgia Cooperative Extension Service
College of Family and Consumer Sciences
In cooperation with the College of Agricultural and Environmental Sciences*

Increase Short-life Supply With Vacuum Seal Jars

As you work to build your short-life food storage, you should begin to consider techniques to help extend the shelf life of your food. The longer it will last, the more you

can store. In addition to freezing, dehydrating, canning, smoking, pickling, and storing in a dark, cool place, simply removing the oxygen from food will make it last much longer.



foodsaver.com

Many are familiar with vacuum bag sealers that allow you to suck the air out and seal it shut. Freezing food this way can extend it's life up to five times. It also dramatically reduces or eliminates freezer burn. Many aren't aware of what else their sealers can do though. Many models come with a utility port where you can connect attachments, such as a jar sealer. An inexpensive but powerful addition to your preservation toolkit, vacuum sealing jars should become part of your cooking and food storage routine.

Are you tired of raisins going stale and brown sugar going hard? I am. It won't be happening at my house anymore. Suck the air out! Vacuum sealing is not a substitute for canning, but it is an effective way to prolong the life of food. Jellies, mustard, spices, nuts, rice, flour, and dried fruits and vegetables are just a few examples of what you can store, prolonging shelf life years and years.

The jar sealer fits on your own Ball® and Kerr® Mason jars and comes in wide and regular-mouth sizes. I purchased the one by FoodSaver to go with the vacuum sealer I already own. Using the attachment is even easier than sealing bags.

First, wash your jars, lids, and rings in hot, soapy water. I like the wide-mouth jars for this type of storage as they are much easier to get things in and out of and easier to clean. I can actually fit my fist into the jar since I have small hands.



Next, fill the jars. Use a glove so that you don't leave the moisture and oils from your hands on the food. Leave one inch of space between the food and the top of the jar.



Connect the utility hose to the vacuum sealer and then engage the lock. Now place a lid on top of the jar. Do not attempt to seal with the ring. You can use it later to prevent the lid from getting knocked, but it is not necessary with jar sealing.



Then, connect the other end of the hose to the jar attachment and press the attachment down firmly over the top of the jar. Your vacuum sealer should have a special button for sealing canisters. Once the vacuum stops, pull the hose out of the attachment to release the pressure. You can then remove the attachment from the jar by pulling directly upward. Don't forget to disengage the lock on the sealer once you are finished.

Once you are done, you will have jars of food ready for the shelves. Open the sealed jars by placing a teaspoon between the edge of the lid and the highest part of the threads on the bottle opening and prying down.



Here, you can see dehydrated tomatoes, cherry tomatoes, peppers, and jalapenos from this summer's harvest. I store a jar of each item in the kitchen pantry and the rest go in the store room. Remember, this is food that you are eating regularly and rotating. You are

Keep Your Food Stored Properly

February 19, 2010 by [Johnny](#)

Filed under: [Gourmet Foods](#)

Freeze dried food is commonly found in emergency food storages. What could be done to make it last longer?

Freeze dried food is the one that lost 98 percent of water. This food does not have any bacteria or insects on it. That is why this food has a very long shelf life. But freeze dried food still have one enemy left. And this enemy is oxygen.

If your freeze dried food does not contact with oxygen, it could last for more than 30 years. This means that even in 25-30 years these food products will taste the same way and have the same nutritional value. Even beyond this period of time these food products will be safe to eat, but they might taste or look differently.

Oxygen absorbers are the common way to extend the shelf life of your freeze dried foods. They are materials that actively react with oxygen. They combine with oxygen and therefore remove it from the environment. Iron powder and iron carbonate are usually used in oxygen absorbers. They are very effective.

Oxygen absorbers react with oxygen until they are fully oxidized. This means they cannot react with oxygen any more. That is why you need to make sure your oxygen absorbers are properly sealed before you used them.

If you want to use oxygen absorbers for your freeze dried food, just put them in the container of food before it is sealed. This way oxygen absorber will absorb all the oxygen that gets into the container over the period of storage. And no oxygen will be left to react with the food.

There are two major types of oxygen absorbers on the market. One of them requires moisture to work. It is usually used for storing bread and meats which contain some moisture. And another type of absorbers contain their own moisture and therefore could be used for storing dried foods.

You need to understand that any vacuum container will let some air inside over the years. Even if it is a top quality container. That is why oxygen absorbers are needed. They are able to absorb oxygen that is present in the air initially during the packing process. And afterwards they will also be able to absorb oxygen from the air that leaks in over time.

Oxygen absorbers will allow to greatly extend the shelf life of your dried foods. And this means you will be able to save some money on your food storage program.

Nitrogen packing is another common way of fighting oxygen in foods. Here the container is packed in a nitrogen environment or is flushed with nitrogen. This means that containers are filled with nitrogen, but not air. And this in turn means they have no oxygen inside initially.

Long Term Storage

MASTER FOOD LIST

___ 6 GRAIN PANCAKE MIX
___ 6 WAY ROLLED GRAIN, 6 TYPES
OF GRAIN
___ 9 GRAIN CRACKED CEREAL
___ ALFALFA FOR SPROUTING
___ ALFALFA, POWDER
___ ALFALFA, CUT
___ Almonds, Raw
___ ALLSPICE (JAMAICAN) POWDER
___ ALLSPICE (JAMAICAN) WHOLE
___ Amaranth, Organic
___ ANISE (STAR), WHOLE
___ ANISE SEED, WHOLE
___ APPLE FLAKES, PEACH FLAVOR,
DEHYDRATED
___ APPLE FLAKES, STRAWBERRY
FLAVOR
___ APPLE SLICES,
___ APPLESAUCE, DEHYDRATED
___ ARROWROOT POWDER
___ BAKING POWDER,
___ BAKING SODA,
___ BANANA SLICES, DEHYDRATED,
___ BARBECUE SPICE BLEND -
GROUND
___ BARLEY FLAKES
___ BARLEY FOR SPROUTING
___ BARLEY, HULLED,
___ Barley, Hulless Waxy

___ BARLEY, PEARL
___ BASIL (EGYPTIAN) - CUT
___ BASIL (SWEET CALIFORNIA), CUT
___ BAY LEAVES, CUT

___ BAY LEAVES, WHOLE

___ BEANS, BLACK, BULK, FREEZE
DRIED
___ BEANS, 10-BEAN MIX,
___ Anasazi Beans
___ BEANS, AUZZUKIE
___ BEANS, BABY LIMAS,
___ BEANS, BLACK EYED,
___ BEANS, BLACK TURTLE,
___ BEANS, GARBANZO,
___ BEANS, GREAT NORTHERN
WHITE,
___ BEANS, GREEN, DEHYDRATED,
___ BEANS, KIDNEY,
___ BEANS, LARGE LIMA,
___ BEANS, MUNG,
___ BEANS, NAVY, BULK,
DEHYDRATED,
___ BEANS, PINK,
___ BEANS, PINTO,
___ Refried Beans
___ Refried Beans w/corn oil
___ BEANS, SMALL RED
___ BEANS, SMALL WHITE, NAVY
___ BEANS, SOY,
___ BEANS, SPROUTING, AUZZUKIE,
___ BEANS, SPROUTING, GARBANZO,
___ BEANS, SPROUTING, MUNG,
___ BEANS, SPROUTING, SOY,
___ BEE POLLEN
___ Bouillon, Beef
___ Bouillon, Chicken
___ BROCCOLI, DEHYDRATED
___ BUCK WHEAT, HULLED,
___ BURDOCK ROOT CUT
___ BUTTER POWDER,

___ BUTTERMILK POWDER
 ___ CABBAGE
 ___ CABBAGE SEED,
 ___ CAJUN SPICE BLEND, GROUND
 ___ CAKE MIX, GINGERBREAD (ADD
 WATER)
 ___ CAKE MIX, BROWNIE (ADD
 WATER)
 ___ CAKE MIX, CARROT (ADD WATER)
 ___ CAKE MIX, DEVIL'S FOOD
 ___ CAKE MIX, LEMON
 ___ CAKE MIX, POUND CAKE (ADD
 WATER)
 ___ CAKE MIX, SPICE
 ___ CAKE MIX, SWISS CHOC (ADD
 WATER)
 ___ CAKE MIX, WHITE

 ___ CAKE MIX, YELLOW
 ___ CAKE, FUNNEL (ADD WATER)
 ___ CARAWAY SEED
 ___ CARDAMOM (DECORTICATED)
 WHOLE
 ___ CARDAMOM (WHOLE GREEN
 PODS)
 ___ CARDAMOM (GROUND)
 ___ CAROB (ROASTED), POWDERED
 ___ CARROT DICES, DEHYDRATED,
 ___ CAYENNE (40 HEAT UNIT)
 DOMESTIC
 ___ CAYENNE (60 HEAT UNIT)
 IMPORTED
 ___ CAYENNE (90 HEAT UNIT)
 ___ CELERY
 ___ CELERY SEED - GROUND
 ___ CELERY SEED - WHOLE
 ___ CHAMOMILE TEA BAGS
 ___ CHEESE SAUCE, DEHYDRATED,
 BULK
 ___ CHEESE, CHEDDAR,
 DEHYDRATED, BAG
 ___ CHIA SEEDS (FOR SPROUTING)
 ___ CHICKWEED
 ___ CHILI BLEND, GROUND
 ___ CHILI PEPPERS, GROUND
 ___ CHILI, CRUSHED
 ___ CHINESE FIVE SPICE,
 ___ CHIVES, CUT
 ___ CHOCOLATE CHIPS, MILK
 CHOCOLATE
 ___ CHOCOLATE CHIPS, SEMI SWEET
 ___ CILANTRO CUT

___ CINNAMON CHIPS, SMALL CUT
 ___ CINNAMON POWDER
 ___ CINNAMON STICKS, 1 INCH,
 ___ CLOVES (SMALL VERY
 FRAGRANT)
 ___ CLOVES POWDER
 ___ Cocoa Mix
 ___ Cocoa Mix Chocolate Mint Truffle
 ___ Cocoa Mix Mint
 ___ Cocoa Mix, Orange Creme
 ___ COCOA FOR COOKING,
 ___ COCONUT (UNSWEETENED) -
 MEDIUM
 ___ CORIANDER SEED, GROUND
 ___ CORIANDER SEED, WHOLE
 ___ CORN MEAL, BAG
 ___ CORN, SWEET, DEHYDRATED
 ___ CORN, WHOLE YELLOW, PAPER
 BAG

 ___ Corn, Yellow Grit-hominy polenta
 ___ CORNSTARCH
 ___ Corn Syrup Solids
 ___ CREAM OF TARTAR
 ___ CUMIN SEED, GROUND
 ___ CUMIN SEED, WHOLE
 ___ CURRY POWDER, HOT BLEND
 ___ CURRY POWDER, REGULAR
 BLEND
 ___ DILL SEED, WHOLE
 ___ DILL WEED, (DOMESTIC) CUT
 ___ DOUGH ENHANCER, NATURAL
 ___ DRESSING, 1000 ISLAND
 ___ DRESSING, BLEU CHEESE,
 ___ DRESSING, OUR HOUSE DRESSING
 ___ DRINK BASE, APPLE CIDER,
 INSTANT,
 ___ DRINK MIX, APPLE,
 DEHYDRATED,
 ___ DRINK MIX, CHERRY,
 ___ DRINK MIX, Fruit Punch
 ___ DRINK MIX, GRAPE,
 ___ DRINK MIX, HOT CIDER,
 ___ DRINK MIX, LEMONADE,
 ___ DRINK MIX, ORANGE,
 ___ DRINK MIX, Peach
 ___ DRINK MIX, PINK LEMONADE,
 ___ DRINK MIX, STRAWBERRY,
 ___ DRINK MIX, Tofu
 ___ DRINK, APPLE, W/FRUIT JUICE
 ___ DRINK, PEACH, DEHYDRATED, BG
 ___ EGG MIX, DEHYDRATED,
 ___ EGG WHITES, DEHYDRATED,

___ EGGS, Whole
 ___ FAJITA SEASONING,
 ___ FENNEL SEED, POWDER
 ___ FENNEL SEED, WHOLE
 ___ FENUGREEK SEED, WHOLE
 ___ FLAVOR CRYSTALS, MAPLE,
 NATURAL & ART
 ___ FLAVOR CRYSTALS, VANILLA,
 NATURAL & AR
 ___ FLAVOR CRYSTALS, WALNUT,
 NATURAL & AR
 ___ FLAX SEED,
 ___ FLOUR, ALL PURPOSE,
 ___ FLOUR, BAKERS BLEND high
 protein
 ___ FLOUR, Whole Wheat
 ___ FLOUR, Whole Wheat Red
 ___ FLOUR, UNBLEACHED,
 ___ FLOUR, UNBLEACHED, Hard White
 ___ FLOUR, UNBLEACHED-Red

 ___ FLOUR, UNBLEACHED-White
 ___ FRANKINCENSE
 ___ FROSTING MIX, CHOCOLATE
 ___ FROSTING MIX, FUDGE
 ___ FRUCTOSE,
 ___ FRUIT BLEND (TASTY TEA) NO
 CAFFEINE
 ___ FRUIT BLEND TEA BAG
 ___ FRUIT GALAXY, DEHYDRATED
 BAG
 ___ FRUIT WHIRLS
 ___ GARLIC (DOMESTIC),
 ___ GARLIC GRANULES
 (CALIFORNIA)
 ___ GARLIC POWDER (DOMESTIC)
 ___ GARLIC MINCED
 ___ G EL CAPS -00-
 ___ GELATIN, CHERRY,
 ___ GELATIN, LEMON,
 ___ GELATIN, LIME,
 ___ GELATIN, ORANGE,
 ___ GELATIN, PEACH,
 ___ GELATIN, RASPBERRY,
 ___ GELATIN, STRAWBERRY,
 ___ GERMADE,
 ___ GINGER ROOT PIECES, 1/4 IN
 PIECES
 ___ GINGER ROOT POWDER
 ___ GINSENG POWDER
 ___ GOTU KOLA POWDER
 ___ GRANOLA, 25 LB BAG
 ___ GRAVY MIX, BROWN,

___ GRAVY MIX, CHICKEN,
 ___ GRAVY MIX, TURKEY,
 ___ GRAVY, COUNTRY STYLE,
 ___ GREEK SEASONING, GROUND
 ___ HERB MIX (SALT SUBSTITUTE)
 ___ HONEY, Clover
 ___ HONEY, Creamy Whipped
 ___ HONEY, COX'S (CREAMED)
 ___ ITALIAN SEASONING, CUT
 ___ ITALIAN SEASONING, GROUND
 ___ KELP POWDER
 ___ Kamut
 ___ LECITHIN GRANULES
 ___ LEMON GRANULES
 ___ LEMON JUICE POWDER (INSTANT)
 ___ LEMON PEEL CUT
 ___ LEMON PEPPER BLEND, GROUND
 ___ LENTILS, 100 LB BAG
 ___ LICORICE MINT BLEND (TEA) NO
 CAFFEINE
 ___ LICORICE ROOT POWDER

 ___ LICORICE SPICE BLEND (TEA)
 CAFFEINE FREE
 ___ LICORICE STICKS
 ___ MACE, GROUND
 ___ Macaroni & Cheese
 ___ MAPLE LEAF
 ___ MARGARINE POWDER,
 ___ MARJORAM, CUT
 ___ MEAT TENDERIZER, SEASONED,
 ___ MEAT TENDERIZER,
 UNSEASONED,
 ___ MICROWAVE POPCORN CINCH
 BUTTER
 ___ MILK, INSTANT, NON FAT DRY,
 ___ MILK, REGULAR, NON FAT DRY,
 ___ MILLET,
 ___ MILLET, HULLED,
 ___ MIX, BELGIAN WAFFLE
 ___ MIX, BLUEBERRY MUFFIN
 ___ MIX, BROWNIE
 ___ MIX, BUTTERMILK BISCUIT
 ___ MIX, Cheasecake
 ___ MIX, CHOCOLATE CHIP COOKIE
 ___ MIX, COOKIE, CHOCOLATE CHIP
 ___ MIX, Fudge Brownie
 ___ MIX, Honeywheat Bread & Roll
 ___ MIX, Scones
 ___ MIX, WHITE FROSTING,
 ___ MOLASSES, HOME MADE,
 ___ MRE, COMPLETE MEAL,
 ___ MRE, Applesauce

___ MRE, Beef Frankfurters
 ___ MRE, Beef Ravioli
 ___ MRE, Beef Steak (chunked & formed)
 ___ MRE, Beef Teriyaki
 ___ MRE, Cheese Spread
 ___ MRE, Cheese Tortellini
 ___ MRE, Cherry Beverage Powder
 ___ MRE, Solid Chicken Breast Patties
 ___ MRE, Chicken Noodle
 ___ MRE, Chicken Salsa
 ___ MRE, Chili Macaroni
 ___ MRE, Chocolate covered cookies
 ___ MRE, Cocoa
 ___ MRE, Crackers
 ___ MRE, Ham Slices
 ___ MRE, Lemon Pound Cake
 ___ MRE, Meat Loaf W/Brown Onion
 Gravy
 ___ MRE, Mexican Rice
 ___ MRE, Oatmeal Cookie Bar
 ___ MRE, Pasta Vegetable
 ___ MRE, Pasta & Vegetable Alfredo Sauce

 ___ MRE, Peanut Butter
 ___ MRE, Pork w/Rice
 ___ MRE, Pork Chow Mein
 ___ MRE, Escalloped Potato W/Ham
 ___ MRE, Potato Sticks
 ___ MRE, Spaghetti
 ___ MRE, Grilled Turkey Breast & Potatoes
 ___ MRE, Turkey Breast & Potatoes
 ___ MRE, Western Beans
 ___ MRE, White Rice
 ___ MUFFIN, BLUEBERRY
 ___ MUFFIN, CORN,
 ___ MUNG BEANS (FOR SPROUTING)
 ___ MUSHROOM SLICES,
 DEHYDRATED,
 ___ MUSTARD SEED (BROWN) WHOLE
 ___ MUSTARD SEED (YELLOW)
 POWDER
 ___ MUSTARD SEED (YELLOW)
 WHOLE
 ___ MYRRH GUM PCS
 ___ Noodles, Egg
 ___ NUTMEG, GROUND
 ___ NUTMEG, WHOLE
 ___ OAT BRAN,
 ___ OAT GROATS,
 ___ OATS
 ___ OIL, 100% CANOLA FRYING OIL,
 ___ ONION, CHOPPED
 ___ ONION, GRANULES

___ ONION, POWDER, DOMESTIC
 ___ ORANGE PEEL GRANULES
 ___ ORANGE SPICE
 ___ OREGANO (GREEK), CUT
 ___ OREGANO (MEXICAN), CUT
 ___ OREGANO (MEXICAN), GROUND
 ___ OREGANO (MEXICAN), WHOLE,
 ___ PAN D'ARCO (CUT)
 ___ PANCAKE MIX, 6 Grain
 ___ PANCAKE MIX, Blueberry
 ___ PANCAKE MIX, BUTTERMILK,
 ___ PANCAKE OLD FASHIONED,
 ___ PAPRIKA GROUND
 ___ PARSLEY FLAKES (CALIFORNIA)
 ___ PARSLEY HERB POWDER
 ___ PASTA, EGG NOODLES,
 ___ PASTA, LASAGNA, WIDE CUT,
 ___ PASTA, MACARONI, JUMBO
 SHELL,
 ___ PASTA, MACARONI, LARGE
 SHELL,
 ___ PASTA, MACARONI, ELBOW,
 ___ PASTA, MACARONI, SALAD,

 ___ PASTA, MACARONI, SMALL
 ELBOW
 ___ PASTA, MACARONI, SMALL
 SHELL,
 ___ PASTA, MACARONI, Whole Wheat
 ___ Pasta-Pizza Sauce Mix
 ___ PASTA, SPAGHETTI,
 ___ Peach Slices
 ___ peach Flavor Apple Slices
 ___ PEANUT BUTTER POWDER,
 DEHYDRATED
 ___ PEAS, Alaskan
 ___ PEAS, BLACK EYED,
 ___ PEAS, SPLIT GREEN,
 ___ PEAS, SPLIT YELLOW,
 ___ PEAS, SWEET GARDEN,
 DEHYDRATED
 ___ PEAS, WHOLE GREEN,
 ___ PEPPER (BLACK) 1/4 CRACKED
 ___ PEPPER (BLACK) TABLE GRIND
 ___ PEPPER (WHITE), FINE GROUND
 ___ PEPPERCORNS (BLACK), WHOLE
 ___ PEPPERMINT, DOMESTIC
 ___ PEPPERMINT TEA BAGS
 ___ PEPPERS (GREEN BELL)
 ___ PICKLING SPICE BLEND, WHOLE
 ___ POPCORN, RABBIT EARS,
 ___ POPPY SEED
 ___ POPPY SEED, (BLUE), WHOLE

___ POTATO DICES, DEHYDRATED
 ___ POTATO FLAKES, DEHYDRATED,
 ___ POTATO GRANULES,
 ___ POTATO SLICES, DEHYDRATED,
 ___ POTATO, HASHBROWNS,
 DEHYDRATED,
 ___ POULTRY SEASONING, GROUND
 ___ PSYLLIUM HUSKS
 ___ PUDDING, BANANA, ADD
 MILK/INST
 ___ PUDDING, BUTTERSCOTCH,
 MILK/INS *
 ___ PUDDING, Custard
 ___ PUDDING, CHOCOLATE,
 MILK/COOK *
 ___ PUDDING, CHOCOLATE,
 MILK/INST *
 ___ PUDDING, COCONUT, MILK/INST *
 ___ PUDDING, LEMON, MILK/INST *
 ___ PUDDING, Tapioca
 ___ PUDDING, VANILLA, ADD
 MILK/INST *
 ___ PUDDING, VANILLA, MILK/COOK
 ___ PUMPKIN PIE SPICE,

 ___ PUMPKIN SEEDS, SHELLED
 ___ Quinoa,
 ___ RADISH SEED,
 ___ RADISH SEED, (FOR SPROUTING)
 ___ RAISINS, Select
 ___ RAISINS, Golden
 ___ RASPBERRY LEAF
 ___ RED CLOVER SEEDS (FOR
 SPROUTING)
 ___ RICE, Basmati Brown-Organic
 ___ RICE, BROWN, LONG GRAIN
 ___ RICE, Par Boiled
 ___ RICE, WHITE, LONG GRAIN
 ___ ROSE HIP POWDER
 ___ ROSEMARY, CUT
 ___ ROSEMARY, GROUND
 ___ ROSEMARY, WHOLE
 ___ RYE FLAKES, PAPER BAG
 ___ RYE, PAPER BAG
 ___ SAGE, FINE POWDER
 ___ SAGE, RUBBED
 ___ SAGE, WHOLE
 ___ SALAD SUPREME SEASONING
 ___ SALT
 ___ SAUCE, AU JUS INSTANT
 ___ SAUSAGE SEASONING,
 ___ SESAME SEED (NATURAL) WHOLE
 ___ SHEPHERDS PURSE

___ SHORTENING POWDER,
 DEHYDRATED
 ___ SLIPPERY ELM POWDER
 ___ SOUP BASE, BEEF FLAVOR
 ___ SOUP BASE, CHICKEN FLAVOR,
 ___ SOUP BASE, CREAM, NON DAIRY
 ___ SOUP MIX, ABC,
 ___ SOUP MIX, BEEF BARLEY
 ___ SOUP MIX, OLD FASHIONED,
 ___ SOUP, AU-JUS SAUCE
 ___ SOUP, BEEF, BARLEY,
 VEGETABLE
 ___ SOUP, BEEF Noodle
 ___ SOUP, BEEF Flovored Stew
 ___ SOUP, CHICKEN NOODLE, (GREAT
 FLAVOR)
 ___ SOUP, CORN CHOWDER BASE,
 MAKES
 ___ SOUP, CREAM OF CHICKEN,
 MAKES
 ___ SOUP, CREAM OF MUSHROOM,
 MAKES
 ___ SOUP, CREAM PEA CHOWDER,
 MAKES
 ___ SOUP, CREAMY CHEDDAR CHWD,

 ___ SOUP, Creamy Potato
 ___ SOUP, FRENCH ONION SOUP,
 ___ SOUP, ITALIAN TOMATO/VEG,
 ___ SOUP, MINESTRONE,
 ___ SOUP, Mountain Stew Blend
 ___ SOUP, NE CHOWDER BASE,
 ___ SOUP, OLD FASHIONED SOUP MIX
 ___ SOUP, ORIGINAL CREAM SOUP
 BASE
 ___ SOUP, VEGETABLE BEEF #
 ___ Sour Cream Powder
 ___ SOUTHERN BUTTERMILK BISCUIT
 MIX
 ___ SOUTHERN CORNBREAD II
 (YELLOW)
 ___ SOY SAUCE,
 ___ SPEARMINT SPICE BLEND (TEA)
 NO CAFFEIN
 ___ SPELT, (ORGANIC)
 ___ SPINACH FLAKES
 ___ SUGAR, BROWN,
 ___ SUGAR, POWDERED,
 ___ SUGAR, WHITE
 ___ SUNFLOWER SEED, RAW,
 ___ Sweet Potato
 ___ SYRUP, APRICOT,
 ___ SYRUP, BLUEBERRY,

___SYRUP, BOYSENBERRY,
 ___SYRUP, NATURAL BUTTER
 FLAVOR,
 ___SYRUP, STRAWBERRY,
 ___SYRUP, LIGHT CORN,
 ___T.V.P. BACON FLAVORED,
 ___T.V.P. BEEF FLAVORED,
 DEHYDRATED
 ___T.V.P. CHICKEN FLAVORED,
 ___T.V.P. IMAGIC BARBECUE
 MIX
 ___T.V.P. IMAGIC BBQ
 FLAVOR,
 ___T.V.P. IMAGIC SLOPPY JOE
 MIX
 ___T.V.P. IMITATION HAM
 FLAVOR CHIPLETS

___T.V.P. PEPPERONI,
 IMITATION FLAVOR
 ___T.V.P. SAUSAGE FLAVOR
 T.V.P. TACO BEEF FLAVOR
 ___T.V.P. ULTRA-SOY,
 MINCED, NATURAL *FLAVOR*
 ___TACO SEASONING,
 GROUND
 ___TAPIOCA PEARLS
 (MEDIUM) WHOLE
 ___TARRAGON (CALIFORNIA),
 CUT

___TEA STRAINER(S)
 ___THYME, GROUND
 ___THYME LEAVES
 ___TOMATO POWDER,
 DEHYDRATED,
 ___TUMERIC POWDER
 ___VALERIAN ROOT CUT
 ___VALERIAN ROOT POWDER
 ___VANILLA EXTRACT
 ___VEGETABLE FLAKES,
 MIXED
 ___VEGETABLE SOUP BLEND
 ___VEGETABLE STEW BLEND
 ___WHEAT BRAN, PAPER BAG
 ___WHEAT FLAKES, WHITE,
 ___WHEAT GERM
 ___WHEAT, CRACKED,
 ___WHEAT, GOLDEN 86,
 ___WHEAT, HARD RED
 STORAGE,
 ___WHEAT, HARD WHITE,
 ___WHEAT, SOFT WHEAT,
 ___WHEAT, VITAL GLUTEN,
 ___WHEAT, WHITE, GOLDEN
 86,
 ___WHEY,
 ___WHITE CREAM SAUCE
 ___WHITE PEPPER, WHOLE
 ___YEAST, INSTANT

SEED LIST

Eventually you will need to start raising your own food. To do this, you will need seeds, but not the kind of seeds you buy at the store. Why? Because those are hybrid seeds, and most hybrid seeds have no capacity to reproduce.

Hybrid seeds are a cruel trick played out on humanity. Seeds are God’s gift to mankind,

and for corporations and marketing people to purposely create seeds that can’t produce offspring seems criminal. Yet this is exactly what goes on every day, all over the world. It’s all about protecting patents and “profits.” Well, those profits might get you killed if you’re dumb enough to go along with the mainstream and buy hybrid seeds.

You need non-hybrid seeds. These are genetically-pure seeds, grown for hundreds or thousands of years, that consistently produce viable offspring. There’s only one place I know of to get a complete garden-package of non-hybrid seeds at an affordable price: the **Ark Institute**. Buy

their non-hybrid seed package and store it away as if it were gold. If civilization breaks down, these seeds may be the key to your survival and prosperity. While everyone else is scratching their heads wondering why their green beans won't sprout, you'll be reaping a huge harvest of self-proliferating, nonhybrid fruits and vegetables.

When you buy the non-hybrid seed package from the **Ark Institute**, you'll receive these seeds:

- | | |
|-------------------------------|--------------------------------|
| ○ Asparagus | ○ Spanish Onions |
| ○ Green Bush Beans | ○ Red Onions |
| ○ Yellow Bush Beans | ○ Yellow Onions |
| ○ Red Kidney Beans | ○ Scallions |
| ○ White Navy Beans | ○ Green/Red Sweet Pepper |
| ○ Pinto Beans | ○ Long Yellow Sweet Peppers |
| ○ Sweet Green Peas | ○ Cayenne Hot Pepper |
| ○ Snow Peas | ○ Pie Pumpkins |
| ○ Red Beets | ○ Giant Radish |
| ○ White Sweet Corn | ○ Spinach |
| ○ Yellow Sweet Corn | ○ Canning/Catsup Tomato |
| ○ Spring Broccoli | ○ Yellow Summer Squash |
| ○ Fall Broccoli | ○ Zucchini Summer Squash |
| ○ Red Cabbage for Salads | ○ Butternut Squash |
| ○ Cabbage for coleslaw/kraut | ○ Acorn Winter Squash |
| ○ Early Carrots | ○ Solid Salad/Canning Tomato |
| ○ Mid-Season/Late Carrots | ○ Italian Plum Tomato |
| ○ Salad Cucumbers | ○ Large Salad Tomato |
| ○ Pickling Cucumbers | ○ Heirloom Slicing Tomato |
| ○ Eggplants | ○ Flour/M Meal Corn |
| ○ Butterhead Lettuce | ○ Wheat |
| ○ Red Lettuce | ○ Drought-resistant Cantaloupe |
| ○ Mildew-resistant Cantaloupe | ○ Romaine Lettuce |
| ○ Summer Oak Leaf Lettuce | ○ Parsley |
| ○ Basil | |

3 Months without Hope

One rule of three that I have often seen added is to those listed at the beginning of this manual is: ***3 Months without hope.***

A sure way to fall into despair during a crisis is to have failed to prepare for it; disasters by nature most times lead to chaos, suffering and distress, but when you add in hunger, thirst and cold to the chaos depression and hopelessness will soon follow. Preparedness, training and a plan can do much to reduce the chaos about you and though it is true that

often chance seems play a great deal in who survives a crisis situation remember the words of Louis Pasteur: **“Chance favors the prepared mind.”**

Why Should and What do We Prepare for?

Be thou prepared, and prepare for thyself, thou, and all thy company that are assembled unto thee, and be thou a guard unto them. Ezekiel 38:7

SHOULD BELIEVERS PREPARE FOR HARD TIMES OR “JUST HAVE FAITH”?

By Steve Collins

Many Christians see that hard times are coming. The biblical prophecies have warned about an unprecedented, global, end-time crisis, and we may be entering the early phases

of that crisis now. Indeed, one does not need to be a believer to understand hard times are coming. Any non-believer can see it easily just by watching the news and reading internet reports.

Based on my emails and Christian links sent to me, I see two camps of modern Christian thought on how Christians should react to this crisis. One camp says we should simply “have faith” and rely on God to protect us in the future. An extreme version of this viewpoint maintains that it is a failure of faith to make any physical preparations for the crisis. The other camp believes that people should make physical preparations now to prepare for very difficult times ahead of us. This blog will make it clear I am in the latter camp, and that the scriptures support that view.

Remember Hurricane Katrina and the survivors who lacked everything and awaited rescue from helicopters and hand-outs from the government? Due to historic debt and the financial crisis, the government is in far weaker condition now that it was in the time of Hurricane Katrina. You may be “on your own” for some time in the event of a local disaster. In the event of a national disaster, you may be on your own for months. Even FEMA advises citizens to have some stockpiles of essentials to be able to “be on your own” for days in the event of an earthquake, tornado, hurricane, etc.

Proverbs 22:3 warns: *“A prudent man foresees the evil, and hides himself: but the simple pass on and are punished.”*

Proverbs 6:6 advises mankind: *“Go to the ant, you sluggard, consider her ways and be wise, which...provides her meat in the summer and gathers her food in the harvest.”*

These scriptures advise believers to foresee future dangers and prepare for them in advance while they can do so. God equips some animals to store up food supplies for

winter, but he gives human beings minds with which we should be able to see dangers coming in the future. God warned Joseph of a terrible famine that was coming in seven years in order to give him time to make prodigious preparations for seven years to prepare for it (Genesis 41:46-49). Joseph did not “lack faith” by making advance preparations; he showed faith by acting on the warnings and making those preparations! If Joseph had not done so, Jacob’s family and many others would have starved to death. God gave Noah a 120-year advance warning about the impending Deluge, and Noah and his family acted on God’s warning and built the Ark (Genesis 6:3, 14-22 and

Hebrews 11:7). God gave Lot and his family advance warning to get out of Sodom before it was destroyed. *The biblical record is clear that God expects his people to act on his warnings.* The Bible is full of warnings about famines, pestilences, wars, persecutions and evil times which will befall the earth in the last days. God has *already* given us many warnings in his Word! Like biblical personalities of old, we should act on those warnings.

One reader of this website sent me the first link, a warning from Christian pastor David Wilkerson that God’s judgment is about to fall in the form of a severe crisis. This is not an alarmist warning—one can come to this same conclusion simply by reading the financial pages. Whether his timing proves to be correct or not, his counsel for believers to have at least a 30-day supply of food and necessities is wise advice and is based on the wisdom of the scriptures in Proverbs cited above. A disaster needing that kind of preparation could be precipitated by an earthquake in California or the New Madrid fault zones, a mega-hurricane, a financial collapse in which the dollar loses most or all of its value, a government-declared “bank holiday” of unknown length or a war in the Mideast which paralyzes oil shipments and banking transactions for a considerable period of time. Any number of things could cause a sudden, global crisis. Another possibility is a bird-flu pandemic or some other kind of global plague. Another reader sent me the second link that the alertness of a Canadian lab discovered the presence of live avian-flu cultures wrongly mixed among vaccinations vs. that very threat. If these active cultures had been disseminated in the form of vaccines, a mass pandemic could have struck as a result of either human error or intentional terrorism.

Believers may have to rely on God for help when sudden, *unexpected* disasters or threats overtake them. However, I think it is “tempting God” to do nothing and wait for him to protect us from an impending danger when he gives us plenty of advance warnings. Christ himself declared that it was “tempting God” to deliberately place yourself in a dangerous situation to see if God will protect or rescue you (Matthew 4:6-7). By refusing to make preparations when God has given advance warnings, is one not “tempting God” by ignoring God’s warnings? Believers should also remember Paul’s strenuous warning

in I Timothy 5:8 that one “denies the faith and is worse than an infidel” if we do not “provide” for the needs of our own household. If God gives us numerous advance warnings of dangerous and hard times in the latter days (which he has), should we not take God seriously and prepare for those anticipated dangers (as did Noah and Joseph) so our households are prepared for the danger?

If you believe the biblical warnings of famines, pestilences and severe challenges in the latter-days just ahead of us, then you can see the evil times ahead of time. Proverbs 22:3

tells us that if we can see those dangers ahead of time, we should prepare for those hard times. You know what the needs of you and/or your family will be if a disaster (or disasters) strike. You should act on God's counsel and make preparations now...before the hard times hit. This is not a "lack of faith." I think it is exercising proper faith to take God at his word and act on those warnings to meet difficult times. I don't know when these times will hit, but we know the Bible warns us that these hard times are coming.

Not only should you make preparations for the well-being of yourself and your loved ones, it is also wise to make preparations to help others who will be in need when hard times come

(Ephesians 4:28). Remember that it is "more blessed" to be the giver than the receiver (Acts 20:35) in a time of need.

10 Morale Boosters for Any Worst Case Scenario

by Jack C.

Ok, so the IHTF (It Has Hit the Fan). You are hunkered down with your preps about you. There's no 'zombies' knocking down your door, but the first few days are nerve-wracking to be sure. You've been busy securing what you can, monitoring the situation and generally getting into a survival routine to match whatever is going on.

But after a few days hopefully, you have gotten a handle on things and your adrenaline has stopped pumping full throttle and the work that at first seemed that there weren't enough hours in the day for is now routinely done. So now what happens with the initial action over and hopefully you are just biding time and waiting for things to get back to something much more normal? What if it's an extended period? How do you keep morale up, stave off depression, and keep hope alive?

First, hopefully you are prepared for whatever the event is. Being prepared and being able to provide even just the basics will go far in reducing worry and panic. Full bellies (even if it isn't exactly what you wanted), sated thirst, and a warm, dry place to sleep will at least give you something to build on.

Here are some additional ideas to keep up the morale of your group.

1. *Don't hide just how bad things are. Even kids are smart enough after a while to know what is going on. Hiding it won't help and might even hurt if they believe you've*

failed to make them aware, told them what to expect and what to do and not to do. No, you don't have to go into gory details, but they have to understand what has happened so they can deal with what they have to do now – their new reality.

2. *Keep busy. That might be very easy at first, especially if you are talking about some natural event like an earthquake or hurricane. Just making needed patchwork repairs and clean-up, along with all the added chores needed to just get by, will keep you*

busy for some time, but after a while, even those chores may run out. There's a reason the military has always had busy work to help people stay out of trouble. Remember your Grandmother saying idle hands are the devils workshop? It's true. Make up a schedule and keep with it. Day after day of doing nothing will wear you out physically, mentally and emotionally. Even if you are hunkered down, you can't just lie around, eat, and sleep. You have to keep busy doing things. A schedule will bring order to what is a chaotic situation. It will also give purpose to the day, allow you to share the work better, and make everyone aware of just what is expected of them in support of the group.

3. All work and no play make Jack a dull boy, and this is just as true for adults as it is for children. Make sure there is playtime for everyone. In your preps have some card and board games and have a game night or game time. Books are another thing that should be in your preps. [Family](#) favorites, classics. Some of my most cherished memories are reading [The Hobbit](#) and [The Lord of the Rings](#) to my children at night. Good stories often manage to transport us to other places for a bit, and reading about others overcoming adversity often manages to make our own troubles seem manageable.

4. [Family](#) movie night is another idea, but if the power is out, a portable DVD player can still make it possible to gather around and watch a family favorite. Don't forget the popcorn, which should be part of your preps.

5. Music 'hath charms to sooth the savage beast', music is always welcome and a MP3 player and a small speaker set runs on minimal power and a good MP3 player can hold thousands and thousands of songs. If you watched the movie 'The Book of Eli' you will know what I mean.

6. Food, especially comfort food, will be welcome. Store away some hard candy in your preps for an occasional sweet treat. A dessert always goes a long way in brightening what might otherwise be another bland, dull, monotonous meal. So learn some easy and quick dessert recipes that can be made from your [food storage](#).

7. Rarely in the history of men has the human race been so conscious of their personal hygiene. If water is obtainable, make some available for personal use and baths (even a spit bath). This will go a long way in raising a person's morale. Consider adding a [solar camp shower](#) to your preps. There are a number of various models available, and a hot shower washes away far more than just dirt. Toiletries are often mentioned in the blogs and journals of people who have lived through SHTF. So add to your preps soap, deodorant and toothpaste. All this will go a long way in making things tolerable, and they have a history of being good barter items as well.

8. Learning materials. For kids flash cards, math books, spelling and educational work books. Books that teach skills and materials to go with them like sewing, knitting and woodworking supplies. In an extended SHTF scenario home schooling can be beneficial to both 'teachers' and students.

9. Learn to change and adapt. People handle change differently, some find it easier than others, but if it's a major SHTF situation that you are dealing with, you have to

expect that things just aren't going to go straight back to the way they were, maybe even never. The sooner you accept the situation, the less you will fret over it. It may not be easy, but it will be essential that you quickly learn to deal with a 'New Normal' whatever that might be. Also, you need to be prepared for ups and downs during the 'recovery', stay on your guard, and be prepared to revert to full survival mode at any time. Keep prepping! Nothing will get you down quicker than a missed opportunity to replenish or acquire additional preps because things seem fine and then the roll coaster ride that life often is can always and suddenly go on a fast downhill run. One other adaptation that many Americans will have to deal with is that of multi-generational and even multi-family households. This is something that was the normal, but hasn't been for years. Unlike the traditions of much of the world, Americans move out of their parents homes and establish their own. During SHFT the more people in your home or group, the better your chances are of survival. There was a reason families were big in the 19th century. Staying alive was a lot of work and the more hands there were the more work that could be shared and done. A small family unit will struggle during most SHTF events and will simply NOT survive an extended collapse that lasts years. There is a reason the family unit was prized for thousands of years and though everyone has stories of family strife, in the end blood really is thicker than water.

10. *Last, but most importantly, remember the Sabbath. Keeping faith in the Lord will do more than everything previously mentioned. You may think you are not a preacher, and ask, "What do I know about leading a service?" The Bible instructs us that men are to be the spiritual heads of their household, and we lead by example. No one expects you to be Billy Graham, but every man should be able to handle a Bible reading and singing a few simple hymns. Pick the old ones, the ones that most know by heart, maybe even have a couple CD's. Download or get from your church children's Sunday school papers/handouts and use them. They are simple and easily taught and learned by all. I suggest you use especially those in which people of faith live through adversity, like the Exodus, the Stories of David, Joseph and Job, Daniel and the lion's den, or the story of Shadrach, Meshach and Abednego. Teach that believers have often been tested by trials, but that those who keep the faith have endured. My church has a whole library of our pastor's sermons available for free download.*

That's my list and though I am sure that many will have something to add or expound on one of those that I have listed. One of the most important things we must remember during SHTF is not to just live through it, but to live and thrive during it as well.

Compiler's Note: *Part of keeping your morale up is knowing what to expect. Fear and Ignorance is just as big any enemy as any 'zombie'. The following articles are practical real life experiences of people who have live through SHTF. Read, learn and 'gird your loins' accordingly.*

The One-Hour Meltdown

Robert Wayne Atkins, P.E.

Introduction

The following is just my opinion. It is nothing more than my opinion. I have nothing to substantiate or prove any aspect of my opinion. My opinion is simply the logical conclusion of a law-abiding sixty-year old Christian grandfather who has both an engineering degree and an M.B.A. degree and who has seen both good times and hard times during his life.

The Current Situation:

At the present time every nation in the entire world is facing serious financial and social stress. If only a few nations were involved then it might be possible to contain the upcoming meltdown to a few specific geographical areas. This has been successfully done in the past. However, since the entire world is currently on the edge of the cliff, when the meltdown begins it will impact almost everyone on the face of the earth.

Unless God chooses to intervene, the meltdown is no longer avoidable. Our governments and our financial institutions are no longer in control. However, to keep the system working just a little longer they must maintain the illusion that they have the system under control. But the system is broken and it can't be fixed.

There are two reasons why the system can't be fixed:

1. It has grown beyond its own capacity to support itself.
2. It has become so complex that no one can do anything significant to fix it because it is hemorrhaging in too many different places.

The average person in every nation on the face of the earth knows the meltdown is coming. The wealthy people know it. The poor people know it. Nobody wants it to happen. But almost everyone is just patiently waiting for it to begin and at the same time hoping that it doesn't begin too soon.

Nobody knows when the meltdown will actually start. It may begin one-month from now. Or a year from now. Or three-years from now.

But almost everyone knows that at some future date the meltdown will occur.

This widespread knowledge of the impending disaster is the reason that when the disaster begins it will quickly and completely spiral out-of-control in one-hour or less. In my opinion, most people do not seriously believe it could happen this quickly. Most people expect a more gradual meltdown. They may be right because nobody can predict the future, and that includes myself.

The One-Hour Meltdown

However, my personal opinion is that once the meltdown begins then in less than one-

hour it will quickly escalate far beyond anyone's ability to control or manage it on a worldwide basis. The five basic assumptions that cause me to believe in my "one-hour meltdown theory" are as follows:

1. Banks: The financial institutions around the world cannot withstand a full-scale worldwide bank run. Therefore, they have already made plans to immediately shut down the instant they are told to do so. Within minutes, all across the globe, all the ATM machines will be offline, all credit card and debit card verification transactions will be halted, and all banks will have their vaults locked and their doors locked and their building emptied of all personnel, except perhaps for some special security guards. All high-level bank executives will immediately disappear to a wide variety of remote safe unknown locations. All telephone call inquiries to any of the financial institutions will be automatically answered by a computer with a pre-recorded message similar to the following: "Our system is currently experiencing an extremely high call volume and therefore we are unable to answer your call at this time. Please try again later when our call volume returns to normal."

2. Governments: The vast majority of our government leaders all over the world are relatively intelligent individuals. They completely understand the ramifications of a "bank holiday" in our computer controlled financial economy. Therefore, all government offices will also be immediately shut down, and they will empty their buildings and lock their doors. Any transaction in progress, including any trials in progress, will be immediately halted and postponed until some future date. All high-level government officials, including all judges and tax officials, will immediately disappear to a wide variety of remote safe unknown locations.

3. Retail Businesses: Since they will be unable to process even simple transactions, all retail establishments, both large and small, will immediately lock their doors to prevent anyone else from entering. If possible, they will complete any transactions for customers already inside their building if those customers have enough cash to pay for their purchases. Any customers wishing to pay by check or credit card or debit card will be told that the verification system is down and their transaction can't be completed. All customers will then be immediately escorted to the doors and the doors will be briefly opened and then immediately locked after they exit. In addition, in a manner similar to what happened during the World Trade Center meltdown, each store's management may demand that their employees remain at their stations until further notice or they will lose their jobs for leaving without management's permission. But most of the more intelligent employees will leave at the same time as the store's last few remaining customers. The store's special security guards may or may not remain behind in order to protect the store with their lives. Since most of these special security guards are not paid exceptionally well, a large number of them may decide that they should return home and protect their own families instead.

4. Criminals: Anyone and everyone who has any criminal tendencies and who has been patiently waiting for this to happen will immediately see it as a once-in-a-lifetime opportunity to improve their financial situation. More than likely the vast majority of these criminals have already made very detailed plans that includes exactly which

businesses they are going to rob first, second, third, and so on. Any business with a reasonable level of cash-on-hand will be very high on every criminal's list. Every jewelry store and pawn shop that has any type of silver or gold jewelry, or precious stones

(diamonds, rubies, emeralds, etc.), will be very high on everyone's list. The warfare that breaks out at these establishments between competing criminals will not be pleasant.

5. Normal People: Normal average people will begin looting. Grocery stores will be broken into and they will be completely emptied from wall-to-wall, including the rear storage area, in less than one-hour. Stores that have firearms, ammunition, appliances, clothing, shoes, or anything else needed by the average citizen will be emptied in less than one-hour. In skirmishes over the few remaining resources, normal average people will begin killing one another inside the stores, and in the parking lots outside the stores, and on the streets as these fully loaded vehicles try to escape with their loot.

The above events will all happen simultaneously during the first one-hour of the meltdown. After that first hour has passed, things will really begin to get nasty. Everyone will quickly realize there are not enough law enforcement personnel to protect everyone and everything. Although the military will probably be ordered to protect specific high priority establishments and resources, there will simply not be enough military personnel to protect individual civilians or businesses.

Lessons from Argentina's Economic Collapse

Part I

By Ferfal

(Editor's note: the article that follows is a very sobering account of the effect that the collapse of the Argentine economy (1999 - 2002) had on its citizens, as seen through the eyes of one of them. The economic collapse wiped out the middle class and raised the level of poverty to 57.5%. Central to the collapse was the implementation of neo-liberal policies which enabled the swindle of billions of dollars by foreign banks and corporations. Many of Argentina's assets and resources were shamefully plundered. Its financial system was even used for money laundering by Citibank, Credit Suisse, and JP Morgan (sound familiar?). The net result was massive wealth transfers and the impoverishment of society which culminated in many deaths due to oppression and malnutrition. I am not sure the same thing is about to happen here, but I am sure that there is a distinct possibility that it might. Just food for thought - JSB)

Wednesday, 13 December 2006

For western countries such as the UK, the first major problems of Peak Oil, assuming there are no oil shocks, will not be the shortage of oil but the economic crises that will occur. Argentina is a recent example of a country that suffered a serious economic crisis, and although Argentina and the UK are not identical, anyone interested in how economic crises can affect individual lives will be very interested in the following vivid description of life for an Argentinian following the economic collapse.

My brother visited Argentina a few weeks ago. He's been living in Spain for a few years

now. Within the first week, he got sick, some kind of strong flu, even though climate isn't that cold and he took care of himself.

Without a doubt he got sick because there are lots of new viruses in my country that can't be found in 1st world countries. The misery and famine lead us to a situation where, even though you have food, shelter and health care, most others don't, and therefore they get sick and spread the diseases all over the region.

What got me started on this post is the fact that I actually saw this coming, and posted on the subject here at Frugal's, months before the new viruses spread over the country and the news started talking about this new, health emergency, which proves that talking, thinking and for sharing ideas with like minded people (you guys), does help to see things coming and prepare them with enough time.

So I started thinking about several issues, what I learned (either the hard way or thanks to this forum) after all these years of living in a collapsed country that is trying to get out an economical disaster and everything that comes along with it.

Though my English is limited, I hope I'm able to transmit the main ideas and concepts, giving you a better image of what you may have to deal with some day, if the economy collapses in your country.

URBAN OR COUNTRY?

Someone once asked me how did those that live in the country fare. If they were better off than city dwellers. As always there are no simple answers. Wish I could say country good, city bad, but I can't.

Because if I have to be completely honest, and I intend to be so, there are some issues that have to be analyzed, specially security. Of course that those that live in the country and have some land and animals were better prepared food-wise. No need to have several acres full of crops. A few fruit trees, some animals, such as chickens, cows and rabbits, and a small orchard was enough to be light years ahead of those in the cities. Chickens, eggs and rabbits would provide the proteins, a cow or two for milk and cheese, some vegetables and fruit plants covered the vegetable diet, and some eggs or a rabbit could be traded for flour to make bread and pasta or sugar and salt. Of course that there are exceptions.

For example, some provinces up north have desert climate, and it almost never rains. It is almost impossible to live off the land, and animals require food and water you have to buy. Those guys had it bad, no wonder the northern provinces suffer the most in my country.

Those that live in cities, well they have to manage as they can. Since food prices went up about 200%-300%. People would cut expenses wherever they could so they could buy food. Some ate whatever they could, they hunted birds or ate street dogs and cats; others starved.

When it comes to food, cities suck in a crisis. It is usually the lack of food or the

impossibility to acquire it that starts the rioting and looting when TSHTF. When it comes to security things get even more complicated.

Forget about shooting those that mean you harm from 300 yards away with your MBR. Leave that notion to armchair commandos and 12 year old kids that pretend to be grown ups on the internet.

Some facts:

- 1) Those that want to harm you/steal from you don't come with a pirate flag waving over their heads.**
- 2) Neither do they start shooting at you 200 yards away.**
- 3) They wont come riding loud bikes or dressed with their orange, convict just escaped from prison jump suits, so that you can identify them the better. Nor do they all wear chains around their necks and leather jackets. If I had a dollar for each time a person that got robbed told me, "They looked like NORMAL people, dressed better than we are", honestly, I would have enough money for a nice gun. There are exceptions, but don't expect them to dress like in the movies.**
- 4) A man with a wife and two or three kids can't set up a watch. I don't care if you are SEAL, SWAT or John Freaking Rambo, no 6th sense is going to tell you that there is a guy pointed a gun at your back when you are trying to fix the water pump that just broke, or a carrying a big heavy bag of dried beans you bought that morning.**

The best alarm system anyone can have in a farm are dogs. But dogs can get killed and poisoned. A friend of mine had all four dogs poisoned on his farm one night, they all died.

After all these years I learned that even though the person that lives out in the country is safer when it comes to small time robberies, that same person is more exposed to extremely violent home robberies. Criminals know that they are isolated and their feeling of invulnerability is boosted. When they assault a country home or farm, they will usually stay there for hours or days torturing the owners. I heard it all: women and children getting raped, people tied to the beds and tortured with electricity, beatings, burned with acetylene torches.

Big cities aren't much safer for the survivalist that decides to stay in the city. He will have to face express kidnappings, robberies, and pretty much risking getting shot for what's in his pockets or even his clothes.

So, where to go? The concrete jungle is dangerous and so is living away from it all, on your own. The solution is to stay away from the cities but in groups, either by living in a small town-community or sub division, or if you have friends or family that think as you do, form your own community small community.

Some may think that having neighbors within "shouting" distance means loosing your privacy and freedom, but it's a price that you have to pay if you want to have someone to help you if you ever need it. To those that believe that they will never need help from anyone because they will always have their rifle at hand, checking the horizon with their

scope every five minutes and a first aid kit on their back packs at all times.... Grow up

SERVICES

Whatever sort of scenario you are dealing with, services are more than likely to either suffer in quality or disappear all together. Think ahead of time, analyze possible SHTF scenarios and which service should be affected by it in your area.

Think about the most likely scenario but also think outside the box. What's more likely? A tornado? But a terrorist attack isn't as crazy as you thought it would be a few years ago, isn't it?

Also analyze the consequences of those services going down. If there is no power then you need to do something about all that meat you have in the fridge, you can dry it or can it. Think about the supplies you would need for these tasks before you actually need them. You have a complete guide on how to prepare the meat on your computer... how will you get it out of there if there is no power? Print everything that you consider important.

WATER

No one can last too long without water. The urban survivalist may find that the water is of poor quality, in which case he can make good use of a water filter, or that there is no water available at all. When this happens, a large city where millions live will run out of bottled water within minutes.

In my case, tap water isn't very good. I can see black little particles and some other stuff that looks like dead algae. Taste isn't that bad. Not good but I know that there are parts of the country where it is much worse. To be honest, a high percentage of the country has no potable water at all.

If you can build a well, do so, set it as your top of the list priority as a survivalist. Water comes before firearms, medicines and even food.

Save as much water as you can. Use plastic bottles, refill soda bottles and place them in a cool place, preferably inside a black garbage bag to protect it from sun light. The water will pick some plastic taste after a few months, but water that tastes a little like plastic is far way better than no water at all.

Whatever the kind of SHTF scenario you are dealing with, water will suffer. In my case the economical crash created problems with the water company, that reduces the maintenance and quality in order to reduce costs and keep their income in spite of the high prices they have to pay for supplies and equipment, most of which comes from abroad, and after the 2001 crash, costs 3 times more. As always, the little guy gets to pay for it.

Same would go for floods or chemical or biological attacks. Water requires delicate care and it will suffer when TSHTF in one way or another. In this case, when you still have tap water, a quality filter is in order, as well as a pump if you can have one. A manual

pump would be ideal as well if possible.

Estimate that you need a approximately a gallon per person per day. Try to have at least two-four weeks worth of water. More would be preferable.

POWER

I spent WAY to much time without power for my own taste. Power has always been a problem in my country, even before the 2001 crisis.

The real problem starts when you spend more than just a few hours without light. Just after the SHTF in 2001 half the country went without power for 3 days. Buenos Aires was one big dark grave People got caught on elevators, food rot, hospitals that only had a few hours worth of fuel for their generators ran out of power. Without power, days get to be a lot shorter. Once the sun sets there is not much you can do.

I read under candle light and flashlight light and your head starts to hurt after a while. You can work around the house a little bit but only as long as you don't need power tools. Crime also increases once the lights go out, so whenever you have to go somewhere in a black out, carry the flashlight on one hand and a handgun on the other. Summarizing, being in a city without light turn to be depressing after a while. I spent my share of nights, alone, listening to the radio, eating canned food and cleaning my guns under the light of my LED head lamp. Then I got married, had a son, and found out that when you have loved ones around you black outs are not as bad. The point is that family helps morale on these situations.

A note on flashlights. Have two or three head LED lights. They are not expensive and are worth their weight in gold. A powerful flashlight is necessary, something like a big Maglite or better yet a SureFire, specially when you have to check your property for intruders. But for more mundane stuff like preparing food, going to the toilet or doing stuff around the house, the LED headlamp is priceless. Try washing the dishes on the dark while holding a 60 lumen flashlight on one hand and you'll know what I mean. LEDs also have the advantage of lasting for almost an entire week of continuous use and the light bulb lasts forever.

Rechargeable batteries are a must (ed. Get a solar powered battery charger) or else you'll end up broke if lights go out often. Have a healthy amount of spare quality batteries and try to standardize as much as you can.

I have 12 Samsung NM 2500Mh AA and 8 AAA 800mh for the headlamps. I use D cell plastic adaptors in order to use AA batteries on my 3 D cell Maglite. This turned out to work quite well, better than I expected.

I also keep about 2 or 3 packs of regular, Duracell batteries just in case. These are supposed to expire around 2012, so I can forget about them until I need them. Rechargeable NM batteries have the disadvantage of loosing power after a period of time, so keep regular batteries as well and check the rechargeable ones every once in a while. After all these years of problems with power, what two items I would love to have?

1) The obvious. A generator. I carried my fridge food to my parents house way to many times on the past. Too bad I can't afford one right now

2) A battery charger that has both solar panel and a small crank. They are not available here. I saw that they are relatively inexpensive in USA. Do yourself a favor and get one or two of these.

Even if they don't charge as well as regular ones, I'm sure it will put out enough power to charge batteries for LED lamps at least.

GAS

Gas has decreased in quality as well, there is little gas. Try to have an electric oven in case you have to do without it.

If both electricity and gas go down, one of those camping stoves can work as well, if you keep a good supply of gas cans. The ones that work with liquid fuel seem to be better on the long run, since they can use different types of fuel.

You can only store a limited amount of compressed gas and once you ran out of it, you are on your own if stores are closed or they sold them out.

Anyway, a city that goes without gas and light for more than two weeks is a death trap, get out of there before it's too late.

A DIFFERENT MENTALITY

I was watching the People & Art channel with my wife the other night. It was a show where they film a couple for a given period of time and some people vote on who is the one with the worst habits, the one they find more annoying.

We were in our bed, and this is when I usually fall asleep but since the guy was a firearms police instructor I was interested and managed to stay awake.

At one point the guy's wife said that she found annoying that her husband spent 500 dollars a month on beauty products for himself. 500 USD on facial cream, special shampoo and conditioner, as well as having his nails polished! If you are that guy and happen to be reading this, or if you know him, I'm sorry, but what an idiot!!

"500 USD, that's a small generator or a gun and a few boxes of ammo" I told my wife. "That's two months worth of food" she said. We were each thinking of a practical use for that money, the money this guy was practically throwing away.

Once the SHTF, money is no longer measured in money, but you start seeing it as the necessary goods it can buy. Stuff like food, medicine, gas, or the private medical service bill.

To me, spending 500 dollars on beauty products, and to make it worse, on a guy? That's simply not acceptable.

The way I see it, someone with that mentality can't survive a week without a credit card, no use in even considering a SHTF scenario. And this guy is a firearms instructor?...

probably the kind of guy that will say that a handgun is only used to fight his way to his rifle... and his facial night cream...

Once you experience the lack of stuff you took for granted, like food , medicines, your set of priorities change all of a sudden. For example, I had two wisdom tooth removed last year. On both occasions I was prescribed with antibiotics and strong Ibuprofen for the pain. I took the antibiotics(though I did buy two boxes with the same recipe just to keep one box just in case) but I didn't use the Ibuprofen, I added it to my pile of medicines.

Why? because medicines are not always available and I'm not sure if they will be available in the future. Sure, it hurt like hell, but pain alone isn't going to kill you, so I sucked it up. Good for building up character if you ask me. Make sacrifices so as to ensure a better future, that's the mentality you should have if you want to be prepared. There's stuff that is "nice to have" that has to be sacrificed to get the indispensable stuff. There's stuff that is not "basic need stuff" but it's also important in one way or another. My wife goes to the hairdresser once every month or two. It's not life or death, but it does make her feel better and it boosts her morale. I buy a game for the Xbox or a movie to watch with my wife every once in awhile, just to relax. 7 or 10 dollars a month are not going to burn a hole in my pocket.

