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Safe Handling of Food During Emergencies

Purdue University Cooperative Extension Service
SAFE HANDLING OF FOOD DURING EMERGENCIES

Sometimes ice and snow can immobilize the state for several days and cut off electricity to homes during the winter months. Summer storms can cause flooding and also can damage power lines and cut off electricity. Limited energy supplies also limit the amount of energy available for home consumption.

This bulletin contains information needed for safe handling of food and beverages during power shortages and floods. It also provides information on the kinds of foods to store for emergencies. Information is provided about handling of foods which have been thawed or contaminated.

Emergency Supplies

The needs during emergencies will be different for various families. It is important to assure that enough food, medicines and other critical supplies are on hand to last for one or more weeks in case you are housebound due to snow.

Stockpile Food

Stockpiled foods should be selected as closely to family preferences as possible.

If an infant, elderly or family member who has dietary problems is present, make certain that a two week supply of food is stored for them. An infant needs specially prepared food or food that can be easily strained or chopped.

Dry milk should be kept at all times for the infant. Extra prescriptions needed by the infant should be kept.

When available, choose cans and jars in sizes that will supply one meal for the family for items that deteriorate rapidly without refrigeration.

What Kinds of Food Are Needed for An Adequate Diet

Deviation from a good dietary pattern for a few days should cause no serious problems in well-nourished healthy people. Food spoilage and contamination are the major concerns during emergencies when power is disrupted.

For longer period of time adequate nourishment can be obtained by eating foods similar to those outlined in the Basic-Four Food Guide. This guide suggests that 2-4 servings of food from the milk group, 2 or more servings of food from the meat group, 4 servings from the bread group and 4 servings of fruit and vegetables be eaten. The serving size is usually smaller than what is ordinarily "thought" to be a serving size for a particular food. For example, people usually eat more meat than is necessary. The serving size is 2-3 ounces of meat, 4 tablespoons of peanut butter, 1 cup of beans or 2 eggs. Milk helps to supply some protein in the diet.

Table 1 is a guide for the kinds and amounts of food needed by a person for one day or two weeks and contains suggested products to keep for emergencies. Table 2 and 3 shows sample meals that require very little or no cooking.

Storing and Replacing Foods

Since emergencies are erratic keep emergency food on hand at all time. However, to maintain the texture and

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nutritional value, food should be rotated. Use the food for regular meals and replace it with more recently purchased food. This food should go in the back of the storage unit and the older supply in the front. Date and label cans.

All food should be used between six months and one year. It will still be safe after one year but the texture and nutritional value of the food may be altered or reduced.

Food should be stored in a cool dry place at temperatures no higher than 70°F and no lower than 40°F.

Be careful to protect food in boxes from rodents and insects. Leave the food in their original container and store box and all in a closed metal container.

Canned food is generally safe to eat as long as the seal of the can is not broken. Do not use canned goods that bulge, leak or spurt liquid or contain mold or off-odors when opened. Gas bubbles, cloudiness and a surface film usually indicate bacterial growth.

Preparing Food During a Power Failure

During a power failure, cooking and eating habits must change to fit the situation. You may have no heat, no refrigeration, and limited water. In addition, health risks from contaminated or spoiled food may increase. When preparing food during a power outage:

1) Consider the amount of cooking time needed for particular foods. If you have limited heat for cooking, choose foods which cook quickly such as one-dish meals or serve no-cook foods.

2) Examine alternative cooking methods. These include:

a) Fireplace. Many foods can be skewered, grilled or wrapped in foil and cooked in the fireplace.

Corn, potatoes, squash, and apples can be wrapped in heavy foil and cooked in the hot bed of coals.

The best types of wood to use for a cooking fire are dry hardwoods such as oak, hickory, black locust, hard maple, or birch.

