COURSE BOOK

FOOD SAFETY ON THE GO

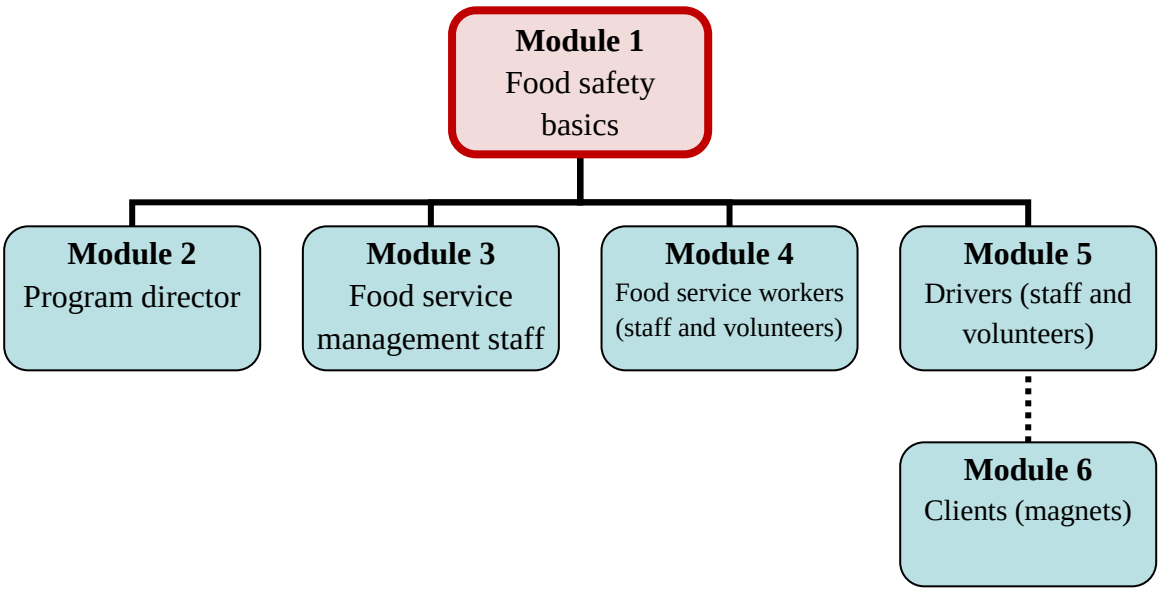
MODULE 1:
FOOD SAFETY BASICS

Pilot version

Table of Contents

Introduction

"Food Safety on the Go" is a food safety training program for staff, volunteers and clients of home-delivered meal programs. It is made up of 6 modules. Module 1, Food safety basics, is an overview of food safety for all staff and volunteers. Modules 2 through 5 are for specific individuals within a program: Module 2 is for the program director, Module 3 is for the food service management staff, Module 4 is for food service workers (staff and volunteers), and Module 5 is for drivers (staff and volunteers). Module 6, which is for clients, is in the form of magnets for drivers to give to clients.



Thank you for participating in the "Food Safety on the Go" training program.

Module 1 – Food safety basics

Length

~30 minutes

Audience

This lesson is for all staff and volunteers of a home-delivered meal program (program director, food service management staff, food service workers, and drivers).

Purpose

This lesson explains why food safety is important when providing meals to older adults. It discusses the food safety responsibilities of home-delivered meal programs.

1. Why food safety is important when providing meals to older adults

    a. What is foodborne illness?

Foodborne illness, often called "food poisoning," is any illness that is caused by eating food that is contaminated. A foodborne illness outbreak is when two or more people get the same illness after eating the same food. Bacteria and viruses are the most common causes of foodborne illness. Bacteria that can cause foodborne illness include *Salmonella*, *Campylobacter*, and *E. coli*, and viruses that can cause foodborne illness include Norovirus and Hepatitis A.

In the U.S. in 2006, an *E. coli* outbreak infected about 200 people in 26 states after they ate contaminated spinach. Over half of the infected people were hospitalized, about one sixth developed kidney failure, and at least three people died (1).

