COOKING WITHOUT POWER
Fuel Considerations

(See also attached Fuel Storage Issues and Guidelines, *local laws may vary)

PROPANE – inexpensive; readily available; stores indefinitely; high heat output; works well down to 0°; can be used indoors with ventilation (oxygen depletion sensor – ODS - recommended); use caution–ignition sources can cause explosions; no priming required; legal limits on amounts you can store – see attached fuel storage guidelines.

5 gallon propane tank cooking 3 hot meals a day for a family of 6 on the average will last about 5 weeks IF you are conservative on your fuel. Small canisters last on average 2 ½ hours for most cooking or 182 canisters to cook for 1 hour each day for a year. Tanks are more economical.

CHARCOAL – inexpensive; readily available; stores indefinitely if stored properly in an airtight container and kept dry; heat is predictable (each briquette produces about 35° F); produces carbon monoxide (**outdoor use only**); requires lighter fluid to light or charcoal chimney starter and newspaper; less charcoals required for a box oven than dutch ovens.

1 lb. charcoal = about 15-17 briquettes. Approximately 10-25 briquettes per meal or approximately 320 lbs per year (used conservatively) for cooking 1 hr a day (1 meal).

ALCOHOL – inexpensive; readily available; stores indefinitely; inexpensive equipment; lower heat output than most fuels; doesn't perform as well in colder conditions; indoor use with ventilation; low volatility. Can use rubbing alcohol (isopropyl 70% or higher) or denatured alcohol (ethyl alcohol) found in paint departments/stores. Do not use wood alcohol (methanol) as it is toxic. Isopropyl gives off more soot while denatured alcohol burns cleaner. Isopropyl is less expensive while denatured alcohol is more efficient. Save money and buy in bulk.

1 pint will cook 3 meals for 1-2 people/50 gallons will last over a year.

WOOD - wood burning can be banned on no-burn days unless it is primary source of heat; requires ample storage space; hardwood burns longer; should be protected from moisture; no toxic fumes.

4-5 cords of wood to heat home during winter. Considerably less for cooking only.

KEROSENE – inexpensive; readily available; use only high-quality kerosene which lasts 3 yrs or more with additives; burns easily; high heat output; low volatility; questionable whether it is safe to use indoors; burns dirty; legal limits on amount you can store – see attached fuel storage guidelines.

WHITE GAS (Coleman Fuel) – inexpensive; easy to find in U.S.; clean burning; easy to light; produces a lot of heat; volatile; produces carbon monoxide (**outdoor use only**); highly flammable; priming required; reliable; efficient; works well in colder conditions; legal limits on amounts you can store – see attached storage guidelines; 6-7 yr. shelf life if unopened, 3-4 years opened ¾ full and 1-2 years opened ½ full.

BUTANE – more expensive overall; not as readily available; high heat output; indoor use with ventilation; clean burning; convenient'; easy lighting; will not work below 32° F, no priming required; highly flammable, stores approx. 8 years; see attached storage guidelines.

One canister lasts about 5 hours at a simmer or 1 ½ hours at a rolling boil.

Fuel Saving Techniques and Tips

SOLAR COOKING - Using the power of the sun can conserve fuel on sunny days.

HAYBOX COOKING – Slow cooking heated food without fuel by insulating it.

VOLCANO OUTDOOR COOK STOVE – a fuel efficient and versatile stove that has a draft system for temperature control. It uses 1/3 to 1/2 less charcoal than without. It accommodates pans, skillets, griddles, woks, grills and Dutch Ovens. Can also use wood or pellets as a fuel source. See www.volcanostoves.com for more info.

OTHER IDEAS

- Stack Dutch Ovens to conserve fuel.
- When cooking outside, protect stoves and ovens from winds.
- Cook with a lid on to prevent heat loss.
- Use short, broad-bottom cooking vessel, such as a covered skillet rather than a tall, narrow pot.
- Expose more of the food's surface to heat by spreading out your ingredients in a larger pan or placing them in individual-size small containers such as banana bread or meatloaf in muffin tins, bread shaped into balls on a cookie sheet instead of loaf pan, etc.
- Use a small flame. Cooking takes a little longer, but uses less fuel.
- Use a cylindrical metal skirt around the pot which allows for maximum heat transfer while preventing heat from blowing away into the kitchen. A metal mixing bowl can be used instead, though not as efficient…or use both the skirt and the bowl.
- Insulate the pot by placing a small fabric hot pad or aluminum foil hot pad over pot lid.
- Use a reflective back drop such as a cookie sheet covered in foil.
- Use a pressure cooker for shorter cook times.
- Grind your beans into flour for shorter cook times. Makes good creamed soups.
- Soak and/or sprout grains and beans for shorter cook times.
- Crack grains or roll grains for shorter cook times.
- Save fuel and eat your grains raw – ie, sprout them; roll them (Marga Mulino flake roller/grain mill) ie. rolled oats, etc. can be eaten raw in cold milk or water; soak grains and put through a food/meat grinder, can add spices or flavorings (drink soaking water for added nutrition); grow wheat grass and drink the juice, make essene bread.

Purchase and mount fire extinguishers, carbon monoxide detectors, and smoke alarms in your home. Make safety your first consideration!

Fuel Storage Issues and Guidelines

www.slcgov.com/fire/comm_ed/safety_tips_10.htm

Common Questions and Answers:

Question: Can I store emergency fuel containers inside my home, basement and/or attached garage?
Answer: No! Generally speaking, we ask that you only store emergency fuel containers in a detached shed or garage to minimize fire hazards and ignition sources. Two or three (2 or 3) 1 – gallon DOT rated containers for gasoline, and 2-cycle fuel for general operation of lawn maintenance equipment. We have experienced many serious problems with larger quantities of fuel inside homes, basements, attached garages and carports.