Addictions such as alcohol, drugs or even cigarettes should be avoided by the survivalist. They are bad for your health, cost a lot of money that could be much better spent, and create an addiction to something that may not be available in the future. Who will have to tolerate your grouchy mood when your brand of smokes is no longer imported after TSHTF?

GRAY/BLACK MARKET

Once the SHTF the black/gray market will take no time to appear all around you. In my country, gray markets were even accepted in the end. At first it was all about trading skills or craft products for food. Districts and towns would form their own barter markets, and created their own tickets, similar to money, that was used to trade. This didn't last long. Those tickets were easy to make on your home computer, there was no control and eventually people went back to paper money.

These markets were usually placed on warehouses or empty land, and were managed by some wise guy and a few thugs or hired security. Anyone can go rent a kiosk inside these markets for about 50-100 pesos (about 20-30 dollars) a day and sell his goods and services.

Prices within these markets is usually respected... lets just say that these managers don't call the police if someone tries anything funny, like stealing, fighting or taking advantage of women. That's not good for their business and anyone that tries to mess with their business finds out how much pain the human body can actually experiment or gets a free ticket to meet the Lord.

Sometimes even uniformed cops manage security on these markets, for a small fee of course. As always, you still have to be careful. They may still try to pick your pockets or even attack you once you leave the market. Once you leave the market, you are on your own, as always.

This market evolves, and now a lot of different products are available. Today I visited my local market, a warehouse that is fairly well set up and cleanly managed. They had problems for selling stolen merchandise and fake Brand name clothes a few days ago. What can be found at a local markets? Mostly food and clothing. Some have more variety than others but cheese, canned food, spices, honey, eggs, fruits, vegetables, beer, wine and cured meat are generally available, same as bakery products and pasta. These are less expensive than those found at supermarkets. Fresh fish is sometimes available but not always, people don't trust much products that need refrigeration, and they get those at supermarkets instead.

Clothes are also popular and you can find copies of brand name clothes, imitations, or even original stolen new clothes, the same goes for shoes and sneakers. Children clothes, underwear, socks, sheets and towels are all very popular. Some sell toys, but they are always China made, mostly poor quality though there are some few exceptions. Others sell tools, also made in China can be found as well, but they are of poor quality. Some offer their services and repair stuff or offer work as handyman.

You would be amazed of the junk that these guys manage to fix: TVs, CD players, Power tools, etc. They even manage to solder the small integrated circuits boards sometimes. Give one of these guys a screw driver and a bar of chocolate and he will fix a nuclear submarine.

After food and clothes, the 3rd most popular item has to be CDs and DVDs, movies, music, play station 2 and Xbox games, programs, it all ends up there just one or two days after the official release in USA. Seems that they have a guy hidden under Bill Gate's desk or something.

Anyway, almost everything can be found there, and if you want, you can ask around, talk to the right guy and buy illegal stuff like drugs or black market guns and ammo. The quality of the drugs is questionable, of course, and a lot of addicts die from the mixtures these guys sell.

Guns are mostly FM High Powers, Surplus 1911s and Colt .45s, Sistemas, and old Colt Detective revolvers in 38 special that found their way from police and military armories into the black market. Condition isn't very good but if you have money you'll be amazed of what you can end up with. Everything that is used by the military and police, including SMGs a, Browning 50 BMG Machine guns, and even frag grenades, is available in the black market, if the customer has the amount of money and a little patience, of course. The big guns may take a while, but the handguns and grenades are readily available.

Lessons from Argentina's economic collapse

GOLD:

Someone hit me in the head please because I messed up about the gold issue.

Everyone wants to buy gold! "I buy gold. Pay cash" signs are everywhere, even on TV! I can't believe I'm that silly!

I just didn't relate it to what I read here because they deal with junk gold, like jewelry, either stolen or sold because they needed the money, not the gold coins that you guys talk about. No one pays for the true value of the stuff, so big **WARNING!** Sign on people that are buying gold coins.

Since it is impossible to determine the true mineral percentage of gold, small shops and dealers will pay for it as regular jewelry gold.

What I would do if I were you: Besides gold coins, buy a lot of small gold rings and other jewelry. They should be less expensive than gold coins, and if the SHTF bad, you'll not be losing money, selling premium quality gold coins for the price of junk gold. If I could travel back in time, I'd buy a small bag worth of gold rings.

Small time thieves will snatch gold chains right out of your neck and sell them at these small dealers found everywhere. This is **VERY** common at train stations, subways and other crowded areas.

So, my advice, if you are preparing for a small economical crisis, gold coins make sense. You will keep the value of the stuff and be able to sell it for its actual cost to gold dealers or maybe other survivalists that know the true value of the item.

In my case, gold coins would have been an excellent investment, saving me from losing money when the local economy crashed. Even though things are bad, I can go to a bank down town and get paid for what a gold coin is truly worth, same goes for pure silver. But where I live, in my local are small time dealers will only pay you the value of junk gold, no matter what kind of gold you have. So, I'd have to say that if TSHTF bad, gold jewelry is a better trade item than gold coins.

GUNS, AMMO AND OTHER GEAR

After TSHTF in 2001, only the most narrow minded, brain washed, butterfly IQ level idiots believed that the police would protect them from the crime wave that followed the collapse of our economy.

A lot of people that could have been considered antigun before, ran to the gun shops, seeking advise on how to defend themselves and their families. They would buy a 38 revolver, a box of ammo, and leave it in the closet, probably believing that it would magically protect them from intruders.

Oh, maybe you don't think that firearms are really necessary or your beliefs do not allow you to buy a tool designed to kill people. So you probably ask yourself, is a gun really necessary when TSHTF? Will it truly make a difference?

Having gone through a shtf scenario myself, total economical collapse in the year 2001, and still dealing with the consequences, 5 years later, I feel I can answer that question. YES, you need a gun, pepper spray, a machete, a battle axe, club with a rusty nail

sticking out of it, or whatever weapon you can get hold of.

A LOT has been written on survival weapons. Everyone that is into armed survival has his or her own idea of the ideal gun battery. Some more oriented to a hunting point of view, others only as self defense means and others consider a little of both, and look for general purpose weapons.

Talking about guns, there is one special subject I want to rectify, and it's the point on what's the primary weapon for the survivalist, specially a urban survivalist that has to function in a society, yes, even after the SHTF.

People, if you are interested in real world SHTF situation, and you want to prepared for the real deal, then understand that this isn't black or white. You wake up one day and listen on the radio that the economy collapsed and that the stock market closed indefinitely.

CRIME AND INSECURITY

Even though crime has always been an issue in South America, my country was quite the exception. It was dangerous, yes but nothing like after the 2001 economical crisis. One used to be able to let kids play on the sidewalk, or walk back home from a party, a few blocks, and be somewhat safe. This all changed now. There are no kids playing on the sidewalks anymore. I should emphasize this a little more. There are absolutely NO kids playing on the sidewalks at all, at any time of the day. Maybe a kid rides his bike a few meters on the sidewalk, but always under the supervision of an adult. A kid riding a bike on his own will get that bike stolen in no time, probably get hurt in the process, therefore no responsible parent leaves a kid alone on the street. Teenagers present a greater problem. You can't keep a 15 or 16 year old inside a house all day long, and even though they are big enough to go out on their own, when the sun goes down things get much worse.

This is when parents organize themselves; either taking them to someone's house or to a club and picking them up at a certain time. Taxis and remises are used sometimes , but there have been lots of cases of girls getting raped, so no parent worth a buck leaves his son or daughter in hands of a stranger. After years of living like this, almost everyone learned to be careful; sometimes they had to learn the hard way. Practically no one leaves a door or window opened or unlocked. Nor do they hang out in front of the house talking to friends. A bad guy might just see you there, like a sitting duck, pull a gun on you and take you inside your house.

There are no "bandit's law" anymore. One used to hear people talk about "You shouldn't resist a robbery, give them what they want and they'll go away". That holds true no more. These guys are under the influence of drugs, epoxy glue, or just hate your guts so much, because you have a better life than they ever dreamed of, because they were abused since the day they were born, that they will hurt and humiliate you as much as they can. Letting a criminal inside your house almost guarantees you that he will rape/beat/ torture and abuse whoever they find inside.

I personally drew a line a few years ago and decided, after one long, serious conversation with my wife; that no one would be allowed inside the house, no matter what. We figured that there are worse things than death. Having decided that, I make sure I always have a weapon on me. They'll have to pay dearly for my life, plus interests.

By far, the most dangerous moment of the day, is when I (or my wife) leave/enter my house. A solid, secure house cannot be broken in easily, so criminals wait until you are standing on front of the door with the keys on your hand to jump on you. This is why we are extra alert when approaching our house, look all around us and if we see anything strange, keep walking around the block or keep on driving. No door is ever opened when there is a strange person around. Whenever someone knocks on our door (and we don't know him/her), they are answered from a second story window. Criminals sometimes disguise as electric company guys or something like that, saying that they have to fix something. NO! If there is something to be fixed they can fix it on the sidewalk. Anything inside your house is your responsibility and the company is not going to fix it for you. Either way, it's always better to play it safe, Better to be rude than dead.

On the car/driving issue, that calls for an entire post dedicated to SHTF driving. For now I'll just say that windows and doors have to be closed at all times, a weapon must be within arms reach, and that stop signs and traffic lights have a hole new meaning once TSHTF. If your country ever falls as mine did, you'll remember me whenever you see a traffic light. You never stop at a red lights or stop sign unless there is traffic, especially at night.

At first, police would write you a ticket for not stopping at a red light if they saw you (another way of saying that they will ask for a bribe if they see you pass a red light), but after a few months they realized that nothing could be done, people would rather risk a ticket than risking their lives, so they decided to turn traffic lights to permanent yellow at night, after 8 or 9 PM. This is, of course, very dangerous. Night car accidents are both frequent and brutal since sometimes both cars hit each other at full speed.

MissinLink asked some good questions that might interest others as well, and since we are on the security issue, here they are:

"Do the invaders of homes in the country just drive up in cars or trucks? Do they hide and sneak up? How do these home invaders attack a home in the country? A similar question could be asked for homes in the city."

Sometimes they just drive up to where you are working, if you are far away from the home, but most of the time they sneak up on you. Criminals are not stupid, and they will

spend days checking the place and specially YOUR ROUTINE. For example, if they see that you lock the gate at night, as most do, they will wait for you behind a tree until you are close. This is done a lot. Dogs are the best alarm you can find, and criminals know that. They will poison them with pills when you go to sleep and attack the place in the middle of the night. I know of many that had their dogs killed. If they think that security is tight, they will just hide near the main gate, and wait for you to leave or return. When you stop at the gate and must get out of the truck to open/close the main gate, they attack. I'd say that the most frequent kind of attack is attacking by surprise when you enter/leave your home. *"Most common times of attack? Day night evening morning? I understand occur when coming or going from ones home, etc."* 7 am, 9 am, 1pm 7pm, all are

common times for attacks. There is no "safe" hour of the day.

Night is particularly dangerous. Maybe attacks during the day are faster, they want to get some money or jewelry and leave fast, while at night they might stay inside more time, maybe till the next day. But there are no fixed patterns. If I could give one advice concerning SHTF security, it would be: Eyes and ears wide open when you enter/leave your home. If possible, keep a gun on your hand when doing either one. If something looks, even "feels strange, then go around the block and check again, carefully. If you see them still there, either call the police (if still available) or get help. If you approach the house with a large number of people they will leave.

One time, I saw a couple of strange looking guys at my door. I went round the block and saw them still there. I started flashing the car lights and the horn and they left. I had a gun with me, though, so be careful when trying this. Also, remember that a car is one heavy, powerful piece of machinery. I know a guy that had one of those big chrome-tube bumpers installed on his truck, especially for hitting those that were stupid enough to try and make him stop by standing in front of the car.

If I had a truck, I would do so myself. Though I would keep my mouth shut about it, as always. Just say that you think it looks cool or something. Every now and then someone tries to force me to stop my car by standing in front of it (I suppose there are still fools out there that get robbed this way), in the middle of the street. I just aim at them and accelerate at full speed. They always jump out of the way before I hit them. By the way, at first, doing this made me feel nervous, but can you believe that now it's just common driving, as normal as changing gears? I guess it's a little sad.

Lessons from Argentina's economic collapse

Part III

By Ferfal

Studying the SHTF at the University: Dark omens:

I forgot it! Darn, same as the gold stuff but worse, much worse. I've never been good at remembering some things, like numbers and names of people I meet, I forget those (instantly), they just flee my mind, uneventfully, but I do remember some other things that don't seem to be as important. I do remember living in USA as a kid. I remember my

school, Pierce School, Don't remember exactly where it was, because we lived some in Boston, Massachusetts and some in New Hampshire. I remember my best friend, Freddy, and a girl (why is there always a girl?) Samantha, Sam. She was red haired and tall, I had a picture of her playing together but I lost it. Some time between the age of 3 and 26 I lost that picture that was so dear to me. I remember the smell of an orange shaped "scratch and smell" sticker my kindergarten teacher stuck in a small book we made once. But I almost forgot this forever. This, this was important, a moment where the life we once knew stopped existing, and a group of students, in a class room that looked like an abandoned building, realized it, all 60 of us at the same time.

It's 1:06 AM over here. I just finished showering and my wife and son are asleep. I was putting shampoo on my hair, thinking about what I wrote today on this post, and remembered the exact moment when I realized along with several other people, not only that TSHTF (that we all knew) but that the world we once knew no longer existed, and that this was not a hurricane, this was an ice age period, it wouldn't just go away.

We understood it the same way a kid understands photosynthesis: Because a teacher coldly explained it to us, even used graphics. I slept 5 hours yesterday, 2 hours the day before yesterday. Saturday night I didn't sleep at all. I'm already used to it. Deadlines at the University, staying late at night, drawing in CAD 3D, waiting until Renders are ready.

It's a competitive world out there, and no one sympathizes with what you are going through, they just want you to perform as expected, and the standard is always high. It happened 4 years ago, almost a year after the December 2001 crisis. It was a social studies class and this teacher, don't remember if it was a he or a she, was explaining the different kinds of social pyramids. God! Now I remember more! We even had a text book with those darn, cruel pyramids! The first pyramid explained the basic society. A pyramid with two horizontal lines, dividing those on top (high social class) those in the middle (middle class) and the bottom of the pyramid (the poor, proletariat). The teacher explained that the middle of the pyramid, the middle class, acted as a cushion between the rich and the poor, taking care of the social stress. The second pyramid had a big middle section, this was the pyramid that represents 1st world countries. In which the bottom is very thin and arrows show that there is a possibility to go from low to middle class, and from middle to the top of the social pyramid. Our teacher explained that this was the classic, democratic capitalist society, and that on countries such as Europeans one, socialists, the pyramid was very similar but a little more flat, meaning that here is a big middle section, middle class, and small high and low class. There is little difference between the three of them.

The third pyramid showed the communist society. Where arrows from the low and middle class tried to reach the top but they bounced off the line. A small high society and one big low society, cushioned by a minimal middle class section of pyramid. Then we turned the page and saw the darned fourth pyramid. This one had arrows from the middle class dropping to the low, poor class.

"What is this?" Some of us asked.

The teacher looked at us. "This is us"

"It's the collapsed country, a country that turns into 3rd world country like in pyramid five where there is almost no middle class to speak, one huge low, poor class, and a very small, very rich, top class."

"What are those arrows that go from the middle to the bottom of the pyramid?" Someone asked.

You could hear a pin drop. "That is middle class turning into poor".

I won't lie, no one cried, though people rubbed their faces, held their heads and their breath. No one cried, but we all knew at that very moment that all we thought, all we took for granted, simply was not going to happen.

"You see, the income from the middle class is not enough to function as middle class any more. Some from the top class fall to middle class, but the vast majority of the middle class turns into poor" Said the teacher.

I don't know how many people in that room suddenly understood that he/she was poor.

The teacher continued "You see, we have a middle class that suddenly turns to poor, creating a society of basically poor people, there is no more middle class to cushion tensions any more. Middle class suddenly discovers that they are overqualified for the jobs they can find and have to settle for anything they can obtain, there for unemployment sky rockets, too much to offer, too little demand. You see they prepare, study for a job they are not going to get. You kids, you are studying Architecture because you simply wish to do so. Only 3 or 4 percent of you will actually find a job related to architecture."

We all sat there, letting it all sink in. After a few months, it all proved to be true. Even the amount of students that dropped out of college increased to at least 50%. They either so no point in studying something that would not make much of a difference in their future salaries, had no money to keep themselves in college, or simply had to drop college to work and support their families.

Someone once said, in this forum, that if this had happened in USA, the social unrest would have been much worse, because people from S. America are stronger. At first, I told him that I didn't think so, I said that all humans adapt when they have no other choice. But now that I consider it more, maybe he was right. Not that S. Americans are stronger, but they are more used to adversities. Most of us are children from grandparents that escaped civil war, either in Spain or dictators in Italy, our parents survived the dirty war, even more dictators, and therefore their children are of strong character too.

Can USA citizens survive what we survived? Of course they can, though I think that there are too many that are not like you, many that don't prepare, and take everything for

granted. Those are the ones that will be responsible for the increase in the social unrest once the SHTF, those that were too lazy to take care of themselves before the SHTF, or that had gone soft through out the years, believing that the government will "take care of them because they pay their taxes". But in the end, they will pull through. People will adapt, they always do. You'd be surprised. And those that don't want to adapt to the new reality they live in, will die young, thus cleaning the gene pool and ensuring the continuity of the specie. It's been this way for thousands of years.

MISCELLANEOUS Q&A

Don't prepare for an idiot shooting a Raven at you 200 yards away, prepare for the sneaky son of a gun that waits until you are distracted, fed the dogs some nice pills, and gets to you when you less expect him. THAT is much more likely than someone attacking you 200 yards away.

I didn't mean it as an insult to anyone, I'm well aware that there are cases of people shooting enemies 1000 yards away. That is war. Killing someone that wants you dead before he gets close to you is perfectly logical. Please name me one case of self defense where the person shot the bad guy 100 yards away.

I had a guy try to steal my car a while ago while visiting a friend at his farm. I saw the guy next to my car about 300 meters away. I had my FAL PARA with me, since we where going to spend some time shooting that morning.

I could have shot that guy from a safe distance, right? But you can't do that in real life. People that shoot others 300 meters away for no reason, claiming self defense, are called psychos. I had to fold my rifle, hide it under my coat, walk to where my car and the guy where, and ask him what he wanted. When he said that he was there to take the car I leveled my FAL at him, and as it usually happens in real life, the guy almost pissed his pants, and left, babbling some BS story I no longer remember.

If someone starts shooting at you 300 yards away, and you shoot back in self defense, that's ok, but that rarely, if ever, happens.

Any bad guy that has survived through puberty will be smart enough to get close, very close, maybe when you are distracted with some chore/fieldwork and point a gun at you, asking you to calm down and walk into the house.

No way can you know what a man's intentions are 200 yards away, unless he starts shooting at you like an idiot. And if he wants you dead that bad, he will get close enough and make sure that that one shot is the last thing you hear on this planet. As I said, dogs are the best alarm on the field, though those too can be eliminated, as it happened to my friend. A shame by the way, they were nice dogs.

But if your idea of a self defense plan is shooting anyone that happens to be within your 200 yard range, do as you wish. You will not have to worry much about survival, State penitentiary will provide all you need.

It is one thing to go to war, and it is another, completely different, to live your life in a SHTF situation. When you deploy in a war zone, you set yourself mentally to do a job, when the job is done, you return home, you turn the mental combat switch off. You cannot live your entire life as if you were in combat, it's impossible.

I'm as alert as I can be, all day long, and all night. Thanks to that I kept my family and myself safe, while everyone else I know has at least been involved in one or more violent crimes. I'm so winded up that the slightest sound will make jump out of bed at night and have my pistol ready even before I'm conscious of what I'm doing.

My house is the only one in the block that has not been broken into, my wife and son are safe, safer than all the other stupid sheep that blame God for whatever happens to them, and do nothing to prevent it themselves. But still, you have to live your life, go to work, go to the supermarket... live a life! do everyday stuff.

The stress of living that way will be the end of you, I'm 26 years old and already have problems related to high stress like high blood pressure, migraines, insomnia, etc. NSA "You make it sound like carrying a pistol on your person is a fairly common occurrence (at least now)."

My mistake, it is not common, at least for descent working people. There are parts where criminals carry their guns openly, sticking out of their joggings and no one does anything about it. No one dares mess with them, these are neighborhoods where police don't dare to enter.

Carrying a handgun, ready for use (loaded and on your person) is illegal, unless you have a permit that is almost impossible to get. You need to own a large company, and justify carrying the gun because you transport large amounts of money (several thousands of USD on daily basis). Carrying a gun for self defense is not a reason for a carry permit, only the protection of money. It's ridiculous, isn't it?

Still, owning handguns is not that complicated, once you get a gun user card, but a ccw permit card is out of the question.

Some gun users still choose to carry guns, even though they don't have a carry permit. This is not allowed and you might lose your gun user card for this. Carrying a gun, bought in the black market, and without even having a gun user card, will take you straight to jail.

On the issue of cops and guns, some may understand that you are carrying for self defense, because you are in a very dangerous area, and if you have your gun user card that shows that you bought that gun legally, he MAY be sensitive and let you go, or not. More than likely, he will ask for a small "tip", for his troubles. It's a matter of luck actually. You have to consider all this, and decide if the risk of getting caught is greater than the risk of getting killed for not being able to defend yourself.

We often call unprepared people, the mass, sheep. Sheep describes them pretty well. They do as the rest of them do, don't fight for their rights, accept almost everything and so on. But what happens when "sheep" get desperate? Well, that 's what happened here. After years of closing factories and the destruction of the national industry, extremely low wages, people got fed up. This destructive economy by Menem, our previous president, one of the most corrupt president in the history, (he was into the bombing of the jew embassy, managed the drug market in the country, just to mention some) plus the stupidity of the following president, De la R  a, was a formula for disaster.

One day the Minister of Economy declared that no one would be able to get more than 100 bucks a day from the ATM(correct?) nor close accounts. You could just get 100 bucks out of the bank a day. That was it.

Then came the devaluation. Before this happened 1 U\$\$= 1 \$ Argentine peso. Suddenly this changed into 1 U\$\$ dollar= 2 peso then 2.5 even 4 pesos. Today 1U\$\$= 3 Pesos.

The banks kept the people's money, including their deposits in US dollars. If you had

1000 U\$\$ dollars in Bank Boston for example, they turned it into 1000 pesos, that equaled 333 U\$\$ dollars. They stole 666 dollars from you!

Prices went up 200%, 300% and sometimes more. Imagine for one moment what your life would be like if today you go to your local 7-11 and everything has gone up 200%. How would you survive with your pay check?

The sheep got desperate. First, because they had been stolen by banks and wouldn't return the money to the people.(the so called "corralito") then because the classes with the lowest income found out that their salaries weren't high enough to buy the minimum food stuff to survive. The country marched asking for the presidents resignation. He had to leave the presidential palace in a chopper...

Banks were destroyed by people that wanted their hard earned money back. Supermarkets and other shops were looted, as well as regular houses. This lasted for about a month, the chaos spread all over the country, concentrated in the largest cities.

I remember being at a supermarket and the mob outside, negotiating with the manager. Sometimes, they would not destroy the place if the supermarket surrendered them the goods peacefully.

Food got scarce. I mean, you could buy just a certain amount of milk or water, 4 bottles for example. And most imported goods disappeared. Electro domestics such as TV, videos, and refrigerators kept their prices in dollars, inaccessible for most people. The same happened with real estates, cars and luxury goods.

Today this all seems far away. Not because it got better, but because us humans have this damn capacity to "get used to".

How did our lives change? I cant even being to explain... everything changed!
The streets are more dangerous than ever, thanks to the general poverty.
Education suffered thanks to this as well. Kids working or stealing to survive instead of going to school.

How could I explain this to you?....

For example, tools are really expensive, since most come from abroad... remember, our national industry was sold out or destroyed.

Stuff like MRE, Emergency food bars are impossible to get. No one imports them anymore. (I paid 10 dollars for 1 MRE a guy had).

Guns and ammo are really expensive and are sold in small quantities.
Forget about buying a "case" of ammo! Forget it! I know it's hard for some of you to imagine this, but you just can't buy a " case" of anything. A large store may have 10 or 15 boxes of 308, 20 rounds each box. Small stores have 10. or less. Only common ammo is available such as 22, 38, 357. 9mm, some 40 s&w, 12 ga 308 and a little 223, that's pretty

much it. Ammo for my 357 sig is hard to get. I buy a box of it every time I find one around... and it's extremely expensive.

IF you just HAVE to buy something strange like 300 magnum or 270 (strange for us J) there's one place you can get them from but be prepared to pay +100 dollars for 20 rounds. While we are at it, there are also few models of guns, 70 % of it is used. You can find about 4 or 5 12 ga pumps, mossberg 500, Maverick or Rem 870 in each store. Handguns are relatively plentiful, not the newest models but still there's some Beretta, Glock, Colt, S&W, Walther, Taurus, Rossi and Sig. Same goes for Mausers and bolt action rifles as well as side by side shotguns.

Semi auto rifles are hard to get. Some big gun shops have 1 FAL each. M16 are quite rare and expensive. Saw a Galil and a SKS(600 dollars) the other day, but it's not common and the red tape is HUGE. I found a good FMK3, one of the few left around, and bought it for 250 dollars, but this isn't common.

Shoes and clothes are also, expensive, even in US\$. Labor is cheep; you can have a maid and a gardener for 300 dollars. There's no "safe" job. With 20% unemployment they pay you whatever they want and if you don't like it there are 100 persons waiting to get your job. Owning a shop-business is hard. You have to consider armed robbery (some get hit 10 times a month) and still you have to pay the police for protection (from themselves) Hope it helps, at least so you can have an idea how your world would be if this happened in your country, hope you never have to experience it in the flesh...

Well, one thing I learned with all this is that people adapt, people get "used to".
And finally, people accept. I have a hard time seeing people eat out of trash cans, that's one thing I'll never get used to.

Every night entire families, wife, husband and 2 or 3 kids, little kids about 3 years old go

throw trash cans in search of food. At almost every light stop there's little bare foot kids begging, all dirty and skinny. That's the thing that affected me most, the starving children.

One guy in another board told me he didn't care for this "bleeding Heart thing" and that "Life is rough. Get used to it." I told him that I didn't need someone that lives in San

Diego, California, explain me how rough life is. I've seen dead people, man, I once saw a guy "sew" his mouth shut with a piece of rusted wire he got out of a broom, and all that I can handle, but a 3 year old sobbing because he's starving, Im sorry, I can't.

Believe me, it's one thing to see a little kid starving in Africa, you probably saw that terrible image a million times, but now imagine that that kid speaks English, with an American accent, and you see the Hollywood sign in the background.

Both cases are terrible, but the one that looks as if he could be your son and not some kid in Africa or Croatia hits a nerve. Because "those things don't happen here". It happens to others, not in my country, not in my neck of the woods. Sorry , Im babbling here. Back to your question:

You guys have most stuff covered, but there's some stuff I'd like to share:

- 1) Don't invest all your money in your country. Don't put all your eggs in the same basket, just in case economy goes to hell. Invest in a country in Europe, in Australia, whatever, I don't know, but not in the same place. I did this, but most people didn't and got screwed.
- 2) Keep cash. Both dollars and Euros. I know some of you just don't like the European money, but it's the only way you have to cover most bases. Here the national paper money was worth 1/3 from one day to another.
- 3) If you have land, have some animals. Even a few chickens and rabbits can make a huge difference and will complement your staple food.
- 4) Buy guns and ammo. Not 20, but a couple of fighting guns, 1 or 2 Mausers and 2 or 3 handguns. You know the kind. Get lots of 22 ammo.
- 5) Try to get 2 or 3 similar guns, like 2 or 3 AR, Fals, or SKS. This way you can use the same ammo and if 2 guns brake you may be able to fix 1. For example, If I were you, Id buy 3 or 4 SKS and 3000 rounds of ammo. If your SKS brakes, you have a spare gun that you already know how it works and are used to.
- 6) Spare parts are ok, but make sure you know how to replace them, a gunsmith may not be available. If not, get a similar gun as back up.
- 7) Don't trust the media. If you watch the news here, reporters say everything is ok, everything is fine. But then you talk to your neighbor and it turns out Mr. X got shot yesterday, the nice girl on the next block got kidnapped and raped, and today the boy next door was also kidnapped. This is the kind of conversations I have in my neighborhood, I'm not kidding.
- 8) Keep 6 months- a year worth of food stored if you can and have a well or at least a good supply of bottled water stored as well a 2 water purifier and a good supply of filters for them. The water network works but it's not safe. Some time ago an entire town got sick because of the contaminated tap water and lots of people died.

9) B-proof vest. I'd sell my left testicle for one these days. I never believed I would ever need one and now here I am. Get one of those that can go under the regular clothes.
10) Keep your passport and cash ready. If you can afford it, the best thing to do in such a country is getting the hell out of it! Maybe you have family somewhere else, keep in touch just in case. I did with my family in Spain and I going there as soon as I can.
"What about essential services like power and water?"

Power get cut some times but not for long, a couple of flash lights and your ok.
Water is still working but you can't drink. Most of the water supply in Bs As shouldn't be drank, I used to drink it but this year the water was just too dirty. Even if we still pay our water bill and the gov. says it's ok for drinking this water wouldn't be accepted in the US. Here the water companies can bribe their way out of it.

"Were they always delivered reliably or were there blackouts etc...."

There were blackouts, I remember once most of the country was without light for about a day. Buenos Aires was without light for 4 days.

"What about medical care, how do people get treated for injuries or illness?"
If you have private health you are ok, but if you don't have the money for it you might as well put a bullet in your head. Free hospitalization, forget it, you'll die because of an

infection. They don't have supplies, even sterile needles are hard to get in a public hospital. No way, if you don't have private health you have a foot in your grave already.
"Is the crime mostly simple street crime or is it highly organized with gangs and cartels/mafia style?"

Both. The police handles most organized crime. The governors are the head of the organizations of each Province. The worst part is the kidnapping. About 2 or 3 persons get kidnapped each day in my neighborhood.

For example, I keep 10 pesos (about 3 dollars) bills to give to the police if I get stopped when driving. You HAVE to bribe the cop that stops you, the last time I got stopped by a couple of cops I played a little hard to get (pretended I didn't understand he wanted money) the cop got really nervous so I just gave him the money and he calmed down, he let me go.

The cops are involved in most illegal activities like drugs, prostitution, robbery and kidnaps. That's why I keep the high power Hirtemberg 9mm stuff and AP 308, because there a big chance the "perp" might be wearing a "Policia Federal" body armor vest.

They ask for donations. That's right, the government asks the people for donations instead of doing things themselves.

And the best part is that once they get all the donations.(mostly food, milk, blankets and such) The damn Governors SELL the donated goods to the poor. No, you can't imagine the kind of corruption we have here.

The problem is that nothing is being done to get us on the right track, because a small group of people wants this country as poor as possible to take advantage of it. Imagine having to pay your employees 1 dollar a day and selling the soya, meat and other agricultural products you get at international prices.

The people that own small portions of land have it worse than those professionals that are in the city. This is because they are destroyed by the larger land owners such as Benetton and other large international corporations.

But you are right, they can at least live out of their land. The poor people in cities have to collect cardboard or look in the garbage.

You are also right about people now fixing things instead of buying new ones. Seems as handyman will always find a way to survive.

The only things that can be imported are the cheap ones from China, or Brasil. Other products like large plasma TVs and such are rare and only accessible to the extremely wealthy.

For example, I had to buy a electric shaver because the Gillette blades are too expensive. No way am I going to spend 6 dollars for a pack of Gillette Sensor. And so you adapt to what's available and what you can afford.

People that live in the Patagonia are a little better off than those that live in other Provinces. The rich people do well everywhere (except for the kidnaps and murder) but the poor people that live in the south have better land and can at least grow and raise a few animals. The central part of Argentina, and the North has been severely punished. Tucum  n is a disaster, as well as Chaco, Entre Rios, and others, the amount of children that starve to death is astonishing.

The Chileans returned to Chile long ago, Chile is MUCH better off. Argentineans are going to Chile looking for job.

Buenos Aires is also a disaster area. Even the "nice part" of Buenos Aires, the Capital where the nice Hotels are, the part that tourists see, turns into a complete nightmare after 10 pm.

During the day tourist from around the world shop and sight see, ignoring the beggars.

But at night the picture is Mad Max 4:

All the "cartoneros", people that pull carts in search of cardboard and paper to sell, flood the city. And I mean flood: 20 to 30 persons per block.

They pull the carts themselves, followed by the wife and a few children. They pick the paper out of the trashcans and eat whatever they scavenge. The government considers them "employees" God only knows why, since they have no salaries, just the paper they get. This is just another "trick" the government has to reduce the unemployment %, considering these poor people that eat out of trashcans employed. (Our politicians have no shame) As I write this I hear shoots being fired outside and people screaming.. jjejee, I

never would have think that I would be writing this today, 3 years ago, but now it's almost normal.

Gold&silver kept their true value, as they always do. I didn't have gold, but had dollars and Euros. Now that you mention it gold might be a good way to go for the Americans.

Dollars, Euros and gold and you'd have most bases covered.

You can't barter gold at a supermarket for example, you would loose too much money.

But you can wait until things settle and change for dollars/Euros or other stable paper money and save yourself from devaluation. Or get out of dodge with your gold and deposit it in a safe country. The point is that gold never loses its value because, unlike paper money, it holds value itself.

Foreign accounts could not be touched since they are protected by other countries law, not affected by national executive orders.

Imagine a federal agent calling a Suzie Bank.

"Hi, I'd like to seize Mr. Smiths accounts"

"Why?"

"Well, because I want to steal his money"... Wouldn't work.

Lessons from Argentina's economic collapse

Part IV

By Ferfal

A LIST OF THINGS THAT "If you had it to do over again" YOU WOULD GET.

Nomad came up with this one. It's a good idea because it may help some of you from

making the same mistakes I did. There are things you don't think about until you need them, and then it's too late.

OK, If I had to do all this from scratch? Say, for example, if I had a 2 year warning, fairy godmother appears one night , all dressed in blue waving a magic wand, saying " Your country will go down the sewer in 2 years, consider yourself warned dear"

There are several things I would have done differently, and things I would have bought: Food: I'll get to the food issue soon enough, but you can never have too much canned, or other long shelf life food. This was probably one of my greatest mistakes, I overlooked the food problem.

I was talking to my wife today while driving, asked her the same question Nomad asked me "what would you do if you could go back in time, before the 2001 crisis".

My wife, though smart, isn't much into preparedness, but she answered "I'd buy food" in a heartbeat.

"Don't you remember that you could only buy one small bottle of oil at a time, same with sugar, flour and milk. Don't you remember all those empty shelves at the supermarket.?" Definitely, more food, specially food that lasts for a few years.

CAR

I would have bought a 4x4, even though I live in the city. A 4x4 allows you to dive over the sidewalk or through wasteland, away from roadblocks or riots. I've see those that have 4x4s simply go off road, climb over a boulevard and leave while the rest of us poor

car owners have to stay. A 4x4 truck also has more mass and power in case that someone tries to cut you off or rams you with the car. It's less likely to stop running if you hit someone or several people (in a riot situation) since it's prepared for cross country use and the engine is much more protected.

Fuel containers: Not only jerry cans, but those big metal containers, that hook up like small "u-hauls" ? I'm not sure about their capacity, maybe they can hold one or two barrels of gas. I saw them at construction sites, and they were not that expensive if bought used, before the 2001 crisis. Now, I don't know. Haven't seen them for a while.

A generator: These are imported and very expensive for us. I think that they are now making them here, but I'm not sure about the quality.

A nice TV and DVD player: I know what you are thinking "this guy has gone ... "nuts" " Please, let me explain.

Going out for dinner or to the movies is not only dangerous but also expensive. You WILL find much better use for that money if SHTF.

There are places in Buenos Aires where you can go out for dinner, movies, or theater shows and have a good time, safely. They either have their own security or arrange with the police for added security. These are the kinds of places you are likely to visit if you ever come to Argentina, places were tourists can move around, relatively safe (there are always exceptions, of course). But these places are either for tourists or for the extremely wealthy. I have a good socio-economical level, better than 96% of the population at least, yet I cant afford to spend that amount of money every weekend or even two weekends a month. Going out for a walk is a possibility, and we do go out for a walk every now and then, but lets just say that the view isn't that good, and you can only walk about 6 blocks in the same direction before you get out of the are which is guarded by private security, after that you are on "you are on your own" land. You CAN go for a walk (just like millions that live in Somalia or Afghanistan go for a walk as well) millions of citizens do, but I'd rather not risk it.

Just the day before yesterday, a young woman was waiting at the bus stop in my

neighborhood, holding her 6 month old daughter. A cop that was chasing a bad guy opened fire with his High Power, with no regard to bystanders as they always do. The 9mm FMJ (JHP are not allowed for the average police) went right through the baby's buttocks and through the mother. Miraculously, the bullet didn't hit any of the baby's internal organs and the mother also survived after a few days at the hospital. Was that just luck? Maybe, I prefer to think that God does work in mysterious ways.

We have a lot of cases like this, were innocent people get shot by the police, and the stupid "no JHP" rule makes it worse, since 124 gr. FMJ 9mm will penetrate walls, windows, even bad guys and end up injuring or killing innocent people.

So, back to the TV. Good places are too expensive, and just going out for a walk at night with your wife/girlfriend is out of the question. All of a sudden popcorn , pizza and a movie sounds like a good plan.

I'm not saying that you should spend all day in front of the screen like a zombie. Reading is nice, I love reading myself, but once the SHTF, going out with a date at night wont be that easy, nor will it be that cheap. You will end up paying for that added security the shop/bar/theater owner hired, the higher price of gas and food, while a DVD copy can be found everywhere, and costs only a couple of bucks.

After the SHTF there will be a lot of "why don't we watch a movie" nights. Like it or not TV is cheap, safe entertainment. A play station or xbox is also nice to have. Even if the country collapses, there will always be a guy with a DVD writer making copies. Just something to think about if you like movies.

BOOKS

Oh, almost forgot. If you like reading a lot, buy books now, even if you wont read them for some time. If your economy crashes, paper will become a source of income for many. We have thousands of scavengers collecting cardboard and paper all day long, specially at night when people take out the trash. As a result, books are not cheap, because they have a value of its own in the form of paper.

Also, consider that books are heavy, making transportation expensive and many are printed abroad. Just as an example: I returned from visiting my parents in Spain with three suitcases. ONE suit case was entirely full of books. Books cost about 80%-200% more than what they cost in USA or Spain.

GUNS & AMMO:

I always liked guns, so I always had weapons. But I didn't have an adequate survival battery. If you don't have a good survival selection of weapons, buy them now, or as soon as your budget allows. Make it one of your priorities, just after food, water and shelter. There are several posts on the ideal choice of weapons. Get at least a service size pistol and a military semi auto rifle and a 22 handgun/rifle. (try to get both if you can, they are not that expensive).

A bolt rifle (preferably in the same caliber as the semi) a pump 12 ga shotgun and a sub rifle, like a SMG or pistol caliber semi auto carbine (same caliber as pistol) would complete the package.

I forgot to buy a 22 pistol until after 2001, and ended up paying for a Norinco 22 pistol the same price I would have paid for a Ruger pistol before the crisis.

My advice is: See what you use regularly and what you expect to need after TSHTF. Of those goods, see where they are made. If they are made outside your country, they will either increase in price or stop importation entirely after TSHTF.

In my case, one good example (of many, many others) is Gillette disposable blades. They are made in USA, and right now they cost a fortune. But as I said before, check what is being imported.

No point in buying cases of Cubans for trade after TSHTF if you live in Cuba, right? I wouldn't think of these items as trade goods, but as "gifts" to buy favors, build up relationships with police, government officials, doctors, people you might need favors from.

Stuff, like liquor/wine, a nice pen, perfume, makeup and other "free shop" kind of items can go a long way when you need some strings pulled, or a "friend" within certain circles. And it's not only the item, sweet talking also must be applied.

For example, you need to renew your driver's license after the XXXX crisis. The problem is that the office is low on personnel (they had to let go 25% and 50% are on strike) so you'll have to wait 4 months until you get an appointment.

You approach the information desk where you find Betty. Now, Betty hasn't had a date since the age of 10, and she weighs as much as a healthy manatee (though she's not THAT pretty) you kindly ask her to please help you fill the paperwork, and though she's as cold as a Popsicle, you keep calling her by her first name and when you leave she smiles and says good bye.

The next day you drop by and give Betty a Revlon lipstick for "helping" you fill the form, which had difficult questions like "name?" "Age?". It cost you about 4 bucks before the crisis but, since it's made in France, it went up to 20 dollars and then, 2 months ago, they

no longer imported it. Revlon saw that they no longer had a market for their 4 Euro lipstick, which now costs Americans 20 dollars and the segment that used to buy it is spending that money in other items like food, so their marketing experts told them that the 4 Euro lipstick is no longer profitable in USA.

Betty used to love that particular lipstick, she thought it made her look like Cindy Crawford (poor Betty) but 20 dollars was more than she could spare in her good looks, and when she finally decided to drop the 40 pounds of M&M's she ate a month in favor

for the lipstick, the girl at the drugstore told her that the item is no longer imported into the USA.

Her face lights up when she sees your present, and tells you that you shouldn't have bothered, and she asks how did it go with your license. You tell her that you actually have a problem, it seems that it takes 4 months to renew, and you ask her if , well, maybe she can do something about it... you get the picture.

In other occasions people will let you know that they want a plain and simple "bribe", and there 50 bucks or 100 bucks according to the situation will get the job done. I've used "gifts" (a perfume) to get my passport faster, saved a few months, and I've used bribes every single time the police stopped me for "inspection". I know this does not apply to 1st world countries where most officers are honest self sacrificed people, I mean no insult to the law enforcement community on this forum, but please understand that it does apply to 3rd world countries, and I'm not getting shot by an angry cop over 10 or 20 pesos, let them have their bribe. I tried it once and I will never try it again. A cop stopped me and started BS me. I told him "ok officer, guess you'll have to write me a ticket, I understand". He didn't want to write a ticket , he wanted money and things got ugly. I'm never doing anything that stupid again.

FOOD

A delicate issue. Even though not in the same way, it does affect us all. Keep in mind that if TSHTF, prepared or not, food will always be in your thoughts. If you don't have it you'll do ANYTHING to get it, and if you are prepared you'll worry about being able to get more for the future. Once you see food prices go up between 200% and 300%, or simply see it missing, you'll realize what a valuable commodity food really is.

To those that think that food will never be a problem in USA:

Come visit my country, even though there are desert areas up north, most of the country is fertile "Pampa".

Just after WWII Argentina practically fed Europe. Argentina was known in Europe as " the world's granary". Cattle and wheat was enough to feed our own country and another continent.

So, what happened? Why are there so many that have little or no food and end up eating out of dumpsters?

I mean, the land is still there, isn't it?

Well, the country is the same country that used to be called the "world's granary" but some things changed. Several big, multinational corporations, such as Benetton, bought hundreds of thousands of acres of natural resources. I don't know the exact number, but I do remember that the media started talking about the integrity of the sovereignty of the country being at risk because of these massive purchases of land, so you can imagine how many acres were bought. Mysteriously, the media suddenly dropped the subject.

Another important factor is that now, with our new economy, it's not good business to sell Argentine food to Argentina. Why sell a kg of meat to the local market for 17 pesos when they can now sell it to Spain for 17 Euros when 1 Euro = 3,5 pesos?

All this combined with high unemployment, salaries that are not enough to buy the minimal amount of calories for a typical family, and the high prices resulted in a country that slowly started to suffer hunger. Again, I can pin point the exact moment when the entire country realized what was happening.

After the 2001 crisis things had been bad, but people in Buenos Aires, the capital city and the richest province, didn't realize how bad things actually were in the other provinces. This was until teachers noted that kids had problems with education. You see, they noticed that they had problems to concentrate, that they fell asleep, and that they found it difficult to resolve mathematical equations.

They later found out that this was due to mal nutrition, kids were not receiving the minimum amount of nutrients for a healthy working body.

The breaking point was when a reporter interviewed a little girl about 8 or 9 years old. The reporter lady asked her what she wanted to be when she grew up, the usual kiddy questions. The girl, crying, said that she didn't want to be anything that she didn't care. The lady asked her why was she crying. She said that she cried because she was hungry, that she had nothing to eat for days, and it was then that I noticed how skinny the little girl actually was.

Seeing children starve is terrible, I guess we all saw those images of the starving kids in Africa. But when you see them speak your same language, with your same accent, in your own country, it hits a nerve.

People talked about it for weeks, and they interviewed pediatricians that confirmed that the number of children dying because of hunger had increased drastically in the last few

months. So whatever happens, let it be a hurricane, economical collapse, earthquake or meteor hitting earth, food and water always come first.

Ideally you already have a food plan and have a year worth of food in your basement... You don't? hmm... neither did I when the SHTF and let's just say that I had my manhood up my throat all the time, fearing that supermarkets would definitely close and me and my family would be left without food.

If you don't have your food needs sorted out already, just do what I did, start buying a little extra every time you go to the supermarket. The points you want to look for your storage food are, in order of importance:

- 1) No need of fridge.
- 2) High nutritious value/volume
- 3) Long shelf life, between 1-5 years.

- 4) That they don't need water
- 5) That they don't need cooking

This will usually take you to canned meats, canned tuna, canned vegetables, dried pasta, dehydrated soups, chocolate, milk powder, marmalades, soups, rice and dried beans. Canned food is excellent when it comes to long shelf life. Most of the time they are already hydrated, so they don't need water, and you can eat them out of the can. Just watch out not to dent the can, if this happens air may get inside and ruin it. If you have a dent or bump in a can, consume it fast. Also remember that once the can is opened, you have to remove the food from the can.

My favorite canned food is tuna. It lasts forever, it's full of proteins, and no matter how often I eat it, it always tastes good. Besides you can combine it with frizzed vegetables or rice.

Canned fruits and vegetables are also good, but they have much less vitamins than the fresh ones, and you lose most of it unless you drink the liquid they come in.

Dried pasta may need a lot of water to cook, but it's one of the best ways to store carbs in convenient to use form. Flour or wheat can also be stored in large quantities and are nutritious, but they require more preparation to consume.

We've become quite independent from the fridge, and only use it to keep frozen our fresh pasta (Ã±oqui) pizza and frizzed vegetables.

We practically freeze everything, because it lasts longer, practically indefinitely, and because if the lights go out a large mass of frozen food will last for hours, even a day or two. The more mass of food you have frizzed to longer it will hold.

The survivalist, especially the urban one, should try to rely as little as possible on the fridge. That's why canned food and freeze dried food is your best friend. Yet, anyone who has been for a while with no fresh fruit knows that after some time the skin starts to suffer. Sores will appear after a while, especially on delicate skin like the lips and mouth.

Once you start eating fresh fruits and vegetables again they go away.

This happened to me once, spent too much time without fresh vegetables and my mouth was a mess, full of sores. After a week of eating fresh vegetables regularly the symptoms disappeared. That's why you should try to have some fresh food to supplement your storage food. Not much, just 2 or 3 fruit trees on your garden and a small orchard would be fine. You don't have to feed out of this, you just need a little fresh veggies or fruit every once in a while.

On the news right now while I write this: We had elections last Sunday, we voted senators. It seems that in one of the north provinces people were surrendering their ID documents for bags of groceries, some for water, or for 10 pesos (3 USD) they were later taken to warehouses where they spent the night to ensure that they voted. The next day the candidate's men took them to vote, howled inside cattle trucks, like animals. When they

arrived they were given their ID documents back with the number of list they had to vote. Thugs guide them and ensure they vote who they want.

HEALTH & FITNESS

Visit your doctor NOW. Get yourself fixed. Visit the dentist and make sure your mouth is in perfect conditions. Nothing is worse than having toothache and no one available to take care of it. Remember that doctors may not be as available as they are now, in the future. For example I got eye surgery to take care of my sight problem. Now I see perfectly without glasses.

The advantage of laser eye surgery isn't limited to not needing glasses. (which can break and would be nearly impossible to replace after TSHTF) Even people react to you in a different way. Humans are after all instinctive animals. Bad guys will look at you as a weaker person if you wear glasses. Maybe they don't know that at a conscious level, maybe they do, but they do react differently.

This is not me imagining stuff, it's the way things are. Old people and women are specially vulnerable. After old people and women and children, come small framed people, the smaller you are, the weaker you look, the more likely you are to be chosen as a victim by a bad guy. It sounds, cruel, and it sure is, but that's the way it works.

A young man with a well formed body, broad shoulders, muscled arms and a "don't f*** with me" face, is less likely to be a victim of small time thieves. If a professional group chooses you as a target that's a completely different story, of course.

Talk to your doctor a lot. Just like "The little Prince", never stop yourself from asking a question. Adopt that as a general philosophy and you'll end up learning a little about everything. Mechanics, doctors, policemen, you can always learn something new from people with skills. As a survivalist, and as a smart person, you should try to know a little about everything. Always be curious.

That's how I learned that I had to diversify my stock of antibiotics. A doctor told me, that the body will adapt if you always use the same, making that particular antibiotic not that effective, specially in small children, so now I keep two different kinds of antibiotics.

Working out 3 times a week, for a couple of hours will keep you in shape. I work out at home, I have a bench and some weights. Try to complement some aerobics and weight lifting.

Working the boxing bag is good exercise, works most muscles if done right, and you'll have a much more powerful punch. Keep in mind that a bag is no replacement for a sparring partner and that the bag does not faint nor does it punch back. Still, it good

exercise and your punch will be more powerful if you connect.

Running belts and bicycles are also good.

Research on the subject and make your own routine, join a gym and talk to a professional if possible.

Whatever you do, the idea is to have a fit, healthy body. No use in shooting $\hat{A}\frac{1}{2}$ MOA at 100 yards if you have a gut that hangs half way to the floor and you cant run that same distance without needing an oxygen mask.

I know, shooting is fun, and working out isn't. At least for most, but after some time you'll start to enjoy it, your stamina and morale will definitely increase, and you'll start looking forward to working out.

The survivalist that spends 3 hours a week on his gun skills and no time at all on his own body is not doing things right.

Imagine if you have to run away from a riot/gunfight/attack while carrying your BOB, or fighting bare handed against someone that got you by surprise. This applies for life in general , before or after TSHTF a man has to now how to fight bare handed. You don't have to be Bruce Lee or Mike Tyson, just know how to through a decent punch, cover your face, or some kind of martial art classes.

I once had a fight that got a little ugly. It happened in my mother in law's house, which proves that thing can go bad everywhere at any time. A guy my wife's sister was dating argued with me and things got physical. He had problems with the police for beating up an ex girlfriend (which he was proud of, go figure) and had spend 2 years in jail for stealing cars. My wife's sister was showing up with mysterious bruises on her body, from "falling while working out". So you could say this guy wasn't my favorite person.

Anyway, he grabbed my neck by surprise, I grabbed his arm with both hands, one in his hand and the other in his elbow, and twisted it around. The leverage made him let go of my neck and a kept on twisting it forcing him around. He punched me with his other hand but the positing wasn't on his favor so it was just a glancing blow. He pushed with his back against me, so I placed my left arm around hid neck, my elbow flexed over his Adam's apple.

The guy went berserk so I decided that I had to hold on until he passed out, or I would get seriously hurt. I had practiced this choking move with my friend, the one that has the

farm I talked about before. He told me that after 30 seconds of choking the person passes out, and after 60 seconds, if you keep choking him, he dies. So I placed my left arm firmly around his neck while holding my left hand firmly with my right arm, pressing as hard as I could. The guy went nuts. He slammed me against the walls, trying to get me away from his back.

He started clawing with his fingers on my biceps, desperate. Me? I just hold my lock around his neck, mentally counting. As if by magic, after 20-25 seconds. He lost all strength and fell to his knees like a rag doll, and I let him go.

Meanwhile my wife, her sister and my mother in law were all screaming at me to stop.

Once he caught his breath he said that I was psycho, and that he was just fooling around. Not believing a word he said, I said I was sorry and we both got into the elevator, since we were leaving.

As soon as I close the elevator door, the s*** bag attacks me again. I guess he felt humiliated in front of the woman he beat up. He tried to grab me the same way I did. I knew that this was getting out of hand and I completely lost patience with this clown.

I brought my serrated Cold Steel El hombre from my pocket and placed the dull side against his arm. He got the message instantly a let go of me. Once he did this I shoved him against the elevator, my forearm pressing against his neck and the knife under the neck as well. He calmed down instantly, saying he was sorry, bla ,bla, bla.

When we got out of the elevator I told him that if he ever got close to me or my family again I would put a bullet in his head. I never saw him again.

This guy was a thief and women beater and I had no use him. Besides these are the kind of rats that would brake into your house when you leave, or worse. I'm ranting all over the place again.

What I mean is that practicing defensive moves is useful, specially if you spar with someone that knows his thing. My friend practices Judo. He won the state championship and was left in 3rd place in the nationals final.

Practice as you would fight in real life. Getting choked isn't nice, but you get to know what you are working with and know how effective it actually is. Being in shape will also make you less prone to diseases, such as high pressure, heart problems, and will boost your immune system in general.

Knowing first aid procedures is always helpful. I'll take the red cross course this summer. Keep a first aid kit and any other special medicine you may need. If you take drugs regularly try to have at least a year's worth of the stuff.

Medicines are hard to get and expensive, many are made in other countries and if SHTF they might not be available. My father in law has Parkinson and needs a special medicine that is no longer imported. He asks friends that travel to get it for him.

I stock pile as much medicines as I can. Apart from the regular 1st aid kit stuff you usually have at home, I concentrate on Ibuprofen and antibiotics, both for children and adults.

Antibiotics are precious here, with all the viruses that are floating around. Lung infections are particularly dangerous.

Also remember that keeping a clean, ventilated house goes a long way when it comes to preventing diseases. This is hard when the city is full of filth and there are cockroaches and rats everywhere but it can be done.

My neighborhood isn't that bad, there are places that are much, much worse, where people literally sleep and eat with rats. Cockroaches are a problem, but I keep them somewhat controlled with that poison that comes in syringes and you place around the house. That reminds me, stock up on rat and cockroach poison.

Services are bad in general, and the garbage collectors are no exception.

Once, they went on strike for about a week (though there are worst places where they go months without collecting) and you could see rats running around eh piles of garbage that people threw on the street's boulevard.

This is not healthy, of course. And helps spread diseases all over the city, so keep that in mind as well.

Not all situations are self evident at first, problems can quickly arise from what at first seems to be not an uncommon inconvenience. But when you add frustration, worry and time you will find that there are always a few people whose emotions will quickly escalate to anger especially among those people who feel privileged or those who feel they are disadvantaged in someway.

In today's society wherein what was once thought of as common courtsey is becoming rarer and rarer and the 'me first' mentality is the order of the day things can quickly spiral out of control.

We have all seen on the news where a sporting event rivalry has quickly escalated to myham between fans, even celebrations of liked minded fans can rapidly deteriorate into a riot like disturbance.

Often when crowds gather for whatever reason 'Crowd Psychology' can take over, wherein actions of a few are quickly mimiked; add frustrations, grievences (real of imagined) and animosities quickly suface to fuel these actions and before long violence can erupt. In the following article we read a first hand account of how quickly a mundane situation can escalate into serious and potentially dangerous state.

An event at my grocery store

by TeddiRevolution

A severe storm came through my town last night and it knocked out power in my local grocery store for a bit. This was no big deal, as it has happened before. There was, however, a bigger problem we discovered very quickly: The credit and debit no longer worked, and checks couldn't be used. Foodstamps and WIC did not work either.

Coincidentally, there was a rush of people in the store at this same time, and the lines began to clog very fast. People in line joked about how anyone ever did this 100 years ago, things like that. Everyone figured the glitch would be ironed out momentarily. Since nothing else worked, those people who were stuck were forced to use the store ATM that would charge them to withdraw money. They weren't happy but they got in line and started to get the cash they needed.

Until the ATM froze up.

Now the fake smiles and annoyed chatter had disappeared and reality struck for a lot of people, they had no way to access their money, they had no way to pay for their food. Those who unloaded their carts were completely stuck and the ones waiting in line didn't want to give up their spot to go to the bank. People became vocal very quickly.

"There's no way the whole system can go at once!"

"What the Hell do I do now?"

"I'm not leaving without this food."

People started pointing fingers at the cashiers, THEY must have done something. When the manager tried to explain it was not the cashier's doing, the company was to blame for making such a flawed system. Soon enough, with no knowledge of how the system actually worked, people began blaming others for buying too many groceries in the first place. In the span of a few minutes, perfectly calm, content people turned on those around them and eventually each other because food and money weren't immediately available to them.

About that time the manager announced that the debit and checking was back up, and the ATM unfroze and people got their money.

All of the things mentioned could have been causes for the glitch, but how the customers reacted was stunning to me. I can't say what would have happened if the problem hadn't resolved itself, but I know that in a situation where other variables were involved such as a national crisis or mass panic, there would have been chaos.

If people react in such a way when a small wrench is thrown into the works, what reactions would come from a multitude of things going wrong all at once? After what

I saw last night, I wouldn't want to be near a public place should the house of cards topple over, and I don't recommend anyone planning a trip to the store that day.

Thoughts On Disaster Survival, *Post Katrina...*

The follow information was provided via several emails by a friend heavily involved in the New Orleans disaster of hurricane Katrina, durring the course of the disaster itself. Many of the comments were LIVE to that moment in time....

I've had over 30 people staying with me since Sunday, evacuating from New Orleans and points south in anticipation of Hurricane Katrina. Only two families were my friends they told other friends of theirs that they knew a place where they could hole up, and so a whole bunch arrived here! I didn't mind, because there were six RV's and travel trailers, so we had enough accommodation. However, I've had the opportunity to see what worked - and what didn't - in their evacuation plans and bug-out kits, and I thought a few "lessons learned" might be appropriate to share here.

1. Have a bug-out kit ready at all times. Many of these folks packed at the last minute, grabbing whatever they thought they'd need. Needless to say, they forgot some important things (prescription medications, important documents, baby formula, diapers, etc.). Some of these things (e.g. prescriptions) obviously can't be stocked up against possible emergency need, but you can at least have a list in your bug-out kit of what to grab at the last minute before you leave!

2. Renew supplies in your bug-out kit on a regular basis. Batteries lose their charge. Foods have an expiration date. So do common medications. Clothes can get moldy or dirty unless properly stored. All of these problems were found with the folks who kept

backup or bug-out supplies on hand, and caused difficulties for them.

- 3.** Plan on needing a LOT more supplies than you think. I found myself with over 30 people on hand, many of whom were not well supplied and the stores were swamped with literally thousands of refugees, buying up everything in sight. I had enough supplies to keep myself going for 30 days. Guess what? Those supplies ended up keeping 30-odd people going for two days. I now know that I must plan on providing for not just myself, but others in need. I could have been selfish and said "No, these are mine" - but

whatgood would that do in a real disaster? Someone would just try to take them, and then we'd have all the resulting unpleasantness. Far better to have extra supplies to share with others, whilst keeping your own core reserve intact (and, preferably, hidden from prying eyes!).

4. In a real emergency, forget about last-minute purchases. As I said earlier, the stores were swamped by thousands of refugees, as well as locals buying up last-minute supplies. If I hadn't had my emergency supplies already in store, I would never have been able to buy them at the last minute. If I'd had to hit the road, the situation would have been even worse, as I'd be part of a stream of thousands of refugees, most of whom would be buying (or stealing) what they needed before I got to the store.

5. Make sure your vehicle will carry your essential supplies. Some of the folks who arrived at my place had tried to load up their cars with a humongous amount of stuff, only to find that they didn't have space for themselves! Pets are a particular problem here, as they have to have air and light, and can't be crammed into odd corners. If you have to carry a lot of supplies *and* a number of people, invest in a small luggage trailer or something similar (or a small travel trailer with space for your goodies) - it'll pay dividends if the S really does HTF.