In the U.S. in 2008, a *Salmonella* outbreak infected over 700 people in 46 states after they ate contaminated peanut butter or other peanut products. This led to one of the biggest food recalls in the U.S. – about 4,000 food products were recalled (2). Of the infected persons, about one fourth were hospitalized and nine died (3).

While outbreaks like these often make the news, they make up only a small percent of the foodborne illness cases in the U.S. every year. Most foodborne illness cases are not part of a recognized outbreak.

b. How common foodborne illness is

Every year, about 48 million Americans, or one in six Americans, gets a foodborne illness, Approximately 128,000 of them go to the hospital and 3,000 die (4). Adults age 50 and older are more likely to be hospitalized and die of foodborne illness than the rest of the population (5). The health-related cost of foodborne illness in the U.S. is thought to be about $152 billion per year (6).

c. Symptoms of foodborne illness

Harmful bacteria and viruses in food go to the stomach and intestines where they can cause the first symptoms of foodborne illness. Symptoms of foodborne illness can include nausea, vomiting, stomach pain, diarrhea, fever and dehydration. Other health conditions can also cause these symptoms.

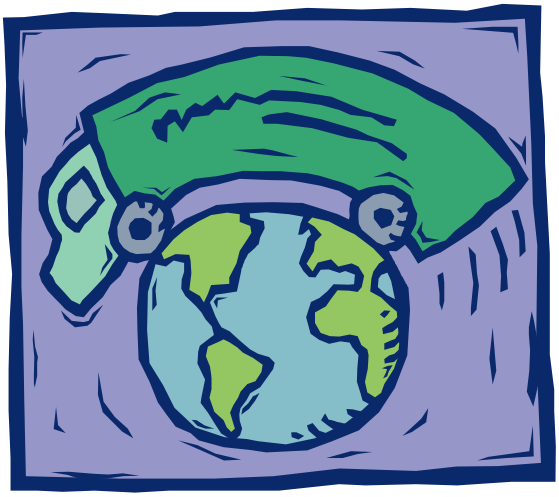
Symptoms of foodborne illness may not appear for days or even weeks after a person eats a contaminated food. People with foodborne illness may think they have the "stomach flu" or the "24-hour flu." However, "the flu," or influenza, is mainly a respiratory illness caused by influenza viruses, which are often spread from person to person through coughing or sneezing. Foodborne illness, on the other hand, is mainly an intestinal disease caused by eating food that contains harmful bacteria or viruses.

Foodborne illness can lead to serious complications, including kidney failure, arthritis, meningitis, paralysis, or even death.

d. Where harmful bacteria and viruses come from

i. The food supply has changed

The food supply in the U.S. is one of the safest in the world. However, nowadays many foods are produced on a larger scale than they were before, go through more processing, and come from further away, which has raised the chance of food contamination. A few decades ago, food was grown, produced, and distributed locally. Now, many foods travel over 1,000 miles to get from a farm to a person's plate.



About 20% of all foods eaten in the U.S. come from other countries, which may have different food production practices. These days, foods are often handled by many people, using many types of equipment, so there are many possible sources of food contamination.

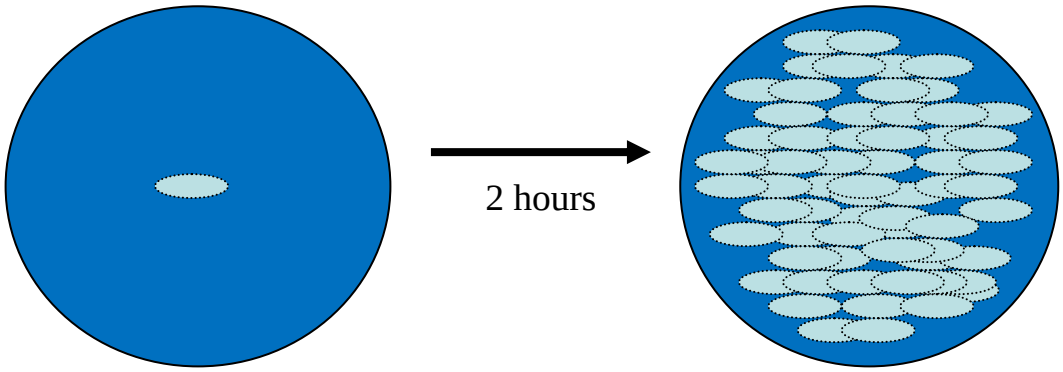
ii. How harmful bacteria and viruses contaminate food