When wood is not available, tightly rolled newspapers are alternatives. Logs can be made by rolling newspapers tightly and tying them with wire or by opening the newspaper, rolling it from a corner, and tucking in the ends. Even better logs can be prepared beforehand by soaking the newspapers in water as you roll them and then letting them dry before use. Paper logs made during the summer months can be a good clean source of cooking heat during the winter months. You may also find that artificial logs made of pressed wood particles are a valuable source of cooking heat. Be sure your fireplace has adequate ventilation when you burn anything in it.

b) Candle warmers and other devices such as fondue pots may be used if no other heat source is available. Use safety precautions with these devices. Never use fuel burning camp stoves or charcoal burners inside the home, even in a fireplace. Fumes from these stoves can be deadly.

c) Camp stoves – these stoves should be used only outside the house as propane or butane fire is difficult to extinguish. There is little you can do to put out a propane or butane fire unless you can turn off the gas. Learn where the shut-off valve is. A dry chemical extinguisher will put out gasoline or oil fires but will not put out butane or propane.

d) Outdoor cooking – That charcoal grill you may have used for picnics or barbeques can be very useful for cooking under emergency conditions. Do your charcoal cooking outside where there is plenty of ventilation, and well away from flammable materials. In addition to the...
many types of meats you may have already cooked, charcoal is useful for foil cooking and one-pot meals cooked in pans on top of the grill.

Charcoal should NEVER be used as the fuel for any type of indoor fire without adequate ventilation. The carbon monoxide from the burning charcoal is very dangerous.

3) Do not cook frozen foods unless you have ample heat for cooking. Most frozen foods require considerably more cooking time and heat than canned goods. Also, if power is off, it is best to leave the freezer door closed to keep food from thawing.

Water Sources

A disaster may disrupt the electricity needed to pump water in the home or the water supply may become contaminated. Everyone in your family needs at least two quarts of water or other liquids daily (more in hot weather). You also need pure water for preparing food, brushing teeth, and keeping clean.

When warned of a severe storm which could cause flooding, insure an adequate supply of safe water by boiling water and storing it in sterilized containers. Sterilized water will keep for six months to one year. The water may taste flat but can still be used in cooking or by adding powdered fruit mixtures.

You may have emergency sources of water, such as ice cubes, on hand. Soft drinks and fruit juices are water substitutes. In addition, the water in your water pipes and toilet flush tanks (not the bowls) is safe to drink if you closed the valve on the main water line before the flood.

To use the water still in the pipes, turn on the faucet located in the highest point in the house — usually in a upstairs bathroom. This lets air into the system. Then draw water from the lowest faucet in the house.

Your hot water heater or water pressure tank could supply many gallons of safe water in an emergency. Before using water from the water heater switch off the gas or electricity which heats the water. Leaving the heating part on while the heater is empty could cause an explosion or burn out the elements. After turning off the gas or electricity open the drain valve at the bottom of the tank. Do not turn the water heater on again until the water system is back in normal service.

Purification

Unless you are absolutely certain your home water supply is not contaminated by flood water, purify all water before using it for drinking, food preparation, brushing teeth, or dishwashing. If the water contains sediment or floating material, strain it through cloth before treating it. Water can be purified by boiling or by chemical treatment.

Boiling

If you are not sure about the sanitary condition of your water either boil or treat it with chemicals. Boil water at a rolling boil for ten minutes to kill any disease causing bacteria in the water. Add a pinch of salt to each quart of boiled water to improve the taste.

Chemical Treatment

If water cannot be boiled, treat it chemically. Two chemicals usually found in the home will purify water.

1) Chlorine bleach such as Clorox or Purex. Household bleach is a good disinfectant for water. However, check the label to be sure that hypochlorite is the only active ingredient in the bleach. Do not use any bleach which contains soap.
Percent chlorine  Add per gallon water
1%  40 drops
4 to 6%  8 drops
7 to 10%  4 drops
Unknown  10 drops

Mix the bleach thoroughly into the water. Let it stand for 30 minutes. The water should have a slight chlorine odor. If it doesn't, repeat the dose and let the water stand for an additional 15 minutes.

2) Iodine - Household iodine from the medicine chest or first aid will purify water. The iodine should be 2% United States Pharmacopeia (U.S.P.) strength. Add 20 drops per gallon of clear water, and 40 drops per gallon of cloudy water. Water purification tablets will also purify water. Follow manufacturer's directions. Water purification tablets are available at drug stores.

