

Collecting this kind of information is sort of a hobby to me, as many of you know. (Currently I am including some of my relatives in my emails, who do not know.) This article, from the site mentioned, is as good a one that covers basic needs in case of emergencies.

Note that today, 12 Feb, 2002 the government is warning about possible continued terrorist attacks, maybe even today. You do not know where and when this information may be useful. I wish I had written this article myself - it tells a lot in a little space. You can not always do what they recommend, but this is "food for thought." - Paul

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Survival Ring Services, Civil Defense Now! Food and Water  
<http://www.survivalring.org/cd-foodandwater.htm>

Civil Defense Now! - Food and Water/72 Hour Kit  
By Richard A. Fleetwood - May 2001

Friends,

This page is a great start for you on creating a very important tool to help you thru ANY desperate or disaster situation. It was compiled and placed in a report created for the Church of Jesus Christ of Latter-Day Saints, and was published as 86 Page PDF file which you can download from Survival Ring, as well as many other places. The manual states that any or all parts may be copied and distributed to benefit those who would put the information to good use. I present it here in HTML format to help EVERYONE wanting to create the best 72 hour kit they can to take care of their families. My thanks to all the many people in the church, who helped compile and collate this great reference. Please read carefully and act quickly just in case you ever REALLY need to use one of these kits.

Contained on this page is information on 72 hour kits, emergency water supplies, and emergency heating, cooking, and lighting.

## **72 Hour Kits**

The objective of the Family 72-Hour Emergency Preparedness Kit is to have, previously assembled and placed in one location, all of those essential items you and your family will need during a 72-hour time period following an emergency. When an emergency occurs you will probably not have the luxury of going around the house gathering up needed items, especially if you have to evacuate your home on short notice.

Take time now to gather whatever your family needs to survive for three days(72 Hours) based upon the assumption that those items are the only possessions you will have. Store these kits in a closet near the front door or some other easily accessible place where they can be quickly and easily grabbed on the way out the door.

Pack all items in plastic Zip-loc type bags to keep them dry and air tight. This will prevent a liquid item from spilling and ruining other items in your kit and keep rain and other forms of moisture away from the items stored.

Keep a list of the dates when certain items need to be reviewed, especially foods, outgrown clothing and medications so that they may be properly rotated.

Emergency supplies are readily available at preparedness and military surplus stores. Fear may well be responsible for more deaths than exposure, hunger and injury combined. Realizing you have fears and that these are normal emotions in unfamiliar situation, you will be aware of them and better able to cope with them as they appear. Fears can be expected in any outdoor problem situation. Fear of the unknown and fear of your ability to cope with the situation will be foremost, along with a fear of being alone, darkness, suffering, or death. Fear is usually based on lack of self-confidence and lack of adequate preparation and experience. Knowledge and experience (practice sessions), will help to instill confidence and help to control fear.

### **Container**

The container you choose for your kit must be waterproof, have some type of carrying handle, and must be able to be carried easily by family plastic bucket, duffel bag, trunk or footlocker, plastic garbage cans.

### **Water**

Advised amounts of water for a kit vary. The Utah County Sheriff's office recommends a minimum of two quarts per day for each adult. However, a person can survive quite well on less, and the load of carrying six quarts of water with a pack is great. Outdoor survival course veterans agree that a two-liter bottle should be adequate. Water purification tablets or crystals need to be a part of each kit. Refer to Emergency Water Supply for treatment methods and information on portable water filters.

### **Food**

You should include in your kit a three-day supply of non-perishable food. The food items should be compact and lightweight, in sealed packages. MRE's (Meals Ready to Eat) are a good choice because they require little or no preparation. Freeze-dried foods are lightweight but require extra water in your kit. Canned goods are heavy with extra refuse. Plan nutritionally balanced meals, keeping in mind that this is a survival kit. Include vitamins or other supplements, if desired.

Possible foods for a kit might include:

- MRE's
- snack crackers
- hard candy
- dried fruits
- instant oatmeal
- powdered milk
- jerky
- bouillon cubes
- raisins/nuts
- instant rice/potatoes
- dried soups
- gum

- granola bars
- instant pudding
- powdered drink mixes

Also include a mess kit or other compact equipment for cooking and eating. A can opener may also be useful.

## **Shelter**

The objective of shelter is to provide emergency housing. It is extremely important to be physically protected from nature's weather elements. There are many types of shelter that can be easily included in your 72-hour kit. You may want to consider family tent, backpacker's tent, tube tent, rain poncho, garbage bags, nylon rope or cord, duct tape, space blanket and space sleeping bag.

