# 1
# Providing Safe Food

# Providing Safe Food

**Objectives:**

By the end of this chapter, you should be able to identify the following:

- What a foodborne illness is and when a foodborne-illness outbreak has occurred

- TCS and ready-to-eat food

- The five risk factors for foodborne illness

- The populations that have a higher risk for foodborne illness

- Ways to keep food safe

- The roles of government agencies in keeping food safe

# Challenges to Food Safety

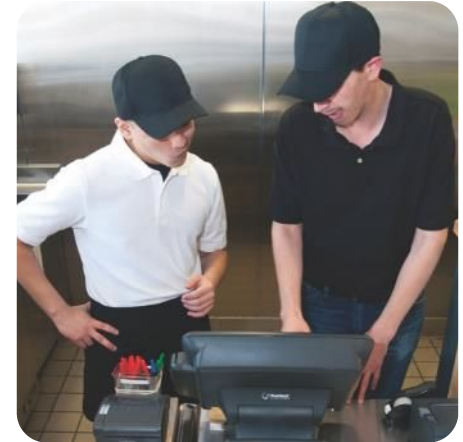**A foodborne illness is a disease transmitted to people through food.**

**An illness is considered an outbreak when:**

- Two or more people have the same symptoms after eating the same food.

- An investigation is conducted by state and local regulatory authorities.

- The outbreak is confirmed by laboratory analysis.

# Challenges to Food Safety
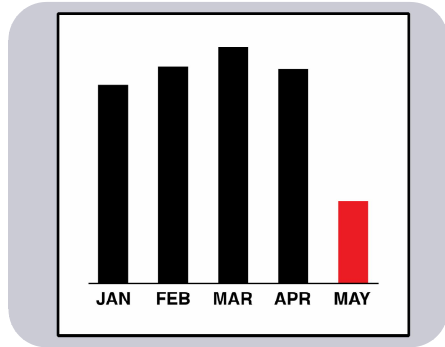
**Challenges include:**

- Time

- Language and culture

- Literacy and education

- Pathogens

- Unapproved suppliers

- High-risk customers

- Staff turnover

## Costs of a foodborne illness to an operation:

Loss of customers and sales
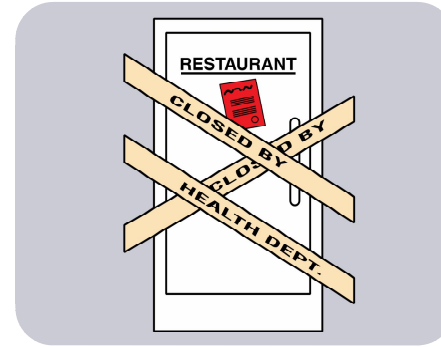
Loss of reputation
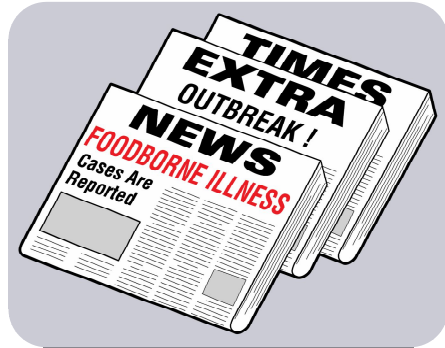
Negative media exposure

Lowered staff morale

# Costs of Foodborne Illness

## Costs of a foodborne illness to an operation:
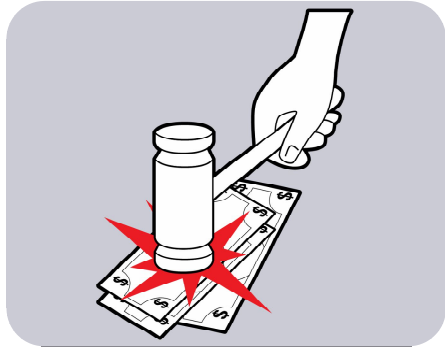
Lawsuits and legal fees
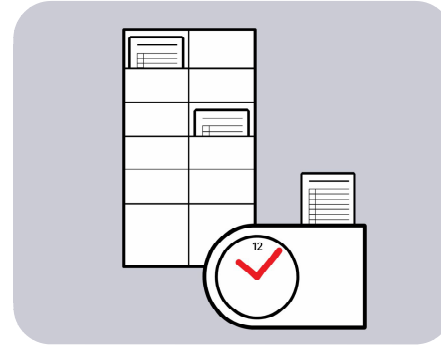
Staff missing work
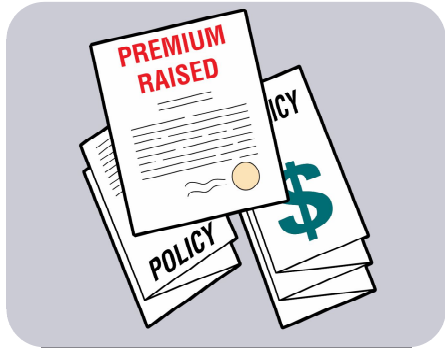
Increased insurance premiums
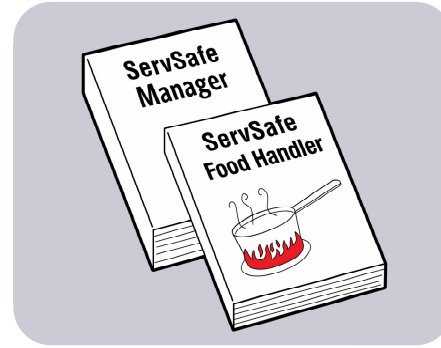
Staff retraining

