chapter 2
Forms of Contamination

ServSafe
National Restaurant Association

How Contamination Happens

Contaminants come from a variety of places:

- Animals we use for food
- Air, contaminated water, and dirt
- People
  - Deliberately
  - Accidentally

How Contamination Happens

People can contaminate food when:

- They do not wash their hands after using the restroom
- They are in contact with a person who is sick
- They sneeze or vomit onto food or food-contact surfaces
- They touch dirty food-contact surfaces and equipment and then touch food

Biological Contamination

Common symptoms of foodborne illness:

- Diarrhea
- Vomiting
- Fever
- Nausea
- Abdominal cramps
- Jaundice (yellowing of skin and eyes)

Onset times:

- Depend on the type of foodborne illness
- Can range from 30 minutes to six weeks

The “Big Six” Pathogens

Food handlers diagnosed with illnesses from the “Big Six” pathogens cannot work in a foodservice operation while they are sick.

- *Shigella* spp.
- *Salmonella* Typhi
- Nontyphoidal *Salmonella* (NTS)
- Shiga toxin-producing *Escherichia coli* (STEC), also known as *E. coli*
- Hepatitis A
- Norovirus

Major Bacteria That Cause Foodborne Illness

The FDA has identified four types of bacteria that cause severe illness and are highly contagious:

- *Salmonella* Typhi
- Nontyphoidal *Salmonella*
- *Shigella* spp.
- Shiga toxin-producing *Escherichia coli*

Major Bacteria That Cause Foodborne Illness

Bacteria: *Salmonella* Typhi (SAL-me-NEL-uh TI-fee)
Source: People

Food Linked with the Bacteria	Prevention Measures
• Ready-to-eat food • Beverages	• Exclude food handlers diagnosed with an illness caused by *Salmonella* Typhi from the operation
	• Wash hands
	• Cook food to minimum internal temperatures

Major Bacteria That Cause Foodborne Illness

Bacteria: Nontyphoidal *Salmonella* (SAL-me-NEL-uh)
Source: Farm animals

Food Linked with the Bacteria	Prevention Measures
• Poultry and eggs • Meat • Milk and Dairy products • Produce, such as tomatoes, peppers, and cantaloupes	• Cook poultry and eggs to minimum internal temperatures
	• Prevent cross-contamination between poultry and ready-to-eat food
	• Keep food handlers who are vomiting or have diarrhea and have been diagnosed with an illness from nontyphoidal *Salmonella* out of the operation

Major Bacteria That Cause Foodborne Illness

Bacteria: *Shigella* spp. (shi-GEL-uh)
Source: Humans

Food Linked with the Bacteria	Prevention Measures
• Food easily contaminated by hands, such as salads containing TCS food (potato, tuna, shrimp, macaroni, chicken)	• Exclude food handlers who have diarrhea and have been diagnosed with an illness caused by *Shigella* spp. from the operation • Exclude food handlers who have diarrhea from the operation
• Food that has made contact with contaminated water, such as produce	• Wash hands
	• Control flies inside and outside the operation

Major Bacteria That Cause Foodborne Illness

Bacteria: Shiga toxin-producing *Escherichia coli* (ess-chur-EE-kee-UH-KO-LI)
Source: Intestines of cattle; infected people

Food Linked with the Bacteria	Prevention Measures
• Ground beef (raw and undercooked) • Contaminated produce	• Exclude food handlers who have diarrhea and have been diagnosed with a disease from the bacteria • Cook food, especially ground beef, to minimum internal temperatures
	• Purchase produce from approved, reputable suppliers
	• Prevent cross-contamination between raw meat and ready-to-eat food

Major Viruses that Cause Foodborne Illnesses

The FDA has identified two viruses that are highly contagious and can cause severe illness:

- Hepatitis A
- Norovirus

Food handlers diagnosed with an illness from hepatitis A or Norovirus must not work in an operation while they are sick.

