



Epidemiology of Foodborne Diseases

Center for Acute Disease Epidemiology (CADE)
hhs.iowa.gov/center-acute-disease-epidemiology

PATHOGEN	INCUBATION PERIOD / COMMUNICABILITY	ASSOCIATED FOODS / TRANSMISSION	SIGNS AND SYMPTOMS	PUBLIC HEALTH RESPONSE
<i>Bacillus anthracis</i> [†] (anthrax - gastrointestinal)	1-7 days. Not communicable person-to-person.	Ingestion of raw or undercooked meat from infected animals.	Nausea, vomiting, bloody diarrhea, acute abdominal pain followed by fever, and signs of septicemia.	Report immediately to Iowa HHS Not spread person-to-person, no recommendation for exclusion.
<i>Brucella abortus</i>, <i>Brucella melitensis</i>, and <i>Brucella suis</i> *	Highly variable; usually 5-60 days. Rare person-to-person transmission.	Ingestion of raw milk and dairy products (unpasteurized cheese) from infected animals. Contact of non-intact skin with body fluids of infected animals.	Fever, sweating, weakness, headache, muscle and joint pain, weight loss.	Report to Iowa HHS within 3 days Rare person-to-person transmission; exclude symptomatic persons until 24 hours after symptoms have resolved.
<i>Campylobacter</i> [†]	Usually 2-5 days, with a range of 1-10 days. While uncommon, person-to-person transmission can occur for up to 7 weeks	Ingestion of undercooked meat (particularly chicken and pork), contaminated food and water, or unpasteurized dairy products. Person-to-person transmission is uncommon.	Diarrhea (may be bloody), abdominal pain, fever, malaise and sometimes vomiting.	Report to Iowa HHS within 3 days Exclude symptomatic people from food handling, childcare, and direct patient care until 24 hours after symptoms have resolved. Stress proper handwashing. Those in other occupations should refrain from activities until 24 hours after symptoms have resolved.

<i>Clostridium botulinum</i> [†] (botulism - foodborne)	Neurological symptoms usually appear within 12-36 hours. Range 6 hours to 8 days.	Ingestion of food in which toxin has formed, and not destroyed due to inadequate heating during preservation and without subsequent adequate cooking, (e.g. home canned vegetables and fruits, garlic in oil).	Early signs are marked fatigue, weakness, vertigo, constipation, vomiting, and diarrhea, followed by blurred vision, diplopia, dysphagia, dry mouth and symmetrical descending muscle weakness with respiratory muscle paralysis.	Report immediately to Iowa HHS Not communicable person-to-person; no recommendation for exclusion.
<i>Clostridium perfringens</i> (toxin)	6-24 hours, usually 10-12 hours. Not communicable person-to-person.	Common sources include meat, poultry, gravy, and dried or precooked foods. Infection often occurs when foods are prepared in large quantities and kept warm for a long time before serving.	Sudden onset of abdominal cramps followed by diarrhea and usually nausea; fever and vomiting are usually absent. Mild disease of short duration (1 day or less).	Single cases are not reportable to Iowa HHS. Suspected outbreaks should be reported. Not spread person-to-person, no recommendation for exclusion.
<i>Cronobacter (infants)</i>	Occurs in the first days or weeks of life.	Dry foods like powdered infant formula, powdered milk, and starches, and in contaminated feeding items like breast pump equipment.	In infants, illness usually starts with fever and poor feeding, excessive crying, or low energy. Some babies may also have seizures. Meningitis can occur in infants (especially those <2 months old).	Report to Iowa HHS within 1 day Not spread person-to-person, no recommendation for exclusion.

