

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile ^{2,3}	Duration of Illness ²	Period of Communicability	Characteristic Foods ^{3,4}	Criteria for Confirmation in an Outbreak Setting ***** Specimen Submission Requirements for testing performed at OSPHL, if applicable.
I. Agents typified by nausea and vomiting, <i>without</i> fever, within 8 hours of eating						
<i>Bacillus cereus</i> ("emetic variety")	2–4 hours (1–6 hours)	Vomiting, with nausea and diarrhea (abrupt onset)	24 hours	Not communicable (preformed enterotoxin). N.b., emetic toxin is heat resistant.	Cooked rice, meats, vegetables.	Isolation of 10 ⁵ organisms per gram from stool or two or more ill persons OR isolation of 10 ⁵ organisms per gram of epidemiologically implicated food. ***** Testing not performed at OSPHL. Contact ACDP for testing options.
<i>Staphylococcus aureus</i>	2–4 hours (30 minutes – 8 hours)	Vomiting, with nausea, cramps, and diarrhea (abrupt onset)	24–48 hours	Not communicable (preformed enterotoxin) N.b., emetic toxin is heat resistant.	Sliced or chopped ham and meats, custards, cream fillings, mushrooms, egg salad	Isolation of organism from stool or vomitus from two or more ill persons OR detection of enterotoxin in epidemiologically implicated food OR isolation of 10 ⁵ organisms per gram of epidemiologically implicated food. ***** Testing not performed at OSPHL. Contact ACDP for testing options.
II. Agents typified by diarrhea and abdominal cramps, <i>without</i> fever, within 24 hours of eating						
<i>Bacillus cereus</i> ("diarrheal variety")	8–16 hours	Cramps and diarrhea	~24 hours	Not communicable (enterotoxin formed <i>in vivo</i>)	Custards, cereals, puddings, sauces, meatloaf	Isolation of 10 ⁵ organisms per gram from stool or two or more ill persons and not from stool of control patients OR isolation of 10 ⁵ organisms per gram of epidemiologically implicated food. ***** Testing not performed at OSPHL. Contact ACDP for testing options.

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<i>Clostridium perfringens</i>	10–12 hours (6 – 24 hours)	Cramps and diarrhea	Up to 24 hours	Not communicable (enterotoxin formed <i>in vivo</i>)	Meat, poultry, gravy, Mexican foods	Isolation of 10 ⁵ organisms per gram from stool or two or more ill persons OR demonstration of enterotoxin in the stool of two or more ill persons OR isolation of 10 ⁵ organisms per gram of epidemiologically implicated food. ***** Testing not performed at OSPHL. Contact ACDP for testing options. A loss of viability of <i>C. perfringens</i> will occur if foods are frozen or held under prolonged refrigeration.
III. Agents typified by diarrhea and abdominal cramps, with fever, within 12–48 hours of eating						
<i>Campylobacter jejuni</i>	2–5 days (1–10 days)	Cramps and diarrhea (sometimes bloody), with vomiting and fever	48 hours – 10 days	2–7 weeks	Raw milk, poultry and poultry products, liver parfait and pâté, contaminated water, young cats, dogs and livestock	Isolation of organism from clinical specimens from two or more ill persons OR isolation of organism from epidemiologically implicated food. ***** Transfer stool into Cary-Blair transport medium to the fill line. Store and transport at refrigerated temperatures to OSPHL with OSPHL Form 60, General Microbiology Test Request Form. Food testing not performed at OSPHL. Contact ACDP for testing options.
<i>Escherichia coli</i> Enteroinvasive (EIEC)	12–48 hours	Cramps and diarrhea, with fever, headache	5–10 days	Weeks to months	Uncooked vegetables, salads, water, cheese	Isolation of same enteroinvasive serotype from stool of two or more ill persons. ***** Testing may be available at OSPHL upon special approval from ACDP. Contact ACDP to discuss.