# How Foodborne Illnesses Occur

**Unsafe food is the result of contamination:**

- Biological

- Chemical

- Physical
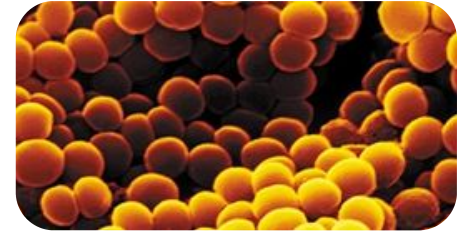
# Contaminants

**Biological contaminants:**

- Bacteria

- Viruses

- Parasites

- Fungi
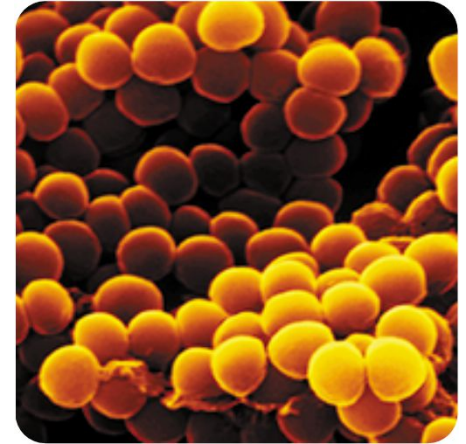
# Contaminants

**Chemical contaminants:**

- Cleaners

- Sanitizers

- Polishes

# Contaminants

**Physical hazards:**

- Metal shavings

- Staples

- Bandages

- Glass

- Dirt

- Natural objects (e.g., fish bones in a fillet)

# How Food Becomes Unsafe

**Five risk factors for foodborne illness:**

1. Purchasing food from unsafe sources.

2. Failing to cook food correctly.

3. Holding food at incorrect temperatures.

4. Using contaminated equipment.

5. Practicing poor personal hygiene.

# How Food Becomes Unsafe



Time-temperature abuse



Cross-contamination



Poor personal hygiene



Poor cleaning and sanitizing

# How Food Becomes Unsafe

## Time-temperature abuse:

- When food has stayed too long at temperatures good for pathogen growth

# How Food Becomes Unsafe

**Food has been time-temperature abused when:**

- It has not been held or stored at the correct temperature.

- It is not cooked or reheated enough to kill pathogens.

- It is not cooled correctly.

# How Food Becomes Unsafe

## Cross-contamination:

- When pathogens are transferred from one surface or food to another

# How Food Becomes Unsafe

**Cross-contamination can cause a foodborne illness when:**

- Contaminated ingredients are added to food that receives no further cooking

- Ready-to-eat food touches contaminated surfaces.

- Contaminated food touches or drips fluids onto cooked or ready-to-eat food.

- A food handler touches contaminated food and then touches ready-to-eat food.

- Contaminated wiping cloths touch food-contact surfaces.

# How Food Becomes Unsafe

**Poor personal hygiene can cause a foodborne illness when food handlers:**

- Fail to wash their hands correctly after using the restroom

- Cough or sneeze on food

- Touch or scratch wounds and then touch food

- Work while sick

# How Food Becomes Unsafe

**Poor cleaning and sanitizing can spread pathogens from equipment to food when:**



- Equipment and utensils are not washed, rinsed, and sanitized between uses.

- Food contact surfaces are wiped clean instead of being washed, rinsed, and sanitized.

- Wiping cloths are not stored in a sanitizer solution between uses.

- Sanitizing solutions are not at the required levels.

# Food Most Likely to Become Unsafe

**The two types of food that are most likely to become unsafe:**

- TCS food

- Ready-to-eat food

# Food Most Likely to Become Unsafe

## TCS food:

- Food requiring time and temperature control to limit pathogen growth—"time and temperature control for safety"
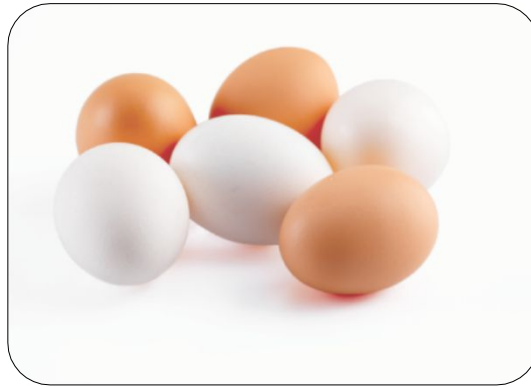
**TCS food:**

# Food Most Likely to Become Unsafe

**TCS food:**
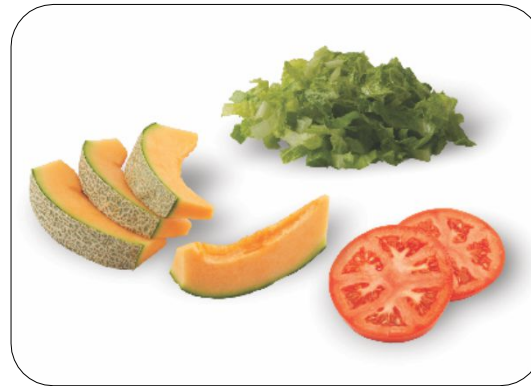
# Food Most Likely to Become Unsafe

**Ready-to-eat food is food that can be eaten without further:**

- Preparation

- Washing

- Cooking

**Ready-to-eat food includes:**

- Cooked food

- Washed fruit and vegetables

- Deli meat

- Bakery items

- Sugar, spices, and seasonings

# Populations at High Risk for Foodborne Illnesses

**These people have a higher risk of getting a foodborne illness:**

- Elderly people

- Preschool-age children

- People with compromised immune systems

# Keeping Food Safe

**Focus on these measures:**

- Purchasing from approved, reputable suppliers

- Controlling time and temperature

- Preventing cross-contamination

- Practicing personal hygiene

- Cleaning and sanitizing

# Keeping Food Safe

**Training and monitoring:**

- Train staff to follow food safety procedures.