<p><i>Cryptosporidium</i> *</p>	<p>1-12 days is the likely range, with an average of about 7 days.</p> <p>Communicable from onset of illness to several weeks after symptoms have resolved.</p>	<p>Outbreaks have been associated with child care centers, swimming pools and lakes, and unpasteurized beverages contaminated with animal manure.</p> <p>Person to person and fecal-oral transmission. Contaminated food or water.</p>	<p>Diarrhea, which may be profuse and watery, cramping abdominal pain. General malaise, fever, anorexia, nausea, and vomiting occur less often. Symptoms often wax and wane.</p>	<p>Report to Iowa HHS within 3 days</p> <p>Exclude symptomatic persons until 24 hours after symptoms have resolved.</p>
<p><i>Cyclospora cayetanensis</i> *</p>	<p>Average 1 week with a range of 2 days to 2 weeks.</p> <p>Direct person-to-person transmission is unlikely.</p>	<p>Ingestion of contaminated foods such as fresh produce including lettuce, basil, cilantro, berries, other fruits, and vegetables.</p>	<p>Profuse watery diarrhea, nausea, anorexia, abdominal cramping, fatigue, and weight loss; fever is rare. Symptoms can last more than one month if not treated.</p>	<p>Report to Iowa HHS within 3 days</p> <p>Direct person-to-person transmission is unlikely; exclude symptomatic persons until 24 hours after symptoms have resolved.</p>
<p>Enterohemorrhagic <i>Escherichia coli</i> (EHEC) *‡ Shiga toxin producing <i>E. coli</i> (STEC)</p>	<p>2-10 days with a median of 3-4 days.</p> <p>Communicable from onset of illness to one week or less in adults; can be up to 3 weeks in one third of children.</p>	<p>Ingestion of contaminated foods such as undercooked ground meats, unpasteurized milk, fruits or vegetables contaminated with feces and contaminated water.</p> <p>Person to person and fecal-oral.</p>	<p>Diarrhea that may range from mild and non-bloody to stools that are virtually all blood, abdominal pain, nausea, and vomiting. Usually little or no fever present.</p>	<p>Report to Iowa HHS within 3 days</p> <p>Exclude patients and symptomatic contacts from high-risk settings (food handling, direct patient care, child care) until 2 negative stools are collected at least 24 hours apart and at least 48 hours after antibiotics are discontinued. Those in other occupations should refrain from activities until 24 hours after symptoms have resolved.</p>

<i>Giardia lamblia</i> *	Usually 3-25 days or longer; median 7-10 days.	May be transmitted through contaminated water and food. Person-to-person and fecal-oral transmission, especially in child care centers.	Acute diarrhea can lead to chronic diarrhea, flatulence, bloating, fatigue, pale greasy stools, malabsorption, and weight loss. In severe cases, reactive arthritis may occur.	Report to Iowa HHS within 3 days Symptomatic persons should be excluded from activities until 24 hours after diarrhea have resolved.
Hepatitis A *	15-50 days, average 28-30 days. Communicable approximately 2 weeks before to 1 week after onset of jaundice.	Sources include raw produce, undercooked foods and cooked foods that are not reheated after contact with infected food handler, and shellfish harvested from contaminated waters. Person to person and fecal oral transmission.	Diarrhea, dark urine, jaundice, and generalized symptoms such as fever, headache, nausea, and abdominal pain. Many cases, especially infants and children, will be asymptomatic. Can last weeks to months.	Report to Iowa HHS within 1 day Exclude persons from food handling, providing child care, and providing patient care until 7 days after onset of jaundice or two weeks after onset of symptoms. Those in other occupations should refrain from activities until 24 hours after symptoms have resolved.
<i>Listeria monocytogenes</i> * ‡	1-4 weeks; up to 70 days. Communicable for duration of excretion of organism, this may be up to several months.	Ingestion of fresh soft cheeses, unpasteurized milk, ready-to-eat deli meats, hot dogs, undercooked poultry, unwashed raw vegetables.	Fever and diarrhea. Pregnant women can experience flu-like symptoms and lead to premature delivery or stillbirth. Elderly, immunocompromised, and neonates are at risk for septicemia or meningitis. Non-pregnant persons can experience headache, stiff neck, confusion, loss of balance, and convulsions in addition to fever and muscle aches.	Report to Iowa HHS within 1 day Exclude symptomatic persons until 24 hours after symptoms have resolved.