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<i>Salmonella</i> (non-typhoid)	29–54 hrs (1–5 days) [According to ACDP] 12–36 hrs (6 hours – 10 days) [according to everyone else]	Cramps and diarrhea, with vomiting and fever	4–7 days	Several days to several years, depending on type. Concentrations/infectivity typically higher when symptomatic	Poultry, eggs, meat, raw tuna, raw milk or milk products, sprouts, other produce, raw nuts and nut butters, spices (cross-contamination important)	Isolation of organism of same serotype from clinical specimens from two or more ill persons OR isolation of organism from epidemiologically implicated food. ***** Transfer stool into Cary-Blair transport medium to the fill line. Store and transport at refrigerated temperatures to OSPHL with OSPHL Form 60, General Microbiology Test Request Form. Food testing not performed at OSPHL. Contact ACDP for testing options.
III. Agents typified by diarrhea and abdominal cramps, with fever, within 12–48 hours of eating (continued)						
<i>Shigella</i>	1-3 days (12 hours – 7 days)	Cramps and diarrhea (may be bloody), with fever	2–7 days	4 weeks after illness	Eggs, salads, lettuce, infected food handlers, soiled diapers, direct oral-anal contact, foreign travel	Isolation of organism of same serotype from clinical specimens from two or more ill persons OR isolation of organism from epidemiologically implicated food. ***** Transfer stool into Cary-Blair transport medium to the fill line. Store and transport at refrigerated temperatures to OSPHL with OSPHL Form 60, General Microbiology Test Request Form. Food testing not performed at OSPHL. Contact ACDP for testing options.

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<i>Vibrio parahaemolyticus</i> and other noncholerae vibrios	12–24 hours (4–96 hours)	Cramps and watery diarrhea, sometimes with nausea, vomiting	1–7 days (according to Orpheus, up to 3 weeks)	Not communicable	Seafood, especially oysters and other shellfish; occasionally salmon	Isolation of organism from stool of two or more ill persons. ***** Transfer stool into Cary-Blair transport medium to the fill line. Store and transport at refrigerated temperatures to OSPHL with OSPHL Form 60, General Microbiology Test Request Form. Test must be ordered on Form 60, as test is not part of OSPHL routine enteric screening. Food testing not performed at OSPHL. Contact ACDP for testing options.

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III. Agents typified by diarrhea and abdominal cramps, with fever, within 12–48 hours of eating (continued)						
<i>Yersinia enterocolitica</i>	35–48 hours (24 hours – 10 days)	Cramps, diarrhea, fever, headache, vomiting, pseudo-appendicitis	1–3 weeks	2–3 weeks	Raw or undercooked pork and pork products such as chitterlings, milk, tofu, farm animals, dogs	Isolation of organism of same serotype from clinical specimens from two or more ill persons OR isolation of organism from epidemiologically implicated food. ***** Transfer stool into Cary-Blair transport medium to the fill line. Store and transport at refrigerated temperatures to OSPHL with OSPHL Form 60, General Microbiology Test Request Form. Test must be ordered on Form 60, as test is not part of OSPHL routine enteric screening. Food testing not performed at OSPHL. Contact ACDP for testing options.

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IV. Agents typified by vomiting, diarrhea, cramps, myalgias, and headache <i>with</i> fever, within 24 hours of eating						
<i>Listeria monocytogenes</i>	18–31 hours	Fever, with diarrhea, myalgia, and headache.	Days to weeks	Not known	Inadequately pasteurized milk, lunch meats and cold cuts, unpasteurized soft cheeses, sprouts, and pâtés	Isolation of <i>Listeria monocytogenes</i> of the same subtype from two or more ill persons exposed to the epidemiologically implicated food or to food from which the same subtype of <i>Listeria monocytogenes</i> has been isolated. ***** Collect at least 2 grams (5–10 g is ideal) of fresh stool (pea size) within three days of illness and refrigerate prior to the shipment. Stool in Cary-Blair transport medium to the fill line is also accepted. DO NOT FREEZE, Store and transport at refrigerated temperatures to OSPHL for receipt within 24–36 hours of collection, with OSPHL Form 60, General Microbiology Test Request Form. Food testing not performed at OSPHL. Contact ACDP for testing options.