6. A big bug-out vehicle can be a handicap. Some of the folks arrived here with big pickups or SUV's, towing equally large travel trailers. Guess what? - on some evacuation routes, these huge combinations could not navigate corners very well, and/or were so difficult to turn that they ran into things (including other vehicles, which were NOT about to make way in the stress of an evacuation!). This led to hard feelings, harsh words, and at least one fist-fight. It's not a bad idea to have smaller, more maneuverable vehicles, and a smaller travel trailer, so that one can "squeeze through" in a tight traffic situation. Another point a big SUV or pickup burns a lot of fuel. This is bad news when there's no fuel available! (See point 10 below.)

7. Make sure you have a bug-out place handy. I was fortunate in having enough ground (about 1.8 acres) to provide parking for all these RV's and trailers, and to accommodate 11 small children in my living-room so that the adults could get some sleep on Sunday night, after many hours on the road in very heavy, slow-moving traffic. However, if I hadn't had space, I would have unhesitatingly told the extra families to find somewhere else - and there *wasn't* anywhere else here, that night. Even shops like Wal-Mart and K-Mart had trailers and RV's backed up in their parking lots (which annoyed the heck out of shoppers trying to make last-minute purchases). Even on my property, I had no trailer sewage connections, so I had to tell the occupants that if they used their onboard toilets and showers, they had to drive their RV's and trailers somewhere else to empty their waste tanks. If they hadn't left this morning, they would have joined long, long lines to do this at local trailer parks (some of which were so overloaded by visiting trailers and RV's that they refused to allow passers-by to use their dumping facilities).

8. Provide entertainment for younger children. Some of these families had young children (ranging from 3 months to 11 years). They had DVD's, video games, etc. - but no power available in their trailers to show them! They had no coloring books, toys, etc. to keep the kids occupied. This was a bad mistake.

9. Pack essentials first, then luxuries. Many of these folks had packed mattresses off beds, comforters, cushions, bathrobes, etc. As a result, their vehicles were grossly overloaded, but often lacked real essentials like candles, non-perishable foods, etc. One family (both parents are gourmet cooks) packed eighteen (yes, EIGHTEEN!!!) special pots and pans, which they were going to use on a two-burner camp stove... They were horrified by my suggestion that under the circumstances, a nested stainless-steel camping cookware set would be rather more practical. "What? No omelet pan?" Sheesh...

10. Don't plan on fuel being available *en route*. A number of my visitors had real problems finding gas to fill up on the road. With thousands of vehicles jammed nose-to-tail on four lanes of interstate, an awful lot of vehicles needed gas. By the time you got to

a gas station, you were highly likely to find it sold out - or charging exorbitant prices, because the owners knew you didn't have any choice but to pay what they asked. Much better to leave with a full tank of gas, and enough in spare containers to fill up on the road, if you have to, in order to reach your destination.

11. Have enough money with you for at least two weeks. Many of those who arrived here had very little in cash, relying on check-books and credit cards to fund their purchases. Guess what? Their small banks down in South Louisiana were all off-line, and their balances, credit authorizations, etc. could not be checked - so many shops refused to accept their checks, and insisted on electronic verification before accepting their credit cards. Local banks also refused (initially) to cash checks for them, since they couldn't check the status of their accounts on-line.

Eventually (and very grudgingly) local banks began allowing them to cash checks for not more than \$50-\$100, depending on the bank. Fortunately, I have a reasonable amount of cash available at all times, so I was able to help some of them. I'm now going to increase my cash on hand, I think... Another thing - don't bring only large bills. Many gas stations, convenience stores, etc. won't accept anything larger than a \$20 bill. Some of my guests had plenty of \$100 bills, but couldn't buy anything.

12. Don't be sure that a disaster will be short-term. My friends have left now, heading south to Baton Rouge. They want to be closer to home for whenever they're allowed to return. Unfortunately for them, the Governor has just announced the mandatory, complete evacuation of New Orleans, and there's no word on when they will be allowed back. It will certainly be several weeks, and it might be several months. During that period, what they have with them - essential documents, clothing, etc. - is all they have. They'll have to find new doctors to renew prescriptions; find a place to live (a FEMA trailer if they're lucky - thousands of families will be lining up for these trailers); some way to earn a living (their jobs are gone with New Orleans, and I don't see their employers paying them for not working when the employers aren't making money either); and so on.

13. Don't rely on government-run shelters if at all possible. Your weapons **WILL** be confiscated (yes, including pocket-knives, kitchen knives, and Leatherman-type tools); you will be crowded into close proximity with anyone and everyone (including some nice folks, but also including drug addicts, released convicts, gang types, and so on); you will be under the authority of the people running the shelter, who **WILL** call on law enforcement and military personnel to keep order (including stopping you leaving if you want to); and so on. Much, much better to have a place to go to, a plan to get there, and the supplies you need to do so on your own.

14. Warn your friends not to bring others with them!!! I had told two friends to bring themselves and their families to my home. They, unknown to me, told half-a-dozen other families to come too - "He's a good guy, I'm sure he won't mind!" Well, I did mind... but since the circumstances weren't personally dangerous, I allowed them all to hang around. However, if things had been worse, I would have been very nasty indeed to their friends (and even nastier to them, for inviting others without clearing it with me first!). If you are a place of refuge for your friends, make sure they know that this applies to them **ONLY**, not their other friends. Similarly, if you have someone willing to offer you refuge, don't

presume on his/her hospitality by arriving with others unforeshadowed.

15. Have account numbers, contact addresses and telephone numbers for all important persons and institutions. My friends will now have to get new postal addresses, and will

have to notify others of this their doctors, insurance companies (medical, personal, vehicle and property), bank(s), credit card issuer(s), utility supplier(s), telephone supplier(s), etc. Basically, anyone who sends you bills, or to whom you owe money, or who might owe you money. None of my friends brought all this information with them. Now, when they need to change postal addresses for correspondence, insurance claims, etc., how can they do this when they don't know their account numbers, what number to call, who and where to write, etc.?

16. Have portable weapons and ammo ready to hand. Only two of my friends were armed, and one of them had only a handgun. The other had a handgun for himself, another for his wife, a shotgun, and an evil black rifle - MUCH better! I was asked by some of the other families, who'd seen TV reports of looting back in New Orleans, to lend them firearms. I refused, as they'd never handled guns before, and thus would have been more of a danger to themselves and other innocent persons than to looters. If they'd stayed a couple of days, so that I could teach them the basics, that would have been different but they wouldn't, so I didn't. Another thing - you don't have to take your entire arsenal along. Firearms for personal defense come first, then firearms for life support through hunting (and don't forget the skinning knife!). A fishing outfit might not be a bad idea either (you can shoot bait!). Other than that, leave the rest of your guns in the safe (you *do* have a gun safe, securely bolted to the floor, don't you?), and the bulk ammo supplies too. Bring enough ammo to keep you secure, but no more. If you really need bulk supplies of guns and ammo, they should be waiting for you at your bug-out location, not occupying space (and taking up a heck of a lot of weight!) in your vehicle. (For those bugging out in my direction, ammo supply will NOT be a problem...)

17. Route selection is very, very important. My friends (and their friends) basically looked at the map, found the shortest route to me (I-10 to Baton Rouge and Lafayette, then up I-49 to Alexandria), and followed it slavishly. This was a VERY bad idea, as something over half-a-million other folks had the same route in mind... Some of them took over twelve hours for what is usually a four-hour journey. If they'd used their heads, they would have seen (and heard, from radio reports) that going North up I-55 to Mississippi would have been much faster. There was less traffic on this route, and they could have turned left and hit Natchez, MS, and then cut across LA on Route 84. This would have taken them no more than five or six hours, even with the heavier evacuation traffic. Lesson think outside the box, and don't assume that the shortest route on the map in terms of distance will also be the shortest route in terms of time.

18. The social implications of a disaster situation. Feedback from my contacts in the LSP and other agencies is very worrying. They keep harping on the fact that the "underclass" that's doing all the looting is almost exclusively Black and inner-city in composition. The remarks they're reporting include such statements as "I'm ENTITLED to this stuff!", "This is payback time for all Whitey's done to us", and "This is reparations for slavery!". Also, they're blaming the present confused disaster-relief situation on racism "Fo sho, if Whitey wuz sittin' here in tha Dome waitin' for help, no way would he be waitin' like we

is!" No, I'm not making up these comments... they are as reported by my buddies. This worries me very much. If we have such a divide in consciousness among our city residents, then when we hit a SHTF situation, we're likely to be accused of racism,

paternalism, oppression, and all sorts of other crimes just because we want to preserve law and order. If we, as individuals and families, provide for our own needs in emergency, and won't share with others (whether they're of another race or not) because we don't have enough to go round, we're likely to be accused of me very much. If we have such racism rather than pragmatism, and taking things from us can (and probably will) be justified as "Whitey getting his just desserts". I'm absolutely not a racist, but the racial implications of the present situation are of great concern to me. The likes of Jesse Jackson, Al Sharpton, and the "reparations for slavery" brigade appear to have so polarized inner-city opinion that these folks are (IMHO) no longer capable of rational thought concerning such issues as looting, disaster relief, etc.

19. Implications for security. If one has successfully negotiated the danger zone, one will be in an environment filled, to a greater or lesser extent, with other evacuees. How many of them will have provided for their needs? How many of them will rely on obtaining from others the things they need? In the absence of immediate State or relief-agency assistance, how many of them will feel "entitled" to obtain these necessities any way they have to, up to and including looting, murder and mayhem? Large gathering-places for refugees suddenly look rather less desirable... and being on one's own, or in an isolated spot with one's family, also looks less secure. One has to sleep sometime, and while one sleeps, one is vulnerable. Even one's spouse and children might not be enough... there are always going to be vulnerabilities. One can hardly remain consciously in Condition Yellow while bathing children, or making love! A team approach might be a viable solution here.

20. Too many chiefs, not enough Indians in New Orleans at the moment. The mayor has already blown his top about the levee breach: he claims that he had a plan in place to fix it by yesterday evening, but was overruled by Baton Rouge, who sent in others to do something different. This may or may not be true... My LSP buddies tell me that they're getting conflicting assignments and/or requests from different organizations and individuals. One will send out a group to check a particular area for survivors but when they get there, they find no-one, and later learn that another group has already checked and cleared the area. Unfortunately, in the absence of centralized command and control, the information is not being shared amongst all recovery teams. Also, there's alleged to be conflict between City officials and State functionaries, with both sides claiming to be "running things" and some individuals in the Red Cross, FEMA, and other groups appear to be refusing to take instructions from either side, instead (it's claimed) wanting to run their own shows. This is allegedly producing catastrophic confusion and duplication of effort, and may even be making the loss of life worse, in that some areas in need of rescuers aren't getting them. (I don't know if the same problems are occurring in Mississippi and/or Alabama, but I wouldn't be surprised if they were.) All of this is unofficial and off-the-record, but it doesn't surprise me to hear it. Moral of the story if you want to survive, don't rely on the government or any government agency (or private relief organization, for that matter) to save you. Your survival is in your own hands - don't drop it!

21. Long-term vision. This appears to be sadly lacking at present. Everyone is focused on the immediate, short-term objective of rescuing survivors. However, there are

monumental problems looming, that need immediate attention, but don't seem to be getting it right now. For example:

The Port of Louisiana is the fifth-largest in the world, and vital to the economy, but the Coast Guard is saying (on TV) that they won't be able to get it up and running for three to six months, because their primary focus is on search and rescue, and thereafter, disaster relief. Why isn't the Coast Guard pulled off that job now, and put to work right away on something this critical? There are enough Navy, Marine and Air Force units available now to take over rescue missions.

Another example there are over a million refugees from the Greater New Orleans area floating around. They need accommodation and food, sure but most of them are now unemployed, and won't have any income at all for the next six to twelve months. There aren't nearly enough jobs available in this area to absorb this workforce. What is being done to find work for them, even in states remote from the problem areas? The Government for sure won't provide enough for them in emergency aid to be able to pay their bills. What about mortgages on properties that are now underwater? The occupants both can't and won't pay; the mortgage holders will demand payment; and we could end up with massive foreclosures on property that is worthless, leaving a lot of folks neck-deep in debt and without homes (even damaged ones). What is being done to plan for this, and alleviate the problem as much as possible? I would have thought that the State government would have had at least the skeleton of an emergency plan for these sorts of things, and that FEMA would have the same, but this doesn't seem to be the case. Why weren't these things considered in the leisurely days pre-disaster, instead of erupting as immediate and unanswered needs post-disaster?

22. Personal emergency planning. This leads me to consider my own emergency planning. I've planned to cover an evacuation need, and could probably survive with relative ease for between two weeks and one month but what if I had been caught up in this mess? What would I do about earning a living, paying mortgages, etc.? If I can't rely on the State, I for darn sure had better be able to rely on myself! I certainly need to re-examine my insurance policies, to ensure that if disaster strikes, my mortgage, major loans, etc. will be paid off (or that I will receive enough money to do this myself). I also need to provide for my physical security, and must ensure that I have supplies, skills and knowledge that will be "marketable" in exchange for hard currency in a post-disaster situation. The idea of a "team" of friends with (or to) whom to bug out, survive, etc. is looking better and better. Some of the team could take on the task of keeping a home maintained (even a camp-type facility), looking after kids, providing base security, etc. Others could be foraging for supplies, trading, etc. Still others could be earning a living for the whole team with their skills. In this way, we'd all contribute to our mutual survival and security in the medium to long term. Life might be a lot less comfortable than prior to the disaster, but hey - we'd still have a life! This bears thinking about, and I might just have to start building "team relationships" with nearby [people of like mind]!

23. The "bank problem." This bears consideration. I was at my bank this morning, depositing checks I'd been given by my visitors in exchange for cash. The teller warned

me bluntly that it might be weeks before these checks could be credited to my account, as there was no way to clear them with their issuing banks, which were now under water and/or without communications facilities. He also told me that there had been an endless stream of folks trying to cash checks on South Louisiana banks, without success. He warned me that some of these local banks will almost certainly fail, as they don't have a single branch above water, and the customers and businesses they served are also gone - so checks drawn on them will eventually prove worthless. Even some major regional banks had run their Louisiana "hub" out of New Orleans, and now couldn't access their records. I think it might be a good idea to have a "bug-out bank account" with a national bank, so that funds should be available anywhere they have a branch, rather than keeping all one's money in a single bank (particularly a local one) or credit union. This is, of course, over and above one's "bug-out stash" of ready cash.

24. Helping one's friends is likely to prove expensive. I estimate that I'm out over \$1,000 at the moment, partly from having all my supplies consumed, and partly from making cash available to friends who couldn't cash their checks. I may or may not get some of this back in due course. I don't mind it - if I were in a similar fix, I hope I could lean on my friends for help in the same way, after all! - but I hadn't made allowance for it. I shall have to do so in future, as well as planning to contribute to costs incurred by those who offer me hospitality under similar circumstances.

25. People who were prepared were frequently mobbed/threatened by those who weren't. This was reported in at least seven incidents, five in Mississippi, two in Louisiana (I suspect that the relative lack of Louisiana incidents was because most of those with any sense got out of Dodge before the storm hit). In each case, the person/family concerned had made preparations for disaster, with supplies, shelter, etc. in good order and ready to go. Several had generators ready and waiting. However, their neighbors who had not prepared all came running after the disaster, wanting food, water and shelter from them. When the prepared families refused, on the grounds that they had very little, and that only enough for themselves, there were many incidents of aggression, attempted assault, and theft of their supplies. Some had to use weapons to deter attack, and in some cases, shots were fired. I understand that in two incidents, attackers/would-be thieves were shot. It's also reported that in all of these cases, the prepared families now face threats of retribution from their neighbors, who regarded their refusal to share as an act of selfishness and/or aggression, and are now threatening retaliation. It's reportedly so bad that most of the prepared families are considering moving to other neighborhoods so as to start afresh, with different neighbors. Similar incidents are reported by families who got out in time, prepared to spend several days on their own. When they stopped to eat a picnic meal at a rest stop, or an isolated spot along the highway, they report being approached rather aggressively by others wanting food, or fuel, or other essentials. Sometimes they had to be rather aggressive in their turn to deter these insistent requests. Two families report attempts being made to steal their belongings (in one case, their vehicle) while over-nighting in camp stops on their way out of the area. They both instituted armed patrols, with one or more family members patrolling while the others slept, to prevent this. Seems to me to be a good argument to form a "bug-out team" with like-minded, security-conscious friends in your area, so that all concerned can provide mutual security and back-up. My take I can understand these families being unwilling to share the little they had, particularly in light of not knowing when supplies

would once again be available. However, this reinforces the point I made in my “lessons learned” post last week plan on needing much more in the way of supplies than you initially thought! If these families had had some extra food and water in stock, and hidden their main reserve where it would not be seen, they could have given out some help to their neighbors and preserved good relations. Also, a generator, under such circumstances, is a noisy (and bright, if powering your interior lights) invitation saying “This house has supplies - come and get them”. I suspect that kerosene lanterns, candles and flashlights might be a more “community-safe” option if one is surrounded by survivors.

26. When help gets there, you may get it whether you like it or not. There are numerous reports of aggressive, overbearing behavior by those rescuers who first arrived at disaster scenes. It’s perhaps best described as “I’m here to rescue you - I’m in charge - do as I say - if you don’t I’ll shoot you”. It appears that mid-level State functionaries and Red Cross personnel (the latter without the “shoot you” aspect, of course) were complained about most often. In one incident, a family who had prepared and survived quite well were ordered, not invited, to get onto a truck, with only the clothes on their backs. When they objected, they were threatened. They had pets, and wanted to know what would happen to them and they report that a uniformed man (agency unknown) began pointing his rifle at the pets with the words “I’ll fix that”. The husband then trained his own shotgun on the man and explained to him, in words of approximately one syllable, what was going to happen to him if he fired a shot. The whole “rescuer” group then left, threatening dire consequences for the family (including threats to come back once they’d evacuated and torch their home). The family were able to make contact with a State Police patrol and report the incident, and are now determined that no matter how much pressure is applied, they will not evacuate. They’ve set up a “shuttle run” so that every few days, two of them go upstate to collect supplies for the rest of the family, who defend the homestead in the meantime.

Another aspect of this is that self-sufficient, responsible families were often regarded almost with suspicion by rescuers. The latter seemed to believe that if you’d come through the disaster better than your neighbors, it could only have been because you stole what you needed, or somehow gained some sort of unfair advantage over the “average victims” in your area. I’m at a loss to explain this, but it’s probably worth keeping in mind.

27. There seems to be a cumulative psychological effect upon survivors. This is clear

even – or perhaps particularly - in those who were prepared for a disaster. During and immediately after the disaster, these folks were at their best, dealing with damage, setting up alternative accommodation, light, food sources, etc. However, after a few days in the heat and debris (perhaps worst of all being the smell of dead bodies nearby), many found their ability to remain positive and “upbeat” being strained to the limit. There are numerous reports of individuals becoming depressed, morose and withdrawn. This seemed to happen to even the strongest personalities. The arrival of rescuers provided a temporary boost, but once evacuated, a sort of “after-action shell-shock” seems to be

commonly experienced. I don't know enough about this to comment further, but I suspect that staying in place has a lot to do with it - there is no challenge to keep moving, find

one's survival needs, and care for the group, and one is surrounded by vivid reminders of the devastation. By staying among the ruins of one's former life, one may be exposing oneself to a greater risk of psychological deterioration.

28. There is widespread frustration over the lack of communication and empathy by rescuers and local/State government. This is partly due to the absence of electricity, so that TV's were not available to follow events as they unfolded but it's also due to an almost deliberate policy of non-communication by rescuers. There are many accounts of evacuees wanting to know where the bus or plane was going that they were about to board, only to be told "We don't know", or "To a better place than this". Some have found themselves many States away from their homes. Other families were arbitrarily separated upon rescue and/or evacuation, and are still scattered across two or three States. Their efforts to locate each other are very difficult, and when they request to be reunited at a common location, all of those with whom I have contact report a blanket refusal by the Red Cross and State officials to even consider the matter at this time. They're being informed that it will be "looked into" at some future date, and that they may have to pay the costs involved if they want to join up again. This, to families who are now destitute! I'm very angry about this, but it's so widespread a problem that I don't know what can be done about it. I hope that in future, some means will be implemented to prevent it happening again. Lesson learned never, EVER allow yourselves to be separated as a family, even if it means waiting for later rescue and/or evacuation. Insist on this at all costs!

29. Expect rescuers (including law enforcement) to enforce a distinctly un-Constitutional authority in a disaster situation. This is very widely reported, and is very troubling. I hear repeated reports from numerous States that as evacuees arrive at refugee centers, they and their belongings are searched without Constitutional authority, and any personal belongings seen as potentially suspicious (including firearms, prescription medication, etc.) are confiscated without recourse to the owner. I can understand the point of view of the receiving authorities, but they are acting illegally, and I suspect there will be lawsuits coming from this practice. Another common practice reported on the ground in the disaster areas is for people to be ordered to evacuate, irrespective of their needs and wishes - even those folks who were well-prepared and have survived in good shape. If they demur, they are often threatened and bullied in an attempt to make them abandon their homes, pets, etc. Lesson learned in a disaster, don't expect legal and Constitutional norms to be followed. If you can make it on your own, do so, without relying on an unsympathetic and occasionally overbearing rescue system to control you and your destiny.

30. Don't believe that rescuers are all knights in shining armor who will respect your property. There have been numerous reports of rescuers casually appropriating small items that took their fancy in houses they were searching. Sometimes this was blatant, right in front of onlookers, and when protests were made, the response was either threatening, or a casual "Who's going to miss it now?". Some of our field agents report that this happened right in front of their eyes. Another aspect of this is damage caused to

buildings by rescuers. I've had reports of them kicking in the front door to a house, or a window, instead of trying to obtain access with as little damage as possible; climbing on clean, highly-polished tables with hobnailed boots in order to get at an attic hatch to

check for survivors; etc. When they left the house, often the door or window was left open, almost a standing invitation to looters, instead of being closed and/or secured. When the families concerned get home, they won't know who caused this damage, but they will certainly be angered by it. I think that if one evacuates one's home, it might be a good idea to leave a clearly-visible notice that all residents have evacuated, so as to let would-be rescuers know that this house is empty. On the other hand, this might make it easier for looters, so what you gain on the swings, you lose on the round-about...

31. If you choose to help, you may be sucked into a bureaucratic and legal nightmare.

Example: a local church in the beginning stages of the crisis offered its hall to house evacuees. Local and State officials promptly filled it up with over 100 people. Their "social skills" proved extremely difficult to live with... toilets were blocked, restrooms left filthy, graffiti were scrawled and/or carved on the walls, arguments and disputes were frequent (often escalating to screaming matches, sometimes to physical violence), evacuees roamed the neighborhood (leading to all sorts of reports of petty theft, vandalism, etc.), church workers were subject to aggressive begging and demands, etc. Requests to the authorities to provide better security, administrative assistance, etc. apparently fell on deaf ears - the crisis was so widespread and overwhelming that a small facility such as this seems to have been very low on the priority checklist. After two days of this, with complaints from the neighbors becoming more and more insistent, the church informed local officials that it wanted the evacuees removed at once, if not sooner. They were promptly subject to bureaucratic heavy-handedness (including threats to withhold previously-promised reimbursement for their expenses); threats of lawsuits for daring to insinuate that the evacuees were somehow "lower-class" in their conduct, and for alleged racism, slander, and general political incorrectness; and threats of negative publicity, in that officials threatened to put out a press release denouncing the church for its "elitist" and "un-co-operative" attitude in a time of crisis. The church initially caved in to this pressure, and allowed the evacuees to stay but within a couple more days, the pressure from neighbors and from its own members became impossible to bear, and they insisted on the evacuees being removed to a Red Cross shelter. I'm informed that repairs to their hall will cost over \$10,000. This is only one example among many I could cite, but it makes the point clear - if you offer your facilities to authorities, you place yourself (to a certain extent) under their control, and you're potentially liable to a great deal of heavy-handed, insensitive bureaucratic bullying. Those of you in the same position as this church (i.e. with facilities you could make available) might wish to take note.

32. Law enforcement problems will often be "glossed over" and/or ignored by authorities. In many cities housing evacuees, there have been private reports of a significant increase in crime caused by their presence but you'll find that virtually all law enforcement authorities publicly deny this and/or gloss over it as a "temporary problem". This is all very well for publicity, but it ignores the increased risk to local residents. I've been tracking crime reports in about a dozen cities, through my contacts with local law enforcement and the Louisiana State Police. All the LEO's I speak with, without

exception, tell me of greatly increased crime, including rape, assault, robbery, shoplifting, vandalism, gang activity, etc. However, you won't see these reports in the news media, and will often see senior LE figures actively denying it. The officers with whom I speak are angry and bitter about this, but they aren't "go public", as their jobs would be on the

line if they did so. They tell me that often they're instructed not to report certain categories of "incident" at all, so as not to "skew" or "inflate" the "official" crime figures. I've also heard reports from Texas, Alabama and Tennessee of brand-new high-end motor vehicles (e.g. Cadillacs, Lincolns, BMW's, etc.) with New Orleans dealer tags being driven through various towns, on their way North and West. The drivers were described as "gang-bangers" (and sundry less complimentary terms). However, there have been no reports of stolen vehicles from New Orleans, because there are no workers to check out dealer lots, or report thefts, and no working computers to enter VIN's, etc. into the NICS database of stolen vehicles - so officers have had no choice but to let these vehicles proceed. Draw your own conclusions.

33. Your personal and/or corporate supplies and facilities may be commandeered without warning, receipt or compensation. I've had numerous reports from in and near the disaster zone of individuals (e.g. boat-owners, farmers with barns, tractors, etc.) and corporate groups (e.g. companies with heavy equipment, churches with halls, etc.) finding an official on their doorstep demanding the use of their facilities or equipment. If they demurred, they were told that this was an "emergency situation" and that their assistance was being required, not requested. Some of them have lost track of the heavy equipment "borrowed" in this way, and don't know where it is, whether or not it's still in good condition, and when (if ever) it will be returned - and in the meantime, they can't continue their normal operations without this equipment. Others have had their land and facilities effectively confiscated for use by rescue and relief workers, storage of supplies, etc. In some cases, in the absence of their owners, the property of the individuals and groups concerned (e.g. farm gasoline and diesel supplies, the inventory of motor vehicle dealers, suppliers of foodstuffs, tarpaulins, etc.) have been commandeered and used by law enforcement and relief workers, without permission, receipts, reimbursement, etc. Protests have been met with denials, threats of arrest, insinuations of being "uncaring" and "un-co-operative", etc. Lesson learned if you've got what officials need in a time of crisis, forget about Constitutional protections of your property! Sure, you can sue after the fact, but if you need your goods and facilities for your own survival, you're basically SOL. Those of us who stockpile necessities for potential crises like this might want to consider concealing our stockpiles to prevent confiscation and if you need certain equipment for your own day-to-day use (e.g. tractors for farmers, generators, etc.), you might have a hard time retaining possession of these things. This problem applies to relief workers also I've had several reports of private relief workers (e.g. those sent in by churches, etc.) having their vehicles and supplies commandeered by "official" relief workers, without compensation or receipt, and being kicked out of the disaster area with warnings not to return. The fact that the "private" workers were accomplishing rather more than the "official" workers was apparently of no importance.

34. If you look like you know what you're doing, you may be a target of those less prepared. There have been many, many reports of individuals who were more or less prepared for a disaster being preyed upon by those who were not prepared. Incidents

range from theft of supplies, through attempts to bug out with these persons (uninvited), to actual violence. It's genuinely frightening to hear about these incidents, particularly the attitude of those trying to prey on the prepared they seemed to feel that because you'd taken steps to protect yourself and your loved ones, you had somehow done so at their expense, and they were therefore "entitled" to take from you what they needed. There's

no logical explanation for this attitude, unless it's bred by the utter dependence of many such people on the State for welfare, Social Security, Medicare/Medicaid, etc. Since they've always been dependent on others, and regarded this as an "entitlement", in a disaster situation, they seem to automatically assume that they're "entitled" to what you've got! In one case, the family's pet dog was held hostage, with a knife at its throat, until the family handed over money and supplies. In two cases, families were threatened with the rape of their women unless they co-operated with the aggressors. In four cases that I know of, children were held hostage to ensure co-operation. There have also been reports of crimes during the bug-out process. Families sleeping in their cars at highway rest areas were a favorite target, including siphoning of gas from their tanks, assaults, etc. The lessons to be learned from this are obvious. One family can't secure itself against these threats without great difficulty. It's best to be "teamed up" with neighbors to secure your neighborhood as a whole, rather than be the one house with facilities in an area filled with those less prepared. If you're in the latter situation, staying put may not be a safe option, and a bug-out plan may be vital. When bugging out, you're still not safe from harm, and must maintain constant vigilance.

35. Those who thought themselves safe from the disaster were often not safe from refugees. There have been many reports of smaller towns, farms, etc. on the fringe of the disaster area being overrun with those seeking assistance. In many cases, assistance was demanded rather than requested, and theft, looting and vandalism have been reported. So, even if you think you're safe from the disaster, you may not be safe from its aftermath.

36. Self-reliance seems to draw suspicion upon you from the authorities. I've mentioned this in a previous e-mail, but I've had many more reports of it from those who survived or bugged out, and it bears re-emphasizing. For reasons unknown and unfathomable, rescue authorities seem to regard with suspicion those who've made provision for their safety and have survived (or bugged out) in good shape. It seems to be a combination of "How could you cope when so many others haven't?", "You must have taken advantage of others to be so well off", and "We've come all this way to help, so how dare you not need our assistance?" I have no idea why this should be the case... but there have been enough reports of it that it seems to be a widespread problem. Any ideas from readers?

37. Relief workers from other regions and States often don't know local laws. This is a particular problem when it comes to firearms. I've had many reports of law enforcement officers sent to assist in Louisiana from States such as New Jersey, California, etc. trying to confiscate firearms on the streets, etc., when in fact the armed citizens were legally armed, under local law. One can't reason with these officers in the heat of the moment, of course, and as a result, a number of people lost their firearms, and have still not recovered them (and in the chaos of the immediate postdisaster situation, they may never do so,

because I'm not sure that normal procedures such as logging these guns into a property office, etc. were followed). I understand that in due course, steps were taken to include at least one local law enforcement officer in patrols, so that he could advise officers from other areas as to what was legal, and what wasn't. Also, in Louisiana, law enforcement is conducted differently than in some other States, and officers from other States who came to assist were sometimes found to be domineering and aggressive in enforcing a law enforcement "authority" that doesn't normally apply here. So, if you're in a disaster area

and help arrives from elsewhere, you may find that the help doesn't know (or care) about local laws, norms, etc. Use caution!

38. Relief organizations have their own bureaucratic requirements that may conflict with your needs. A good example is the Red Cross. In many cases, across three States, I've had reports that locals who needed assistance were told that they had to register at a particular Red Cross shelter or facility. The help would not come to them they had to go to it. If they wished to stay on their own property, they were sometimes denied assistance, and told that if they wanted help, they had to move into the shelter to get it. Also, assistance was often provided only to those who came in person. If you left your family at home and went to get food aid, you might be denied aid for your whole family because there was no evidence that they existed - only the number that could be physically counted by relief workers (who would not come to you, but insisted you come to them) would be provided with food. Needless to say, this caused much anger and resentment. I hope that these "lessons learned" are of use to you. I'm more and more convinced that in the event of a disaster, I must rely on myself, and a few friends, and never count on Government or relief organizations for the help I'll need. Also, I'm determined to bug out for a fairly long distance from a disaster in my home area, so as to be clear of the post-disaster complications that may arise. Once again (as it has countless times throughout history), we see that to rely on others (let alone Government) for your own safety and security is to invite complications at best, disaster at worst.

My SHTF Experience-Wartime

The following is a number of postings made on SurvivalistBoards.com (<http://www.survivalistboards.com/showthread.php?t=189395>) by a Bosnia war survivor who called himself Selco.

For the sake of space I have edited out the questions and responses he received and I have only reprinting his answers.

I have not attempted to edit Selco's answers for spelling, grammar or punctuation.

I think that Selco's firsthand experience with real SHFT to be invaluable and hope that you find them as useful, insightful and thought provoking as I did.

my shtf experience-wartime

OK, i wanna share with you my own experience. (be patient with my English, i am from far away)

I am from Bosnia, and as some of you may know it was hell here from 92-95, anyway, for 1 whole year i lived and survived in a city of 50 000- 60 000 residents WITHOUT:

electricity, fuel, running water, real food distribution, or distribution of any goods, or any kind of organized law or government. The city was surrounded for 1 year and in that city actually it was SHTF situation.

We did not have organized army or police force, there was groups of defenders, actually anybody who had a gun, fight for his own house and his own family.

Some of us was better prepared, but most of families had food for couple of days, some of us had pistol, few owned AK-47 when all started.

Anyway, after one month or two, gangs started with their nasty job, hospital looked like butchery, police force vanished, 80 percent of hospital staff gone home.

I was lucky, my family was big in that time (15 members in one big house, 5-6 pistols, 3 Kalashnikov s) so we lived and survived, most of us.

I remember US Air force dropped MRE every 10 days (god bless USA for that) as help for surrounded city, it just was not enough. Some of houses had little gardens with some vegetables, most did not.

After three months rumors started about first deaths from starvation, deaths from low temperatures, we stripped every door , window frame from abandoned houses for heating, i burned all my own furniture for heating, lot of people died from diseases, mostly from bad water (two of my family members), we used rain water for drink, several times i ate pigeons, once i ate rat.

Money did not worth sh..

We traded things, black market worked, few examples: for 1 corned beef can you could have woman for couple of hours(sounds bad, but it was reality) i remember, most of that womans were just desperate mothers, candles, lighters,antibiotics,fuel,batteries, rifle ammo and of course food, we fight like animals for that.

In situation like that lot of things change, most of people turned to monsters, it was ugly. Strength was in the numbers, if you were alone in the house, you ve been probably robbed and killed, no matter how well armed.

Anyway, war ended, again thanks to America (and again god bless USA for that) It is not important witch side had right in that war.

It was almost 20 years ago, but believe me, for me it was just like yesterday, i remember everything, and i think i learned a lot.

Me and my family are prepared now,i am well armed, stocked and educated. It is not important what going to happen, earthquake,war, tsunami,aliens terrorists, important thing is that something gonna be.

And from my experience, you can not survive alone, strength is in the numbers, be close with your family, prepare with them, choose your friends wisely and prepare with them too.

And at the end, this is my first post, and my English is not so good, so don't judge me too hard.

#

First, thank you for your questions, i did not expect this amount of interest for my post.

I'll be glad to share a lot of things with you guys because i want to learn a lot of things from you.

Anyway:

Bosnia has a lot of woods and forests when you check a map, but i lived in a city closer to the croatian border, more to the south, i don't want to mention the name of the city, but if you check a map, the south part of my country closer to croatia is all in rock 😊

Yes we had some trees in my city, parks, fruit trees, but most of the city is buildings and

houses 😊 but believe me all trees in the city are going to be burned very fast when you don't have electricity for cooking and heating. After that all you have is furniture, doors, wooden floors... (and believe me that stuff is burning too fast)

There was almost no car use in town because: most of the roads jammed with ruins, abandoned cars, destroyed houses stuff like that, and petrol was like gold.

If i needed to go somewhere i almost always used night time, never go alone but also never go in a big group (2-3 men maybe), always armed, very fast, always in shadows, through ruins, rarely openly on the street, actually always hiding.

We did not have suburbs and farmers, in suburbs were enemy army, we were surrounded with enemy army, and inside town you did not know who is your enemy.

And yes, there were organized groups of gangs, 10-15 people, sometimes even 50, but also there were normal people like you and me, fathers, granddads, decent folks, who robed and killed, there was not too much good and bad guys, most of us was gray, ready for everything.

Of course you can ask.

We use what we had, we were not prepared for that situation, we did not know for prepping.

So you can imagine in some aspects we go back in stone age, actually in most of.

We just used everything what we had, one example, i had in my propane (or butane i am not sure) stove big bottle, cylinder (i am not sure is that right word), and i did not use it for

cooking or heating, it was to valuable, i manage to built (fix) that bottle with my friend so i can attach a hose on some kind of ventil (sorry my english is going down here) so i can fill those disposable lighters,(they are not disposable if you knowhow to) those lighter worth a small fortune.

To make story short, somebody bring me empty lighter to me and i fill that lighter with gas, usually i took one can for that or one candle or whatever he can offer me.

I hope you understand my example, my english is poor on some things.

One more example, i am a registered nurse, in time like that, my knowledge was my thing for trade.

And yes, be trained and educated, in times like that it worth a fortune if you know how to fix things, all your goods is going to be exhausted one day, but your specific knowledge can be your food.

I mean learn to fix things (shoes or people, whatever you can)

My neighbor use to know how to make some kind of oil for oil lamps(oil in glass, peace of rope) and he was not hungry, he never show me how he made that oil 😊 i belive he use some tree behind his house and small amount of disel, i don t know.

My point is learn things, people always need somebody who know to fix things.
#

It was not survival movie, it was ugly, we did what we have to do to survive.
Nobody wins, we just survived, with a lot of bad dreams.
If i have extra three monts to prepare?

Hmmm, probably run overseas 😊

Joke

OK, Now i am very well aware how things can go very bad in very short time so i have food, hygiene, energy etc. supply for 6 months, i live in apartment with some improved security, i have house with shelter in a village some 5 miles from my apartment, in that house also supply for 6 months, that village small community, most of them are my relatives,most of them are prepared (they learned that from war), i have four kind of fire weapons with 2000 bullets for each (sorry, can not go in details, laws are different here for rifles).

I have big garden with that house and some good knowledge about gardening and farming.

I think i have knowledge now to smell trouble, you know when everybody is saying that everything is going to be fine you somehow know that is everything going to fall apart.

I think i have strength to do everything what it takes to keep me and my family alive,

because when everything is going to sh.., be sure, you are going to do some bad things to save your kid. You don t want to be hero, you want to survive with your family.
I am nurse, also i am paramedic (US standards)

And i am willing to learn from all of you.

Thank you

#

Well depends, i guess if you stock only one thing you are not going to survive, unless you want to survive like robber, then you need only gun and lot od ammo.

I believe besides ammo food hygiene and energy things (batteries etc.) you need to focus on small things for trade, pocket knives, lighters, flints.

Also LOT of alcohol, kind that can stay long, i mean stuff like whiskey and that, does not important what kind, you can have cheapest kind, it is very good thing for trade in desperate time.

Also lack of hygiene things killed a lot of people, i ve seen that.

You gonna need to have some simple things, like for example lot of garbage bags, i mean

a lot, many uses for that, and a LOT of duct tape, many many uses for that.

In case of weapon keep it simple, i mean now i always carry Glock 45 with me, because i like that gun, but it is not usual gun and usual caliber here, so i also have two 7,62 mm TT russian pistols hidden, because almost everybody have that gun here and a lot ammunition.

I don t like Kalashnikov, but here there is that rifle on almost every 3rd house so...

Most of the time i collect my water from roof in 4 big barrels during the war, then cooked to disinfect, we also had river in that town, too poluted but if you can t choose...

I don t think i am expert, i am here to learn.

#

I guess it depends how far you going to go to survive with your actions, you need to be prepared to do some ugly things.

Oh yes it changed my perspective on life, i know now that bad things can happens, and on more important thing, actually i believe it is most important: I don't anymore believe government and authority, not at all. When they really doing their best to assure you that everything going to be fine, you can be sure that something bad is happening.

Do not just believe, research.

#

About survival.

I don't know about other people on this forum, but I have a lot of alcohol stocked now.

At the beginning of war a tank grenade smashed the front wall of a small distillery (alcohol factory) close to my house, so we took something around 500 liters of rakia (it is something like Bosnian whiskey, I guess, it's made from grapes, very strong). It was great stuff for trading, people used alcohol a lot, desperate times I think, we also use it for disinfection.

About hygiene, cups and plates, paper or plastic, you're gonna need a LOT, I know, we did not have it at all.

My opinion that hygiene things are more important maybe than food, you can easily shoot a pigeon, if you have a grandmother she may know some edible plants on the nearest small hill

(my experience) but you can not shoot hand sanitizer 😊

Water purifying pills, all kind of cleaning stuff, sanitizers, a lot of soap, bleach, gloves, masks, all disposable, take very good care about first aid training, learn how to treat smaller cuts, burns or even gunshot wound, there is no hospital, even if you found a doctor somewhere he probably does not have any meds, or you do not have stuff to pay him. Learn how and when to use antibiotics and have a lot.

Believe me with good knowledge and good amount of meds you are gonna be rich.

#

About gold and silver, yes, I personally gave all my gold for ammunition in that time, but it did not worth too much.

About pets, I did not have it, I did not notice a lot of pets in that time, did somebody eat it? I don't know, probably.

About small family, hmm, not good, usually few smaller families get together in the biggest house and stay together, all relatives (my case)

Small family or single man, not good for survival in town SHTF, maybe in wilderness (I don't have experience in that). Even if you stay low profile, hidden in your house with a lot of food etc, sooner or later a mob will come, and you have maybe have one or two guns, very hard. I agree with low profile policy, it is very important not to attract people with anything, but when they come, you need to have numbers, people and guns, best people is your family.

About moving through the city: always night time as I mentioned, never alone, 2-3 men, very fast, never attract with anything, look like everybody else, if most folks look desperate, poor, dirty you need to look same, there is no need that everybody know you have good amount of food, ammo, clean clothes and everything else back at home. Look and act like everybody else. When somebody attacks you or your family then you need to show that you are very ready.

I never walked in big groups, in that time and that situation a big group is a gang.

Now, this is all my experience, it was then, i did a lot of mistakes, i am not expert, i am here just like any of you, to learn and share.

For example i don t know too much about wilderness survival, i am here to check it.

Oh yes, few things to the Sedoy: my wife is different ethnicity, and she is also a Catholic, i am not, and to answer you : no i am not going to shoot her.

#

Well, who ever died or get killed in that period, did not get proper funeral. Folks used every piece of free land, close to house for burial, sometimes even in the garden, 2-3 city parks turned to graveyards, after war most of them are exhumed and properly buried.

There was not noting like burning bodies or anything similar, as far as i know.

Oh one more interesting thing about fire, some people use to go few miles during the night only to find fire somewhere so they can fire piece of wood and bring it home, and start fire for cooking or heating, lighters and matches was really precious, and most of the folks did not have enough firewood do keep always fire. For most of the people it was constant search for something, fire, wood, food, ammo...

Hm, i had a lot of alcohol as i mentioned before, i traded almost everything without any problem, let me say it like this: consumption of alcohol was probably 10 times more than in normal time. Not to mention cleaning and disinfection.

#

On the other side you made a very good point, if you have money and time and you have a storage it is probably better to store cigarettes or candles and batteries for trade, or food.

I was not prepper at that time, we did not have time to prepare, few days before SHTF politicians on TV stated that everything is fine, when sky fell down we just take what you can.

Thanks

#

About cooking, before the SHTF i used in my house electricity for booth, cooking and heating, so when everything started i traded some stuff for some kind of old wood stove, i put it in kitchen and fix exhaust pipe (right word?) trough hole in wall, i use that for cooking and heating.

During the summer i cooked in my backyard (walled fence, brick, luckily)

Concerning the smell of the food, hm, i ll try to picture situation: no electricity, no running water, sewage off for months, dead bodies in ruined houses, grime and mess, believe me it was very hard to smell something nice. It was not like in movies, it was ugly, dirty, and smelly.

Yes i had few problems because of cooking, only few, but as i sad before, enough people,

properly armed and with will to defend and you can manage most of the problems with that.

Probably situation would be different in wilderness.

I ate mostly some kind of pancakes with local herbs (does not require cooking oil and too much firewood), and of course everything what i could get and trade, rice was good to eat, not too much firewood for that.

I think i had luck, only few times i ate funny things like pigeons.

I always had something to trade, i guess that saved me, and guns of course.

#

No problem

First almost nobody were out during the day because of snipers, line of defence was very close, so whatever you have to do, you do it during the night, trade something, look for firewood (i can express how much this was important in town, and hard), looking for anything, check somebody, go to hear news (very very important, lot of people get killed because they go somewhere just to see what happening, or what s new) remember, no news, no radio ,no tv, nothing, rumors fed lot of people.

Already explained, you can stay home and die of hunger and cold, or even infection of some small wound or go out and risk your life, try to find - trade anything useful

I did have situations concerning my house only, it is no need for too much details, we had more fire power, and brick wall. Also we had something like street watch, people from my street were good organized, in case of gangs, now there were a lot shootings.

There was pretty much shooting in town, i did not have enough weapon at the beginning, one rifle and one pistol (ww2), maybe 100 bullets, later i trade some things for more rifles and ammo, remember i gave car battery for 2 rifles. How much ammo ?
A LOT, as more as you can.

Most of the time you are not able to determine who is enemy or friend, expect my family and few real friend, everybody else is potential enemy. When your friend must choose between his child s death and your death guess who is going to choose.

6. Rumors, somebody tells you that some old guy few block away have some cans and he is looking for ammo or whatever, you go there, as i say you are always looking for something. Same some people would came in my street as traders, witha some goods. There was something like trade street during the night, actualy it was a big ruins of sport center, you can go overthere and look for something or offer something, but it was not controlled by anyone so it was too dangerous.

It was primitive pretty much, brick wall around house,bags of sand on windows and doors, over that bags we used whatever you can, big pieces of metal, stones, inside house

we put all kind of stuff on windows, only small opening left for rifle, always 5 members of family ready for fight, one always outside on street hidden.
Stone age situation 😊

To avoid snipers, we stay home at day, it was not so much night snipers, even during the night we never walked openly on the streets if we can avoid that, always shortcuts, through ruins, fast and quiet.

#

Everything connected to hygiene worth ed a lot, toilet paper too, after some time i believe more people dies from diseases connected with lack of hygiene than from gangs.

#

No problem

we used shovel and any piece of land close to house, sounds dirty, and it is dirty, washing with collected rainwater, sometimes go to river (most of the time that was too dangerous) Most of the time we did not have toilet paper, even if i had it, i trade it.

It was a bad situation all the time.

If i can give some advice: first to prep is a weapon and ammo, then everything else, i mean everything, depends how much money and space you have, if you forget something no problem there is always somebody ready for trade, but if you forget guns and ammo then you may not be able to get to trading places.

I do not see big family or group of really(i mean really) good friends as more mouth to feed, i see them as more guns and strength, it is in people nature to adapt.

And keep it simple and use common sense, in the first period weak people vanished, other fight.

Go with small thing, lighters, candles, flints. It is great idea to have fuel generator(electrical generating unit?) but i think is better idea to have 1000 bic lighters. Fuel generator is great, but in shtf scenario in town it is going to attract whole army, 1000 bic lighters don t take too much space, cheap, you can always trade it for something.

Real SHTF scenario demands completely change of normal mindset, hard to explain, i ll try through examples.

#

Hm, you re right, after the war every house here had a weapon from war, and yes police did some actions to take illegal weapon from population, depends from man to man i guess, lot of people find ways to hide their weapon somewhere, just in case.

I also have legal weapon (license), and authority here have some thing they call it "temporary collecting", it is says something like : in a case of unusual event (riots, unrest, etc) government have right to temporary collect all legal weapon, so i keep always in mind that, and i acted like some people.

You know some people have legal weapon for everyday carry(i have glock 45 and taurus 38) but some people with legal weapon also have illegal weapon hidden somewhere just in case SHTF and "temporary collecting"

It is not hard to get weapon in SHTF if you have good stuff for trade, but other thing is important, first days of SHTF is worst in terms of chaos and panic, maybe you not gonna have time to get gun. And to be unarmed in chaos panic and riots is bad.

In my case man needed car battery for radio i think, and he had some extra rifles, so we trade.

#

Wounds was mostly gunshot wounds of course, without specialists and everything else, if wounded manage to find doctor somewhere he had like 30% chances to live, again it is

not movie, mostly they died, lot of died even from minor cuts infections, i had antibiotics maybe for 3-4 treatment. Of course for my family only.

Simple things killed people, diarrhea can kill you in a few days without meds and rehydration, (fluid therapy, IV) especially small kids. Lot of fungal skin diseases, and food poisoning, we could not do too much. Basically we treated diseases mostly with local herbs, and if you had wound, put rakia on it and try to find antibiotics somewhere.

So i was good at fixing wounds in term of emergency help, but longer procedure-bad prognosis.

What i learned? Hygiene again, and a lot of meds, especially antibiotics. You need to learn to treat lot of stuff, go online, finish some training, EMT maybe, first aid etc.

In SHTF things are different, learn how to open IV, when to use certain drug, or antibiotics.

Get your self ANA TE (anti tetanus) shot injections , snake poison kit, adrenaline kit (allergic reactions, different kinds) thick removal kit, (thick related illness can kill you, learn how to remove thick)...

Get in your prepper storage some reanimation kit (simple one) like small oxygen cylinder, BVM mask etc. It is not really hard to learn to use all of these.

OK let s clear something, of course you can not use anything of this in real world unless you are certified and trained for that (EMT, nurse, physician).

But in SHTF nobody ask you for license, just learn and have in your storage big part for medical things.

So to answer question how did i help and treat, most of the time very poor,i help some with resources that i have, i took food or something else for exchange, i was badly prepared for that, now i am what do i need to have.

#

Great question!

USA drop not only MRE, there was few types of things, MRE dropped seperetly, i guess drop something like big box full of MRE (300-500) that box attached on parachute fall apart on some altitude and then rain of single MRE 😊 second kind was a parachute with big pallete, most of the time there was flour inside, a lot of flour. I remember also pallete full of some kind of cookies or biscuits, in small metal containers. I never picked anything except food, i heard stories about boxes of clothes and all other stuff, i never seen it, again rumors raged.

Anyway they did not come on some schedule, we never know when, and it was not organized at all, it was first come first gets, more precise more armed gets more.

#

No, not really, i mean sometimes you can use foreign money if you had it to buy

something, (dollars or German marks) but even in that rare occasion rate was unbelievable for examples 1 can of beans for 30-40 dollars (normal value was maybe 0,50) i guess somebody had connections with outside world, black market you know, so

he can earn lot of money. But it was very rare. Trade was main thing to get something.

Local currency crashed very fast, in few weeks or month maybe

#

I am sure you are very well prepared.

Now this was my personal experience, maybe my situation was specific, it was only one town during the four year war, and it was completely cut of from everything and everybody for about 1 year. Difference is that most of us was not prepared and aware what is gonna happen .

Again from my experience: if you are alone in the town in SHTF, do not wall your self, do not put fancy armored door, bulletproof windows, i suggest, tear down your wall, crash your windows, take old clothing and broken LCD tv garbage and put it on your lawn, take some dead animal dog or cat maybe, and put it on your lawn for stench. To make story short- do everything so your house look robbed, empty and non interesting.(most of the people do not go in already stripped house, especially with stench of dead things)

Of course before all of this invest some money in good basement, with hidden entrance, air filtering your stock, your weapon and you inside, use night time to go out and survive. This is only suggestion, i don t know for sure of course.

Maybe is better thing to offer your specific skills to some friends or family and move in.

#

Just like most of the things, these things you could find if you have something interesting to offer, but i remember formula was very very expensive to trade.

Fuel was hard to find i remember that.

Real problem was that babies and small kids are more sensitive to lack of hygiene-diseases, if you do not have enough really clean water weakest gonna be sick first, if you

don t have meds or don t know to treat them you are in problem.

So, yes people are bartering for that too, but it was constant struggle to find it, trade it, bring it home...

So i think, bigger storage, smaller problem.

#

Again it was no rules, as i say before low profile, we concealed everything, if i had nice pair of boots during my walk i kept em dirty, nobody look well, nobody wants to look well, nothing was organized, trade worked based on street news(correct word?)

OK it worked like this, if i want to get MRE for example i waited for dark, i took rifle, pistol, knife, dark jacket and boots lot of ammo but not too much to slow me so i can run, my brother same, and we re headed at the first barricade (car wreck) in my street, two guys from my street watched always there for potential trouble, i ask them did they hear anything about any MRE for trade somewhere near, sometimes they heard sometimes not.

If i judge that worth risk i ll go there and trade, in that other street few other guys watch for that other street and i trade with them, or they can tell me who had MRE in that part of town. There was something like "trusted" people for trade, other not, some part of

town were more dangerous, other not, no rules.

Even rates for trade are changed very often, example, if planes drop food twice this week MRE is probably going to be cheaper for trade.

It was constant risk with everything, potential trader never knows is other trader going to kill him or trade with him, first few minutes two people(strangers) talked hidden behind rubbles 30-40 meters apart, and then after some faith is gain we traded.

We never took more then few things to trade, more things to have means more risk.

We did not concealed our weapon, two armed guys looking poor, we did not want to be target, if we see larger group of people, we hide.

Well good question, but i think i am missing some English words in my vocabulary to express some feelings 😊

#

Jako hrabra izjava prijatelju.

U neka druga vremena ovakve bi se izjave riješavale na drugaciji nacin, hajde ako su ti roditelji kako tvrdis ili neko od tvojih iz mojih krajeva onda bi razumjeli ovo.

Hello again, these few words above are for that guy who said that his parents are from my area, so that is not going to be problem for him.He also states i am fake, and no that words above are not insulting in any way, i am not doing that never

I just came home from night shift and i found some disturbing things (i am gonna said insults) because if somebody tells you that you are fake, i believe that is insult.

I wanted at first to have this forum forever, but through my experience I've learned what is tolerance and patience. As to be honest there is a lot of great stuff here, I don't wanna go 😊

So I have a suggestion, I can't go public with my proofs, it is complicated why, yes I am new to the forums of any kind, no I am not new to English (I did not use it for a few years) and NO I am not fake.

Anyway I think you always gonna have doubt in me, so I suggest a few things: I think administrators of this forum can easily check my IP addresses, then if an administrator thinks I have some value on this forum, I ask him, I call him, let him address me through private message and I can provide him some info, after he reads that, I'm sure he is gonna be sure I am not fake, sorry guys I live here in a different world and I can not go in public with some things, so I am gonna tell/write that stuff only to an administrator, I believe it is gonna stay between me and him, and I think you are gonna all believe his judgment.

Any way thank you very much (it means a lot to me) to all who think that my English is great, I always think somebody going to mock on my wrong phrases, I know my grammar

is not great, but I am doing my best 😊

And yes for unknown words I am using online Croatian-English dictionary, I put a link below

<http://www.englesko.hrvatski-rjecnik.com>

And don't be confused, Serbian, Bosnian, Croatian it is the same language, few different words and phrases, I guess like difference between states in USA.

Anyway if administrators do not have interests in that conversations with me and I leave this forum, just keep this in mind: be prepared, be also mentally prepared, it is not like in movie at all.

Thank you and bye, or goodbye.

#

Thanks for nice words

I believe there are two reasons for people to think I am not real.

Maybe I am not introduce myself enough, so I try to do that now, with limited info.

I learned English language 8 years in elementary school, then 4 years in my medicine school (nursing school), then I had some luck to get a job which involves active use of English language, at that job I took and finished EMT training (USA standards) and finished ACLS, PALS, PHTLS, BLS instructor, AMLS courses, nurses and EMTs know what kind of courses are, not important for non-medical people to explain.

I like Simpsons i hate reality shows 😊

I like blues and rock, i like Apocalypse now and Full metal jacket (old things but great)

Almost every younger man in my country understand English language, maybe 30 % of them can write and conversate pretty good, as i already said i had luck to use it actively few years.

Anyway i did not use it for few years.

Second reason, most of the people just can not believe some things can happen in normal world, before that happen we have normal life, like most people in Europe, we was not some strange folks from strange country far far away, we had a decent life, apartment, car, summer vacation on sea cost, movies, concerts.. when all happens.

I am trying to say here, sh.. can happen anywhere, to anyone, in any country and system, i believe too sh.. can happen to all of us together at the same time.

Now again i have something like normal life, normal job and family, situation in my country is pretty much confused, with lot of corruption, high unemployment, political confusion , high crime rate and similar things.

Some folks thinks maybe i have some hidden reasons to write my posts, and i am lying. Reasons for me to be here are: I am just like everybody else here interested in survival and prepping theme, also i noticed trough some posts, and of course movies and some books wrong perception of SHTF (again it is my opinion only), there is something like romantic (romanticied?) SHTF, or something like that. That perception is joke, and i belive it is dangerous to preparing your mindset basing on that perception. On the other side i can talk only based on my expirience, maybe i am wrong for some future

SHTF, for example i do not know nothing about wilderness survival, living in woods, camping hiking and things like that, it is funny because most of my country is in woods and mountains 😊

People, i am sharing my expirience with you, my mistakes, my bad judgments, trough your comments and your questions i wanna learn things for next SHTF, i did not came here as smartest guy on forum.

So to conclude this, if you do not like my posts, do not read it anymore, if you think i am fake, go away from this posts please.

To all others ho like my posts, thank you for reading it.

AND at the end of this post, one picture worth 1000 words, so i will put two pictures how it looked (i quess everyone can acces my album in my profile) i did not took that pictures, those are not pics of my town (i have reasons to not mention my town or put pictures of

it), they are pictures of town 100 miles from my town with similar situation like in mine(in some ways they were better organised) remember this: it was normal town, normal people, like most cities in world.

thank you

#

As far as i can remember, not too much accidental fires, but on the other side there was a lot intentional fires due to firing, and also we here traditionally do not have wood houses in town, almost always it is different type of brick.

#

😊 it was yellow color, sometimes brown, i do not know from what he made oil, mixture of couple of things i think, he jealously kept the recipe, lamp was rudimentary thing, put the 10 cm. of shoestring through bottle cap (aluminum i think) dip that in cup of that oil, shoestring is 2-3 cm above cap, everything else is dipped in oil.

It smells horrible, and gives a lot of black smoke, but it lights.

Of course we could use cooking oil for this, but most of the time it was too precious.

#

Mostly men used guns, but my family in that house was big, and there is no need for a woman to use gun, in other houses maybe was different situation, so, no rules.

Again it depends, when we have enough food and other things we tried to keep normal life during the day in house, but mostly in that period night and day switched places.

#

And somebody ask me about, night visions and guns .

It was pretty much basic list of weapons, like for pistols it was 7,62 and 7,65 red flag pistols (copies of Russian guns), ak 47 (serbian version, good rifle in that time) then PAP rifle (serbian semi automatic rifle, good rifle with fixed bayonet and nice tromblon option -or grenade launching option) lot of combinations of hand made weapon and real weapon, like hand (bomb) grenade throwing device, we called it "drunk man" it is basically slingshot with bomb-hand grenade(sounds funny i know)

Of course lot of knives, axes, guy from my street even had a spear, i don't know did he ever use it

No i did not see night vision devices at that time, not on our side.

#

About alcohol first, you're right but you are right in both ways, people need alcohol more in desperate times than usual, so it is kind of gambling i guess, it is very good item for trading, i never had problems with alcohol trading and having more problems with trading other things.

Also i am thinking about something else, maybe it is better to fill my storage with something less space consuming but still interesting for trade, like batteries, antibiotics etc.

Thing is i had all that alcohol for free, i did not buy it. I don't know about this.

In most of the situations people attack me because they think they are stronger, they did not know for sure what i really had.

About ammunition trade, it depends how much ammo you are going to have, sometimes i trade ammo for food, and in few weeks again food for ammo, but i never never do trade at my home, and never bigger amounts, very few people knowed how much of anything i had in my house.

The point is store as much of anything as you can store (space , money) later during the situation you ll see what is most popular, correction ammo and guns always gonna had 1 place for me, but who knows maybe number 2 for trading gonna be for example masks with filters.

About medical issue , i ll write in my next post what do i have now in my medical part of storage

About medical issue , i ll write in my next post what do i have now in my medical part of storage

Defence were very primitive, again we were not prepared, we use what ever we could, windows were broken, roofs mostly damaged from shelling, all windows were blocked with something, sand bags and rocks, every night i blocked my yard gate with junk-rubble from the street and i use old alluminium ladder to get over the wall, when i come back i called somebody from house to get me that ladders so i can move in.

Guy from my street barricaded his house completely, if he go out at night he use a hole that he maded in one room that is connected with neighbor s house, and go trough his (ruined and destroyed) house out, actually he had secret entrance.