Question: Can I store as many containers as I want in my garden shed or unattached garage?
Answer: No. Depending on the type of fuel (gasoline, kerosene, diesel, and propane), you are only allowed to store limited quantities of each type of fuel, in certain kinds and sizes of containers. See the guidelines below.

Question: What authority does the fire department have to tell me what I can and cannot do in my own home?
Answer: The legal authority comes from fire prevention related portions of the Utah State Code and Local City and county ordinances. This really is a life safety (your life safety) issue. Also your homeowner's insurance provider would like you to keep the quantities of flammable liquids stored at your residence to a bare minimum.

Storage of Flammable Liquids (Gasoline and Coleman White Gas)

Maximum residential storage of flammable liquids (gasoline and white gas) shall be limited to 25 gallons; preferably stored in an unattached garage or shed. Of this 25 gallon total, no more than 10 gallons can be stored in an attached garage; and absolutely no flammable liquid storage is allowed in basements. (2000 IFC 3404.3.4.4, NFPA 30)

Empty containers shall be counted as full when calculating total storage capacity. (2000 IFC 3404.3.3.4)

Flammable liquid storage containers shall be of an approved type. (2000 IFC 3404.3.1.1) Most of these containers are labeled as approved for flammable liquid use, and indicate the standards they are designed to meet (DOT, ASTM, NFPA 30, etc.) Always use approved or original retail containers. (No Used Milk Jugs!)

If you decide to store more than 5 gallons of flammable liquids at your home, you need at least one 2A10BC rated fire extinguisher, located no closer than 10 feet, and no further than 50 feet. (2000 IFC 3404.3.3.1)

Control of sources of ignition is mandatory! All transfer and dispensing of flammable liquids requires careful attention be paid to eliminating static spark discharge, and ignition of flammable vapors. Open flames and high temperature devices must be controlled and approved for use with flammable liquids. And smoking is prohibited in the storage area. (2000 IFC 3405.3.2, 3404.2.4)

Flammable and Combustible liquids in fuel tanks of motor vehicles (gasoline, diesel and 2-cycle blends) are exempt and therefore not considered as part of your total home fuel storage quantities. (2000 IFC 3404.3.3)

Home Storage of Combustible Liquids (Diesel, Kerosene and Lamp Oil)

Maximum residential storage of combustible liquids (Diesel, Kerosene and Lamp Oil) shall be limited to 60 gallons; preferably stored in an unattached garage or shed. Of this 60 gallon total, no more than 10 gallons can be stored in an attached garage; and absolutely no combustible liquid storage is allowed in basements. (2000 IFC 3404.3.4.3, 3404.3.5.1, NFPA 30)

Combustible liquid storage containers shall be of an approved type. (2000 IFC 3405.2.4) Most of these containers are labeled as approved for flammable liquid use, and indicate the standards they are designed to meet (DOT, ASTM, NFPA30, etc). (No Used Milk Jugs!)

If you decide to store more than 25 gallons of combustible liquids at home you need at least two 2A10BC rated extinguishers, located no closer than 10 feet, and no further away than 50 feet. (2000 IFC 3403.2.1, 906.3)

Control of ignition sources is mandatory! All transfer and dispensing of combustible liquids requires careful attention be paid to eliminating static spark discharge, and ignition of flammable vapors. Open flames and high temperature devices must be controlled and approved for use with flammable/combustible liquids. And smoking is prohibited in the storage area. (2000 IFC 3405.3.2, 3404.2.4)

Portable Kerosene heating appliances shall be (UL) listed, and shall be limited to a fuel tank capacity of 2 gallons. (2000 IFC 603.4, 603.4.1) However, the Uniform Fire Code (Article 61) specifically prohibits the use of these unvented heating appliances in occupied living spaces. If you decide to use these devices, closely follow the manufacturer's instructions for use, always maintain adequate separation from combustible surfaces, maintain good ventilation in order to prevent carbon monoxide poisoning, and use a battery powered Carbon Monoxide detector to detect dangerous conditions.

Home Storage of Flammable Gases (Propane and Butane)

Residential Propane storage issues are more complex than those for flammable and combustible liquids. If you want a permanent LP-Gas system and tank installed, county ordinance allows you up to 2000 gallons water capacity in heavily populated areas, provided you obtain a permit, comply with relevant installation codes, and hire a state licensed contractor to perform the work and supply the equipment. However some cities have passed local ordinances that restrict total LP-Gas capacity to 500 gallons or less, where natural gas service is readily available. Please contact any state licensed Propane supplier, under "Gas-Propane" in the yellow pages, for more information regarding permanent Propane gas installations. (2000 IFC 3803, 3804)

For portable DOT tank storage, you are allowed up to 25 gallons total capacity. You could have up to five 5-gallon (20 lb.) portable appliance cylinders (the size usually found on barbecue grills – DOT 4BA240); or one 23 gallon (100 lb.) cylinder (DOT 4b240), in storage at your home, in an unattached garage or shed. But, if you want to store propane and flammable/combustible liquids together, they should be separated by at least 10 feet. (2000 IFC 3809.12)

You are only allowed to store up to two (2) of the small portable 1-pound disposable propane cylinders inside your home or attached garage. All other propane cylinders storage must be outside your home in an unattached garage or shed.

Propane cylinders attached to heating and/or cooking appliances, as well as those mounted on trailers, motor homes, and campers, do not count towards your total storage capacity.