

Major Pathogens That Cause Foodborne Illness (Bacteria, Parasites, Viruses)

Pathogen	Methods of Transmission	Symptoms and Potential Impact
<i>Campylobacter jejuni</i>	<ul style="list-style-type: none"> Contaminated water Raw milk Raw or undercooked meat, poultry, or shellfish 	<ul style="list-style-type: none"> Fever, headache, and muscle pain followed by diarrhea (sometimes bloody), abdominal pain, and nausea that appear 2 to 5 days after eating; may last 7 to 10 days. May spread to bloodstream and cause a serious life-threatening infection.
<i>Clostridium perfringens</i>	<ul style="list-style-type: none"> Called the “cafeteria germ” because many outbreaks result from food left for long periods on steam tables or at room temperature. Meats, meat products, and gravy 	<ul style="list-style-type: none"> Intense abdominal cramps and diarrhea begin 8 to 22 hours after eating; usually lasts 24 hours. In the elderly, symptoms may last 1 to 2 weeks. Complications and/or death occur only very rarely.
<i>Escherichia coli</i> O157:H7 One of several strains of <i>E. coli</i> that can cause human illness	<ul style="list-style-type: none"> Undercooked beef, especially hamburger Unpasteurized milk and juice Contaminated raw fruits and vegetables, and water Person-to-person 	<ul style="list-style-type: none"> Severe diarrhea that is often bloody, abdominal cramps, and vomiting. Usually little or no fever. Can begin 1 to 8 days after food is eaten; lasts about 5 to 10 days. Some, especially the very young, have developed hemolytic-uremic syndrome (HUS) that causes acute kidney failure or even death.
<i>Listeria monocytogenes</i> Can grow slowly at refrigerator temperatures	<ul style="list-style-type: none"> Contaminated hot dogs, luncheon meats, cold cuts, fermented or dry sausage, and other deli-style meat and poultry Soft cheeses and unpasteurized milk 	<ul style="list-style-type: none"> Fever, chills, headache, stiff neck, backache, sometimes upset stomach, abdominal pain, and diarrhea. May take up to 3 weeks to become ill. At-risk patients (including pregnant women) may later develop more serious illness from this bacteria that could result in death. Pregnant women who think they have eaten contaminated food should seek medical advice.
Noroviruses (and other caliciviruses)	<ul style="list-style-type: none"> Shellfish and fecally contaminated foods or water Ready-to-eat food touched by infected food workers, e.g., salads, sandwiches, ice, cookies, fruit 	<ul style="list-style-type: none"> Nausea, vomiting, stomach pain, fever, muscle aches, and some headache usually appear within 1 to 2 days and may last 1 to 2 days. Diarrhea is more prevalent in adults, and vomiting is more prevalent in children.
<i>Salmonella</i> (over 2,300 types)	<ul style="list-style-type: none"> Raw or undercooked eggs, poultry, and meat Raw milk or juice Cheese and seafood Contaminated fresh fruits and vegetables 	<ul style="list-style-type: none"> Stomach pain, diarrhea, nausea, chills, fever, and headache usually appear 8 to 72 hours after eating; may last 4 to 7 days. A more severe illness may result if the infection spreads from the intestines to the bloodstream. Without treatment, death may result.
<i>Staphylococcus aureus</i>	<ul style="list-style-type: none"> Contaminated milk and cheeses Salty foods; e.g., ham Sliced meat Food made by hand that require no cooking; e.g., puddings, sandwiches Foodworkers who carry the bacteria and contaminate food 	<ul style="list-style-type: none"> Nausea, vomiting, stomach cramps, and diarrhea usually occur within 30 minutes to 6 hours after eating contaminated food. Symptoms typically last 1 to 3 days; the young and the elderly may have a more severe illness.
<i>Toxoplasma gondii</i>	<ul style="list-style-type: none"> Accidental ingestion of soil contaminated with cat feces on fruits and vegetables; raw or undercooked meat 	<ul style="list-style-type: none"> Flu-like illness usually appear 5 to 23 days after eating; may last months. Those with a weakened immune system may develop more serious illness. Can cause problems with pregnancy, including miscarriage.
<i>Vibrio vulnificus</i>	<ul style="list-style-type: none"> Undercooked or raw seafood, such as fish and shellfish 	<ul style="list-style-type: none"> Diarrhea, stomach pain, and vomiting may appear within 1 to 7 days and last 2 to 8 days. May result in a blood infection; can result in death for those with a weakened immune system.