Harmful bacteria and viruses that contaminate food can come from many different sources. Bacteria that cause foodborne illness can come from the soil, water, air, plants, animals and humans. Food can be contaminated during growing, harvesting, processing, storing, shipping, preparation in a kitchen, holding, or meal delivery.

Viruses that cause foodborne illness mainly come from humans, and can be transmitted to food by an infected person who handles the food. People can carry harmful viruses or bacteria in their feces and can transfer them to their hands after using the restroom. If they do not wash their hands properly, they can then spread the harmful viruses or bacteria to food.

Most bacteria and viruses that cause foodborne illness go unnoticed because they don't change the way food looks, smells or tastes. Some people even claim that the potato salad or other food that made them sick was the best they ever tasted. Bacteria that spoil food and change its smell, taste or texture are generally different from the bacteria that cause foodborne illness.

Bacteria can multiply in food, while viruses can only multiply inside living cells, such as in a person's body. Bacteria grow best in certain conditions. Most harmful bacteria grow best at temperatures between 41 and 135 degrees Fahrenheit. When conditions are right, bacteria can double in number every 20 minutes. Within two hours, one bacterium can multiply into 64 bacteria. Within ten hours, one bacterium can multiply into a billion bacteria.



Some bacteria can produce toxins, either in food or in people's intestines, which can cause foodborne illness. Some bacteria can also change into a different form, called spores. Spores can survive in difficult conditions such as at high temperatures. When conditions get better, spores can change back into active bacteria, which can cause foodborne illness.

e. Why older adults are at higher risk of foodborne illness

i. Weaker immune system

Older adults are especially vulnerable to foodborne illness. With age, the immune system can become weaker and have a harder time fighting off harmful bacteria and viruses. Stomach acid, which limits the number of harmful bacteria and viruses that enter the intestines, often decreases with age. Many older adults also take medications which lower the amount of stomach acid.

A certain number of harmful bacteria or viruses are needed to cause foodborne illness, and this amount is called the infectious dose. The infectious dose can be much lower for people with weak immune systems. Older people with less stomach acid can become infected by lower numbers of harmful bacteria and viruses.

ii. Effects of health conditions

Health conditions such as diabetes, arthritis, cancer, heart disease, and kidney disease, as well as the side effects of some medications for these conditions, can weaken the immune system and increase a person's risk of getting a foodborne illness. According to national surveys, home-delivered meal clients have much higher rates of these health conditions than the general population. Home-delivered meal clients are therefore at substantially higher risk of foodborne illness than the general population.

iii. Clients may not handle and store food properly

Studies have found that in the general population, most people do not handle and store meals and leftovers safely, which increases their risk of foodborne illness (7). Home-delivered meal clients, and especially those with limited cooking experience, may not know how to handle and store food safely. Teaching clients how to handle and store home-delivered meals safely is key to lowering their chance of getting a foodborne illness.

2. Programs are responsible for delivering safe food

a. Cost of a foodborne illness outbreak

A foodborne illness outbreak can cost a home-delivered meal program much more than the cost of properly training staff and volunteers in food safety. It only takes one mistake for an outbreak to happen. Besides causing ill clients, an outbreak can lead to lawsuits against the program, low morale among staff and volunteers, negative attention from the media, a damaged reputation, and it may even cause the program to close.

