

Appendix C: Kentucky Field Guide for Foodborne and Waterborne Diseases

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KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹

(Organized Alphabetically by Agent)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
<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)	Fried rice, meats, vegetables	<ul style="list-style-type: none"> Isolation of 10⁵ <i>B. cereus</i>/gm of implicated food, OR Isolation of <i>B. cereus</i> from stool or vomitus of ill person. Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219
<i>Bacillus cereus</i> ("diarrheal" variety)	6 - 24 hours	Cramps and diarrhea	24 - 48 hours	Not communicable (enterotoxin formed in vivo)	Fried rice, meats, vegetables	<ul style="list-style-type: none"> Isolation of 10⁶ <i>B. cereus</i>/gm of implicated food, OR Isolation of <i>B. cereus</i> from stool of ill person. Feces, rectal swabs, vomitus. Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219
<i>Campylobacter jejuni</i>	48 hours - 5 days (24 hours - 10 days)	Cramps and diarrhea (sometimes bloody), with vomiting and fever	48 hours - 10 days	2 - 7 weeks	Raw milk, poultry, water	<ul style="list-style-type: none"> Isolation of <i>C. jejuni</i> from implicated food, OR Isolation of <i>C. jejuni</i> from stool or blood of ill person Feces, rectal swabs Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219

¹ The Kentucky Field Guide to Foodborne and Water-Borne Diseases is based on the Oregon Health Services Compendium of Acute Food-borne Diseases and a similar table developed by epidemiologists at the Foodborne and Diarrheal Disease Branch, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, and on Tauxe RV, Hughes JM. Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 2015, page 1288-1289 (Table 103-3).

² CDC. Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians and Other Healthcare Professionals. MMWR 2004; 53(RR04). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available online at <https://www.cdc.gov/mmwr/preview/mmwrhtml/r5304a1.htm>.

³ CDC. Guidelines for Confirming Cause of Foodborne Disease Outbreaks at https://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/confirming_diagnosis.html. Heymann, DL, Ed. Control of Communicable Disease Manual. Washington, D.C.: American Public Health Association, 2015.

⁴ CDC. Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians and Other Healthcare Professionals. MMWR 2004; 53(RR04). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available on-line at <https://www.cdc.gov/mmwr/preview/mmwrhtml/r5304a1.htm>.

⁵ "Characteristic foods" for each foodborne and water-borne agent are based on epidemiological data gathered by epidemiologists in the Acute and Communicable Disease Program, Center for Disease Control and Epidemiology, Oregon Health Division, and on Tauxe RV, Hughes JM. Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 2015, page 1288-1289 (Table 103-3).

KENTUCKY FIELD GUIDE FOR WATERBORNE AND FOODBORNE DISEASES

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(Organized Alphabetically by Agent)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
Ciguatera poisoning	1 - 6 hours; usually within 24 hours	Diarrhea, nausea, vomiting, paresthesias, reversal of temperature sensation	Days to weeks to months	Not communicable	Large ocean fish (grouper, amberjack, barracuda, snapper)	<ul style="list-style-type: none"> Demonstration of ciguatera toxin 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
<i>Clostridium botulinum</i>	12 – 48 hours (2 hours to 8 days)	Nausea, vomiting, diarrhea, with or just before onset of descending paralysis	Days to months	Not communicable (preformed enterotoxin)	Improperly canned or similarly preserved foods; honey (infants)	<ul style="list-style-type: none"> Detection of <i>C. botulinum</i> toxin from implicated food, OR Detection of <i>C. botulinum</i> toxin from human sera, or feces, OR Isolation of <i>C. botulinum</i> from stool of persons with clinical syndrome, OR Consistent clinical syndrome in persons known to have eaten same food as persons with laboratory proven cases. 25 - 50 gm feces, 10 mL sera in red top tube⁶ Sterile, leak-proof unbreakable container. Form 219
<i>Clostridium perfringens</i>	10 - 12 hours (6 - 24 hours)	Cramps and diarrhea	24 - 48 hours	Not communicable (enterotoxin formed in vivo)	Meat, poultry, gravy, Mexican foods	<ul style="list-style-type: none"> Isolation of $>10^5$ <i>C. perfringens</i>/gm of implicated food, OR Isolation of <i>C. perfringens</i> in stool of ill persons, OR Detection of enterotoxin by latex agglutination (from stool extracts or culture isolates). 5 - 50 gm stool Kit #10

⁶ DLS staff must be contacted before any specimens for botulism will be tested.

APPENDIX C

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹
(Organized Alphabetically by Agent)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
<i>Cryptosporidium parvum</i>	2 - 12 days (usually 7 days)	Profuse watery diarrhea, abdominal cramps, nausea, low-grade fever, anorexia, vomiting (Some infected individuals have no symptoms at all)	1 - 2 weeks	Weeks to months	Fruits, produce, or water	<ul style="list-style-type: none"> ▪ Demonstration of <i>C. parvum</i> oocysts from implicated food, OR Demonstration of <i>C. parvum</i> oocysts from stool of ill persons, OR Demonstration of <i>C. parvum</i> in intestinal fluid, or small bowel biopsy specimens, OR Demonstration of <i>C. parvum</i> antigen in stool by a specific immunodiagnostic test (e.g., enzyme-linked immunosorbent assay (ELISA)). ▪ Walnut-sized stool ▪ 10% formalin
<i>Cyclospora cayentanensis</i>	1 - 14 days (usually 7 days)	Diarrhea, nausea, anorexia, weight loss, cramps, gas, fatigue, low-grade fever; may be relapsing or protracted	3 - 5 weeks If untreated, symptoms can return	Direct Fecal-Oral does not occur, shed oocysts need 1 - 2 weeks to mature in environment before infectious.	Raspberries, basil, snow peas, mesclun lettuce	<ul style="list-style-type: none"> ▪ Demonstration of the parasite by microscopy or molecular methods in stool or in intestinal aspirate or biopsy specimens from two or more ill persons <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> ▪ Demonstration of the parasite in epidemiologically implicated food
<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	<ul style="list-style-type: none"> ▪ Demonstration of <i>E. coli</i> of same serotype in implicated food and stools in persons, OR Isolation of <i>E. coli</i> of the same serotype shown to be enteroinvasive or enterotoxigenic from stool of ill persons ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Form 219

