

Foodborne Diseases FactSheet

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Overview

Infectious diseases spread through food or beverages are a common, distressing, and sometimes life-threatening problem for millions of people in the United States and around the world. The U.S. Centers for Disease Control and Prevention (CDC) estimates 76 million people suffer foodborne illnesses each year in the United States, accounting for 325,000 hospitalizations and more than 5,000 deaths.

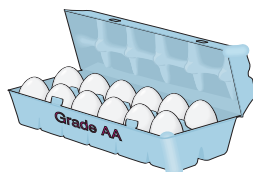
Foodborne disease is extremely costly. Health experts estimate that the yearly cost of all foodborne diseases in this country is \$5 to \$6 billion in direct medical expenses and lost productivity. Infections with the bacteria *Salmonella* alone account for \$1 billion yearly in direct and indirect medical costs.

There are more than 250 known foodborne diseases. Bacteria cause the most cases, followed by viruses and parasites. Natural and manufactured chemicals in food products also can make people sick. Some diseases are caused by toxins (poisons) from the disease-causing organism, others by bodily reactions to the organism itself. People infected with foodborne germs may have no symptoms or develop symptoms ranging from mild intestinal discomfort to severe dehydration and bloody diarrhea.

Recently, public health, agriculture, and environmental officials have expressed growing concern over keeping the nation's food and water supply safe from terrorist acts. This bioterrorism threat is being studied by a number of U.S. agencies, including the Food and Drug Administration, Department of Agriculture, Centers for Disease Control and Prevention, Environmental Protection Agency, and National Institutes of Health.

This fact sheet will describe five foodborne diseases caused by bacteria.

- Botulism
- Campylobacteriosis
- *Escherichiacoli* (*E. coli*) infection
- Salmonellosis
- Shigellosis



Preventing Foodborne Diseases

Many times, foodborne diseases are easy to avoid. These are some basic ways to prevent being infected by most foodborne germs. Specific ways to avoid getting sick from foodborne organisms are described in the sections on foodborne diseases.

- Wash hands carefully before preparing food.
- Wash hands, utensils, and kitchen surfaces with hot soapy water after they touch raw meat or poultry.
- Cook beef and beef products thoroughly, especially hamburger.
- Cook poultry and eggs thoroughly.
- Eat cooked food promptly and refrigerate leftovers within two hours after cooking.
- Wash fruits and vegetables thoroughly, especially those that will be eaten raw.
- Drink only pasteurized milk and juices and treated surface water.
- Wash hands carefully after using the bathroom, changing infant diapers, or cleaning up animal feces.

Botulism

Botulism is a rare but serious illness caused by botulinum toxin (poison) produced by *Clostridium botulinum* bacteria. This toxin affects the nerves and if untreated, can cause paralysis and respiratory failure. U.S. health care providers report an average of 110 cases of food, infant, and wound botulism to CDC each year. About 10 to 30 outbreaks of foodborne botulism are reported every year. Although this illness does not occur frequently, it can be fatal if not treated quickly and properly.

How is C. botulinum transmitted?

Often, cases of foodborne botulism come from home-canned foods with low acid content, such as asparagus, green beans, beets, and corn. *C. botulinum* is anaerobic, which means it can survive and grow with little or no oxygen. Therefore, it can survive very well in sealed containers. Outbreaks of the infection, however, are often from more unusual sources such as chili peppers, tomatoes, and improperly handled baked potatoes wrapped in aluminum foil.

What are the symptoms of foodborne botulism?

- Double vision and drooping eyelids
- Slurred speech
- Dry mouth and difficulty swallowing
- Weak muscles

Symptoms of foodborne botulism usually begin within 18 to 36 hours after eating contaminated food, but can occur in as few as six hours or as much as ten days afterward.

How is it diagnosed?

A health care provider can use laboratory tests to identify *C. botulinum* toxin in the blood or stool of an infected person.

Some ways to prevent foodborne botulism.

- Follow strict hygienic steps when home canning.
- Refrigerate oils with garlic or herbs.
- Keep baked potatoes wrapped in aluminum foil hot until served, or refrigerate them.
- Consider boiling home-canned food before eating it, to kill any bacteria which might lurk in the food.

Campylobacteriosis

Campylobacteriosis is an infectious disease caused by *Campylobacter* bacteria. *Campylobacter jejuni*, *C. fetus*, and *C. coli* are the types that usually cause campylobacteriosis in people. *C. jejuni* causes most cases of the illness.