- Provide initial and ongoing training.

- Provide all staff with general food safety knowledge.

- Provide job-specific, food safety training.

- Retrain staff regularly.

- Document training.

# Keeping Food Safe

**Training and monitoring:**

- Monitor staff to make sure they are following procedures.

- If a task is done incorrectly, take corrective action immediately.

- Retrain an employee or multiple employees if they often complete a task incorrectly.

# Keeping Food Safe

**The person in charge must:**

- Be a Certified Food Protection Manager

- Be onsite during operating hours

# Keeping Food Safe

**The person in charge may not need to be onsite at all times if:**

- The operation poses minimal risk for causing a foodborne illness
  - Based on the kind of operation it is
  - Based on the type of food served or sold
    - Cashier-less markets and convenience stores are examples

# Keeping Food Safe

**To become a Certified Food Protection Manager:**

- You must pass a test from an accredited program

- The program must be accredited by an agency approved by a Conference for Food Protection

- Completing this course and passing the ServSafe exam meets this requirement

# Keeping Food Safe

**Why is it important to be a Certified Food Protection Manager:**

- CDC study suggests that it
  - reduces the risk of foodborne illness.
  - was a distinguishing factor between restaurants that experienced an outbreak and those that had not.
- FDA studies suggest more effective control of risk factors for foodborne illness

# Keeping Food Safe

## Government agencies:

- The Food and Drug Administration (FDA)

- U.S. Department of Agriculture (USDA)

- Centers for Disease Control and Prevention (CDC)

- U.S. Public Health Service (PHS)

- State and local regulatory authorities

# Keeping Food Safe

**Regulatory authority responsibilities include:**

- Inspecting operations

- Enforcing regulations

- Investigating complaints and illnesses

- Issuing licenses and permits

- Approving construction

- Reviewing and approving HACCP plans

# 2
# Forms of Contamination

# Forms of Contamination

## Objectives:

By the end of this chapter, you should be able to identify the following:

- Biological, chemical, and physical contaminants and ways to prevent food from being contaminated by them

- How to prevent the deliberate contamination of food

- The correct response to a foodborne-illness outbreak

- The most common food allergens and how to prevent exposure to food allergens

# How Contamination Happens

**Contamination:**

- Presence of harmful substances in food

**Contaminants can:**

- Be biological, chemical, or physical

- Cause foodborne illness

- Result in physical injury

# How Contamination Happens

**Contaminants come from a variety of places:**

- Animals we use for food

- Air, contaminated water, and dirt

- Chemicals we use in our operations

- Naturally occurring, such as fish bones

- People

  - Deliberately

  - Accidentally

# How Contamination Happens

**People can contaminate food when:**

- They don't 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.

# How Contamination Happens

**Simple mistakes can cause contamination:**

- Allowing ready-to-eat food to touch a surface that contacted raw meat, seafood, or poultry

- Storing food or cleaning products incorrectly

- Failing to spot signs of pests

# Biological Contamination

**Microorganism:**

- Small, living organism that can be seen only with a microscope

**Pathogen:**

- Harmful microorganism

- Make people sick when eaten or produce toxins that cause illness

**Toxin:**

- Poison

# Biological Contamination

**Four types of pathogens can contaminate food and cause foodborne illness:**
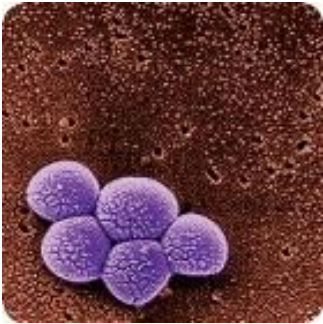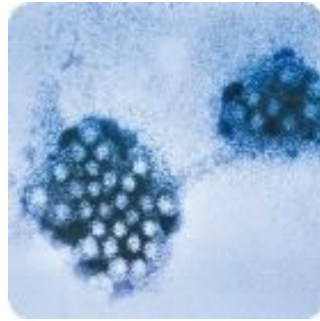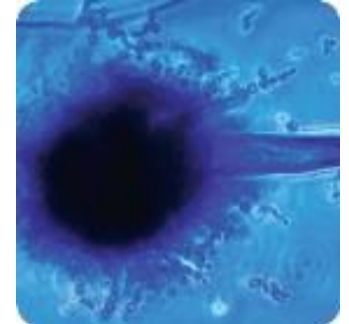
| Bacteria | Viruses | Parasites | Fungi |

# Biological Contamination

**The Big Six Pathogens:**

- *Shigella* spp.