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V. Agents typified by vomiting, diarrhea, myalgias, and headache <i>without</i> fever, within 24–48 hours of eating						
Norwalk virus and other caliciviruses	Typically 24–48 hours (10–72 hours)	Vomiting, with diarrhea, headache, and myalgia. Usual symptom profile: Diarrhea: 80% Vomiting: 60% Nausea: 75% Fever: 30%	24–72 hours	Throughout the period of vomiting and diarrhea and 2–3 days after symptoms end	Shellfish, water, salads, frosting, “handled” foods.	Detection of viral RNA in stool or vomitus by reverse transcriptase-polymerase chain reaction (RT-PCR) from two or more persons. ***** Collect 2 grams of whole stool (walnut-sized) OR 5 mL of diarrheal stool (about 3 tablespoons) in sterile container. Stool in Cary-Blair transport medium to the fill line is accepted but not preferred. Store and transport at refrigerated temperatures to OSPHL with OSPHL Form 42, Virology/Immunology Test Request Form. Food testing not performed at OSPHL. Contact ACDP for testing options.
VI. Agents typified by watery diarrhea and headache <i>without</i> fever, within 24–48 hours of eating						
<i>Cyclospora cayetanensis</i>	7 days (1–11 days)	Watery diarrhea, fatigue, protracted diarrhea, often relapsing	Several weeks to a month	Not communicable	Water, uncooked food, raw produce	Detection of <i>Cyclospora</i> organisms or DNA in stool, intestinal fluid/aspirate or intestinal biopsy specimens. ***** Testing not performed at OSPHL. Contact ACDP for testing options.

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VI. Agents typified by watery diarrhea and headache without fever, within 24–48 hours of eating (continued)						
<i>Escherichia coli</i> Enterotoxigenic (ETEC) ⁵	10–72 hours (10 hours – 7 days)	Cramps, profuse watery diarrhea, some vomiting	3–4 days; up to 3 weeks	Weeks to months	Food and water, produce, seafood, sushi	Isolation of organism of same serotype demonstrated to produce heat-stable (ST) or heat labile (LT) enterotoxin from stool of two or more ill persons. ***** Testing may be available at OSPHL upon special approval from ACDP. Contact ACDP to discuss.
<i>Vibrio cholerae</i> O1 and O139	2–3 days (several hours – 5 days)	Profuse watery diarrhea and vomiting, which can lead to severe dehydration and death within hours	72 hours – 7 days; causes life-threatening dehydration	Usually a few days after recovery except when in a carrier state	Shellfish, water, “street food,” foods contaminated by infected food handlers	Isolation of toxigenic organism from stool or vomitus of two or more ill persons OR significant rise in vibriocidal, bacterial-agglutinating, or anti-toxin antibodies in acute and early convalescent phase sera among persons not recently immunized OR isolation of toxigenic organism from epidemiologically implicated food. ***** Transfer stool into Cary-Blair transport medium to the fill line. Store and transport at refrigerated temperatures to OSPHL with OSPHL Form 60, General Microbiology Test Request Form. Test must be ordered on Form 60, as test is not part of OSPHL routine enteric screening. Food testing not performed at OSPHL. Contact ACDP for testing options.

