Cornell University
Cooperative Extension
Onondaga County

220 Herald Place, 2nd Floor
Syracuse, New York 13202-1045
Telephone: 315.424-9485
Fax: 315.424-7056
E-mail: onondaga@cornell.edu
www.cce.cornell.edu/onondaga

Planning for Weather-Related Emergencies

Recommendations for Food and Water Safety

Compiled by

Cornell Cooperative Extension of Onondaga County

220 Herald Place, 2nd Floor
Syracuse, NY 13202-1045
315-424-9485
www.cce.cornell.edu/onondaga

Revised 2009

Based on material from
Division of Nutritional Sciences, Cornell Cooperative Extension
Food Safety and Inspection Service (FSIS) USDA

The Cornell University Cooperative Extension education system enables people to improve their lives and communities through partnerships that put experience and research knowledge to work.

For other publications or information, please contact our office or visit our website.

Kathleen Dischner, MSEd. R.D.
Nutrition, Health and Safety Team Coordinator
Food, Nutrition and Health

FOOD SAFETY AND NATURAL DISASTERS

Sooner or later most households face a natural disaster that causes a food emergency. A tornado, ice storm, or flooding may create food safety and supply problems never before encountered. The emergency may be more common, such as a power failure during a thunderstorm or severe weather or illness that prevents people from getting to the store. Whatever the cause, emergencies demand knowledge of food safety. Below are some tips for planning ahead for emergencies and for handling food and water problems in the wake of natural disaster or other emergency.

PLAN AN EMERGENCY FOOD SUPPLY

To keep food safe and avoid foodborne illness, people need to know what foods to store before a natural disaster, as well as how to handle food afterwards. It is important to stock food that does not require refrigeration. Store foods your household normally eats, plus some favorite treats. Don't forget animal food for pets. Avoid stocking too many foods high in salt that will increase thirst. Store single servings or one-meal sizes to avoid leftovers, since refrigeration may not be available. Canned foods keep almost indefinitely as long as cans are undamaged. However, for the best quality and nutritional value, replace canned goods every 1-1½ years. Use the older canned food in cooking and buy new items for the emergency stockpile. Finally, store emergency food and supplies where they will be safe from insect and rodent pests and possible flooding.

Foods Recommended For Storage In Case of Emergency:

- Ready-to-eat canned foods – vegetables, fruit, beans, meat, fish, poultry, meat mixtures, pasta
- Soups-canned or "dried soups in a cup"
- Smoked or dried meats like beef jerky
- Dried fruit
- Juices-canned or powdered-vegetable and fruit
- Milk-powdered, canned, or shelf-stable brick pack
- Staples-sugar, salt, pepper, instant potatoes and rice, coffee, tea, cocoa
- Ready-to-eat cereals, instant hot cereals, crackers
- High energy foods-peanut butter, jelly, nuts, trail mix, granola bars
- Cookies, hard candy, chocolate bars, juice drinks, other snacks

Other Recommended Supplies And Equipment:

- Bottled water, 1 gallon per person per day (drinking/food prep)
- Chlorine bleach, 1 gallon 5.25% sodium hypo chlorite
- Disposable plates, cups, tableware, plastic bags
- Can opener, other utensils, paper towels, packaged hand wipes
- Covered 2 quart saucepan
- Canned heat burner and extra fuel
- Charcoal for outdoor cooking
- First aid kit
- Flashlight and extra batteries
- Matches in a waterproof container
- Disinfecting deodorant spray
- Shovel, hammer, nails, knife, rope or cord
- Transistor radio with extra batteries
- Toilet tissue and plastic bags (folding portable toilets are available)

FOOD SAFETY WHEN THE POWER GOES OUT

Power outages probably are the most common problem facing households during a natural disaster or emergency.

