

A Case of Food Poisoning

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Part I: What food might be causing the foodborne illness?

The Hill family reunion was fantastic! The weather was warm and sunny. Grandma Hill kept the picnic table loaded with food all afternoon.

One day later, a number of family members experienced vomiting and diarrhea. Some of the family members were so sick that they needed to go to the emergency room at the local hospital. Three of the family members required hospitalization for severe dehydration. Family members suspected that they had food poisoning.

Uncle Bill wondered what they ate that made them so sick. He called some of the people who attended the reunion and asked them what they ate at the reunion.

The chart that Uncle Bill made (**What People at the Reunion Said They Ate**) is on the next page.

1. Based on the information in Uncle Bill's chart, what food (or foods) might be the source of the illness? Explain why you chose this food or foods.

What People at the Reunion Said They Ate

	People at reunion	Chicken	Hot Dogs	Mixed Green Salad	Macaroni and Cheese	Corn	Blueberries
Got Sick	Fred	yes	no	yes	yes	yes	yes
	Emma	yes	no	yes	yes	yes	yes
	Monique	no	yes	yes	yes	no	yes
	Diana	yes	no	yes	yes	yes	no
	Matt	no	yes	yes	no	yes	yes
	Jeremy	yes	yes	no	yes	yes	no
	Jenny	yes	no	yes	yes	no	no
	Ralph	yes	no	yes	yes	yes	yes
	Gina	yes	yes	yes	no	no	yes
	Jacob	no	yes	yes	yes	no	yes
Karen	yes	no	yes	no	yes	yes	
Did NOT Get Sick	Joe	yes	no	no	no	yes	no
	Sarah	yes	yes	no	yes	yes	no
	Claire	yes	no	no	yes	yes	yes
	Anna	no	yes	no	yes	no	yes
	Mike	yes	yes	yes	no	no	yes
	Erin	yes	no	no	yes	yes	yes
	Doug	no	no	no	no	yes	no

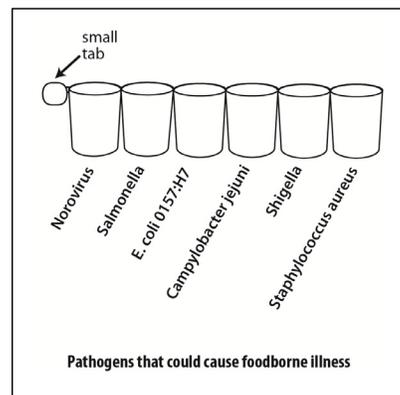
Part 2: What pathogen might be causing the foodborne illness?

Emergency room physicians reported that they were seeing a large number of people from the local area who appeared to have symptoms of foodborne illness, also known as food poisoning. Over the past few days, they had seen more than 100 people who had serious vomiting and diarrhea. The physicians contacted the State Health Department to report a possible outbreak of foodborne illness. They also sent samples of diarrhea from several patients to the State Health Department laboratory so that the samples could be tested for common pathogens that cause foodborne illness.

Your lab kit contains a simulated sample of diarrhea collected from one of the patients. Use the materials in the “For Part 2” bag and the instructions below to determine which pathogen might be causing the foodborne illness.

1. Each well on the well strip is already coated with a different kind of antibody that can only attach to one specific type of pathogen. **Set the well strip on the diagram in the Pathogen Testing kit.**

Be careful to arrange the well strip so that the small tab is on the left.



2. Put 3 drops of the simulated Patient Diarrhea Sample into each of the wells.
3. Put 3 drops of Pathogen Testing Solution into each of the wells. Use a different toothpick to stir the mixtures in each of the wells.
4. Observe the color of the contents of each of the wells.
 - A yellow color indicates the antibodies in the well have attached to a specific pathogen that is present in the diarrhea sample.
 - A blue or green color indicates the pathogens that are not present in the diarrhea sample.
5. Based on the results the diarrhea sample testing, what pathogen is most likely to be causing the foodborne illness. Support your answer with information from the tests that you conducted.

Part 3: Which food is contaminated?

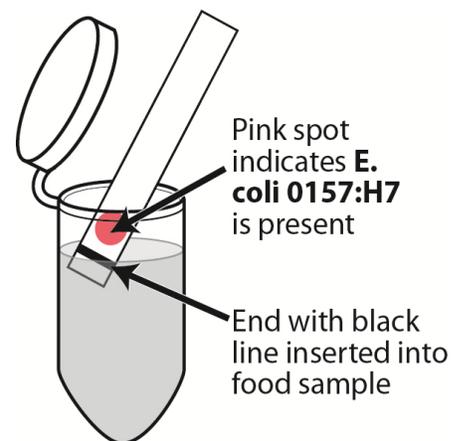
The physicians and Health Department officials began interviewing patients to determine which food was contaminated by the pathogen. They discovered that all of the patients had shopped at *Village Grocery Mart*, the town's only supermarket. The patients had all purchased and eaten the following foods:

- Blueberries
- Green peppers
- Lettuce
- Bean Sprouts

The Health Department sent a laboratory technician to collect samples of these foods from *Village Grocery Mart*. The laboratory technician mashed up small quantities of each of the four kinds of food and then mixed the mashed food with water. He filtered the samples and collected the fluid from each of the foods.