KENTUCKY FIELD GUIDE FOR WATERBORNE AND FOODBORNE DISEASES

KENTUCKY FIELD GUIDE FOR WATERBORNE AND FOODBORNE DISEASES¹ (Organized Alphabetically by Agent)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DL ⁵
<i>Escherichia coli</i> enterotoxigenic (ETEC)	24 - 48 hours (21 - 68 hours)	Cramps, watery diarrhea, some vomiting Usual symptom profile: diarrhea 80-100% cramps 82% vomiting <50% nausea <50% fever <50% myalgia <50% headache <50%	24 hours - 11 days (medium 3 days)	Weeks to months	Seafood (crab, shrimp and scallops), salads and other foods served cold	<ul style="list-style-type: none"> Demonstration of <i>E. coli</i> of same serotype in implicated food and stools in persons, OR Isolation of <i>E. coli</i> of the same serotype shown to be enteroinvasive or enterotoxigenic from stool of ill persons Feces, rectal swabs Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Form 219
<i>Escherichia coli</i> enterohemorrhagic (<i>E. coli</i> O157:H7 and others)	48 hours - 8 days (24 hours - 10 days)	Bloody diarrhea, with cramps, vomiting, fever; hemolytic uremic syndrome (2 - 7% of cases)	5 - 10 days	1 - 4 weeks	Beef, venison, raw milk, water, produce	<ul style="list-style-type: none"> Demonstration of <i>E. coli</i> isolates from stools that are enterotoxigenic or enterohemorrhagic. Feces, rectal swabs Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Form 219
<i>Giardia intestinalis</i> ⁶	3 - 25 days (usually 7 days)	Diarrhea, gas, cramps, nausea, fatigue	2 - 6 weeks	Variable, as long as carrier status persists	Water, direct fecal oral, food contaminated by ill handler	<ul style="list-style-type: none"> Demonstration of the parasite in stool or small-bowel biopsy specimen of two or more ill persons
Heavy Metals (antimony, arsenic, cadmium, copper, iron, lead, mercury, tin, zinc)	5 minutes - 8 hours (usually <1 hour)	Vomiting, with nausea, cramps, and diarrhea	Usually self-limited	Not communicable	Acidic foods and beverages prepared, stored or cooked in containers coated, lined or contaminated with offending metal	<ul style="list-style-type: none"> Demonstration of high concentration of metal in epidemiologically implicated food Collect suspect food or metal container

¹ 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.

² Period of Communicability and Characteristic Foods are taken from Los Angeles County Department of Public Health. *GIARDIASIS*. Acute Communicable Disease Control Manual (B-73). October 2018.

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<i>Listeria monocytogenes</i>	24 hours (2-3 weeks)	Fever, with diarrhea, myalgia, headache Usual symptom profile: fever 72% diarrhea 68% myalgia 56% cramps 55% vomiting 35%	3 - 7 days	Not known	Inadequately pasteurized milk, precooked meat	<ul style="list-style-type: none"> Isolation of <i>Listeria monocytogenes</i> of the same serotype from two or more ill persons exposed to epidemiologically implicated food or to food from which the same-type <i>Listeria monocytogenes</i> has been isolated Isolation from a normally sterile site: blood, CSF, amniotic fluid, fetal/placental tissue Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219
Norovirus and other caliciviruses	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	Duration of vomiting and diarrhea	Shellfish, water, salads, frosting, "handled" foods	<ul style="list-style-type: none"> Diagnosed is often based on symptoms, onset times, and ruling out other enteric pathogens, OR Identification of virus in stool by polymerase chain reaction (PCR). Stool or vomitus of ill person Sterile, leak-proof container without preservatives. Must be refrigerated. Form 275
Paralytic shellfish poisoning	30 minutes - 3 hours	Paresthesias, feeling of floating, loss of balance, dry mouth, double vision, dysarthria, shortness of breath	Days	Not communicable	Clams, mussels, cockles	<ul style="list-style-type: none"> Detection 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 fish
Poisonous mushrooms (muscimol, muscarine, psilocybin, coprinus, artemenaritis, ibotenic acid)	<2 hours	Vomiting, diarrhea, confusion, visual disturbances, salivation, diaphoresis, hallucinations, disulfiram-like reaction	Usually self-limited	Not communicable	Wild mushrooms	<ul style="list-style-type: none"> Clinical syndrome among persons who have eaten mushroom identified as toxic type, OR demonstration of toxin in epidemiologically implicated mushroom or food containing mushrooms Collect mushrooms or food containing mushrooms