It may look weird to say but most secured houses are gone first, of course we had some very nice houses in neighborhood, with walls, dogs, alarms, steel bars on windows, alarms. And you can guess what happened, mob attacked those houses first, some were defended other not, depend how many guns and hands thea have inside.

So i think security is great, but be sure that you keep it low profile, forget about alarm, if you live in town and SHTF you gonna need simple looking non interesting secured house, with lot of guns and ammunitions.
Just keep it low profile and not interesting.

On my apartment door now i have steel door for security reason, but only to keep me trough first short period of chaos, then i am moving out to connect with bigger group of armed people (family and friends) in the country (i hope)

Well in my case migration did not happen because it happen very fast, other army just closed city in ring and that s it, if you ask me where was that army and how we did not seen them coming, the answer is simple, that army was an ally of army of my side and people, and one day we woke up and figured they are enemy now and they are closing all ways out. Politics . It is true, one more side of civil war.

But i heard from others parts of country, and my frends who stayed in villages in the

other parts in state, that they have much better situations, countryside had land, corn, wheat, fruit trees, farms etc they had enough food, it was bad, but much better than in city.

I know one thing if we had some way out from the town, we would use it, we did not have it.

#

You right with one thing, topics, i am getting overwhelmed with questions and i keep forgetting to answer some question, some other themes are to complex for me (like bank accounts, loans, and hyperinflation,) and to answer only that i need like 5-6 pages.

On the other hand i check some of the stuff from that Argentine guy, i did not read book, i found one article from his book (free), yes a lot of similar things but some other different too.

I believe guy is describing collapse due to economic reasons, i am describing collapse due to war and siege, and some of the things are completely different.

But yes main problems are same, food, shelter, security... I believe they had collapse on larger scale, (territorial) but i also believe we had completely switch on the middle age society for one period of time. I just can not compare it with any movie, i mean forget

about small little communities doing fine, and they all have leader who is wise, while whole world falling apart around them, but i have read one book (fictional) few years

ago, and i like the way that author described how people mindset changing during SHTF, and what are they willing to do for their own, i found it pretty much accurate in that part, so to all, check that book :John Christopher- Death of grass

I promise i ll try to answer all of your question, i ll even try to form some topics, chapters or something like that.

Thank you

#

About banks, loans, credit cards. Complete monetary system died for about one year, so nothing works.

It is complex question in many ways, i ll try it to answer it in some future posts, need much more time and much much more space to describe it. Even now almost 20 years later folks are at European court suing banks, because they dont want to admit their savings in banks, lot of different things happened in that period , they changed money, i mean monetary name, they changed it 2-3 times , hyperinflation occurs, lost of paper trails about savings, loans ... i remember some people use that situation to get rich, they still rich 😊

So i ll try to describe that in separate post.

There was a lot problems with proving people s property after everything, for example: my father had nice apartment and because war he must leave it, after war ended he was at

court for about 4 years proving that apartment was his, reasons for that were different, because politics in that time, but also he did not have enough paper work to prove that apartment was his (he did not took papers from apartment when he fled, he had more important things to care) On the other side during the worst period, people just moved in empty house, and that s it.

I mention rural areas in other post. As far as i remember it was better there.

In that period there is not running vehicle, actually i remember tank at the front line, and Lada Niva (check it on web) with cut of doors and roof and installed machine gun (i think it was an old m53) and those two only moved when they fired(they keep it hidden behind ruined houses)

For let me call it "civilian population" there was no moving with vehicles, streets were mostly under rubble and unusable and fuel was too expensive.

Not to draw attention was a big thing, about clothing, there use to be some sort of town defense, it was not like real military, mostly mixed civilian clothes with part of uniforms, different weapon, so no rules.

But as soon as go in to that things and try to talk about two armies, their strength, war crimes, politics i am not gonna like it any more, because people gonna start to choose sides, and i think it is not important for us here.

As i sad before there was not organized army, but we all been like soldiers, we had to, most of us carry weapon and try to protect from enemy army and robbers.

Inside the town you did not want to look fancy because somebody shoot you and took your good stuff, you did not want to have fancy rifle, because probably you not gonna find ammo in that caliber and also you are drawing attention.

So let s me try to put it this way: if SHTF tomorrow, i will try to look like most of the people outside, scared, desperate, confused and i ll scream maybe, no fancy looking stuff, i ll not go out in fancy new uniform and yell "I am here, you are finished now looters and robbers" I ll stay low profile, heavily armed and well prepared waiting to see my options,

even if i have to go out with all my gear to do things i ll go in night, with best friend or brother. Maybe sounds ridiculous, but from my expirience it works, be wery well prepared, but let nobody outside your house know or see that.

No matter how good is your house security, how good is your weapon, if people see that they have good reason to rob you they probably rob you in town SHTF, it is only matter of time and number of guns. Don t ever give them reason to be interesting for robbing. Stay uninteresting. Now this is my opinion, maybe is not working in different situation.

About robbing grocery store and gas stations, it happened very very fast, as soon as shooting started all valuable things was emptied, there vas some effort of authority to keep it together but everything fall apart in first weeks.

#

Good question

Of course there was some signs, but we did not see it, or we did not wanted to see it.

Some major figures left town before everything started, we knew that, i seen that, we just could not believe that kind of things can happen to normal people.

I guess it is in human nature that some things can not be comprehended. Maybe i ve seen that something bad is gonna happen, i just keep (like most people) saying: "oh at the end they will fix that"

I think next time gonna be easier for me to see that something is coming.

I believe that most important thing is to accept fact that bad things can and eventually will happen. And of course i don t believe to much to main media, i rather go online and try to research things and separate facts from lies.

You see situation in my country (and in most surroundings countries) now is : Crime rate is increasing, unemployment is going mad, there is feel of desperation, prices of food and fuel constantly going up, politicians are corrupt more than ever, drugs, gangs.

So i would be idiot now to to say : "Oh somebody will fix everything"

I think there s more chance that everything going to explode trough some kind of collapse.

#

No not really people like honest brokers, i mean there was not anything like guy who is honest and who had lot of things so i can visit him, just rumors, and word on the street where i can get something.

There was a few guys like "rich guys" who had luxury stuff, but they were untouchable, something like "war lords"

But if you ask me can you be something like "big guy" in times like that, i guess answer is yes, if you have enough people, firearms, black market connections, and knowledge i mean info .

They called "war profiteers" and some of them get rich in that times, some of them are still making decisions.

#

Yes that is one answer to that, also it is not popular here to talk about some things, some memories are still fresh, it happened not so long ago, it need some time to go by to talk openly about some things. Some big figures from that period and place are still alive and active.

So let s keep it simple, it is not important for you to know exact name, place and year of that events.

About part 2, i don t think that any kind of real war can happen here, nobody here have enough economical and military power to start that again.

But part 2 i believe will happen because economical reasons, because everything is going

down. For example my salary is around 600 US dollars for month, and 1 liter of fuel (i can not remember how much gallons is that) is around 1,80 US dollar. Actually my salary is staying same, everything else is going up 😊

And i can say i am lucky to have job !

In last 10-12 years crime rate is going sharply up, drugs use is unbelievable, gangs problem is getting worse, corruption on every level is everyday thing, unemployment, every next paycheck is small victory, retired people can not effort even decent food from their pensions...

And when you add on all this unsolved problems from war it is not bright. I think complete collapse of country can happen due to bankruptcy.

Immediate reasons can be many.

And then again we have SHTF.

#

No it is not too personal at all.

Reasons are very simple, and there are few of them. First we live close to our work place, i live actually something like 1 mile from my workplace, second our villages are pretty much different from your countryside, they are much more rural, and to live in the village, and work in the town is much more expensive if you want to live normal life (especially with the kids).

So to be short, it is easier for now, and yes i am scared to be trapped again in town, i am

preparing things so i can be ready to leave everything and run to countryside in a sign of trouble.

#

People owned mostly ak 47 actually it was serbian issue, m70, folding stock version was better for streets, then was semi automatic PAP rifle (good for hit someone, i mean with stock, heavy rifle, but precise, nice bayonet) it was safer to launch grenades from PAP then from AK

Of course there was a m48 rifles, younger people did not like it, most of them was rusted,

i never used it to shoot at someone , but i ve seen some folks doing some amazing shots with that, yes some were with sniper.

But i have used for month semi automatic CZ (ceska zbrojovka) with sniper, very good, easy to use, very light, small caliber 22, also great for street , when i could not find ammo for that anymore i trade it 😊
sleng was:

ak47-ciganka (pronounced like tzigakha, means gipsy woman)

m48- tandzara (pronounced like tanjara, means thick stick)

TT pistol- pracka, means slingshot



I was not some weapon expert, i used what i had, even now i am not expert, now i have what i like.

#

Forgot to mention you, lot of folks used do cut of the stock and barell from that m48, it looked like mad max gun 😊 but useful only maybe to 50-60 meters, for streets again.

#

Me and my family in that time were like "middle class" we did not starve to much, had some bad days with food but not too much, i was (like everybody else) on constant search for food (and everything else), few potatoes, some rice, green salad from garden, cans and powdered eggs (luxury) we cooked when we had fire wood, then again for a week or two only local herbs (i don t know name, it is cow food i think) older folks pick that, it is looked just like ordinary grass to me, it did not have any taste at all.

Most of our family eat together, we share everything, we were family.

Generally speaking our health was poor, mostly due the cold during the cold months, bad food and of course bad water, each member suffers diarrhea for a longer period more or less.

Whenever i recall memories about that period first things that came on my mind are not guns or security problems, i always remember cold and smell.

I was something about 65 kg in that period, now i have 95kg. I am 185 cm high. I lost 15 teeth in that and right after that period. I had skin problems for 3 years after that. Not to talk about psychological issues. I am fine now 😊

One more thing

Man i like your avatar, i believe that scene goes like this:

Bart: dad i believe you just shot zombie Flanders

Homer: Uh, he was a zombie?

It is Halloween special, i don't know part

Simpsons rules 😊

#

You have right with this, traditionally people consume alcohol in big ammounts here at Ballkan region, i am something like occasionally drinker, beer mostly.

So here it make sense to store alcohol in case of SHTF , again it is matter of space and money. And in depressing situations people drink much more.

One more thing, in SHTF addicts are still addicts, drinker stays drinker, smoker stays smoker and drug user stay drug user, some of them just gonna find some easier ways go get their stuff.

Oh and i keep forgetting to mention, tobacco, store it as more as you can, if you in a

struggle for money like most of us store it in a cheaper form that you have there. For example i am smoker, i was smoker in those time, and i smoked some pretty bad tobacco in that time, still i trade some good things for that tobacco. Cigarettes were like second valute(monetary) sometimes.

If we wanted to express worth of some thing, we express it in guns, cigarettes or sometimes foreign money.

So it is not important do you smoke, have and store lot of cigarettes, cheaper ones, it does not matter kind, nobody will choose to much.

#

I completely agree with you about drug and alcohol usage, i mentioned i work in ER, i know what alcohol and drugs doing to the people and whole families. Also i am father so i am always concerned about that things.

On the other side if i can give you advice for some future SHTF it is gonna be: do not be sure in anything what you believed prior to SHTF.

It is gonna be situation that gonna required some hard choices, everyone of us will have to choose, understanding of good and bad can be messed up.

I must say ,i never robbed anyone, never kill someone for food or something like that. But also i never have to do that. I always managed to find other ways to do that, harder ways always. Easier thing to say now is i ll never gonna do bad things in similar situation.

True is you ll never now what you going to do in that situations and how far you are going to go to protect and feed your family.

Prepare for everything.

Please do not take this too personal, you see i found your arguments normal and noble, and i share it too.

Just keep in mind that good people gonna be forced to do bad things in order to keep family alive. Is that making them bad people? I don t know, maybe.

Good and bad can pretty much mixed in that situations.

I guess as i said, each and everyone of us will have to choose.

#

Prior that war there were different law about owning a weapon, so very few citizen had legal weapon, on the other hand few months before war black market started with selling guns and rifles, prices were high, i think now that was another sign that s something wrong going to happen.As far as i can remember there was not anything like confiscating legal weapon.

Now the law is different, it is pretty much easy to get license and buy weapon (legal), but they made a law which they call "temporary collecting" It states that government have right to collect all legal weapon from citizens in case of some happening (they say riots,

unrest's, happenings like that, but they are not to precise, so i guess they can confiscate it whenever they want)

#

Yes there was some.

Everything from "stone age" things like pieces of concrete wall above yard door (not in use door for hiding group), grenades in glass cups with pin taken out, bombs on move (i don't know English word, simple bomb with rope, activating with your leg,) small mines buried or taken beneath leafs or peaces of rocks, we call it "paste" mines, not too strong, usually took took your foot off, ih you had good boots not even that.

There were not so much sophisticated explosive things, my friend was miner in military, he installed 2 MRUDS in his yard, i just check it, it is similar to American Claymore mine. That friend is now in civilian demining business, funny.

Some people use to steal mines from first line, and use it for protection

#

We did have situations like that, with constant shelling and all of that, my house was hit by two grenades (mortar i think), almost every house was damaged,more or less.

Most of the situations was rescue, due to people been captured into damaged and destroyed house, there were some solidarity in the street for dealing that situation.

Our town had fire-rescue department like every normal town, but it fall apart like everything else.

Yes i often offer my medical skills to other, nothing special, mostly to "plug the hole" or advice somebody, so nothing sophisticated. Without enough equipment or supply you can do too much.

About your skills, i believe you as firefighter and probably first responder have good base to have some great skills for SHTF.

Upgrade it if you can, for example (maybe you already did, i don t know) specific rescue operations (hard terrain mission), or do more on training about mass casualty incidents,more trauma training, these are examples only.

To answer your question, no i don t think fire departments are ready for real SHTF

(maybe in short period they are ready), neither the law, EMS or any other organized level of authority.

If normal circulation and transport of goods stops (reason may not be too important,war, terrorists,nature...) everything will crush,sooner or later, depends of the level of wealth and organization of your country-town, i have seen that.

I believe it gonna stand on ordinary man, family or smaller community in countryside to take care for every aspect of life.

#

It is not rally important for us on this forum what started my SHTF, in my case it was war and siege, as i mention before it results with complete collapse of everything, we lived and survived for one year in that conditions

Meteors, terrorists, nature disasters can create similar condition, all distribution and organization of any kind will collapse just what happened in my case.

I am putting this videos my cities just so you all can understand that there were normal cities and normal folks, so my point is that this kind of SHTF can happen to any of us in every corner of world, and whatever are reasons can be, the result will be always the same, complete collapse, if we understand that i think we can prepare better.

This video is taken week or two after truce is signed, you can notice that in some parts of town electricity is back, and also there is UN peacekeepers in street checking people.

So just remember, normal folks, normal life, normal city. And then SHTF.

By: Selco

Compiler's Note: Selco has gone on to create a Blog of his own at: <http://shtfschool.com/>
Here is one of the articles from his blog.

Selco on Signs of SHTF

Posted by JAY

Good question when did i figured that SHTF in city is started. I do not now for sure, but i think it was then when i saw that i can not leave the city, and when i saw some ordinary nice folks doing horrible things. Because important thing is to know, bad people, gang

members, people who did horrible things, they did not came from other planet, they were with us all the time, some of them were criminals, some of them were normal people, they all just seen their chance when chaos started.

About organization in my house, it was not democracy at all, there was something like leader, smartest man i queses, he made some decisions about what to eat, and when, what we going to trade, what was safe and what not. But every member did something. Someone was better with fixing things than with shooting, someone else was great for trading, one of my relative was great for scouting, he use to be in special parachute unit

in army 15 years before that, so he knew some things. So i think it is great idea to preparing as a group or family, so each member can learn some skills, more skills means better chances. It is not only about storing food and guns.

Why i believe it is gonna happen again? I ll try to explain situation in my country in present time. Well, economy is gone to hell, costs of living is constantly going up, there s

sharp rising of crime, even during a day it is not safe to walk in areas of town where is no too many people, especially for females, gangs activity is higher then ever before. There is a whole generation of young people without job, without any future, they see their chance in crime, gangs, drug business. They do not remember war, they have different picture about war and chaos. They actually wishing the chaos. Every football game is possible start of rioting. To have job is luck, even if you have it it is hard to live. Every aspect of authority is corrupt, government, police, courts, health... You can sense feeling of rising rage. Situation is similar in most of the surrounding countries. I think some organized crime groups have much more members and will than police force.

I was not prepper prior this situation, so in many fields i did poor, but i can mention what was hard to get in the city. I mean everything was hard to get, but you just do not think about some things until you notice you need it, and then is probably too late. Now let me know, i am not making some survival list here, so i am not mentioning usual things like food, ammo, guns, hygiene etc.

Small precise tools, like tools to fix watch or lighter, flints for lighters, sewing tools,aluminum foil as a help for cooking, garbage bags heavy duty lot of , nylon tarps, containers all kinds (jars, plastic canisters...)ropes all kinds, Velcro tapes, duct tape , chains and locks, belts all kinds including those belts like truck drivers use for fixing the load- don t know word sorry fabric bags (like bags for coffee), stuff to reinforce your windows and doors like metal plates, all kinds of tools.

If you ask me what tools, simple advice is: every tool that you need to take one ordinary house in parts, and to take that parts to your home, and every tool to fix stuff in your house.

But remember to keep it simple in prepping for city SHTF, I mean if you are planing to start generator unit in ruined city to have it like in good times,probably you gonna end up

dead. It is much better to have solar batteries chargers and a lot rechargeable batteries. If you are storing things for trade in SHTF then store small things, batteries, candles, antibiotics, hand sanitizers, lighters etc. You are not be able to carry big things in city and

look for trade.

Now my advice is: keep your storing and prepping as a secret, or keep it inside your group, family, friends if they preppers too. Do not just go around with attitude that the end is coming and i am prepared and stocked. They all going to remember you when they get hungry. Hungry people are desperate people.

My friend had small portable stove, maybe shoebox size, it used petroleum, gas, alcohol, had some kind of small pump installed on it, i remember it was made in Spain for Spanish army. It was very valuable thing.

Anything related to medicine was very valuable so go big with medicine. First i suggest educate as more as you can, i mean you can kill someone with wrong drug easily. Do not just go online and buy trauma kits or drug box,or whole list of antibiotics,first learn how to use it, it is maybe second most valuable knowledge in SHTF.

I think in order to survive this kind of situation man need some reasons, of course main reason was to stay alive, but without any other reason some people can easily turn to animals.

People needed hope, good news. Normal people in normal times usually do not understand importance of news, communications and things like that. It was some kind of information blackout, only few people had batteries for radio, so to at the time when information reaches you, it is probably completely useless and false.

It is strange feeling, when that situation is happening you have feeling it is end of the world, nobody cares, nobody knows for your suffering, that can kill your will for survival. So yes i think it is a great idea to have something to communicate with others, like CB or something like that, but again, keep it as as secret, not to mention to have correct information is very important and valuable.

Security and Self-Defense

The Biblical Case for Self-Defense

*By admin
handsonsurvival.com*

I. The Biblical Case for Self-Defense.

It is noteworthy that the Bible records many accounts of fighting and warfare. The providence of God in war is exemplified by His name YHWH Sabaoth ("The LORD of hosts"—Exodus 12:41). God is portrayed as the omnipotent Warrior-Leader of the

Israelites. God, the LORD of hosts, raised up warriors among the Israelites called the shophetim (savior-deliverers). Samson,

Deborah, Gideon, and others were anointed by the Spirit of God to conduct war. The New Testament commends Old Testament warriors for their military acts of faith

(Hebrews 11:30-40). Moreover, it is significant that although given the opportunity to do so, none of the New Testament saints—nor even Jesus—are ever seen informing a military convert that he needed to resign from his line of work (Matthew 8:5-13; Luke 3:14).

Prior to His crucifixion, Jesus revealed to His disciples the future hostility they would face and encouraged them to sell their outer garments in order to buy a sword (Luke 22:36-38; cf. 2

Corinthians 11:26-27). Here the "sword" (Greek: *maxairan*) is a dagger or short sword that belonged to the Jewish traveler's equipment as protection against robbers and wild animals. A plain reading of the passage indicates that Jesus approved of self-defense.

Self-defense may actually result in one of the greatest examples of human love. Christ Himself said, "Greater love has no one than this, that he lay down his life for his friends"

(John 15:14). When protecting one's family or neighbor, a Christian is unselfishly risking his or her life for the sake of others.

Theologians J. P. Moreland and Norman Geisler say that "to permit murder when one could have prevented it is morally wrong. To allow a rape when one could have hindered it is an evil. To watch an act of cruelty to children without trying to intervene is morally inexcusable. In brief, not resisting evil is an evil of omission, and an evil of omission can be just as evil as an evil of commission. Any man who refuses to protect his wife and children against a violent intruder fails them morally."?

II. Another Article on Biblical Self-Defense:

The Concept of Self-Defense

Our Lord would be contradicting Himself or Scripture by saying that one must never defend himself or his family in any circumstance. The Word of God does allow and encourage self-defense. In the Scriptures we do not find God encouraging His people to be either "hawks" or "doves" when dealing with self-defense. They are just to be reasonable.

In the early part of redemptive history we see the patriarch Abraham mustering one of the first armed militias (without the approval of any state or federal government, I would note) to rescue his kidnapped nephew, Lot (Gen. 14:21ff). This was not revenge but was purely defending and protecting (here rescuing) a family member and retrieving property. This can be labeled as a biblical example of self-defense. It is interesting to note that later "[t]he Israelite army was a militia army which came to battle with each man bearing his own weapons – from the time of Moses, through the Judges, and beyond." (Pratt; *ibid.*)

In Exodus 20:13, part of the Ten Commandments, we read "Thou shalt not kill" (KJV). The accurate English translation would be "You shall not murder". This commandment does NOT forbid the taking of life under certain circumstances. A good interpretation what this commandment does mean (requires of us) is found in the Westminster Larger

Catechism:

What Are the Duties Required In the Sixth Commandment?

Answer: The duties required in the sixth commandment are, all careful studies, and lawful endeavors, to preserve the life of ourselves and others by resisting all thoughts and purposes, subduing all passions, and avoiding, all occasions, temptations, and practices, which tend to the unjust taking away the life of any; by just defense thereof against violence, patient bearing of the hand of God, quietness of mind, cheerfulness of spirit; a sober use of meat, drink, physical, sleep, labour, and recreations; by charitable thoughts, love, compassion, meekness, gentleness, kindness; peaceable, mild and courteous speeches and behaviour; forbearance, readiness to be

reconciled, patient bearing and forgiving of injuries, and requiting good for evil; comforting and Succouring the distressed, and protecting and defending the innocent. (Q. &A. 135; emphasis added).

Note that the Catechism says to "preserve the life of ourselves and others by resisting..." (emphasis added). The writers of this fine document understood the necessity, at times, to

use defensive measures to aid others when necessary. They also say "by just defense thereof against violence." This is a call for the legitimate use of self-defense. The Scriptures they use to defend (no pun intended) this statement are Ps. 82:4; Prov. 24:11-12; 1 Sam. 14:45.

Another passage of Scripture in Exodus tells us that protecting your family and possessions by using physical force when an intruder enters your home at night is legitimate: "If a thief be found breaking up, and be smitten that he die, there shall no blood be shed for him. If the sun be risen upon him, there shall be blood shed for him; for he should make full restitution; if he have nothing, then he shall be sold for his theft." (Ex. 22:2-3). This passage simply means that one can defend his home and life and that of his family if a thief or intruder comes in at night and threatens them. If it is during the daylight hours and the situation is not life threatening then lethal force can NOT be used.

In 1 Samuel 13:19,22 (see main page for the verses and a short comment) we see what happens when individuals of a nation no longer have the equipment to make and bear arms and defend themselves, their families and their nation. An open invitation to be attacked and plundered. Is this not, in reality, what the anti-self-defense people are setting us up for?

In Nehemiah 4 we see that the Jews were instructed to defend themselves and the wall they were building from those who wanted to use any means to keep it from being built. "They which builded on the wall, and they that bare burdens, with those that laded, every one with one of his hands wrought in the work, and with the other hand held a weapon. For the builders, every one had his sword girded by his side, and so builded. And he that sounded the trumpet was by me." (Neh. 4:17,18; KJV).

There are other Old Testament passages could be given but these ought to suffice. In the New Testament we have such passages as Luke 22:36, which says: "Then said he unto them, But now, he that hath a purse, let him take it, and likewise his scrip: and he that hath no sword, let him sell his garment, and buy one". Our Lord encouraged His disciples to get protection for use in self-defense. Elsewhere in the NT we have Paul saying that one must take care of his own family ([1 Tim. 5:18](#)) and, as I said on the main page, this also implies defending them as well. The New Testament does not contradict the Old Testament instruction on self-defense by saying "turn the other cheek".

Conclusion

This short article is not meant to be the last answer on the issue nor do I expect to necessarily change the pacifists' minds. However I hope that I have shown that "turning the other cheek" does not forbid one to use self-defense when one's life and/or family is

facing life threatening situations. Referring to the [Matt. 5:38-39](#) passage to prove pacifism is misleading and wrong.

I am thoroughly convinced that the Scriptures allow us to defend ourselves. That means that I have God-given rights to "bear arms" in order to do so. Only God can take away that right. I conclude with a quote from the late Dr. A. T. Robertson, a Greek language scholar, on the Matthew passage: Jesus protested when smitten on the cheek ([John](#)

[18:22](#)). And Jesus denounced the Pharisees (Matt 23) and fought the devil always. The language of Jesus is bold and picturesque and is not

to be pressed too literally (he is speaking here of the passage in question, GC). Paradoxes startle and make us think. We are expected to fill in the other side of the picture....Aggressive or offensive war by nations is also condemned, but not necessarily defensive war or defense against robbery and murder. Professional pacifism may be mere cowardice. (A.T. Robertson. "Word Pictures in the New Testament", Vol. I, p. 48).

This last section contains some quotes from Biblicalselfdefense.com. To read the full article please visit his site.

Permission granted by MT

III. The Biblical Obligation to Preserve Life

We begin by first looking at the Biblical obligation to preserve life. The Bible clearly teaches that we must preserve life—our own lives and the lives of other people. 1 Corinthians 6:19f teaches that our bodies are not our own.

Rather, our bodies belong to God. Our bodies are His property and so we are not permitted to treat or destroy them as we please:

19 Or know ye not that your body is a temple of the Holy Spirit which is in you, which ye have from God? and ye are not your own; 20 for ye were bought with a price: glorify God therefore in your body. (1Co 6:19-20 ASV)

Not only are we to take care of our bodies and the life contained. We have an obligation to preserve the body and life of other people. Psalm 82:4 even cites an obligation to protect those who are in danger:

Psalm 82:4 Rescue the weak and needy; Deliver them out of the hand of the wicked.

Consider also Proverbs 24:11, which indicates we have a duty to preserve the lives of those who are harming themselves:

Proverbs 24:11 Deliver those who are drawn toward death, And hold back those stumbling to the slaughter.

Ezekiel 33 is a well-known passage:

Ezekiel 33 "... 6 'But if the watchman sees the sword coming and does not blow the trumpet, and the people are not warned, and a sword comes and takes a person from them, he is taken away in his iniquity; but his blood I will require from the watchman's hand.'

If you know danger is coming to others, and you deliberately fail to warn the others of the danger, you are guilty of harming the victims. This is not to say that you can make people heed your warning. The surrounding verses also say that if the people refuse to heed the warning of the watchmen, the watchman is not guilty if they are harmed.

We also see principles in Mosaic law teaching that if we fail to guard the lives of others, we are guilty. In Deuteronomy 22:8, if someone falls from your roof, and you failed to install a safety fence around the edge, you would be held liable for the death of that person. Likewise, in Exodus 21:29-31, if a man has an ox which is prone to harm people, the owner is held liable if he fails to confine it and the ox harms or kills others. If the ox harms someone, the negligent owner is fined. If the ox kills someone, the negligent owner is to be put to death.

The principle could hardly be stated more forcefully: you must protect your life and the lives of others.

"Star Trek: Deep Space Nine-Episode- The Siege of AR-558 (#7.8)" (1998)

Quark: Let me tell you something about Hew-mons, Nephew. They're a wonderful, friendly people, as long as their bellies are full and their holosuites are working. But take away their creature comforts, deprive them of food, sleep, sonic showers, put their lives in jeopardy over an extended period of time and those same friendly, intelligent, wonderful people... will become as nasty and as violent as the most bloodthirsty Klingon. You don't believe me? Look at those faces. Look in their eyes.

There is only a thin veneer that separates civilization from man's innate barbarity.

Thucydides

Defense

"People who live in delightful, well-mannered suburbs, who never have to contest for their lives and property, often fail to grasp the subtle logic of violence. It is a mistake seldom made by hardened criminals."

James Dale Davidson and Lord William Rees-Mogg in THE GREAT RECKONING

In a massive social collapse, most people will be able to keep only that which they can defend. This includes their lives, their homes, their food, their money, and if they're

male, even their wives and perhaps their children. This is a thought that may disturb many people who are doing serious emergency planning; many members of our church do not have a "survivalist" background or mindset and they've never had any reason to think about physically defending that which is precious to them. A major disaster may change all that, just as it may change nearly everything else in the world for those living through it.

In an orderly, productive society with a stable division of labor, the harsh realities of life are not so obvious. You have laws that most people obey and you have professional police who enforce those laws. It's their job to defend the lives and property of the

average citizen; if there's any violence to be done in that defense, the police handle that. The average person never has to consider defending what is his unless he is personally threatened by a criminal. The threat of force by the police keeps order in the society and tends to discourage aggressive criminal behavior (not always very well in today's world I'll admit). It also tends to hide a basic truth about the nature of human relations.

In a massive social collapse, law and public order break down and the truth about human rights is revealed: An individual has rights only as long as he can defend them. This is the subtle logic of violence. It has always been true but it's something to which most of us have never given a moment's thought. It's also a concept that makes some Saints uncomfortable because it contradicts much of the illusions by which we have lived all of our lives. However, unless you understand and accept this basic fact of life, you may not survive the coming challenges.

If a disaster crashes down hard upon us, it will destroy all the illusions and most of the rules we have lived by for the past hundred years or more. It will create harsh new rules. When the fundamental order of a society changes and new rules arise, those who fail to understand the new rules suffer the most.

There's a reason for the information in the above paragraphs: It may save your life. Why? Because it's not just having a weapon that's important, or even knowing how to use one; it's knowing full well why you need to use it and therefore not hesitating to use it when needed. *A gun in your hand is totally worthless against an assailant unless you're fully willing to use it to defend yourself. **You must understand that the new rules brought on by a major disaster may require you to defend your life personally.***

The information here meant for the average Saint; it's essentially one average Saint

speaking to another. Most of us are not survivalists and we have not had much experience with guns. We have no particular interest in, and precious little time to learn about, exotic weapons with foreign sounding names. We need basic information about basic weapons that work dependably and don't cost a fortune.

In a bad scenario, it is not likely that things will deteriorate into some kind of violent chaos. The more likely worst case scenario is one in which there may be unrest and martial law in the urban areas and far less order than we're accustomed to everywhere (more akin to New Orleans) but nothing that resembles the Future War in *The Terminator*. Desperate people take desperate chances, the more base emotions become

prominent in many people's behavior, and hunger, cold, lust, greed and fear take charge of people's actions. You probably won't have to worry about roving gangs; but your concern will be with one or two people breaking into your house for food or whatever may be available, stealing vegetables from your garden or firewood from your woodpile, etc. This is what you'll need to defend against and this is something you can handle.

The best weapon for home defense is a shotgun with a short barrel. There are three reasons why this is true. First, there is nothing scarier than looking at that big black hole

at the end of the barrel of a shotgun when it's pointed at you. Second, when you fire a shotgun at close range it's impossible to miss; you're going to hit what you're aiming at.

Third, when you hit someone with a shotgun, he doesn't get up and come at you. A short barrel gun is easier to handle than one with a long barrel.

There are several good basic shotguns on the market. One of the best is a 12 gauge Remington pump 870 Express Magnum with an 18" barrel. It's not fancy and it's not pretty but it will do the job. As someone told me not long ago, just hearing the unmistakable click of a pump shotgun being cocked will scare off most intruders. The Remington costs about \$250 new. Mossberg also makes a good pump 12 gauge, along with several other manufacturers. If there is a good gun shop in your area, stop by and look at what's available. Ask questions; most gun shop employees are very knowledgeable and willing to share that knowledge with you.

The other useful weapon for home or personal defense is a handgun. Although an automatic shoots faster and loads quicker than a revolver, it is a more complex mechanism and may jam occasionally, whereas a revolver almost never jams. Also for a novice, a revolver is less intimidating to hold and shoot. Maybe it's all those Roy Rogers and Gene Autry movies, but somehow a revolver just seems more familiar to someone who is not used to guns.

The best revolver to have is a .357 magnum with a 4 inch barrel. It can fire both .38 and .357 shells (use the .38 ammo for practice because it's cheaper than the .357). A .357 is powerful. Powerful enough to kill or seriously injure an assailant and it's common enough to be affordable. I'd stick to a well-known brand such as a Smith & Wesson. Taurus makes a good handgun that is less expensive than the very top names. Again, ask at the gun shop.

If the gun is for a small female, the .357 may be too heavy and awkward to use

effectively. In that case a .38 or even a .32 may be a better choice. Remember that a smaller caliber weapon does not have the stopping power of a larger one, so if you have to shoot someone to defend yourself, keep shooting until you empty the gun. Once you've wounded someone, he's going to try to kill you if he possibly can, so you don't want to inflict a minor wound; you must stop him!

No matter which guns you get, be sure to get lots of ammunition. Any ammo you don't use or need could be a great trade item after a disaster. Walmart generally has good prices

on ammunition. Gun shows are always a good place to shop for ammo deals.

If you know someone who has a good bit of knowledge and experience with guns, get him to teach you how to shoot safely. It is a terrible mistake to have a gun and not know anything about proper shooting and gun safety. If there is a gun course offered in your area, take it; ask about this at your local gun shop.

Be sure to keep your guns away from your children! Put them where you can get to them quickly if needed but in a place to which they don't have access. There are lockable gun boxes on the market that are quick to get into if you know how, but impossible for a child to open; again, ask at the gun shop.

Finally, there is a cardinal rule about guns that should always be kept in mind:

Never point a gun at someone unless you are completely willing to shoot.

If your assailant senses hesitancy, he'll move quickly and take the gun away from you. Your life may depend upon this so it's essential to accept it completely. Go back and read the opening paragraphs above.

In a disaster the rules have changed; understand that and you will survive; fail to understand that and you will perish.

Surviving in the City

Introduction

While we all want to do our best to prepare for a coming crisis, and many Saints realize the city is perhaps the worst place to live, very few of us are really prepared to pack up the old Winnebago and head for the hills. Most American Saints, whether they're aware or not, are going to stay in the cities.

This is not a hasty decision for most Saints. Most of us depend on the city for our livelihood, and we can be better prepared by continuing to live in the city, earn a good income, and make preparations for exiting the city at the appropriate time – or by staying in the city and living off existing supplies.

This special report explains some of the most critical dangers of living in a city and presents some solutions to surviving them. If you are one of the Saints who has decided to stay in the city, you'll benefit greatly from this information.

Cities are artificial

Every city is an artificial construct. Cities formed as people came together to conduct business, participate in social interaction, and benefit from efficiencies in public services (such as schools, sewers, water, etc.) and a common defense. Yet cities cannot survive alone. They need resources from the country; most notably, food, water and electricity. While electricity and water can sometimes be created or found within city limits, the acreage requirements of food dictate that no city could possibly feed its own people.

Read that last phrase carefully: "No city can feed its own people." Not one. Cities are, by their very nature, dependent on the importation of food. The advent of just-in-time delivery systems to our grocery stores means that most cities would run out of food within a week if supplies were for some reason disrupted.

Remember, cities are not self-sufficient. Although they may seem to be in 2005, they

have for a long time been entirely dependent on the American farmer for their support – something almost all Americans take for granted (except the farmer, of course...)

Risks in the City

The city presents some serious risks during a crisis. The four most serious ones are 1. the collapse of social order (riots), 2. the failure of the water treatment and delivery systems, 3. the depletion of food supplies 4. the failure of the power grid and 5. you may be quarantined. While not every situation will appear in every city, every situation will most certainly appear in some cities. Will that include yours? We'll tackle these one at a time:

1. The Collapse of Social Order

“Social order” is a delicate thing, and it exists as a psychological barrier that could easily collapse under the right conditions. We all saw this during the L.A. Riots following the Rodney King trial verdict as citizens of L.A. set fire to their own town, yanked people from vehicles and beat them literally to death, and even fired guns at firemen attempting to save their buildings! More recently we were all witness to the looting, violence and total breakdown of society following Hurricane Katrina in New Orleans.

What allowed this to happen? Simple: the simultaneous melting away of the psychological barrier of “order.” Once people realized 911 couldn't handle the load, or was offline, that the local police were helpless or had simply abandoned their posts, “Law and Order” ceased to exist in their minds. They then conducted their lives in the way they always wanted to, but couldn't because of the police. That is, they ran out to the local stores and just took whatever they wanted (looting). They took out their racial frustration on innocent victims who happened to be driving through the area, and they let loose on a path of destruction that only stopped when men with rifles (the National Guard) were called in to settle things down. In other words, *only the threat of immediate death stopped the looting and violence*. Rifles work wonders.

Imagine store owners lying prone on the roofs of their stores with AK-47's, firing at anyone who approached. This is exactly what happened in Los Angeles. But worse, imagine the lawless horde firing at the rescue copters trying to bring in supplies to the desperate masses in New Orleans.

The National Guard eventually got things under control. This event was isolated, however, to one city. Imagine a hundred cities experiencing the same thing. Will the National Guard be able to handle the load? Not likely. What about local police? They aren't fools; if things look bad enough, they'll grab their families and head for the hills, just like they did in New Orleans.

No pension is worth getting killed for. A few U.S. cities could be transformed into literal warzones overnight. It would require all-out martial law and military force to have any

chance whatsoever of bringing order to these streets. And the reality is that there are not enough military in the USA to secure all of the cities if this happens.

This collapse of social order is perhaps the greatest risk of staying in the city during a crisis. What, exactly, would cause this collapse of social order? *Lack of three things:*

food, water, and money. When people run out of food, some will begin ransacking their neighborhood, searching for something to eat. (Remember that in a city, a “neighbor” does not mean the same thing as a “neighbor” in the country. They are not necessarily your friends.) It won’t take long, then, for violence to take over in some cities. While certain regions will certainly manage to keep things under control and people will form lines at the local (depleted) Red Cross shelter, other cities will see an explosion of violence. Imagine the gang-infested regions of L.A., Chicago, New York, St. Louis & New Orleans. Do you think those people are going to stand in line and wait?

They already have guns; now they finally get to use them. Pent-up racial tensions & hostilities will simply serve as justification for shooting people of the same or other color in order to get their food.

Even if the food somehow gets into the cities, lack of money (due to the government not sending out checks) could cause the same thing. Eventually, lack of money results in looting and mass theft. As the stealing balloons, it also results in a collapse of social order. Water; the same thing (but faster). The collapse of social order is also very dangerous because it doesn’t require any “actual” collapse of the power grid, telecommunications, transportation or banking. Social order is a psychological artifact. It is a frame of mind, and any global panic can quickly remove the mental barrier that right now keeps people basically “lawful.”

2. The Failure of Water Treatment and Delivery Systems

Will the water treatment facilities fail during a crisis? Many will. Some won’t. The problem lies in figuring out whether yours will. Certainly, they depend on electricity, and if the power goes down, so will the water.

The most important question here, though, is about what will happen when the water stops flowing (or if it is flowing, but it’s not drinkable). As you are probably aware, while people can live without food for long periods of time (2-3 weeks), water is needed on a daily basis. You can go 2-3 days without it, at most, but beyond that, you’ll quickly turn to dust.

That means people will do anything to get water, because to not have it means death. And guess where it’s going to be the most difficult to actually get water? You guessed it:

in the cities. During the first day of the water crisis, many people still won’t figure out what’s going on. They’ll figure it’s a temporary breakage of a water main and the government will get it fixed within hours. As those hours stretch into the next day, these people will get very worried.

By the second day, more and more people will realize the water isn’t coming. At that point, you could easily see a breakdown of social order, as described in the previous

section (as you can see, these things all tend to cause each other...). People will begin their “search for water,” and the first place they’re likely to go is where they always go for liquids: the grocery store, the local Walmart, the 7-11. The shelves will be cleaned out rather quickly.

Beyond that (because those liquids aren't going to last long), you're going to see people engaged in a mass-exodus from the cities. They'll take the gas they have left in their tanks and they'll leave the city in search of water. Some will go to "Grandma's house" out in the country where they might at least find a pond or stream to drink from. Others will simply go on an expanded looting mission, stopping at any house they see and asking the residents (with a gun in their face, likely) if they have any water to "donate."

As a result of all this, if water stops flowing, here are the events you can expect to see in some of the worse-off cities:

- Looting of all the grocery stores by the second or third day (remember New Orleans?)
- Minor outbreaks of violence during the looting. Shop owners, for example, may attempt to defend their shops with firearms (ala L.A. Riots)
- Mass exodus of residents from the city in search of water
- Ransacking of any houses or farms within a gas-tank radius of the city, presumably by desperate people with guns
- Mass traffic jams on the outbound highways as people run out of gas and abandon their vehicles (if bad enough, this could actually block the highways and trap people in the cities)
- (Remember Hurricane Rita?)
- Mass outbreak of water-borne diseases as people use streams and rivers as both a water fountain and a bathroom. People crapping upstream are going to infect the people drinking downstream. Very few have any kind of water filtration device.

That last point is really critical. Once the water flow stops, disease is going to strike.

4. *The Depletion of Food Supplies*

The food supplies will likely dwindle quickly as we approach a possible crisis due to people stocking up just in case. Once the crisis actually hits, expect to see breakdowns in the transportation sector that will result in major delays in food delivery. This means food may arrive in sporadic fashion in some cities (if at all).

Once this happens, food suddenly becomes really valuable to people (even though they take it for granted today). And that means any small shipment of food that arrives will be

quickly grabbed and eaten or stored. It only takes one week without food to remind people how much they actually need it, so expect the atmosphere to be that of a "near panic" if food is delayed by as little as three days.

The level of panic will vary from city to city. Some cities or towns may experience very little difficulty receiving food. Others may face near-starvation circumstances.

Remember, the cities depend entirely on food shipped in from the farms and food processing companies. Also, note that if there's a water problem as mentioned in the previous section, and the mass exodus begins, the highways may be jammed up at critical locations, causing gridlock for the trucking industry. If we're lucky, some trucks will continue to roll. If we're not, assume that nothing gets through.

A shortage of food ultimately results in the same behavior as a shortage of water. First, people eat what's in the pantry, then they loot the grocery stores. After that, with all local supplies depleted and no hope on the horizon, they leave the city and start ransacking nearby homes. Some will hunt in nearby forests, but most city-dwellers don't know how to hunt. In any case, anyone with the means to leave the city will likely do so soon after their food shortage begins.

4. The Failure of the Power Grid

Nothing is as suddenly obvious – nor has such a gigantic psychological impact – as the failure of the power grid. When the electricity stops, almost everybody knows it at the same instant (unless it happens at night).

Naturally, during the first few hours of the power failure, if it occurs, people will assume it's a temporary situation. Maybe a tree fell on some power lines, or perhaps a transformer blew-up somewhere nearby. They'll sit tight and wait for the power to come back on.

What if it doesn't? Then the city faces a severe problem. Without power, obviously, everything shuts down. Within hours, the looting begins in the more crime-ridden cities (we saw this in New York a few decades ago...). The longer the power stays off, the worse the social disorder.

The loss of power will bring the entire city to a halt. While vehicles may get around for a few more days (using whatever fuel they have left), businesses obviously won't be operating. Houses that depend on electricity for heat will quickly reach winter temperatures, freezing many occupants to death. While those that depend on electricity for Air Conditioning will just as quickly reach Summer temperatures, resulting in death from heat stroke. Hospitals and police stations may have generators on hand, with a few days' worth of fuel, but in short order, that will be depleted, too.

But the water treatment plant will almost certainly be off-line without power, causing all the events mentioned in the water section, above. *Let's face it, the power is the worst thing to be without in the city.* If you have power, you can survive a food shortage, perhaps even a short water shortage. But without power, all bets are off. If you have a "bug-out" vehicle stocked and ready to go (see below), this might be the time to bail.

5. Quarantine, Marshal Law or city has been sealed off.

A new threat that manifest itself in the aftermath of Hurricane Katrina is the possibility that the government will Quarantine or Seal off the exits of a city to keep all of the residents

contained within its boundaries so as not to allow them to flee or leave. This could be done for purely noble reasons like controlling an outbreak of disease/plague from spreading to nearby communities or for more diabolical reasons like exerting control over population centers by stopping the free movement of people. If you lived in New Orleans, the only time you could leave was before and during the Hurricane. Afterwards you were trapped and could only leave when and where you were permitted. Countless people tried to walk out of the city and were turned back at gunpoint by the National Guard only to be sent back into the hell hole until they could be “outprocessed” and evacuated. Regardless of why, the issue is that should you choose to remain in the city, *you may not have the option of leaving once the disaster response begins.*

Solutions in the City

Okay, so you’re stuck in the city. You’ve made the decision to stay. You’ve read the problems above, you believe they make sense, and you’re intelligently frightened.

What now?

You really have two strategies. You can:

- Stay and defend your house
- Bug out (leave the city and head for the hills)

Important! This is not an either/or situation. You can begin by staying in your house and assessing the situation. You’ll want to have a “bug-out” vehicle stocked and ready, just in case, if you can afford one, but you may never actually choose to bug out. You’ll have to be the ultimate

judge of this. Just remember that when you bug out, you face major risks and disadvantages. Among these:

- 1. You’re severely limited in how much you can carry
- 2. You have limited range due to fuel
- 3. You expose yourself to social chaos, roadblocks, random violence, etc.
- 4. Your house will certainly be looted while you’re gone
- 5. You run the risk of mechanical breakdowns of your vehicle
- 6. You must have a place to go that you know is in better shape than where you currently are.

In general, unless you have a specific, known safe place as your final destination, I don’t advise people to bug out. Just “heading for the hills” is a very poor plan. You might not make it. But heading for Grandma’s house or some known, safe place could be a very good plan indeed, depending on whether Grandma is ready, willing and able to accept you!

For these reasons (and more), staying and defending your house is sometimes the only reasonable course of action, even if it seems dangerous. For the most part, looters and

people looking for food are going to have plenty of easy victims, so if you show a little willingness to use force to defend your property, you’ll likely send people on to the next house.

That is, until the next house is already empty and you appear to be the last house on the block with any food and water left. If you're in a bad enough area, your neighbors may "gang up" on you and demand your supplies or your life. This is truly a worst-case scenario, and unless you literally have a house full of battle rifles and people trained to use them (and the willingness to shoot your neighbors), you're sunk. *This is why the best situation by far is to keep your neighbors informed and help them get prepared.* Then you (both your member and non-member neighbors) can act as a group, defending your neighborhood and sharing the supplies you have with anyone willing to help defend you. (And don't think for a second that your non-member neighbors won't remember all that food storage in your garage!)

When you have this kind of situation going, your neighbors realize you are their lifeline. You supply them with food and water, and they will help support you because they are, in effect, supporting their own lives. The best situation is when your neighbors and other ward members have their own food and water supplies. That way, they aren't depleting yours, and they have a strong motivation for getting together with you defend your neighborhood. (More on this below...)

Storing (and Hiding) Your Food

Storing food is just as important in the city as in the country, but hiding it is far more important. That's because in the worst areas, marauders will be going from house to house, demanding your food or your life. If you're dumb enough to put everything you own in the obvious places, you might as well not buy it in the first place. They will find it. To count on having any amount of food left over after the marauders break in, you'll need to hide your food. One alternative is to plan on defending your home with force. If you have enough gun-wise people in the house, and enough firearms and ammo, you can probably pull this off. But most Saints aren't nearly as experienced with firearms as the gang members. A better alternative might be to plan on bringing your supplies to your ward/stake building where all of the Saints can both pool and defend their resources. This of course will depend greatly on your local Bishop and Stake President.

Back to hiding: the best way to hide your food is to bury it. You'll need airtight containers, long-term food that won't rot and you'll need to plan ahead. Bury your food at night so nobody will notice, and make sure you don't leave the map on the refrigerator door! (Better to memorize it!)

Try to get the ground to look normal after you're all finished. You'll want to bury your food as early as possible because it gives the grass time to regrow over the spot. If you're in an area that snows, you'll have a great concealment blanket! Most food marauders won't go to the trouble to dig up food, especially if you insist you don't have any.

Best plan: Have some smaller amount of food stashed around the house, letting them find something. Better to give them something and send them on their way. The art of hiding your food is an ancient one. You've got to get creative. Use the walls, the floors, and the structure of the house.

If hiding your food is simply not an available alternative, then try not to advertise it. Keep it put away in your house or garage in as discreet a manner as possible. Don't make a point of telling people that you have a years supply (or more). Word gets around fast that Bro. Jones has a ton of food in his garage. Boxes of food fit nicely under beds, behind furniture, in the attic, etc.. Be Creative!!

To sum up the food storage, you really have three strategies here:

- Store it all in your house and plan on defending it by force.
- Bury it in your yard in case you get overrun by looters.
- Store part of it in your house, and hide the bulk of it.
- Relocate all of it as soon as you recognize a major disaster is in progress

An alternative to burying that would be faster and easier would be to simply build a false wall in your garage and seal up your food behind the false wall. Sure, you might loose 2-3 feet of useable space in your garage, but the tradeoff is knowing everything is safe and sound.

Storing Extra Water

water can be stored in exactly the same way, although you might want to bury the barrel before you actually fill it with water. Make sure you treat your storage water, rotate it or have filters on hand when you get ready to use it.

If you don't have a yard, or it's not practical to bury your water, you'll have to store water inside your house. This can get very tricky because water takes up a lot of space and it's very difficult to conceal. It's best to get containers made for long-term storage, but in a pinch, use what you can find, just make sure its clean and food grade material. But a lot of these containers will deteriorate quickly, and they may break easily. Also, consider what happens if your water may be subjected to freezing. Will your containers survive? Be sure to leave enough air space to handle the expansion.

In order to prepare yourself for the water shortage, assuming you're going to stay in the city, stock at least six months of water at a minimum two gallons a day per person. That's nearly 400 gallons of water if you have two people. Of course, even with the best in-house preparations, you may find yourself depleted of water supplies. In this situation, one of your best defenses is to have a really good water filter (like the Katadyn filter) that can remove parasites and bacteria from the water. You can also treat your water in other ways (iodine, distillation, silver solution, bleach, etc.). Armed with these items, you can safely use stream or river water (or even pond water) for drinking.

WATER WELLS

By far, the best solution for obtaining long-term water supplies is to drill a well. Buy the best-quality handpump available (cast-iron pumps available from Lehman's) and a good cylinder. They will last a lifetime if installed properly. With this setup, you'll have a near-unlimited supply of water.

The total cost of doing this, depending on where you live, ranges from about \$4000 - \$6000. Is it worth it? If you've got the money, I think so. However, many cities simply don't allow the drilling of wells, so you may not be able to get one drilled even if you want to.

The deeper your well, the more expensive it gets. Most well drilling companies charge by the foot. When water is deeper, you also need a bigger pump and a more powerful cylinder, so the costs tend to really grow the deeper you go. If you can find water at 20', you're very lucky and it might not cost you even \$2000. If you have to go down to 200', it might cost you \$7500, and you're at the depth limit of hand-powered pumps anyway.

Defending Your Life and Property

Let's talk about force. No doubt, there are plenty of nice people in this country, and I think that in small towns and rural areas, people are going to find ways to cooperate and get along. I also think, however, that some cities will suffer complete social breakdown and violence will rule. If you happen to be stuck in one of these cities, you're going to need to use force to defend your house. The section that follows discusses what I consider to be extreme responses to violence in the most dire situations. Hopefully, you won't find yourself in these circumstances, but if you do, the information below may be valuable.

Important: Do not use your lights at night. If you are stocking propane-powered lanterns, solar-powered flashlights, or other unusual supplies, using them at night will announce to everyone within line of sight that you have more than the "usual" supplies. Expect them to come knocking in your door. At most, let a fire burn in the fireplace, but in general, avoid drawing attention to your house.

Defending your house is a crucial element on your stay-in-the-city plan. Make your house your fortress, and hold drills to help other family members practice some of the more common activities such as hiding, defending, evacuating, etc.

Some useful items for home defense include:

- A guard dog
- Pepper spray
- Firearms
- Smoke bombs (military-grade)
- Trip wires

Let's go over these:

The guard dog is certainly a welcome addition to any family trying to defend their house. Although he probably eats a lot of food, the investment is worth it. Dogs also tend to sleep light, so let them sleep right next to the food storage areas, and make sure you sleep within earshot. If the dog barks, don't consider it an annoyance, consider it an INTRUSION.

Pepper spray is a great alternative to the firearm. It will incapacitate people and certainly give them a painful experience to remember. On the downside (potentially), it might just remind them that next time they come back for food, they better kill you first. So

understand the limitations of pepper spray.

Firearms are useful for obvious reasons. In the worst-case scenario, when looting is rampant, you may have to actually shoot someone to protect yourself or your family. If you're squeamish about pulling the trigger under these circumstances, don't plan to stay in the city. Use the "bug out" plan instead.

Smoke bombs can be useful for covering a planned escape from your house. You can purchase highvolume smoke bombs that will quickly fill up any house with an unbreathable cloud of military-grade white smoke.

Trip wires are great perimeter defenses. You can buy them from Cheaper Than Dirt (they run a few hundred dollars). They will give you early warning if someone is approaching. You can connect the tripwires to flares, shotgun shells, lightsticks or other warning devices. This way, you can have an audible or visible alert, your choice.

In addition to these devices, you can make significant fortification-style improvements to your home. While none of these are very affordable, they certainly help defend your home:

- Replace glass windows with non-breakable plexiglass
- Add steel bars to the windows
- Replace all outside door locks with heavyduty deadbolts
- Replace all outside doors with steel doors, preferably without windows
- Remove bushes and other shrubs where people might hide
- Black out the windows entirely to avoid light escaping at night (similar to what residents of London did during the WWII bombing raids)
- Build secret hiding places for food, coins, or even people
- Create escape hatches or passageways
- Rig pepper-spray booby traps

These aren't as absurd as they might at first sound. Many Saints living in rough cities already have steel bars covering their windows, and removing extra bushes and shrubs is a well known tactic for making your home a safer place.

LIGHT

To light your home when there's no electricity, try the following:

- Use LED flashlights and rechargeable solarcharged batteries. You can buy all these items from the Real Goods catalog.
- Use propane-powered lanterns. You can find these in the camping section of your local Walmart. Be sure to purchase extra mantles and store lots of propane.
- Purchase quality oil lamps from Lehman's and stock up on oil. You can also purchase cheap kerosene lamps from the Sportman's Guide or Walmart, then simply purchase and store extra kerosene.
- Buy extra candles.

- Purchase lots of olive oil. Not only can you cook with it (and besides, it's a lot healthier than corn or vegetable oil), olive oil also burns as a clean candle fuel. You can float a wick in a jar half-full of olive oil and light the wick. Viola, a home-made candle. Olive oil is a fantastic item for your storage anyway because even if you purchase all the grains in the world, you'll still need cooking oil, and you obviously can't buy powdered cooking oil. Well-stored olive oil can last for thousands of years.

STAYING WARM

Did you know that people won't steal giant logs? Although they may easily steal wood you've already chopped, most people won't have any way of stealing logs. They're too heavy, and the vehicles won't have any gas left. For this reason, your best bet in regards to stocking fuel for your house is to stock up on UNCUT wood logs.

It takes a lot of extra research to find out how to get them (took me a few weeks of asking around), but you can find a source if you look hard enough. Or you can usually get a permit to go out and cut your own. The effort is worth it, because this will give you a ready-to-go source of heat and fuel that cannot be easily stolen.

The catch, of course, is that you'll need equipment to cut and chop the wood. A chainsaw is REALLY nice in this way, but it requires fuel. Fortunately, chain saws don't use much fuel, so if you have a way to store as little as 50 gallons or so, you've got enough to power your chainsaw for a few years (at least!). You'll need fuel stabilizers, too, which you can buy at your local Walmart. (Be sure to buy extra chains for your chainsaw, too.)

You'll also need splitting hardware. You can buy log splitters or just buy an axe, a wedge, and a sledgehammer. Better yet, buy all four so you have a choice of what to use. And remember, wood splits much better when it's frozen, too, so you might just wait until the cold hits in Winter to start splitting your wood. Only split a little at a time, because you don't want to end up with a big pile of nicely-split wood sitting out in your yard. It will invite theft from people who don't have any. If you already have trees on your property, you're all set. Cut down about 4-5 cords right now, so they can start drying out, then chop them as you need 'em.

A "cord" of wood, by the way, is a volume measurement. It's 8' x 4' x 4', or 128 cubic feet of Wood (stacked). Some people that sell wood will try to rip you off, so make sure you know what you're buying. If you purchase logs, it's better to get a price per linear foot, based on the diameter of the log. For example, you might ask for logs that are an

average of 10" in diameter, and you'll ask how much the charge per linear foot would be. Something in the range of \$1 - \$2 would be great.

I've already mentioned the importance of getting along with your neighbors. It really is crucial to your city-based survival plan. The best situation to be in, as mentioned before, is to have neighbors & other church members who are aware of the issue and who are getting ready for it by stocking their own food, water, and other supplies. Every neighbor

& member that becomes selfreliant is one less neighbor or member you'll have to support.

The range of neighbor situations, from best to worst, is as follows:

- Best case: your neighbor is current Recomend holder, is aware of and both temporaly & Spiritually prepared for an emergency with their own supplies and training.
- Good case: your neighbor is aware of a potential crisis, and even though they don't have their own supplies, they're willing to help defend yours as long as you share
- Bad case: your neighbor is a non-member that didn't prepare for it, figuring they would just steal from you if things got bad. They are aware of YOUR supplies but don't have their own.
- Worst case: your neighbor isn't aware of anything, he is anti-mormon and he's a violent, angry neighbor just released from prison. He is going to be caught off guard by the ensuing events and will likely attempt to use violence to get what he needs or wants.

Your decision on whether to stay in the city may depend greatly on the quality and quantity of your neighbors. If you do live in a bad neighborhood, do what you can to relocate. If you live in a good neighborhood, do the best you can to educate and inform your neighbors. *This might well be the most important missionary work you ever do for your own temporal salvation!*

Gun Control in the Cities

No matter how you felt or thought about gun control in the past, it's time to face disaster-induced reality. The gun-control politicians (and the people who supported them) have placed Americans in a situation where not only can the police not protect us in a timely manner, but we cannot lawfully defend ourselves. Criminals unlawfully have firearms; citizens lawfully don't. Intentionally or otherwise, guncontrol supporters have created a situation where an unfortunate number of innocent men, women and children are going to be in danger during a crisis simply because they could not obtain the tools of self-defense.

It also happens that the cities where the rioting will likely be the worst are precisely the cities where firearms are most likely to be banned from lawful ownership (and where criminals may wield nearabsolute power for a while...). Perhaps when society recovers from it, we can review the fallacy in the cause / effect logic that keeps people voting for gun-control laws, but in the mean time, millions of people are going to have to resort to breaking the law in order to protect.

And yes, you too will have to resort to breaking the law if you are to acquire a firearm in an area where guns are entirely banned from private citizens (like New York, Los Angeles, etc.).

After the disaster hits, if the rioting gets really bad, we're going to see local police begging law-abiding citizens for help. Your firearm will be a welcome addition to the force of law and order, believe me. No local cop is going to mind you having a handgun if you're manning a roadblock protecting a neighborhood of families with children. Act

responsibly, tell them what you're doing, and they'll probably give you a big thanks. But if you're carrying a gun while you smash a window of the Walmart and walk off with a stereo; well that's a different story. Be prepare to get shot.