Major Viruses That Cause Foodborne Illness

Virus: Hepatitis A (HEP-a-TI-tiss)
Source: Infected people

Food Linked with the Virus	Prevention Measures
• Ready-to-eat food • Shellfish from contaminated water	• Exclude food handlers who have been diagnosed with hepatitis A from the operation
	• Exclude food handlers who have jaundice for seven days or less from the operation
	• Wash hands
	• Avoid bare-hand contact with ready-to-eat food
	• Purchase shellfish from approved, reputable suppliers

Major Viruses That Cause Foodborne Illness

Virus: Norovirus (NOR-o-VI-rus)
Source: Infected people

Food Linked with the Virus	Prevention Measures
• Ready-to-eat food • Shellfish from contaminated water	• Exclude food handlers who are vomiting or have diarrhea and have been diagnosed with Norovirus from the operation
	• Wash hands
	• Avoid bare-hand contact with ready-to-eat food
	• Purchase shellfish from approved, reputable suppliers

Biological Toxins

Origin:

- Naturally occur in certain plants, mushrooms, and seafood

Seafood toxins:

- Produced by pathogens found on certain fish
  - Tuna, bonito, mahimahi
  - Histamine produced when fish is time-temperature abused
- Occur in certain fish that eat smaller fish that have consumed the toxin
  - Barracuda, snapper, grouper, amberjack
  - Ciguatera toxin is an example

Biological Toxins

Illness:

- Symptoms and onset times vary with illness
- People will experience illness within minutes

General symptoms:

- Diarrhea or vomiting
- Neurological symptoms
  - Tingling in extremities
  - Reversal of hot and cold sensations
- Flushing of the face and/or hives
- Difficulty breathing
- Heart palpitations

Deliberate Contamination of Food

Groups who may attempt to contaminate food:

- Terrorists or activists
- Disgruntled current or former staff
- Vendors
- Competitors

FDA defense tool:

- A.L.E.R.T.

Deliberate Contamination of Food

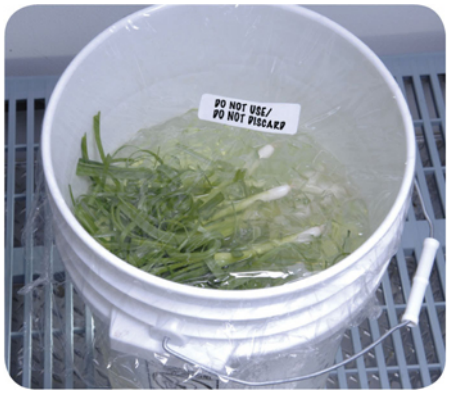
Assure	Make sure products received are from safe sources
Look	Monitor the security of products in the facility
Employees	Know who is in your facility
Reports	Keep information related to food defense accessible
Threat	Develop a plan for responding to suspicious activity or a threat to the operation

Responding to a Foodborne-Illness Outbreak

- Gather information
  - Ask the person for general contact information
  - Ask the person to identify the food eaten
  - Ask for a description of symptoms
  - Ask when the person first got sick
- Notify authorities
  - Contact the local regulatory authority if an outbreak is suspected

Responding to a Foodborne-Illness Outbreak

- Segregate product
  - Set the suspected product aside if any remains
  - Include a label with “Do Not Use” and “Do Not Discard” on it
- Document the information
  - Log information about suspected product
  - Include a product description, product date, lot number, sell-by date, and pack size



Responding to a Foodborne-Illness Outbreak

- Identify staff
  - Keep a list of food handlers scheduled at time of incident
  - Interview staff immediately
- Cooperate with authorities
  - Provide appropriate documentation
- Review procedures
  - Determine if standards are being met
  - Identify if standards are not working

Preventing Allergic Reactions

To help prevent allergic reactions, service staff should:

- Describe menu items to guests, and identify any allergens in the item.
- Suggest menu items without the allergen.
- Clearly identify the guest's order for kitchen and service staff.
- Deliver food separately to prevent cross-contact.

Avoiding Cross-Contact

When preparing food for a guest with a known allergy, kitchen staff should:

- Check recipes and food labels for the allergen
- Use cleaned and sanitized utensils
- Wash hands and change gloves
- Use separate fryers and cooking oils
- Label packages properly