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<i>Salmonella</i> spp (non-typhoidal)	12 - 36 hours (6 hours – 10 days)	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 milk (cross contamination important)	<ul style="list-style-type: none"> Isolation of <i>Salmonella</i> from implicated food or water, OR Isolation of <i>Salmonella</i> from stool from ill persons. Feces, rectal swabs Enteric pathogens kit with buffered glycerol saline. Form 219
Scombroid fish poisoning (histamine fish poisoning)	1 minute – 3 hours; usually within 6 hours	Cramps, diarrhea, headache, nausea, flushing, urticaria	3 - 6 hours	Not communicable	Mishandled fish (mahi-mahi, tuna, mackerel, bluefish, salmon, bonito, skipjack)	<ul style="list-style-type: none"> 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 (fish of order Scombroidei) Collect epidemiologically implicated fish
Shellfish poisoning (diarrhetic, neurotoxic, amnesic)	20 minutes - 2 hours	Cramps, diarrhea, headaches, vomiting, amnesia, seizures	Days	Not communicable	Mussels, oysters	<ul style="list-style-type: none"> 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 epidemiologically implicated shellfish
<i>Shigella</i>	24 - 48 hours (12 hours - 6 days)	Cramps and diarrhea (may be bloody), with fever	4 - 7 days	4 weeks after illness	Eggs, salads, lettuce	<ul style="list-style-type: none"> Isolation of <i>Shigella</i> from implicated food, OR Isolation of <i>Shigella</i> from stool of ill persons. Feces, rectal swabs Enteric pathogens kit with buffered glycerol saline. Form 219
<i>Staphylococcus aureus</i>	2 - 4 hours (30 minutes - 8 hours)	Vomiting, with nausea, cramps, and diarrhea (abrupt onset)	24 -48 hours	Not communicable (performed enterotoxin)	Sliced/chopped ham and meats, custards, cream fillings, mushrooms, egg salad	<ul style="list-style-type: none"> Isolation of an enterotoxin producing strain of <i>S. aureus</i> in implicated food, OR Isolation of enterotoxin producing strain of <i>S. aureus</i> from stool of ill persons <i>Staphylococcus aureus</i> Feces, rectal swabs

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<i>Vibrio cholerae</i> non-O1 and non-O139	12 - 24 hours (12 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	Several days	Shellfish	<ul style="list-style-type: none"> Enteric pathogens kit with buffered glycerol saline. Form 219 Isolation of <i>V. cholerae</i> non-O1 or non-O139 from stool of ill person. Isolation of <i>V. cholerae</i> non-O1 or non-O139 from implicated food is supportive evidence. Feces, rectal swabs Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219
<i>Vibrio cholerae</i> O1 and O139	24 - 72 hours (12 hours - 5 days)	Diarrhea, vomiting water	72 hours - 7 days	Usually a few days after recovery except carrier state	Shellfish, water or foods contaminated by infected food handlers	<ul style="list-style-type: none"> Isolation of toxigenic <i>V. cholerae</i> O1 or O139 from implicated food, OR Isolation of <i>V. cholerae</i> O1 or O139 from stool or vomitus of ill persons, OR Significant rise (fourfold) in vibriocidal antibodies. Feces, rectal swabs Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219
<i>Vibrio parahaemolyticus</i>	12 - 24 hours (2 - 48 hours)	Cramps watery diarrhea, with nausea, vomiting, and fever	2 - 5 days	Not communicable	Seafood, especially crabs and oysters	<ul style="list-style-type: none"> Isolation of 10⁷/g <i>V. parahaemolyticus</i> from implicated food (usually seafood), OR Isolation of <i>V. parahaemolyticus</i> from stool of ill persons. Feces, rectal swabs Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219

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<i>Vibrio vulnificus</i>	12 - 72 hours	Fever, diarrhea, abdominal cramps, nausea, vomiting hypotension, septicemia in individuals with chronic liver disease, chronic alcoholism, hemochromatosis, or immunocompromising conditions		Not communicable	Seafood	<ul style="list-style-type: none"> ▪ Isolation of <i>V. vulnificus</i> from implicated food (usually seafood) OR Isolation of <i>V. vulnificus</i> from a clinical specimen (blood, wound, stool). ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219
<i>Yersinia enterocolitica</i>	36 - 48 hours (24 hours – 10 days)	Cramps, diarrhea, fever, headache, vomiting, pseudoappendicitis	1 - 3 weeks	2 - 3 weeks	Milk, tofu, pork	<ul style="list-style-type: none"> ▪ Isolation of organism from clinical specimens from two or more ill persons OR isolation of organism from epidemiologically implicated food ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219

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KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹ (Organized by Incubation Period)

Agent ¹	Usual Incubation period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
Scombroid fish poisoning (histamine fish poisoning)	1 minute–3 hours; usually within 6 hours	Cramps, diarrhea, headache, nausea, flushing, urticaria	3-6 hours	Not communicable	Mishandled fish (mahi-mahi, tuna, mackerel, bluefish, salmon, bonito, skipjack)	<ul style="list-style-type: none"> 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 (fish of order Scombroidei). Collect epidemiologically implicated fish. Demonstration of high concentration of metal in epidemiologically implicated food. Collect suspect food or metal container.
Heavy Metals (antimony, arsenic, cadmium, copper, iron, lead, mercury, tin, zinc)	5 minutes - 8 hours (usually <1 hour)	Vomiting with nausea, cramps, and diarrhea	Usually self-limited	Not communicable	Acidic foods and beverages prepared, stored or cooked in containers coated, lined or contaminated with offending metal	<ul style="list-style-type: none"> 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 epidemiologically implicated shellfish.
Shellfish poisoning (diarrhetic, neurotoxic, amnesic)	20 minutes - 2 hours	Cramps, diarrhea, headaches, vomiting, amnesia, seizures	Days	Not communicable	Mussels, oysters	<ul style="list-style-type: none"> 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 epidemiologically implicated shellfish.

¹ The KY Field Guide to Foodborne and Water-Borne Diseases is based on the Oregon Health Services Compendium of Acute Foodborne Diseases and a similar table developed by epidemiologists at the Foodborne and Diarrheal Disease Branch, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, and on Tauxe RV, Hughes JM. Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 1995, page 1017 (table 6).

² CDC. Diagnosis and management of foodborne illness: a primer for physicians. MMWR 2001; 50(RR2). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available on-line at <http://www.cdc.gov/mmwr/preview/mmwrhtml/r5002a1.htm>

³ CDC. Guide to confirming the diagnosis in Foodborne diseases at https://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/confirming_diagnosis.html Chin, J, Ed. Control of Communicable Disease Manual. Washington, D.C.: American Public Health Association, 2000.

