

Lesson 8

Keeping Our Food Safe

[Lesson Duration: 50 minutes, plus 10 optional minutes]

Lesson Overview

Each year thousands of Americans experience **foodborne illnesses** caused by **pathogens** or biological toxins. Agricultural chemicals and additives in our food supply contribute to risks of chronic illnesses such as cancer. Students will explore how food becomes contaminated, the consequences for **public health**, and how to prevent and respond to **food safety** issues.



Learning Objectives

- Identify sources of food contamination throughout the **food system**.
- Explore how public health officials respond to foodborne illness outbreaks.
- Identify opportunities to improve food safety.



Essential Questions

- Where, when, and how is our food system vulnerable to contamination?
- How can we determine the origin of a foodborne illness outbreak?
- What should be done to improve food safety?



Materials

- Student handouts
- Presentation slides
- Answer Key
- FoodSpan Infographic



Resources

- *Food Safety primer* (www.foodsystemprimer.org/food-safety/)

Warm-up: Food Contamination: Where Are We Most Vulnerable?

[5 minutes]

Have students pair up and make their best guess about where food safety is threatened by chemicals or pathogens (e.g., disease-causing bacteria and viruses). Ask each pair to choose any food item and list at least three situations, from production through consumption, in which it could be contaminated.

If needed, provide students with the following example: an apple could be contaminated during production by the spraying of **pesticides**, during transportation by coming into contact with contaminated containers, or during preparation if it is sliced on a contaminated cutting board. Ask for volunteers to share and generate a list on the board.

Main Activity: How Does Food Become Contaminated?

Science, Social Studies, FACS
[15 minutes]

Students will learn about the different ways food can become contaminated as it moves along the supply chain. Display the **Presentation slides** as an introduction to microbial and chemical contamination.

Have students read the **Food Contamination Handout** for a summary of ways that food can become contaminated. Ask students to compare the list from the warm-up with what they learned from the handouts. Discuss similarities and differences.

“Food safety involves everybody in the food chain.”

– Mike Johanns,
former U.S. Senator



Before writing childrens' books, Theodore Geisel (Dr. Seuss) illustrated advertisements for the pesticide DDT. Pesticides can contaminate produce and animal products.

Photo credit: Dr. Seuss Collection, Special Collections & Archives, University of California, San Diego. Used with permission.



Industries such as mining, coal burning, and manufacturing release chemicals into air, water, and soil. These chemicals can make their way into our food supply.

Photo credit: Emilian Vicol. Public domain.

Main Activity: Food Safety in Action: Outbreak Investigation

Social Studies, Science, Health, FACS
[25 minutes]

In a hypothetical scenario about a foodborne illness outbreak, students will act as local health department officials. An outbreak is defined as two or more cases caused by the same contaminated food and resulting in the same illness. Using data collected from a survey of event attendees, they will determine the food and the pathogen most likely responsible for the outbreak.

Provide pairs of students with copies of the **Outbreak Investigation Handout** and explain their task. Use the **Answer Key** to verify students' responses. Once students have completed the investigation, ask:

- Which pathogen in which food caused the outbreak?
- What was challenging about this activity? What was surprising?
- What did you learn about how public health officials respond to outbreaks?
- How could an outbreak like this have been prevented?

Optional Activity: How Do We Prevent Food Contamination?

Health
[10 minutes]

Have students work in groups to create a list of interventions to improve food safety at various points along the supply chain. Consider both behavioral and policy changes. For example:

- **Production:** Limit the use of chemical pesticides; strengthen environmental regulations to prevent manure from contaminating vegetable crops (see **Food Safety primer** for details).
- **Processing:** Reduce line speeds at meat processing plants to improve detection of contaminated carcasses and prevent cross-contamination; eliminate food additives implicated in health risks.
- **Transport:** Ensure transport containers are not contaminated; maintain proper storage temperatures during transit.
- **Preparation:** Wash hands and countertops; keep leftovers chilled; keep raw meat separate from other foods; cook meats and fish to appropriate temperatures.

Discuss: What can and should policymakers, businesses, and citizens do to help promote these interventions? What can you do to reduce your exposure to food safety hazards?



Teacher note: In the Epidemic Curve section of the Outbreak Investigation, after students have calculated the mode incubation period, they can also calculate the mean and median incubation periods. Outbreak investigators use this information for clues about which pathogen caused the illness.

Wrap-up: Food Safety and Me

[5 minutes]

Have students write a journal entry in response to the prompts: *Where is our food system vulnerable to contamination? How can we promote food safety? How can individuals, communities, and governments make a difference?* Optional: Have students share their responses.

Extensions:

Revisiting the Infographic (Social Studies, Health)

Distribute copies of the **FoodSpan Infographic** (students may already have their own from previous lessons). Ask students to identify parts that represent food safety. Ask: *Do these accurately and fully represent what we learned about food safety? If not, what could we add to make the infographic more accurate?* Working individually or as a class, have students draw their own versions, create a collage, or add images to the existing infographic. Share photos of students' work on social media and tag #foodspan.

Food Safety News Report (Social Studies, Health, ELA)

Students will write a newspaper article or record a video newscast reporting on the foodborne illness outbreak from the main activity. Students should cover "the five W's" (who, what, where, when, why), including the steps involved in the investigation.

Food Safety at School (Health)

Students will visit their school's kitchen and interview someone on the cafeteria staff. They should prepare a list of questions about how the school keeps people safe from foodborne illness. Students can write a reflection or give a presentation on what they learned.

Food Safety Ambassadors (Social Studies, Health)

Students will design and implement a campaign to promote food safety in their community. This could involve creating posters or videos, writing blogs, and/or using social media.



Share Your Knowledge: How can we promote food safety? Ask students to tweet food safety tips and tag **#foodsafety** and **#foodspan** to join the conversation.