



---

## **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 mundane, 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 a 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 food-borne 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 & 1/2 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 an Emergency:**

- Ready-to-eat canned foods - vegetables, fruits, 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, soft drinks, other snacks

*Helping You Put Knowledge to Work*

**Other Recommended Supplies and Equipment:**

- Bottled water, 2 gallons per person
- Chlorine bleach, 1 gallon 5.25% sodium hypochlorite
- 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, candles
- 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:

**Foods That Can Be Stored at Room Temperature (above 40°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

### Foods to Discard:

Other refrigerated foods stored above 40°F for over 2 hours should be discarded. Throw away moldy items or food with an unusual odor or appearance. The following foods are often implicated in causing food-borne illness and should be discarded if stored above 40°F for over 2 hours:

- Raw or cooked meat, poultry, and seafood
- Meat-topped pizza, lunch meats
- Casseroles, stews, or soups
- Milk/cream, yogurt, soft cheese
- Mayonnaise, tartar sauce, or creamy dressings
- Cooked pasta, potato, rice, and salads prepared from these foods
- Refrigerator and cookie doughs
- 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 a high water content, such as meat or fruit, will stay frozen longer than food with a 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 and quilts, 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 re-freezing reduces the quality of foods, particularly fruits, vegetables, and prepared foods. Foods which have completely thawed but are still cold – about 40°F (and have been held at this temperature no longer than 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 multiply rapidly in these foods. If ice crystals are present, re-freezing is possible.
- Meat and Poultry – should be discarded if the color or odor is poor or questionable or if the meat temperature has exceeded 40°F 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.

At times, the only practical solution is to can thawed food to save it. Keep canning supplies on hand, keep canning equipment in good working order, and use current canning instructions.

#####

### **WATER IN AN EMERGENCY**

The body's most important need is for water. Most people could live a long time without food as long as they had some water.

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, soft drinks, and fruit juices 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 electricity 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 electricity 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 electricity or gas to heat the 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), cheese cloth, 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 16 drops of bleach, or about one-fourth teaspoon. Two-liter soft drink bottles are about one-half gallon of ins size: use 8 drops or 1/8 teaspoon bleach for each of these bottles. 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 flood waters. 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. Flood waters may carry silt, raw sewage, oil, or chemical wastes. Filth and disease bacteria in flood water can contaminate food, making it unsafe to eat.

Thoroughly inspect any food left in the house after a flood. Flood water 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 which have come in contact with flood waters.
- Glass jars and bottles of commercially canned food such as apple sauces, 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 which 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 which have been in contact with flood waters.
- Home-canned foods. However:

If you are sure that home-canned food was NOT completely immersed in flood water, 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 flood water or backed-up water in a basement must be thoroughly washed, rinsed, and sanitized. Use this method:

- Mark contents on the can with a permanent ink pen.
- 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 which smells or looks spoiled, as heat damage may have occurred.

Prepared by Donna Scott, M.S., Department of Food Science, and Christina Stark, M.S., R.D., Division of Nutritional Sciences, Cornell Cooperative Extension, January, 1998.