

Foodborne Pathogens

Bacteria	Associated Foods	Symptoms and Potential Impact	Prevention
Campylobacter jejuni	Contaminated water, raw or unpasteurized milk, and raw or undercooked meat, poultry, or shellfish.	Diarrhea (sometimes bloody), cramping, abdominal pain, and fever that appear 2 to 5 days after eating; may last 7 days. May spread to the bloodstream and cause a life-threatening infection.	Cook meat and poultry to a safe minimum internal temperature; do not drink or consume unpasteurized milk or milk products; wash your hands after coming in contact with feces.
Clostridium botulinum	Improperly canned foods, garlic in oil, vacuum-packed and tightly wrapped food.	Bacteria produce a nerve toxin that causes illness, affecting the nervous system. The toxin affects the nervous system. Symptoms usually appear within 18 to 36 hours but can sometimes appear as few as 6 hours or as many as 10 days after eating; double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, and muscle weakness. If untreated, these symptoms may progress causing muscle paralysis and even death.	Do not use damaged canned foods or canned foods showing signs of swelling, leakage, punctures, holes, fractures, extensive deep rusting, or crushing/denting severe enough to prevent normal stacking. Follow safety guidelines when home canning food. Boil home canned foods for 10 minutes before eating to ensure safety. (Note: Safe home canning guidelines may be obtained from State University or County Extension Office).
Clostridium perfringens	Meats, meat products and gravy Called "the cafeteria germ" because many outbreaks result from food left for long periods in steam tables or at room temperature.	Intense abdominal cramps nausea, and diarrhea may appear 6 to 24 hours after eating; usually last about 1 day, but for immune comprised individuals, symptoms may last 1 to 2 weeks. Complications and/or death can occur only very rarely.	Keep hot foods hot and cold foods cold! Once food is cooked, it should be held hot, at an internal temperature of 60°C (140°F) or above. Use a food thermometer to make sure. Discard all perishable foods left at room temperature longer than 2 hours; 1 hour in temperatures above 60°C (90°F.)



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Cryptosporidium	Soil, food, water, contaminated surfaces. Swallowing contaminated water, including that from recreational sources (e.g., a swimming pool or lake); eating uncooked or contaminated food; placing a contaminated object in the mouth.	Dehydration, weight loss, stomach cramps or pain, fever, nausea, and vomiting; respiratory symptoms may also be present. Symptoms begin 2 to 10 days after becoming infected and may last 1 to 2 weeks. Immune-compromised individuals may experience a more serious illness.	Wash your hands before and after handling raw meat products and after changing diapers, going to the bathroom, or touching animals. Avoid water that might be contaminated. (Do not drink untreated water from shallow wells, lakes, rivers, springs, ponds, and streams.)
Escherichia coli O157:H7	Uncooked beef (especially ground beef), unpasteurized milk and juices (e.g., “fresh” apple cider); contaminated raw fruits and vegetables, or water. Person-to-person contamination can also occur.	Severe diarrhea (often bloody diarrhea), abdominal cramps, and vomiting. Usually little or no fever. Can begin 2 to 8 days, but usually 3-4 days after consumption of contaminated food or water and lasts about 5 to 7 days, depending on severity. Children under 5 are at greater risk of developing hemolytic uremic syndrome (HUS), which causes acute kidney failure.	Cook hamburgers and ground beef to a safe minimum internal temperature of 71°C (160°F). Drink only pasteurized milk, juice, or cider. Rinse fruits and vegetables under running tap water, especially those that will not be cooked. Wash your hands with warm water and soap after changing diapers, using the bathroom, handling pets or having any contact with feces.



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Listeria monocytogenes	Ready-to-eat foods such as hot dogs, luncheon meats, cold cuts, fermented or dry sausage, and other deli-style meat and poultry. Also, soft cheeses made with unpasteurized milk. Smoked seafood and salads made in the store such as ham salad, chicken salad, or seafood salad.	Fever, muscle aches, and sometimes gastrointestinal symptoms such as nausea or diarrhea. If infection spreads to the nervous system, symptoms such as headache, stiff neck, confusion, loss of balance, or convulsions can occur. Those at risk (including pregnant women and newborns, older adults, and people with weakened immune systems) may later develop more serious illnesses; death can result from Listeria. Can cause severe problems with pregnancy, including miscarriage or death in newborns.	Cook raw meat, poultry and seafood to a safe minimum internal temperature; prevent cross-contamination separating ready-to-eat foods from raw eggs and raw meat, poultry, seafood, and their juices; wash your hands before and after handling raw meat, poultry, seafood and egg products. Those with a weakened immune system should avoid eating hot dogs, and deli meats, unless they are reheated to 74°C (165 °F). Do not drink raw (unpasteurized) milk or foods that have unpasteurized milk in them, (e.g. soft cheeses). Do not eat deli salads made in store, such as ham, egg, tuna or seafood salad.
Salmonella (over 2300 types)	Raw or undercooked eggs, poultry, and meat; unpasteurized milk and juice; cheese and seafood; and contaminated fresh fruits and vegetables.	Diarrhea, fever, and abdominal cramps usually appear 12 to 72 hours after eating; may last 4 to 7 days. In people with a weakened immune system, the infection may be more severe and lead to serious complications, including death.	Cook raw meat, poultry, and egg products to a safe temperature. Do not eat raw or undercooked eggs. Avoid consuming raw or unpasteurized milk or other dairy products. Produce should be thoroughly washed before consumption.
Shigella (over 30 types)	Person-to-person by fecal-oral route; fecal contamination of food and water. Most outbreaks result from food, especially salads, prepared and handled by workers using poor personal hygiene.	Disease referred to as "shigellosis" or bacillary dysentery. Diarrhea (watery or bloody), fever, abdominal cramps; 1 to 2 days from ingestion of bacteria and usually resolves in 5 to 7 days	Hand washing is a very important step to prevent shigellosis. Always wash your hands with warm water and soap before handling food and after using the bathroom, changing diapers or having contact with an infected person.

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Staphylococcus aureus	Commonly found on the skin and in the noses of up to 25% of healthy people and animals. Person-to-person through food from improper food handling. Multiply rapidly at room temperature to produce a toxin that causes illness. Contaminated milk and cheeses.	Severe nausea, abdominal cramps, vomiting, and diarrhea occur 30 minutes to 6 hours after eating; recovery from 1 to 3 days — longer if severe dehydration occurs.	Because the toxins produced by this bacterium are resistant to heat and cannot be destroyed by cooking, preventing the contamination of food before the toxin can be produced is important. Keep hot foods hot 60°C (140°F) or hotter and cold foods cold 4°C (40°F) or under. Wash your hands with warm water and soap and wash kitchen counters with hot water and soap before and after preparing food.
Vibrio vulnificus	Uncooked or raw seafood (fish or shellfish); oysters	In healthy persons symptom include diarrhea, stomach pain, and vomiting May result in a blood infection and death for those with a weakened immune systems particularly with underlying liver disease.	Do not eat raw oysters or other raw shellfish; cook shellfish (oysters, clams, mussels) thoroughly. Prevent cross-contamination by separating cooked seafood and other foods from raw seafood and its juices. Refrigerate cooked shellfish within two hours after cooking.

Source: <https://www.fsis.usda.gov/food-safety/foodborne-illness-and-disease>