Refrigerated Foods

Generally, food in the refrigerator is safe as long as the power is out no more than a few hours. Keep the door closed; food will remain chilled for 4-6 hours if the door is not opened. When power is restored, check all the food according to the following guidelines:

Food That Can Be Stored At Room Temperature (Above 40º F) A Few Days:

- Butter and margarine
- Hard and processed cheeses
- Fresh fruits and vegetables
- Fruit juices
- Dried fruits and coconut
- Fresh herbs and spices
- Opened jars of salad dressing, peanut butter, jelly, relish, taco sauce, barbecue sauce
- Mustard, ketchup and olives
- Flour and nuts
- Fruit pies
- Bread, rolls, cakes and muffins

Food To Discard:

Other refrigerated foods stored above 40º F over 2 hours should be discarded. Throw away moldy items or food with an unusual odor or appearance. The following foods have been implicated in causing foodborne illness and should be discarded if stored above 40º F for over 2 hours:

- Raw or cooked meat, poultry and seafood
- Meat-topped pizza, lunchmeats
- Casseroles, stews or soups
- Milk/cream, yogurt, soft cheese
- Cream-based dressings
- Cooked pasta, potato, rice, and salads prepared from these foods
- Refrigerated cookie dough
- Fresh eggs, egg substitutes
- Cream-filled pastries
- Custard, chiffon or cheese pies
- Gravies

Frozen Foods

Food in a full freezer will stay frozen for about 2 days; a half-full freezer for about 1 day. The kind of food in the freezer makes a difference. For instance, foods with high water content, such as meat or fruit, will stay frozen longer than food with low water content, such as bread. Beyond this, you need to take some precautions:

- Keep the door closed
- Call a freezer locker plant to see if it is operating and, if so, whether it has room for your food. If space is available, wrap the food in newspaper or blankets and rush it to the locker plant.
- If locker space is not available, use dry ice if you can get it. Allow 2 to 3 pounds of ice per cubic foot of freezer space. A 25-pound block of dry ice should keep a half-full 10-cubic foot cabinet below freezing for 2-3 days. A fully loaded cabinet will stay frozen 3-4 days if dry ice is added soon after the power goes out. A 50-pound block should keep food safe in a full 18-cubic-foot freezer for 2 days.
- To pack the freezer with dry ice:

1. Always use gloves when handling dry ice. Wrap it in brown paper for longer storage.
2. Move any food from the freezing compartment to the storage compartment of the freezer.
3. Put heavy cardboard directly on the packages of frozen food and place dry ice on top of cardboard. In upright freezers, place dry ice on each shelf.
4. Fill partly empty freezer with crumpled paper to lessen air currents, which cause dry ice to dissipate.
5. Cover the freezer with blankets, quilts, etc., adding crumpled newspaper for added insulation. Be sure air vent openings are left open to allow gas from dry ice to escape. In addition, the power may be restored and ventilation will be needed.

What To Do With Frozen Food If It Thaws

Despite your best efforts, the food in your freezer may partially or completely thaw before power is restored. Foods may be safely refrozen if they still contain ice crystals. Partial thawing and refreezing reduces the quality of foods, particularly fruits, vegetables, and prepared foods. Foods, which have completely thawed, but are still cold – about 40ºF (and have been held at this temperature no longer then 1 or 2 days after thawing) - may be refrozen if the following criteria are met:

- Fruits – may be refrozen if they still taste and smell good. Fruits beginning to ferment are not dangerous to eat, but will have an off-flavor.
- Vegetables – should not be refrozen if thawed completely since bacteria may begin to multiply. If ice crystals are present, refreezing is possible.
- Meat and poultry – should be discarded if the color or odor is poor or questionable or if the meat temperature has exceeded 40ºF for 2 hours. Unspoiled meat may be cooked and then refrozen.
- Fish and shellfish – should not be refrozen if thawed completely since these foods are extremely perishable. May refreeze if ice crystals are present.
- Frozen dinners and ice cream – Do not refreeze.

