

Chapter 2 – Foodborne Disease Outbreaks

Foodborne disease organisms, toxins and chemicals can enter any food establishment on any given day. The supervisor for the establishment needs to understand information about these unwelcome visitors.

IDENTIFICATION OF DISEASE ORGANISMS

Significant foodborne disease organisms, toxins and chemicals, and their effect on public health are identified in the chart at the end of this chapter. The elements pertaining to the chart are as follows:

Causative Agent. This is the bacterium, virus, or other cause of a foodborne illness. Unfortunately, most of the diseases and the organisms that cause them (or causative agents) do not have easy-to-remember names. They are technical names created by scientists. Although it is not necessarily important to be able to pronounce them, it is important to be able to associate a name with a particular disease.

Incubation time. The timeframe starting from the ingestion of the organism, toxin or chemical to the time that the symptoms begin.

Onset Time. The specific time that symptoms start to appear.

Symptoms. Most symptoms are understandable. Less common terms are explained in the glossary.

FOODBORNE DISEASE OUTBREAK

When people ingest foodborne disease organisms, toxins or chemicals, an outbreak often occurs. Therefore, it is important to know the **definition of a foodborne disease outbreak**. It is defined as follows:

- A. Two or more persons experiencing a similar illness, usually gastrointestinal, after eating a common food.
- B. Epidemiologic analysis or laboratory test implicates food as the source of illness.
- C. One case of botulism or chemical poisoning constitutes an outbreak.

OCCURRENCE OF FOODBORNE DISEASE OUTBREAKS

Of the places identified, the frequency of foodborne disease outbreaks in the United States is as follows (percent frequency in parentheses):

- Restaurants, cafeterias, delicatessens and other commercial food establishments (57%)
- Homes (29%)
- Schools (6%)
- Church functions (3%)
- Picnics (3%)
- Camps (2%)

Because many foodborne disease outbreaks are not recognized or just considered "a bug that's going around," a considerable number of outbreaks go unreported. It is estimated that the actual number of

outbreaks is 10 to 100 times more than reported – perhaps as many as 76 million cases per year. These cases result in an estimated 325,000 hospitalizations and 5,000 deaths each year in the United States.

FACTORS CONTRIBUTING TO OUTBREAKS

Investigations of foodborne disease outbreaks have revealed the following as the most important contributing factors:

- Poor personal hygiene
- Improper holding temperatures
- Improper cooking or inadequate re-heating
- Cross Contamination (equipment, bare hand contact, improper cleaning/sanitizing)
- Food from unsafe sources

Poor personal hygiene is generally recognized as the most common contributing factor for foodborne illness. This simply means that food establishment workers don't wash their hands frequently enough throughout the day. Proper handwashing is one of the simplest, most effective ways to minimize the risk of causing a foodborne illness.

ECONOMIC IMPACT OF OUTBREAKS

Although the full economic impact of foodborne diseases has not been measured, reputable preliminary studies have estimated that the 12.6 million annual cases in the United States cost \$8.4 billion. The number of cases and cost are continuing to rise. The chart includes the annual number of cases and the average cost per case.

IDAHO FOODBORNE DISEASE OUTBREAKS

The following outbreaks represent a few that have occurred in Idaho:

- 650 persons became ill after eating at a Moscow restaurant. Salad bar lettuce contaminated with a viral agent was the suspected cause.
- 11 confirmed cases of salmonellosis were attributed to a foodborne disease outbreak at a Kootenai County truck stop. It is suspected that poor food-handling practices by the employees caused the outbreak.
- 165 persons became ill after eating a catered meal at a Boise athletic club. It is suspected that sick food handlers contaminated coleslaw during preparation.
- 33 persons became ill after eating a catered meal at a McCall business meeting. It is believed that the food handler contaminated the food with a viral agent.
- People became ill after eating the "daily special" at a Butte County restaurant. Ham and the stool samples of two affected persons both tested positive for the same food poisoning organism.
- 11 people attending a southeastern Idaho movie theater became ill after drinking carbonated fountain drinks contaminated with copper from the water line.

- 8 people attending a wedding reception became ill after eating deli foods prepared by an employee with an infected hangnail.

SUMMARY

- Foodborne disease organisms, toxins and chemicals can enter establishments on any given day.
- The onset time, symptoms and severity of foodborne diseases can be different depending on the causative agent.
- Common symptoms of foodborne illness include abdominal pain, nausea, vomiting, and diarrhea. However, these symptoms can differ greatly from person to person and can also vary for each of the possible causative agents.
- Two or more persons experiencing a similar illness after eating a common food generally identify a foodborne disease outbreak.
- Restaurants, cafeterias, delicatessens and other commercial food establishments are implicated in more than half of the foodborne disease outbreaks.
- The five most important factors that contribute to foodborne disease outbreaks are improper holding temperatures, poor personal hygiene, inadequate cooking, contaminated equipment, and food from unsafe sources.
- It is estimated that 12.6 million cases of foodborne diseases occur in the United States each year at a cost of \$8.4 billion.
- Examples in Idaho suggest that Idaho food establishments are not immune from outbreaks.