The Daily New

Foodborne illness outbreak sickens dozens of people

BY LARRY SCHROEDER

A foodborne illness outbreak that was linked to chicken left at room temperature for over 6 hours has afflicted over 30 people. The bacterium that contaminated the chicken was *Salmonella,* a common cause of foodborne illness. 3 people had to be

Recession is declared over

BY DONNA MASON

A panel of private economists declared that the U.S. recession ended in June 2009. The 18-month downturn was the longest recession in the post-World War II era.

The unemployment rate was 9.6 percent

b. Programs need food safety policies and procedures

Foodborne illness is preventable, and most foodborne illness can be avoided if food is handled properly. To keep food safe, it is necessary to:

- buy food from approved, reputable suppliers. For example, "homemade" foods should not be purchased.
- cook food to a safe temperature
- keep foods at safe temperatures, and store foods correctly

- clean and sanitize equipment properly, and avoid cross-contamination, which is the transfer of harmful bacteria or viruses from one surface or food to another
- maintain good personal hygiene

To make sure that safe food is delivered to clients, proper food safety policies and procedures are needed throughout the flow of food, which includes purchasing, receiving, storage, preparation, holding and delivery. A team effort is needed to develop and follow appropriate food safety policies and procedures throughout the flow of food.

c. Staff and volunteers need to be trained in food safety

For a program to deliver safe food, it is important to train staff and volunteers in food safety as soon as they start working or volunteering at the program, and at least once a year after that.

d. Temperature requirements

To keep harmful bacteria from growing and causing foodborne illness, it is important to control food temperatures throughout the flow of food. Food safety procedures are needed to make sure that food is stored at the correct temperature, cooked to a safe temperature, cooled and reheated properly, held at an appropriate temperature, and delivered at an appropriate temperature.

Many bacteria that cause foodborne illness grow fastest at temperatures between 41 and 135 degrees Fahrenheit – this is known as the temperature "danger zone." Potentially hazardous foods are foods that support the growth of harmful bacteria. Some examples of potentially hazardous foods are dairy products, eggs, meat, poultry, seafood, cooked rice and vegetables; tofu, sprouts, sliced melons, cut tomatoes, and cut leafy greens. Potentially hazardous foods should be kept out of the temperature danger zone.

Refrigerating or freezing food can slow or stop the growth of most harmful bacteria, but usually does not destroy them. Cooking food to proper temperatures can destroy most harmful bacteria, but bacterial toxins and spores are often able to survive cooking temperatures, and can lead to foodborne illness.

Therefore, bacterial growth needs to be avoided in the first place, by keeping potentially hazardous foods out of the temperature danger zone.

e. Staff and volunteers need to be in good health and maintain good personal hygiene

Staff and volunteers need to be in good health and to maintain good personal hygiene so that they don't transmit harmful viruses or bacteria through food to clients. Washing hands is one of the best ways to reduce the risk of foodborne illness, as it can keep harmful viruses and bacteria from spreading. Hands should be washed in warm soapy water for at least 20 seconds before and after handling food, after using the restroom, and after touching one's hair, face, body, clothing, or anything else that could contaminate hands. Hands should be dried with a clean paper towel or a hand dryer.

Staff and volunteers who work with food should also keep their fingernails short and clean, bathe or shower before working with food, and keep their hair clean. They should wear clean clothes and a clean hair restraint when working with food. If food service workers wear aprons and leave a food preparation area, for example to go to the restroom, they should take off their aprons and store them properly. Food service workers should remove any jewelry from their hands and arms before working with food. They should not eat, drink, smoke, or chew gum or tobacco while handling food or while working in a food preparation area.