⁴ CDC. Diagnosis and management of Foodborne illness: a primer for physicians. MMWR 2001; 50(RR2). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available on-line at <http://www.cdc.gov/mmwr/preview/mmwrhtml/r5002a1.htm>

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APPENDIX C

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Paralytic shellfish poisoning	30 minutes–3 hours	Paresthesias, feeling of floating, loss of balance, dry mouth, double vision, dysarthria, shortness of breath	Days	Not communicable	Clams, mussels, cockles	<ul style="list-style-type: none"> Detection 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 fish.
Ciguatera poisoning	1-6 hours; usually within 24 hours	Diarrhea, nausea, vomiting, paresthesias, reversal of temperature sensation	Days to weeks to months	Not communicable	Large ocean fish (grouper, amberjack, barracuda, snapper)	<ul style="list-style-type: none"> Demonstration of ciguatera toxin 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.
Poisonous mushrooms (muscimol, muscarine, psilocybin, copinin, antrementsans, ibotenic acid)	<2 hours	Vomiting, diarrhea, confusion, visual disturbances, salivation, diaphoresis, hallucinations, disulfiram-like reaction	Usually self-limited	Not communicable	Wild mushrooms	<ul style="list-style-type: none"> Clinical syndrome among persons who have eaten mushroom identified as toxic type OR demonstration of toxin in epidemiologically implicated mushroom or food containing mushrooms. Collect mushrooms or food containing mushrooms.
<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)	Fried rice, meats, vegetables	<ul style="list-style-type: none"> Isolation of 10⁷ <i>B. cereus</i>/gm of implicated food OR Isolation of <i>B. cereus</i> from stool of ill person. Enteric pathogens kit with Cary-Blair media. Refrigerate. Complete Form 219 or order in Outreach.
<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)	Sliced/chopped ham and meats, custards, cream fillings, mushrooms, egg salad	<ul style="list-style-type: none"> Isolation of an enterotoxin producing strain of <i>S. aureus</i> in implicated food OR Isolation of enterotoxin producing strain of <i>S. aureus</i> from stool of ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.
<i>Bacillus cereus</i> ("diarrheal" variety)	6-24 hours	Cramps and diarrhea	24-48 hours	Not communicable (enterotoxin formed in vivo)	Fried rice, meats, vegetables	<ul style="list-style-type: none"> Isolation of 10⁷ <i>B. cereus</i>/gm of implicated food OR Isolation of <i>B. cereus</i> from stool of ill person. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair media. Refrigerate. Complete Form 219 or order in Outreach.

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<i>Clostridium perfringens</i>	10-12 hours (6-24 hours)	Cramps and diarrhea	24-48 hours	Not communicable (enterotoxin formed in vivo)	Meat; poultry, gravy, Mexican foods	<ul style="list-style-type: none"> Isolation of $>10^5$ <i>C. perfringens</i>/gm of implicated food, OR Isolation of <i>C. perfringens</i> in stool of ill persons, OR Detection of enterotoxin by latex agglutination (from stool extracts of culture isolates). 5-50 g stool. Kit #10.
<i>Vibrio cholerae</i> non-01 and non-0139	12-24 hours (12 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	Several days	Shellfish	<ul style="list-style-type: none"> Isolation of <i>V. cholerae</i> non-01 or non-0139 from stool of ill person. Isolation of <i>V. cholerae</i> non-01 or non-0139 from implicated food is supportive evidence. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.
<i>Vibrio parahaemolyticus</i>	12-24 hours (2-48 hours)	Cramps, watery diarrhea with nausea, vomiting, and fever	2-5 days	Not communicable	Seafood, especially crabs and oysters	<ul style="list-style-type: none"> Isolation of 10^7/g <i>V. parahaemolyticus</i> from implicated food (usually seafood) OR Isolation of <i>V. parahaemolyticus</i> from stool of ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.
<i>Salmonella</i> spp (non-typhoid)	12-36 hours (6 hours-10 days)	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 milk (cross contamination important)	<ul style="list-style-type: none"> Isolation of <i>Salmonella</i> from implicated food or water OR Isolation of <i>Salmonella</i> from stool from ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.

APPENDIX C

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹
(Organized by Incubation Period)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
<i>Clostridium botulinum</i>	12-48 hours (2 hours to 8 days)	Nausea, vomiting, diarrhea, with or just before onset of descending paralysis	Days to months	Not communicable (preformed enterotoxin)	Improperly canned or similarly preserved foods; honey (infants)	<ul style="list-style-type: none"> Detection of <i>C. botulinum</i> toxin from implicated food, OR Detection of <i>C. botulinum</i> toxin from human sera, or feces, OR Isolation of <i>C. botulinum</i> from stool of persons with clinical syndrome, OR Consistent clinical syndrome in persons known to have eaten same food as laboratory confirmed cases. <ul style="list-style-type: none"> 25-50 g feces, 10 ml sera in red stoppered tube,⁶ Sterile, leak-proof unbreakable container. Complete Form 219 or order test in Outreach.
<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	<ul style="list-style-type: none"> Demonstration of <i>E. coli</i> of same serotype in implicated food and stools in persons OR Isolation of <i>E. coli</i> of the same serotype shown to be enteroinvasive from stool of ill persons. <ul style="list-style-type: none"> Feces, rectal swabs. Enteric pathogens kit with Cary Blair media, Refrigerate. Complete Form 219.
<i>Vibrio vulnificus</i>	12-72 hours	Fever, diarrhea, abdominal cramps, nausea, vomiting hypotension, septicemia in individuals with chronic liver disease, chronic alcoholism, hemochromatosis, or immunocompromising conditions		Not communicable	Seafood	<ul style="list-style-type: none"> Isolation of <i>V. vulnificus</i> from implicated food (usually seafood) OR Isolation of <i>V. vulnificus</i> from a clinical specimen (blood, wound, stool). <ul style="list-style-type: none"> Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.