WATER IN AN EMERGENCY

The body's most important need is for water. Most people could live several days without food as long as they have potable water to drink.

Each person will need a gallon of water per day for 3 or 4 days. If warning of disaster has been given, fill large, clean containers and bathtubs with water. Ice, bottled drinks and fruit juices may serve as water substitutes in emergencies.

After a natural disaster, consider all water from wells, cisterns and other delivery systems in the disaster area unsafe until tested. Most homes today have a reserve supply of water built into them. Your hot water heater or water pressure tank would supply many gallons of emergency water. First, turn off the electric or gas supply to the heater. Turn off the gas at the intake valve or turn off the electric at the circuit breaker for the water heater, or unplug the unit. You can obtain water by opening the drain valve at the bottom of the tank. Pipes and plumbing carry several gallons. Toilet tanks (not bowls) also have a fresh water supply. When power is restored and the tank refills with water, turn on the gas or electric to heat the water.

In the event of any major disaster affecting area water, you can prevent contaminated water from entering your house by closing the main water valve. To use the water still in the pipes, turn on the faucet that is located at the highest point in your house. This lets air into the system. Now you can draw water as needed from the faucet that is located in the lowest point in the house. If the main water valve is closed, be sure that gas to heat water is turned off to prevent overheating.

When a safe supply of water is not available, or if, due to the disaster, your usual supply becomes unsafe for drinking, you must treat the water before it can be used for drinking, cooking, or brushing teeth. There are two ways of treating water: boiling or adding bleach. If the supply has been made unsafe because of untreated surface water (floods, streams or lakes), boiling is the better treatment.

If the water looks cloudy, it should be filtered before treating. You may use coffee filters, towels (paper or cotton), cheesecloth, a cotton plug in a funnel, etc. Use several layers for best results. You can also use filters designed for camping and backpacking.

Boiling

Boiling is the best way to purify water that is unsafe because of bacteria. Place the water in a clean container and bring to a full boil and continue boiling for at least 3 minutes. If you are 5,000 feet or more above sea level, increase the boiling time to at least 5 minutes.

Boiled water should be kept covered while cooling.

Purifying By Adding Liquid Bleach

If boiling is not possible because of lack of fuel, electricity, or equipment, the water can be treated with liquid household chlorine bleach (such as Clorox, Purex, etc.), which contains 5.25% sodium hypochlorite. Do not use scented or “color-safe” bleaches or bleaches with added cleaners.

Place the water (filtered if necessary) in a clean container and add bleach. For each gallon of water, add 8 drops or one-eight teaspoon. Mix the water and bleach thoroughly and allow to stand for at least 30 minutes before using the water. If the water is cloudy, or very cold, increase the standing time to 60 minutes before using. If the water does not have a slight bleach odor after standing, repeat the bleach treatment and let stand another 15 minutes.

Note: Chlorine will not kill parasites such as Cryptosporidium or Giardia, which may be present in floodwaters. Parasites can cause severe illness in persons who are weakened because of health problems. Boiling is the best treatment in these situations.

FLOOD CONTAMINATED FOODS

Food may be contaminated during storms that cause flooding. Floodwaters may carry silt, raw sewage, oil, or chemical wastes. Filth and disease bacteria in floodwater can contaminate food, making it unsafe to eat.

Thoroughly inspect any food left in the house after a flood. Floodwater may have covered it, dripped on it, or seeped into it. Even though some foods (see below) are protected by their containers, if you are in doubt about the safety of a food, throw it out rather than risk disease. Use the following guidelines when deciding which foods to discard and which to save:

