

Food and Water Safety

During Hurricanes, Power Outages & Floods





Course Information

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Course Objectives

At the end of this course, students will be able to:

- Understand that flooding and power outages can cause health risks by contaminating food and water supplies.
- Identify safe internal temperature ranges for refrigerators and freezers.
- Name precautions that will help to insure an adequate supply of uncontaminated water.
- Name methods of identifying food and water contamination after a flood.



Introduction

The Food and Drug Administration (FDA) issued a public warning on September 1, 2006, regarding possible power outages and flooding due to current storms that threatened both coasts of the United States.

The FDA's warning was issued as a result of coastal hurricanes. We might think that hurricanes are not a danger to Oklahoma because our state is not near any ocean. However, hurricanes can affect our weather, too.

Did You Know?

In late September of 1986, the remnants of Hurricane Paine drifted north from Mexico and caused over 2 feet of rain to fall just north of Lake Keystone in NE Oklahoma. The Corps of Engineers had to release water from Keystone Dam through floodgates to save the dam. This sent a torrent of water down the Arkansas River to Sand Springs, Tulsa, and surrounding areas. The floods lasted about a week and sent over 300,000 cubic feet of water per second through Tulsa. Citizens labored to plug sandbags into levees, and more than 1,800 homes and businesses went underwater. Numerous people lost electrical power during the flood.



Picture: The flood-swollen Arkansas River in early October of 1986. Photo courtesy of Tulsa Now Public Online Forum.