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VII. Agents typified by bloody diarrhea <i>without</i> fever, within 48 hours of eating						
<i>Escherichia coli</i> Shiga-toxin-producing (STEC; Enterohemorrhagic: <i>E. coli</i> O157:H7 and others)	48 hours – 8 days (24 hours – 10 days)	Bloody diarrhea with cramps, vomiting; hemolytic uremic syndrome (2%–7 % of cases)	5–10 days	1–4 weeks	Beef, venison, raw milk, sprouts, water, leafy greens, other produce, unpasteurized apple cider.	Isolation of <i>E. coli</i> O157:H7 or other shiga-toxin-producing <i>E. coli</i> from clinical specimens from two or more ill persons OR isolation of <i>E. coli</i> O157:H7 or other STEC from epidemiologically implicated food. ***** Transfer stool into Cary-Blair transport medium to the fill line. Store and transport at refrigerated temperatures to OSPHL with OSPHL Form 60, General Microbiology Test Request Form. Test must be ordered on Form 60, as test is not part of OSPHL routine enteric screening. Food testing not performed at OSPHL. Contact ACDP for testing options.
VIII. Agents typified by malaise, nausea, abdominal pain and jaundice <i>with</i> fever, within 15–50 days of eating						
Hepatitis A	28–30 days (15–50 days)	Fever, malaise, nausea, abdominal pain, jaundice. Children <5 are typically asymptomatic	Weeks to months	2 weeks before symptom onset and 1 week after onset of jaundice	Raw or undercooked shellfish from contaminated waters, raw produce, water, foods contaminated by an infected food handler	Collect and submit 1.5 mL serum or 5mL whole blood in a red top or serum separator tube (SST). Store and transport at refrigerated temperatures for receipt at OSPHL less than 7 days after collection. Submit with OSPHL Form 42, Virology/Immunology Test Request Form. ***** Food testing not performed at OSPHL.

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IX. Botulism (foodborne)						
<i>Clostridium botulinum</i>	12–72 hours (2 hours – 8 days)	Double vision, eyelid drooping, and descending paralysis, sometimes accompanied or preceded by nausea, vomiting, or diarrhea	Days to months	Not communicable (preformed enterotoxin)	Improperly canned or similarly preserved foods; fermented fish (“stink heads”); honey (infants)	Detection of botulinum toxin in serum, stool, gastric contents, or implicated food OR isolation of organism from stool or intestine ***** Infant botulism: Submit 5g or 5mL stool in a sterile screw-top container Adult botulism: Submit 5mL serum (preferred). 5g or 5mL stool in a sterile screw top container is accepted. Food: Collect 100–200g of food items aseptically into a sterile container or submit in original container. For all specimen types, submit at refrigerated temperatures with one OSPHL Form 60, General Microbiology Test Request Form per specimen.

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X. Agents most readily diagnosed from the history of eating a particular type of food						
Heavy metals (antimony, arsenic, cadmium, copper, iron, lead, mercury, tin, zinc)	5 minutes – 8 hours (usually <1 hour)	Vomiting, with nausea, cramps, and diarrhea, vision impairment, muscle weakness, other neurological symptom	Usually self-limited	Not communicable	Acidic foods and beverages prepared, stored, or cooked in containers coated, lined, or contaminated with offending metal, environmental exposure, rice or produce grown in contaminated soil.	Demonstration of high concentration of metal in epidemiologically implicated food. ***** Collect suspect food or metal container. Testing not performed at OSPHL. Contact ACDP for testing options.
Poisonous mushrooms	<2 hours	Vomiting, diarrhea, confusion, visual disturbances, salivation, diaphoresis, hallucinations, disulfiram-like reaction	Usually self-limited	Not communicable	Wild mushrooms	Clinical syndrome among persons who have eaten mushrooms identified as toxic type OR demonstration of toxin in epidemiologically implicated mushrooms or food containing mushrooms. ***** Collect mushrooms or food containing mushrooms. Testing not performed at OSPHL. Contact ACDP for testing options.