- *Salmonella* Typhi

- Nontyphoidal *Salmonella* (NTS)

- Shiga toxin-producing *Escherichia coli* (STEC), also known as *E. coli*

- Hepatitis A

- Norovirus

# Symptoms of Foodborne Illness

**Common symptoms of foodborne illness:**

- Diarrhea

- Vomiting

- Fever

- Nausea

- Abdominal cramps

- Jaundice—a yellowing of the skin and eyes



**Onset times:**

- Depend on the type of foodborne illness

- Can range from 30 minutes to six weeks

# Bacteria: Basic Characteristics

**Location:**

- Found almost everywhere

**Detection:**

- Cannot be seen, smelled, or tasted

**Growth:**

- Grow rapidly if FAT TOM conditions are correct

**Prevention:**

- Control time and temperature
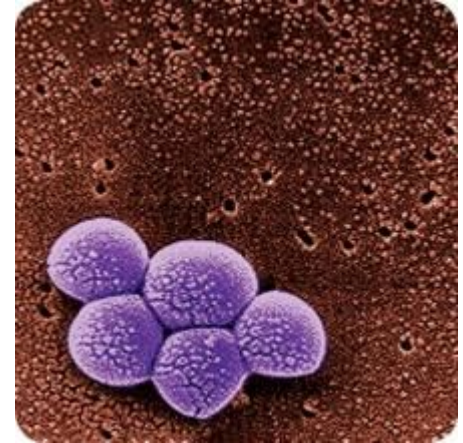
# Bacteria: Conditions for Growth
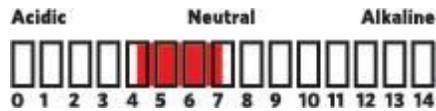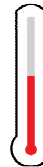


**Food**

**Acidity**

**Temperature**

**Time**

**Oxygen**

**Moisture**

# Bacteria: Conditions for Growth

**Food:**

- Most bacteria need nutrients to survive.

- TCS food supports the growth of bacteria better than other types of food.

**F**
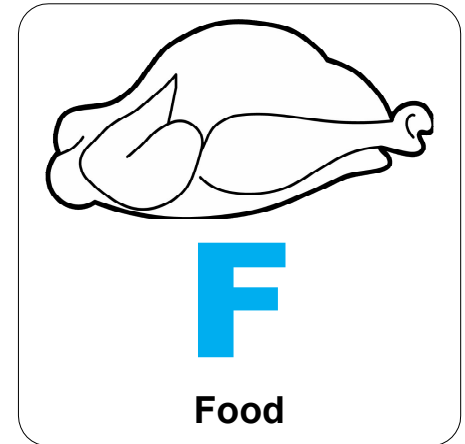
**Food**

# Bacteria: Conditions for Growth

## Acidity:

- Bacteria grow best in food that contains little or no acid.



Acidity
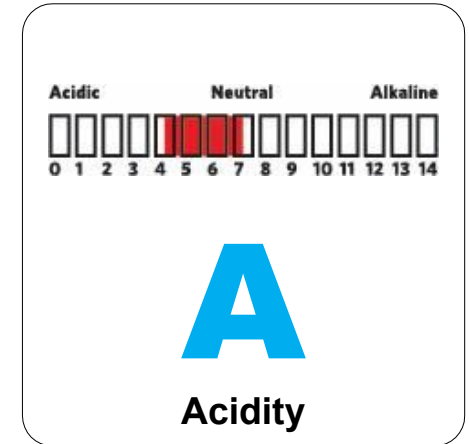
# Bacteria: Conditions for Growth

## Temperature:

- Bacteria grow rapidly between 41˚F and 135˚F (5˚C and 57˚C).

  o This range is known as the temperature danger zone.

- Bacteria growth is limited when food is held above or below the temperature danger zone.
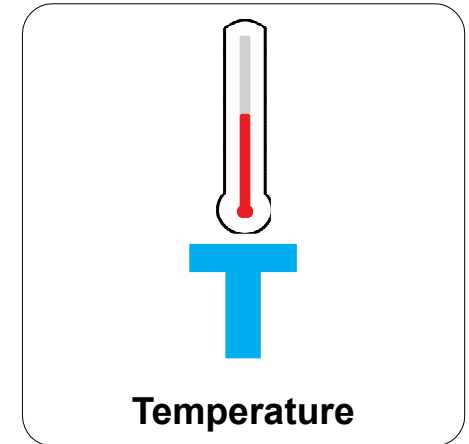
**Temperature**

# Bacteria: Conditions for Growth

## Time:

- Bacteria need time to grow.

- The more time bacteria spend in the temperature danger zone, the greater chance they have to grow to unsafe levels.

**Time**
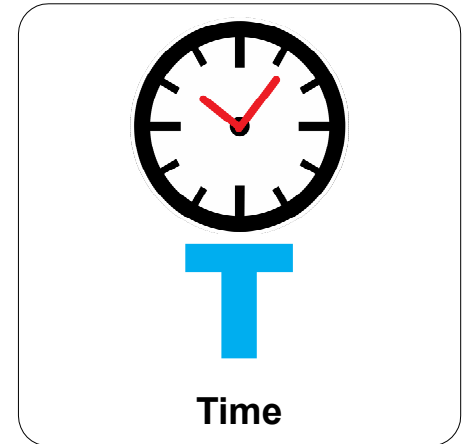
# Bacteria: Conditions for Growth

## Oxygen:

- Some bacteria need oxygen to grow.

- Other bacteria grow when oxygen isn't there.

Oxygen
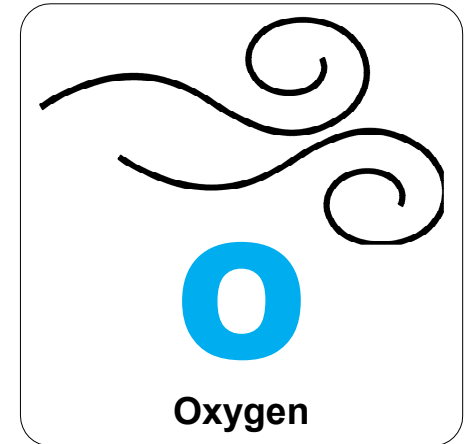
## Moisture:

- Bacteria grow well in food with high levels of moisture.

- $a_w$ = water activity; the amount of moisture available in food for bacterial growth.