See, cops don't mind private ownership nearly as much as we've all been led to believe. I know, I work with law enforcement officers in a small town, and I ask them about topics like this. When the crisis hits, they'll be more than happy to have your cooperation. We're all going to need as many lawabiding gun-toting citizens as possible in order to fend off the criminals and establish some degree of order.

One More Reason To Move Out

If you really feel you need a firearm to protect yourself and your family, your best bet may be to move to a city or state where people are a lot more accepting of firearms. You'd be surprised what a difference the locale makes. Check the gun laws in any state you're considering moving to. Obviously, "cowboy" states like Arizona, Texas and Wyoming will have fewer restrictions on firearms (and, interestingly, they have less of a problem with gun violence). States where the population is more dense (like Florida, California, New York) tend to have much greater restrictions on private ownership of firearms.

Bugging Out

Suppose it's July 14, 2006, and you've changed your mind about this city thing. You happened to be right smack in the middle of one of the worst-hit cities in the country. The looting is getting worse, the power has been out for two weeks, and your water supplies are running low. You still have enough gas in your truck to make it out of town... if you can get past the gangs, that is. You've decided to **BUG O U T !**

Some basic pointers:

- Don't try to bug out in a Chevy Geo. You will likely need a big heavy 4x4 truck in order to go off-road and around stalled vehicles
- Get something that can carry at least 1000 pounds of supplies. A big 4x4 pickup will do nicely! Yes, it requires more fuel, but you can carry the fuel as cargo.
- Don't bug out unless you can have someone ride shotgun, literally. You will need an armed passenger in case you run into not-so-nice people.

WHAT TO TAKE

Ahh, the bug-out supply list. All this will fit in your truck. Here's what you should take if you're preparing to bug out with two people:

- Your 96 hour kits for each person in the vehicle
- 20 gallons of water
- 40 gallons of extra fuel or more (and a full gas tank)

WHERE TO GO

As mentioned earlier, if you have a designated place of refuge (Grandma's house, a cabin in the woods, etc.), head straight for it. If not, you're basically driving anywhere you can

go, so try to head for an area that forested and near a creek or river where you can get some water.

Conclusion

Choosing to remain in the city is a rational choice for many Saints in many situations. However, as you have seen from the dangers described here, the further away you can get from the population centers in general, the better your chances of surviving.

Most Saints, perhaps yourself included, have a difficult time actually accepting that a major disaster is going to be as bad as described in this report. And after all, if you leave the city, sell out, quit your job, and move to the country – and then nothing bad happens – you will have disrupted your life, and you may find yourself broke, jobless, and homeless. You COULD assume it will be a mild event, which I suppose is also a credible possibility. In that case, surviving in the city will be quite feasible, especially if you have neighbors that can support your efforts and you don't live in a dangerous city with high racial tensions. However, the very nature of a major disaster means that if only one or two major infrastructure components goes down, the ripple effect will quickly create a much worse scenario. It seems there is very little room for “mild” effects unless they are miniscule. The most likely scenario at this point clearly points to massive disruptions, severe shortages in food and water, loss of power in some areas, and a breakdown of social order in certain areas where the population density is high.

But you can survive anything with good planning, an open mind, and plenty of practice. Why not start now?

Selecting Survival Firearms*

By Sergeant

Raise your hand if you would try to adjust your carburetor with a crowbar. How many of you would try to build a cabin with only a saw, or treat a broken arm with epinephrine? These are similar tasks to trying to survive without a proper selection of firearms, and histrionics aside, are a proper analogy - for a firearm is a tool.

Given the societal changes that have occurred in this century, especially since the end of WW2, it is not especially surprising that a vast majority of folks are not well versed in firearms lore and the selection and use of weaponry. Having grown up on a farm in very rural country, I am more the exception than the rule, but a rural background by itself does not instill the knowledge to select a proper variety of firearms any more than living in

Detroit makes you a car manufacturer. You have to apply yourself to the study of weapon usage and capability, and to their use in the field to gain insight that keeps you from wasting your money on things that don't appreciably help your chances of surviving.

Before you can make an intelligent choice, it would help if you knew what was out there, don't you think? While there are many hundreds of different firearms offered for sale today, and thousands of variations of barrel length, caliber, finish, sights, and other

options, hopefully I can condense that down into a more digestible group that are most pertinent to survivalists today. The table below covers most of the types available:

Shoulder-Fired			Handguns		
Rifles	Shotguns	Special	Revolvers	Pistols	Special
Bolt Action	Pump	Single-Shot	S/A	S/A	Derringers
Semi-Auto	Semi-Auto	Interchangeable barrel	D/A	D/A	Single-shot
Lever Action	Over/Under	.50 Caliber	DAO	DAO	Bolt-Action
Pump	Side by Side	Other		Other	Other

- S/A Single Action Hammer must be cocked for each shot
- D/A Double Action Squeezing the trigger also cocks the hammer
- DAO Double Action Only Trigger-cocking for every shot

While every person has to decide just what role firearms will play in their own plans, I feel that automatically disqualifying any type from your battery for semantic reasons (i.e., "handguns are evil", or "assault rifles kill babies" or some such drivel) is both silly and dangerous. Without going into Second Amendment rights or discussion, I'd just like to say that if I need a pistol (for example), then I need it badly, and probably *right now*. Not having one because someone arbitrarily said I couldn't is just plain wrong.

I can hear you now - "Will you quit BS-ing and get on with it?" Okay, okay! Here's my version of the nitty-gritty: I think every would-be survivalist should have the ability to protect themselves in a variety of situations, and have the ability to hunt small game and whatever else is in their area, or the area where they will be (expect to be) in case of emergency. Redundancy is recommended, great variety is not, unless you can afford to do it right. My base line requirements are these:

- Rifle for defense/offense
 - Rifle for hunting if fighting rifle is not suitable
 - Shotgun for defense/hunting

- .22 Rifle for small game & plinking (informal target practice)
- Handgun for defense
- Handgun for field work
- Handgun for concealment/defense

A couple of these, most notably the fieldwork handgun and the hunting rifle are of lower priority than the others, and if pressed, I could work with less. Obviously you can't carry all of these at the same time, so you may wonder why you need them. The answer is, you

won't be fighting all the time, you won't be hunting all the time, you won't be carrying a rifle all the time and you won't need to conceal a handgun all the time. You get the picture. Also there are many other tasks that may need doing which I'll touch on later, but they are more specialized and not, to my mind, as likely to be important.

When considering what type of weapons to purchase, you also have to think about how many to get. While it seems prudent to get the defensive weapons first, at some point, if you accept the basic premise, you'll end up with the entire spectrum. At that point you should probably plan your back-up package. Consider the current Special Forces logistical doctrine, which holds with the PACE concept - Primary, Alternate, Contingency, Extra. While we as individuals do not have the budget of the Federal Government, we should keep this in mind as an excellent method of planning, and build redundancy into our plans. If you've read the late Mel Tappan's definitive (though now somewhat dated) work *Survival Guns*, you are familiar with several precepts that should be nearly gospel. Some of these being have the right firearm (tool) for the job, have enough firearms, and have spare parts and plenty of ammunition. It is not necessary to get carried away with any thoughts of romanticism about weaponry, nor is it necessary to get one of everything, but do consider these thoughts from that signature volume: For every adult, contributing member he recommends you have (as a *minimum*):

- one fighting rifle, plus a spare for every two (people)
- a shotgun for every two
- a fighting handgun each, plus a spare for every two
- everyone should have one .22 and a working handgun
- a concealment handgun for every two

If you think this looks a lot like what I wrote above, you're right on the money. While a lot of new and significantly improved firearms have been introduced since it was written, his words still carry a lot of wisdom.

Personally, I don't think that's enough, at least from a long-term perspective and neither did he. His "ideal" inventory of weapons for two people includes something on the order of 40 weapons, including a deluxe over/under hunting shotgun, and more calibers to stockpile than you're likely to find in your local gun shop!

I prefer a spare fighting rifle and handgun for each person and a shotgun and concealment handgun for each, plus more working weapons - albeit in calibers that, for the most part, are already in your inventory. I like the idea of having a complete battery both at home

and at the retreat, and having at least one weapon available in many of the different locations that I may find myself temporarily stranded. If this sounds rather dramatic I apologize, but if I had the bucks, I could plan a pretty intensive war room! (Hello, Walter Mitty) Enough fluff, let's get on to the subject at hand.

The fighting rifle is where most controversy comes in. The entire family of semi-automatic, magazine fed rifles of suitable caliber (meaning 7.62 NATO, 7.62 x 39, or 5.56 NATO) is overpriced and over-restricted. In truth, however, pretty much all of the available choices are well constructed and serviceable, which makes selection mostly a

matter of personal preference. The most commonly available weapons in this category

are the AR-15, AK-47, SKS, M1A, FN-FAL, HK's 91 & 93, and Ruger's Mini-14. The M1 Garand is part of this group, but you'll not find a great selection of the more esoteric rifles (such as the Galil, Valmet, Beretta, Sig, etc.) in this country, and spare parts & magazines could prove difficult to find if you didn't stock enough for a protracted emergency.

There are those who hold the view that a magazine-fed semi-auto is not needed...that we are not likely to have to fight an infantry engagement. Regardless of who is right, they have some valuable insights in weaponry choices, and encourage the lever-action .30-30, .44 or .357 Magnum as a worthy alternative. After your initial reaction, listen to some of their arguments: Rapid fire repeater. Greater magazine capacity than most sporters. Much better trigger actions than most any battle rifle you'd care to name. Light weight. Cost is less than 20% of an assault rifle. These are, you have to admit, some pretty significant considerations. Think about it - you can buy two lever guns (at @ \$200 each) and a thousand rounds of ammo (@ \$500, if you shop around) for enough less than a state of the art auto (\$1200 & up) to either get ANOTHER thousand rounds, or a handgun, shotgun, or a couple of .22's. Pretty convincing, especially when you consider it's increased versatility over a .223, better shooting rifles than the .30 Russian Short (7.62x39), and much lighter weight than any .308 battle rifle available.

The hunting rifle is, for most of us, a fairly easy choice - if you live in the lower 48 and don't plan to hunt elk, moose, or grizzly, then anything from the .243 to the .300 Winchester Magnum is suitable, with something in the middle probably most appropriate. I like the .308, mainly for it's universal availability and the wide choice of bullets available, both loaded and separately as components. And of course, for it's ammo interchangeability with a battle rifle.

The hunting rifle is probably a scope-sighted bolt-action job, with limited magazine capacity. It may be able to stand in for a "sniper" rifle, if it is accurate, your ammo and shooting skill are up to the task, and you don't have to drag it around on the ground, beat it against building walls, jump out of airplanes with it, or any of the myriad other tasks that military and law-enforcement professionals routinely encounter.

Some of the most common & popular rifles today are the Remington 700 (choice of the U.S. Army & Marine Corps as the M24 & M40A1), Winchester's M70, and

Ruger's M77. Savage sells their M110 & 112, which are super deals, both in price and accuracy, and recently introduced a short action which should be even stiffer & thus more accurate, while ending up lighter and shorter as well. There are lots of surplus Mausers on the market, of various model, manufacturer, and condition, as well as new production ones. As with all the other weapon types we'll discuss, there are many more types for sale than I could ever talk about in one article, so I'm only listing some of the most popular - don't think that your weapon, if it works for you, is somehow unsatisfactory. Just think about spare parts and ammo availability.

If you want to do some varmint hunting (coyote, groundhog, prairie dog, etc.) then you'll want a heavy-barreled .223 or .22-250, or something similar. If you think you can

accurately shoot a deer or other large animal at long range, something more potent is called for. Starting at 7 millimeter (.28 caliber) magnums and working up through the .33 calibers, there are quite a few new cartridges that are very capable of taking out whatever you hit at ranges approaching 1000 meters. These cartridges send 160 to 250 grain bullets through the barrel at speeds up to 3600 FPS! Of course, to be able to hit anything at great distance requires immense amounts of practice and skill, but there you are.

If you feel that life doesn't begin until 600 meters, there are several .50 caliber rifles on the market that have been proven in battle in the last dozen years or so. There are several accounts of **2 MILE** shots by Marine Corps snipers in Iraq during Desert Storm, and I personally laid behind a .50 on the Kuwaiti border in November of '90, looking at an Iraqi who, had we been shooting, would have been toast - at about 1200 meters. I was a guest of a Navy SEAL team, charged (later) with imitating a Marine battalion - just the dozen or so SEALs at that one Saudi Customs site. During those pre-shooting days, they were engaged with underwater reconnaissance - what they were originally developed to do.

The point I want to make about working rifles is that, given some realistic evaluations of what you will expect them to do, there are countless rifles out there that will work, and most of them will do everything you want. That is why I recommend sticking with one of the most popular calibers (.270, .30-06, .308, etc.), and spending the money saved for more ammo to practice with and stockpile. There's nothing wrong with having a spare working rifle, along with your spare "fighting" pieces, but have a real good reason if it's not the same model and caliber.

The shotgun, often called the "front door gun" where I come from, is the very picture of versatility. With slugs and a sighted, rifled barrel (is it still a shotgun if you put a rifled barrel on it?) it is deadly out to 125 yards or so. Everyone is familiar with its traditional bird-hunting role. With heavy loads of buckshot it is big medicine during building-clearing ops. With the near-universal availability of replacement barrels, chokes, stocks, and other options, they can be customized to suit your requirements, and rapidly and easily changed to do something else. Remington's 870 is the popular choice in this category, but hard on it's heels are Mossbergs 500 & 590 (choice of the Marine Corps in recent competition), and Winchester's 1200. These are all pump guns, but some autoloaders that make the cut are the HK/Benelli M1 Super 90, Beretta's 1201, and

Probably the top shotgun accessories today are white light systems, the best of which is Laser Products Sure-Fire line. Available for most of the guns listed above, these units replace the factory forend with a completely self-contained flashlight/switch/forend combo that is extremely bright. It also allows single-hand control, something not possible before its introduction without dangling wires and taped-on switches. Additionally, the Side-Saddle spare ammo carrier that attaches to the side of the receiver and holds six extra rounds right at the balance point - accessible to either hand for tactical reloads while keeping the weapon on target - is virtually a standard addition to the tactical shotgun, and is well worth considering.

If you have ever lived or worked in the country, you'll immediately recognize the need for a .22 rifle. Whether you have rabbits in the garden, gophers in the yard, or starlings in the chicken feed, or simply want a way to spend an enjoyable afternoon, there is no other firearm that you will use as much or enjoy as much as a .22. Scopes are optional - I have several .22 rifles, about half of which are scoped. Marlin's line of bolt and semi-auto rifles have dominated the price wars for years, and are excellent buys, as is the Ruger 10/22 & bolt action 77/22, which is also available in .22 magnum, .22 Hornet, and now, .44 Magnum so strong is it's receiver. Ruger recently introduced its 96/22 lever-action rifle, and Winchester and Marlin also sell lever actions. Remington has a fine line (no surprises there) of bolt and semi-auto rifles as well. Don't overlook the variety of rifles that take-down for easier carry. These include Marlin's Papoose, the old Charter Arms AR-7 (now produced by Henry Arms), and Springfield Armoury's M6 combination .22/.410 shotgun. These are all lightweight rifles that are easily carried and offer a great improvement in accuracy for most shooters over trail handguns, while retaining the light weight that encourages their inclusion on your packing list for survival excursions or bug-out bags.

If you have the money, a top-drawer .22 rifle can be an immense joy to own and shoot. These rifles, by such makers as Kimber, Anschutz, and Walther can shoot rings around most anything going. With match ammo, these things go into groups that must be measured with a micrometer. The downfall? The same one I keep bringing up. Call me a miser, but if I can accomplish the mission with a \$200 rifle I don't see why I should pay \$1000 for only marginally improved ability. Unless you are a serious competitor, you probably don't need the difference between a 50 yard, one-inch group, and one that goes into an eighth-inch. Assuming a squirrels-head target, if you can hold on it, you can hit it with either, and I'd rather spend the additional \$800 on ammo and other things.

Nothing spells relief when things go bump in the night like a heavy handgun. The primary requirements are absolute reliability, adequate power and the accuracy to hit your target. The details are as numerous as the choices. The long-time favorite is the M1911A1-style .45. A large, heavy, and powerful handgun, its exploits are legendary. There are vastly more modern pistols, but very few approach the success of it's long heritage, and none has the wide base of knowledge, spare parts, or accessories. The Glock line is one that has been fantastically popular. There are those whom the lack of an external locking safety bothers, but the plastic Austrian gun's record doesn't reflect a

problem. It's extreme reliability, light weight and accuracy have made converts of countless thousands of happy souls. Available in all the modern, effective calibers, in magazine capacities from 9 to 33 rounds, there is probably a Glock that is right for you. The U.S. Military has purchased the Beretta M92 and the Sig/Sauer P228 for our standard military pistols as the M9 and M11, respectively, and many Federal and State agencies have followed their lead. Smith & Wesson, Heckler & Koch (HK), Walther, Browning, Ruger and Taurus round out the most popular autos with a variety of models to fill any need.

All this talk about semi-auto's should not lead you to believe that revolvers somehow became ineffective the day everyone started switching to autos - far from it. A properly loaded revolver of quality design and manufacture is still potent medicine, and in the hands of a trained person can stand and deliver the goods. While autos will always have

improved reload times and higher capacity, speedloaders and situational awareness, proper use of cover & concealment, and carrying the fastest reload of all - a spare weapon - will negate most of the arguments against them. No other handgun can compare with the .357's stopping record when using 125 grain hollow-points at a nominal 1400 FPS. And no other weapon is as versatile in as many conditions as a good four or six-inch barreled revolver.

The field handgun can double as the defense handgun, if you select carefully, and actually there is a lot to recommend such a course of action. This generally will be a revolver of suitable caliber, meaning either .357 Magnum, .44 Special or Magnum, .45 ACP or .45 Colt. The .38 Special is marginally acceptable, but since you can fire this cartridge in the .357, I see no need to limit yourself by choosing a .38 as your only chambering, at least in this larger revolver. In any case, if the field revolver is going to be your self-defense piece as well, it really must be a double action number with a swing-out cylinder for rapid reloading.

Some of the advantages of having a single weapon perform both missions are: You only have to store one caliber of ammo, You only need to practice with a single weapon to remain proficient, and initial procurement costs are cut in half or so - you'll still need a backup (ideally an identical duplicate), but generally a good revolver costs noticeably less than an equally good semi-auto, and it's ancillary items cost a lot less (speedloaders vs. magazines, anyway). If you opt for this course, I strongly urge you to stick with the .357, although you can get .44 Special (NOT magnum) guns built on medium frames these days, if you prefer big-bore bullet weights. You'll probably get tired of carrying the 50 oz. of a large frame .44 or .45 a lot quicker than a 32 oz. medium frame .357 or .44 Special.

If you do not require it to do double duty - and I recommend against it, if you can afford it - you can get away with a Single-Action revolver, preferably in a heavy caliber. I have a stainless steel Ruger Super Blackhawk in .44 Magnum, with a 5-1/2 inch barrel that I carry in a Bianchi Ranger convertible nylon holster. This holster allows you to carry it crossdraw, allowing easier carry of a slung rifle or backpack, while still permitting conventional carry when it is your only partner.

And finally, the hideout piece. A smaller, lighter, and usually less-powerful firearm than your primary handgun, it is often the one you have with you when the excrement impacts with the rotary oscillator. That being the case, don't neglect your training regimen with this weapon. It is probably more difficult to shoot well than your larger one, and, while marksmanship basics remain the same, they ARE more difficult to apply with grips and sights that are too small for most folks. Especially in dim or no light conditions, when your heart is racing, your hands are slippery and sweating, and you only went out for some milk for tomorrow's breakfast. This is a very important decision, but one that today is easier than ever before.

For most folks this will be a small frame .38 Special, but with the proliferation of sub-compact autos in serious calibers, more people are choosing autos than ever before. Kahr Arms' 9mm, and their new MK-9, are both smaller than just about anything out there,

Kel-Tec's P-11, S&W's Sigma 9 & .380, Colt's Pony & Mustang - the list just goes on

and on. Also there are scads of .32, .25, and .22 miniature autos, and Freedom Arms' incredibly small .22 single-action revolver 5-shooters are wonders of micro-machining. For the traditionalist, or one who would rather depend on the proven .38, the S&W Centennial line are the ones to beat - concealed hammer, round grip frame, 2 inch barrel; at their best with an aluminum frame - they are also available in stainless and in .22, 9mm and .357 (stainless only) and with 3-inch barrels and adjustable sights. Colt has it's new DS-II .38 6-shot revolver (the Smiths are 5-shooters) and lots of it's old line such as the Agent and Detective Special are available used. Ruger's SP-101 is extremely robust for it's size and is available in the same calibers as the Smith & Wesson offerings, and also in .32 H&R Magnum. Taurus's M85 revolvers are very popular in this role, as well.

Having gone over the basics, let me touch on what I referred to as "Special" weapons in the table at the beginning of this article. There are a lot of firearms available that have a pretty narrow niche to fill. Some of them however - such as T/C's Contender, which, if you're not familiar with it, is a single shot pistol that breaks open like a shotgun, and allows you to change it's barrel with one of a wide-variety of other calibers & lengths - are very versatile. Consider that you can have scoped .223, .30-30 and .22 barrels, and a .45 Colt/.410 shotgun barrel, along with the frame, ammo for each, and cleaning & survival equipment, in a case 16 inches by 8 inches and weighing less than 10 pounds. This is an extremely versatile piece, and one that doesn't fit neatly into a pre-planned category, but rather may be at it's best in a Bug-Out Bag or kept in a vehicle. While there are other single-shots and break-open pistols available, none have the variety of calibers or widespread availability of the Contender. Additionally, if you purchase the optional 16 1/4 barrels, you can install the available buttstock to make a very lightweight, compact carbine that is even easier to shoot accurately.

There are those who live in states which allow civilian ownership of fully-automatic weapons who have or would like to have one. Personally I think this is a mistake - at least, if you are including it in your defense planning. Owning one as a part of your shooting hobby is something else entirely. But, for those who can afford their prodigious ammunition appetite and don't mind the Federal paperwork and giving up their privacy

rights (legally possessing - and don't think about having one illegally - an automatic weapon gives the BATF the right to unannounced inspections of your storage of it, and brings in an entire new spectrum of Big Brother). Anyway, if you feel you really need it for your defense planning a sub-machine gun (a compact, fully automatic weapon which shoots a pistol cartridge) is most effective up close (up to 75 meters or so), and a .30 caliber medium machinegun on a tripod is pretty good out to a thousand meters or so - if you can afford to practice enough to get good enough to hit at that distance. Trust me - you can't just yank the trigger and "mow 'em down" - you still have to practice.

A silencer, or more properly a sound suppressor, is a horse of an entirely different color. Being restricted by the same laws as full-automatics, a suppressor is something that is

much more user-friendly. It allows the shooter to hunt without giving away his position and to practice without earplugs. They ease the training of new shooters and help them avoid flinching, and in a more sinister context, allow such tasks as "sentry takedown"

without alerting other guards. The military recognizes this and has a suppressor kit for the M9 Beretta, and the recent SOCOM (Special Operations COMmand) pistol contract specifies a sound suppressor as part of the package. EGW and Jonathan Arthur Ciener are two of the more widely known companies which sell suppressors in the States.

Along with decisions about what firearms to own, come more choices concerning ammunition.

The caliber of weapon you have obviously narrows down the choices considerably, but they can still be nearly overwhelming. If you have made the wise choice of purchasing military caliber weapons, then by all means take advantage of the availability of surplus ammo. Round for round you won't find a better deal, and you can't even reload .308 or .223 ammo as cheaply as you can pick up surplus stuff - but. There's always a but in there somewhere, isn't there? In this case it is the sometimes questionable quality or reliability of ammo that may have been (and probably was) stored in very questionable conditions - widely varying temperature and humidity, perhaps contaminated with petroleum products - who knows? It may also be un-reloadable with Berdan primers, and could have corrosive primers as well. None of these are disqualifiers, but you need to know in advance and be prepared to compensate for these factors. In any case, it pays to check out a good sample of whatever lot you may purchase for reliability and accuracy, and make sure it's pressures don't exceed the strength of your rifle.

There is an old axiom that will hold true as long as we have firearms - you can never have too much ammunition. In any case, keep at least 500 rounds per weapon, and if you have battle rifles, I would rather have ten times that much. Or more. And 5,000 rounds would just be a *starting* point for a machinegun. Be sure, however, that your ammunition is stored properly and safely - you don't want to have all you've worked for destroyed because of carelessness.

Don't ignore cleaning supplies or spare parts. Keep large quantities of cleaning solvent, patches, bore brushes, Q-tips, pipe cleaners, and lubricating oil & gun grease on hand so you can keep those valuable investments doing their job. At the same time, wouldn't you

hate to have that rifle inoperative because your firing pin broke, or mainspring went soft, and you couldn't replace it? We're talking \$5 or \$10 parts, which could cost you a lot if neglected. In general, purchase firing pins, extractors, ejectors, and all internal and magazine springs, and any other parts with a history of breakage or early replacement. Manufacturer's manuals, disassembly and repair books, and any other reference on your specific type should be gathered as well, for the inevitable necessary repairs down the line.

Please don't take the lack of mention of all the countless other manufacturers or models to mean they are somehow unsuited for use - the best gun in the world is the one you have when you need it. Take heart in the fact that, despite the best efforts of the anti-gunners we still have some of the most liberal gun laws of anyone anywhere in the world. Whatever your feelings are toward the NRA, if you own any firearms at all you should be a member - they are THE voice of law-abiding citizens in Congress's ear, and despite the negativity spread by it's detractors, it has been very effective in keeping our cause foremost in the American legislators mind. Join them and help support the right of all

American citizens to keep and bear arms!

Practical Planning and DIY Preparedness Projects

Money

The first thing to understand is that nearly all of the current money supply is in the form of electronic data entries on computers rather than in cash. Most of the wealth of the world is in promises to pay (credit) rather than in cash. Of the approximately \$460 billion U.S. money supply, only about 4%, \$17.9 billion, in cash is currently circulating in the U.S. (according to the St. Louis Fed figures for June, 1998). The rest is held by individuals, companies, banks and governments in foreign countries. When a disaster hits and the computers in the banks or ATMs go down, or if there are bank runs, all that electronic wealth could evaporate overnight. In the event of a national disaster, the total money supply could shrink by 96%.

Most people (Saints and non-members alike) currently thought of as wealthy have their wealth tied up in credit-related investments of one kind or another—the stock market, bonds, CD's, real estate, etc. Almost nobody keeps a big stash of cash around because there's been no need for large amounts of cash for a long, long time. All these currently wealthy people could suddenly become poor if a financial crash were to hit us. I don't mean metaphorically poor, I mean really freezing, starving poor, broke, destitute. All their resources will be in the wrong form for the new conditions. Only those who have cash will be wealthy after a national disaster; survival requires cash.

Can't the government simply print enough paper money to replace all the electronic money? The answer is no, it's impossible. The presses at the Bureau of Engraving and Printing are already running at capacity 24 hours a day just to replace the paper money that wears out each year. To replace just the \$17.9 billion of paper currency currently circulating would take 2 years at the current BEP printing capacity. It would take several decades to replace the entire \$460 billion.

It has been reported that the Fed has been printing and stockpiling cash in case of a bank run, and they will have an extra \$50 billion on hand along with \$150 billion they have

apparently been secretly stockpiling for years. This makes a possible total of \$218 billion just in case. Even if this is true, \$218 billion is a long, long way from \$460 billion and light years away from \$7 trillion, which is the total value of the entire U.S. economy. Note that if the total U.S. economy is worth \$7 trillion but that only \$460 billion of that total exists as physical cash (and only \$17.9 billion is circulating within our borders), then the vast majority of the wealth of America is obviously only electronic, credit money. After a major disaster or financial crash, no banks or no electricity or no oil or coal or no trains means no electronic wealth. We're back to an all-cash economy.

Cash For Survival

The answer to the money question is a simple one: *Have Cash*—coins and green pieces of paper with pictures of dead presidents on them. Start converting some of your credit

investments and electronic forms of money into cash. If you have cash after the disaster, you will be one of the few wealthy people in the world. Not only will you be able to survive the disastrous times, you will be able to use your cash to build a prosperous future for you and your family.

A word of warning: you must be very careful to keep a low profile both now and in the future. You want to attract as little attention as possible now while you convert to cash and later when you use your cash, for two different but equally vital reasons.

First, although you have every right to convert all your investments and savings into cash, doing so may invite the attention of the government DEA agents who may think you're some kind of drug dealer. The drug laws are so powerful regarding the confiscation of suspected drug dealers' wealth that you could find yourself in a protracted legal battle to get back the money that belongs to you. You want to avoid attracting the attention of bank tellers or branch managers who might report to the DEA that you are withdrawing large sums of cash.

Secondly, when everyone around you is impoverished and hungry, it's very prudent to keep your own wealth out of sight. A desperate man will go to extremes to feed his family and keep them sheltered and warm; a hungry man will do what is necessary to procure food. Someone who flashes a lot of cash is courting danger.

Get your cash in tens and twenties and a few fifties. If you receive any crisp new bills, stop off at a convenience store and buy a candy bar or something, hand the clerk a new bill and you will receive older, worn bills in change. Afterwards, anyone with brand new money may invite envy as a hoarder or may become a target for robbers. You want to avoid attracting attention to yourself both now and then.

You will need ones and fives after a disaster, but it's too noticeable to cash a large check and ask for a lot of very small bills.

Coins

You will also need coins. Gold and silver might be useful during the rebuilding stage several years after the crisis, but for the first couple of years, ordinary dimes and quarters, nickels and pennies will be the most easily traded form of money. In a massive deflation, which is what a financial crash would create, real hard money becomes far more

valuable. A loaf of bread that costs \$1.25 today may cost 5 cents afterwards assuming there's any bread to be had. People are completely used to ordinary pocket change coins, so that's what they will most readily accept for local transactions—and I believe nearly all transactions will be local after a major national disaster.

You need to start saving up a coin stash. Once a month or so, take a few \$20 bills to a bank in which you do not have an account and trade them for rolls of quarters or dollar coins. Any bank will exchange paper for coins without question.

Gold And Silver

Gold and silver coins are real money, based on their standard precious metal content;

they have always been a historical refuge in times of crisis and because of increased public awareness about a possible disasters, gold and silver coins are becoming more desirable to have. You are not interested in numismatic collectible coins; you're only interested in gold and silver coins for their precious metal content.

The cheapest way to hold silver coins is to buy pre-1965 junk silver dimes and quarters. No one knows the future value ratio of silver coins to copper-clad coins (our currently circulating ones) after a disaster, but there's no doubt that silver coins will be worth considerably more than clads once people get used to having them.

You pay a higher premium for silver dollars than you do for silver dimes and quarters but it would be wise to have some silver dollars on hand as part of your survival plan. They are bigger and more impressive looking than dimes and quarters; even though a silver dollar may have the same metal content as ten silver dimes or four silver quarters, it just looks more valuable. The alternative is to buy brand new American Silver Eagles. These are current manufacture pure Silver coins from the US Mint. Though not commonly seen in circulation, they are legal tender and worth far more than their face value.

Gold

Gold coins are the most desirable, most valuable, form of real, hard money. Gold is scarce, it does not rust or corrode, it's very beautiful to look at, it's highly desirable as jewelry, it has industrial uses, and a long, long monetary history in many cultures worldwide. It's the real deal.

Right now the price of gold is higher than it's been for 25 years, which should warn us that inflation is on the way (Inflation or the threat of inflation causes an immediate rise in the price of gold).

The best gold coins are American coins in one oz., 1/2 oz., 1/4 oz. and 1/10 oz. denominations. People have no experience with real gold money and they will probably

more readily accept U.S. gold coins than foreign coins. Although the U.S. 1 oz. Liberty coin is slightly more expensive to buy than the South African Kruger Rand, for example, when you go to spend gold, you'll find it easier to move the American coins.

Get more smaller denomination gold coins than larger ones. In other words, buy more 1/10 oz. coins than 1/4 oz. coins, and more 1/4 oz. coins than 1/2 oz. coins, etc. The reason for this is that gold is an immense store of value for its size and weight. You will not be able to go into a local flea market or general store with a one oz. gold coin and be able to buy a few loaves of bread and some local cheese. How will the store owner make change for such a high value coin? You will use the fraying paper money, followed by clad coins and then silver coins before you'll place any gold on the counter. Gold is for large purchases so a small gold coin will be of far greater use on most occasions than a larger one. Save your 1 oz. gold coins to purchase major items.

Storing Cash

Now you need to find a safe place to hide your cash. First, tell no one that you have a load of cash, except possibly your spouse, and don't tell your spouse unless you're absolutely certain of the strength of your marriage. I'm not kidding. Hard times drive

people to do things they would not do ordinarily, and if the hammer hits hard as it may well do, these will be the hardest times in our country's history. If your spouse is a full and completely trustworthy celestial partner in your life, consider yourself fortunate and keep no secrets; otherwise, be careful. If you plan to hide your cash somewhere in your house, you want to make sure to protect it from fire, so go to a Walmart or a similar discount store and buy a fireproof storage box. You should be able to get one for under \$40. It will protect your cash from burning for a half hour of direct flame. Put your paper money and your gold and silver in the box. If you fill it up, buy another one and fill that one up too. As you begin changing some of your electronic credit wealth into cash, gold and silver, your money is fully under your control. As long as you keep it safe, it will always be there for you.

Clothing

Clothing is something that is not considered often enough by Latter Day Saints in planning for a disaster. You'll find many chat room and discussion board references to food, water, housing, etc., but very few references to clothes. Yet finding suitable clothing will be a very real concern in a long term disaster.

Clothes wear out or your kids grow out of them. In these normal times, you just drive to the mall or Walmart or wherever and buy what you need. There's always plenty available. This might not be true after a major disaster. It takes factories to make clothes; it takes international trade, a reliable banking system, dependable distribution systems, accurate billing systems, sophisticated telecommunications, the power grid, computers, computers, computers! Even in a less than worst case scenario, there will definitely be problems in some or all of these areas. If you want to have clothes for your family in 2006 or later, you will need to get them now.

If you have children, this will take some thought. Will the clothes your oldest child wears become too small before they can be worn out, which means they can be handed down to younger siblings, or has your oldest essentially finished growing? Do you have boys or girls or both? Boys tend to wear out their clothes sooner than girls. Do you live in a cool northern area or a warmer southern one? The best way to figure out your family's clothing needs is to pretend they have nothing whatsoever to wear and you have been given the job of outfitting the entire family from underwear to topcoat. Actually you have been given this job, just not all at once. A disaster changes all that as it changes so many things. The bright side is that you can forget about getting them what's fashionable this year. No one will have the slightest interest in fashion after a disaster ; we'll all be too concerned with getting enough food and keeping warm.

We don't know how long the really nasty times will be. I'm planning on at least 1 year of chaos followed by a couple years of rebuilding. This seems reasonable to me based on what I've learned about a large scale disaster. If you agree with this estimate, you'll need to have *at least* two full years of clothes for your family. I'm thinking in terms of three years of clothes just to be sure. Since you already have clothes for everyone, you have part of this job done. You may have three years worth of clothes for your family in your house right now. The only really tricky part is allowing for growth if you have children.

Make a list with each family member on it and write down what each one needs, beginning with the oldest child. If the oldest still has some growing to do, figure that there will be hand-me-downs available to younger siblings. Allow at least five long sleeve and five short sleeve shirts per child and five pairs of pants also. The oldest male can always hand down his outgrown shirts and pants to both younger brothers and sisters. Five pairs of underpants and undershirts, five pairs of socks, two sweaters, a jacket and a heavy coat per child should be the minimum. A few dresses and skirts for the girls would be nice. As I said, you already have most of this. The only difference from your normal clothing concerns is the fact that you will need to buy clothes for growing children now instead of next year and the year after.

There may not be much joy in your children's lives for a few years—things will be so terribly different from what they're used to—so have a few nice things tucked away for them, particularly for daughters. Kids are still kids and they love an attractive surprise. There may be some local social events in your area they'd like to look nice for so plan ahead for this, which means don't take them clothes shopping with you.

Shoes may be the worst clothing problem we have. Unless there is a cobbler in your area, which is very rare these days, there will be no way to repair shoes or resole them when they're worn out. The shoe purchase procedure is the same as with your other clothing concerns: figure out what each child will need for two or three years, allowing for growth, buy it now and put it away.

Each child will need several pairs of everyday shoes to play in (or work in if things get really bad), plus a pair of nicer shoes for church or whatever social occasions may occur and some sturdy boots for winter snows.

Buy in a similar manner for you and your spouse or any other adults in the family. You don't have to buy everything new for adults or children; go to thrift shops or yard sales and stock up. If you find a good source of inexpensive clothes, buy lots of things in all the average sizes. Remember that most people will not be at all prepared for a crash so any clothes you don't need will be excellent barter items.

Emergency Heating and Cooking

HEATING

Coal stores well if kept in a dark place and away from moving air. Air speeds deterioration and breakdown, causing it to burn more rapidly. Coal may be stored in a plastic-lined pit or in sheds, bags, boxes, or barrels and should be kept away from circulating air, light, and moisture. Cover it to lend protection from weather and sun.

Wood. Hardwoods such as apple, cherry, and other fruit woods are slow burning and sustain coals. Hardwoods are more difficult to burn than softer woods, thus requiring a supply of kindling. Soft woods such as pine and cedar are light in weight and burn very rapidly, leaving ash and few coals for cooking. If you have a fireplace or a wood/coal

burning stove, you will want to store several cords of firewood. Firewood is usually sold by the cord which is a neat pile that totals 128 cubic feet. This pile is four feet wide, four feet high, and eight feet long. Some dealers sell wood by the ton. As a general rule of thumb, a standard cord of air dried dense hardwood weighs about two tons and provides as much heat as one ton of coal. Be suspicious of any alleged cord delivered in a 1/2 or 3/4 ton pickup truck.

For best results, wood should be seasoned (dried) properly, usually at least a year. A plastic tarp, wood planks, or other plastic or metal sheeting over the woodpile is useful in keeping the wood dry. Other types of fuels are more practical to store and use than wood or coal.

Newspaper logs make a good and inexpensive source of fuel. You may prepare the logs in the following manner:

Use about eight pages of newspaper and open flat. Spread the stack, alternating the cut sides and folded sides.

Place a 1" wood dowel or metal rod across one end and roll the paper around the rod very tightly. Roll it until there are 6-8 inches left to roll, then slip another 8 pages underneath the roll.

Continue this procedure until you have a roll 4-6 inches in diameter. With a fine wire, tie the roll on both ends.

Withdraw the rod. Your newspaper log is ready to use.

Four of these logs will burn about 1 hour.

Propane is another excellent fuel for indoor use. Like kerosene, it produces carbon dioxide as it burns and is therefore not poisonous. It does consume oxygen so be sure to crack a window when burning propane.

Propane stores indefinitely, having no known shelf life. Propane stoves and small portable heaters are very economical, simple to use, and come the closest to approximating the type of convenience most of us are accustomed to using on a daily basis.

The storage of propane is governed by strict local laws. In this area you may store up to 1 gallon inside a building and up to 60 gallons stored outside. If you store more than these amounts, you will need a special permit from the fire marshal.

The primary hazard in using propane is that it is heavier than air and if a leak occurs it may “pool” which can create an explosive atmosphere. Furthermore, basement natural gas heating units CANNOT be legally converted for propane use. Again, the vapors are heavier than air and form “pockets.” Ignition sources such as water heaters and electrical sources can cause an explosion.

White gas (Coleman fuel). Many families have camp stoves which burn Coleman Fuel or white gasoline. These stoves are fairly easy to use and produce a great amount of heat. However, they, like charcoal, produce vast amounts of carbon monoxide.

NEVER use a Coleman Fuel stove indoors. It could be a fatal mistake to your entire family.

Never store fuels in the house or near a heater. Use a metal store cabinet which is vented on top and bottom and can be locked.

Kerosene (also known as Range Oil No. 1) is the cheapest of all the storage fuels and is also very forgiving if you make a mistake. Kerosene is not as explosive as gasoline and Coleman fuel.

Kerosene stores well for long periods of time and by introducing some fuel additives it can be made to store even longer. However, do not store it in metal containers for extended time periods unless they are porcelain lined because the moisture in the kerosene will rust through the container causing the kerosene to leak out.

Most hardware stores and home improvement centers sell kerosene in five gallon plastic containers which store for many years. A 55 gallon drum stores in the back yard, or ten 5 gallon plastic containers will provide fuel enough to last an entire winter if used sparingly.

Caution: To burn kerosene you will need a kerosene heater. There are many models and sizes to choose from but remember that you are not trying to heat your entire home. The

larger the heater the more fuel you will have to store. Most families should be able to get by on a heater that produces about 9,600 BTUs of heat, though kerosene heaters are made that will produce up to 25,000 to 30,000 BTUs. If you have the storage space to store the fuel required by these larger heaters they are excellent investments, but for most families the smaller heaters are more than adequate. When selecting a kerosene heater be sure to get one that can double as a cooking surface and source of light. Then when you are forced to use it be sure to plan your meals so that they can be cooked when you are using the heater for heat rather than wasting fuel used for cooking only.

When kerosene burns it requires very little oxygen, compared to charcoal. You must crack a window about 1/4 inch to allow enough oxygen to enter the room to prevent asphyxiation. During combustion, kerosene is not poisonous and is safe to use indoors. To prevent possible fires you should always fill it outside. The momentary incomplete combustion during lighting and extinguishing of kerosene heaters can cause some unpleasant odors. To prevent these odors from lingering in your home always light and extinguish the heater out of doors. During normal operation a kerosene heater is practically odorless.

Charcoal. *Never* use a charcoal burning device indoors. When charcoal burns it is a voracious consumer of oxygen and will quickly deplete the supply in your little “home within a home.” Furthermore, as it burns it produces vast amounts of carbon monoxide which is a deadly poison. If you make the mistake of trying to heat your home by burning charcoal it could prove fatal to your entire family. **Never burn charcoal indoors.**

Cooking

To conserve your cooking fuel storage needs always do your emergency cooking in the most efficient manner possible. Don't boil more water than you need, extinguish the fire as soon as you finished, plan your meals ahead of time to consolidate as much cooking as possible, during the winter cook on top of your heating unit while heating your home, and cook in a pressure cooker or other fuel efficient container as much as possible. Keep enough fuel to provide outdoor cooking for at least 7-10 days.

It is even possible to cook without using fuel at all. For example, to cook dry beans you can place them inside a pressure cooker with the proper amount of water and other ingredients needed and place it on your heat source until it comes up to pressure. Then turn off the heat, remove the pressure cooker and place inside a large box filled with newspapers, blankets, or other insulating materials. Leave it for two and a half hours and then open it, your meal will be done, having cooked for two and a half hours with no heat. If you don't have a large box in which to place the pressure cooker, simply wrap it in several blankets and place it in the corner.

Store matches in waterproof airtight tin with each piece of equipment that must be lit with a flame.

Sterno fuel, a jellied petroleum product, is an excellent source of fuel for inclusion in your back pack as part of your 72 hour kit. Sterno is very light weight and easily ignited

with a match or a spark from flint and steel but is not explosive. It is also safe for use indoors. A Sterno stove can be purchased at any sporting goods store and will retail between \$3 and \$8, depending upon the model you choose. They fold up into a very small, compact unit ideal for carrying in a pack. The fuel is readily available at all sporting goods stores and many drug stores. One can of Sterno fuel, about the diameter of a can of tuna fish and twice as high, will allow you to cook six meals if used frugally. Chafing dishes and fondue pots can also be used with Sterno.

Sterno is not without some problems. It will evaporate very easily, even when the lid is securely fastened. If you use Sterno in your 72 hour kit you should check it every six to eight months to insure that it has not evaporated beyond the point of usage. Because of this problem it is not a good fuel for long-term storage. It is a very expensive fuel to use compared to others fuel available, but is extremely convenient and portable.

Coleman fuel (white gas), when used with a Coleman stove is another excellent and convenient fuel for cooking. It is not as portable nor as lightweight as Sterno, but produces a much greater BTU value. Like Sterno, Coleman fuel has a tendency to evaporate even when the container is tightly sealed so it is not a good fuel for long-term storage. Unlike Sterno, however, it is highly volatile; it will explode under the right conditions and should therefore never be stored in the home. Because of its highly flammable nature great care should always be exercised when lighting stoves and lanterns that use Coleman fuel. Many serious burns have been caused by carelessness with this product. Always store Coleman fuel in the garage or shed, out of doors.

Charcoal is the least expensive fuel per BTU that the average family can store. Remember that it must always be used out of doors because of the vast amounts of poisonous carbon monoxide it produces. Charcoal will store for extended period of time if it is stored in air tight containers. It readily absorbs moisture from the surrounding air so do not store it in the paper bags it comes in for more than a few months or it may be difficult to light. Transfer it to airtight metal or plastic containers and it will keep almost forever.

Fifty or sixty dollars worth of charcoal will provide all the cooking fuel a family will need for an entire year if used sparingly. The best time to buy briquettes inexpensively is at the end of the summer. Broken or torn bags of briquettes are usually sold at a big discount. You will also want to store a small amount of charcoal lighter fluid (or kerosene). Newspapers will also provide an excellent ignition source for charcoal when used in a funnel type of lighting device.

To light charcoal using newspapers use two or three sheets, crumpled up, and a #10 tin can. Cut both ends out of the can. Punch holes every two inches around the lower edge of the can with a punch-type can opener (for opening juice cans). Set the can down so the punches holes are on the bottom. Place the crumpled newspaper in the bottom of the can and place the charcoal briquettes on top of the newspaper.

Lift the can slightly and light the newspaper. Prop a small rock under the bottom edge of the can to create a good draft. The briquettes will be ready to use in about 20-30

minutes. When the coals are ready remove the chimney and place them in your cooker. Never place burning charcoal directly on concrete or cement because the heat will crack it. A wheelbarrow or old metal garbage can lid makes an excellent container for this type of fire.

One of the nice things about charcoal is that you can regulate the heat you will receive from them. Each briquette will produce about 40 degrees of heat. If you are baking bread, for example, and need 400 degrees of heat for your oven, simply use ten briquettes.

To conserve heat and thereby get the maximum heat value from your charcoal you must learn to funnel the heat where you want it rather than letting it dissipate into the air around you. One excellent way to do this is to cook inside a cardboard oven. Take a cardboard box, about the size of an orange crate, and cover it with aluminum foil inside and out. Be sure that the shiny side is visible so that maximum reflectivity is achieved. Turn the box on its side so that the opening is no longer on the top but is on the side. Place some small bricks or other noncombustible material inside upon which you can rest a cookie sheet about two or three inches above the bottom of the box. Place ten burning charcoal briquettes between the bricks (if you need 400 degrees), place the support for your cooking vessels, and then place your bread pans or whatever else you are using on top of the cookie sheet. Prop a foil-covered cardboard lid over the open side, leaving a large crack for air to get in (charcoal needs a lot of air to burn) and bake your bread, cake, cookies, etc. just like you would in your regular oven. Your results will amaze you.

To make your own charcoal, select twigs, limbs, and branches of fruit, nut and other hardwood trees; black walnuts and peach or apricot pits may also be used. Cut wood into

desired size, place in a large can which has a few holes punched in it, put a lid on the can and place the can in a hot fire. When the flames from the holes in the can turn yellow-red, remove the can from the fire and allow it to cool. Store the briquettes in a moisture-proof container. Burn charcoal only in a well-ventilated area.

Wood and Coal. Many wood and coal burning stoves are made with cooking surface. These are excellent to use indoors during the winter because you may already be using it to heat the home. In the summer, however, they are unbearably hot and are simply not practical cooking appliances for indoor use. If you choose to build a campfire on the ground outside be sure to use caution and follow all the rules for safety. Little children, and even many adults, are not aware of the tremendous dangers that open fires may pose.

Kerosene. Many kerosene heaters will also double as a cooking unit. In fact, it is probably a good idea to not purchase a kerosene heater that cannot be used to cook on as well. Follow the same precautions for cooking over kerosene as was discussed under the section on heating your home with kerosene.

Propane. Many families have propane camp stoves. These are the most convenient and easy to use of all emergency cooking appliances available. They may be used indoors or out. As with other emergency fuel sources, cook with a pressure cooker whenever possible to conserve fuel.

HOMEMADE COKE CAN ALCOHOL STOVE

This is a spin on the homemade coke can alcohol stove after a fair amount of trial and error. For whatever reason, we are unable to find the link from which the original instructions for this stove were obtained. I do have my printed copy and credit is given to

LaMar Kirby – Utah Lake District, Orem Ut. (lkirby@corel.com) for providing construction directions.

Start by assembling the supplies. You'll need tin snips, hammer, small finishing nail, drill, ¼ inch bit, small coffee can (11 oz?), two soda cans, a rubber band and some cotton string. Optional drill bits include 1/16 inch and ½ inch.



Drill holes in the bottom of one of the cans. These should circle the edge and a few in the middle. The very center hole needs to be large enough to thread the string through. The other holes should be about 1/16 inch. I have read that using a push type thumb tack makes a nice size hole, but I always managed to bend the thumb tack after one or two holes. A small finishing nail (brad) can be gently tapped through with a hammer or a small drill bit can be used.



Take the can with the holes and cut off the bottom, about 1 inch up from the bottom. Cut ½ inch slits around the cut edge, about every half inch.

Now take the other can and cut off the bottom, about 1.5 inches from the bottom.

Insert the can with the holes inside the bigger can. The slits are to make it a little easier to insert one into the other. Gently tap until one is snug inside the other.

Push the string into the center hole. 4 or 5 inches of string should be plenty. Leave about an inch or so hanging outside the can.



The fuel (alcohol) is poured into the top of the can. This will soak the string, which will act as a wick. The purpose of the wick is to keep the flame going until the alcohol is warm enough to stay lit. The wick is our primary contribution to the coke can design.

Our second contribution is the pot stand. We found that by using this pot stand, boil time was greatly reduced.

Start by cutting the coffee can down to about 3 inches. Drill holes with a $\frac{1}{4}$ inch drill bit around the base and upper lip of the can. Drill (or use tin snips) 4 of the holes at the upper lip of the can to about $\frac{1}{2}$ - $\frac{3}{4}$ inch in diameter.



The stand serves several purposes. It reflects heat in, it acts as a wind shield, and it holds the pot. When cool, it can hold the stove for packing. It is handy to have a glove to use a hot mitt (to lift hot pots from the stove), to extinguish the stove (quickly smother the fire and little damage should result to the glove), and also act as a cushion to keep the stove from rattling in the pot stand when packed.



Here is the package ready to go.



The lid from the coffee can won't fit snug without the original lip of the can so a rubber band is use to keep it together. The stove alone weighed about 0.5 ounces, the stove and pot stand together weighed about 2.5 ounces. The glove and fuel are extra. We were able to bring 2 cups of cold tap water to a boil in about 6 – 7 minutes.

Perry Michael Koussiafes,

8/8/00

Compiler's Note: *Many who have downloaded and read previous versions of this manual will note that the article on alcohol stoves has been much reduced in this new version. I did this for three reasons one alcohol stoves may not due to air temperature elevation and/or fuel type be unable to reach a temperature high enough to boil water something that is important during an emergency. Two for more than one or two people the stoves are general not big enough for cooking a complete meal and would only be sufficient for heating up ready made meals. Three they require fuel that may not be readily available of replaceable in an emergency. Alcohol stoves do have a place in Bug-Out-Bags, but are not suitable for long term use.*

Rocket Stove: how to build one in an afternoon

by Emma Holister



If the price of gas and electricity is getting you down, build a simple rocket stove and cook with twigs! It's free and it's sustainable. Cooking with a rocket stove is another big step towards freedom from extortionate energy bills and the multinational giants ransacking our planet and our bank accounts.

A rocket stove can be used outside in the summer, on your terrace or balcony, or indoors in the winter, hooked up to a chimney with a hood. Because of the insulated interior, this stove gives off far less smoke and carbon monoxide than a normal fire. Only when igniting and putting out the fire is there really any smoke worth speaking of. This simple design creates a strong air suction that makes the cooking flame very intense with just a few twigs. Using bigger and more twigs gives a stronger flame which will heat your pans

faster than a gas hob. You can reduce the flame by reducing the amount or size of the twigs.

I built this rocket stove in an afternoon, using the information and explanation video at <http://rocketstoves.org>

You can download the Aprovecho Research Centre booklet 'Capturing Heat' that the video was based on here:

http://rocketstoves.org/capturing_heat/pdf/capturing_heat.pdf

In it you will find plans not only for a rocket stove like this one but also a passive cooker heat box (I'll explain that later, it's very useful to use in tandem with the rocket stove), a solar cooker and a large bread oven.

My rocket stove is very rudimentary. I've never done metal work before so I was as new to this as the next person. You'll need to forgive the unintentional advertising for the sunflower cooking oil...the 25 litre / 5 gallon tin was perfect for my stove! In Europe it's quite difficult to find this size barrel and you may need to go begging at the back door of

your local restaurant for their empties. If you are worried about the paint on the barrel then put it in a fire to burn away the thin layer of paint. However, once I got my stove going, the main part of the barrel, being well insulated with ash, doesn't get hot at all, only the top edge gets charred.

In the photo below you can see the 25 litre tin of sunflower oil I found dumped next to the public garbage bins in my neighbourhood. It needed a bit of a scrub to remove the excess oil and a bit of rust that had started to build up. Inside this barrel will go my old iron stove pipe, one straight piece and one elbow piece, that I got out of my cellar. It has a diameter of 13cm (approx 4 inches). In the video the chap uses a thin tin stove pipe that he then changed his mind about as it can release toxins. My stove pipe is a tough old iron thing that had to be cut with an electric metal disk saw. However, cutting it with a metal handsaw would have been possible, had I been brave...

The tools you'll need:

Leather gloves to protect your hands – without them you will gash yourself!

A felt tip pen for marking where you'll cut

A chisel and hammer to make the first hole in the tin before cutting

Tin snips to cut the tin barrel

A metal file to smooth off the rough edges of the cut tin

Either an electric disk saw for cutting the iron stove pipe or a good metal hand saw (and plenty of patience)

Pliers to grip, bend and squeeze the tin into shape

A ruler, tape measure or piece of wood to measure the length of stove pipe

Step by Step with Photos

The first thing to cut in the barrel is the bottom hole where the wood will be fed into the stove pipe. This is done easily by using your pen to trace around the diameter of your

stove pipe placed 5cm (approx 2 inches) above the bottom of the barrel. This gap is to prevent the base of the rocket stove overheating. Next, take the hammer and chisel, hold the barrel so it doesn't slip, give the chisel a good whack in the centre of the traced circle to create a hole in the tin, then work the tin snips into that hole, cut towards the edge, then all around the edge till the hole is complete. Cutting slightly inside the traced line will give you a neater, tighter fit with the stove pipe; if it's too small you can always make it bigger, but not vice versa.



After cutting the bottom hole, it's time to cut the top of the tin off...If you're not sure of cutting a straight line all the way around, trace one first with your pen using a stick or measure to guide your pen evenly.



The edges of the tin will be very rough and must be filed down carefully so as not to cut your hands.



The tin snips can sometimes get a bit stuck so I'd occasionally pull the tin apart with my pliers so as to make cutting easier.



And back to filing off those nasty rough edges...



Once the edges were filed, I wanted to create a rounded-off top edge and so I set about bending the edge of the cut tin inwards, gripping only about four millimetres of tin for the inward folding flap.



I then squeezed that narrow flap down, creating a fold in the tin that will not cut the hands. This top ridge needs to be pretty even so check it with a level if you're a perfectionist – which I'm not I just gave it a whack with a hammer here and there where it went up too high and checked by eye that the cooking grill sat evenly on it.



And here below, an exciting moment....slotting in the stove pipe elbow...it juts out of the tin's exterior by about 4 to 5cm (measuring at the top edge).



Here's the view of that exciting moment from above...



Then I slotted in my straight length of stove pipe onto the elbow. I wanted the central pipe to sit about two or three cm below the rim of the outer tin, so I rested a thin length of wood from the outer edge to the central column, inclined it down the pipe a couple of cm and marked that point with a pen.



Then I took that same thin strip of wood, drew a little line on it the same length for the stove pipe I'd marked, and then continued drawing the line around the pipe using the length of wood and its marker to keep the line even all the way round. A tape measure could also have been used, but I was too lazy to go and get it out of my tool box....

True to my usual methods, this was all guess-work. When fitted in place the entire vertical length of the inner stove pipe, from its top edge to the base inside the elbow piece is 32cm.



The line I drew was rough but accurate enough, thanks to guiding my hand with the length of wood... I then got David to cut it with the electric disk saw while I held it in place. The disk saw gives off a lot of sparks and you must protect your eyes with goggles as well as using gloves and keeping your hands well away from the cutting area when you hold or clamp the pipe down so it won't move during the cutting.

Once it was cut I slotted it into the elbow piece. So this inner pipe sits a couple of cm below the outer edge of the rocket stove so that the flames don't get blocked by the bottom of your saucepan.



Just in case, I got David to file off with the disk saw the enamel and paint where the pipe comes through the bottom hole because I was in two minds about filling the slightly uneven gaps (I'm no expert with those tin snips!) with some type of soldered metal....but in the end, the ash insulation is tightly packed and doesn't fall out as long as you don't knock the stove around. In this photo below you can see how the final stove pipe looks with elbow and vertical piece slotted together.



Now I filled the gap between the stove pipe and its outer tin casing with ash from last winter's log fire, being sure to pack it down tight and push it firmly under the elbow pipe.



I filled it to a level that left a depth of about 8 or 9cm from the outer tin's top rim to the surface of the ash.



Then I hunted around for the top piece of metal to slot over the stove pipe to keep it snugly in place along with the ash. The original lid of the tin exterior was no good....so I grabbed another lid from an old tin of paint and cut that up instead. Again, if you want to get rid of the layer of paint on the can, burn it first in a fire.



I measured the diameter of the rocket stove's outer tin and cut out a circle from the tin lid with the same diameter. Luckily for me, the interior line of the lid was almost exactly the same diameter so I didn't need to draw a line. Had I not had that stroke of luck, I'd have put the rocket stove onto the lid, traced a line around its base, and cut the circle a few millimetres inside the line to compensate for the difference in diameter between the outside of the tin and the inside.

I left three little flaps to fold down and give the lid a bit of extra anchorage. I filed down the rough edges and with the pliers bent the outer edge slightly downwards so that it would curve down into the ash instead of curving up where it could get caught or scratch.



I then placed a piece of stove pipe in the center of the lid, using my pen as a measure to gauge the length between the outer edge and the pipe, making sure it was even all round and therefore centered properly. Then I held it firmly and traced a line around the pipe for where I was going to cut the hole.



Here below is the final traced line, ready to cut out. I placed it in the rocket stove just to check I hadn't completely boded the diameter, it's a rough job, but good enough.

Out come the chisel and hammer again. I whacked a hole in the center...



...got my tin snips out again and cut the circle out...



....filed off the rough edges and slotted it into place over the central stove pipe. This keeps the pipe in place and holds the ashes down. I did a rough job (I'm a beginner after all) and there is a little ash around some of the edges still, but this doesn't affect the efficiency of my stove at all.



Now the final touches, putting in the stove's twig shelf. You cannot just put the twigs straight into the stove pipe without a shelf because they need to be raised in order to allow air to flow underneath, as with a vent, to get the fire going. I could have used the tin top but I used another scrap of tougher tin I found lying around. This shelf has to be long enough to hold the twigs but not so long that it intrudes into the bent part of the pipe's elbow, that's where the flames belong.



I cut it with folded-down edges so that it could be wedged into the pipe quite firmly.



I gave it a final tap with the hammer to push it in snugly. I should really have allowed part of the shelf to jut out to give the twigs an extra platform, but as I use bricks to support the ends of the sticks I didn't bother.



And hey presto, the stove is ready to fire up – that is, once you’ve put the oven/barbecue grill on top and removed the curious cat...

This pot is perfect for two reasons: one, it is black, so when the bottom gets blackened by the flame it doesn’t show, and two, it’s cast iron, which retains the heat. So once you’ve got your soup or rice boiling you can remove it from the fire and place it in an insulated box where the heat gets trapped and the soup continues cooking.