## **Bedding**

- Bedding should be warm, lightweight, comfortable, waterproof and compact.
- Sleeping bag (2 ½ pound hollow-fill)
- Insulation. Under your sleeping bag you will need some insulation to protect you from the cold ground. Though foam pads are generally thought of as an item of comfort, their true importance is in insulating you from the ground. The best types are "closed cell" foam pads about 3/8 of an inch in thickness. They are very light weight and easily attached to the backpack for carrying. You may also use a poncho, plastic ground cloth, newspapers, leaves, or pine boughs, for insulation but they are not nearly as effective as the closed cell foam pads.

- Blankets can be used to make a bed roll but generally they are not as comfortable nor as warm as a sleeping bag. Wool blankets are the best since they retain their warming ability even when wet. However, blankets are very heavy and bulky.

- Space blanket or bag. As explained in the previous section space blankets and space bags (aluminum coated mylar) are very efficient at retaining body heat and are a must for every 72-hour kit. Even when used by themselves, without the added benefit of a sleeping bag they will keep you warm during the night. In cold winter weather they may not be entirely comfortable but they will probably keep you warm enough to keep you alive. Being plastic, however, they are impervious to moisture. This is good for keeping out rain but they also retain sweat and condensation from your breath. you may find that periodically during the night you will have to air them out in order to sleep comfortably. They can also be used during the day to protect from rain, sun and to retain body warmth.

## **Clothing**

Include in your kit one change of clothing and footwear, preferable work clothing. Anticipate severe weather conditions. If you have a growing family remember to update clothing sizes and needs at least once a year. Try to avoid wearing cotton clothing. Tight cotton clothing holds water next to the skin. Wet inner clothing causes freezing. Cotton clothing "wicks" (draws water up the very small individual fibers), thus retaining water and spreading it over the entire body, causing loss of body heat at an ever greater rate. Wool clothing is best. Wool is a natural thermostatic insulator that keeps

you warm in the winter and cool in the summer. Wool is naturally durable and can withstand rugged and tough wear. Wool also repels water and has the unique property of keeping the body warm even if it does get wet. Wool dries from the inside out and does not "wick." Include two pairs of wool socks- one pair for wearing and one for keeping your feet warm while sleeping.

## **Fuel**

**Every family member should have fire starting materials and know how to start a fire.** Several of these items should be assembled into a kit and labeled as "fire starting kit." Teach all family members how to use them and let them practice building fires with all methods until they feel totally confident with their ability to do so. Even little children aged five or six can be safely instructed in correct fire building techniques under proper supervision. Then if an emergency arises, they will not panic or feel overwhelmed or frightened at the prospect of building a fire for their warmth and protection.

Some different sources are:

- Matches. Carry at least two dozen wooden kitchen matches that have been either dipped in wax or nail polish to make them waterproof or carry them in a waterproof container.
- Metal match. Waterproof, fireproof, durable, and non-toxic. Will light thousands of fires. Available at sporting goods stores.
- Butane lighters, such as Bic cigarette lighters, are excellent ways to light a fire.
- Magnesium fire starters are good for starting fires with wet or damp wood. Shave magnesium shavings off of a magnesium block with a pocket knife and then strike a spark from a flint starter with a pocket knife. Magnesium burns exceptionally hot and will ignite almost any combustible material. Works even when wet and can be purchased at most sporting goods stores.

**Paul's interjected note:** the shavings from a magnesium fire starter will blow about with every wind and eddy, even those you can not see. A good trick one author recommended (Outdoor Survival Manual- Maers) might to be to trap the shavings between to decaying leaves, so that the sparks from the striker can fall through the openings in the leaves, and catch the magnesium. You should also note that the black bar on the magnesium fire starter is actually made of flint. You can spark it, alone, if you do not want to use the magnesium. Use the back of your knife blade to create the sparks. **Much later note**, if a Magnesium Fire Starter is dropped from waist height to a hard surface, the top bar usually comes off. In storage, I wrap mine with duct tape. Look into a Strike Force Fire starter, is my recommendation.

- Small magnifying glass. Use to concentrate sunlight onto paper, shredded bark or other tinder.
- Flint and steel A spark from flint and steel (such as an empty cigarette lighter or flint and steel striking bar), when directed at dry paper (especially toilet tissue), shredded bark, dry grass or other tinder, if persisted in patiently will work very well to start a fire. This is the most reliable "non-match" method of starting a fire.
- Commercial fire starter kits. These come in a variety of styles and

fuels.