- $a_w$ scale ranges from 0.0 to 1.0.

- Water has a water activity of 1.0.

**Moisture**
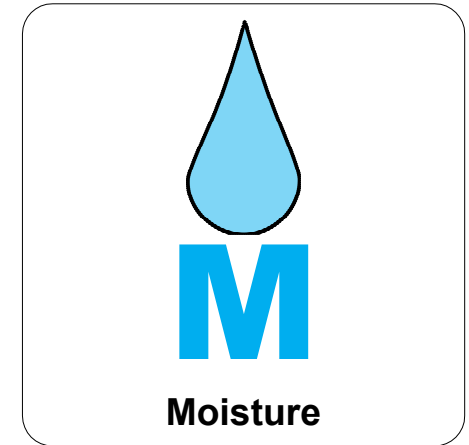
# Controlling FAT TOM Conditions

## The conditions you can control:

● Temperature

○ Keep TCS food out of the temperature danger zone.

● Time

○ Limit how long TCS food spends in the temperature danger zone.

# 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 *E. coli* (STEC)

**Food handlers with illnesses from these bacteria must not work in a foodservice operation while they are sick.**

# 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<br>• Beverages | • Exclude from the operation food handlers diagnosed with an illness caused by *Salmonella* Typhi.<br>• Wash hands.<br>• Cook food to minimum internal temperatures. |

# Major Bacteria That Cause Foodborne Illness

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

| Food Linked with the Bacteria | Prevention Measures |
|---|---|
| • Poultry and eggs<br>• Meat<br>• Milk and dairy products<br>• Produce | • Cook poultry and eggs to minimum internal temperatures.<br>• Prevent cross-contamination between poultry and ready-to-eat food.<br>• Exclude from the operation food handlers who are vomiting or have diarrhea and have been diagnosed with an illness caused by nontyphoidal *Salmonella.* |

# Major Bacteria That Cause Foodborne Illness



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

| Food Linked with the Bacteria | Prevention Measures |
|---|---|
| • Food easily contaminated by hands, such as salads containing TCS food (potato, tuna, shrimp, macaroni, chicken)<br>• Food that has made contact with contaminated water, such as produce | • Exclude from the operation food handlers who have diarrhea and have been diagnosed with an illness caused by *Shigella* spp.<br>• Wash hands.<br>• 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) (STEC), also known as *E. coli*

**Source:** Intestines of cattle; infected people

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

# Viruses: Basic Characteristics

## Location:

- Carried by human beings and animals

  - Require a living host to grow

  - Do not grow in food

  - Can be transferred through food and remain infectious in food
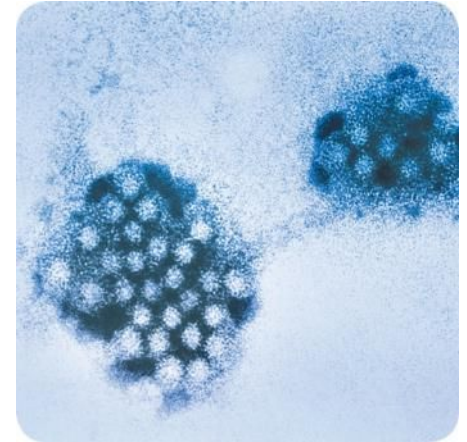
## Sources:

- Food, water, or any contaminated surface
- Typically occur through fecal-oral routes

# Viruses: Basic Characteristics

## Destruction:

- Some, such as Hepatitis A, are not destroyed by normal cooking temperatures

- Good personal hygiene must be practiced when handling food and food-contact surfaces

- Quick removal and cleanup of vomit is important
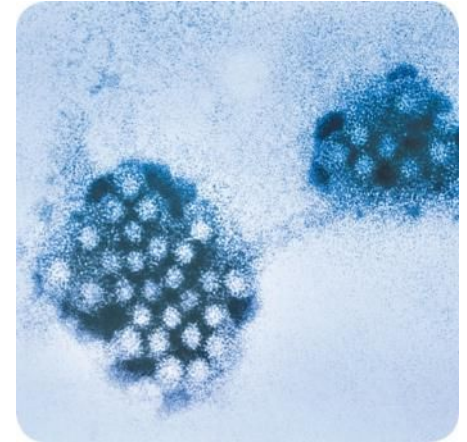
# Major Viruses That Cause Foodborne Illnesses

**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:** **Human feces**

## Food Linked with the Virus

- Ready-to-eat food
- Shellfish from contaminated water

## Prevention Measures

- Exclude from the operation staff who have been diagnosed with Hepatitis A.
- Exclude from the operation staff who have had jaundice for seven days or less.
- 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:** Human feces

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

# Parasites: Basic characteristics

**Location:**

- Require a host to live and reproduce

**Source:**

- Seafood, wild game, and food processed with contaminated water, such as produce

# Parasites: Basic characteristics

**Prevention:**

- Purchase food from approved, reputable suppliers.

- Cook food to required minimum internal temperatures.

- Fish that will be served raw or undercooked must be correctly frozen by the manufacturer.

**Yeasts, molds, and mushrooms:**

- Some molds and mushrooms produce toxins.

- Throw out moldy food, unless mold is a natural part of the food.

- Purchase mushrooms 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 is produced when fish is time-temperature abused.

- Occur in certain fish that eat smaller fish that have consumed a 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

  o Tingling in extremities

  o Reversal of hot and cold sensations

- Flushing of the face

- Difficulty breathing

- Burning in the mouth

- Heart palpitations

- Hives

# Biological Toxins

## Prevention:

- Purchase plants, mushrooms, and seafood from approved, reputable suppliers.