f. Programs need to monitor and keep records

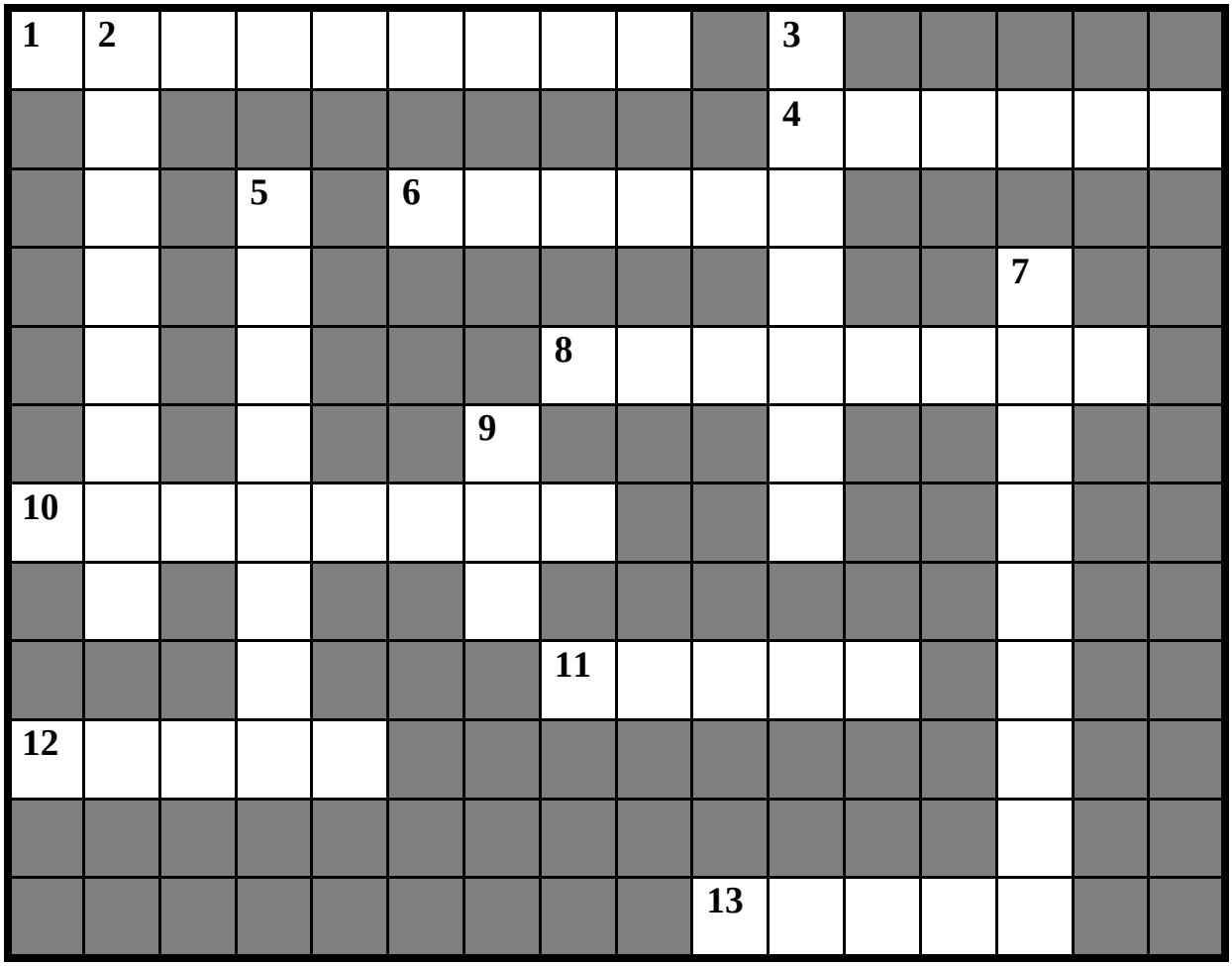
Monitoring is observing and taking measurements to make sure that food safety procedures are being followed. For example, food temperatures should regularly be measured and written down throughout the flow of food, to make sure that food is kept at safe temperatures. Programs need to consistently monitor and enforce food safety procedures, to help keep food safe and lower the chance that clients will get a foodborne illness.