- Steel wool. Fine steel wool (used for scrubbing pots and pans- but not Brillo pads or other types that have soap already impregnated into them) can be used for tinder. Hold two "D" flashlight cells together in one hand (or one 9-volt transistor radio battery) while touching one end of a clump of steel wool to the positive end of the battery and the other end of the steel wool to the negative end of the battery. The current causes the steel wool fibers to incandesce and then produce a flame. It burns very hot and fairly fast so have lots of other tinder to burn once the steel wool ignites.
- Candles can be used for warmth, light, and starting fires. To start a fire simply cut a piece of candle about ½ inch in length and place it on top of the tinder. When lit the wax will run over the tinder making it act as a wick and ignite. You can also place small twigs and other easily burnable materials directly into the fame to build a fire.
- Car Battery. If you are near your car you can easily put sparks into tinder by attaching any wires to the battery posts and scraping the ends together in the tinder.
- Sterno fuel and stoves make an excellent cooking fuel when backpacking or in emergencies. Sterno can be lit with a match or by a spark from flint and steel. Slivers of gelled sterno can be cut from the can and placed on top of tinder and lit with flint and steel or with a match. It burns hot enough to ignite even damp tinder.
- Cotton balls and gauze from the first aid kit make excellent tinder and can be ignited with sparks or with matches.
- Fuel tablets such as tri-oxane and gelled fuels store well and ignite quickly and easily. Some can be fairly expensive, however.
- Butane and propane stoves. These are made especially for backpackers. The fuel is cheaper than sterno, it burns hotter and it heats better in windy situations than other fuels. Propane, however is more difficult to light as outside temperatures near zero.

### **First Aid Kit**

Update your first aid skills. Keep your first aid kit well supplied. Suggested first-aid supplies for 72-hour kit:

- first aid book · waterproof container · assortment of band-aids · gauze pads · butterfly bandages · cotton balls · small roll of gauze · adhesive tape · cotton swabs (Q-Tips) · safety pins · Pepto-bismol tablets · antacid tablets (good for bee sting) · cold pack · consecrated oil · hydrogen peroxide · alcohol (disinfectants) · smelling salts · medicine dropper tweezers · alcohol wipes · Benadryl capsules · aspirin (promotes healing of burns) · Tylenol (chewable for children) · collapsible scissors · thermometer · crushable heat pack · special prescriptions or equipment · small tube or packets antiseptic cream · ointment · small spool thread/two needles

### **Miscellaneous**

Some other miscellaneous items that may be very helpful are: · light stick · small flashlight · extra batteries · pocket handwarmer · compact fishing kit · compass · pocketknife · 50 ft. nylon cord · plastic poncho · garbage bag · paper or cards · pen, pencil · fine wire · extra plastic bags · small scriptures · favorite songs · small game, toy, etc. · spare glasses · money (small bills and change) · field glasses · toothbrush/toothpaste · metal mirror · comb · razor · pre-moistened

wipes · toilet paper · feminine products · sunscreen · soap · lip balm with sunscreen · bandana (may be used for hat, washcloth, mask, sling, tourniquet) · tube soap, bar soap, waterless soap · identification/medical permission card · special blanket or such for little people · portable radio with extra batteries

### **Family Information Record**

In addition to emergency survival supplies you should also collect vital family information. Record and keep it in at least two safe places—a fire resistant "get-away" box that you can take with you if you have to leave the home, and a safe-deposit box at your bank or credit union.

The following items would be useful for you to record and keep in these two locations:

- Genealogy records · Full name and social security numbers of all family members · Listing of vehicles, boats etc. with identification and license numbers · Listing of all charge account card numbers and expiration dates, bank account numbers (both checking and saving), insurance policy numbers, securities, deeds, and loan numbers showing the company name, address and telephone numbers.
  
- Name, address, and telephone number for each of the following:  
Ø employer Ø schools Ø fire/paramedics Ø family contacts Ø utility company Ø police Ø doctor Ø hospital Ø attorney Ø civil defense · Location of important documents Ø insurance policies Ø deeds Ø securities Ø licenses Ø loans Ø will Ø safe-deposit box key Ø vehicle titles (pink slips) Ø birth/death certificates Ø social security I.D. cards Ø citizenship papers Ø letter of instruction Ø tax returns (last 5 years)

### **Infants**

When assembling items for your 72-hour kit be sure to include all necessary items for infants. It would be a good idea to include a separate back pack or other container that holds nothing but infant supplies (which can be surprisingly voluminous). This kit should be kept with the kits of other family members so that it will not be forgotten in a moment of haste. As the baby begins to grow, replace clothing and diapers with the next larger size.