Storms & Related Dangers

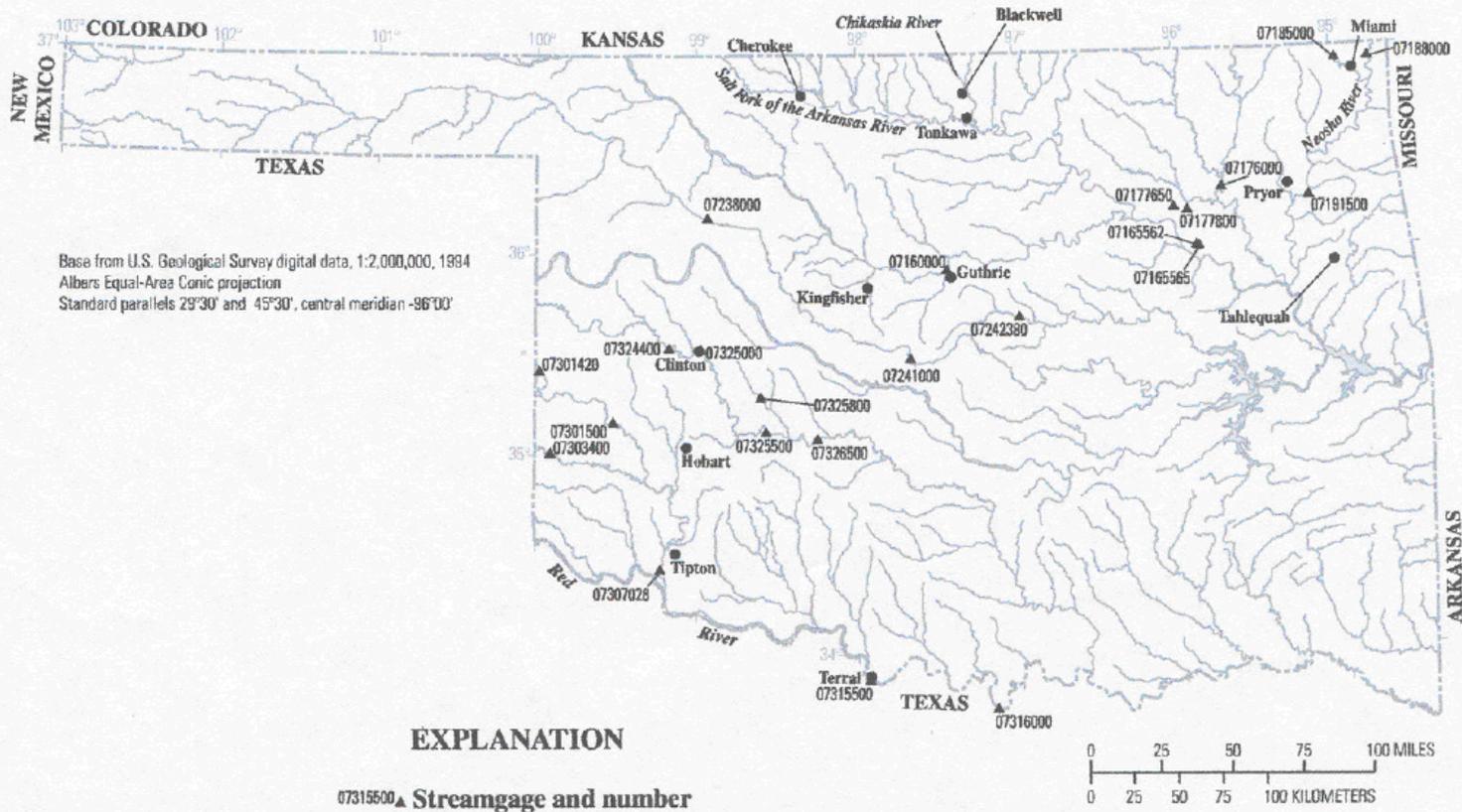


Figure 48. Location of streamgages with significant floods during 1994–98 water years for Oklahoma.

This map from the U.S. Geological Survey shows significant flood locations in Oklahoma from 1994-1998.



FDA Warning

As mentioned previously, the FDA issued a public warning in September 2006.

Robert E. Brackett, Ph.D, Director of the FDA's Center for Food Safety and Applied Nutrition, stated:

"Foods that are inadequately refrigerated during storm-related power outages, and foods or bottled water contaminated by flood waters, present a potential health risk to consumers."

The FDA also issued guidelines on how to prevent these health risks. This course will present the guidelines.



Part 1 -

Be Prepared

Part 1: Be Prepared

A little planning and preparation can help you keep your food and water safe during floods and power outages.

- Make sure you have appliance thermometers in your refrigerator and freezer. An appliance thermometer will indicate the temperature in the refrigerator and freezer in case of a power outage.



Photo: Appliance thermometers help you to determine if your frozen and refrigerated food is safe.

Part 1: Be Prepared



Make sure the refrigerator is at or below 40°F.



Make sure the freezer is at or below 0°F

Part 1: Be Prepared

- Freeze containers of water for ice to help keep food cold in the freezer, refrigerator or coolers after the power is out. If your normal water supply is contaminated or unavailable, the melting ice will supply drinking water.



Picture: It only takes a few minutes to fill up plastic containers and freeze them for emergency use.

Part 1: Be Prepared

- Group food together in the freezer. This helps the food stay cold longer if the power goes out.



Picture: Grouped packages stay colder longer.



Picture: Packages in a single layer lose cold faster than grouped packages.

Part 1: Be Prepared

- Have coolers on hand to keep refrigerator food if the power will be out for more than 4 hours. Purchase gel packs, or make ice cubes and store in the freezer for use in the refrigerator or coolers.



Picture: Freeze gel packs ahead of time for use in emergencies.

Part 1: Be Prepared

- Plan ahead and know where dry ice and block ice can be purchased.



Part 1: Be Prepared

- Store food on shelves that will be safely out of the way of contaminated water, in case of flooding.



Part 1: Be Prepared

- Make sure to have a supply of bottled water stored where it will be as safe as possible from flooding.



Picture: Purchase bottled water and store it for emergency use.



Part 2 -

When the Power
Goes Out

Part 2: When the Power Goes Out

- Keep the refrigerator and freezer doors closed as much as possible to maintain the cold temperature. The refrigerator will keep food cold for about 4 hours if it is unopened. A full freezer will keep the temperature for approximately 48 hours (24 hours if it's half-full) if the door remains closed. Buy dry or block ice to keep the refrigerator as cold as possible if the power is going to be out for a prolonged period of time.

Safety Tip:

Fifty pounds of dry ice should hold an 18-cubic foot fully-stocked freezer cold for two days.



Part 2: When the Power Goes Out

- Wash fruits and vegetables with uncontaminated water before eating.



Part 2: When the Power Goes Out

- For infants, it's safest to use prepared, canned baby formula that requires no additional water. However, if it's necessary to use concentrated or powdered formula, prepare with bottled water if the local water source is potentially contaminated.