- Control time and temperature when handling raw fish.

# Chemical Contaminants

## Sources:

- Cleaners, sanitizers, polishes, machine lubricants, and pesticides

- Deodorizers, first-aid products, and health and beauty products

  o Hand lotions, hairsprays, etc.

- Certain types of kitchenware and equipment

  o Items made from pewter, copper, zinc, and some types of painted pottery

# Chemical Contaminants

**Symptoms:**

- Vary depending on chemical consumed.

- Most illnesses occur within minutes.

- Vomiting and diarrhea are typical.

# Chemical Contaminants

## Prevention:

- Use chemicals approved for use in foodservice operations.

- Purchase chemicals from approved, reputable suppliers.

- Store chemicals away from prep areas, food-storage areas, and service areas.

  - Separate chemicals from food and food-contact surfaces by spacing and partitioning.

- NEVER store chemicals above food or food-contact surfaces.

# Chemical Contaminants

**Prevention:**

- Use chemicals for their intended use and follow manufacturer's directions.

- Only handle food with equipment and utensils approved for foodservice use.

- Make sure the manufacturer's labels on original chemical containers are readable.

- Follow the manufacturer's directions and local regulatory requirements when throwing out chemicals.

**Sources:**

- Common objects that get into food
  - Metal shavings from cans
  - Wood
  - Fingernails
  - Staples
  - Bandages
  - Glass
  - Jewelry
  - Dirt
- Naturally occurring objects such as fruit pits and bones

# Physical Contaminants

**Symptoms:**

- Mild to fatal injuries

- Cuts, dental damage, and choking

- Bleeding and pain

**Prevention:**

- Purchase food from approved, reputable suppliers.

- Closely inspect food received.

- Take steps to prevent physical contamination, including practicing good personal hygiene.

# Deliberate Contamination of Food

**Groups who may attempt to contaminate food:**

- Terrorists

- 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.

- Notify authorities.

- Segregate product.

- Document information.

- Identify staff.

- Cooperate with authorities.

- Review procedures.

# 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 the time of the incident.
  - Interview staff immediately.
- Cooperate with authorities:
  - Provide appropriate documentation.
- Review procedures:
  - Determine if standards are being met.
  - Identify if standards are not working.

# Food Allergens

**Food allergen:**

- A protein in a food or ingredient some people are sensitive to.

- These proteins occur naturally.

- When an enough of an allergen is eaten, an allergic reaction can occur.

# Food Allergens

**Allergy symptoms:**

- Nausea

- Wheezing or shortness of breath

- Hives or itchy rashes

- Swelling in various parts of the body, including the face, eyes, hands, or feet

- Vomiting and/or diarrhea

- Abdominal pain

- Itchy throat

# Food Allergens

**Allergic reactions:**

- Symptoms can become serious quickly.

- A severe reaction, called anaphylaxis, can lead to death.

# Food Allergens

## Common Food Allergens—The Big Eight



Milk



Soy



Eggs



Wheat



Fish, such as bass, flounder, and cod



Crustacean shellfish, such as crab, lobster, and shrimp



Peanuts



Tree nuts, such as walnuts and pecans

# Preventing Allergic Reactions

## Food labels:

- Check food labels for allergens.

# Preventing Allergic Reactions

## Service staff:

- Describe menu items and preparation to guests.

- 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.
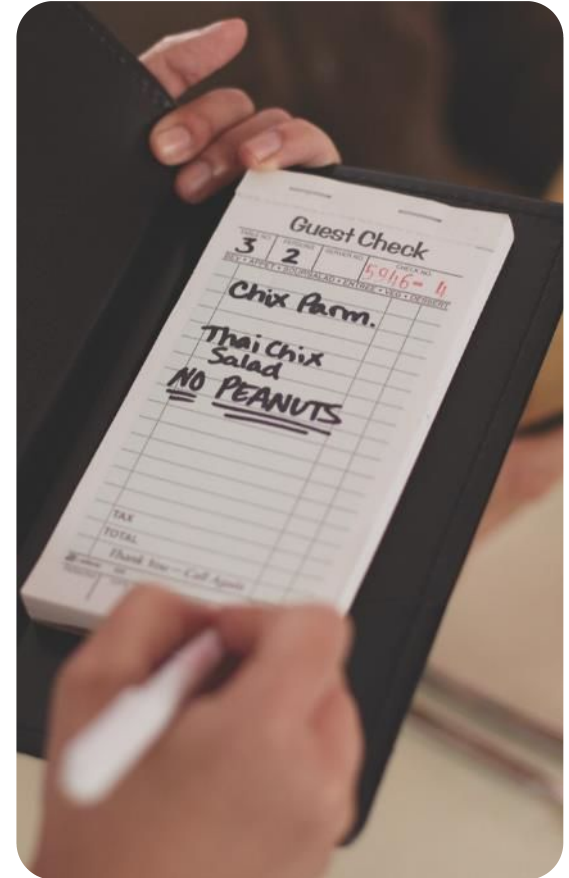
# Preventing Allergic Reactions

## Kitchen staff:

- Avoid cross-contact

  - Do NOT cook different types of food in the same fryer oil.

  - Do NOT put food on surfaces that have touched allergens.

# Preventing Allergic Reactions

## How to avoid cross-contact:

- Check recipes and ingredient labels.

- Wash, rinse, and sanitize cookware, utensils, and equipment.

- Make sure the allergen doesn't touch anything for customers with food allergies.

- Wash your hands and change gloves before prepping food.

- Use separate fryers and cooking oils for guests with food allergies.