### **Car Mini-Survival Kit**

Your car is frequently your home away from home. Most of us spend many hours in our cars each month. Anything from a jammed-up freeway to a major disaster could force you to rely on your car for short-term shelter and survival. It is a wise practice to keep simple provision for emergencies in your car. A self-made cold-weather car kit, as described in some preparedness stores, is also good to keep in the car.

### **At-Work Survival Kit**

Many persons stand a 40 percent chance of being at work when an earthquake or other emergency strikes. A mini-survival kit kept at your place of work could make the hours until you are able to get home more comfortable and safer. This kit could be a duplicate of the car mini-survival kit.

## **Emergency Water Supply**

Health department and public water safety officials use many safeguards to protect the sanitary quality of your daily drinking water. However, this protection may break down during emergencies caused by natural disasters. During times of serious emergency, the normal water supply to your home may be cut off or become so polluted that it is undrinkable. A supply of stored water could be your most precious survival item!

You and your family may then be on your own to provide a safe and adequate water supply. Remember that typhoid fever, Dysentery, and infectious hepatitis are diseases often associated with unsafe water.

Don't take a chance! Generally, under serious disaster conditions, no water can be presumed safe--all drinking and cooking water should be purified.

## **Required Amounts of Drinking Water Per Person**

A minimum of two quarts and up to one gallon of water is needed per day, depending on the size of the person, the amount of exertion, weather, and perspiration loss. A minimum of seven gallons pure water per person would be needed for a two-week survival supply. With careful rationing, this amount would be sufficient for drinking, food preparation, brushing teeth, etc. Fourteen gallons per person will allow for hygiene care.

Keep an emergency supply of drinking water in plastic containers. Commercially bottled drinking water is available. It stays pure for months and has the expiration date clearly marked on it.

There are several other sources of water if your water supply is turned off--water drained from the hot water tank (usually contains 30 to 60 gallons of usable water), clear water from the toilet flush-tank, if kept constantly clean ( not the bowl !), melted ice cubes, canned fruits and vegetable juices, and liquid from other canned goods.

1. If water is cloudy, smelly, or otherwise polluted, strain it through a paper towel or several layers of clean cloth into a container in order to remove any sediment or floating matter.
2. Water that is boiled vigorously for five full minutes will usually be safe from harmful bacterial contamination.
3. If boiling is not possible, strain the water as above and treat by adding ordinary liquid chlorine household bleach or tincture of iodine. Since liquid chlorine bleach loses strength over time, fresh bleach should be used as a water disinfectant. If the bleach is a year old the amount should be doubled. Two-year-old bleach should not be used as a water disinfectant.
4. Other chemical treatments for water purification also include halzone tablets, iodine tablets or crystals. Mix thoroughly by stirring or shaking the water in its container. Let it stand for 30 Minutes. A slight chlorine odor should be detectable in the water; if

not, repeat the dosage and let the water stand for an additional 15 minutes before using. Use an eye dropper to add the chlorine or the iodine to the water. Use it only for this purpose.

#### How to Prepare and Store Bottles of Purified Water

Keep the drinking water safe from contamination by carefully storing in clean non-corrosive, tightly-covered containers. Use one-gallon containers, preferably made of heavy opaque plastic with screw-on caps. Plastic milk bottles are not recommended. Sterilize the bottles.

Number of drops to be added per quart of water:

Chlorine -----	Clean -----	Cloudy
Common household laundry bleach -----	2 -----	4
Tincture of Iodine -----	3 -----	6

From medicine chest or first aid kit (2% chlorine) (Rotate your iodine each year to ensure that it will work when you need it)

#### Emergency Water Supply

1. Wash bottles with soapy water, then rinse thoroughly.
2. Run about three quarts tap water into one of the containers, then add 3/4 cup bleach to the water.
3. Shake well, turning upside down a time or two so that the stopper will be sterilized also.
4. Let the mixture stand for two to three minutes, then pour it into the next container. You can use the same chlorinated water for several containers.
5. Fill the empty bottle with pure or purified water and seal it tightly close with cap or stopper.
6. Label with "Drinking Water--Purified", and the date of preparation.
7. Water purification tablets may also be used and are available in drug stores and sporting goods stores. They are recommended for your first aid kit. Four tablets will purify one quart of water.
8. Some stored water may develop a disagreeable appearance, taste, or odor. These properties are not necessarily harmful. Inspect your water supply every few months to see whether the containers have leaked or other undesirable conditions have developed. Replace the water if it becomes contaminated.