⁶ DLS staff must be contacted before any specimens for botulism will be tested.

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹ (Organized by Incubation Period)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
<i>Listeria monocytogenes</i>	24 hours (9-50 hours)	Fever with diarrhea, myalgia, headache Usual symptom profile: fever 72% diarrhea 68% myalgia 56% cramps 55% vomiting 35%	3-7 days	Not known	Inadequately pasteurized milk, precooked meat	<ul style="list-style-type: none"> Isolation of <i>Listeria monocytogenes</i> from a normally sterile site. Isolate from blood, cerebrospinal fluid, amniotic fluid, placental/fetal tissue. Pure culture TSA or blood agar slant. Complete Form 219 or order test in Outbreak.
<i>Escherichia coli</i> enterotoxigenic (ETEC) ⁷	24-48 hours (21-68 hours)	Cramps, watery diarrhea, some vomiting Usual symptom profile: diarrhea 80-100% cramps 82% vomiting <50% nausea <50% fever <50% myalgia <50% headache <50%	24 hours-11 days (medium 3 days)	Weeks to months	Seafood (crab, shrimp and scallops), salads and other foods served cold	<ul style="list-style-type: none"> Demonstration of <i>E. coli</i> of same serotype in implicated food and stools in persons OR Isolation of <i>E. coli</i> of the same serotype shown to be enterotoxigenic from stool of ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary Blair media. Refrigerate. Complete Form 219.
Norwalk virus and other caliciviruses	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	Duration of vomiting and diarrhea	Shellfish, water, salads, frosting, "handled" foods	<ul style="list-style-type: none"> Diagnosis is often based on symptoms, onset times, and ruling out other enteric pathogens OR Identification of virus in stool by PCR. Stool of ill person. Sterile, leak-proof container without preservatives. Refrigerate. Complete Form 275 or order test in Outbreak.
<i>Shigella</i>	24-48 hours (12 hours-6 days)	Cramps and diarrhea (may be bloody) with fever	4-7 days	4 weeks after illness	Eggs, salads, lettuce	<ul style="list-style-type: none"> Isolation of <i>Shigella</i> from implicated food OR Isolation of <i>Shigella</i> from stool of ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outbreak.

⁷ 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.

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹
(Organized by Incubation Period)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
<i>Vibrio cholerae</i> O1 and O139	24-72 hours (12 hours-5 days)	Diarrhea, vomiting water	72 hours-7 days	Usually a few days after recovery except carrier state	Shellfish, water or foods contaminated by infected food handlers	<ul style="list-style-type: none"> Isolation of toxigenic <i>V. cholerae</i> O1 or O139 from implicated food, OR Isolation of <i>V. cholerae</i> O1 or O139 from stool or vomitus of ill persons, OR Significant rise (fourfold) in vibriocidal antibodies. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.
<i>Yersinia enterocolitica</i>	36-48 hours (24 hours-10 days)	Cramps, diarrhea, fever, headache, vomiting, pseudo-appendicitis	1-3 weeks	2-3 weeks	Milk, tofu, pork	<ul style="list-style-type: none"> Isolation of organism from clinical specimens from two or more ill persons OR Isolation of organism from epidemiologically implicated food. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.
<i>Campylobacter jejuni</i>	48 hours-5 days (24 hours-10 days)	Cramps and diarrhea (sometimes bloody) with vomiting and fever	48 hours-10 days	2-7 weeks	Raw milk, poultry, water	<ul style="list-style-type: none"> Isolation of <i>C. jejuni</i> from implicated food OR Isolation of <i>C. jejuni</i> from stool or blood of ill person. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair media. Refrigerate. Complete Form 219 or order in Outreach.
<i>Escherichia coli</i> enterohemorrhagic (<i>E. coli</i> /O157:H7 & others)	48 hours-8 days (24 hours-10 days)	Bloody diarrhea with cramps, vomiting, fever; hemolytic uremic syndrome (2-7% of cases)	5-10 days	1-4 weeks	Beef, venison, raw milk, water, produce	<ul style="list-style-type: none"> Demonstration of <i>E. coli</i> isolates from stools that are shiga toxin-producing or enterohemorrhagic. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.
<i>Cyclospora cayentanensis</i>	1 - 14 days (usually 7 days)	Diarrhea, nausea, anorexia, weight loss, cramps, gas, fatigue, low-grade fever; may be relapsing or protracted	3 - 5 weeks if untreated, symptoms can return	Direct Fecal-Oral does not occur, shed oocysts need 1 - 2 weeks to mature in environment before infectious.	Raspberries, basil, snow peas, mesclun lettuce	<ul style="list-style-type: none"> Demonstration of the parasite by microscopy or molecular methods in stool or in intestinal aspirate or biopsy specimens from two or more ill persons <p>OR</p> <ul style="list-style-type: none"> Demonstration of the parasite in epidemiologically implicated food

¹Kentucky Department for Public Health, 275 East Main St., Frankfort, KY 40621. (502) 564-3261. 24 hour Division of Epidemiology Emergency HOTLINE: 1-888-9REPORT, 1-888-973-7678. Revised August 2021

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹ (Organized by Incubation Period)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
<i>Cryptosporidium parvum</i>	2-12 days (usually 7 days)	Profuse watery diarrhea, abdominal cramps, nausea, low-grade fever, anorexia, vomiting (Some infected individuals have no symptoms at all.)	1-2 weeks	Weeks to months	Fruits, produce, or water	<ul style="list-style-type: none"> Isolation of <i>C. parvum</i> oocysts from implicated food, OR Isolation of <i>C. parvum</i> oocysts from stool of ill persons, OR Demonstration of <i>C. parvum</i> in intestinal fluid, or small bowel biopsy specimens, OR Demonstration of <i>C. parvum</i> antigen in stool by a specific immunodiagnostic test (e.g., EIA/ELISA). Walnut-sized stool, 10% formalin. Demonstration of the parasite in stool or small-bowel biopsy specimen of two or more ill persons
<i>Giardia intestinalis</i> ⁶	3 – 25 days (usually 7 days)	Diarrhea, gas, cramps, nausea, fatigue	2 – 6 weeks	Variable, as long as carrier status persists	Water, direct fecal oral, food contaminated by ill handler	

⁶Period of Communicability and Characteristic Foods are taken from Los Angeles County Department of Public Health, GIARDIASIS, Acute Communicable Disease Control Manual (B-73), October 2018.