**Norovirus
(Norwalk virus)**

Usually 24-48 hours with a range of 10-50 hours.

Most communicable during acute stage of disease and can shed virus for 2-3 weeks after symptom resolution.

Ingestion of contaminated food or water handled by infected persons.

Person to person and fecal oral transmission.

Nausea, vomiting, diarrhea, malaise, headache, myalgia, and low-grade fever. GI symptoms usually last 24-72 hours.

Single cases are not reportable to Iowa HHS. Suspected outbreaks should be reported.

Exclude ill food handlers from work for 48 hours after diarrhea and vomiting stops. Persons in other occupations should refrain from activities until 24 hours after symptoms have resolved.

***Salmonella* spp.*†**

6-72 hours, average 12-36 hours.

Communicability is usually several days to several weeks, throughout the course of infection.

Ingestion of raw or undercooked foods of animal origin.

Contact with infected animals. Person to person and fecal-oral transmission.

Diarrhea, fever, and abdominal cramps. Some may experience nausea, vomiting, or headache.

Report to Iowa HHS within 3 days

Exclude symptomatic persons until 24 hours after symptoms have resolved.

***Salmonella Typhi**‡**
(typhoid fever)

3 days to over 60 days, usual range of 8-14 days.

Communicable as long as bacilli appear in excreta, usually from the first week throughout convalescence. 2-5% become carriers.

Ingestion of water or foods contaminated with feces or urine of infected patients or carriers. Rare in developed countries.

Person to person and fecal oral transmission.

Insidious onset of sustained fever, marked headache, constipation, malaise, and myalgia; diarrhea is uncommon.

Report to Iowa HHS within 1 day

Exclude patients and symptomatic contacts from high-risk settings (food handling, direct patient care, child care) until 3 negative stools are collected at least 24 hours apart, at least 48 hours after antibiotics are discontinued, and at least 1 month after onset. Those in other occupations should refrain from activities until 24 hours after symptoms have resolved.

***Shigella* spp.** * ‡

12-96 hours, average 1-3 days. Up to one week with *Shigella dysenteriae* type 1.

Communicable during acute infection and up to 4 weeks after onset of illness.

Food or water contaminated with fecal material.

Usually person to person spread, fecal-oral transmission.

Abdominal cramps, fever, and diarrhea. Stools may contain blood and mucus. Young children may get convulsions.

Report to Iowa HHS within 3 days

Exclude patients and symptomatic contacts from high-risk settings (food handling, direct patient care, child care providers) until 2 negative stools are collected at least 24 hours apart and at least 48 hours after antibiotics are discontinued. Children who attend child care should be excluded until 48 hours after resolution of diarrhea or until 24 hours after treatment with antibiotics has started and it has been 24 hours after diarrhea has stopped. Those in other occupations should refrain from activities until 24 hours after symptoms have resolved.

Vibrio cholerae *

From a few hours to 5 days, usually 2-3 days.

Communicable as long as stools are positive; usually only a few days after recovery.

Ingestion of contaminated water or food, often particularly raw or undercooked shellfish.

Painless profuse diarrhea without abdominal cramps or fever. Stools are colorless, with small flecks of mucus (“rice-water”). Nausea and profuse vomiting occur early.

Report to Iowa HHS within 1 day

Exclude symptomatic persons until 24 hours after symptoms have resolved.

* **Disease is reportable to CADE**

† **Disease is IMMEDIATELY reportable to CADE 1-800-362-2736**

‡ **Disease for which isolates are required to be sent to the State Hygienic Laboratory 319-335-4500**

Remember: Handwashing is the most important act a person can do to prevent transmission of disease.

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