#### Portable Water Purification Equipment

A high quality filter system should possess the following characteristics: light-weight; have fewer parts (less to go wrong); a fine pre-filter; a replaceable or clearable filter; tight, well-made pump; high volume output; quick filtration; should screen out organisms over 0.5 microns (0.2 microns is best).

A system with all of these features may not be inexpensive, however. The cost will usually reflect reliability as well as technology of design. Always use a filter properly. Use clearest water available, allowing suspended matter to settle out. Use pre-filter if your system has one. Do not let outlet end of filter come in contact with contaminated water. Be sure vessel you're pumping into is clean.

Sanitize all bottles!  $\frac{1}{4}$  Cup Clorox to 1 Quart Water

## **Emergency Heating, Cooking & Lighting**

### 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  $\frac{1}{2}$  or  $\frac{3}{4}$  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 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 oxygen 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.

Heaters	-----Amount-----	Burning Time
Catalytic	----- 5 quarts -----	18-20 hours
	----- 3 quarts -----	12 hours
White Gas Stoves		
(two burner)	----- 2 quarts -----	18-20 hours
	----- 3 ½ pint -----	4 hours
	----- aerosol can	

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.

Lighting

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 serious 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.

Flashlights are excellent for most types of emergencies except in situations where ruptured natural gas lines may be present. Never turn a flashlight on or off if there is any possibility of ruptured gas lines. Go outside first, turn it on or off, then enter the building. The three main problems with relying upon flashlights is that they give light to very small areas, the batteries run down fairly quickly during use, and batteries do not store well for extended time periods. Alkaline batteries store the best if stored in a cool location and in an airtight container. These batteries should be expected to store for three to five years. Many manufacturers are now printing a date on the package indicating the date through which the batteries should be good. When stored under ideal conditions the shelf life will be much longer than that indicated. Lithium batteries will store for about twice as long as alkaline batteries (about ten years).

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.

#### 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 or 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.

Paul's second interjected note: I find the common taper, or dinner candle to be the best. You get as much time burning as you do with the larger candles, for your money, without having to deal with a lot of melted wax. Often you can buy tapers for 25 cents each, at outlet stores. The larger, harder to manage candles cost much more than that, when you consider lit-candle time. Avoid scented candles, if you can. Several of my church friends bought large amounts of candles from a candle factory, cheap. The drawback is that many of them are scented, and at least one member of our church can not be around scented candles. Again, simple candles are best. See if you can find an old-fashioned taper candle holder with a thumb ring.

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.

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.

Propane and Coleman lanterns.

Camp lanterns burning Coleman fuel or propane make excellent sources

of light. Caution should be used in filling and lighting Coleman lanterns because the fuel is highly volatile and a flash type fire is easy to set off. Always fill them outside. Propane, on the other hand, is much safer. It is not as explosive and does not burn quite as hot. A double mantle lantern gives off as much light as two 100-watt light bulbs. Either propane or Coleman fuel type lanterns are very reliable and should be an integral part of your preparedness program. Be sure to store plenty of extra mantles and matches.

Store lots of wooden matches (1,000-2,000 is not too many). Also store butane cigarette lighters to light candles, lanterns and fireplaces. It would be a good idea for everyone to have a personal fire building kit with at least six different ways to start a fire.

Above all, your home and family must be protected from the ravages of fire by your actions. Study the instructions for any appliance used for heating, cooking, or lighting and understand their features as well as their limitations.

Don't go to sleep with any invented burning device in your home. Your family might not wake up.

Whatever you store, store it safely and legally. In an emergency, survival may cause you to make decisions that are questionable with regard to safety. Become educated to the inherent hazards of your choices and make a decision based on as much verifiable information as possible. You and your family's lives will depend on it.

Consider carefully how you will provide fuel for your family for heating, cooking, and lighting during times of emergencies. Next to food, water, and shelter, energy is the most important item you can store.

Fuel -----	Amt-----	Burning Time
White gas Lanterns		
Two mantle -----	2 pints -----	10-12 hours
Single mantle ----	2 pints -----	16-18 hours
Kerosene Lanterns -1	quart -----	45 hours
Candles -----	¾ X 4" -----	2 1/3 hours
-----	7/8 X 4" -----	5 hours

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