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KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹ (Organized by Symptomology)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
Agents typified by nausea and vomiting, without fever, within 8 hours of consuming.						
<i>Bacillus cereus</i> ("emetic" variety)	2-4 hours (1-6 hours)	Vomiting, with nausea and Diarrhea (abrupt onset)	24 hours	Not communicable (performed enterotoxin)	Fried rice, meats, vegetables	<ul style="list-style-type: none"> Isolation of 10⁵ <i>B. cereus</i>/gm of implicated food OR Isolation of <i>B. cereus</i> from stool of ill person. Enteric pathogens kit with Cary-Blair media. Refrigerate. Complete Form 219 or order in Outreach.
<i>Staphylococcus aureus</i>	2-4 hours (30 minutes-8 hours)	Vomiting, with nausea, cramps, and diarrhea (abrupt onset)	24-48 hours	Not communicable (performed enterotoxin)	Sliced/chopped ham and meats, custards, cream fillings, mushrooms, egg salad	<ul style="list-style-type: none"> Isolation of an enterotoxin producing strain of <i>S. aureus</i> in implicated food OR Isolation of enterotoxin producing strain of <i>S. aureus</i> from stool of ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.

¹ *The KY Field Guide to Foodborne and Water-Borne Diseases* is based on the *Oregon Health Services Compendium of Acute Foodborne Diseases* and a similar table developed by epidemiologists at the Foodborne and Diarrheal Disease Branch, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, and on Tauxe RV, Hughes JM, Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 1995, page 1017 (table 6).

² CDC. Diagnosis and management of foodborne illness: a primer for physicians. MMWR 2001; 50(RR2). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available on-line at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5002a1.htm>

CDC. Guide to confirming the diagnosis in Foodborne diseases at https://www.cdc.gov/foodsafety/outbreaks/investigation-outbreaks/confirming_diagnosis.html Chin, J, Ed. Control of Communicable Disease Manual. Washington, D.C.: American Public Health Association. 2000.

³ CDC. Diagnosis and management of Foodborne illness: a primer for physicians. MMWR 2001; 50(RR2). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available on-line at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5002a1.htm>

⁴ "Characteristic foods" for each foodborne and water-borne agent are based on epidemiological data gathered by epidemiologists in the Acute and Communicable Disease Program, Center for Disease Control and Epidemiology, Oregon Health Division, and on Tauxe RV, Hughes JM, Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 1995, page 1017 (table 6).

⁵ Division of Laboratory Services, Kentucky Department for Public Health <https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx> 1-502-564-4446.

APPENDIX C

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹
(Organized by Symptomology)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
Agents typified by abdominal cramps and diarrhea, without fever, within 24 hours of consuming.						
<i>Bacillus cereus</i> ("diarrheal" variety)	6-24 hours	Cramps and diarrhea	24-48 hours	Not communicable (enterotoxin formed in vivo)	Fried rice, meats, vegetables	<ul style="list-style-type: none"> Isolation of 10⁶ <i>B. cereus</i>/gm of implicated food OR Isolation of <i>B. cereus</i> from stool of ill person. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair media. Refrigerate. Complete Form 219 or order in Outreach. Isolation of >10⁵ <i>C. perfringens</i>/gm of implicated food, OR Isolation of <i>C. perfringens</i> in stool of ill persons, OR Detection of enterotoxin by latex agglutination (from stool extracts of culture isolates). 5-50 g stool, Kit #10.
<i>Clostridium perfringens</i>	10-12 hours (6-24 hours)	Cramps and diarrhea	24-48 hours	Not communicable (enterotoxin formed in vivo)	Meat, poultry, gravy, Mexican foods	
Agents typified by abdominal cramps and diarrhea, with fever, within 12-48 hours of consuming.						
<i>Campylobacter jejuni</i>	48 hours-5 days (24 hours-10 days)	Cramps and diarrhea (sometimes bloody) with vomiting and fever	48 hours-10 days	2-7 weeks	Raw milk, poultry, water	<ul style="list-style-type: none"> Isolation of <i>C. jejuni</i> from implicated food OR Isolation of <i>C. jejuni</i> from stool or blood of ill person. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair media. Refrigerate. Complete Form 219 or order in Outreach. Demonstration of the parasite by microscopy or molecular methods in stool or in intestinal aspirate or biopsy specimens from two or more ill persons <p>OR</p> <ul style="list-style-type: none"> Demonstration of the parasite in epidemiologically implicated food
<i>Cyclospora cayentanensis</i>	1 - 14 days (usually 7 days)	Diarrhea, nausea, anorexia, weight loss, cramps, gas, fatigue, low-grade fever; may be relapsing or protracted	3 - 5 weeks. If untreated, symptoms can return	Direct Fecal-Oral does not occur, shed oocysts need 1 - 2 weeks to mature in environment before infectious.	Raspberries, basil, snow peas, mesclun lettuce	