According to CDC, *C. jejuni* is the leading cause of bacterial diarrheal illness in the United States, affecting an estimated 2.4 million people every year. The bacteria cause between 5 and 14 percent of all diarrheal illness worldwide. *C. jejuni* primarily affects children under 5 years old and young adults (15-29 years old) Health care providers report more than 10,000 cases to CDC yearly. In the United States, few people die from *Campylobacter* infection.



How is Campylobacter transmitted?

Humans can get infected from handling raw poultry, eating undercooked poultry, drinking nonchlorinated water or raw milk, or handling infected animal or human feces. Most frequently, poultry and cattle waste are the sources of the bacteria, but feces from puppies, kittens, and birds also may be contaminated.

What are the symptoms of campylobacteriosis?

- Diarrhea (often bloody)
- Abdominal cramping and pain
- Nausea and vomiting
- Fever

- Tiredness

Some infected people have no symptoms. Campylobacteriosis usually lasts for 2 to 5 days, but in some cases as long as 10 days. Rarely, some people have convulsions with fever or meningitis.

How is it diagnosed?

A health care provider can use laboratory tests to identify *Campylobacter* in the stool of an infected person.

How is it treated?

Most people infected with *Campylobacter* will get better with no special treatment. If a person needs treatment, a health care provider can prescribe an antibiotic such as ciprofloxacin or azithromycin. Erythromycin helps treat diarrhea caused by *Campylobacter*. Those with diarrhea should drink plenty of water.

Ways to prevent campylobacteriosis.

- Wash hands before preparing food.
- Wash hands immediately after handling raw poultry or other meat.
- Wash all food preparation surfaces and utensils that have come in contact with raw meat thoroughly with soap and hot water.
- Cook poultry products to an internal temperature of 170 degrees Fahrenheit for breast meat and 180 degrees Fahrenheit for thigh meat.
- Drink pasteurized milk and chlorinated or boiled water.
- Wash hands after handling pet feces.

E. coli Infection

Certain types of *Escherichia coli* bacteria, commonly called *E. coli* can cause foodborne illness. Harmless strains of *E. coli* can be found widely in nature, including the intestinal tracts of humans and warm-blooded animals. Disease-causing strains, however, are a frequent cause of both intestinal and urinary-genital tract infections.

Several different strains of harmful *E. coli* can cause diarrheal disease. A particularly dangerous type is called enterohemorrhagic *E. coli*, or EHEC. EHEC often causes bloody diarrhea and can lead to kidney failure in children or people with weakened immune systems.

Another foodborne illness is Escherichia coli O157:H7. Cattle are the main sources of *E. coli* O157:H7, but other domestic and wild mammals also can harbor these bacteria. *E. coli* O157:H7 infection can be prevented by thoroughly cooking ground beef, avoiding unpasteurized milk, and washing hands carefully.

How is E. coli transmitted?

E. coli bacteria and its toxins have been found in:

- undercooked or raw hamburgers
- salami
- alfalfa sprouts;

- lettuce
- unpasteurized milk, apple juice, apple cider; and
- contaminated well water.



Unsuspecting swimmers have been infected by accidentally swallowing unchlorinated or underchlorinated water in swimming pools contaminated by human feces. People also can get infected by swimming in sewage-contaminated water.

What are the symptoms of *E. coli* infection?

E. coli toxin can damage the lining of the intestine and cause other symptoms including

- Nausea
- Severe abdominal cramps
- Watery or very bloody diarrhea
- Tiredness
- Vomiting (occasionally)

Occasionally, people develop low-grade fever. Symptoms usually begin from 2 to 5 days after eating contaminated food and may last for 8 days.

How is *E. coli* diagnosed?

A health care provider can use laboratory tests to identify *E. coli* in the stool of an infected person.

How is *E. coli* infection treated?

Most people recover from *E. coli* infection within 5 to 10 days without treatment. Antibiotics are usually not helpful, and health care experts recommend against taking antidiarrheal medicines.

Some ways to prevent *E. coli* infection

- Eat only thoroughly cooked beef and beef products.
- Cook ground beef patties to an internal temperature of 160 degrees Fahrenheit.
- Avoid unpasteurized juices.
- Drink only pasteurized milk.
- Wash fresh fruits and vegetables thoroughly before eating raw or cooking.

Salmonellosis

Salmonellosis, or *salmonella*, is an infection caused by *Salmonella* bacteria. *Salmonella* infections are increasing in the United States. Many types of this bacteria cause disease in animals and people. While the occurrence of different types of *Salmonella* varies from country to country, *Salmonella typhimurium* and *S. enteritidis* are the two most commonly found in the United States.