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X. Agents most readily diagnosed from the history of eating a particular type of food (continued)						
Shellfish poisoning (diarrheic, neurotoxic, amnesic) ⁴	20 minutes – 3 hours	Cramps, diarrhea, headaches, vomiting, amnesia, seizures, tingling or numbness of lips and throat, can cause death	Days	Not communicable	Mussels, oysters, scallops, razor clams, squid, anchovy	Detection of toxin in epidemiologically implicated food OR detection of large numbers of shellfish-poisoning-associated species of dinoflagellates in water from which epidemiologically implicated mollusks are gathered. ***** Collect any amount of implicated shellfish. Testing not performed at OSPHL. Contact ACDP for testing options.
Ciguatera poisoning ⁴	1–6 hours (usually within 6 hours)	Diarrhea, nausea, vomiting, paresthesias, sensitivity of extreme temperatures, arrhythmia	Days to weeks to months	Not communicable	Large, tropical ocean fish (grouper, amberjack, barracuda, snapper)	Demonstration of ciguatoxin in epidemiologically implicated fish OR clinical syndrome among persons who have eaten a type of fish previously associated with ciguatera fish poisoning. ***** Collect epidemiologically implicated fish. Testing not performed at OSPHL. Contact ACDP for testing options.
Scombroid fish poisoning (histamine fish poisoning) ^{4,5}	1 minute – 3 hours (usually within 6 hours)	Facial / trunk flushing, heart palpitations, nausea, vomiting, diarrhea, food tasting “peppery” or “metallic”	6–12 hours	Not communicable	Tuna-like fish (mahi-mahi, tuna, mackerel, bluefish, salmon, bonito, skipjack)	Demonstration of histamine in epidemiologically implicated fish OR clinical syndrome among persons who have eaten a type of fish previously associated with histamine fish poisoning (especially fish of the <i>Scombridae</i> family). ***** Collect epidemiologically implicated fish. Testing not performed at OSPHL. Contact ACDP for testing options.

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X. Agents most readily diagnosed from the history of eating a particular type of food (continued)						
Paralytic shellfish poisoning ⁴	30 minutes – 3 hours	Paresthesias, feeling of floating, loss of balance, dry mouth, diplopia, dysarthria, shortness of breath, respiratory paralysis; death is possible	Days	Not communicable	Clams, mussels, cockles, oysters, scallops	Demonstration of toxin in epidemiologically implicated fish OR detection of large numbers of shellfish-poisoning-associated species of dinoflagellates in water from which epidemiologically implicated mollusks are gathered. Collect epidemiologically implicated shellfish. ***** Testing not performed at OSPHL. Contact ACDP for testing options.

Acknowledgments and references

1. The *OHA Compendium of Acute Food-borne Diseases* is based on a similar table developed by epidemiologists at the Foodborne and Diarrheal Diseases Branch, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention
2. Heymann DL. Control of communicable diseases manual. 20th ed. Washington, DC: American Public Health Association, 2015.
3. Symptom profiles and characteristic foods are taken from Dalton CB, Mintz ED, Wells JG et al. Outbreaks of enterotoxigenic *Escherichia coli* infection in American adults: a clinical and epidemiologic profile. *Epidemiol Infect* 1999; 123:9–16. “Characteristic foods” for each FBD agent are based on epidemiological data gathered by epidemiologists in the Acute and Communicable Disease Prevention Section, Center for Public Health Practice, Public Health Division, Oregon Health Authority;
4. Food and Drug Administration. Bad Bug Book, Foodborne Pathogenic Microorganisms and Natural Toxins. Second Edition. Foodborne Pathogenic Microorganisms and Natural Toxins. 2012.
5. Feng C, Teuber S, Gershwin ME. Histamine (Scombroid) Fish Poisoning: a Comprehensive Review. *Clin Rev Allergy Immunol* 2016;50:64–9.

Note: Use laboratory submission instructions with caution. Current criteria are posted at www.healthoregon.or/labtests.

Revision History

November 2018 – Updated to reflect testing no longer performed at OSPHL for the following pathogens: *Bacillus cereus*, *Staphylococcus aureus*, *Clostridium perfringens*, and *Cyclospora cayetanensis* (Poissant).

February 2018 – updated formatting, references, lab submission instructions, OSPHL address, added hepatitis A, updated disease facts (Poissant)

August 2008 - Compendium updated (Lee)

August 2001 – Compendium adapted from CDC table (Cieslak, Lee)