Part 3 -

Once the Power is
Restored



Part 3: Once Power is Restored

- Determine the safety of your food. If an appliance thermometer was kept in the freezer, check the temperature when the power comes back on. If the freezer thermometer reads 40°F or below, the food is safe and may be refrozen. If a thermometer has not been kept in the freezer, check each package of food to determine its safety. You can't rely on appearance or odor. If the food still contains ice crystals or is 40°F or below, it is safe to refreeze or cook the food.

Part 3: Once Power is Restored

- Refrigerated food should be safe as long as the power was out for no more than four hours. Keep the refrigerator door closed as much as possible. Discard any perishable food (such as meat, poultry, fish, eggs, or leftovers) that has been above 40°F for two hours or more.

Safety Tip:

Perishable food such as meat, poultry, seafood, milk and eggs that are not kept adequately refrigerated or frozen may cause illness if eaten, even when they are thoroughly cooked.



Part 4.1

When Flooding Occurs

(Water Safety)



Part 4: When Flooding Occurs

Water Safety

Flood water can contain numerous disease-causing organisms, such as *E. coli* bacteria. It's important to use safety precautions to avoid being harmed.

The most likely symptoms of ingestion of flood water contaminated with bacteria are stomach-ache, fever, vomiting and diarrhea. Also, people can become ill if they have an open cut, wound, or abrasion that comes into contact with water contaminated with certain organisms. One may experience fever, redness, and swelling at the site of an open wound, and should see a doctor right away if possible.



Part 4: When Flooding Occurs

Water Safety

- Use bottled water that has not been exposed to flood water, if it is available.
- If you don't have bottled water, you should boil water to make it safe. Boiling water will kill most types of disease-causing organisms that may be present. If the water is cloudy, filter it through clean cloths or allow it to settle, and draw off the clear water for boiling. Boil the water for one minute, and store it in clean containers with covers.



Part 4: When Flooding Occurs

Water Safety

- If you can't boil water, you can disinfect it using household bleach. Bleach will kill some, but not all, types of disease-causing organisms that may be in the water. If the water is cloudy, filter it through clean cloths or allow it to settle, and draw off the clear water for disinfection. Add 1/8 teaspoon (or 8 drops) of regular, unscented liquid household bleach for each gallon of water, stir it well, and let it stand for 30 minutes before you use it. Store disinfected water in clean containers with covers.



Part 4: When Flooding Occurs

Water Safety

- If you have a well that has been flooded, the water should be tested and disinfected after flood waters recede. If you suspect that your well may be contaminated, contact your local or state health department or agricultural extension agent for specific advice.



Part 4.2

When Flooding Occurs

(Food Safety)

Part 4: When Flooding Occurs

Food Safety

- Do not eat any food that may have come into contact with flood water.
- Discard any food that is not in a waterproof container if there is any chance that it has come into contact with flood water. (See list at right for examples.)

Which containers are NOT waterproof?

Those with:

- screw-on lids
- snap lids
- pull tops
- crimped caps

Why are these containers hazardous? Because contaminated water can lodge in the lids and pull tabs, leading to possible contamination when the containers are opened.



Part 4: When Flooding Occurs

Food Safety

- Discard cardboard juice/milk/baby formula boxes and home-canned foods if they have come into contact with flood water, because they cannot be effectively cleaned and sanitized.
- Inspect canned foods and discard any food in damaged cans. Can damage is shown by swelling; leakage; punctures; holes; fractures; extensive deep rusting; or crushing/denting severe enough to prevent normal stacking or opening with a manual, wheel-type can opener.

Part 4: When Flooding Occurs

Food Safety

- Undamaged, commercially prepared foods in all-metal cans and retort pouches (see example at right) can be saved if you take the steps detailed on the next slide.



Picture:

**What is a retort pouch?
It's a flexible, shelf-stable pouch that does not need refrigeration until it's opened.**



Part 4: When Flooding Occurs

Food Safety - Saving undamaged, commercially prepared foods in all-metal cans and retort pouches

- Remove the labels if possible, since they can harbor dirt and bacteria.
- Thoroughly wash the cans or retort pouches with soap and water, using hot water if it is available.
- Brush or wipe away any dirt or silt.
- Rinse the cans or retort pouches with water that is safe for drinking, if available, since dirt or residual soap will reduce the effectiveness of chlorine sanitation.