KENTUCKY FIELD GUIDE FOR WATERBORNE AND FOODBORNE DISEASES

KENTUCKY FIELD GUIDE FOR WATERBORNE AND FOODBORNE DISEASES¹ (Organized by Symptomology)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
<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	<ul style="list-style-type: none"> Demonstration of <i>E. coli</i> of same serotype in implicated food and stools in persons OR Isolation of <i>E. coli</i> of the same serotype shown to be enteroinvasive from stool of ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair media, Refrigerate. Complete Form 219.
<i>Salmonella</i> spp (non-typhoid)	12-36 hours (6 hours-10 days)	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 milk (cross contamination important)	<ul style="list-style-type: none"> Isolation of <i>Salmonella</i> from implicated food or water OR Isolation of <i>Salmonella</i> from stool from ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative, Refrigerate. Complete Form 219 or order test in Outreach.
<i>Shigella</i>	24-48 hours (12 hours-6 days)	Cramps and diarrhea (may be bloody) with fever	4-7 days	4 weeks after illness	Eggs, salads, lettuce	<ul style="list-style-type: none"> Isolation of <i>Shigella</i> from implicated food OR Isolation of <i>Shigella</i> from stool of ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative, Refrigerate. Complete Form 219 or order test in Outreach.
<i>Vibrio parahaemolyticus</i>	12-24 hours (2-48 hours)	Cramps watery, diarrhea with nausea, vomiting, and fever	2-5 days	Not communicable	Seafood, especially crabs and oysters	<ul style="list-style-type: none"> Isolation of 10⁵/g <i>V. parahaemolyticus</i> from implicated food (usually seafood) OR Isolation of <i>V. parahaemolyticus</i> from stool of ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative, Refrigerate. Complete Form 219 or order test in Outreach.

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES:
(Organized by Symptomology)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
<i>Vibrio vulnificus</i>	12-72 hours	Fever, diarrhea, abdominal cramps, nausea, vomiting hypotension, septicemia in individuals with chronic liver disease, chronic alcoholism, hemochromatosis, or immunocompromising conditions	1-3 weeks	Not communicable	Seafood	<ul style="list-style-type: none"> Isolation of <i>V. vulnificus</i> from implicated food (usually seafood) OR Isolation of <i>V. vulnificus</i> from a clinical specimen (blood, wound, stool). Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.
<i>Yersinia enterocolitica</i>	36-48 hours (24 hours-10 days)	Cramps, diarrhea, fever, headache, vomiting, pseudoperitonitis	1-3 weeks	2-3 weeks	Milk, tofu, pork	<ul style="list-style-type: none"> Isolation of organism from clinical specimens from two or more ill persons OR isolation of organism from epidemiologically implicated food. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outreach.
Agents typified by abdominal cramps and diarrhea, without fever, within 72-96 hours of consuming.						
<i>Giardia intestinalis</i> ³	3 - 25 days (usually 7 days)	Diarrhea, gas, cramps, nausea, fatigue	2 - 6 weeks	Variable, as long as carrier status persists	Water, direct fecal oral, food contaminated by ill handler	<ul style="list-style-type: none"> Demonstration of the parasite in stool or small-bowel biopsy specimen of two or more ill persons
Agents typified by vomiting, diarrhea, cramps, myalgias, and headache with fever, within 24 hours of consuming.						
<i>Listeria monocytogenes</i>	24 hours (9-50 hours)	Fever with diarrhea, myalgia, headache Usual symptom profile: fever 72% diarrhea 68% myalgia 56% cramps 55% vomiting 35%	3-7 days	Not known	Inadequately pasteurized milk, precooked meat	<ul style="list-style-type: none"> Isolation of <i>Listeria monocytogenes</i> from a normally sterile site. Isolate from blood, cerebrospinal fluid, amniotic fluid, placental/fetal tissue. Pure culture TSA or blood agar slant. Complete Form 219 or order test in Outreach.

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹ (Organized by Symptomology)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁶
Agents typified by vomiting, diarrhea, cramps, myalgias, and headache without fever, within 24-48 hours of consuming.						
Norwalk virus and other caliciviruses	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 Duration of vomiting and diarrhea	Shellfish, water, salads, frosting, "handled" foods		<ul style="list-style-type: none"> Diagnosis is often based on symptoms, onset times, and ruling out other enteric pathogens OR Identification of virus in stool by PCR. Stool of ill person. Sterile, leak-proof container without preservatives. Refrigerate. Complete Form 275 or order test in Outbreak.
Agents typified by watery diarrhea and headache without fever, within 24-48 hours of consuming.						
<i>Escherichia coli</i> enterotoxigenic (ETEC) ⁶	24-48 hours (21-68 hours)	Cramps, watery diarrhea, some vomiting Usual symptom profile: Diarrhea 80-100% cramps 82% vomiting <50% nausea <50% fever <50% myalgia <50% headache <50%	24 hours-11 days (median 3 days)	Weeks to months	Seafood (crab, shrimp and scallops), salads and other foods served cold	<ul style="list-style-type: none"> Demonstration of <i>E. coli</i> of same serotype in implicated food and stools in persons OR Isolation of <i>E. coli</i> of the same serotype shown to be enterotoxigenic from stool of ill persons. Feces, rectal swabs. Enteric pathogens kit with Cary Blair media. Refrigerate. Complete Form 219.
<i>Vibrio cholerae</i> 01 and 0139	24-72 hours (12 hours-5 days)	Diarrhea, vomiting water	72 hours-7 days	Usually a few days after recovery except carrier state	Shellfish, water or foods contaminated by infected food handlers	<ul style="list-style-type: none"> Isolation of toxigenic <i>V. cholerae</i> 01 or 0139 from implicated food. OR Isolation of <i>V. cholerae</i> 01 or 0139 from stool or vomitus of ill persons. OR Significant rise (fourfold) in vibriocidal antibodies. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outbreak.