Salmonellosis may occur in small, contained out-

breaks in the general population or in large outbreaks in hospitals, restaurants, or institutions for children or the elderly. While the disease is found worldwide, health experts most often report cases in North America and Europe. Every year, CDC receives reports of 40,000 cases of salmonellosis in the United States. However, the agency estimates that 1.4 million people in this country are infected and that 1,000 people die each year with salmonellosis. Symptoms are most severe in the elderly, infants, and people with chronic conditions. People with AIDS are particularly vulnerable to salmonellosis, often suffering from recurring episodes.

How is foodborne *Salmonella* transmitted?

Salmonella bacteria can be found in food products such as raw poultry, eggs, and beef, and sometimes on unwashed fruit. Food prepared on surfaces that previously contained raw meat or meat products can, in turn, become contaminated with the bacteria. This is called cross-contamination.

In the past few years, CDC has received reports of several cases of salmonellosis from eating raw alfalfa sprouts grown in contaminated soil. *Salmonella* infection frequently occurs after handling pets, particularly reptiles like snakes, turtles, and lizards.

Salmonellosis can become a chronic infection in some people who may not have symptoms. Though they may have no symptoms, they can spread the disease by not washing their hands before preparing food for others. In fact, health care experts recommend that people who know they have salmonellosis not prepare food or pour water for others until laboratory tests show they no longer carry *Salmonella*.

What are the symptoms of salmonellosis?

- Diarrhea
- Fever
- Abdominal cramps
- Headache

In most people, symptoms begin from 12 hours to 3 days after being infected. These symptoms, along with possible nausea, loss of appetite, and vomiting, usually last for 4 to 7 days. Diarrhea can be severe and require hospitalization.

How is it diagnosed?

A health care provider can use laboratory tests to identify *Salmonella* in the stool of an infected person.

How is salmonellosis treated?

Most cases of salmonellosis clear up within 5 to 7 days and don't require treatment. People with severe diarrhea

may need intravenous fluids. If the infection spreads from the intestines into the bloodstream, health care providers can treat it with antibiotics such as ampicillin.

Ways to prevent foodborne salmonellosis

- Drink only pasteurized milk.
- Cook poultry and eggs thoroughly.
- Don't eat foods containing raw eggs, such as homemade caesar salad dressing, cookie dough, and hollandaise sauce or drink homemade eggnog made with raw eggs.
- Handle raw eggs carefully.
- Keep eggs refrigerated.
- Throw away cracked or dirty eggs
- Cook eggs thoroughly.
- Cook poultry products to an internal temperature of 170 degrees Fahrenheit for breast meat and 180 degrees Fahrenheit for thigh meat.
- Wash all food preparation surfaces and utensils that have come in contact with raw poultry or raw eggs with soap and hot water.
- Wash hands immediately after handling raw poultry or raw eggs.
- Wash hands immediately after handling reptiles or contact with animal feces.

Shigellosis

Shigellosis, also called bacillary dysentery, is an infectious disease caused by Shigella bacteria. Four main types of Shigella cause infection: Shigella dysenteriae, S. flexneri, S. boydii, and S. sonnei. CDC estimates that more than 400,000 cases occur every year in the United States. Health care providers report about 18,000 cases to CDC each year. Most cases in this country are caused by S. sonnei.

What are the symptoms of shigellosis?

- Fever
- Tiredness
- Watery or bloody diarrhea
- Nausea and vomiting
- Abdominal pain

Symptoms usually begin within 2 days after being exposed to Shigella. Symptoms usually are gone within 5 to 7 days.

How is shigellosis treated?

People with mild infections usually get better quickly, without taking medicine. When treatment is necessary, health care providers usually prescribe an antibiotic such as ampicillin or ciprofloxacin. Antidiarrheal medicines may make the illness worse.

Ways to prevent shigellosis

- Wash hands thoroughly with soap and water before preparing foods and beverages.
- Wash hands thoroughly after using the bathroom or changing infant diapers.
- Disinfect diaper-changing areas after use.
- Help young children wash their hands carefully after they use the bathroom.
- Avoid swallowing swimming pool water.

For More Information

National Institute of Allergy and Infectious Diseases, National Institutes of Health at:

<http://www.niaid.nih.gov>, U.S. Centers for Disease Control and Prevention, National Center for Infectious Diseases, www.cdc.gov.

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