An insulated box can be made by putting one smaller wooden box on little legs inside a bigger box, filling the gap with ash (cold ash, naturally) or sawdust, boxing it in, and covering with a lid that is also insulated. This way you don’t need to stand over your rocket stove for long.

You cannot leave a rocket stove to cook the way you can with gas or electric hobs. Rather than seeing this as a disadvantage it might be worth thinking of all the lives that can be saved, as leaving pans on the hob is one of the biggest causes of house fires. If you leave a rocket stove unattended it will simply go out after about five minutes. Therefore, learning a few tricks with insulated passive cooker boxes and keeping your blackened utensils away from other dishes, will make life with the rocket stove a lot simpler.



David had to get cracking because I wanted my dinner...he made me a marvellous curry...



The twigs can be set alight by placing a handful of straw in the pipe's elbow, adding more straw if they are slow to take. With long sticks, bricks can be placed underneath them for support. When you want to put the twigs out, have a little pot with sand handy to plonk them into.

And finally, below is a nice view of the flames from above...



Compiler's Note: *There are a good number of videos readily available on YouTube showing the construction of various sizes and styles of Rocket Stoves, you may wish to review them, though all Rocket Stoves are built with the same basic design. Also the author above choice to use wood ash as their insulator, should wood ash not be readily available vermiculite; medium or light grade or a mixture of the two (readily available in most garden shops) makes an ideal insulator. Additionally a light pumice rock mixture of large and small particulates works well.*

How to Make a Survival Stove (Car Heater)

With winter coming soon for many of us who live in the colder climates, getting stranded in your car can become a dangerous possibility. As a result, everyone's emergency car kit should contain the ability to heat your car if you were stranded or holed up waiting the passage of a winter storm.

Even if running your engine is an option, you may need to conserve fuel for the return trip. Also, carbon monoxide can build up inside a standing vehicle while the engine is running, even if the exhaust pipe is clear. In this article, I will be demonstrating how you can make your own survival heater for your car that is cheap, safe to use, and easy to construct.

What You'll Need



A small empty metal can: You want this to be slightly taller but thinner than a standard roll of toilet paper. My can of choice is an unused 1 quart aluminum paint can found in most hardware stores. You can also use an empty food can that fits this description.

A larger metal can that can easily accommodate the first one: I use a 1 gallon unused paint can (again found in most hardware stores). Another option is a coffee can, metal bucket and so on.

Some type of lid that can be placed over the larger can: I also like to get a lid for the smaller can for which I will explain later.

Toilet paper (unscented)

Six bottles of 70 to 91% isopropyl alcohol (rubbing alcohol)

Matches or some other fire starter

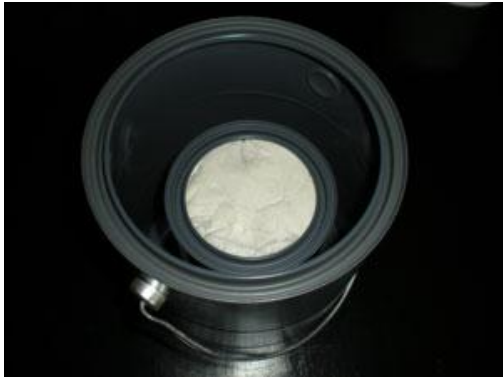
How to Put it All Together



Prepare the toilet paper: The first step is to take out the central cardboard tube from the toilet paper roll, leaving only the paper behind.

Squeeze the paper into the smaller can: Next you'll want to squeeze and roll the paper into the smaller can. If the can is so small that a full-size paper roll has no chance of fitting inside it, then you can remove some of the external sheets (just like you would if you were going to the bathroom) until it does squeeze into the can. It's important that it fills up the entire volume of the can.

Add the fuel: If you are now ready to use it, simply add the alcohol until the toilet roll inside the can is completely saturated. One of the benefits of using a 1 quart unused paint can is that you can store the stove with the fuel already added by placing the air-tight lid over the can. This saves space and allows you to have more fuel available. The lid can also be used to control the output of the flame which I will explain below.



Place the smaller can into the larger one and position it in your car: The larger can provides an insulating barrier and some protection for passengers and your car. You'll also want to position it in a place that's far enough from anything combustible. Use the palm check. Put the back of your hand against the surface you're worried about and if you can't keep your hand there without burning it then it's either to close or you'll need to adjust the flame.

Light the stove: First, open the window just a crack to provide some airflow and then carefully place a match (or throw some sparks using a firesteel) onto the saturated toilet paper and viola! you've got yourself a burning stove. Use caution in lighting as it will combust very quickly. It's best to partially cover the smaller can with a lid to decrease the size of combustion (you can always increase it later (see next section)).

Controlling the Burn Rate



You may notice if you follow the steps above, that a pretty sizable flame results from having the smaller can's opening completely exposed. While this is fine if you want to warm up faster, it does tend to go through the fuel fairly quickly and is not so efficient. A better way is to partially cover the smaller can with a lid. Or if you used a 1 quart paint

can, you can make a small hole (about the size of a quarter) in the lid it comes with and place that on top of the can. Both of these methods control the burn rate and allow the stove to provide a constant heat.

Another option is instead of completely saturating the toilet roll (as indicated in step 3 above) you can pour just a few ounces of alcohol on the paper and regularly add more as it burns out. This will also control the size of the flame and conserve fuel. I prefer to use the lid method over this one since you don't have to regularly add alcohol (it's nice to sleep for a stretch of time and not have to regularly add fuel).



A Word on Carbon Monoxide

I'm sure by now many of you are thinking, "What about the dangers of carbon monoxide?"

Carbon monoxide is produced from the partial oxidation of carbon-containing compounds. “Partial oxidation” is just a big word for what happens when combustion (fire) takes place in an area where there isn’t much oxygen. This is most apparent when one operates a generator inside a home or if their wood stove is improperly vented. In the case of this alcohol stove, while there is risk of carbon monoxide emissions (rubbing alcohol contains carbon: C_3H_7OH) the risk is very minimal. Opening your window slightly should provide sufficient oxygen for a clean burn. If you still are concerned about it, I would recommend purchasing a battery-operated carbon monoxide alarm and turning it on (putting in the batteries) when running the stove. This will provide you ample warning should there be an issue.

by Tactical Intelligence on September 8th, 2009

Windshield Shade Solar Cooker



Kathy Dahl-Bredine developed the **Windshield Shade Solar Cooker** while experimenting with various designs of cookers to introduce in the indigenous communities where Kathy lives and works in southern Mexico. She hit upon an utterly simple way to make an instant portable solar oven. Taking a reflective accordion-folded car windshield shade, you can turn it into a version of the solar funnel simply by attaching little Velcro tabs along the long notched side.

Materials needed

- Reflective accordion-folding car sunshade
- Cake rack (or wire frame or grill)
- 12 cm. (4 ½ in.) of Velcro
- Black pot
- Bucket or plastic wastebasket
- Plastic baking bag

Instructions



Making the funnel

Lay the sunshade out with the notched side toward you, as above.

Cut the Velcro into three pieces, each about 4 cm. or 1 ½ inches long.

Stick or sew one half of each piece, evenly spaced, onto the edge to the left of the notch. Attach the matching half of each piece onto the underneath side to the right of the notch, so that they fit together when the two sides are brought together to form a funnel. (I first tried sewing these on a sewing machine, but found it cut through the reflective material.) If using stick-on Velcro, you can align the two pieces easily like this: Stick down one side of the Velcro, then press the two pieces of Velcro together, fold the shade into the funnel shape and stick down the second side.

Press the Velcro pieces together, and set the funnel on top of a bucket or a round or rectangular plastic wastebasket.

Place a black pot on top of a square cake rack, placed inside a plastic baking bag. A standard size rack in the U.S. is 25 cm. (10 in.). This is placed inside the funnel, so that the rack rests on the top edges of the bucket or wastebasket. Since the sunshade material is soft and flexible, the rack is necessary to support the pot. It also allows the sun's rays to shine down under the pot and reflect on all sides. If such a rack is not available, a wire frame could be made to work as well. *Note: The flexible material will squash down around the sides of the rack.*

Tips



Cooker with stabilizing stick

- The funnel can be tilted in the direction of the sun.
- A stick placed across from one side of the funnel to the other helps to stabilize it in windy weather (see photo).
- After cooking, simply fold up your “oven” and slip the elastic bands in place for easy travel or storage.

I have found this totally simple solar oven extremely practical, as it is so lightweight and easy to carry along anywhere. But in addition, it has reached a higher temperature in a shorter time than all the other models I have experimented with so far (I haven’t used a parabolic) - a little above 350 degrees F. I have cooked black beans in about the same amount of time as on a gas stove;

I’ve used it to bake breads, granola, brownies, lasagna, all sorts of vegetables, and to purify water. The sunshade may not be available everywhere, but I suspect it can be

found in most urban fabric stores. Cost of the sunshade was about \$3.00 USD; the Velcro about \$.25.

by Kathy Dahl-Bredine

Emergency Lighting

Should there be a temporary lapse in electrical power, alternative sources of lighting must be stored in advance. Before the event, this is relatively inexpensive and easy. After the event, it becomes very difficult, perhaps impossible.

In most emergencies with a several day time span (hurricanes, ice storms, etc.) battery operated lighting will often see us through. However, with a major emergency the duration can be much greater. There are many products on the market that will serve well for these longer emergencies.

There are now several solar products that can provide lighting, even after cloudy days. There are solar lanterns, solar flashlights, even solar battery chargers. The solar walkway lamps that line outdoor paths are available in home centers. These can be brought in at night to provide ambient lighting. Solar photovoltaic panels or wind generators, hooked

to batteries, can provide lighting and cost as little as \$100 per light. With solar or wind, once the power is restored, you still have free, non-polluting lighting.

Kerosene lanterns and gas lanterns are common choices. With these be sure you have enough fuel stored safely away from the house. Gas lantern are very noisy but give off lots of heat. Kerosene lanterns can smell but scented fuel is available.

Candles should not be ruled out. However, common decorative candles have a short life. Emergency candles can have up to 100 hours of burn time and an indefinite shelf life. Be sure to have a good quality fire extinguisher in each room where candles, kerosene and gas are being used. Most of the alternatives require a fire or flame, so use caution. More home fires are caused by improper usage of fires used for light than for any other purpose. Especially use extra caution with children and flame. Teach them the proper safety procedures to follow under emergency conditions. Allow them to practice these skills under proper adult supervision now, rather than waiting until an emergency strikes.

Cyalume sticks are the safest form of indoor lighting available but very few people even know what they are. Cyalume sticks can be purchased at most sporting goods stores for about \$2 per stick. They are a plastic stick about four inches in length and a half inch in diameter. To activate them, simply bend them until the glass tube inside them breaks, then shake to mix the chemicals inside and it will glow a bright green light for up to eight hours. Cyalume is the only form of light that is safe to turn on inside a home after an earthquake. One of the great dangers after a earthquake is caused by ruptured natural gas lines. If you flip on a light switch or even turn on a flashlight you run the risk of causing an explosion. Cyalume will not ignite natural gas. Cyalume sticks are so safe that a baby can even use them for a teether.

Two-Mantle Gas Lantern

A gallon of Coleman-type fuel utilized with a two-mantle gas lantern has a burning time of approximately 40 hours. Light output is approximately the same as a 200W light bulb. Assuming an operating or burning time of 5 hours per day, the following approximate amounts of fuel would be consumed: White gas may be substituted in some camping equipment, but read and follow the specific instructions of the equipment manufacturer. A gas lantern gives a high intensity light and lots of heat, too—though the pressurized gas delivery system is quite noisy when operating. Two-Mantle Gas Lantern Fuel Consumption

Period	Fuel Consumed per 5 Hours of use.
Day,	1 pint.
Week,	1 gallon.
Month,	4 gallons.
Year,	50 gallons.

Kerosene Lanterns

Given today's technology, a kerosene lantern seems a bit old-fashioned and out of place! However, a kerosene lantern with a 1" wick will burn approximately 45 hours per quart

of kerosene, saving lots of natural resources and utilizing approximately one-fourth as much fuel as a gas lantern. Kerosene lanterns are an effective and fairly safe lighting source. There are now scented lamp oils which replace kerosene. This lamp oil is generally available in retail stores. Make sure the oil is approved for use in your lamp.

There is a difference in lighting quantity and quality, as the kerosene lantern is quite dim when compared to the two-mantle gas lantern. The light output of a kerosene lantern is comparable to a 40W-60W light bulb. As a rule of thumb, the typical kerosene lantern burns approximately 1 ounce of fuel per hour. Burning at the rate of 5 hours each day, the following approximate amounts of kerosene would be used:

Kerosene Lantern Fuel Consumption

Period Fuel	Consumed per 5 Hr.
Day,	1/4 pint.
Week,	1 quart.
Month,	1 gallon.
Year,	12 gallons.

Kerosene lamps are excellent sources of light and will burn for approximately 45 hours on a quart of fuel. They burn bright and are inexpensive to operate. The main problem with using them is failure to properly trim the wicks and using the wrong size chimney. Wicks should be trimmed in an arch, a “V,” an “A” or straight across the top. Failure to properly trim and maintain wicks will result in smoke and poor light.

Aladdin type lamps that use a circular wick and mantle do not need trimming and produce much more light (and heat) than conventional kerosene lamps. These lamps, however, produce a great amount of heat, getting up to 750 degrees F. If placed within 36 inches of any combustible object such as wooden cabinets, walls, etc. charring can occur. Great caution should therefore be exercised to prevent accidental fires.

The higher the elevation the taller the chimney should be. Most chimneys that come with kerosene lamps are made for use at sea level. At about 4500 feet above sea level the chimney should be about 18-20 inches high. If your chimney is not as tall as it should be you can improvise by wrapping aluminum foil around the top of it and extending it above the top. This will enable the light to still come out of the bottom portion and yet provide proper drawing of air for complete combustion. If the chimney is too short it will result in smoke and poor light. Be sure to store extra wicks, chimneys and mantles.

Tallow Candles

Tallow candles burn brighter, longer, and are fairly smokefree when compared to wax candles. Tallow candles are generally available in specialty stores only, unless you make your own. Wax candles are available almost anywhere housewares are sold. Store tallow candles in a cool, dry location. Candles stored in the freezer will burn slower and without dripping.

Emergency Candles

There are two types of emergency candles available for camping, storage, and emergency purposes.

Candles. Every family should have a large supply of candles. Three hundred sixty-five candles, or one per day is not too many. The larger the better. Fifty-hour candles are available in both solid and liquid form. White light colored candles burn brighter than dark candles. Tallow candles burn brighter, longer, and are fairly smoke free when compared to wax candles. Their lighting ability can be increased by placing an aluminum foil reflector behind them or by placing them in front of a mirror. However, candles are extremely dangerous indoors because of the high fire danger—especially around children. For this reason be sure to store several candle lanterns or broad-based candle holders. Be sure to store a goodly supply of wooden matches.

Save your candle ends for emergency use. Votive candles set in empty jars will burn for up to 15 hours. Non-candles (plastic dish and paper wicks) and a bottle of salad oil will provide hundreds of hours of candle light.

The type made of hardened wax in a can has the capability of utilizing several wicks simultaneously. The other type is a liquid paraffin-filled bottle with a wick for easy lighting. The liquid paraffin burns without odor or smoke. This candle has a minimum 100-hour burning time and indefinite shelf life.

Tallow Candle Burning Rate

Height	Diameter	Approximate Burning Time in Hours
6"	1/2"	3
6"	1"	8
9"	2"	48

Trench candles can be used as fireplace fuel or as a candle for light. To make trench candles:

1. Place a narrow strip of cloth or twisted string (for a wick) on the edge of a stack of 6-10 newspapers.
2. Roll the papers very tightly, leaving about 3/4" of wick extending at each end.
3. Tie the roll firmly with string or wire at 2-4" intervals.
4. With a small saw, cut about 1" above each tie and pull the cut sections into cone shapes. Pull the center string in each piece toward the top of the cone to serve as a wick.
5. Melt paraffin in a large saucepan set inside a larger pan of hot water. Soak the pieces of candle in the paraffin for about 2 minutes.
6. Remove the candles and place on a newspaper to dry.

© Robert Roskind 1998, & Greg Pope 2005

Emergency Electric Lighting

Electric lighting has several advantages over other types, and some drawbacks. It's more portable and safer than fire based light. It can be extremely light weight and reliable. It's major drawback is the requirement of a power source. The most portable and available power source we currently have on the market is the traditional battery.

Emergency Lights

<i>Light role</i>	<i>Minimum Recommended</i>	<i>Recommended</i>
EDC	1 per kit	1 per person and kit with spares
Low Level	2 per family	2 per family with spares
Thrower	1 per family	1 per adult
Headlamps	1 per family	1 per adult
Small Lantern	1 per family	2-3 per family
Large Lantern	1 per family	2-3 per family

Note, some lights can serve in more than one role. Especially multi level adjustable lights.

EDC

Short for Every Day Carry. These lights should be small enough that you won't mind carrying it around everywhere with you. You never know when you might need a light in an emergency.

There will likely be no power and having a flashlight on you will give you additional flexibility in where you can go and when. You don't need to always always have it with you, but it's nice to have that option. Ideally it will run off a single cell, or two small cells. Having a bright mode is nice, but not essential, it can be just a low mode light, or just a high mode light. This light can also be multi role, act as a low level light and a thrower, maybe even a lantern when standing on it's tail indoors. There are some nice

lights out there but they can get expensive quick. If you use flashlights be sure to use krypton or halogen light bulbs in them because they last much longer and give off several times more light than regular flashlight bulbs on the same energy consumption. Store at least two or three extra bulbs in a place where they will not be crushed or broken.

Low Level

This light is what you can get away with when traveling through known territory, around camp, through your house, a night trip to the out house/latrine, reading at home base. Conserves batteries, last a long time. Size is probably not important. This is probably the role that will see the most use, this is the easiest to find and is also the most important.

Thrower

This is your big light. You may need it for search and rescue, a security patrol around a camp site, illuminating an area a long distance away (hence the name, it "throws" light far). It probably won't be in use every day, and it will eat batteries fast so you wouldn't

want to run it all the time anyway. It's likely to be a larger light and only carried when a need is anticipated. Probably the least important, but when you need it you need it.

Headlamp

This light will be used for night work or work in the dark where you need both hands free. If you've ever tried to do the dishes by hand, without power, or any other such similar task you will quickly appreciate what a headlamp can do for you. You may not have the ability to ask someone to hold a flashlight for you as you accomplish a task. It should be reasonably small and use small batteries. It is possible to rig up a flashlight to perform this role, for example, an EDC and a holder for it in a hat. A lantern can also perform this role to a degree, however, an actual headlamp still is a good idea.

Small Lantern

Sometimes you need to light up a room to socialize or you need a small light to read by. It mostly gives light to a small group of people. Other possibilities are using a flashlight in "candle mode", which is either with the bezel off the light exposing the lamp or just standing the flashlight on it's tail and letting the light reflect off the ceiling.

Large Lantern

When more light is required than a small lantern provides, allows a group of people to have light in a small, usually stationary, place. Eating a meal at night, or socializing would be good examples.

Types of lamps for lights

Incandescent/Halogen/Krypton

These are not recommended for general flashlight use. They are not very durable, prone to break easily – especially when dropped. They are inefficient, consume batteries rapidly and generally get dim quite quickly with use. Really they are only suitable for use in a thrower type of light, and even then should probably be avoided due to their fragility.

LED

These are excellent for most all uses, more efficient than incandescent/halogen bulbs. Highly durable and only get more efficient as batteries deplete. You get what you pay for with these lights, really nice flashlights can be had. Do some research and get what fits inside your budget and meets your needs. They are getting better every year. Regulated lights are more efficient than the cheaper lights with resistors. As of July 2006, I have in my hands high power production LEDs that are just as efficient as Fluorescents (finally!). So in 4 to 6 months I expect them to be on the shelves. Unfortunately they are expensive currently, this will change with time.

Fluorescent

Probably the best choice for large lanterns on a budget. Last a reasonably long time, they are not very expensive so you should own a few. The major drawback is they cannot be dimmed to save power, and don't work so well in cold weather.

Self Powered Lights

These are generally not recommended for several reasons. They are usually bulky and prone to mechanical failure. This is especially true since they are very cheaply made, making them more of a novelty item than actually useful. If you're really interested in these, I would recommend a shake light. They appear quite durable, the mechanical part is only a loose magnet that goes back and forth inside a sealed container. Not prone to breakage, though the light level is low. Be aware that there have been reports of shake lights on the market that have coin cell batteries in them, they look nice and bright when you pick them up. Once the batteries die (a few hours) they run on shake power which is nowhere near as bright as the batteries were.

Solar lights are nice, but I would first buy a solar battery charger and not have to carry the bulk of a solar cell around with me when using the light. Internally a solar light is going to have a battery anyway.

Self powered lights can probably only fill the role of a low level light.

A short course in Battery Chemistries

Primary Cells (single use, disposable cell)

The most common primary cells are Heavy-Duty and Alkaline, Lithium primary cells are also available but they can't always be used in devices that normally take Alkaline and Heavy-Duty batteries. Pure Lithium battery cells put out 3.0 volts rather than the normal 1.5. This requires either a different bulb or a "dummy" empty cell to be used to keep the overall voltage correct. But there are also new low voltage 1.5v Lithium batteries as well.

Rechargeable Cells (multi use cells)

The most common today are probably NiMH cells. NiCd is an older technology.

Lithium-ion is a newer technology, though it differs significantly from the more common cells.

<i>Cell Type</i>	<i>Shelf Life</i>	<i>Capacity</i>	<i>Sizes Available</i>	<i>Cycles</i>	<i>Cold</i>
<i>Weather</i> Heavy-Duty	8+ Years	Low	AAA, AA, C, D, 9V	1	Poor
Alkaline	8+ Years	Medium	AAA, AA, C, D, 9V	1	Poor
Lithium (Primary)	15+ Years	High	AAA, AA, C, D	1	
<i>Excellant</i> NiCd	3 Months	Med-Low	AAA, AA, C, D, 9V	1-2K	Good
NiMH	2 Months	Medium	AAA, AA, C, D, 9V	500-800	Poor
Lithium-ion	6 Months	High	R123A, other related sizes	300-500	
<i>Excellent</i>					

This table is a quick reference to some general comparisons of various cell types.

Other general notes on various cell types. Shelf Life improves if you store the batteries in a cooler environment. After a rechargeable battery loses its charge due to shelf life, a simple

recharge will put you back in business. Cold weather is defined as sub-freezing temperatures, and all cell types that got a “poor” rating can be warmed up in a pocket, put in an appliance and be expected to work again until they get too cold.

Battery cells should be treated like fuel. Take care of them, do not get them wet, do not throw them in fires, try not to drop them or get them banged up and they should be quite safe. Get water proof carry cases for your kits for them. You probably shouldn't store cells in devices if they are going to be packed away. If you store quantities of Lithium batteries in a house they should be stored in a fire proof box with vent holes drilled into a side of the box as a safety precaution (do not place vent holes near flammable objects). Do not store them in a tent. Don't get paranoid about Lithiums, you probably use them every day in devices like a cell phone, but you've probably hear a story or two of “exploding” batteries. What they really do is “vent rapidly with flame” (quite rare), use caution and don't buy knock offs.

Primary cells should be in your emergency kits as well as a small reserve for extended on the go emergencies, rechargeable cells will be more useful in a longer term emergency when you can settle down a bit but power still doesn't exist. AA cells are the most available with the best prices, adapters can also be found to make them fit into devices that use C and D batteries. AA rechargeable also don't require nearly as long as D cells to recharge.

Heavy Duty (Single use, Disposable)

Poor, not recommended. Cheap lights come with these batteries, it should also be taken as a sign that the light manufacture has cut every conceivable cost in the production and shipping of his light. Avoid them.

Alkaline (Single use, Disposable)

Good value. Costs are very reasonable, just stay away from poor brands as they are likely to leak and damage your devices and the residue is usually toxic. Duracell, Energizer, Rayovac, and most storebrand names are fine (Costco, Rite-aid). Stay away from Western Family and unknown brands.

Lithium (Single use, Disposable)

Expensive, but great cold weather performance for a primary cell, highest energy density. It would be good to have a few of these around for AA devices. Also in cases where weight, size, and capacity is more of an issue than cost.

NiCd (Rechargeable)

Most durable type of rechargeable cell. There is a reason that in an era of NiMH and Li-ion batteries power tools and other such items that see regular hard use still use NiCDs. You can expect these cells to give you 5 years of use from the date of manufacture, if you care for them. And they do require care, suck them dry once every month or two and they'll hold out the longest. For longer term storage, put them in a cool place at about half charge. Not a bad value, good cold weather performance without a high cost. I would have some of these if you plan on using a standard rechargeable. Toxic, please use care when disposing of these cells.

NiMH (Recharagable)

Best value and convenience, an excellent value for what you receive with these batteries. They don't hold a charge long on the shelf but for regular battery use, they can't be beat. Some newer cells are available with a low self-discharge property at slightly reduced capacity (see Sanyo Eneloop or Titanium Enduro cells). They don't like the cold very much, so if it's cold outside you can put a flashlight in your pocket where it'll be warmer. Expect up to 3 years effective use from the date of manufacture, longer is possible but probably at reduced performance as the cell deteriorates.

Lithium-Ion (Recharagable)

Rather exotic and requires special care and attention. Special chargers are required, only really an option when you have a larger power source available to charge off of, like a car or off grid electrical system, or if you know how to build your own solar system to run the charger. Good cold weather performance, good power density (superior to even NiMH). However they deteriorate rapidly with time. Even 1 year will see reduced performance. You've probably noticed this with your cell phone and laptop computer batteries. Not the best long term option.

Lead Acid

Lowest self discharge of the rechargeable cells. Also the cheapest per unit of power. However they are also the least portable being the bulkiest. They can work well for area lighting and lanterns. Also for recharging smaller cells.

Once you have a good idea what you want and have acquired a few items. Run a family home evening off your battery devices only. Spend 1, 2, or even 3 days without the grid electric lights, learn what your needs are and use this information to fill them.

2005 Brandon Mansfield

THE SUPPLY TABLE (Master Preparedness List)

This list is based on a family of *two/three adults and two/three children* that want to take their preparedness beyond the simple 96 hour kits and become more fully prepared for

What ever may come. The items within each category are listed by "Purchase Priority". The quantities listed are for a 30 day to one-year crisis. Because some items are impossible to store indefinitely or it would not be cost-effective to store the quantities necessary to maintain our current lifestyle, it is assumed that alternate sources or substitutes will be found or changes in lifestyle will occur if the crisis lasts over one year. Quantities could be adjusted for other estimated lengths of crisis.

There are 3 major groupings that are based on the duration of the "Crisis", 30 Days, 90 Days and 1 Year. (*I know the list looks daunting at first glance, but just focus in on one group at a time*). Within each of these three durations, items are prioritized. It should be your goal to obtain all of the "30 Day" items in sequence from Priority 1 to 3, by April 1st. Then move onto your "90 Day" items in the same manner obtaining them by July 1st, and finally onto your "1 Year" items by October 1st. This will allow you to build up your

preparedness in stages, 30 Days first (as these items would be needed in EVERY scenario) 90 Days second (as they build on the 30 day list), and finally your 1 Year equipment that rounds out your preparations.

The purchase priority is not how important the item is. I believe everything on this list is important. The purchase priority is how soon the item should be purchased *to avoid shortages should other people decide to start “stocking up” on the same items.* I firmly believe that there will be a wake up call for a lot of people. A priority “1” item should be purchased ASAP. A priority “2” item should be purchased before most people figure out what is going on. Priority “3” items should be available until later. These are common household items which should be manufactured and shipped right up until the last minute. The purchase date is my guideline of when to make purchases. Items with a “Last minute” listing are perishable and you want as long a shelf life as possible. Signs of shortages or panic should be watched closely to avoid missing out on these items. The final three columns indicate whether I think the item would be necessary for a 1 month, three month, one year to indefinite crisis.

Clothing

Keep in mind that a crises will likely be during the winter and adjust this list for your climate. Warm, Waterproof, Windproof clothing. Think *Wool, Gore-Tex, Polarfleece, Polypro, Thinsulate. Avoid Cotton!*

Item	Qty. Required	Priority	Plan Date	
Duration				
Bandanas	24 each	3		
<i>(inexpensive shield face, head cover, wash cloth, bandage, sanitary pad)</i>				
Baclava	1/person	3	4-1-08	30 Day
Boots	2/person	2	4-1-08	30 Day
Boots, (insulated)	1/person	2	4-1-08	30 Day
Bra athletic	2/female	3	4-1-08	30 Day
Clothes line	100 ft	3	4-1-08	30 Day
Clothes pins	250	3	4-1-08	30 Day
Clothes Wringer (hand crank)	1	2	7-1-08	90 Day
Coats	1/person	2	4-1-08	30 Day
Hats	1/person	3	7-1-08	90 Day
Iron-on patches.	2 packages	3	4-1-08	30 Day
Laundry detergent	5 (5gal)	3	4-1-08	30 Day
Long sleeve shirt/high collar	5/person	3	4-1-08	30 Day
Long underwear	3/person	2	4-1-08	30 Day
Needles Assortment		3	7-1-08	90 Day
Non-electric washing machine	1	1	4-1-08	30 Day
Jean Pants	6/person	3	4-1-08	30 Day
Rain Parka/Rain Pants	2/person	2	4-1-08	30 Day
Safety pins Assortment		3	7-1-08	90 Day
Sewing patterns Assortment		3	10-1-08	1 Year
Sewing supplies Assortment		2	4-1-08	30 Day
Shirts 6/person		3	4-1-08	30 Day

Shoelaces	20	3	7-1-08	90 Day
Snow Jacket	1/person	3	4-1-08	30 Day
Socks heavy	12/person	3	4-1-08	30 Day
Stove iron	1	1	7-1-08	90 Day
Sweats/nightclothes	2/person	3	4-1-08	30 Day
Tennis Shoes	2pair/person	3	4-1-08	30 Day
Thread Assortment		3	7-1-08	90 Day
Underwear	12/person	3	4-1-08	30 Day
Wash board	2	1	7-1-08	90 Day
Wash tub	2	1	7-1-08	90 Day
Winter gloves	1/person	2	4-1-08	30 Day
Work Gloves	3	2	7-1-08	90 Day
Zippers and buttons Assortment		3	4-1-08	30 Day

Communications

The phone/address books are of friends and family so that you can look them up after the worst has passed. If phones are not working you may have to travel to their home to check on them.

*Keep these items in waterproof containers. Many survival and camping stores sell flat, water tight pouches. If you have a food vacuum sealer, this is another great use for it!

Item	Qty. Required	Priority	Plan Date	
Duration				
Addresses of friends /family	1 set			
CB Radio	1	2	4-1-08	30 Day
Cell phone				
Frequency lists/books	1	2	7-1-08	90 Day
Map of your local area	2	2	4-1-08	30 Day
Phone numbersof friends/family	1 set			
Pre-addressed, stamped postcards	1 set			
Radio (hand cranked)	1	1	4-1-08	30 Day
Road Flares	8	3	7-1-08	90 Day
Short-wave Radio	1	1	7-1-08	90 Day
Signal Flares	12	2	7-1-08	90 Day
Signal Mirror	1/person	3	7-1-08	90 Day
Signal Whistle	2/person	3	7-1-08	90 Day

Documents

	Now	30/90/Year	
Birth, death, marriage certificates and divorce decrees,			Now
30/90/Year			

Charge card account numbers, "lost or stolen" notification numbers	Now
30/90/Year	
Deeds and contracts,	Now
30/90/Year	
House and life insurance policies,	Now
30/90/Year	
Inventory of valuable household items,	Now
30/90/Year	
Medical records including immunizations	Now
30/90/Year	
Passports, where pertinent for each family member	Now
30/90/Year	
Social security numbers	Now
30/90/Year	
Stocks and bonds	Now
30/90/Year	
Vaccination records	Now
30/90/Year	
Wills	Now
30/90/Year	

Entertainment & Education

Disasters may provide excellent opportunities to share Christ with others so extra scriptures would be a good thing to have.

Item	Qty. Required	Priority	Plan Date	
Duration				
Bible & scriptures	1/person	3	4-1-08	30 Day
Bibles & BOM	6	1	4-1-08	30 Day
Board Games	1 set	3	4-1-08	30 Day
Books for pleasure reading	Many	3	4-1-08	30 Day
Book on Edible plants	1	3	10-1-08	1 Year
Card game book	1	3	4-1-08	30 Day
Cards	4 sets	3	4-1-08	30 Day
Crayons	2	3	4-1-08	30 Day
Domino game book	1	3	4-1-08	30 Day
Dominoes	1	3	4-1-08	30 Day
Erasers	10	3	4-1-08	30 Day
Home School Curriculum	1/child	2	10-1-08	1 Year
How to books	Many	1	7-1-08	90 Day
Hoyle game rule book	1	3	4-1-08	30 Day
Magnifying Glass	1 each	3	4-1-08	30 Day
Non-electric pencil sharpener	2	3	4-1-08	30 Day
Paper	100 pads	3	4-1-08	30 Day
Paper Clips, assorted sizes	1 box	3	4-1-08	30 Day
Pencils	100	3	4-1-08	30 Day
Pencil Sharpner	2	3	7-1-08	90 Day
Pens	50	3	4-1-08	30 Day

Reference books	1	7-1-08	90 Day
Rubber Bands, assorted sizes 1 box	3	4-1-08	30 Day
Safety Pins, assorted sizes 1 box	3	4-1-08	30 Day
Toys	3	4-1-08	30 Day

First Aid Supplies

Item	Qty. Required	Priority	Plan Date	Duration
Ace bandage	5	3	4-1-08	30 Day
Band aids	6 large assort	3	4-1-08	30 Day
Band aids Finger tip	1 large box	3	4-1-08	30 Day
Band aids Knuckle	1 large box	3	4-1-08	30 Day
Bandages (Ace) elastic, 4"	2	3	4-1-08	30 Day
Bandages, gauze, 2", 3", 4"	4 boxes	3	4-1-08	30 Day
Bandages, gauze, 18" x 36"	1	3	4-1-08	30 Day
Bandages, burns (Second Skin)	1 box	2	4-1-08	30 Day
Bandages Triangular	3	3	4-1-08	30 Day
Birth supply kit	1	3	7-1-08	90 Day
Burn Dressings (Burn Free)	Assorted	2	4-1-08	30 Day
Butterfly closures /Leukostrips	1 large box	3	4-1-08	30 Day
Cold/heat Pack, instant	5 each	3	4-1-08	30 Day
Cold/heat Pack, reusable	1	3	4-1-08	30 Day
Cotton Balls	1 box	3	4-1-08	30 Day
Cotton Swabs	1 large box	3	4-1-08	30 Day
Eyedropper	1	3	4-1-08	30 Day
Eye pads	1 large box	3	4-1-08	30 Day
First aid manual	1	3	10-1-08	1 Year
Gauze 2"	5 rolls	3	4-1-08	30 Day
Gauze 3"	5 rolls	3	4-1-08	30 Day
Latex gloves	1 box	3	4-1-08	30 Day
SAM splint	1	3	10-1-08	1 Year
Scalpel	1 box	3	4-1-08	30 Day
Scissors, Surgical pointed	1	3	10-1-08	1 Year
Shears	2	3	10-1-08	1 Year
Snake bite kit	1	3	7-1-08	90 Day
Space Blankets	4	3	4-1-08	30 Day
Sterile pads 4" x 4"	1 large box	3	4-1-08	30 Day
Sterile pads 5" x 9"	1 large box	3	4-1-08	30 Day
Surgical tape	10 rolls	3	4-1-08	30 Day
Thermometer	4	3	4-1-08	30 Day
Tongue Depressors	6	3	4-1-08	30 Day
Tweezers	4	3	4-1-08	30 Day

First Aid, Perishables

Item	Qty. Required	Priority	Plan Date	
Duration				
Alcohol	6	3	7-1-08	90 Day
Alcohol Moist Towelettes	100	3	Last minute	30 Day
Analgesic Cream (<i>Camphophenique</i>)	1 tube	2	Last minute	30 Day
Antacid (<i>Mylanta, Tums, Pepto-Bismal</i>)	1 box	2	Last minute	30 Day
Antibiotic (<i>Amoxicillin /Erythromycin/Tetracycline for general infections</i>)	1 set	2	Last minute	30 Day
Anti-Diarrheal (<i>Imodium, Diasorb, Lomotil</i>)	1 box	2	Last minute	30 Day
Anti-fungal (<i>Desenex, Micatin, Tinactin, Lotrimin</i>)	1 box	2	Last minute	30 Day
Antihistamine (<i>Benadryl, Claratyne</i>)	1 box	2	Last minute	30 Day
Antiseptic Ointment (<i>Neosporin</i>)	3 tube	2	Last minute	30 Day
Aspirin	6 (100)	3	Last minute	90 Day
Bee sting ointment	6 tubes	3	Last minute	30 Day
Bicarbonate of Soda	1 box	2	7-1-08	90 Day
Bronco Dialator (<i>Primatine Mist</i>)	1	2	Last Minute	30 Day
Burn Ointment (<i>Hydrocortisone, Derm-Aid</i>)	1 tube	2	Last minute	30 Day
Cold/Flu Tablets (<i>Nyquil</i>)	1 box	2	Last minute	30 Day
Constipation (<i>Ex-Lax, Dulcolax, Durolax</i>)	1 box	2	Last minute	30 Day
Cough Syrup (<i>Robitussin, Dimetap</i>)	1 bottle	2	Last minute	30 Day
Epsom Salts	1 box	2	7-1-08	90 Day
Eye Drops (<i>Visine</i>)	1 bottle	2	Last minute	30 Day
Eye Wash	1 bottle	2	Last minute	30 Day
Hemorrhoid Relief (<i>Preparation H, Anusol</i>)	1 tube	2	Last minute	30 Day
Hydrogen peroxide	6 bottles	3	7-1-08	90 Day
Ibuprofen (<i>Advil, Motrin</i>)	1 box	2	Last minute	30 Day
Itching, Insect/Rash (<i>Caladril, Calamine</i>)	1 bottle	2	Last minute	30 Day
Itching (<i>Dibucaine, Lanacane</i>)	1 tube	2	Last minute	30 Day
Lice (<i>Nix or RID Lice Shampoo</i>)	1 tube	2	Last minute	30 Day
Lip Balm (<i>ChapStick, Blistex</i>)	1 tube	2	Last minute	30 Day
Lubricant, Water Soluble (<i>K-Y Jelly</i>)	1 tube	2	Last minute	90 Day

Meat Tenderizer	1 bottle	2	7-1-08	90 Day
bites & stings				
Nasal Decongestant (<i>Actifed, Sudafed Sinex</i>)	1 bottle	2	Last minute	30 Day
Nausea, Motion Sickness (<i>Kwells, Dramamine, Meclizine</i>)	1 box	2	Last minute	30 Day
Non-Aspirin Pain Reliever (<i>Tylenol</i>)	1 box	2	Last minute	30 Day
Pain, Fever Reducer (<i>Panadeine, Mobigesic</i>)	1 box	2	Last minute	30 Day
Pain Reliever with Codeine (<i>Tylenol 3</i>)	1 box	2	Last minute	30 Day
Prescriptions (as needed)		1	Last minute	30 Day
Petroleum Jelly (<i>Vaseline</i>)	1 jar	2	Last minute	30 Day
Poison Ivy/Oak (<i>Neoxyn</i>)	6 bottle	2	Last minute	30 Day
Poison Absorber (<i>Activated Charcoal</i>)	1 bottle	2	Last minute	90 Day
Soap, liquid, antibacterial	1 bottle	3	Last minute	30 Day
Sunburn Relief (<i>Solarcaine</i>)	1 can	2	Last minute	30 Day
Sunscreen (SPF 15 at least)	1 bottle	2	Last minute	30 Day
Vomit Inducer (<i>Ipecac</i>)	1 bottle	2	Last minute	30 Day
Yeast Infection Treatment (<i>Gyne-Lotrimin, Monistat</i>)	1 tube	2	Last minute	30 Day

Food Preparation

The fire place insert would ideally be designed to cook on. The fire grate is for cooking outside over an open fire. Crisco shortening is listed because it can be stored for a long time.

Item	Qty. Required	Priority	Plan Date	
Duration				
Plastic Wrap	1 roll			
Aluminum foil, Heavy	6 large rolls	3	4-1-08	30 Day
BBQ grill (charcoal/propane)	1	3	7-1-08	90 Day
Boning Knife	2	3	4-1-08	30 Day
Bread Loaf Pan	4	3	4-1-08	30 Day
Butcher Knife	1	3	4-1-08	30 Day
Butter churn	1	2	10-1-08	1 year
Camp Stove	1	2	4-1-08	30 Day
Can opener (hand cranked)	2	3	4-1-08	30 Day
Can Opener, heavy duty	1	3	4-1-08	30 Day
Canning books	1 set	2	7-1-08	90 Day
Cast iron cook set - (<i>Complete!</i>)	1 set	2	4-1-08	30 Day
Cheesecloth	1 roll	3	4-1-08	30 Day
Cheese press	1	2	10-1-08	1 Year
Coffee filters	100	3	4-1-08	30 Day
Coffe maker, metal	1	3	4-1-08	30 Day

Coleman metal dinner plates	1 set	2	4-1-08	30 Day
Coleman Cooler	2	3	4-1-08	30 Day
Corkscrew	1	3	4-1-08	30 Day
Crock pot, Large	1	1	10-1-08	1 Year
Cultures	1 set	3	Last Minute	90 Day
Dish Cloths	6	3	4-1-08	30 Day
Dishwashing liquid	5 gal	3	4-1-08	30 Day
Dutch Oven, small with lid	1	2	4-1-08	30 Day
Dutch Oven, large with lid,	1	2	7-1-08	90 Day
Fire grate	1	1	7-1-08	90 Day
Fireplace insert	1	1	4-1-08	30 Day
Grain mill (hand cranked)	1	1	4-1-08	30 Day
Grater	1	3	4-1-08	30 Day
Hot Pad	1 set	3	4-1-08	30 Day
Kettle, huge, for boiling water	1	2	7-1-08	90 Day
Latex disposable gloves	1 box	2	7-1-08	90 Day
Mixing Bowl, Large	1 each	3	4-1-08	30 Day
Mixing Bowl, Small	1 each	3	4-1-08	30 Day
Molds	1 set	3	4-1-08	30 Day
Napkins	10	3	4-1-08	30 Day
Pancake Turners, metal	2	3	4-1-08	30 Day
Paper cups	100	3	4-1-08	30 Day
Paring Knife	1	3	4-1-08	30 Day
Plastic knives, forks, spoons	200	3	4-1-08	30 Day
Pressure cooker	1	2	7-1-08	90 Day
Rennet	1	3	10-1-08	1 Year
Rubber dish gloves	4 Sets	3	4-1-08	30 Day
Sauce Pan, large with lid,	1	3	4-1-08	30 Day
Sauce Pan, small with lid,	1	3	4-1-08	30 Day
Scrub pads	50	3	4-1-08	30 Day
Skillet, large with lid,	1	3	4-1-08	30 Day
Spoons, large metal	2	3	4-1-08	30 Day
Spoons, Wooden	2	3	4-1-08	30 Day
Strainer	1	3	4-1-08	30 Day
Thermos	1/person	2	4-1-08	30 Day
Yeast	1 box	3	Last minute	30 Day
Yogurt culture,	1 box	3	Last Minute	90 Day
Ziploc Bags - Sandwich	100	3	4-1-08	30 Day
Ziploc Bags - Storage	50	3	7-1-08	90 Day
Ziploc Freezer Bags, gallon	2 boxes	3	7-1-08	90 Day
Ziploc Freezer Bags, quart	2 boxes	3	4-1-08	30 Day

Food Storage

Item	Qty. Required	Priority	Plan Date	
Duration				
1 gal. plastic bags	300	3	7-1-08	90 Day
Baskets/crates	24	1	10-1-08	1 year

Boiling canner	1	1	10-1-08	1 year
Bucket opener	2	1	10-1-08	1 year
Canning book	1	1	10-1-08	1 year
Canning jars	100	1	10-1-08	1 year
Canning lids	500	1	10-1-08	1 year
Canning salt	20lb	1	10-1-08	1 year
Canning supplies (Misc)	Assortment	1	10-1-08	1 year
Canning Utensils	Assortment	1	10-1-08	1 year
Colander	1	1	10-1-08	1 year
Desiccants	60 (66gm)	1	4-1-08	30 Day
Food storage buckets	30 (5 gal)	1	7-1-08	90 Day
Jar lifter	1	1	10-1-08	1 year
Jars	Assortment	1	10-1-08	1 year
Lids	Assortment	1	10-1-08	1 year
Mesh bags	24	1	10-1-08	1 year
Oxygen absorbers	50 (500ml)	1	7-1-08	90 Day
Parafin Wax	5lb	1	10-1-08	1 Year
Pressure canner	1	1	10-1-08	1 year
Saucepan	2	1	10-1-08	1 year
Saucepot	3	1	10-1-08	1 year
Scale	1	1	10-1-08	1 year
Storage/garden books	Assortment	2	10-1-08	1 year
Timer	1	1	10-1-08	1 year
Tongs to remove jars	2	2	4-1-08	30 Day
Water storage	10 (5 gal)	1	4-1-08	30 Day
Water storage	2 (55 gal)	1	4-1-08	30 Day
Wax for canning				

Fuel & Power

The amount of firewood will depend on your climate and the efficiency of your stove or fireplace. The kerosene is for the lamps under “General Household”. Sta-bil is an additive which allows gasoline to be stored longer than normal. The barrel is to transport gasoline in if it can be purchased.

Item	Qty. Required	Priority	Plan Date	
Duration				
Barrel (55 gal)	1	1	7-1-08	90 Day
Charcoal	500 lb.	1	4-1-08	30 Day
Fire starters	2	1	7-1-08	90 Day
<i>(jelly, ribbon, tablets, impregnated peat bricks, wax-coated pine cones, magnesium block, flint)</i>				
Fire wood	10 cords	2	4-1-08	90 Day
Fuel filter for generator	1	2	4-1-08	30 Day
Fuel pump	1	1	4-1-08	30 Day
Gasoline	500 gal	2	10-1-08	1 Year
Gas cans (5 gal)	6	2	4-1-08	30 Day
Kerosene	50 gal	2	7-1-08	90 ay
Kerosene storage barrel	1 (55gal)	2	7-1-08	90 Day

Lighter Fluid	5 cans	2	4-1-08	30 Day
Matches 20	(250)	1	4-1-08	30 Day
Propane	500 gal	2	7-1-08	90 Day
Spark plug for generator	1	2	4-1-08	30 Day
Sta-bil	8 qt	1	4-1-08	30 Day
Starter fluid	5 gal	1	4-1-08	30 Day
White Gas Coleman (for campstove)	10 (1 gal)	2	4-1-08	30 Day

Gardening

Non-hybrid seeds will reproduce true to the parent plant. Hybrid seeds may reproduce with a recessive gene. The polyethylene is for covering young plants to maintain warmth and moisture. The styrofoam cups are for coverings seedlings during late winter frosts.

Item	Qty. Required	Priority	Plan Date	
Duration				
Black polyethylene	1	2	10-1-08	1 year
Bleach	5 gal	2	10-1-08	1 year
Clear polyethylene	1	2	10-1-08	1 year
Garden hoses	2	3	4-1-08	30 Day
Herb Seeds	Assortment	2	10-1-08	1 year
Hoe	2	3	7-1-08	90 Day
Misters for seedlings	2	2	10-1-08	1 year
Miracle Gro		2	10-1-08	1 year
Non-hybrid seeds	Assortment	1	10-1-08	1 year
Organic fertilizers	Assortment	2	10-1-08	1 year
Perennial flowerseeds	Assortment	3	10-1-08	1 year
Pull wagon	1	3	7-1-08	90 Day
Rototiller	1	2	10-1-08	1 year
Seed starting containers	Assortment	2	10-1-08	1 year
Seed starting medium	Assortment	2	10-1-08	1 year
Thermometers	2	2	10-1-08	1 year
Soil testing equipment.	1	1	10-1-08	1 year
Sprayer/Pumper-2 gallon size	1	3	7-1-08	90 Day
Styrofoam cups	1000	2	10-1-08	1 year
Watering can	1	2	10-1-08	1 year
Wheel barrel	2	2	10-1-08	1 year

Bug spray. Malathion, Sevin, Dursban and Diazanone. Dursban and Diazanone. Dursban and Diazanone can have severe side effects in humans, for use outside of house, not necessarily on the garden. Fine for flower gardens. Sevin is safer to use on the vegetables.

Hardware & Building Supplies

Item	Qty. Required	Priority	Plan Date
Duration			

A few cases of silicone caulk. (If you are like me and your carpentry isn't perfect.)

Bolts	Assortment	3	7-1-08	90 Day
Bricks, rocks	Assortment	3	10-1-08	1 Year
Cable	100 ft	3	7-1-08	90 Day
Cable clamps	8	3	7-1-08	90 Day
Cement	10 bags	3	10-1-08	1 year
Chains and padlocks.	Several	3	7-1-08	90 Day
Chicken wire, barbed wire, etc.	2 rolls	3	10-1-08	1 Year
Duct tape	10 rolls	3	4-1-08	30 Day
Extra axe handles	2	3	10-1-08	1 year
Long polls	10	3	10-1-08	1 Year
Fencing material.	Assortment	3	10-1-08	1 year
Lumber	Assorted	3	10-1-08	1 Year
Mouse traps	5	3	4-1-08	30 Day
Nails	100 lbs.	3	7-1-08	90 Day
Nuts and bolts	Assorted	3	4-1-08	30 Day
Pipe	Assorted	3	4-1-08	30 Day
Plumbing repair supplies	Assorted	3	4-1-08	30 Day
Polyethylene Black	2	3	7-1-08	90 Day
Polyethylene Clear	2	3	7-1-08	90 Day
Pulleys	4	3	7-1-08	90 Day
Rigging book	1	3	7-1-08	90 Day
Rope	Assorted	3	4-1-08	30 Day
Screws	Assorted	3	7-1-08	90 Day
Spare keys to all of your locks. <i>(Better yet, have them all set up to take the same key).</i>	1 set	2	4-1-08	30 Day
Spare parts for your wheelbarrow	1 set	3	7-1-08	90 Day
Spare toilet parts	1 set	3	7-1-08	90 Day
Tarps	4	3	4-1-08	30 Day
WD-40	1 gal	3	7-1-08	90 Day
Wire	Assorted	3	4-1-08	30 Day

Household Items

The water filter is assuming you have a stream or other reliable source of water. The ni-cad batteries are rechargeable for the radio. Other batteries should be sized according to your needs.

Item	Qty. Required	Priority	Plan Date	
Duration				
Backpack with Frame (for Hauling)	1/person	2	4-1-08	30 Day
Batteries AA	100	1	Last minute	30 Day
Batteries AA, Ni-Cad	8	1	4-1-08	30 Day
Batteries C	20	1	Last minute	30 Day
Batteries C, Ni-Cad	8	1	4-1-08	30 Day
Batteries D	100	1	Last minute	30 Day

Batteries D, Ni-Cad	8	1	4-1-08	30 Day
Battery Charger, SOLAR	2	1	4-1-08	30 Day
Blankets	10	1	4-1-08	30 Day
Camera	1	3	7-1-08	90 Day
Camera batteries	1 set	3	Last minute	90 Day
Camera film	3 rolls	3	Last minute	90 Day
Candles 10 hour	50	1	4-1-08	30 Day
Candles 36 hour	25	1	4-1-08	30 Day
Candles 100 hour (liquid parafin)	25	1	4-1-08	30 Day
Candle holders	1 set	2	4-1-08	30 Day
Candle wax/wick 10lbs 2	7-1-08			90 Day
Carpet sweeper	1	3	4-1-08	30 Day
hand operated				
Clocks wind up	3	3	4-1-08	30 Day
Fanny pack for	1/person	2	4-1-08	30 Day
Fire extinguishers	4	3	4-1-08	30 Day
short excursions				
Flashlights	5	2	4-1-08	30 Day
Flashlight bulbs	2/light	3	4-1-08	30 Day
Handwarmer, lighter fueled	1	3	4-1-08	30 Day
Kerosene Heater	2	1	4-1-08	30 Day
Kerosene lamps	4	1	4-1-08	30 Day
Kerosene lamp wicks	10	1	4-1-08	30 Day
Lighters (disposable)	50	2	4-1-08	30 Day
Light sticks (12 hour)	18	3	4-1-08	30 Day
Matches stick(boxes of 250)	20	2	4-1-08	30 Day
Matches, water/windproof	5 boxes of 20	2	7-1-08	90 Day
Mosquito Netting	1 roll	3	7-1-08	90 Day
Paper towels	100	3	4-1-08	30 Day
Pet Food as needed		3	4-1-08	30 Day
Permanent Ink Marker	2	3	4-1-08	30 Day
Propane Heater	2	2	4-1-08	30 Day
Sleeping bags	1/person	1	4-1-08	30 Day
Sleeping Bag Mattress Pads	1/person	1	4-1-08	30 Day
Tents (2 person)	2	2	4-1-08	30 Day
Trash bags	10 boxes	3	4-1-08	30 Day
Treadle Sowing Machine	1	2	7-1-08	90 Day
Walkie talkies	1 pair	1	4-1-08	30 Day
Watches	5	3	4-1-08	30 Day
Wool Blankets, heavy	2/person	2	4-1-08	30 Day

Infant Supplies

Item	Qty. Required	Priority	Plan Date	
Duration				
Baby Food	????	2	Last Minute	30 Day
Baby Clothes	3 sets	1	4-1-08	30 Day
Baby Powder	2 bottles	1	4-1-08	30 Day
Baby Wash	2 bottles	1	4-1-08	30 Day
Blankets	2 each	1	4-1-08	30 Day
Bottles	3 each	1	4-1-08	30 Day
Diaper Cover		1	4-1-08	30 Day
Diapers, disposable (24 count)	26 boxes	1	4-1-08	30 Day
Diaper Rash Ointment	1 bottle	1	4-1-08	30 Day
Formula	? cans	1	Last Minute	30 Day
Lotion	2 bottles	1	4-1-08	30 Day
nursing bras	1 each	1	4-1-08	30 Day
Nursing pads	4 each	1	4-1-08	30 Day
Teething Ring	1 each	1	4-1-08	30 Day
Towelettes, Pre-moistened	2 boxes	1	4-1-08	30 Day
Toys	As needed	1	4-1-08	30 Day

Miscellaneous

Guns are like tools, it's difficult to have too many. The quantity and types of guns required will vary tremendously from one person to another. No amount of supplies will do you any good if someone else takes them from you by force. Self defense is an important consideration and, if wild game is in the area, hunting can provide fresh meat. The maps should be very detailing showing back roads in case major highways are closed or clogged. I always wanted a night vision scope, so I threw it in for good measure. The safe is for storing records, documents, cash, and gold or silver. A burn barrel is for disposing of household garbage and a spark arrestor is a grated top to prevent accidental fires.

Item	Qty. Required	Priority	Plan Date	
Duration				
5 gallon emergency toilet	1	2	4-1-08	30 Day
Ant spray concentrate	1	3	4-1-08	30 Day
Binoculars	2	3	4-1-08	30 Day
Book on using compass	1	1	4-1-08	30 Day
Burn barrel	2	3	7-1-08	90 Day
Compass	2	1	4-1-08	30 Day
Fishing tackle	Assortment	3	10-1-08	1 year
Knives	Assortment	1	4-1-08	30 Day
Metal bucket - for charcoals/ashes	1	3	4-1-08	30 Day
Night vision scope	1	1	4-1-08	30 Day
O.D. parachute cord	200ft	3	7-1-08	90 Day
Safe	1	1	4-1-08	30 Day

Spark arrestor	2	3	4-1-08	30 Day
Sponges	10	3	4-1-08	30 Day
Toilet seat	1	3	7-1-08	90 Day
Trash bags - 13 gallon size	1 box	3	4-1-08	30 Day
Trash bags - 33 gallon size	1 box	3	4-1-08	30 Day
Water buckets 5 gal	2	3	4-1-08	30 Day
Glue of various types several		3	7-1-08	90 Day
<i>(wood glue, super glue, weather stripping adhesive, etc.)</i>				
Paint	10 gal	3	10-1-08	1 year
Rolls of 10 mil“Visqueen”	3	3	4-1-08	30 Day
Tape assortment		3	4-1-08	30 Day
<i>(especially duct tape, masking tape, packing tape, etc.)</i>				
Window screen.	2 Rolls	3	10-1-08	90 Day

Money

\$1000. in cash and change (during times of disaster charge cards and checks will not be honored *Money is always hard to tuck away and pretend it isn't there, but in this instance, it is a necessity. One can't assume to put expenditures on credit cards during a crisis. Think about it. Whenever you make a purchase, it is always verified by a telephoned authorization number. If phone lines are down and these numbers are not obtainable, chances are your purchase won't be allowed.*

Item	Qty. Required	Priority	Plan Date	
Duration				
Cash	\$1000/person	1	4-1-08	30 Day
Gold	10oz/person	1	10-1-08	1 Year
Silver	100oz/person	1	7-1-08	90 Day

Personal Toiletries

Solar showers use the sun to heat water for bathing. Lime is used to keep down odors from human waste. Quantities are not given for feminine or baby needs because I am not familiar with them.

Item	Qty. Required	Priority	Plan Date	
Duration				
Baby wipes	1 box	3	4-1-08	30 Day
Bar soap	100	3	4-1-08	30 Day
Barber scissors	2 pair	3	4-1-08	30 Day
Birth Control	3 boxes	3	7-1-08	90 Day
Brushes	3/person	3	4-1-08	30 Day
Camping Potty	1	2	4-1-0	30 Day
Chapstick	24	3	4-1-08	30 Day
Combs	3/person	3	4-1-08	30 Day
Contact cleaning supplies	1 set	3	last minute	30 Day
Cotton swabs	4 (500)	3	4-1-08	30 Day
Dental floss	12	3	4-1-08	30 Day
Deodorant (men's)	12	3	4-1-08	30 Day
Deodorant (women's)	12	3	4-1-08	30 Day
Fingernail clippers	1/person	3	4-1-08	30 Day
Fingernail file metal	1/person	3	4-1-08	30 Day

Fluoride Rinse	2 bottles	3	7-1-08	90 Day
Glasses	2 pair	2	7-1-08	90 Day
Insect Repellent	4 cans	3	7-1-08	90 Day
Kleenex	50 boxes	3	4-1-08	30 Day
Lime	100 lbs.	3	7-1-08	90 Day
Liquid Hair Shampoo (Adult)	2 bottles	3	4-1-08	30 Day
Liquid Hair Shampoo (Child)	2 bottles	3	4-1-08	30 Day
Liquid Hand Soap (antibacterial)	5 bottles	3	4-1-08	30 Day
Lotion	12	3	4-1-08	30 Day
Mouthwash	2 bottles	3	7-1-08	90 Day
Panty Liners	1 box	3	4-1-08	30 Day
Razor blades (men's)	30	3	4-1-08	30 Day
Razor blades (women's)	30	3	4-1-08	30 Day
Sanitary Pads	1 box	3	4-1-08	30 Day
Shampoo	24	3	4-1-08	30 Day
Shaving Cream	2 cans	3	4-1-08	30 Day
Solar Shower	2	1	7-1-08	90 Day
Sunglasses	2/person	3	4-1-08	30 Day
Tampons	1 box	3	4-1-08	30 Day
Toenail clippers	3	3	4-1-08	30 Day
Toilet paper	100 rolls	3	4-1-08	30 Day
Toothbrushes	2	3	4-1-08	30 Day
Toothpaste	5 tubes	3	4-1-08	30 Day
Towelettes, Pre-moistened	2 boxes	3	4-1-08	30 Day
Towels	15	3	4-1-08	30 Day
Tweezers, pointed	2	3	4-1-08	30 Day
Wash Cloths & Towel	4/person	3	4-1-08	30 Day

Security Supplies

Common Caliber Ammunition. I've always felt that common caliber ammunition is the best all-around barter item. Top choices are: .22 long rifle, .223 Remington (5.56 mm NATO), .308 Winchester (7.62 mm NATO), .30-06, 12 gauge (2-3/4 inch #4 Buckshot), .45 ACP, and 9mm Parabellum

Item	Qty. Required	Priority	Plan Date	
Duration				
.22 shells	1000	2	7-1-08	90 Day
Gun safe	1	1	4-1-0	30 Day
Guns/Ammo	Assortment	1	4-1-08	30 Day
Military rifle 1 oz. bottles bore cleaner	10	2	7-1-08	90 Day
Ammo reloader	1	2	10-1-08	1 Year
Ammo Cans	5	2	4-1-08	30 Day
Gun accessories	1 set/weapon	2	4-1-08	30 Day
Gun cleaning equipment	1 set/weapon	2	4-1-08	30 day
Military web gear	2/person	2	4-1-08	30 Day

*(lots of folks may *suddenly* need pistol belts, magazine pouches, et cetera.)*

Perimeter alarm of some sort	1 set	2	4-1-08	30 Day
Solar powered perimeter Lights	5	3	4-1-08	30 day
Waterproof dufflebags ("dry bags")	1/person	2	4-1-08	30 Day

Tools

The generator is for emergencies and occasional use like pumping water from a well. I do not think it is feasible to store enough fuel to run a generator full time to maintain our current lifestyle. A cant hook is a tool for rolling logs so that you can move them in to position to cut them for firewood. This assumes a source of timber to be cut for firewood. A list of hand tools could be as long as the rest of the list. At a minimum it should include pliers, wrenches, screwdrivers, and a hammer. The funnels are for transferring fuel and other liquids from bulk

storage containers to daily use containers. A come-a-long is a portable cable winch. It could be used for moving heavy objects like dead cars or fallen trees.