After a Power Failure Refrigerated and Frozen Foods

If flood water has entered your refrigerator or freezer, throw away all food not sealed in metal cans.

If power has been interrupted or the refrigerator or freezer is not working properly, keep the door closed as much as possible to keep cold air inside. This will help prevent food from spoiling or thawing.

Foods in the Freezer

Thawing rate

With the door closed, food in most freezers will stay frozen 1 to 3 days, even in summer. Thawing rate depends on:

1) The amount of food in the freezer. A full freezer will stay cold longer than one partially full.

2) The kind of food. A freezer full of meat will stay cold longer than a freezer full of baked goods.

3) The temperature of the food. The colder the food, the longer it will stay frozen.

4) The freezer. A well insulated freezer will keep food frozen longer than one with little insulation.

5) Size of freezer. The larger the freezer, the longer food will stay frozen.

Emergency Measures

1) Keep the door closed.

2) Food may be placed outside if the temperature is below 0°F.

3) If possible, move food to a locker plant. To move food safely, wrap it in newspapers or blankets, or place it in insulated containers, such as camping coolers.

4) If you can't take food to a locker plant, leave it in your freezer and cover freezer with blankets, quilts, crumpled newspapers, or excelsior.

5) Use dry ice if it is available. Wear gloves to handle dry ice and proceed as recommended.

When food has thawed

You may safely refreeze foods if they still contain ice crystals or if they have been kept below 40°F. and have been thawed no more than 1 or 2 days. Treat completely thawed foods as follows:

Any food can be refrozen if it contains ice crystals and/or the temperature is below 40°F (except shellfish and vegetables). Check the temperature of the freezer.

1) Fruits. Refreeze fruits if they taste and smell good. Fruit that is beginning to ferment is safe to eat, although it will have an off flavor. Such fruit could be used in cooking.
2) Vegetables. Refreeze thawed vegetables only if they contain ice crystals. Bacteria in these foods multiply rapidly. Spoilage may begin before bad odors develop. If you question the condition of any vegetables, throw them out.

3) Meat and poultry. Thawed meat or poultry may be unsafe. Examine each package. If odor is poor or questionable, throw the food out. Discard commercially stuffed poultry. Cook immediately any thawed but unspoiled meat or poultry. After thorough cooking, this meat can be refrozen.

4) Fish and shellfish are extremely perishable. Do not refreeze unless ice crystals remain. This food may be spoiled, even if it has no bad odor.

5) Ice cream. Do not use any melted ice cream.

Foods in the Refrigerator

1) Meat will keep much longer if it is thoroughly cooked as soon as it is taken out of refrigeration. You can extend your food supply by cooking all unspoiled meat immediately, and refrigerating it until you are ready to reheat and serve it.

Meats least apt to spoil quickly are large, solid unboned pieces of fresh beef or lamb such as rump roast or leg of lamb.

Chopped meats like hamburger spoil quickly. Pork, fish and poultry spoil quickly. Throw them out if they have not been refrigerated for several hours. Do not trust your sense of smell with these foods.

Cured meats such as ham or bacon will be safe to eat, even after several days without refrigeration.

2) Depending on the freshness of eggs they can be kept several days in a cool place without refrigeration.

3) Hard cheese will usually keep well at room temperatures. Other cheeses, such as cream cheese, opened containers of cheese spreads, and cottage cheese spoil quickly.

4) Milk spoils quickly without refrigeration. Do not use any milk with a sour smell or taste.

5) Custards and creamed foods spoil quickly and are likely growing places for bacteria. Throw out any of these foods if they have been warmed to room temperature. Spoilage often cannot be detected, since there may be no bad odor or taste.

Contaminated Foods

Contaminated food may be a problem following any storm involving flooding.

Flood waters may carry silt, raw sewage, oil or chemical wastes. Filth and disease bacteria in flood water will contaminate food, making it unsafe to eat.

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

Do not attempt to save the following foods:

1) Opened containers and packages which have come in contact with flood waters.

2) Unopened jars and bottles with paper seals.

3) Containers of spices, seasonings, and flavorings.