- Label food packaged on-site for retail use.

# 3

# The Safe Food Handler

**ServSafe**
National Restaurant Association

# The Safe Food Handler

## Objectives:

By the end of this chapter, you should be able to identify the following:

- How to avoid behaviors that can contaminate food

- How to wash and care for hands

- The correct way to dress for work and handle work clothes

- Where staff can eat, drink, smoke, and chew gum or tobacco to minimize contamination

- How to prevent staff who may be carrying pathogens from working with or around food or from working in the operation

# How Food Handlers Can Contaminate Food

**Situations that can lead to contaminating food:**

- Have a foodborne illness

- Have wounds or boils that contain a pathogen

- Sneeze or cough

- Have contact with a person who is sick

- Use the restroom and do not wash their hands

- Have symptoms such as diarrhea, vomiting, or jaundice—a yellowing of the eyes or skin

**Actions that can contaminate food:**

A. Scratching the scalp

B. Running fingers through hair

C. Wiping or touching the nose

D. Rubbing an ear

E. Touching a pimple or infected wound/boil

F. Wearing and touching a dirty uniform

G. Coughing or sneezing into the hand

H. Spitting in the operation

# Managing a Personal Hygiene Program

**Managers must focus on the following:**

- Creating personal hygiene policies

- Training food handlers on personal hygiene policies and retraining them regularly

- Modeling correct behavior at all times

- Supervising food safety practices

- Revising personal hygiene policies when laws or science change

# Handwashing

## Where to wash hands:

- Wash hands in a sink designated for handwashing.

- NEVER wash hands in sinks designated for food prep or dishwashing or sinks used for discarding waste water.

# Handwashing

## How to wash hands (should take at least 20 seconds):



1. **Wet hands and arms.** Use running warm water.



2. **Apply soap.** Apply enough to build up a good lather. Follow the manufacturer's recommendations.



3. **Scrub hands and arms vigorously for 10 to 15 seconds.** Clean fingertips, under fingernails, and between fingers.



4. **Rinse hands and arms thoroughly.** Use running warm water.



5. **Dry hands and arms.** Use a single-use paper towel or hand dryer.

## Avoid contaminating clean hands:

● Consider using a paper towel to turn off the faucet and to open the door.

# Handwashing

**When to Wash Hands**

**Food handlers must wash their hands *before*:**

- Preparing food

- Working with clean equipment and utensils

- Putting on single-use gloves

# Handwashing

**When to Wash Hands**

**Food handlers must wash their hands *after*:**

- Using the restroom

- Touching the body or clothing

- Coughing, sneezing, blowing their nose, or using a handkerchief or tissue

- Eating, drinking, smoking, or chewing gum or tobacco

- Handling soiled items

- Handling raw meat, seafood, or poultry

- Taking out garbage

# Handwashing

**When to Wash Hands**

**Food handlers must wash their hands *after*:**

- Handling service or aquatic animals

- Handling chemicals that might affect food safety

- Changing tasks (before beginning new task).

- Leaving and returning to the kitchen/prep area.

- Handling money.

- Using electronic devices

- Touching anything that may contaminate hands

# Handwashing

## Corrective Action

**If food handlers have touched food or food-contact surfaces with unclean hands:**

- Dispose of the contaminated food.

- Clean potentially contaminated equipment and utensils.

- Retrain or coach food handlers who are not following proper handwashing procedures if necessary.

# Handwashing

**Hand antiseptics:**

- Liquids or gels used to lower the number of pathogens on skin

**If used, hand antiseptics:**

- Must comply with the CFR and FDA standards

- Should be used only *after* handwashing

- Must NEVER be used in place of handwashing

- Should be allowed to dry before touching food or equipment

## Requirements for food handlers:



Keep fingernails short and clean.



Do NOT wear false nails.
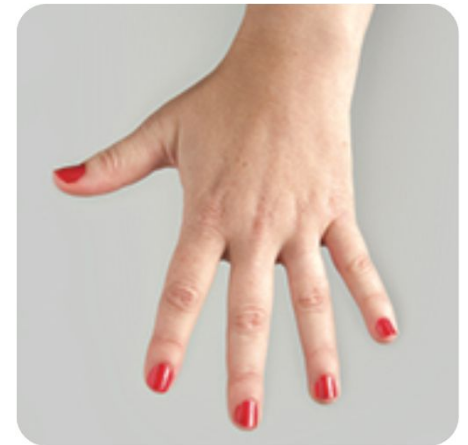


Do NOT wear nail polish.

# Infected Wounds or Cuts

**Infected wounds, cuts, or boils:**

- Contain pus

- Must be covered if they are open or draining

**How a wound is covered depends on where it is located:**

- Hand, finger, or wrist—Cover wounds with an impermeable cover (e.g., bandage or finger cot) and then a single-use glove.

- Arm—Cover wounds with an impermeable cover, such as a bandage.

- Other part of the body—Cover wounds with a dry, tight-fitting bandage.

**Single-use gloves:**

- Must NEVER be used in place of handwashing

- Should be used when handling ready-to-eat food

  ○ Except when washing produce

  ○ Except when handling ready-to-eat ingredients for a dish that will be cooked to the correct internal temperature

# Single-Use Gloves

**Which gloves to buy:**

- Approved gloves

- Disposable gloves

- Multiple sizes

- Latex alternatives

# Single-Use Gloves

## How to use gloves:

- Wash hands before putting on gloves when starting a new task.

- Select the correct glove size.

- Hold gloves by the edge when putting them on.

- Once gloves are on, check for rips or tears.

- NEVER blow into gloves.