Food To Discard

- Opened containers and packages that have come in contact with floodwaters.
- Glass jars and bottles of commercially canned food such as applesauce, mayonnaise, or salad dressing. Contaminated silt may be impossible to clean from under the edges of lids.
- Containers of spices, seasonings, and flavorings.
- Flour, grains, sugar and coffee in canisters or bags.
- Paper, cloth, fiber or cardboard boxes, even if the contents seem dry. This includes salt, cereals, pasta products, rice, and any “sealed” packages of crackers, cookies or mixes, within a larger paper box.
- Cans with dented seams, bulges, rusty spots, or leaks.
- Cans that have been tossed about and are found far from their normal storage spot. Seams on these cans may have been weakened or their seals broken, causing contamination or spoilage.
- Jam or jelly sealed with paraffin.
- Containers with non-sealed, fitted lids, such as cocoa or baking powder.
- Commercially bottled carbonated beverages, if the cap is crusted with silt; don’t attempt to wash, since pressure in bottles may cause an explosion.
- Foil or cellophane packages.
- All fresh vegetables and fruits
- Fresh meat, fish, and poultry that have been in contact with flood waters.
- Home-canned foods, UNLESS THE FOLLOWING APPLIES.

If you are sure that home-canned food was NOT completely immersed in floodwater, and the jar tops did not get wet, the jars may be washed, rinsed, and then sanitized with a strong household bleach solution (1 tablespoon/quart room temperature water). This solution is stronger than that used to sanitize commercially canned foods since jars of home-canned foods cannot be washed as vigorously as commercial cans because the seals might be loosened.

Food To Keep

- Undamaged commercially canned foods in metal cans that are not bulging, leaking or badly dented.

Cleaning And Sanitizing

Cans that have been covered with floodwater or backed-up water in a basement must be thoroughly washed, rinsed and sanitized. Use this method:

1. Mark contents on the can with a permanent ink pen.
2. Remove paper labels as they can harbor dangerous bacteria.
3. Wash cans in a strong detergent solution with a scrub brush. Carefully clean areas around lids and seams.
4. Rinse in clean water.
5. Soak cans in a solution of two teaspoons of 5.25% household chlorine bleach per quart of room temperature water for 15 minutes.
6. Air-dry before opening.
7. Clean and sanitize tableware, dishes, and cookware in the same way.

While raw foods exposed to floodwaters should be avoided because of possible contamination, sometimes they must be used because there is not other food available. If raw foods must be used, wash and rinse them thoroughly and rinse them with a solution of 2 teaspoons 5.25% household chlorine bleach per gallon of water. This solution is weaker than that used to sanitize cans because some bleach may be consumed when the food is eaten. Do not use scented or “color-safe” bleaches with added cleaners.

SAFETY OF FROZEN CANNED FOOD

More than pipes can freeze during icy weather. Frozen canned foods stored in unheated storage areas may also prompt calls from the concerned consumers. If canned foods have frozen, they may still be safe to eat. Safety will depend on the condition of the can or jar. To evaluate safety, consider the following:

Metal Cans

If the seams are still intact, the food is safe to use. Thaw gradually and store at room temperature.

If the seam has broken and the food has thawed to room temperature, it should be discarded.

If the seam has broken and the food is still cold (refrigerator temperature or below), it may be safely salvaged. Transfer it to a container and either store it in the refrigerator or refreeze for future use.

All food that has frozen in glass jars should be examined carefully for spoilage before use. For an extra margin of safety, boil low-acid foods (meats, fish, poultry, vegetables) for 10 minutes before using.

In General

Discard any product with an off-color or odor. DO NOT TASTE food that looks or smells suspicious.

Texture changes of canned vegetables and pasta may occur during freezing. Although mushy, these foods are safe to eat if the can is intact and not swollen.

WHAT ABOUT FOOD THAT HAS BEEN IN A FIRE?

Three factors can affect food that has been exposed to fire – the heat of the fire, smoke fumes, and chemicals used to put out the fire.