Key points

- Foodborne illness, often called "food poisoning," is any illness that is caused by eating food that is contaminated. Harmful bacteria and viruses are common causes.
- Older adults are more likely to be hospitalized and die of foodborne illness than the rest of the population.
- Symptoms of foodborne illness can include nausea, vomiting, and diarrhea, as well as more serious complications. These symptoms may not appear for days or weeks after a person eats a contaminated food.
- Bacteria and viruses that cause foodborne illness usually don't change the way food looks, smells or tastes.
- A foodborne illness outbreak can cost a program much more than the cost of properly training staff and volunteers in food safety. An outbreak can lead to lawsuits, low morale, a damaged reputation, and it may even cause the program to close.
- Foodborne illness is preventable, and most foodborne illness can be avoided if food is handled properly.
- To keep food safe, it is necessary to buy food from approved, reputable suppliers; cook food to a safe temperature; keep foods at the correct temperatures; clean and sanitize equipment properly; avoid cross-contamination; and maintain good personal hygiene.
- For a program to deliver safe food, it is important to train staff and volunteers in food safety as soon as they start working or volunteering at the program, and at least once a year after that.
- Many bacteria that cause foodborne illness grow fastest at temperatures between 41 and 135 degrees Fahrenheit – this is known as the temperature "danger zone." Potentially hazardous foods are foods that support the growth of harmful bacteria. These foods should be kept out of the temperature danger zone.
- Staff and volunteers need to be in good health and to maintain good personal hygiene so that they don't transmit harmful viruses or bacteria through food to clients. Washing hands is one of the best ways to lower the risk of foodborne illness.

Activity: Crossword puzzle

Food safety crossword puzzle



ACROSS

1. _____ illness is any illness that is caused by eating food that is contaminated.

4. A person's ___ _____ system can become weaker with age.

6. The temperature range between 41 and 135 degrees Fahrenheit is called the temperature "___ _____ ___ zone."

8. It is important for staff and volunteers to maintain good _____ hygiene.

10. _____ and viruses are the most common causes of foodborne illness.

11. Most bacteria and viruses that cause foodborne illness don't change the way food _____, smells or tastes.

12. _____-contamination is the transfer of harmful bacteria or viruses from one food or surface to another.

13. Washing your _____ is one of the best ways to reduce the risk of foodborne illness.

DOWN

2. When two or more people get the same illness after eating the same food, it is called an _____.

3. _____ that cause foodborne illness mainly come from humans.

5. _____ of foodborne illness may not appear for days or even weeks after a person eats a contaminated food.

7. Potentially _____ foods are foods that support the growth of harmful bacteria.

9. Every year, about one in _____ Americans gets a foodborne illness.

Glossary

Bacterium: A single-celled organism.
Calibrate a thermometer: Ensure that a thermometer gives accurate readings by adjusting it to a known standard, such as the freezing point or the boiling point of water.
Campylobacter: A group of bacteria, some of which can cause foodborne illness.
Clean: Remove visible soil.
Contamination: The unintended presence of harmful substances or microorganisms.
Cross-contamination: The transfer of harmful bacteria or viruses from one food or surface to another.
E. Coli: A group of bacteria, some of which can cause foodborne illness.
Flow of food: The path food takes through a foodservice operation; it can include purchasing, receiving, storage, preparation, cooking, holding, cooling, reheating, plating and delivery.
Food Code (FDA): A model for state and local regulators to use to develop or update their food safety rules. It is issued by the Food and Drug Administration (FDA), a federal government agency.
Food product recall: An action by a food manufacturer or distributor to remove products from commerce that may cause health problems or death.
Food safety: The conditions and practices that preserve the quality of food to prevent contamination and foodborne illness.
Foodborne illness (often called "food poisoning"): Any illness that is caused by eating food that is contaminated.
Foodborne illness outbreak: An incident in which two or more people get the same illness after eating the same food.
Hazard analysis and critical control point (HACCP) system: A food safety system that can be used to identify, evaluate and control food safety hazards throughout the flow of food.
Health inspector (may also be called sanitarian, health official or environmental health specialist): State, county or city employee who conducts foodservice inspections.
Hepatitis A virus: A virus that can cause foodborne illness.
Immune system: The body's defense system against illness.
Infectious dose: The number of harmful bacteria or viruses that are needed to cause illness.
Jaundice: Yellowing of the skin and eyes; a symptom of various diseases including hepatitis A.
Norovirus: A group of viruses that can cause foodborne illness.
Personal hygiene: Maintaining cleanliness of one's body and clothing to preserve overall health and well-being.
Potentially hazardous food: Food that supports the growth of harmful bacteria.
Ready-to-eat food: Food that will be eaten without any more preparation, washing or cooking.
Salmonella: A group of bacteria, some of which can cause foodborne illness.
Sanitize: Reduce the number of microorganisms on a surface to safe levels.
Shigella: A group of bacteria, some of which can cause foodborne illness.