⁶ 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.

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹
(Organized by Symptomology)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
<i>Vibrio cholerae</i> non-O1 and non-O139	12-24 hours (12 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	Several days	Shellfish	<ul style="list-style-type: none"> Isolation of <i>V. cholerae</i> non-O1 or non-O139 from stool of ill person. Isolation of <i>V. cholerae</i> non-O1 or non-O139 from implicated food is supportive evidence. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outbreak.
Agents typified by bloody diarrhea without fever, within 48 hours of consuming.						
<i>Escherichia coli</i> enterohemorrhagic (<i>E. coli</i> /O157:H7 & others)	48 hours- 8 days (24 hours- 10 days)	Bloody diarrhea with cramps, vomiting, fever; hemolytic uremic syndrome (2-7% of cases)	5-10 days	1-4 weeks	Beef, venison, raw milk, water, produce	<ul style="list-style-type: none"> Demonstration of <i>E. coli</i> isolates from stools that are shiga toxin-producing or enterohemorrhagic. Feces, rectal swabs. Enteric pathogens kit with Cary-Blair preservative. Refrigerate. Complete Form 219 or order test in Outbreak.

¹Kentucky Department for Public Health, 275 East Main St., Frankfort, KY 40621. (502) 564-3261. 24 hour Division of Epidemiology Emergency HOTLINE: 1-888-9REPORT, 1-888-973-7678. Revised August 2021

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹ (Organized by Symptomology)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
Botulism						
<i>Clostridium botulinum</i>	12–48 hours (2 hours to 8 days)	Nausea, vomiting, diarrhea, with or just before onset of descending paralysis	Not communicable (preformed enterotoxin)	Improperly canned or similarly preserved foods; honey (infants)	<ul style="list-style-type: none"> Detection of <i>C. botulinum</i> toxin from implicated food, OR Detection of <i>C. botulinum</i> toxin from human sera, or feces, OR Isolation of <i>C. botulinum</i> from stool of persons with clinical syndrome, OR Consistent clinical syndrome in persons known to have eaten same food as laboratory confirmed cases. <ul style="list-style-type: none"> 25-50 g feces, 10 ml sera in red stoppered tube.⁷ Sterile, leak-proof unbreakable container. Complete Form 219 or order test in Outreach. 	

¹ DLS staff must be contacted before any specimens for botulism will be tested.

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹
(Organized by Symptomatology)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
Cryptosporidiosis						
<i>Cryptosporidium parvum</i>	2-12 days (usually 7 days)	Profuse watery diarrhea, abdominal cramps, nausea, low-grade fever, anorexia, vomiting (Some infected individuals have no symptoms at all.)	Weeks to months	Fruits, produce, or water	<ul style="list-style-type: none"> Isolation of <i>C. parvum</i> oocysts from implicated food; OR Isolation of <i>C. parvum</i> oocysts from stool of ill persons; OR Demonstration of <i>C. parvum</i> in intestinal fluid, or small bowel biopsy specimens; OR Demonstration of <i>C. parvum</i> antigen in stool by a specific immunodiagnostic test (e.g., enzyme-linked immunosorbent assay (ELISA)). Walnut-sized stool, 10% formalin. 	
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	Not communicable	Acidic foods and beverages prepared, stored or cooked in containers coated, lined or contaminated with offending metal	<ul style="list-style-type: none"> Demonstration of high concentration of metal in epidemiologically implicated food. Collect suspect food or metal container. 	
Poisonous mushrooms (muscimol, muscarine, psilocybin, coprinus atromentaris, ibotenic acid)	<2 hours	Vomiting, diarrhea, confusion, visual disturbances, salivation, diaphoresis, hallucinations, disulfiram-like reaction	Not communicable	Wild mushrooms	<ul style="list-style-type: none"> Clinical syndrome among persons who have eaten mushroom identified as toxic type OR demonstration of toxin in epidemiologically implicated mushroom or food containing mushrooms. Collect mushrooms or food containing mushrooms. 	
Shellfish poisoning (diarrhetic, neurotoxic, amnesic)	20 minutes - 2 hours	Cramps, diarrhea, headaches, vomiting, amnesia, seizures	Not communicable	Mussels, oysters	<ul style="list-style-type: none"> 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 epidemiologically implicated shellfish. 	

¹Kentucky Department for Public Health, 275 East Main St., Frankfort, KY 40621, (502) 564-3261. 24 hour Division of Epidemiology Emergency HOTLINE: 1-888-9REPORT, 1-888-973-7678.
²Revised August 2021

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES¹ (Organized by Symptomology)

Agent ¹	Usual Incubation Period (Range) ²	Symptom Profile	Duration of Illness ³	Period of Communicability	Characteristic Foods ⁴	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS ⁵
Ciguatera poisoning	1-6 hours; usually within 24 hours	Diarrhea, nausea, vomiting, paresthesias, reversal of temperature sensation	Days to weeks to months	Not communicable	Large ocean fish (groupers, amberjack, barracuda, snapper)	<ul style="list-style-type: none"> Demonstration of ciguatera toxin 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.
Scombroid fish poisoning (histamine fish poisoning)	1 minute–3 hours; usually within 6 hours	Cramps, diarrhea, headache, nausea, flushing, urticaria	3-6 hours	Not communicable	Mishandled fish (mahimahi, tuna, mackerel, bluefish, salmon, bonito, skipjack)	<ul style="list-style-type: none"> 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 (fish of order Scombroidei). Collect epidemiologically implicated fish.
Paralytic shellfish poisoning	30 minutes–3 hours	Paresthesias; feeling of floating, loss of balance, dry mouth, double vision, dysarthria, shortness of breath	Days	Not communicable	Clams, mussels, cockles	<ul style="list-style-type: none"> Detection 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 fish.