

Disaster Relief

Meal Preparation and Food Safety after a Flood

Flood-Contaminated Foods

Contaminated foods may be a problem after any storm with flooding.

Floodwaters may carry silt, raw sewage, oil, or chemical wastes. Filth and bacteria in floodwater contaminates 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. 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 try to save any of these foods:

- Opened containers and packages that have come in contact with flood waters.
- Unopened jars and bottles with paper waxy seals such as those containing mayonnaise or salad dressing.
- Containers of spices, seasonings, and flavorings.
- Flour, grains, sugars, 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.
- Dented seams, bulging, rusty or leaking tin cans, or 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 may have 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, such as leafy vegetables, that do not have a peel, shell, or coating you can remove before use.
- Fresh meat, fish, and poultry that has been in contact with floodwaters.
- Home-canned foods, even if the jar seems tightly sealed. 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.

Other Packaged Foods

Carefully examine sealed metal drums, metal-linked casks, or cases and wooden barrels such as those used for liquids. If you find leaks, put aside for health teams to check.

Destroy containers that cannot be put where no one will use the foods until they are checked; they may be dangerous.

Examine sealed foil or cellophane containers carefully for leaks or breaks and discard any damaged containers. If the food in these containers is normally finely divided (powdered or granulated) but is now caked or not free-flowing, discard. Discard sound foil packages that show stain on the inner paper wrapper. Unbroken packages with evidence of outer water contamination may be wiped dry and used.

Food To Keep

The following foods are safe if you wash and sanitize food and containers and cook foods before use. Do not eat raw fruit, even if it has been sanitized.

- Undamaged tin cans. Be sure to wash and sanitize the outside of the container before opening the can. For added safety, boil food before using.
- Potatoes. Wash, sanitize, dry, peel, and cook before using.
- Citrus fruits. Wash well, sanitize, peel, and heat to 160 °F for 10 minutes before using.
- Apples and other fruits that can be sanitized, peeled, and cooked before eating.

Disinfecting Cans and Commercial Glass Jars

All cans and commercial glass jars free of rust or dents must be washed and sanitized before they are opened.

1. Inspect cans and destroy any that bulge or leak (indications of spoilage).
2. Remove labels and wash in a strong detergent solution with a scrub brush. Remove all silt.
3. Immerse scrubbed containers for 15 minutes in cold (60 to 70 °F) chlorine solution. Household bleaches contain from 2 percent to 6 percent chlorine. The amount of bleach to add to water depends on the percent chlorine it contains.
4. Remove containers from solution, rinse in clean water, and air dry before opening. Relabel if possible. Use as soon as possible, since containers may rust. Store containers where they will not be contaminated again.

How much bleach to use for purifying water.

Amount of chlorine in bleach	Volume of bleach to add to one quart of water	Volume of bleach to add to one gallon of water
2%	2 tsp	2 tbsp plus 2 tsp
4%	1 tsp	1 tbsp plus 1 tsp
5%	3/4 tsp	1 Tb
6%	1/2 tsp	2 tsp

Here are two other ways to disinfect cans and commercial glass jars:

1. Immerse in some other sterilizing solution if local authorities recommend it. Rinse in clean water.
2. Place containers in boiling water and boil vigorously for at least 10 minutes. Dry cans to prevent rusting. Relabel cans.

Note: Chlorine and most other sterilizing solutions are poisonous. Be careful so family members, pets, and livestock cannot swallow it.

Flooded Garden Produce

If floodwaters have covered a garden, some produce will be unsafe to eat. Here are some things the safety of unharvested fruits and vegetables depends on:

- Kind of produce
- Maturity of produce at the time of flooding
- Time of year flooding occurred (possible recurrence of flood in the same week)
- Severity of flooding (depth of water and silt)
- Duration of flooding
- Bacterial content of floodwater
- Likelihood of contamination from sewage or other bacterial contaminants

Immature Produce

In general, fruits and vegetables that were more than two weeks immature at the time of flooding should be safe to eat by the time they are ready for harvest. For additional safety, disinfect produce (see "Produce Disinfecting Measures" in the next column), and cook it before eating.

Mature Produce

Unless flooding was light and there is no danger of bacterial contamination from floodwater, avoid using fruits and vegetables that were ready for harvest at the time of flooding, unless you can disinfect them, peel them, and thoroughly

cook them. Some fruits and vegetables are more susceptible than others to bacterial contamination.

Leafy vegetables such as lettuce, cabbage, mustard, kale, collards, spinach, Swiss chard, celery, and fleshy vegetables, and berry fruits such as tomatoes, cucumbers, summer squash, strawberries, and peppers would be highly susceptible to bacterial contamination.

Don't pick contaminated strawberries unless there were a quick recession of floodwaters and a lot of immature fruit at time of flooding (two weeks before ripening). Silt and other contaminants might be embedded in the leaves, petioles, stems, or other natural openings of fleshy structures and could be difficult to remove.

Root, bulb, and tuber crops such as beets, carrots, radishes, turnips, onions, and potatoes would be less susceptible to bacterial contamination. Disinfect these vegetables, and peel and cook them thoroughly before eating. Wash and disinfect produce with a protected fruit or tough outer skin such as peas, melons, eggplant, or winter squash before you remove the outer shell, skin, or husk. Then shell, peel, or husk the produce and cook it. Covered sweet corn molds. Discard it.

Produce Disinfecting Measures

Thoroughly wash, disinfect, and cook any produce before eating.

1. Wash in strong detergent solution with a clean scrub brush. Remove all silt.
2. Immerse produce for 15 to 20 minutes in a chlorine solution. Household bleaches contain from 2 percent to 6 percent chlorine. How much bleach to add to water depends on how much chlorine it contains.
3. Rinse thoroughly with safe drinking water.
4. Peel, if possible, and cook thoroughly before eating.



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