4) Flour, sugar and coffee in cannisters.
5) 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 or cookies within a larger paper box.

6) Dented, bulging or leaking tin cans. 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.

7) Jam or jelly sealed with paraffin.
8) Containers with non-sealed, fitted lids, such as cocoa or baking powder.
9) Commercially bottled carbonated beverages, if the cap is crusted with silt.

10) Foil or cellophane packages.

11) All fresh vegetables and fruits which do not have a peel, shell, or coating which can be removed before use; leafy vegetables.

12) Fresh meat, fish, and poultry which have been in contact with flood waters.

13) Home canned foods, even if the jar seems tightly sealed. (However, in some cases, tightly sealed home canned foods may be safe, depending on the flood conditions. If your supply of canned food is extensive, contact a food preservation specialist who can advise you after learning specific facts about flood conditions).

Food to Keep

The following foods are safe if you wash and sanitize containers before use, or wash, sanitize and peel fruits or vegetables:

1) Undamaged tin cans. For added safety boil food before using. Be sure to wash and sanitize container (see below) before opening the can.

2) Potatoes. Wash, sanitize, dry, peel, and cook before using.

3) Citrus fruits. Wash well, sanitize, and peel before using.

4) Apples and other fruits which can be sanitized, peeled, and cooked before eating. Do not eat raw fruit, even if it has been sanitized.

To disinfect cans and commercial glass jars:

All cans and commercial glass jars must be washed and sanitized before they are opened.

1) Remove labels and wash in a strong detergent solution with a scrub brush. Remove all silt.

2) Immerse scrubbed containers for 15 minutes in a chlorine solution. Household bleaches contain from 2% to 6% chlorine. The amount of bleach to add to water would depend on the percent chlorine it contains. Add to 1 gallon of water 6 tablespoons of 2% bleach or 1 tablespoon of 4% bleach or 3/4 tablespoon of 6% bleach.

3) Remove containers from solution, and air-dry before opening. Re-label if possible. Use as soon as possible, since containers may rust. Store containers where they will not be re-contaminated.

To disinfect fruits and vegetables

1) Wash in a strong detergent solution with a scrub brush. Remove all silt.

2) Soak in a chlorine solution for 15 to 20 minutes (See table above for strength of chlorine.)

3) Rinse thoroughly with safe drinking water.