1. Use the materials in the "For Part 3" bag that contains simulated samples of the fluid from each of the four foods and a bag of *E. coli 0157:H7 Fast-Test Strips*.
2. Follow the instructions below to test the four foods for the presence of *E. coli 0157:H7* bacteria:

- Dip the end of the *E. coli 0157:H7 Fast-Test Strip* with the black line into the simulated food samples as shown on the right. **Important: Be sure that at least half of the strip is inserted into the food samples.**
- If a pink area appears on test strip, it indicates that *E. coli 0157:H7* bacteria are present in the food.



3. Which food (or foods) contains *E. coli 0157: H7* bacteria?
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Part 4: Where did the contaminated food come from?

William Hurst, the manager of *Village Grocery Mart* looked at the store records and reported that they purchased the contaminated food from *Organic Produce Supply Company*, a wholesale distributor of many different kinds of produce (fruits and vegetables).

This *Organic Produce Supply Company* purchases dried bean seeds from a seed supplier. The company then moistens the bean seeds and allows them to germinate (begin to grow) in containers for several days. They package the germinated bean sprouts and ship them to grocery stores.

Health department technicians tested the bean sprouts from *Organic Produce Supply Company*. None of the bean sprouts currently in their facility tested positive for *E. coli* 0157:H7. However, several of the employees of the *Organic Produce Supply Company* revealed that the company's refrigeration system had been broken for a few days. The company had also recently changed from prewashing the sprouts to labeling the sprouts "Wash thoroughly before use."

1. Do you think that bean sprouts became contaminated at the produce company, the grocery store, or after they had been purchased for use in salad served at the family reunion? Support your answer from information in the scenarios and from the tests that you conducted.

Not all *E. coli* cause foodborne illness

Escherichia coli (*E. coli*) bacteria commonly live in the intestines of all people and animals. There are hundreds of strains of *E. coli*. Most strains of *E. coli* are normal, are harmless inhabitants of the small intestine and colon, and do not cause disease. In fact, some strains of *E. coli* are beneficial because they produce vitamin K and some B vitamins. Some *E. coli* strains, particularly the *E.coli* 0157:H7 strain, cause "food poisoning" or diarrhea by producing toxins (poisons) that cause intestinal inflammation.

Use the information in the brochure entitled **What You Should Know About Foodborne Illness** to answer the following questions.

2. List at least three types of foods that are likely to cause foodborne illness.

- _____
- _____
- _____

3. Which type of pathogen is responsible for causing the greatest number of foodborne illnesses—bacteria, viruses, fungi, or protozoa?

4. Which is responsible for the majority of cases of foodborne illness—consumer handling of food after purchase, handling of food by restaurants or grocery stores, or contamination at farms and food processing facilities?

5. What two things should people do to help them recover from foodborne illness?

- _____
- _____

6. List at least three symptoms of food poisoning that indicate it would be best to contact a physician.

- _____
- _____
- _____

7. For each “Food Safety Mistake” on the left, write the letter of the appropriate “Why and Solution” on the line.

Food Safety Mistake	Why and Solution
<p>_____ Tasting food to see if it’s still good</p>	<p>A. Why: Washing raw meat or poultry can spread bacteria to your sink, countertops, and other surfaces in your kitchen. Solution: Don’t wash meat, poultry, or eggs.</p>
<p>_____ Eating undercooked or raw meat, poultry, seafood, or eggs</p>	<p>B. Why: Harmful germs can multiply extremely rapidly at room temperature. Solution: Thaw food safely in the refrigerator, in cold water, or in the microwave.</p>
<p>_____ Thawing food on the counter</p>	<p>C. Why: Cooked food is safe only after it’s been cooked to a high enough temperature to kill harmful bacteria. Solution: Use the recommended cooking temperatures and a food thermometer.</p>
<p>_____ Not washing your hands and cooking equipment</p>	<p>D. Why: You can’t taste (or smell or see) the bacteria that cause food poisoning. Tasting only a tiny amount can cause serious illness. Solution: Throw food out before harmful bacteria grows.</p>
	<p>E. Why: Germs on your hands or food preparation equipment can contaminate the food that you or others eat. Solution: Wash hands or cooking equipment the right way—for 20 seconds with soap and running water.</p>

8. There are many things that people can do to prevent contamination of food with the potentially harmful pathogens that cause foodborne illness. Read the brochure entitled **What You Should Know About Foodborne Illness**. As you read:

- Make a list of 3 things that you already do to prevent food poisoning.

- _____
- _____
- _____

- Make a list of 3 additional things that you should remember to do to prevent food poisoning.

- _____
- _____
- _____