Item	Qty. Required	Priority	Plan Date	Duration
1 gal. gas can for mixed gas	1	3	4-1-08	30 Day
10" Wire Cutters	1	3	4-1-08	30 Day
2 cycle oil	6	3	7-1-08	90 Day
24" or 30" Bolt Cutters	1	2	7-1-08	90 Day
Axe	1	3	4-1-08	30 Day
Bar oil	1	3	7-1-08	90 Day
Blades	Assortment	3	4-1-08	30 Day
Bow saw	2	3	4-1-08	30 Day
Bow saw blades	2	3	4-1-08	30 Day
Bungee Straps (variety of lengths)	6	3	4-1-08	30 Day
Bush or Tree Saw	1	3	7-1-08	90 Day
Caulking gun	1	3	4-1-08	30 Day
Chain	1	3	4-1-08	30 Day
Chainsaw	1	3	7-1-08	90 Day
Chainsaw extra chain	2	3	7-1-08	90 Day
Chimney cleaning brush	1	3	10-1-08	1 year
Chisel/Wedge	1	3	4-1-08	30 Day
CO Detector, battery powered	2	3	4-1-08	30 Day
Come-a-long	1	3	4-1-08	30 Day
Crowbar	1	3	4-1-08	30 day
Drill, Hand-operated	1	3	4-1-08	30 day
Dust Mask	1box	3	4-1-08	30 day
Duct/100 MPH Tape	1 box	3	7-1-08	90 Day
Extra air filter	2	3	7-1-08	90 Day
Extra spark plug	2	3	7-1-08	90 Day
Funnels	Assortment	3	4-1-08	30 Day
Garden fork	2	3	7-1-08	90 Day

Generator	1	1	4-1-08	30 Day
Hacksaw	1	3	4-1-08	30 day
Hammer	1	3	4-1-08	30 Day
Hand tools	Assortment	3	4-1-08	30 Day
Hatchet	1	3	4-1-08	30 Day
Ladder	1	3	4-1-08	30 Day
Maul	1	3	4-1-08	30 Day
Oil for generator	12 qt	3	4-1-08	30 Day
Paint brushes	2	3	10-1-08	1 year
Pick	1	3	4-1-08	30 Day
Pins	1 box	3	4-1-08	30 day
Pliers, needle nose	1	3	4-1-08	30 day
Pliers, regular	1	3	4-1-08	30 day
Post Hole Digger, auger type	1	3	4-1-08	30 day
Rope, Nylon	100 feet	3	4-1-08	30 day
Saw horses	2	3	4-1-08	30 day
Scissors	2	3	4-1-08	30 day
Screwdriver, Flat Head	2	3	4-1-08	30 day
Screwdriver, Phillips	2	3	4-1-08	30 day
Sharpening files	1	3	4-1-08	30 Day
Sharpening instruments	1 set	3	7-1-08	90 day
Sharpening stone	Assortment	3	4-1-08	30 Day
Shovel, round	2	3	4-1-08	30 Day
Shovel, sharpshooter	2	3	4-1-08	30 Day
Shovel, Snow	1	3	4-1-08	30 Day
Shovel, square	2	3	4-1-08	30 Day
Sledgehammer	1	3	4-1-08	30 Day
Smoke Detector, battery powered	2	3	4-1-08	30 day
Staple Gun and Staples	1	3	4-1-08	30 day
Swiss Army Knife	1/person	3	4-1-08	30 day
Tin snips	1	3	4-1-08	30 day
Tow Chain/Straps	1	3	4-1-08	30 day
Twine or Heavy String	100feet	3	4-1-08	30 day
Two man tree saw	1	3	10-1-08	1 year
Vice Grips	1	3	4-1-08	30 day
Wedge	1	3	4-1-08	30 Day
welding outfit	1	3	7-1-08	90 Day
Wench and Cable (come along)	1	3	7-1-08	90 day
Wire Cutters	1	3	4-1-08	30 day
Wood Saw	2	3	7-1-08	90 day
Wood Screws	Assorted	3	4-1-08	30 day
Wrenches	Assorted	3	4-1-08	30 day

Transportation

Vehicle maintenance shouldn't be a problem in the short run or the long run if fuel supplies dry up. A "midlength" crisis could call for some basic maintenance though. Bicycles should come in hand for short trips and to avoid drawing attention to yourself when most people are walking. An old rebuilt car. No electronic ignition.

Item	Qty. Required	Priority	Plan Date	
Duration				
12 volt air compressor	1	3	4-1-08	30 Day
Antifreeze	2 gals	3	4-1-08	30 Day
Bicycle	1/person	3	4-1-08	30 Day
Bicycle chain repair kit	1/bike	3	4-1-08	30 Day
bicycle tire repair kit	1/bike	3	4-1-08	30 Day
Bicycle tube hand air pump	1/bike	3	4-1-08	30 day
Fan belts	1set/auto	3	7-1-08	90 Day
Fuses	1 set	3	4-1-08	30 Day
Handlebar Basket	1/bike	3	4-1-08	30 Day
Hi-Lift Jack	1	3	4-1-08	30 Day
Hoses	1set/auto	3	7-1-08	90 Day
Jacks and stands	1 set	3	4-1-08	30 day
Jumper Cables	1	3	4-1-08	30 Day
Manuals	1 set/auto	3	7-1-08	90 day
Oil filter	4	3	7-1-08	90 Day
Oil	24 quarts	3	7-1-08	90 Day
Ramps	1 set	3	7-1-08	90 day
Snow Chains	1set/auto	3	4-1-08	30 day
Spare bicycle tires	2/bike	3	4-1-08	30 Day
Spare bicycle tubes	2/bike	3	4-1-08	30 Day
Spare replacement parts for the car	1 set	3	4-1-08	30 day
Tire pressure gauge	1	3	4-1-08	30 day
Tires and blocks	1/auto	3	4-1-08	30 day
Tire sealer/inflator (can)	2/auto	3	4-1-08	30 Day
Tire wrench	1/auto	3	4-1-08	30 Day
Tools that your particular car needs	1 set	2	4-1-08	30 day
Torx screwdrivers	1 set	3	4-1-08	30 Day
Tow chain	1	3	4-1-08	30 Day
Tow strap	1	3	4-1-08	30 Day
Tube repair kits	1/bike	3	4-1-08	30 Day
Water				
55 gallon water drums	2/person	2	4-1-08	30 day
Bleach -1 gallon (5.25%)	1	3	4-1-08	30 day
Bung Wrench				
Hand pumps for drum	2	2	4-1-08	30 day
Pool tarp - 11 x 16 ft.	1	3	4-1-08	30 day
Pool water testing kit	1	3	4-1-08	30 day
Water bag (collapsible)	1	3	4-1-08	30 day

-5 gallon				
Water can - 5 gallon	2	3	4-1-08	30 day
Water chlorinating granules (pool)	1 box	3	7-1-08	90 day
Water Distiller 1 Year	1	3	10-1-08	
Water filter 30 Day	1	1	4-1-08	
Water filter, 30 Day replacement cartridge	1	1	4-1-08	
Water funnels 30 day	2	3	4-1-08	
Water jug bottles, 2qt 30 Day	2/person	2	4-1-08	
Water pump 90 Day	1	1	7-1-08	

The 100 Items to Disappear First...

The 100 items to disappear first in Sarajevo at the start of the war...

1. Generators (Good ones cost dearly. Gas storage, risky. Noisy...target of thieves; maintenance etc.)
2. Water Filters/Purifiers
3. Portable Toilets
4. Seasoned Firewood. Wood takes about 6 - 12 months to become dried, for home uses.
5. Lamp Oil, Wicks, Lamps (First Choice: Buy CLEAR oil. If scarce, stockpile ANY!)
6. Coleman Fuel. Impossible to stockpile too much.
7. Guns, Ammunition, Pepper Spray, Knives, Clubs, Bats & Slingshots.
8. Hand-can openers, & hand egg beaters, whisks.
9. Honey/Syrups/white, brown sugar
10. Rice - Beans - Wheat
11. Vegetable Oil (for cooking) Without it food burns/must be boiled etc.,)
12. Charcoal, Lighter Fluid (Will become scarce suddenly)
13. Water Containers (Urgent Item to obtain.) Any size. Small: HARD CLEAR PLASTIC ONLY - note - food grade if for drinking.
16. Propane Cylinders (Urgent: Definite shortages will occur.
17. Survival Guide Book.
18. Mantles: Aladdin, Coleman, etc. (Without this item, longer-term lighting is difficult.)
19. Baby Supplies: Diapers/formula. ointments/aspirin, etc.
20. Washboards, Mop Bucket w/wringer (for Laundry)
21. Cookstoves (Propane, Coleman & Kerosene)
22. Vitamins
23. Propane Cylinder Handle-Holder (Urgent: Small canister use is dangerous without this item)

24. Feminine Hygiene/Haircare/Skin products.
 25. Thermal underwear (Tops & Bottoms)
 26. Bow saws, axes and hatchets, Wedges (also, honing oil)
 27. Aluminum Foil Reg. & Heavy Duty (Great Cooking and Barter Item)
 28. Gasoline Containers (Plastic & Metal)
 29. Garbage Bags (Impossible To Have Too Many).
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30. Toilet Paper, Kleenex, Paper Towels
 31. Milk - Powdered & Condensed (Shake Liquid every 3 to 4 months)
 32. Garden Seeds (Non-Hybrid) (A MUST)
 33. Clothes pins/line/hangers (A MUST)
 34. Coleman's Pump Repair Kit
 35. Tuna Fish (in oil)
 36. Fire Extinguishers (or..large box of Baking Soda in every room)
 37. First aid kits
 38. Batteries (all sizes...buy furthest-out for Expiration Dates)
 39. Garlic, spices & vinegar, baking supplies
 40. Big Dogs (and plenty of dog food)
 41. Flour, yeast & salt
 42. Matches. {"Strike Anywhere" preferred.) Boxed, wooden matches will go first
 43. Writing paper/pads/pencils, solar calculators
 44. Insulated ice chests (good for keeping items from freezing in Wintertime.)
 45. Workboots, belts, Levis & durable shirts
 46. Flashlights/Lightsticks & torches, "No. 76 Dietz" Lanterns
 47. Journals, Diaries & Scrapbooks (jot down ideas, feelings, experience; Historic Times)
 48. Garbage cans Plastic (great for storage, water, transporting - if with wheels)
 49. Men's Hygiene: Shampoo, Toothbrush/paste, Mouthwash/floss, nail clippers, etc.
 50. Cast iron cookware (sturdy, efficient)
 51. Fishing supplies/tools
 52. Mosquito coils/repellent, sprays/creams
 53. Duct Tape
 54. Tarps/stakes/twine/nails/rope/spikes
 55. Candles
 56. Laundry Detergent (liquid)
 57. Backpacks, Duffel Bags
 58. Garden tools & supplies
 59. Scissors, fabrics & sewing supplies
 60. Canned Fruits, Veggies, Soups, stews, etc.
 61. Bleach (plain, NOT scented: 4 to 6% sodium hypochlorite)
 62. Canning supplies, (Jars/lids/wax)
 63. Knives & Sharpening tools: files, stones, steel
 64. Bicycles...Tires/tubes/pumps/chains, etc
 65. Sleeping Bags & blankets/pillows/mats
 66. Carbon Monoxide Alarm (battery powered)
 67. Board Games, Cards, Dice
 68. d-con Rat poison, MOUSE PRUFE II, Roach Killer

69. Mousetraps, Ant traps & cockroach magnets
70. Paper plates/cups/utensils (stock up, folks)
71. Baby wipes, oils, waterless & Antibacterial soap (saves a lot of water)
72. Rain gear, rubberized boots, etc.
73. Shaving supplies (razors & creams, talc, after shave)
74. Hand pumps & siphons (for water and for fuels)
75. Soy Sauce, vinegar, bullions/gravy/soup bases
76. Reading glasses
77. Chocolate/Cocoa/Tang/Punch (water enhancers)
78. "Survival-in-a-Can"
79. Woolen clothing, scarves/ear-muffs/mittens
80. Boy Scout Handbook, / also Leaders Catalog
81. Roll-on Window Insulation Kit (MANCO)
82. Graham crackers, saltines, pretzels, Trail mix/Jerky
83. Popcorn, Peanut Butter, Nuts
84. Socks, Underwear, T-shirts, etc. (extras)
85. Lumber (all types)
86. Wagons & carts (for transport to and from)
87. Cots & Inflatable mattress's
88. Gloves: Work/warming/gardening, etc.
89. Lantern Hangers
90. Screen Patches, glue, nails, screws,, nuts & bolts
91. Teas
92. Coffee
93. Cigarettes
94. Wine/Liquors (for bribes, medicinal, etc,)
95. Paraffin wax
96. Glue, nails, nuts, bolts, screws, etc.
97. Chewing gum/candies
98. Atomizers (for cooling/bathing)
99. Hats & cotton neckerchiefs
100. Goats/chickens

From a Sarajevo War Survivor:

Experiencing horrible things that can happen in a war - death of parents and friends, hunger and malnutrition, endless freezing cold, fear, sniper attacks.

1. Stockpiling helps. But you never no how long trouble will last, so locate near renewable food sources.
2. Living near a well with a manual pump is like being in Eden.
3. After awhile, even gold can lose its luster. But there is no luxury in war quite like toilet paper. Its surplus value is greater than gold's.
4. If you had to go without one utility, lose electricity - it's the easiest to do without (unless you're in a very nice climate with no need for heat.)

5. Canned foods are awesome, especially if their contents are tasty without heating. One of the best things to stockpile is canned gravy - it makes a lot of the dry unappetizing things you find to eat in war somewhat edible. Only needs enough heat to "warm", not to cook. It's cheap too, especially if you buy it in bulk.

6. Bring some books - escapist ones like romance or mysteries become more valuable as the war continues. Sure, it's great to have a lot of survival guides, but you'll figure most of that out on your own anyway - trust me, you'll have a lot of time on your hands.

7. The feeling that you're human can fade pretty fast. I can't tell you how many people I knew who would have traded a much needed meal for just a little bit of toothpaste, rouge, soap or cologne. Not much point in fighting if you have to lose your humanity. These things are morale-builders like nothing else.

8. Slow burning candles and matches, matches, matches

*from Jim Rawles at <http://www.survivalblog.com>
<http://www.thepowerhour.com/news/ite...pppearfirst.htm>*

Space Cramp???

(er.. cramped space... where to hide all that Food Storage!)

by Kim Hicken

Storage space got you down? Do you feel as though you are tripping over your food storage? Never fear - there is a light at the end of the storage tunnel! Storage space seems to be a never ending problem these days. Many new homes are built with terrific vaulted ceilings, great views, and NO storage space!!! Older homes can also have a shortage of space. With a little creative thinking, and some planning, Saints can have space to store the important things in your life.

The first thing that must be done, (and this is the very hardest part) is that you must de-junk your home. Saints are all packrats to a certain extent. At a speech regarding the de-junking of our homes, the presenter asked how many people present had a watch at home that did not work. Every single person in the room held up his hand. Do YOU have one of these treasures in your home? (Be honest, now!) We all have things in our homes that were once priceless treasures, but have now become a nuisance. Get rid of them! There are probably a million suggestions of ways to de-junk. Choose one that fits with your life style. A book that can help you with this is Clutter's Last Stand: It's time to de-Junk Your Life by Don Aslett. Check your local library for this, and other books on this subject.

Once you have gotten rid of some of the non-essentials, you must become creative. Stand in each room of your home and take a good look around.

- Is there storage space that is currently not being utilized?

- Is there space that is being used inefficiently?
- Are there shelves that could be built taller?
- Are there shelves that are deep that are only filled partially?
- Making efficient use of the storage space you already have may net you enough new space to store quite a bit.
- There are a lot of nice, new plastic storage containers on the market that may help you store things more easily, and stack them a bit deeper. Sturdy cardboard boxes can also help. Grocery stores will generally give you fruit boxes if you ask.

One Saint who is raising four children in a very small turn-of-the-century stone house has come up with some very creative storage space. She built her own couches using a basic toy-box type design. She purchased thick foam rubber, and made cushions to go on top of the boxes. Then she made coordinating pillows to add more comfort to the couch. The hollow bottoms have given her lots of extra space.

When she moved into the home, the cupboards had space above them. She modified them so that now her kitchen cupboards go all the way to the ceiling. No space has been wasted. She completely utilizes the space under her stairs. An upstairs bedroom built into the attic space still has some space (under the eaves) that she utilizes for additional storage.

Since she does not care for crawling around in dark places, she built small doors into the wall approximately every four feet. When she needs to put something in the space or take something out, she simply reaches in the closest door.

She does not like to move things to vacuum, so she puts many shelves on the walls, and up off the floor. By building shelves in this manner, she has moved miscellaneous family items out of prime food-storage space, allowing her to store more food. In many cases, our best food-storage space is full of things that could be stored elsewhere.

Another Saint who has six children in a modular home has learned to be creative with her space as well. She stood in her rooms and looked around, and before long, she discovered that there was a hollow space between two walls. This was not a huge space, but it was enough to provide her some more storage space. She took the paneling off that portion of the wall, and put a cupboard door on. Cupboard doors are not expensive, nor are they difficult to install. Now she has a storage closet where non-existed originally.

The floor in a small bedroom has a trap door in it that allows her to actually go under her home. There she has found a lot of great space to store things that need to be kept cool. Even in the heat of summer, this space is cool. She uses it to store potatoes, and foods that are in air-tight containers. She has buckets of honey, buckets of wheat, and buckets of beans under this room.

One good trick is to use garbage cans as bedside tables. This is done by purchasing regular garbage cans at a discount store. New ones are recommended because they have no odd smells or dirt attached! One sheet of plywood is then used to cut two circles four

to five inches bigger in diameter than the top of the can. The lids to the garbage cans are not used. Let the kids use them as shields when they play. Place the plywood circles over the top of the garbage cans, and then cover your new bedside tables with nice round covers (called “table rounds”) that coordinate with your bedspread. Nobody will know that your lovely bedside tables are actually garbage cans! This provides wonderful food storage space for some of the items that need to be stored in bulk, such as beans or wheat.

Don’t forget the space under your beds! There are lots of food items that can be stored in the small spaces under your beds. Salt, peanut butter, cans of potato flakes, canned vegetables, and cans of shortening can all be stored easily under the beds. They are also easily accessible.

Take a look at your closets. Is there room on the floor of the closet? There are many commercial closet storage systems on the market that can help you more efficiently use your space. But you can also build your own for less expense. Five gallon buckets can be stored on the floor of the closet, and a board put across the top of them to make a handy shelf for shoes and boots. Does the space in the top of the closet go all the way to the ceiling? Five gallon buckets could be stored up there as well, but it is not recommended to store heavy things in them. This may be a good place to store tissue, paper towels, or toilet paper. If you buy your laundry detergent in big buckets, these make terrific storage containers for such items.

One Saint who struggled with a tiny dining area solved two problems with one solution. She built her own benches with hollow bottoms (the toy box design again). She put colorful cushions on top, and then used her own dining room table. Benches generally seat more people than traditional chairs. Now her entire family can fit in her small dining area, and she has extra storage space as well.

Don’t let storage problems scare you! You are smarter than the things you own! A little creativity and elbow grease can go a long way toward providing more storage space in your home. Now roll up those sleeves and take a good look at YOUR home!

Here are a few more ideas sent by Food Storage Editor, Andrea Chapman:
“I have some ideas for storing in small places. One idea is a little radical, but my husband and I did it and it worked well. We took apart our bed frame and used buckets, about 12-16 to hold up our bed. It was a little higher than before, but it looked fine.

I have a friend who used the #10 cans in boxes that the fit in 6 at a time. She stacked those and used that under the bed. Also, you can stack those three high and put a table cloth over it for a nice little table in the Living Room or Family room. I have also put food storage in the boys room, in their closet on the floor. Not many little kids use all their closet space.”

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Emergency Sanitation

Care and Use of Water Supplies

If you are asked to shut off the service valve that controls the water supply to your home, or if the taps do not flow following a disaster, turn off all the water outlets. These include taps or faucets, valves on pipes supplying floatcontrolled equipment such as flush toilets, air cooling equipment, and heating equipment. Then when the water comes on again your home will not be flooded as these flotation devices sometimes stick after they have been allowed to dry out.

Turn off the gas or electricity that supplies your hot-water heater after closing your home water service valve, or when your water supply is interrupted for any other reason. Otherwise, if the limited supply of water remaining in your hot-water storage tank continues to be heated, an explosion may occur. Also, if no more water can reach the tank, continued heat will soon muddy its contents through oxidation and make the water useless for washing or drinking purposes.

If your water service is cut off following enemy attack or other natural disaster, do not try to telephone or otherwise communicate with your local water department or water company. Once service is restored, the water from your faucets may have a strong chlorine taste. Do not worry about this. It is a sign that extra precautions are being taken for your safety.

It is especially important to be sanitary in the storing, handling, and eating of food to avoid digestive upsets or other more serious illnesses.

Be sure to:

- Keep all food in covered containers.
- Keep cooking and eating utensils clean. Diarrhea may result from dish soap that is not thoroughly rinsed from dishes.
- Keep all garbage in a closed container or dispose of it outside the home when it is safe to go out. If possible, bury it. Avoid letting garbage or trash accumulate inside the shelter, both for fire and sanitation reasons.
- Wash hands and utensils frequently.
- Prepare only as much food as will be eaten at each meal.
- Paper cups and plates, paper towels and napkins are helpful if the water supply is cut off.
- Refrigerators and home freezer units should be kept closed as much as possible once the services they depend on are cut off. The food they contain will keep longer if you plan your meals well in advance so that you won't have to open the doors any more than necessary. If the gas or electric service is not restored within 12 hours, eat or cook the

most perishable items in your refrigerator before they spoil. If foods show signs of decomposition, discard them before they contaminate other foods that keep better.

- Food will keep in home freezer units after they are shut off for varying periods depending on the amount and kind of food, the temperature at which it was kept, and the construction of the freezer. Frozen meats and other frozen foods can be preserved for later use by cooking them soon after they have thawed or by quick refreezing before they have completely thawed.

Official instructions regarding food will be issued locally in the event of an emergency. These instructions will tell you the type of disaster and its effect upon milk and

other foods. Follow official instructions closely. Don't listen to rumors, and don't pass them on to others.

Laundry and Cleaning Supplies

During times of emergency it is critical that sanitation be strictly observed in the cleaning of clothing, bedding materials, and all kitchen and food preparation utensils. A book entitled *Housecleaning on a Shoestring* is available by writing to the Cooperative Extension Service, Utah State University, Logan, UT 84321. It contains useful recipes to make housecleaning products out of basic ingredients found in the home.

EMERGENCY TOILETS & GARBAGE DISPOSAL

What will you do if your toilet stops flushing and you can't get anyone to take your garbage away? If an emergency causes your toilets or garbage service to stop working you **MUST** find a way to safely dispose of the human waste (sewage) and garbage yourself. **If you don't, you will soon be spending most of your time and energy treating sick people, including yourself.**

The three most important things to do are:

1. Bury or store all garbage and human waste at least 100 feet away from water wells or open water.
2. Keep flies, roaches and animals out of the sewage and garbage;
3. Wash or clean your hands whenever you handle something dirty and **BEFORE** you handle anything that you will be putting into your mouth or someone else's mouth.

TOILETS #1 - If the toilet bowl and seat in your home are still usable (not wrecked) scrub the bowl clean using one part of laundry bleach to ten parts of water (10:1). When clean, drain the bowl and dry it. Line the bowl with a plastic or paper bag. Line the inside of the first bag with a sturdy plastic bag and lay the toilet seat on it to keep it open. Use the toilet as you normally do. After every use, sprinkle the waste with the bleach/water solution mentioned above or cover it with a layer of sawdust, wood shavings, lime, dry dirt, grass clippings, etc. Limiting the liquids that go into the bowl will make it easier to change the bags. When the bag is full or you can't stand the smell anymore, carefully tie the top of the bag tightly closed, remove it and replace with another bag. Dispose of the

waste using the instructions below. Other chemicals that can be used in place of liquid chlorine bleach are:

HTH (calcium hypochlorite), which is available at swimming pool supply stores and is intended to be used in solution. Following the directions on the package it can be mixed and stored.

Caution: *Do not use calcium hypochlorite to disinfect drinking water as it kills all the beneficial*

bacteria in the intestinal tract and thus causes mild diarrhea. Portable toilet chemicals, both liquid and dry, are available at recreational vehicle (RV) supply stores. These

chemicals are designed especially for toilets which are not connected to sewer lines. Use according to package directions. Powdered, chlorinated lime is available at building supply stores. It can be used dry. Be sure to get chlorinated lime, not quick lime which is highly alkaline and corrosive.

Caution: *Chlorinated products which are intended to be mixed with water for use can be dangerous if used dry. You may also use powdered laundry detergent, Lysol, Pinesol, ammonia, or other household cleaning and disinfecting products*

#2 - If your toilet bowl is not usable, use a five gallon bucket, wooden box or some other container sturdy enough to sit on. Sit the seat from your toilet on the bucket or make one from layers of heavy cardboard glued together, two boards laid across the top with a gap between them or cut a seat from plywood. Line with bags as outlined in #1 above.

Dispose of the full bags using the instructions below.

#3 - If the emergency will only last for a day or two, you can use “cat holes” outside. These are small, onetime personal use holes you dig in the ground and squat over. The hole should be deep enough to cover your waste **at least six inches deep** when filled. Do not do this any closer than **100 feet** from open water or water wells or the germs in the sewage will get into the water.

#4 – If the emergency will last more than a week and your toilet or bucket commode no longer will do the job you need to make a latrine. Use a shovel or posthole diggers to dig a pit four to six feet deep and about one foot wide. Place a bucket, box, barrel or anything with a hole in it that you can sit on over the pit. Whatever you use **must** cover the pit tightly so that flies cannot get in while no one is using it. The seat and box must be cleaned regularly with the bleach water solution mentioned above and kept tightly covered when not in use. When the pit fills to within eighteen inches of the top, fill the hole in with clean dirt and mound it over. Cover the mound to keep animals from digging it up.

DISPOSING OF WASTES: All wastes must be buried **no closer than 100 feet** from the nearest open water or water well or the germs will get into the water. Buried wastes must be covered with at least eighteen inches of dirt and protected from animals digging it up.

GARBAGE is trash that has food or anything else in it that would make attract insects, rats and other animals. It should not be allowed to accumulate where these pests can get into it. If garbage service is expected to resume in a few days then dry garbage should be tightly sealed in bags or kept in tightly covered garbage cans. Liquid wastes that don't have a lot of fat in them can be poured out outside if kept **more than 100 feet** away from open bodies of water and water wells. Liquids that do have a lot of fat should be buried to prevent attracting flies and roaches.

If garbage service is out for more several weeks and you are unable to store it, then it should be buried. Garbage should be buried **no closer than 100 feet** from open water or water wells. Crush containers to make them smaller. Garbage must be covered by at least

eighteen inches of dirt. If burial is not possible then it will have to be burned. To burn garbage you must use a metal barrel with holes in the bottom and a grate or screen over the top to act as a spark arrester to prevent wildfires. Only dry garbage should be burned. Wet garbage should be buried.

If you have a baby in your home, it is best to keep an ample supply of disposable diapers on hand for emergency use. If these are not available, emergency diaper needs can be met by lining rubber pants with cleansing tissue, toilet paper, scraps of cloth, or other absorbent materials. To help insure proper sanitation it is imperative that you store a sufficient supply of disposable diapers, disposable wipes, and plastic garbage can liners. Change infants and toddlers regularly and keep them clean. Dispose of the soiled diapers in the plastic garbage can liners and keep them tightly sealed when not in use to help prevent the spread of disease. Be sure to wash your own hands regularly when working with infants (especially after each diaper change). Typhoid fever, amoebic dysentery, diarrhea, infectious hepatitis, salmonella and giardiasis are diseases that spread rapidly in times of emergency and threaten all, yet are all diseases that can easily be controlled by simply following the rules of good sanitation.

Disposal of Garbage and Rubbish

Garbage may sour or decompose, rubbish (trash) will not, but offers disposal problems in an emergency. The following suggestions will make it easier for you to take care of the refuse problem.

Garbage should be drained before being placed in storage containers. If liquids are strained away, garbage may be stored for a longer period of time without developing an unpleasant odor. After straining, wrap the garbage in several thicknesses of old newspapers before putting it into your container. This will absorb any remaining moisture. A tight-fitting lid is important to keep out flies and other insects. Final disposal of all stored garbage and refuse can be accomplished in the following manner, provided there is no danger from radioactive fallout:

1. All stored garbage should be buried if collection service is not restored and if unpaved yard areas are available—keep a shovel handy for this purpose. Dig a hole deep enough

to cover it with at least 18-24 inches of dirt, which will prevent insect breeding and discourage animals from digging it up.

2. Other rubbish may be burned in open yard areas (if permission is granted by authorities under existing conditions) or left at dumps established by local authorities. Can should be flattened to reduce their bulk. Do not deposit ashes or rubbish in streets or alley ways without permission. Such material may interfere with the movement and operation of firefighting and other emergency equipment.

Emergency Generators

Generator Basics

Generators are shaft-driven machines that produce electric power. Broadly speaking, they

range in size and capacity from the tiny devices used as sensors to the extremely large machines used at commercial power plants. The term “alternator” is also used and means essentially the same thing. The term “generator set” or “genset” is sometimes used to describe a generator along with a gasoline or diesel engine or other power source.

This article covers the use of generators to provide standby power in an emergency for a single family or small group.

Generators are rated in terms of the amount of power they can produce. This is measured in Watts (W) or Kilowatts (kW). A Kilowatt is equal to 1,000 Watts. Some household items list their power requirement in Watts, such as light bulbs and small appliances. Others only list Amperes (abbreviated A or Amps). Most household electrical loads (including all cord-connected appliances that plug into a standard outlet) run on 120 Volts, and since Watts = Amps X Volts, you can determine Watts by multiplying the amp requirement by 120. Large heating and cooling appliances, and well pumps, sometimes use 240 Volts. This can be determined from the nameplate. For these loads, wattage is determined by multiplying amps by 240.

Generator Types

Commercially available generators useful for small-scale standby power fall into these categories:

Type	Wattage	Price Range
Small portable units marketed primarily for camping	Generally less than 2 kW	\$400-\$600
Midsized portable units	3-5 kW.	\$400-\$2,000
Large trailer-mount units without engines, PTO driven by a tractor	15-60 kW	\$2,000-\$5,000
Large trailer-mount units designed for	10 kW or more..	

construction or industrial use	5-40 kW or more	\$4,000-
Large standby units designed.		
\$12,000		
for permanent installation		
<i>Costs vary depending on ruggedness, reliability, and features.</i>		

The more expensive units typically include features like:

- a. Better quality engines, with pressure lubrication, cast iron cylinder blocks (or cast iron sleeves), oil filters, and electronic ignition. The primary benefit of these is longevity, although the better engines may be somewhat more reliable.
- b. Larger fuel tank for long, unattended runs.
- c. Low oil shutdown to prevent engine damage
- d. Electric start

- e. Built in battery charger for 12V car batteries
- f. Quieter design, achieved through better mufflers, soundproofing, and lower operating RPM
- g. Ground fault circuit interrupters (GFCI) for safety
- h. Wheels. Even the smaller generators are heavy.

There are a wide variety of brands available. All of them work, and most are adequate for occasional standby use.

The generators that are driven by a farm tractor are a good buy if you already own one or more farm tractors. Unlike car and truck mount generators, tractor-driven ones produce ample power. Tractors are better suited to continuous, stationary operation than cars and trucks.

Generator Uses

Generators can be useful in a long-duration power outage by providing power to run essential equipment, such as refrigerators, freezers, lighting, water pumps, sump pumps, and furnaces. They are also useful for providing power where it is inconvenient, costly, or impossible to bring commercially produced power.

Sizing

Determining the exact size generator required for a household involves adding up the wattage required by each load, including the starting power required by the largest motor and any others that will be started at the same time. It is difficult to get accurate results since starting current requirements often vary and because nameplate ratings sometimes overstate the power required.

If a generator is too small for its load, the voltage will drop. This can cause damage to the generator, the load, or both. Circuit breakers and thermal protectors may trip and prevent damage, but cannot be relied upon. Do not connect loads to the generator that are too large for its capacity.

If you only want to run a few critical items, you can use this chart as a guide:

Generator size

1000W or less

1500W

refrigerator

3500W 240V

Most refrigerators and freezers, clothes washer, gas clothes dryer, sump pump, ½ H.P. furnace blower, ½ H.P. well pump (if 120V), nearly any plug-connected appliance with a standard 120V plug

5000W 240V

Will run all the loads in most households including electric water heaters, dryers, well pumps, and ranges; will run many central air conditioning units. Electric heat systems need to be considered case by case as many larger systems use more power than even a big generator like this produces.

Loads typically supported

Lights, radio, battery chargers, clocks, fax, or computer

Above items, also small manual defrost freezer or

Same as 1500W, plus ½ H.P. well pump (if 240V)

Same as 3500W, plus most well pumps up to 2 H.P.

Measuring the Load

Sometimes it helps to measure the amount of power a particular piece of equipment (or an entire household) uses. This may be the only way to determine power requirements accurately if there is no nameplate listing the power required. Clamp-on ammeters are available at most building supply stores for about \$50-\$100 that will measure the number of amps flowing through a wire. They usually include an attachment that you can use for cord-and-plug connected devices. More sophisticated ammeters that measure starting current are available but are costly (\$400) and require some expertise to use.

Electrical Hookup

There are three ways to hook up generators:

- Plug in loads directly, using extension cords if necessary.
- Transfer switch
- Suicide wiring

Plugging in loads to the generator's outlets directly is the simplest and works OK when only a few small loads are used. This method is used in remote areas and for construction, where no electric wiring is present. It also works in standby situations for running a handful of things, say, a freezer, refrigerator, sump pump, and a couple lights. Generators must be operated outdoors unless specifically designed for indoor operation. Those designed for indoor use have an exhaust system that vents outside. Since the generator is usually outside and the load is inside, extension cords are needed. Be sure they're big enough. Most of the orange extension cords sold use 16 gauge wire and are rated for 13 amps. These are fine for a couple of small appliances but create a fire hazard when used for heavier loads.

Transfer switches

Transfer switches allow you to connect a load to either the generator or the commercial power source simply by flipping a switch. They are the only reasonable and safe

alternative for running an entire house from a generator . They are also the only way to run equipment that can't be unplugged, such as furnace blowers, well pumps, and the like. Different configurations are available that allow switching of all or part of a household's electrical circuits. They are expensive and must be installed by an electrician or other qualified person. Some examples:

Transfer switches that have 4-6 different handles, each of which switches a single circuit, are available for around \$200 from many retailers that sell generators. They wire into the house's breaker or fuse panel. You only hook up the circuits that you will need in an emergency, which reduces the cost, and you can switch them one at a time so all the motors don't start at once. Some designs include an ammeter so you can see how much power you're using.

Some designs, including one from Square D that I have seen, use circuit breakers to perform the switching and have an interlock so you can only turn on one circuit breaker – either the generator breaker or the commercial power breaker.

I have seen the se for as little as \$60 plus the cost of the circuit breakers. Again you only hook up the circuits that you think you will need in an emergency. These panels hook up to your main breaker panel as a sub-panel.

Large transfer switches switch the power to a house or group of buildings and are wired between the meter socket and breaker (or fuse) panel. These cost \$300-\$600 depending on capacity. They are costly to install as well. Automatic transfer switches will start the generator and switch the load to it without intervention. Some standby systems have these built in. One catalog I have lists a 200A model as costing almost \$2,000. Telephone companies, hospitals, radio and TV stations, and the like use larger versions of these.

Transfer switches are wired with a large, flexible cord and plug for use with portable generators. The cord and plug are not normally included with the transfer switch and must be purchased separately. Welding supply companies are a good, inexpensive source for the heavy gauge wire required. If you plan to connect the generator to building wiring, consider the transfer switch part of the cost of the generator.

Suicide wiring

Any method of connecting a generator to a building's electrical system, other than by using a transfer switch, falls under the category of suicide wiring. You can be killed. And you can kill an electric lineman if you fail to isolate your generator from the power company's lines, by causing electricity to back-feed into the commercial power system. You can also burn up your generator or your house. It is also against the law in many jurisdictions.

Plan ahead. Buy a transfer switch. Get it installed. Don't use suicide wiring.

Safety

Here's some basic advice on generator safety. Read the instructions for your generator or check with a dealer or licensed electrician for authoritative safety

rules.

1. Follow the safety instructions that come with the generator.
2. Keep the generator outside so you don't breathe carbon monoxide and die. Protected locations, such as a garage with the garage door open, are helpful if the weather is bad.
3. Follow whatever grounding instructions come with the generator. Generators should be grounded but the recommendations for how this is done vary depending on manufacturer.
4. You can get a bad shock by touching a wet power cord or plug while the generator is running. Shut off the engine before fiddling with the power connections if it is wet out.
5. Don't refuel a hot engine. If you refuel at night, use a source of light that won't ignite the gas. The cyalume sticks work well for this.
6. Don't overload extension cords.
7. Use a transfer switch.
8. Store gasoline outside, in a safe container.

More accidents happen during power outages than occur when power is available, particularly fires. Here are some general tips for safety during power outages:

1. Don't leave candles or oil or gasoline lanterns burning unattended.
2. Realize that smoke and carbon monoxide detectors will not work without power.
3. Have fire extinguishers at hand.
4. Have some water drawn up in buckets or pans to use in case the water supply fails.

Fuels and Fuel Storage

Most portable generators run on gasoline. But gasoline is a poor choice for standby use, because it is unsafe to store in residential areas and is prone to deterioration when stored for any length of time.

Gasoline is extremely flammable and should not be stored in any quantity in a house or garage. There is no safe way to store gasoline in a building. Building and zoning codes, and insurance requirements, vary; some municipalities prohibit permanently installed gasoline tanks and limit the size of portable ones.. In the author's area gasoline suppliers recommend that bulk storage tanks be at least 10' away from garages and other buildings. Some of the author's acquaintances store gasoline in 5 gallon cans in a little building not much larger than a doghouse, that is used for nothing else and is a long way from all the other buildings.

Gasoline can be stored in full, sealed containers for 1-2 years or more without deterioration, provided that high temperatures are avoided. Air, water, and heat all contribute to deterioration.

The author uses a commercial fuel preserving additive in the gas tank for his generator, but there is no consensus on misc.survivalism that such additives materially improve the storage life of gasoline. Some, mostly larger, generators are available with diesel engines. These engines are, as a rule, noisier gasoline engines and are more difficult to start in cold weather. For standby use, they may be worth having because of fuel storage considerations.

Diesel fuel and kerosene are much safer to store than gasoline. It is still common to store fuel oil, which has similar properties, indoors in houses in quantities up to 250 gallons. Again, building and zoning codes and insurance rules may limit the amount or method of storage. These products should not be stored in red cans because of the potential for confusion with gasoline. These fuels can be stored 2-3 years before they deteriorate. Midsize and larger generators designed for permanent installation and standby use are available for use with LP gas or natural gas. The engines are like gasoline engines in most respects but replace the carburetor with a mixing system designed for LP or

natural gas. LP gas standby generators are widely used in industrial/commercial settings. The chief benefit is that LP gas can be stored indefinitely without deterioration. LP gas conversion kits are available for many small generators.

Readiness

There are no statistics available, but anecdotal evidence suggests that generators frequently fail to start when they are needed, even in industrial settings where regular maintenance and testing is performed. Electric start generators sometimes fail to start because the battery is dead. Batteries that are continuously trickle-charged may start the engine while being charged but fail when the charger is turned off, as in an actual emergency. Battery terminals also have a way of getting corroded. Stale gasoline can contribute to starting problems, especially in cold weather.

Using starting fluid will sometimes make up for this.

Spare parts and supplies should be kept on hand. At a minimum, some extra motor oil, suitable starting aids, air and oil filters (if used), and a spark plug should be available. You should periodically operate your generator, and hook up whatever loads you plan to use, to make sure that everything is ready if needed. Once a month is probably often enough to catch most problems.

How Practical Is a Generator?

The author has had to resort to using the generator during a couple of long-duration power outages. Severe weather can be extremely disruptive to power systems and the unlucky individuals whose own lines are knocked down in a storm end up at the end of the power company's list for repairs. Power losses can be costly if you stand to lose the contents of your freezer, or if cold weather and no heat threatens to freeze pipes.

On the other hand, unless you can afford a fully automatic, permanently installed system, you had better be able-bodied. It's work to pull out the generator and start it and hook it up even if you have a good setup.

Big generators are noisy. Everyone in the neighborhood will know that you're running one.

You may wish to consider running the generator during only part of a 24-hour period. Most refrigerators and freezers will maintain temperature if operated 50% of the time, depending on ambient temperature, condition of the door seal, and how often the door is opened.

Fuel availability is a thorny issue. Gas stations require electricity to be able to pump gas. The author is fortunate enough to live in a setting where it is possible to store ample quantities of fuel to run the generator for a week or more. Even the worst power outages are ordinarily corrected after a week, two at the most.

Those of you concerned about other TEOTWAWKI scenarios should consider other alternatives that do not rely on fuel availability.

Other Ways to Produce Electricity

Several companies sell inverters that produce 120V electricity using the power from a car or truck's battery and alternator. These are not suitable for most standby uses because the output power is too low. The largest car and truck alternators produce no more than 2000 watts, and this only at high engine speeds. The really big inverters – 2000W and over, capable of running a refrigerator – are expensive, big, heavy, and require heavy cabling to the battery. The logistics of operating a vehicle while stationary must also be considered: how do you secure the vehicle, potential for damage due to low oil or high temperature while unattended, potential for transmission bearing damage due to extended idling, poor fuel economy.

There are some belt-driven and PTO-driven generators for cars and trucks that have similar problems. In addition, most of these units must be operated at a specific speed. Unless the vehicle is equipped with an engine governor, this is difficult.

Uninterruptable power supplies (UPS) are designed primarily for use with computers and communications equipment. They generally are designed for short duration outages, 15 minutes or less.

Solar, hydroelectric, and wind generators are a topic in their own right and are beyond the scope of this FAQ. Many products marketed for use with alternative power systems are also useful for standby use. It might make sense in some cases to have low-voltage DC wiring for lights that can be operated from batteries in an emergency.

Non-electric Alternatives

There are a number of low-tech techniques that can reduce your dependence on electricity. Some are effective by themselves, and others will reduce the size generator you need or the hours you need to run it. Use something besides electricity for the primary source of heat. Although any modern central heating system requires some electricity to operate, you can run a natural gas, LP gas, or oil-fired furnace from a generator of modest size. Electric heat systems can't be operated except by very large generators.

Replace electric appliances with gas. Houses that are served by a natural gas supplier rarely have gas outages and electric outages at the same time (except possibly in earthquake-prone areas). LP gas is stored in tanks and is independent of electrical and other utilities. A gas stove can be used without electricity if the burners are lit with a match. Most gas water heaters don't require electricity at all (except for horizontal exhaust and other power-vented units).

Have a wood stove or fireplace insert that is capable of heating your house. Have enough wood on hand to be able to use it in a power outage.

A wide variety of non-electric lighting is available. Aladdin lamps, which burn kerosene and produce a bright light, are practical and safer to use inside than gasoline lanterns. Lamps that operate on LP gas supplied through pipes are available. They mount

permanently to a wall or ceiling, and are bright, safe, and cheap to operate. Inexpensive kerosene wick lamps are widely available and produce more light than candles.

LP gas and kerosene operated refrigerators and freezers are available. Some will also operate on electricity. Full-size units are expensive but no more so than a good generator installation. Smaller refrigerators, such as those used in RVs, are available too – though some require a 12V DC power source to operate the controls and ignition system even when running on LP gas.

By Steve Dunlop.

Solar Power 101

*By Jeffrey Yago,
P.E., CEM*

Batteries Part I

This article is the first in a series of what will be a beginner's course in solar electricity. Simultaneously we have instituted a Home Energy Information (www.homeenergy.info) section on our website where you can ask questions of Jeff Yago, the author of this series. Yago is a licensed professional engineer and certified energy manager who has written many energy articles for BHM. He has extensive solar thermal and solar photovoltaic system design experience, and is author of *Achieving Energy Independence — One Step At A Time*, which includes many solar system wiring examples. Those interested in solar electricity will want to save these articles for future review when planning your solar system.

I am getting numerous requests from readers wanting very specific guidance on how to install their own solar electric systems. Many have already found that this process is a little like trying to build an automobile by purchasing parts from a NAPA dealer. For example, you can buy a brake drum, wheel bearing, and oil filter, but since your car does not yet exist, how do you know what parts you need, what parts will fit

with other parts, and how should these parts be wired together.

During the next few issues, I will take you through the “basics” of solar system design and installation, and answer your specific questions as we go along. This course will continue on the Backwoods Home Magazine website (www.backwoodshome.com) under their new Home Energy Information (www.homeenergy.info) section. You will be able to e-mail your installation questions and offer suggestions for future home energy saving articles.

Before I can help you design your own solar power system, you have to understand that there are actually many different types of solar power systems, for many different applications.

System types

Some solar power systems are 12-volt DC due to the many low voltage RV and boating lighting and appliances available, and do not have a utility line connection. These DC only systems can be used to power several DC lights in a remote cabin, or a DC well pump in a field for watering cattle. Some solar power systems have an inverter to convert a 12, 24, or 48-volt DC battery voltage into 120-volt AC power to operate standard household appliances. Some grid connected solar power systems are designed for direct connection to your utility line and do not use any batteries at all. Hybrid solar power systems can include a battery bank, a solar array, a generator, and even a wind turbine to provide power at all times with the utility grid serving only as backup. Inverters and solar arrays are available in many different styles, voltages, and wiring configurations. Some solar arrays are mounted on the roof, some on the top of a pole, and some are ground mounted, with each having different wiring rules.

If you visit a solar home that has a well designed and properly installed solar power system, you will find the concept is actually fairly simple. The hard part is knowing what wiring layout was best for this specific home, what size and quantity of each system component was required, and what wire size and fuses were needed to keep from burning down the house.

Batteries

One of the most misunderstood parts of a solar power system is the battery or battery bank, and that is where our class begins. Some solar battery banks use wet cells, like golf cart batteries, while others use sealed or gel cell batteries, and each have different

temperature, mounting, and ventilation requirements.



Visible are the exploded plastic case exposing some of the internal plates as well as battery acid damage to the nearby wood walls and flooring.



A well designed vented battery box. Note the warning signs and locked lid.

Every battery is designed for a specific type of charge and discharge cycle. Car batteries have thin plates to keep their weight down and are designed for a heavy discharge lasting a few seconds, followed by a long period of slow re-charge. A 6-volt golf cart battery (size T-105) is the minimum battery I recommend for a residential solar application. You will need to buy these in “pairs” to make 12 volts. Golf cart batteries have very thick plates and are designed for hours of heavy discharge each day, followed by a fast recharge in only a few hours each night. This is similar to the duty cycle of a residential solar application, only in reverse. A solar battery must be able to provide long periods of deep discharge each evening and night, followed by a full recharge in only a few hours of sunlight each afternoon. Very few batteries can take a deep discharge-recharge cycle every day, and the 6-volt golf cart battery is the least expensive and easiest to find locally that can.

For some reason, everyone wants to use a sealed marine battery for their homegrown solar system. I strongly recommend that you do not. Included is a photo showing a sealed marine battery that “exploded” after being connected to a small solar charger for several months.

Even though this was a small 12-volt DC 5-amp solar charge controller powered from a single 50-watt solar photovoltaic module, this was enough energy to gradually

overcharge the battery and evaporate all of the electrolyte even though this battery was “sealed.” A low electrolyte level can expose the plates which will gradually warp or “grow” in thickness as they oxidize. This can cause an internal short circuit and ignition of the hydrogen gas.

Plate damage can also occur when there is a large buildup of sediment after the upper plate areas become exposed from reduced water levels and begin to “flake” off. Most liquid acid batteries do not vent gasses while discharging. However, near the end of a typical charging cycle, when the battery is almost “full,” the sulfuric acid and water electrolyte will begin to break down into hydrogen and oxygen—a very explosive combination.

When ignited by a nearby spark or flame, an “explosion” can result, but this flash lasts only a fraction of a second, which is usually too fast to ignite nearby walls. However, this is still a very explosive reaction, with plastic battery parts becoming acid-covered shrapnel. While using a hand grinder one day in a shop, I accidentally directed the sparks towards several car batteries being charged about 30 feet away. There was a very loud explosive sound with acid and plastic hitting every wall of the large shop, yet I did not see a flame and there was no fire.

Regardless, it was not a pleasant experience. Always wear eye protection and acid proof gloves when working around batteries, and have lots of water and baking soda nearby. This will neutralize any acid spills from battery refilling and prevent further corrosive damage.

A typical 6-volt golf cart battery will store about 1 kilowatt-hour of useful energy (6 volt



Interior view of the battery box showing the battery inter-connects and fuses.

X 220 amp-hr X 80% discharge = 1056 watt-hours). Since this would only power two 50-watt incandescent lamps for 10 hours ($2 \times 50 \times 10 = 1000$ watt-hours), your alternative energy system will most likely require wiring several batteries together to create a battery bank. Since each golf cart battery weighs almost 65 pounds, there are weight considerations as well as battery gas venting issues to think about.

An area of a garage or storage building having a concrete floor is the most common location for a battery bank, although some large systems have their own specially designed battery room. I am going to assume you are installing a much smaller system and will only require four to eight batteries.

If you need more than the 220 amp-hr capacity contained in each golf cart battery, I suggest switching to the larger “L-16” size traction battery, having a 350 amp-hour rating, which may allow using fewer batteries. This battery is the same length and width as a golf cart battery, but is much taller and twice as heavy. This is an excellent battery for solar applications and can take very heavy charge-discharge cycling. This industrial rated battery may be more difficult to find, as it is only available from battery wholesale distributors.

Batteries can lose over half of their charge when exposed to extreme temperature

swings, so be sure your proposed battery location stays in a 50° to 80° F range, or you will need to insulate the battery box. Since liquid batteries require refilling and battery



Sealed solar gel batteries located
in an open basement rack

terminal cleaning to remove corrosion several times each year, the floor area selected should be able to take an occasional acid spill and water wash down. Battery venting is very important as discussed earlier, and if you build an enclosure around your batteries, it should be designed to direct all vented gasses to the outside. A 2-inch PVC pipe makes a good vent, but be sure it is located at the highest point in your battery enclosure where the lighter hydrogen gas will accumulate. Be sure it also includes a screened vent cap to keep out rain and insects. Do not locate your battery bank near a gas water heater or other open flame appliance that could ignite any accidental hydrogen accumulation.

A battery box can be built using standard 2 x 4 framing construction, with pressure treated plywood lining the interior surfaces. A hinged top door is needed for periodic battery maintenance, and should include a gasket to prevent gases from entering the room. Note how the top of the site-built battery box

shown in these photos slopes up to a high rear area where two PVC vent pipes are located. The interior plywood surfaces of this wood frame construction were painted with several coats of fire and acid resistant paint. Since batteries lose capacity with

lower temperatures, your batteries should not rest directly on a cold uninsulated concrete floor.

Pressure treated 2 x 4s on edge, spaced every 6 inches and covered by a fiberglass laminated concrete board, makes an excellent base for your battery box. This heavy sheet material is sold in most building supply outlets as a backing behind ceramic tile work in wet shower stalls, and is usually available in smaller 2-foot by 4-foot sizes. By careful planning, you may be able to use the entire sheet without cutting or splicing.

If you can afford to invest in the more expensive gel or absorbed glass matte (AGM) batteries, you will have more flexibility in locating your battery bank, since these batteries do not need to be refilled and do not normally generate explosive gasses. The photo shows a large battery bank with the batteries mounted close together in a vertical steel rack. You do not need a vapor proof enclosure or vent pipe when using these batteries, however they cost almost 30 percent more without providing any additional life or storage capacity.

The next article will continue this discussion on battery installation, and will go into series and parallel battery connection, battery wiring materials and sizing, and battery bank fuse and disconnect safety considerations. Be sure to check the Backwoods Home Magazine website for more do-it-yourself solar system installation questions and answers.

Summary

If you will be taking this course, you have a reading assignment before our next class. For the past several years, in almost every issue of Backwoods Home, I have written an article related to solar power systems that included a system description, installation photographs, and actual wiring diagrams. Your first assignment is to review these articles:

Issue # 71, Sept 2001, p. 8, *A Safe Water Supply When You Are Off the Grid*

Issue # 72, Nov 2001, P. 24, *A Solar Primer*

Issue # 73, Jan 2002, p. 27, *Emergency Solar Power*

Issue # 78, Nov 2002, p. 24, *Phantom Solar*

Issue # 79, Jan 2003, p. 50, *Solar Powered Toilet*

Issue # 82, July 2003, p. 16, *Choosing the Right Backup Generator*

Issue # 83, Sept 2003, p. 10, *Battery Powered Weekend Retreat*

Issue # 83, Sept 2003, p. 44, *Standby Battery Charging Techniques*

Issue # 84, Nov 2003, p. 19, *Keep Those Gadgets Working When the Power Goes Out*

If you have not kept your back issues, shame on you. But they are all contained on *Backwoods Home Magazine's Alternative Energy CD-ROM*, available for purchase from Backwoods Home for \$12.95. [Click Here for ordering information](#). Good luck and remember—I will be taking roll.

Solar Power 101

*By Jeffrey Yago,
P.E., CEM*

Batteries, Part II

This is Part 2 of a two-part discussion on battery storage systems. Most solar or generator based backup and off-grid power systems will require a battery bank to store energy for use later when the sun is not shining or the generator is not running. A battery bank is

like the gas tank in your car. The larger the tank, the longer you can go between fill ups. However, a larger tank also means it will take longer to fill up when you do stop. Also, the larger the car's engine (electrical load) the faster you will drain the gas tank (battery), which means you will need to stop more often for gas (recharge).

A battery bank storage system should be sized to get you through several days of stormy weather, but if the battery bank is too large for the size of your solar array or generator powered charger, you may not have time to recharge back to 100% before needing to power the loads again. If the battery load each day is greater than the solar or generator charging each day, the battery bank voltage will drop lower and



6-volt 350-amp-hour batteries with “Flag” terminals allow bolt-on type cable interconnects.

lower each day until it will no longer be able to supply the loads.

Once a solar charged battery bank has been depleted, you will need to turn off all loads until the next sunny day, or utilize a backup generator or wind turbine to help you through the extended period of cloudy days. A dual source charging system allows using a smaller battery bank than a solar only system.

Battery life

Assuming we can put back what we take out each day, there are advantages to having a storage battery larger than needed to meet the daily appliance and lighting loads.

A good quality lead acid battery designed for daily charge/discharge cycling may be advertised to have a 2,000-cycle life, when discharged 20% each time (80% charge remaining). However, this same battery may only have a 400-cycle life if each cycle took the battery down to 90% discharged (10% charge remaining). Since we do not want to replace the batteries every year (400 cycles/365 days), in order to increase battery life we must reduce the depth of discharge (DOD) the battery reaches during each charge/discharge cycle. This is accomplished by using more batteries, larger batteries, or reducing the system load.

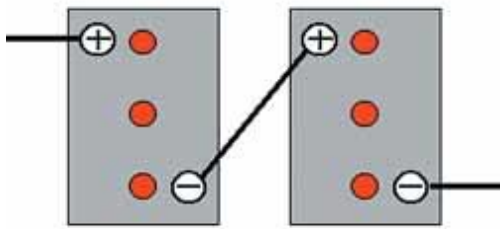


Figure 1: Two 6-volt batteries in series provide 350 amp-hour capacity at 12-volts.

Although an occasional period of stormy weather may require your battery bank to be heavily discharged, your normal average daily discharge should not go below 50%, with 40% a better goal (60% charge remaining).

Battery ratings

When selecting a battery it is the amp-hour (A-Hr) rating that defines its energy storage capacity, and a battery's advertised amp-hour rating can be listed for different discharge time periods, so be sure you are not comparing apples and oranges.

For example, an "L16" size deep discharge battery typically used in solar powered homes has a 350 amp-hour capacity when slowly discharged over a 20-hour period

(C20). However, this same battery has a 460 amp-hour rating when discharged over a 100-hour period (C100), but only a

259 amp-hour rating when discharged over a 6-hour period (C6). The 400 amp-hour battery you find on sale could actually have a smaller capacity than a 350 amp-hr battery if you are comparing amp-hour ratings for different discharge periods.

Since a typical four-hour solar charging period per day or four hours of generator run time per day leaves 20 hours per day for slow discharge before the next charging cycle, the advertised C20 rating will be the closest published discharge rating to the typical daily cycling of most residential off-grid systems.

Battery sizing

Say you want to power a 12-volt DC lighting system for an off-grid cabin that has no other source of power. You have four fluorescent fixtures and they each are 36-watts and draw 3 amps ($36 \text{ watt}/12 \text{ volt} = 3 \text{ amp}$). If all lights are operating at the same time, this means the total lighting load will be 12 amps ($4 \text{ lights} \times 3 \text{ amps}$). Now let's say you will operate these lights from 5:00 pm until 11:00 pm each night, or six hours per day. Your battery system must supply 72 amp-hours ($12 \text{ amps} \times 6 \text{ hours}$) of energy each day to meet your daily power needs, if we ignore all efficiency losses.

If we select a battery having a 350 amp-hour rating, this battery will deliver 175 amp-hours (350×0.50) before needing recharging if discharged to 50%. NOTE: discharging a battery below 50% will greatly reduce battery life. With 175 amp-hours of battery capacity to work with, this means our lighting system can be powered for two days (175 amp-hr/72 amp-hr) before needing recharging. This also means your solar array will

need to put into the battery bank a minimum each day of what you are taking out, plus at least 20% more to account for system and charging losses.

Now comes the confusing part. The 350 amp-hour battery used in this example was a 6-volt battery, and our lighting system requires double that voltage or 12-volts to operate, so we will need two batteries wired in series to provide the 12-volts. Unfortunately this does not also double the amp-hour capacity of this battery bank which will stay the same. Multiple batteries wired in series have the same amp-hour capacity as each individual battery. Only when we wire batteries in parallel do we obtain multiples of the amp-hour capacity, but wiring batteries in parallel does not increase battery voltage.

Battery interconnect wiring

The wiring diagram in Figure 1 shows the battery bank of our remote cabin lighting example, consisting of two 6-volt batteries wired in series. This provides a 12-volt

output with a 350 amp-hour capacity.