4) Peel if possible, and cook thoroughly before eating. Refer any specific questions to health authorities or your county Extension agent.
<table>
<thead>
<tr>
<th>Kind of food</th>
<th>Amount per person for</th>
<th>SUGGESTED FOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 day</td>
<td>2 weeks</td>
</tr>
<tr>
<td>1. Milk</td>
<td>Equivalent of 2 glasses (fluid)</td>
<td>Equivalent of 7 quarts (fluid)</td>
</tr>
<tr>
<td>2. Canned meat, 2 servings poultry, fish, cooked dry beans, and peas.</td>
<td>28 servings (8 to 9 pounds)</td>
<td>Canned meat, poultry-fish - canned meat mixtures canned dry beans - canned spaghetti and rice products Condensed soups containing meat or dry beans - Peanut Butter</td>
</tr>
<tr>
<td>3. Fruits and Vegetables</td>
<td>3 to 4 servings</td>
<td>42 to 56 servings (about 21 pounds, canned).</td>
</tr>
<tr>
<td>4. Cereals and baked goods</td>
<td>3 to 4 servings</td>
<td>42 to 56 servings (about 5 to 7 pounds).</td>
</tr>
<tr>
<td>5. Spreads for bread and crackers</td>
<td>According to family practices</td>
<td></td>
</tr>
<tr>
<td>6. Fats and Vegetable oil</td>
<td>Up to 1 pound or 1 pint.</td>
<td></td>
</tr>
<tr>
<td>7. Sugars, Sweets</td>
<td>1 to 2 pounds</td>
<td></td>
</tr>
<tr>
<td>8. Miscellaneous</td>
<td>According to family practices and extent of cooking possible.</td>
<td>Coffee, tea, cocoa, powdered or canned beverage products, soda, baking powder flavorings, soft drinks</td>
</tr>
<tr>
<td></td>
<td>First day</td>
<td>Second day</td>
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<tr>
<td>------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>MORNING</strong></td>
<td></td>
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<tr>
<td>citrus fruit juice</td>
<td>Ready-to-eat cereal</td>
<td>Fruit juice</td>
</tr>
<tr>
<td></td>
<td>Milk, cold coffee, or tea</td>
<td>Corned beef hash</td>
</tr>
<tr>
<td></td>
<td>Crackers</td>
<td>Crackers</td>
</tr>
<tr>
<td></td>
<td>Peanut butter or other spread</td>
<td>Spread</td>
</tr>
<tr>
<td><strong>NOON</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spaghetti with meat sauce.</td>
<td>Green beans</td>
<td>Baked beans</td>
</tr>
<tr>
<td></td>
<td>Crackers</td>
<td>Brown bread</td>
</tr>
<tr>
<td></td>
<td>Spread</td>
<td>Tomatoes</td>
</tr>
<tr>
<td></td>
<td>Milk, cold coffee, or tea</td>
<td>Fruit</td>
</tr>
<tr>
<td><strong>NIGHT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch meat</td>
<td>Sweetpotatoes</td>
<td>Pork and gravy</td>
</tr>
<tr>
<td></td>
<td>Applesauce.</td>
<td>Corn</td>
</tr>
<tr>
<td></td>
<td>Milk, cold coffee, or tea</td>
<td>Potatoes</td>
</tr>
<tr>
<td>Candy.</td>
<td></td>
<td>Instant pudding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fruit juice</td>
</tr>
<tr>
<td>TABLE 3</td>
<td>SAMPLE MEAL PLANS: LIMITED COOKING FACILITIES</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>First day</strong></td>
<td><strong>Second day</strong></td>
<td><strong>Third day</strong></td>
</tr>
<tr>
<td>Citrus fruit juice</td>
<td>Citrus fruit juice</td>
<td>Prunes</td>
</tr>
<tr>
<td>Ready-to-eat cereal</td>
<td>Hot cereal (quick cooking)</td>
<td>Ready-to-eat cereal</td>
</tr>
<tr>
<td>Milk</td>
<td>Milk</td>
<td>Milk</td>
</tr>
<tr>
<td>Hot coffee, tea, or cocoa</td>
<td>Hot coffee, tea, or cocoa</td>
<td>Crackers</td>
</tr>
<tr>
<td><strong>NOON</strong></td>
<td></td>
<td>Cheese</td>
</tr>
<tr>
<td>Vegetable soup</td>
<td>Beef and vegetable stew</td>
<td>Chile con carne with beans</td>
</tr>
<tr>
<td>Potato salad</td>
<td>Green beans</td>
<td>Tomatoes</td>
</tr>
<tr>
<td>Crackers</td>
<td>Crackers</td>
<td>Crackers</td>
</tr>
<tr>
<td>Ham spread</td>
<td>Peanut butter</td>
<td>Hot coffee, tea, or cocoa</td>
</tr>
<tr>
<td>Milk</td>
<td>Milk</td>
<td></td>
</tr>
<tr>
<td>Candy bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BETWEEN MEALS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit flavored drink or fruit drink</td>
<td>Tomato juice</td>
<td>Fruit flavored drink or fruit drink</td>
</tr>
<tr>
<td><strong>NIGHT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beef and gravy</td>
<td>Tuna fish, cream of celery soup</td>
<td>lunch meat</td>
</tr>
<tr>
<td>Noodles</td>
<td>mixed sweet pickles - combined</td>
<td>Hominy</td>
</tr>
<tr>
<td>Peas and carrots</td>
<td>in one dish</td>
<td>Applesauce</td>
</tr>
<tr>
<td>Instant pudding</td>
<td>Fruit</td>
<td>Cookies</td>
</tr>
<tr>
<td>Hot coffee, tea, or cocoa</td>
<td>Cookies</td>
<td>Peanuts</td>
</tr>
<tr>
<td></td>
<td>Hot coffee, tea, or cocoa</td>
<td>Hot coffee, tea, or cocoa</td>
</tr>
</tbody>
</table>