(continued on next slide)



Part 4: When Flooding Occurs

Food Safety - Saving undamaged, commercially prepared foods in all-metal cans and retort pouches

- Then, sanitize them by immersion on one of the two following ways:
 1. place in water and allow the water to come to a boil and continue boiling for 2 minutes, or
 2. place in a freshly-made solution consisting of 1 tablespoon of unscented liquid chlorine bleach per gallon of drinking water (or the cleanest, clearest water available) for 15 minutes

(continued on next slide)



Part 4: When Flooding Occurs

Food Safety - Saving undamaged, commercially prepared foods in all-metal cans and retort pouches. After sanitizing:

- Air dry cans or retort pouches for a minimum of 1 hour before opening or storing
- If the labels were removable, then re-label your cans or retort pouches, including the expiration date (if available) with a marker
- Food in reconditioned cans or retort pouches should be used as soon as possible



Part 4: When Flooding Occurs

Food Safety

- Thoroughly wash metal pans, ceramic dishes, and utensils (including can openers) with soap and water, using hot water if available. Rinse, and then sanitize by applying a solution of 1 tablespoon of unscented, liquid chlorine bleach per gallon of drinking water (or the cleanest, clearest water available.) Allow to air dry.



Part 5

Self-Assessment



Question 1 – Self-Assessment

1. What kind of thermometer should you use for your freezer and refrigerator?

[Click here for answer](#)

Answer: An appliance thermometer should be placed in the refrigerator and the freezer.



Question 2 - Self-Assessment

2. The temperature in a refrigerator should be at 50°F or below.

[Click here for answer](#)

Answer: False. The temperature in a refrigerator should be 40°F or below.



Question 3 - Self-Assessment

3. The temperature in a freezer should be at 0°F or below.

[Click here for answer](#)

Answer: True.

Question 4 - Self-Assessment

4. Spreading frozen food in a single layer in the freezer will help food stay cold longer if the power goes out.

[Click here for answer](#)

Answer: False. Food should be grouped together to stay cold longer.

Question 5 - Self-Assessment

5. Ice or frozen gel packs should be added to coolers and refrigerators if the power is out for more than 10 hours.

[Click here for answer](#)

Answer: False. Ice or frozen gel packs should be added after 4 hours if the power is still out.



Question 6 - Self-Assessment

6. It's a good idea to store food and bottled water on high shelves if flooding occurs.

[Click here for answer](#)

Answer: True. These items should be stored out of the way of potentially-contaminated flood water.

Question 7 - Self-Assessment

7. Adding 50 pounds of dry ice to an 18-cubic foot fully-stocked freezer should keep the freezer cold for about two days.

[Click here for answer](#)

Answer: True.



Question 8 - Self-Assessment

8. If the power goes out, a full freezer will stay cold longer than a half-full freezer.

[Click here for answer](#)

Answer: True.



Question 9 - Self-Assessment

9. It's safe to wash fruits and vegetables with floodwater before eating them.

[Click here for answer](#)

Answer: False. Floodwater can contain bacteria and other dangerous substances.



Question 10 - Self-Assessment

10. What is the safest type of water to add to powdered baby formula during a flood?

[Click here for answer](#)

Answer: Bottled water.



Question 11 - Self-Assessment

11. When power is restored after an outage, perishable food that has been kept at temperatures above 40°F for 2 or more hours is safe to eat.

[Click here for answer](#)

Answer: False. It should be discarded.



Question 12 - Self-Assessment

12. What are the most likely symptoms that someone will show after ingesting flood water that has been contaminated with bacteria?

[Click here for answer](#)

Answer: Stomach-ache, fever, vomiting, and diarrhea.

Question 13 - Self-Assessment

13. Boiling water, or adding bleach to water, will kill all types of disease-causing organisms in the water.

[Click here for answer](#)

Answer: False. Boiling will kill most organisms, and bleach will kill some organisms, but neither method will kill all organisms.

Question 14 - Self-Assessment

14. Fresh foods that come into contact with flood water should be discarded.

[Click here for answer](#)

Answer: True.

Conclusion

Thank you for completing this course.

As you can see, taking the time to follow the FDA's safety guidelines can lessen your chances of becoming ill from food and water contamination during power outages and floods.

Stay safe!



Floods and power outages can happen to anyone! Photo of Tulsa flood victims in October 1986. Photo courtesy of Tulsa Now Public Online Forum.