If we were to wire the same two batteries in parallel, as in Figure 2, we would get a 6-volt output with a 700 amp-hour capacity.

Unfortunately, this is not enough voltage to operate the 12-volt lights. If series wiring multiplies the voltage, and parallel wiring multiplies the storage capacity (amp-hour), how do we get a higher capacity battery bank to power higher voltage loads?



6-volt 350-amp-hour batteries with "Flag" terminals allow bolt-on type cable interconnects.

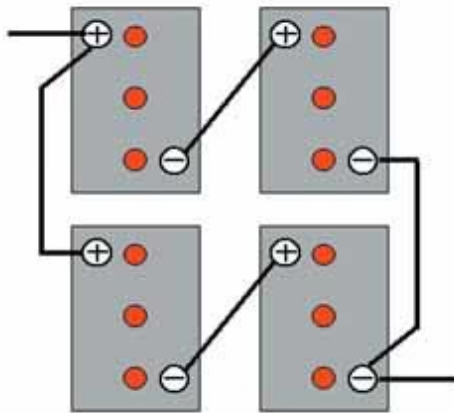


Figure 3: Two sets of two 6-volt batteries wired in series-parallel provide 700-amp-hour capacity at 12 volts.

For large loads, you will either need to use batteries having a higher amp-hour rating, or wire the batteries in series-parallel, as in Figure 3. Four 6-volt batteries wired in series-parallel will provide a 12-volt output with a 700 amp-hour capacity. In any series-parallel battery layout, make sure you do not have more than two cables connected to any single battery flag terminal, as the terminal may not be adequate in size or strength to support more.

Although theoretically we could wire batteries together in as many series and parallel configurations as needed to provide any voltage and amp-hour capacity, having a large number of batteries in parallel is not desirable. If a battery or battery cell fails in an individual series wired string, the battery bank voltage for that series string drops or the voltage output stops completely. If a battery or battery cell fails in a group of batteries wired in parallel, the adjacent string of good batteries will try to flow current into the string having the bad battery or battery cell, which becomes another system load.

Since most battery interconnect wiring uses

fairly large size cables, a cell failure can result in very large currents discharging from one parallel string into another, causing melted battery cables or a boiled dry cell giving off lots of smoke and explosive gasses. It is a good idea to limit your battery bank to no more than four battery strings wired in parallel, with two parallel strings that much safer. You can also reduce the risk associated with batteries wired in parallel by installing a “catastrophic” fuse in each individual series string of a parallel-wired battery bank.

The easiest way to increase battery bank capacity is to switch to a higher voltage system. Since most of today’s 12-volt DC appliances, DC lighting, and DC to AC inverters are now available in 24-volt and 48-volt versions, a 24-volt system will need four 6-volt batteries in series and a 48-volt system will need eight 6-volt batteries in series to achieve the higher voltage. For example, a 48-volt battery bank having sixteen 6-volt batteries would only require two parallel strings of eight batteries each (8 batteries x 6-volts).

NOTE: In all of these wiring examples, the positive (+) and negative (-) connections are located at opposite ends of each battery bank. This causes the electrical path to be equal in length and resistance regardless of which way the electricity flows, resulting in an equally balanced charge and discharge for each individual battery.

Battery protection

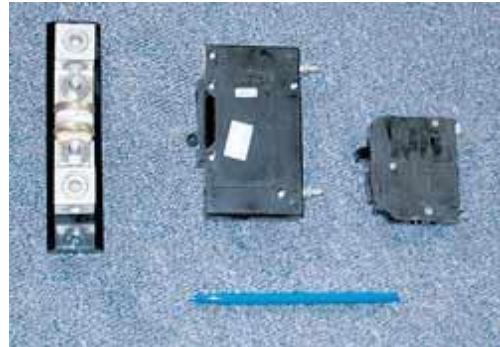
If you have ever dropped a wrench across the terminals of a car battery you know how easy it is to melt metal, even at this low voltage. Every wire connected to the positive (+) terminal of any battery or group of batteries should pass through a fuse to prevent serious damage if there is a system short. You should also understand that an AC fuse or AC circuit breaker would not safely protect a DC wiring circuit. DC electricity does not cycle to zero volts like AC electricity, and a constant DC electrical flow will try to “weld” the switch contacts together when the arc forms as the fuse or circuit breaker starts to open.

Safety devices rated for DC use need to be of much heavier construction than the same amp capacity device intended for AC circuits.

When using multiple batteries to increase the voltage and capacity of your battery bank, be sure to use the proper size and type cables for these interconnects and keep them as short as possible. Do not use automotive or marine type cables or welding cables, as these are not UL listed for residential wiring. UL listed red and black battery interconnects 9 and 12 inches

long, made from #2/0 multi-strand flexible copper cable, with machine crimped all copper terminals on each end, are fairly inexpensive and available from any solar supplier.

Using improper safety devices or undersized low cost non-copper cables and connectors is no place to save money. Be sure your backup power system uses the correct wire sizes for the loads and batteries used, and be sure each circuit is protected by the proper size and type safety device. Our next issue will address everything you wanted to know about battery inverters to power your AC loads.



Catastrophic battery DC safety fuse on left. Note much larger size of 15-amp DC circuit breaker (center) compared to a standard 15-amp AC circuit breaker (right).

Solar Power 101

By Jeffrey Yago, P.E., CEM

Inverters

This article is the third in a series of our beginner's course in solar electricity. Simultaneously we have instituted a [Home Energy Information](http://www.homeenergy.info) (www.homeenergy.info) section on our website where you can ask questions of Jeff Yago, the author of this

series.

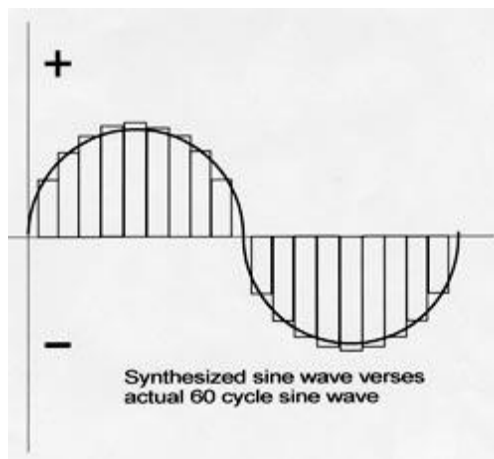
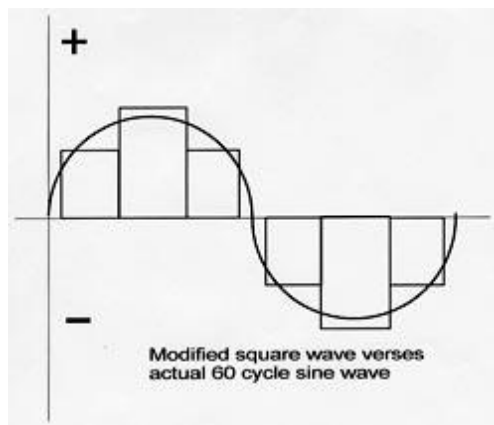
Yago is a licensed professional engineer and certified energy manager who has written many energy articles for BHM. He has extensive solar thermal and solar photovoltaic system design experience, and is author of Achieving Energy Independence — One Step At A Time, which includes many solar system wiring examples.

This third installment of our continuing course on solar electric power system basics will address power inverters. Since all solar photovoltaic modules generate DC electricity, unless all of the lights and appliances being powered are DC, an alternative energy power system will need to include an inverter. This device is used to convert the DC electricity from the solar modules and batteries into AC electricity.

Inverter basics

Early inverters for the consumer market were used mainly for mobile applications like boats and recreation vehicles, and most were designed for 12-volt DC battery ignition systems. Due to an upper capacity limit of approximately 200 amps for the internal power components and heavy welding cables that were being used for connecting these mobile 12-volt systems, 2,400 watts was about the largest capacity inverter that could be made for these applications ($12\text{V} \times 200\text{A} = 2,400\text{ W}$). To keep inverter costs low and the designs simple, these early inverters generated a “modified” sine wave output to simulate the 60-cycle 120-volt AC line voltage. The more “steps” in the modified waveform, the closer the output voltage will be to a normal AC sine wave.

Until the explosive increase in personal computers and microprocessor controlled appliances and audio/video equipment, most electrical loads that included older technology would work fairly well on a modified sine wave inverter. Incandescent lights and power tools also worked well, although some fluorescent fixtures and light dimmers had problems. An AM radio may produce an objectionable hum in the background, and a microwave oven will take much longer than normal to cook the same food, but most of these devices would still operate



on a modified sine wave inverter.

In the early 1990s, quality modified sine wave inverters were being sold by Trace Engineering and Heart Interface. Although still limited to about 2500-watt output using a 12-volt DC input, these became the standard for residential off-grid and back-up power systems. Many of these early models are still in operation and have an excellent reputation for robust design and reliability.

By the mid-90s, lower costs for solar photovoltaic modules and the need to power more sophisticated appliances, computers, and digital audio/video systems created a demand for larger inverter capacities and a smoother 60-cycle voltage waveform. Manufacturers responded with inverter outputs up to 5,500-watts by using higher voltage 24 to 48-volt DC inputs and more sophisticated internal electronics to increase the number of “steps” simulating the 60-cycle sine wave.

Some newer inverter models include a communications “link,” which allows interconnecting multiple inverters to provide synchronized higher wattage and voltage outputs. Since these changes resulted in much higher inverter prices, most manufacturers still offer lower cost modified sine wave models when lower capacity and power quality are not a concern.

The Trace (now Xantrex) SW series 3,600, 4,000 and 5,500-watt inverters and the Outback FX 2000 and 2,500-watt inverters are currently the most popular residential inverters for back-up and off-grid power systems, although there are several other excellent brands just now entering the market. As long as it includes a battery powered inverter, any alternative energy system can continue to power the lights and appliances directly from the batteries after the sun goes down, the wind stops blowing, or the generator is turned off.

Grid-tie systems

As the price of solar photovoltaic modules continues to fall and the price of peak afternoon electricity continues to increase, it is becoming cost-effective in some states to install solar modules just to reduce daytime metered electricity usage and sell any excess power



1500-watt StatPower (now Xantrex) modified sine wave inverter mounted on a battery pack

generated back to the utility. Since these systems are not intended to provide emergency power, a grid-tie inverter can be less expensive since there are no battery chargers, battery bank, or costly high amperage components to buy. Obviously, if these special application inverters require the utility grid to serve as their “battery,” a grid-tie solar system without a battery bank cannot serve as a source for emergency or back-up power. Increasing the voltage for a given wattage allows reducing the current ($\text{watts} = \text{volts} \times \text{amps}$). Since these inverters are designed for much higher DC solar array voltages than low voltage battery based systems, this can substantially reduce solar array wire size and wiring costs.

However, with grid-tie solar array wiring in the 300 to 400-volt DC range, the potential for shock or fire causing arcing is substantially increased over a 12 to

48-volt DC battery based system. All roof mounted solar photovoltaic arrays must be

protected by DC ground fault circuit breakers.

In recent years there have been several American made grid-tie inverters that did not meet promised efficiency performance, and several grid-tie inverter manufacturers have gone out of business which created a shortage in the American grid-tie inverter market. As a result, several European manufacturers moved in and filled this market niche with inverters that had excellent product quality and provided high operating efficiencies. The “Sunny Boy” line from Germany and the more recent Fronius line from Austria are becoming major contenders for this domestic grid-tie inverter market.

Inverter features

Not all inverters are created equal, and there are more differences and options to pick from than just having to decide between a modified sine wave and a pure sine wave unit. Since this may be the most expensive component in your alternative energy system, there is a tendency to under-size the inverter just to save a few dollars. Don’t fall into this trap, as you can always install fewer solar modules now and add more later, to save some up-front costs.

Many models of inverters are available with a built-in load transfer relay. This transfer relay is useful for back-up emergency power applications.

Unlike a straight DC to AC inverter, an “AC input” connection is provided to connect the inverter to a spare circuit breaker in the main house panel. The AC output connections on the inverter are then connected to a new

subpanel that will supply all critical loads in the house. This usually includes some of the lighting circuits, kitchen appliance outlets, refrigerator, and audio/video center.

Although a well pump would be considered a critical load, most inverters have a 120-volt AC output and most well pumps are 220-volt. This will require either buying two matching inverters or using a step-up transformer. As long as utility power reaches the inverter’s AC input side, the transfer relay will continue to pass this AC grid power directly through the inverter to the sub-panel’s critical loads.

Any interruption in utility grid power results in the transfer relay automatically switching to the battery powered inverter output so the subpanel’s loads will now be supplied from the battery bank. Although these inverters are not advertised as suitable as a computer UPS power supply, I have found that the relay transfer time is fast enough to not affect most computers.

Inverters that include the AC input terminals and transfer relay may also include a built-in battery charger. This circuit monitors the battery state of charge and will keep the battery fully charged when utility grid power is available and the transfer relay is switched to grid power. A word of caution is in order however. Most inverter battery chargers are very heavy-duty and charging outputs over 100 amps are not uncommon. Special care must be taken to insure all of the battery charging setpoints are correct on the inverter for the size and type of batteries being used, or this high capacity charger



Trace 4 kW sine wave inverter and optional DC power center

could easily damage a very expensive battery bank.



Outback 2 kW sine wave inverter including optional AC (left) and DC (right) power centers

Some inverters are available with a separate generator start relay. This is a real necessity for back-up and off-grid applications. These inverters may also include a second AC input specifically for generator power. This generator start option allows programming the generator to either start as soon as the utility grid fails, or start when a low battery charge level has been reached. Since the inverter is only operating the generator to recharge the batteries, the generator will

operate fewer hours than a straight generator-only power system. In an application using a large solar array, there will be one or more separate charge controllers feeding DC charging current directly into the battery bank, in addition to this grid or generator powered charging by the inverter.

When using these more sophisticated battery-charging inverters with a solar array, you must take care to properly balance the battery charging setpoints on the inverter with the setpoints on the solar charge controllers. If not set correctly, the inverter will easily “over-power” the output from the solar array and provide all of the battery charging from the utility grid regardless of the available sunlight. Some of the more expensive sine wave inverters are very versatile and provide many different system and battery charging setpoints for system fine-tuning. However, this versatility also requires more knowledge to properly set up a system to maximize its performance. Although these inverters may work right “out of the box,” this does not mean the default settings are right for your specific application. If this appears to be too much of a challenge, you may want to consider a less sophisticated inverter model or hire a professional solar installer.

Almost all inverter manufacturers offer a remote display panel option. From a basic on/off switch to a more sophisticated data display screen, these are really useful if your inverter and battery bank are located in a hard to access crawl space or garage. I like to locate these remote displays in the kitchen where most people pass through several times each day, which allows a quick check on system status.

Some inverters include a separate unused control relay that can be programmed by the installer to switch almost anything. For example, a battery room exhaust fan could be turned on by this relay when the battery voltage reaches a high limit during heavy charging and out-gassing begins. An alarm bell or light could be activated by this relay when a low battery charge is reached to tell the occupants to reduce their electrical usage or to start a manually operated generator.

Please note that not all inverters have these features, so if they are important to your application, be sure to shop carefully. Something to consider when shopping for an inverter is the balance

of system (BOS) components you will also need, as these are not normally included in the advertised inverter base price.

For example, the list price for an Outback FX Series 2500-watt inverter is \$1,995; however, this does not include the optional (but almost always needed) DC cover for \$65, the DC end conduit adapter for \$45, the AC end adapter for \$35, or DC circuit breaker disconnect enclosure for \$519.

The same is also true for the Trace (Xantrex) 3,600-watt SW Plus Series inverter with a list price of \$2,800. This price does not include the optional (but almost always needed) DC conduit box for \$90, the AC conduit box for \$369, or the generator start module option for \$159.



Trace 4 kW sine wave inverter, solar charge controller, and batteries in a pre-wired enclosure



Sunny Boy grid-tie inverter, optional disconnects, and check meter

In addition, the inverter list price for any battery-powered inverter almost never include the required battery hook-up cables, which can run as high as \$200 for a 10-foot pair.

A grid-tie inverter purchase is usually more straightforward, since you will not need heavy battery cables, batteries, or large DC disconnects. A 2500-watt SMA Sunny Boy grid-tie inverter has a list price of \$2,845.

Since this includes a cover with digital display and built-in ground fault circuit

breakers for multiple solar array inputs, the only other electrical component you will need is a \$5 circuit breaker to feed the new inverter AC output to your existing main house circuit breaker panel.

Inverter shopping tips

1. If you are on a tight budget or are building a remote cabin system that will only need

RV or boat-type 12-volt DC lights and appliances, you still may need to power a

limited number of small AC appliances. Consider the 1500-watt StatPower (now Xantrex) low cost modified sine wave inverter designed for mobile applications. This is about the smallest size inverter that can still power a power saw, refrigerator, or microwave oven. Although these are normally 12-volt input inverters, they are available in many different outputs. For a slightly higher price, the Heart Interface (also now Xantrex) 2500-watt RV and marine line of modified sine wave inverters have higher capacities and more features.

Most lower cost inverters are fairly reliable, but they do not have the same robust overload and control features that are found on more expensive models. An accidental system overload when starting a well pump or clothes washer may result in inverter or battery damage when using lower priced and lower wattage models.

2. If you just want to reduce your utility bill and do not need to power lights and appliances after the sun goes down or during a power outage, then your solar power system may not need a battery bank. This will allow using the lower cost “grid-tie” inverter models such as Sunny Boy, Sharp, StarInverter, or Fronius.



Fronius grid-tie inverter and optional AC & DC disconnect

This will also allow using a much higher voltage solar array, which can reduce solar array wire size and associated installation costs.

3. If you plan to install a system that will have a battery bank, and your loads will include more power sensitive computer and digital audio/video equipment, you will probably want to consider one or more Trace (Xantrex) or Outback sine wave inverters powered from a 24 or 48-volt DC battery bank.

4. Wind turbines can quickly recharge a battery bank during unusually high wind conditions. Shutting off a wind driven generator as soon as the batteries are charged can cause over-speed of the now free turning blades. To avoid blade damage, many wind power systems include a “inversion load” control. This allows automatically switching the power output from battery charging to a second load such as electric heating elements in a hot water tank. This provides free water heating while keeping the wind generator under a constant load. There are several new grid-tie inverters just entering the market specifically designed for wind generator type power output. (Photos of inverter installations are courtesy of Dunimis Technology Inc. and Energy Outfitters Inc.)

5. Using a small-scale (under 25-kW) grid-tie inverter to sell power back to the utility is a fairly new concept, and many states and electric utilities require an exterior safety disconnect and a utility inspection process before you can do this legally. Many utilities may also want you to install a special electric meter that totals electric flow in both directions. Be sure to check with your local utility before installing any solar system that will be used to sell electricity back to the utility, as some state regulations are very strict. The next installment in this series of articles will address solar array basics and solar battery charging techniques.

Solar Power 101

By Jeffrey Yago, P.E., CEM

Independence — One Step At A Time, *which includes many solar system wiring examples. It is available from the [Backwoods Home Bookstore](#) or by calling 804-457-9566.*

Many people contact me each month and want to power their all-electric four-bedroom home with three or four solar modules.

I am going to use Part 4, the final installment of our Solar Power 101 series of articles, to dispel some of these solar array misconceptions, and hopefully make you a more knowledgeable solar consumer.

First, if you want to power a conventional all-electric home with solar modules you can forget it, unless you want to spend what your house cost in the first place.

Today's solar modules can convert 14% to 18% of the solar energy they receive into electricity under ideal conditions. This means the more square-feet of solar array you have, the more power you will generate.

However, outdoor temperatures, cloud-cover, site elevation, and shadows from nearby objects will reduce this electrical power output substantially.

After reviewing many popular sizes of modules available from several different manufacturers, I calculated an average nameplate rating of 11 to 12-watts per square foot.

Remember, this performance was measured at perfect “solar-noon” conditions using a sun simulator, not the real sun. Since there will be some efficiency losses for less than perfect “real world” conditions, 10-watts per square-foot of roof area is a good “rule-of-thumb” for most areas in North America.



Kyocera solar modules mounted on outbuilding roof.



Take into account the location of the module junction box when installing modules to minimize interconnect wiring.

Those of you planning a project in sunny southern latitudes can expect better performance than those of you in cloudy northern latitudes, but this will be a good starting point for our discussions.

Basic array sizing

Using the above average peak output of 10-watts per square-foot, this means it will take 100 square-feet of solar array for each kilowatt (kW) of solar output we want. Individual solar modules are now being manufactured with a much higher wattage-per-module to reduce wiring and installation expense. You will want to arrange your array layout using standard size modules, and the actual roof required may be

larger than your initial square foot estimate based on wattage. You will want to leave some space between modules to allow for expansion, and between rows for wiring access (refer to the manufacturer installation instructions.)

Table 1 is a sampling of quality higher wattage modules

Table 1: Solar Module Data				
Manufacturer	Dimensions	Weight (lbs)	Wattage	Sq. Ft.
Shell Solar #SQ80	47.2" x 20.8"	16.7	80 w	6.82
Shell Solar #SQ150	63.9" x 32.1"	38.0	150 w	14.24
British Petroleum #380	47.2" x 20.0"	17.0	80 w	6.56
British Petroleum #3150	62.8" x 31.1"	34.0	150 w	13.56
Kyocera #KC80	38.4" x 25.7"	25.0	80 w	6.85
Kyocera #KC120	56.1" x 25.7"	30.0	120 w	10.01

[available as of October, 2004].

Residential-size solar systems typically have a 24 or 48-volt battery-bank, unless they are grid-tied systems without batteries. Therefore, you should use a module count that is a multiple of two, since most modules have a nominal voltage of 12 or 24-volt. For example, if you wanted to install a solar array in the 2 kW size range, you could install 24 modules at 80-watts each (1,920 watts total), but should not use 25 modules just to make it match a nominal output goal. This will allow equally dividing the voltage and current among other system components, such as array circuit fuses, charge controllers, and wire runs. For example, if we use Shell Solar Model #SQ80 modules as listed in Table 1, we could install two rows of 12 modules (21 ft. wide x 8 ft. long) or four rows of 6 modules (10.5 ft. wide x 16 ft. long.) Both would take up 168 square-feet of roof area, but one layout may fit the proposed roof space better than the other.

A solar module can be mounted in either direction; however, the location of the off-set junction box on the back of a module can affect the length of wire runs between modules.

When selecting the mounting location for your array, keep in mind there should be no shading of any part of the array between 9:00 am and

3:00 pm. A narrow shadow from a nearby chimney partially covering only one module can actually reduce the total array output up to half!

You will receive the highest yearly-total output if the array is on a south facing roof, with a roof slope equal or greater than the latitude for your location. However, we have mounted solar arrays in all orientations from almost due east to due west, and with all roof-mounting angles from vertical to flat, to accommodate unusual local site conditions or design requirements; so don't panic if your planned location is less than perfect.

Expected system performance

Yes, the sun shines all day, but at the lower sun angles before 9:00 am and after 3:00 pm, the solar array will have a much lower power output. During shorter winter months this "solar day" is even shorter. There are weather tables available giving total sun-hours for most cities in the United States, but if you are looking for a ballpark sun-hour per day value, use 4-hours for winter months, and 6-hours for summer months. Again, those of you in more southern latitudes may exceed these averages, while those of you in more northern latitudes may have fewer peak sun-hours per day, especially during winter months.



Round single-crystal Siemens (shell) modules. Note expansion space between module frames.



Siemens (shell) 100-watt modules ground-mounted with horizontal axis.

From our earlier example of a 1,920-watt array, this results in 7.68 kWh/day in the winter (4 hr. x 1,920 watts) and 11.5 kWh/day in the summer (6 hr. x 1,920 watts). Remember, these are manufacture nameplate performance values using sun simulators. Your installation will have a lower output due to the system losses we have already discussed. For most systems and site locations, your actual system useful AC wattage output will be 20 to 30 percent below the module nameplate DC wattage values, even with ideal weather conditions.

Solar module types

In our previous installment, we talked about battery-based inverters and grid-tied inverters that do not use batteries. You can use the same solar modules for both system types, but how the modules are wired together will be different.

Some solar module manufacturers start with a round, single-crystal of silicon that is

sliced into very thin wafers. These have electrical conductors plated to each side, and are then sandwiched between a tempered glass front panel and a vacuum sealed plastic or vinyl material backing. This assembly is then mounted in an aluminum frame, which allows easy attachment to mounting racks or a building structure.

Other solar module

manufacturers start with a “block” of multi-crystalline silicon, which is also sliced into very thin wafers, and follows the same type assembly as the single-crystal module. Since a multi-crystalline material can be cast into larger square blocks than a round single-crystal can be “grown,” a square-shaped solar cell is easier to place close to each

adjoining cell, allowing less material waste and more cell surface area per module frame size.

To achieve the same cell density, most round single-crystal cells have each side cut off to create a square shape with rounded corners. This allows the same cell density per module frame-size, but at a higher material waste and cost.

A third cell technology that offers significant manufacturing cost savings is a solar cell that is “plated” onto the back of the glass front, then this silicon material is “cut” into individual cells using a laser. Unfortunately, the wattage-per-square-foot output for this amorphous cell technology is substantially lower than the more conventional modules, so you will need significantly more roof area for the same output. However, since this amorphous module sells for a much lower price-per-module, your actual array cost per watt will be almost the same.

As research continues in this area, I am sure these lower efficiencies will increase significantly.



Single-crystal cells with squared sides to allow closer cell placement.



Non-glass uni-solar modules and metal backed solarex module.

Some solar manufacturers are using waste silicon left over from micro-electronics manufacturing processes. These are also excellent modules, since this “scrap” silicon is very high grade to start with.

There are some solar manufacturers mounting solar cells directly onto a metal or vinyl backing without any glass front plate. These modules are for applications subject to physical damage, like the deck of a sailboat or vehicle roof. Some modules are flexible and can be rolled up or tied down to irregular mounting surfaces. These are excellent for portable applications, but are not normally available in higher wattage sizes.

Since it costs millions of dollars to set up a solar cell manufacturing facility, most of the solar module brands you will see in the

marketplace today are from large brand name manufacturers and carry excellent product warranties. Some may have a heavier frame than others, and some may have a different size or exterior finish, but they are all very similar. However, you will find that their cost-per-watt and watt-per-square-foot values will be different.

As to which type is better, that is like asking which brand of truck is better. Stay with name brands and solid warranties, and remember, if you do encounter a technical problem or need warranty replacement, that low cost, high volume Internet solar distributor may be long gone when you have a technical problem. Support your local licensed solar dealers and use only licensed electricians for any wiring modifications to your home. Their experience will keep you from making very expensive mistakes. This concludes our series on Solar Power 101. I hope you now are a wiser solar consumer as you start to plan your own alternative energy system purchase.

Preparing for a Pandemic Influenza Outbreak

The Self Imposed Reverse Isolation (SIRQ) Plan

1) Protecting the Family – Building a Safe Haven

- a. Protecting the family from the influenza virus is central to the plan.
- b. This requires that families sequester themselves from the outside world in order to avoid infection.
 - i. Children should not go to school or play with friends.
 - i. Parents should work from home as much as possible.
 - iii. The family should not attend public events (sporting events, cultural events, religious services, etc.).

iv. If family members do have to leave sequestration, they must be educated and committed to maintaining protection.

c. Parents

- i. Must establish their home as a protected cell.
- ii. Must understand that as long as their family is sequestered they are safe, but safety is only good AS LONG AS EVERY FAMILY MEMBER REMAINS SAFE AND DOES NOT BRING THE INFECTION HOME.
- iii. Must understand the importance of not allowing children to interact with others outside the family during the time the plan is in place.
- iv. Must know how to remain safe when they leave the home:
 - 1. Protective equipment,
 - 2. Protective methods of interacting in an infectious environment.
- v. Must have their homes prepared for a disruption in services.

d. Children

- v. Are at high risk for transmission of disease because of less than ideal hygiene, close contact with others in closed environments, inadequate hand washing, etc.
- vi. Need to be sequestered in family groups.
- vii. Need to be isolated from others who are potentially infected.
- viii. Need to be trained in methods of protecting themselves from infection at their level.

2) Protecting the Individual

- a. During an influenza pandemic, any individual that has to interact with the outside world must consider all they come in contact with as being infected.
- b. Individuals must know how to interact in such an environment:
 - i. Need education and training about how to protect themselves.
 - ii. Need protective equipment to allow them to interact.

3) Protecting the Community

- a. Community leadership must support the SIRQ plan and strongly encourage its implementation:
 - i. Educating leaders, families and individuals about the plan.
 - i. Implementation of reverse quarantine protection early (BEFORE THE INFECTION HITS THE COMMUNITY).
 - ii. Cancellation of schools, meetings, public venues, etc. (BEFORE THE INFECTION STARTS)
 - iii. Identify key services and individuals essential to these services:
 - 1. Provide or strongly encourage personal protection use in all essential sectors early.
 - 1. Plan on contingencies
- b. Must provide venues for education of individuals and families.
 - a. Should facilitate obtaining protective equipment for individuals or groups.
 - b. Must lead by example.

This plan can be implemented without government or community support. A family or individual could use this plan and protect themselves as long as they are willing to keep themselves separate.

Biological and Chemical Agent Dispersion

Facts About Biological and Chemical Agents

1. Nerve gas and many other deadly gases cannot be sensed.
2. Some of the symptoms of nerve gas poisoning are as follows:
 - a A feeling of tightness or constriction in the chest.
 - b The onset of an unexplained runny nose.
 - c Small, pin-point size pupils.
 - d A drawing, slightly painful sensation in the eyes or unexplained dim vision.
 - e Difficulty breathing.
 - f Increased salivation and excessive sweating.
 - g Nausea, vomiting, and abdominal cramps.
 - h Generalized muscular twitching, jerking, and staggering.
 - i Headaches, drowsiness, a sense of confusion, and a possible coma.
 - j Death.
3. Biological agents are organisms or toxins that can kill or incapacitate people, livestock, and crops. They can be dispersed by aerosols, animal carriers, and food and water contamination.
4. Chemical agents are poisonous gases, liquids, or solids that have toxic effects on people, animals, or plants. They can be released by bombs, sprayed by aircraft and boats, and used to contaminate air, food, and water supplies.
5. In the event of a biological or chemical attack, you might be instructed to either take immediate shelter where you are and seal the premises or evacuate the area immediately. Follow the Instructions !!!
6. Become aware of the DOT warning placards used for in-transit hazardous materials

What to do *DURING* a Biological or Chemical Dispersion

1. What you should do is to evacuate the area for the amount of time that the authorities say. If an official evacuation is declared, **LEAVE IMMEDIATELY !**
2. In the event of an industrial accident or terrorist attack or other similar problem a broadcast might be made on the EAS (Emergency Alert System) following a general alert signal. It will be broadcasted on the radio, television, loudspeakers, and/or wide area broadcast systems. An example message would be as such: "Attention! Attention! A threat of (nerve gas contamination, radioactive contamination, or whatever the threat is) exists!" The direction of the cloud and the estimated time of arrival and path will be announced along with defensive action that each citizen should take.
3. If you have immediate access to a gas mask or scuba or scba equipment, use it and then proceed to evacuate. If it is not immediately available do not go looking for it. It will be too late. If you can wear your PPE (Personal Protective Equipment) which includes: long-sleeved shirt, long pants, gloves, and a gas mask, so you can be as protected as much as possible.
4. Take your 72-hour kit. Lock your home or office.
5. Use travel routes specified by local authorities—don't use shortcuts because certain areas may be impassable or dangerous.

6. Listen to local authorities. Your local authorities will provide you with the most accurate information specific to an event in your area. Staying tuned to local radio and television, and following their instructions is your safest choice.

7. There should be **no** reason to stay behind when an official evacuation order is announced. But if the situation arises that you cannot evacuate, or you are asked to **“shelter in place”** the following are listed some precautions that can be made. If you are advised by local officials to **“shelter in place”**.

In-Place Sheltering

Authorities have long recognized that it would be extremely difficult to evacuate whole counties in the event of a disaster such as a bio-chemical hazard/incident or chemical spill. The population is too great with too few exit routes. Evacuation is preferable when possible, but if it isn't an option, people can do what is called “inplace sheltering” with some simple preparation. This means that a person sets up a shelter in their own home until the air-borne hazard passes, which could be in several hours or many days. “In place sheltering” involves two types of sheltering.

a Sealing yourself indoors

b Quarantining yourself indoors

Listen for OFFICIAL information to see what kind you need to do. To seal yourself indoors there are some special considerations to take other than just locking the doors. IN ADVANCE, select a room in your home where you would do the in-place sheltering. An upstairs and interior

room is best, as some chemical hazards are heavier than air and travel along the ground and will enter basement shelters. Then make a list and keep it handy of what you will keep in that room or put there quickly if you have to shelter there. You will need to have:

Necessary:

a 200 sq. ft. (1 roll) plastic sheeting (4 mill is better than 3 mill but you can use down to 2 mil)

b 1 or 2 rolls of duct tape

c A battery powered radio or TV to check for OFFICIAL news

d Important personal medications for you and your family

e A flashlight or light stick - incase you loose power - do not use candles or lanterns that burn valuable oxygen

Optional:

a A port-a-potty, (5 gal. bucket lined with heavy duty lawn/leaf garbage bags and some RV/ holding tank toilet chemical or a pail of dirt and a lid or plastic snap-on toilet seat.

b Books, games, or other diversions (do not count on videos you will be covering your outlets)

c A FRS and/or ham radio to get information from local authorities - this does not displace official information sources - *REMEMBER* rumors are not official information.

d A telephone or cell phone

e Water or something to drink

f Food to munch on but not salty foods

It's is better to have this planned in advance and readily accessible than to have to think it up and find it on the spot. Depending on the distance you are from the bio-chemical hazard/incident you could have as little a 5 minutes and as much time as an hour but not

much more than that. Hazardous fumes, vapors and smoke follow the wind patterns. In most areas this is 2 - 3 miles per hour except around canyons and seashores then it can be anywhere from 2 to 40 miles per hour. Most people can walk 2 - 3 miles per hour. SO, if you are not in the immediate path of danger you will have time to get to a place and shelter there. So run - don't walk. To calculate where a good place is, figure any where you can normally, walk to in 5 minutes, realizing that in the event of a incident panic and chaos set in. You will need to plan on been "sealed in" your place for a minimum ONE hour in the absence of official information or longer. Mother nature does a good job of cleaning up chemical hazards/incidents using normal wind patterns and sunlight. This means that most of the dangerous levels of toxic problems sealed against for about an hour.

NOTE: You may still need to stay quarantined indoors for a much longer time just not "sealed in". Our homes cannot provide us with sufficient oxygen to seal ourselves in for long periods of time. You WILL die of asphyxiation if you try this, so don't. Besides it is next to impossible to seal an entire house in a reasonable amount of time, so choose a single room large enough with oxygen for all the intended occupants.

Side note: Full size dogs use twice the amount of oxygen as a full grown adult so you determine if Fido is worth saving.

First:

Turn on a radio or TV for official information.

Second:

You will need to turn off all mechanical or electrical operated air intake or air exchange to your home, business, school, or church, etc., namely your furnace (and gas main shut off) or air conditioner, chimney flue dampers and any fans. Do not take the time to get on your roof to cover vents and/or chimney openings.

Third:

Close, lock and secure your home (windows, doors, animal entries, etc.).

Fourth:

1. Gather your family and any pets you want to save and the listed supplies into your selected room, and using the plastic sheeting and duct tape, make the room as air-tight as possible.
- 2 Wet some (soaking wet) towels and jam them in the cracks under the doors. Where possible select a room large enough to maximized the amount of oxygen you will have until it is safe to come out.
- 3 Cover over windows, heat vents, light switches, power sockets, fire places, baseboard gaps, light fixtures, and entire door frames with duct tape and/or plastic. It is best to have

these pre-cut, well in advance to cover every opening. You can in advance, caulk some cracks and small air leaks into that room.

4 To determine oxygen needs and occupancy have everyone in the room in a standing position stretch their arms out fully. If they can do this with out touching anyone else's outstretched arms/fingers there is enough oxygen for one hour. (i.e. a 8 foot by 6 foot

typical bathroom holds enough oxygen for 2 adults and one child under 6 years of age.

5 Then limit activity and oxygen usage.

6 If the power goes out do not use lanterns or candles. This uses valuable oxygen. Light sticks or flashlights are a better source of light.

7 Stay inside you sealed shelter until you are told, *officially*, it is safe to leave. Realize you may still need to stay indoors, quarantined, for a longer amount of time. In the absence of official information you should leave your shelter after one hours time if you have only allotted yourself an hours worth of air.

Note: *Sheltering in place after a nuclear incident is different see the "Nuclear Disaster and Warfare" section of this booklet for more details.*

Quarantining yourself includes:

1. Gather your family to your home and lock all doors and window.
2. Turn on a radio or TV for official information.
3. Once you have locked yourself in do NOT open the door until you get OFFICIAL information that it is safe to leave.
4. You must guard yourself from ALL contact from all people *and* animals and some insects that have become infected. This may include those near and dear to you. You may have to put down your pets!

Note: *Quarantining yourself does not include or involve sealing yourself in with any kind of duct tape or plastic.*

WHAT To Do AFTER a Biological or Chemical Dispersion

1. Follow the instructions of local and government authorities !
2. If you evacuated, do not return home until it is determined safe to do so.
3. If you feel or suspect you have been affected by the situation contact the local hospital to see if they are receiving patients, if so go get help. Some biological poisonings will require quarantine. If you are turned away by a hospital or treatment center quarantine yourself in your home for the If you are turned away by a hospital or treatment center quarantine yourself in your home for the time told to you by the authorities.
4. If you find that others have been affected you may still want to quarantine yourself for 2 weeks or longer depending on the extent of the problem.

2006, By Kenneth Moravec

Common other Biological / Chemical Agents

Name	Quarantine	Symptoms/Comments	Treatment
Aflatoxin	2 days	liver cancer	None
Anthrax	14 days spores -	malaise, fatigue, cough, respiratory	antibiotics
Ciprofloxacin (bacterium)	tetracycline	respiratory distress, fever, cyanosis,	
Botulinum	0 days	dyspnea, diaphoresis, stridor, toxemia weakness, dizziness, dry mouth nausea,	oxygen, antitoxin
	vomiting, (toxin) difficulty swallowing and talking, blurred vision, drooping eyelids, progressive paralysis, cyanosis, respiratory distress		
Brucellosis	2 days	joint and muscle dysfunction	treat for burns,
Chlorine	2 days	eye and skin burns on contact, broncho	CPR, artificial
ventilation			
Cholera	6 -7 days	-spasm, cyanosis toxemia, vomiting, diarrhea, dehydration,	re-hydration,
tetracycline			
shock		erythromycin	
Clostridium	2 days	Perfringens - gaseous rotting of the flesh	
Plague	90-100 days	bubonic, septicemia, pneumonic, high	antibiotic,
streptomycin (bacterium)		Fever , chills, toxemia, streptomycin	
	doxycycline		
	headache, pneumonia, hemoptysis,	Chloramphenicol	
	malaise, meningitis, dyspnea, stridor,	Ciprofloxacin	
	cyanosis, respiratory failure, death		
Q-Fever	0 days	fever, chills, headache, severe sweats,	tetracycline
	malaise, fatigue, skin rash, respiratory	doxycycline	
	problems		
Ricin (toxin)	0 days	fever, nausea, vomiting, bloody diarrhea,	therapy for acute
lung		abdominal cramps, difficulty breathing,	injury
and			
kidney failure, paralysis circulatory		pulmonary edema	
collaps-paralysis		activated charcoal	
	gastric lavage		
Salmonella	2 days	diarrheal illness, headache, abdominal pain,	re-hydration
nausea		Ciprofloxacin	
Small Pox	30 days malaise,	fever chills, vomiting, headache,	intravenous
hydration,			
(virus)		2-3 days later: flat red spots change to pus	nutrition
		filled lesions on skin and mouth and	pain control,
throat		antiviral drugs	
Staphylococcal	2 days	SEB - fever, chills, shortness of breath,	artificial
ventilation			
Enterotoxin B		nausea, vomiting	
Tularemia	30 days	septicemia, pneumonic, high fever, chills,	antibiotics

headache, hemoptysis, (bacterium) malaise,
meningitis, dyspnea, stridor, cyanosis,
respiratory failure, death

Common Nerve, Blood, Chocking and Blister Agents

Chemical	Comments	Treatment
GA wash with soapy water	Tabun atropine, pralidoxime, CPR.	remove victim from area and entire body especially hair
GB remove victim	Sarin - colorless liquid – evaporates quickly hair with soapy water	pralidoxime, atropine, CPR, from area and wash entire body especially
GD	Soman atropine, from area and wash entire body especially hair with soapy water	pralidoxime. CPR, remove victim
VX victim	thick oil like liquid form area and wash entire body especially hair with soapy water	atropine, pralidoxime, CPR, remove
H	distilled nitrogen mustard gas - blistering and burning of eyes and skin	irrigation of eyes and skin, CPR
HD, HS	mustard gas - blistering and burning of eyes and skin	irrigation of eyes and skin, CPR irrigation of eyes and skin, CPR
HT Chloride	phosgene gas - Carbonyl	
AC	Hydrogen Cyanide - lighter	CPR, artificial ventilation
CK	than air - asphyxiation Cyanogen Chloride - heavier than air - asphyxiation	CPR, artificial ventilation
MDI	Methyl Isocyanate – heavier than air - respiratory distress, induce vomiting skin rash, eye irritation	irrigation of eyes and skin

Nuclear-Chemical Decontamination Kit

Nuclear - Chemical Decontamination Kit

1 5 or 6 gallon bucket with lid
1 - 2 Spray Bottle (s).
1 Bulb Syringe.

- 2 Large Bath Towels.
- 4 - 8 Wash-Cloths
- 1 pkg. Baby Wipes
- 1 Small bottle of liquid soap.
- 1 Small bottle of shampoo.
- 1 - 4 39 gallon size (1 mil) yard bag(s)
- 1 - 4 Twist ties.

** apart from "Decon Kit" but helpful and maybe necessary.*

Before entering your shelter after a nuclear or chemical incident you need to decontaminate your entire body.

- A. Carefully open and arrange your decon kit in such a way that you can reach everything and still keep all possible contamination in one localized area.
- B. Step into the large basin or 39/55 gallon bag so it can catch all water and decontamination coming off of your body.
- C. Carefully strip off all of your clothes. Yes all of them. This is not a fashion show or a time to worry about modesty rather a time to worry about saving your life. Put ALL of your clothes in a 39/55 gallon bag. You may have to cut your clothes off. Speed is an issue. The faster the better.
- D. Remove ALL jewelry, eyeglasses, and plastic coated pictures, identification cards, etc. you may want to save and put them aside. These too will have to be decontaminated with water so realize you will not be able to save non-plastic coated papers or cloth items.
- E. Shower completely with an *outside* shower or hose.

NOTE: *If you do not have an outside shower or hose then do the following:*

- A Open a spray bottle and fill it with water and spray your entire body head to toe with emphasis on all the hair on your body, wherever it is. Your hair must be cleaned well.
- B Take one washcloth and blot down (do not wipe the contamination into your pores) your entire body head to toe, not forgetting the genital areas and orifices, then the face then the rest of the body. Place the wash cloth in the 39/55 gallon bag.
- C Open the spray bottle again and fill it with 2 tablespoons of bleach - If it is a chemical incident. If it is a nuclear incident straight water is okay. Spray your entire body again. Be careful around eyes, ears, nose, and mouth not to do this area if you are using the bleach solution. You do not need bleach in those parts.
- D Fill the small basin with water and with the liquid soap, shampoo, the remaining water in the spray bottle, and a DIFFERENT wash cloth. Soap up and scrub your entire body, especially cracks and crevasses, your jewelry and ID cards you want to save. You cannot save cloth or paper items.
- E Fill up your spray bottle one or more times and rinse down your body completely.
- F. Open the baby-wipes package and use one or more to clean around your eyes, nose, mouth and ears.
- G. Dry off completely and step out of the large basin or bag. Place all towels, washcloths, and other cleaning instruments into the 39/55 gallon bag.
- H. If it is a nuclear incident, with the Rad meter, take readings over your entire body AWAY from your decontamination basin and contaminated clothes and water. You need to bring the radiation level down to 1 R. or less. If the radiation level has not decreased continue washing until it does.
- I. Repeat the process if necessary using clean towels and washcloths.

J. Seal up the 39/55 gallon plastic bag with the wire tie and place as far away from the shelter door as possible with out risking further contamination.

K. Once you are “clean” you may enter your shelter and put on some clean clothes.

2006, By Kenneth Moravec

Nuclear Disaster and Warfare

Facts about nuclear disasters

1. Radiation

- a. Radiation kills and is **not** perceptible to the human senses.
- b. Radiation sickness and radiation poisoning are **not contagious**.
- c. Radiation in perfect circumstances can last more than 20 years.
- d. Radiation under normal circumstances decays or dies very fast (about 14 -21 days).
- e. The most vulnerable to radiation poisoning are young children, elderly, and sick.
- f. Measurement and Time Limitations
 - 1) Radiation is measured in Roentgens (R.).
 - 2) You receive ½ to 1 R. from the x-rays your dentist takes.
 - 3) The human body can receive up to 400 R. and still live (see the “Radiation and Contamination Effect Chart” in this section) although after 400 R. will cause serious damage.

2. Explosion

- a. Most deaths occur due to being exposed to the explosion (which includes the blast, wind, radiation, heat, and light) or due to collapsed buildings or fires. The wind caused by the blast is approximately 200 mph or more from the center of the blast out to about 12 miles.
- b. Even during the worst possible time for a nuclear device to explode (a week day at noon in the middle of winter), it is estimated that only approximately 2% of the actual population would be killed in the explosion. The rest of the casualties would result from radiation sickness and injuries sustained in the days and months to follow.
- c. **Never** look at an explosion, it will blind you (within about 20 miles). The light “flash” can still be seen up to 50 miles away. Do not look at it no matter what the distance.
- d. The entire detonation of a nuclear device only lasts a few seconds.
- e. Radiation levels for the explosion can reach up to 5000 R. or more.

3. Decontamination

- a. Decontamination of radiation contaminated objects includes washing everything.
- b. **Never** burn, boil, or dust off contaminated objects. This only puts the radiation back into the air. You cannot get rid of radiation by burning it.
- c. Any contaminated object that cannot be washed properly (i.e. sponges, cakes, breads, berries, and other porous materials, etc.) should be disposed of.

4. Fallout

- a. "Fallout" is dust, dirt, or particles from an explosion that have radiation molecules on or in them.
- b. A public fallout shelter is a building or structure designated by the government that is said to provide ample protection from radiation and also supposedly has enough supplies in it to house, feed, and provide sanitary needs for the amount of persons allowed into the shelter, although most public fallout shelters are **not** stocked.
- c. Fallout shelter building and shielding materials include: (with a protection factor (PF) of 4 and/or a shielding factor (SF) of .05) 36" of wheat or 24" of rice or 18" of wood or 14" of books or magazines or 9" of empty concrete blocks or 7" of dirt, water, or gravel or 5" of solid bricks or sand or 4" of concrete, glass, or aluminum or 1½" of steel or iron or ¾" of lead
- d. You can find minimal protection in a full basement of a residential type home. (SF .5)
- e. Food and water are unaffected by direct radiation, other than being cooked. However, they can still be contaminated by fallout.
- 1 Fallout-exposed canned or bottled food items are safe and should be washed off before being opened.
- 2 Fallout-exposed solid foods can be eaten, but the outer ¼ inch should be peeled or cut off and disposed of after being washed off.
- 3 Fallout-exposed porous foods should never be consumed.
- 4 Fallout-exposed water is okay to drink, but it should be filtered extensively first (not boiled) to be sure that all fallout particles are not consumed.
- f. Within the first two weeks after the last explosion, protective "fallout" clothing should be worn outside at all times and shed before entering a fallout shelter. Protective fallout clothing includes:
- 1 Headgear or a full brimmed hat with hair completely covered
- 2 Boots or sturdy shoes
- 3 Heavy or thick clothing including gloves (long sleeved shirts and long pants)
- 4 A dust or gas mask or some other form of respiratory protection to ensure that fallout particles are not inhaled.
- g. After five weeks it is safe to be outdoors for up to 14 hours a day. There has been no real study that is available to the public that states when a person could be outdoors for up to 24 hours a day but most of us are not outside more than 4-5 hours anyway.
- h. After a nuclear disaster, before planting crops again you should wait at least 2½ weeks, scrape off or plow at least 18 inches under the top 3 to 5 inches of top soil, and then plant.

What to do to PREPARE FOR a Nuclear Disaster

1. Follow procedures for "General Emergency and Disaster Preparations" (see page 1).
2. Obtain Thyro-Block tablets or some other form of (KI) potassium-iodide or potassium-iodate.
3. Understand the warning signals given by the government and local authorities, what they mean, and how to respond to them.
 - a. The EMERGENCY ALERT SYSTEM (EAS) is broadcast over sirens, radio, television and the internet and lasts for about 10 seconds. After you hear or see this turn on your radio or television to get the **official** message from your local authorities on what to do

and where to go. With this signal or message you will usually have time to evacuate the area or seek adequate shelter. Listen to it !

b. If you live in an area that has a wide area broadcast system - WABS (most major cities do) a wavering siren will sound. This usually does not give you any instructions. After you hear or see this turn on your radio or television to get the official message from your local authorities on what to do and where to go.

c. If you live in an area that does not have a wide area broadcast system or EAS when political tensions begin to rise be attentive to the radio and television news broadcasts as to what to do.

*******REMEMBER a rumor is not a warning !*******

d. If you hear a rumor, do not start packing but rather find official information.

4. Nuclear detonations create EMP's (electromagnetic pulse) which burn out some electric and most electronic equipment rendering computers, televisions, stereos, ATM machines, most newer vehicles (1970 to present), etc. incapacitated. EMP's have no direct affect on living things. Although it would be difficult to protect everything, there are a few things you can do which will help before (not during) a nuclear detonation.

a. Unplug all electric and electronic equipment.

b. Disconnect all telephones, answering machines, modems, etc.

c. Lower or disconnect all antennas on home, handheld, and vehicle radios, shortwave, CB's, HAM radios, etc longer than 12".

What to do *DURING* a nuclear disaster

1. *Remain calm ! Think* through the consequences of all your actions.

2. Time limitations:

a. 24 hours or more: Evacuate and take your family with you BUT only if you have a safe place to go to. Remember roads will be jam-packed and you will not get far

b. 30 minutes to 24 hours: Evacuate to a shelter nearby or your home, if close by, immediately. Do not wait for your family. Go!

c. 5 minutes to 30 minutes: Do not evacuate. Go to the nearest fallout shelter.

d. 30 seconds to 5 minutes: If you do not have time to find adequate shelter, are at work, school, or church, etc., get under a desk, behind a sturdy wall, to the basement, behind a white wall, or to the center-most part of the building and brace yourself as for an earthquake. Before you decide to evacuate think and be sure you are able and want to get on the highways with everyone else trying to do the same. You will see massive delays and traffic.

3. If you are going to evacuate, and have time, remember to turn off all utilities, close your curtains, and lock your house.

4. Do not forget to take your 72-hour kit with you, if you can get to it in time without risking your safety or the safety of others.

5. If you do not have time to go to a shelter and you are at home, follow the instructions in this section for "Things To Do At Home In The Event Of A Nuclear Attack" .

6. Do not bring pets into any public shelter. They will not be allowed.

7. Do not bring pets into your own shelter or basement unless you have at least a three week food supply for them and proper sanitary measures. It is usually best to leave most pets and farm animals in a garage, shed, or barn with an ample supply of food and water. They have a tendency to survive radiation exposure much better than humans. However,

do not leave dogs with other dogs or with any other animals or locked inside. Dogs have a tendency to go wild and will even turn on their own masters under these circumstances.

8. If you are in your vehicle and do not have time to seek proper shelter, stop your vehicle, get out, and lie on the ground face down, preferably in a ditch or culvert or behind or in some other form of protection.

9. If you are outdoors and do not have time to seek proper shelter and have no form of protection around you, lie on the ground face down.

10. If you are caught in the open stay down low until the blast is over, about three seconds. Seek indoor shelter as soon as possible. The blast wave goes out from the center of the explosion and then is sucked back in which causes the mushroom-shaped cloud. So expect two blast waves.

11. **Never** look at the blast. It **will** blind you.

12. If you can feel, hear, or see the blast, you **are** in danger. There may be other blasts.

How to prepare your home basement to act as a fallout shelter

1. First of all this is a minimal protection fallout shelter and also it is *NOT* a blast shelter.

2. You will need to start with a full basement home. If you have a half, daylight, or walkout basement you will need to do extra protection on those exposed walls or parts of walls out of the ground. By starting with a full basement you use the dirt on the four sides of the basement wall as minimal protection. The main worry is overhead.

3. By filling up window wells with dirt, sand, books, or other dense materials - this will help. You can do this either from the outside or if you are out of time from the inside - on the window ledges. The glass in the windows offers no protection.

4. The next step is to build up the overhead protection. You can do this by getting under a sturdy table, workbench, bookshelves with a door across them, doors leaned against the outer basement wall, etc. and then piling on top of the structure dense materials such as materials listed in the first part (Fallout) of this section

4c. You can do this also to main floor over the part of the basement you are in.

5. Be sure when you are done fortifying overhead that you fortify around you on all four sides. The first seven hours after each blast are the most important. This does not mean you can come out of your improvised shelter for long periods of time but if you need to stretch your legs for a minute (emphasis on the minute) you can as long as you stay in the basement.

6. Be sure that you do not seal your self in so tight that you do not have air to breath. *This is not where you use duct tape and plastic.*

7. Remember you need to stay in your shelter for up to 14 days or longer. You will need both sanitation measures, water and food. The more you can do to prepare before a nuclear event the better - even if it is just putting needed materials and supplies in one place so they are easy to grab and use. On the next page are a few examples from FEMA manuals on how you can build these expedient shelters. For more details on these pictures contact the author.

2006, By Kenneth Moravec

What to do *AFTER* a nuclear disaster

1. Begin taking Thyro-Block tablets or some other form of potassium-iodide/iodate according to the instructions on the bottle. It is actually best to start this before or as soon as you get an official warning.
2. It is recommended that if you are within the 350 mile “downwind” radius of an explosion that you stay indoors in a fallout shelter or basement for at least two weeks. This, by the way, under most probable scenarios would cover the entire U.S.A.
3. If you are outside the 350 mile “downwind” radius of an explosion, stay indoors at least 5 - 6 days and then venture out only for short periods of time only if needed.
4. As you begin to leave your shelter, do it for short periods of time only to get rid of sewage and trash.
5. As time goes by, you will be able to leave your shelter for longer periods of time. (See the “Radiation Contamination and Effect Table”) Turn on a battery-powered radio for

Official broadcasts on what to do.

6. After 3 weeks you will need to start your life over again. Remember food production and water filtration should most likely be on the top of your priority list.
7. Most likely everything outside of protected areas will need to be washed, cleaned, or peeled. Never burn or dust off items because it only puts the fallout back into the air.
8. Exposed or contaminated dry items stored in paper bags or other dry containers should be placed in uncontaminated containers, if you plan to use them.
9. Exposed washable loose items, such as fruits and vegetables, should be washed, then cut or peel the outer ¼ inch off.
10. Under no circumstance should exposed porous items (i.e. breads, cakes, lettuce, broccoli, berries, etc.) be eaten.
11. If you think you have fallout on you, discard your outer garments and wash your skin and hair thoroughly.
12. If you insist on going outside in a fallout-contaminated area, put on your protective clothing,
as described earlier in this section. Make sure your hair is covered well. If you have long hair put it up or chop it off.
13. Gasoline and other petroleum products will most likely be scarce, so save them and use them wisely. Remember, most vehicles will probably not operate without mechanical adjustments due to the EMP.
14. As with any civil disturbance, war, or any other disaster, the “have-nots” will become ever so noticeable. Those who “have-not” usually band together to loot, steal, rape, and kill those who have more than they. The police and other protective agencies, if they exist at all, will most likely have their hands full and will not be able to offer very much assistance. Arming yourself might be a wise idea. Self protection may be a necessity,

BUT in no way is the author of this booklet suggesting self-appointed militia or vigilantism. These groups tend to become just as bad as the bands and mobs of “have nots.” Forming a neighborhood watch is probably your best alternative. - militias NO - neighborhood watch YES -

Radiation Dosage Table

Animals & Plants	Maximum average amount of radiation dosage (r.)
pig, dog, cat	300

goat	350
human	400
monkey, mouse	450
sheep	540
fish	550
cow, horse, rat	630
rabbit	800
chicken	1,000
insect	5,000 +
turtle	5,000 +
bacteria, virus	100, 000 +
onions	2,000
oats	3,300

barley, rye, wheat, corn	4,300
fruits, grasses	5,000
potatoes	12,000
cabbage , spinach	14,000
tomatoes	15,000

Although fallout shelters that bear signs similar to the one at the right are often abandoned and not supplied they still offer protection from fallout and radiation sources. If you find that you need to use one you can feel safe in there use but do not depend on them being stocked with any food, water, sanitary or medical supplies. So do not forget your 72-hour kit and all the food and water you can gather when looking to use a fallout shelter. Don't forget your sanitation supplies and more water.



What to do Before a Nuclear Attack

THIS LIST IS IN ORDER OF IMPORTANCE.

If time permits, check all of the things on the list. If time does not permit, start from the top and work down.

1. Do not panic.
2. **Think** through the consequences of all your actions.

3. Gather your family together.
4. Turn on a television or battery powered radio (for official broadcasts).
5. Begin taking a "Thyroid Blocking Agent (Potassium Iodide - KI)" follow the instruction on the bottle.
6. Go to the basement or lowest or center-most part of the house or building.
7. Build a shelter. (if one does not already exist) - See preceding pages for sheltering materials.
8. Turn off the gas or propane.
9. Turn off the electricity.
10. Fill all tubs, basins, and empty containers (preferably with lids) with water.
11. Turn off the water.
12. Bring filled water containers all non-perishable foods into your shelter (enough for 3 weeks).
13. Bring sanitation measures and items into your shelter.

14. Bring clothing, bedding, and sanitary supplies into your shelter.
15. Close and lock all windows and doors.
16. Fill all basement window wells with sand, dirt, books, or any other dense material. Either from the outside or inside on the window ledge depending on how much time you have.
17. Turn off and cover chimneys, air conditioners, vents, etc. to prevent fallout from coming inside.
18. Close all drapes, curtains and blinds to reflect the flash of the blast and discourage burglars.
19. Go to or send one person to the nearest food store with all available cash to buy all of the nonperishable food that they can, if you do not have a food storage in place.
20. Disconnect or lower all antennas, over 12", and unplug all electric and electronic equipment.
21. Bring into your shelter an axe, pry-bars, and shovel (in case you have to dig your way out).
22. Bring into your shelter legal documents.
23. Board up all windows and doors.
24. Prepare your house as if you were preparing for a tornado or hurricane and an earthquake.
25. Pick all ripe (not green) fruit and bring into shelter for immediate consumption.
26. Cover all outside fuel sources (i.e. firewood, coal, etc.) with plastic or heavy canvas.
27. Dig a deep hole down-hill from your water sources and future garden spots for waste disposal.
28. Empty and unplug all refrigerators and freezers of food (either discard it or eat it) and leave it open (to prevent mildew, a can of open ground coffee will help.).
29. Secure all breakables, pictures, water heaters, china closets, vases, etc.
30. Bring in or secure all lawn furniture, toys, and equipment.
31. Fill all cars, trucks, ATV's, motorbikes, chainsaws, etc., with fuel.
32. Move and lock up cars and trucks into garages or carports, or other secured areas then disconnect and remove the battery and any C.B. or HAM radios and bring them inside.
33. Gather together all gardening supplies into one secure place.
34. Cover all furniture, carpets, and rugs with plastic or dust cloths.

35. Take a good bath. It may be your last for a while.
36. Eat a good hot meal. It may also be your last for a while.
37. Recheck food, water, sanitary supplies, bedding, and clothing in your shelter.

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