The heat of the fire can activate high-temperature food-spoilage bacteria in commercial – or home-canned food; these bacteria do not affect canned food under normal circumstances, but after a fire they can make the food inedible. In addition, high temperature of a fire may cause jar lids of home-canned food to come unsealed allowing bacteria to get into the food; the jar lids may "seal" again when the air temperature drops. Toxic fumes released from burning materials can contaminate food, tableware, and cookware, as can toxic components from chemicals used to fight the fire. Use the following guidelines to insure the safety of food after a fire:

- Throw away food stored in permeable packaging such as cardboard, plastic wrap, home-canned food, and screw-topped jars and bottles. Heat damage may have occurred. Toxic fumes and chemicals can get into the packaging and contaminate food.

- Discard raw foods that were stored outside the refrigerator, such as potatoes, squash or fruit, which could be contaminated by fumes or chemicals.

- Check the refrigerator and freezer for off odors. Because door seals on these appliances are not airtight, fumes can contaminate foods within. Discard foods that have off odors or flavors.

- Decontaminate canned goods, tableware, and cookware, which have been exposed to chemicals or fumes using the instructions for cleaning and sanitizing cans after a flood.

- Discard commercially canned food that smells or looks spoiled, as heat damage may have occurred.

Removing Odors From Refrigerators and Freezers

Objectionable odors develop in refrigerators and freezers when:

- Strong flavored foods are kept long periods and/or improperly packaged;
- The appliance is left closed without operating for a long period;
- Foods have accidentally been left to spoil.

These odors can be more or less difficult to remove, depending upon the extent of damage. In refrigerators, insulation is ventilated in a way that odors become absorbed in the insulation and linings, as well as difficult-to-reach coils and parts of storage compartments.

Try these treatments, beginning with a thorough washing and progressing to the more drastic treatments, if necessary:

1. Defrost and thoroughly wash all surfaces with a mild dishwashing detergent. Rinse well with a solution of baking soda (two tablespoons per quart of water). Rinse with clear water and wipe dry. Close the appliance and let operate for two or three hours, or overnight, to determine if odors have been removed.

2. Wash all interior parts with a solution of one-cup vinegar to a gallon of water. Household ammonia (1 cup per gallon of water), or chlorine bleach (1 tablespoon per quart of water), may be used. **Do not combine these ingredients in one solution**.

3. Heated and circulated air may help dry out insulation or draw out odor. To do this, place a small fan-driven heater at a low setting or a portable electric hair dryer in the appliance and leave the door partially open. **Do not have the refrigerator running**.

   Activated charcoal put in the warm freezer will absorb the odors released by the heat.

   It may take several days for insulation to dry out completely. As long as there is sign of moisture dripping from the appliance, the insulation has not dried out completely.

4. Purchase a pint or quart of chloride of lime (sometimes called slack lime). Place 1/2 cup of the dry powder in two or three paper plates or shallow pans. Place the pans on the shelves and/or freezer sections of the empty refrigerator or freezer. Close the door, and then operate at the warmest setting for a half to a whole day. Remove the pans of lime and discard. Repeat two or three times, if necessary.

If the odor persists or returns when regular operation again puts moisture in the insulation, write to the manufacturer, listing the exact model and purchase date (if known), to see if they have any suggestions for the specific insulation materials and construction features of your specific model.

Activated charcoal left in the freezer or refrigerator, even in use, will help to pick up residual odors. The charcoal, however, will need cleaning or replacing as it accumulates odors.

For More information on food safety visit these websites:

http://www.fsis.usda.gov/Fact_Sheets/index.asp (FSIS Fact Sheets)

http://www.fightbac.org/ (FightBac! Consumer Education Program)

http://www.foodsafety.gov (Gateway to Government Food Safety Information)

For More information on emergency preparedness visit these websites:

http://www.ongov.net/EM/ (Onondaga County Department of Emergency Management)

http://emergencypreparedness.cce.cornell.edu/ (New York Extension Disaster Education Network)

http://www.security.state.ny.us/preparedness/index.html (New York State Emergency Preparedness)

http://www.redcross.org/ (American Red Cross)