Spore: A form that some bacteria can take to protect themselves in unfavorable conditions.
Temperature danger zone: The temperature range between 41 and 135 degrees Fahrenheit; many bacteria that cause foodborne illness grow fastest within this temperature range.
Time-temperature abuse: Allowing food to remain too long at a temperature which supports the growth of harmful bacteria.
Toxin: A poison that is produced by living cells or organisms.
Virus: A very small infectious agent that can only multiply inside a living cell.

Food safety websites

- Food safety for older adults
  http://www.foodsafety.gov/keep/groupofpeople/olderadults/index.html
  http://www.fsis.usda.gov/PDF/Food_Safety_for_Older_Adults.pdf
- Federal food safety gateway
  www.foodsafety.gov
- U.S. Department of Agriculture (USDA) Food Safety and Inspection Service
  www.fsis.usda.gov
- U.S. Department of Agriculture (USDA) food safety spotlights
  http://healthymeals.nal.usda.gov/nal_display/index.php?info_center=14&tax_level=1&tax_subject=231
- U.S. Food and Drug Administration (FDA) education resource library
  http://www.fda.gov/Food/ResourcesForYou/Consumers/ucm239035.htm
- Partnership for Food Safety Education
  www.fightbac.org
- Iowa State University Extension food safety project
  http://www.extension.iastate.edu/foodsafety/educators/index.cfm?articleID=295&parent=2
- UC Davis food safety music
  http://foodsafe.ucdavis.edu/index.html#

References

1. Centers for Disease Control and Prevention. Update on Multi-State Outbreak of E. coli O157:H7 Infections from Fresh Spinach. October 6, 2006. http://www.cdc.gov/ecoli/2006/september/updates/100606.htm. Accessed April 7, 2011.
2. U.S. Food and Drug Administration. Peanut Products Recall. http://www.fda.gov/Safety/Recalls/MajorProductRecalls/Peanut/. Accessed April 7, 2011.
3. Centers for Disease Control and Prevention. Investigation Update: Outbreak of Salmonella Typhimurium Infections, 2008–2009. http://www.cdc.gov/salmonella/typhimurium/update.html. Accessed April 7, 2011.
4. Scallan E, Griffin PM, Angulo FJ, Tauxe RV, Hoekstra RM. Foodborne illness acquired in the United States - unspecified agents. Emerg Infect Dis. 2011 Jan. http://www.cdc.gov/eid/content/17/1/pdfs/09-1101p2.pdf. Accessed April 7, 2011.
5. Centers for Disease Control and Prevention. Preliminary FoodNet data on the incidence of infection with pathogens transmitted commonly through food -- 10 states, 2008. MMWR. 2009 Apr 10;58(13):333-7.
6. Scharff, R.L. The Produce Safety Project at Georgetown University. Health-Related Costs from Foodborne Illness in the United States. Mar 3, 2010. http://www.producesafetyproject.org/admin/assets/files/Health-Related-Foodborne-Illness-Costs-Report.pdf-1.pdf. Accessed April 7, 2011.
7. Shapiro MA, Porticella N, Jiang LC, Gravani RB. Predicting intentions to adopt safe home food handling practices. Applying the theory of planned behavior. Appetite. 2011 Feb;56(1):96-103.