IMPORTANT FOODBORNE DISEASE ORGANISMS, TOXINS & CHEMICALS OF PUBLIC HEALTH SIGNIFICANCE

Disease or Causative Agent	Onset Time	Symptoms	Common Food	Contributing Factors*	Duration Annual US Cases Average Case Cost
Staphylococcal Food Poisoning Staphylococcus aureus	2-4 hours (2-7)	Abrupt onset of severe nausea, cramps, vomiting, malaise	Poultry and meat products, egg and potato salads, sauces, dairy products, cream filled baked products	1, 3, 5	Usually Less than 24 hours 185,060 cases \$1,310
Salmonellosis Salmonella spp.	12-36 hours (6-72)	Sudden onset of abdominal pain, fever, nausea, diarrhea; sometimes vomiting	Poultry and meat products, eggs, milk, melons, chocolate	1, 2, 3, 5	Several days 1,341,873 cases \$1,350
Clostridium perfringens Food Poisoning	10-12 hours (6-24)	Abdominal cramps and watery diarrhea; sometimes with nausea, vomiting and fever	Meats, poultry, soups, gravies, sauces, stews, casseroles	1,2	Usually less than 24 hours 248,520 cases \$190
Botulism Clostridium botulinum	12-36 hours (2-140)	Blurred or double vision, dysphagia, dry mouth, vomiting, constipation or diarrhea	Improperly processed, canned, low-acid or alkaline foods; cooked vegetables in oils or butter; foods out of refrigeration in air-tight packages	1, 2, 6	2 - 8 months 58 cases \$322,000
Bacillus cereus Food Poisoning	1-24 hours	Nausea and vomiting for emetic phase, abdominal cramps and diarrhea for diarrheal phase	Rice dishes and pasta products; meat products, soups, vegetables, puddings, sauces	1	Usually less than 24 hours 27,360 cases \$190
Shigellosis Shigella spp.	24-72 hours (12-96)	Abdominal cramps, watery diarrhea (may contain blood and pus), fever, nausea	Meats, shellfish, vegetables, salads, water	1, 5	4 - 7 days 89,648 cases \$390

Disease or Causative Agent	Onset Time	Symptoms	Common Food	Contributing Factors*	Duration Annual US Cases Average Case Cost
Escherichia coli O157:H7 Food Poisoning	4 days (3-9 days)	Abdominal cramps, watery diarrhea which later becomes grossly bloody; sometimes vomiting	Ground beef, raw milk, any foods handled by infected person	2, 5	2 - 9 days 62,458 cases Cost undetermined
Listeriosis Listeria monocytogenes	3-70 days	Mild to moderate flu-like symptoms - fever, intense headache, nausea, vomiting; abortions and stillbirths in pregnant women	Contaminated meats, dairy products and vegetables	1, 3, 5	Duration variable 2,493 cases \$12,500
Campylobacteriosis Campylobacter spp.	3-5 days (1-10)	Nausea, vomiting, abdominal pain, diarrhea, fever, malaise	Meats, poultry, milk	1, 3, 4	1 - 2 weeks 1,963,141 cases \$920
Viral Hepatitis A	28-30 days (15-20)	Onset abrupt with fever, malaise, anorexia, nausea, abdominal discomfort, dark urine, jaundice	Shellfish, sandwiches, salads, other foods handled by infected person	5	2 - 6 weeks 9,200,000 cases \$5,000
Viral Gastroenteritis Norovirus	16-48 hours (5-72)	Nausea, fever, abdominal cramps, vomiting, watery diarrhea	Shellfish, any foods handled by infected person	1, 4, 5	24 - 48 hours 181,000 cases \$890
Scombroid Poisoning Histamine-like substances	1 minute – 3 hours	Flushing, dizziness, headache, burning mouth and throat, vomiting, diarrhea	Tuna, mackerel, bluefish, skipjack, bonito, blue dolphin and related fish	1, 4	Recovery within 24 hours 31,000 cases \$970
Heavy Metal Poisoning Antimony, cadmium, copper, zinc, etc.	Few minutes - 2 hours	Nausea, vomiting, abdominal cramps, diarrhea	High-acid foods and beverages	3, 6	Recovery within 24 hours 96,000 cases \$300

*Most common, as established by CDC: 1) Improper holding temperatures; 2) Inadequate cooking; 3) Contaminated equipment; 4) Food from unsafe source; 5) Poor personal hygiene; 6) Other