- NEVER roll gloves to make them easier to put on.

- NEVER wash and reuse gloves.

# Single-Use Gloves

**When to change gloves:**

- As soon as they become dirty or torn.

- Before beginning a different task.

- After an interruption, such as taking a phone call.

- After handling raw meat, seafood, or poultry and before handling ready-to-eat food.

- After four hours of continuous use.

# Bare-Hand Contact with Ready-to-Eat Food

**NEVER handle ready-to-eat food with bare hands when you primarily serve a high-risk population.**

**Avoid bare-hand contact with ready-to-eat food *unless*:**



- The food is an ingredient in a dish that does *not* contain raw meat, seafood, or poultry *and*

  - The dish will be cooked to at least 145˚F (63˚C).

- The food is an ingredient in a dish containing raw meat, seafood, or poultry *and*

  - The dish will be cooked to the required minimum internal temperature of the raw item(s).

# Personal Hygiene Practices

**Food handlers must:**

- Follow a personal hygiene program.

- Shower or bathe before work.

# Work Attire

**Food handers must use hair restraints:**

- Wear a clean hat or other hair restraint when in a food-prep area.

- Do NOT wear hair accessories that could become physical contaminants.

- Do NOT wear false eyelashes.

- Wear a beard restraint to cover facial hair.

# Work Attire

**Food handers must wear clean clothing:**

- Wear clean clothing daily.

- Change uniforms, including aprons, when they are soiled.

- Change into work clothes at work.

- Store street clothing and personal belongings in designated areas.

- Keep dirty clothing away from food and prep areas.

# Work Attire

**Food handers must handle aprons correctly:**

- Remove aprons when leaving prep areas.

- NEVER wipe your hands on your apron.

# Work Attire

**Food handers must not wear jewelry:**

- Remove jewelry from hands and arms before prepping food or when working around prep areas:

  - Rings, except for a plain band

  - Bracelets, including medical bracelets

  - Watches

- Remove other jewelry, as required by your company.

# Eating, Drinking, Smoking, and Chewing Gum or Tobacco

**Food handlers may only eat, drink, smoke, or chew gum or tobacco in designated areas.**

**Food handlers must NEVER eat, drink, smoke, or chew gum or tobacco when:**

- Prepping or serving food

- Working in prep areas

- Working in areas used to clean utensils and equipment

**Exception:** Employees can drink from a correctly covered container if they are careful to prevent contamination of their hands, the container, and exposed food, utensils, and equipment.

# Policies for Reporting Health Issues

- Tell staff to let you know when they are sick.

- Be prepared to show proof that you have done this, such as:

    o  Signed statements in which staff have agreed to report illness

    o  Documentation showing staff have completed training, which includes information on the importance of reporting illness

    o  Posted signs or pocket cards that remind staff to notify managers when they are sick

# Reporting Illness

**Staff must report illnesses:**

● Before they come to work.

● If they get sick while working

● If they—or someone they live with—has been diagnosed with an illness from one of these pathogens:

- o Norovirus

- o Hepatitis A

- o *Shigella* spp.

- o Shiga-toxin producing *E. coli* (STEC)

- o *Salmonella* Typhi

- o Nontyphoidal *Salmonella*
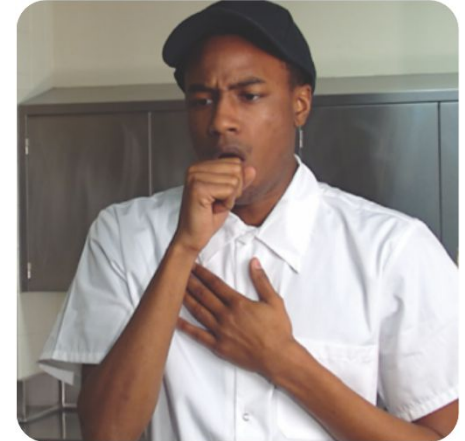
# Reporting Illness

**When food handlers are sick, you may need to:**

- Restrict them from working with exposed food, utensils, and equipment.

- Exclude them from coming into the operation. This is especially important if they have these symptoms:

    - Vomiting

    - Diarrhea

    - Jaundice (a yellowing of the skin or eyes)

    - Sore throat with fever

    - Infected wound or boil that is open or draining (unless properly covered)

# Watching for Staff Illnesses

**Watch for these signs of illness:**

- Vomiting

- Excessive trips to the bathroom

- Yellowing of the skin, eyes, and fingernails

- Cold sweats or chills (indicating a fever)

- Persistent nasal discharge and sneezing

# Restricting or Excluding Staff for Medical Conditions

| If | Then |
|---|---|
| The food handler has an infected wound or boil that is not properly covered. | **Restrict** the food handler from working with exposed food, utensils, and equipment. |
| The food handler has a sore throat with a fever. | ● Restrict the food handler from working with exposed food, utensils, and equipment.<br><br>● Exclude the food handler from the operation if you primarily serve a high-risk population.<br><br>● A written release from a medical practitioner is required before returning to work. |

# Restricting or Excluding Staff for Medical Conditions

| If | Then |
|---|---|
| The food handler<br><br>● Has persistent sneezing, coughing, or a runny nose<br><br>● With discharges from the eyes, nose, or mouth | **Restrict** the food handler from working with exposed food, utensils, and equipment. |

# Restricting or Excluding Staff for Medical Conditions

| If | Then |
|---|---|
| The food handler has at least one of these symptoms from an infectious condition:<br><br>● Vomiting<br><br>● Diarrhea<br><br>● Jaundice (yellow skin or eyes) | **Exclude** the food handler from the operation.<br><br>**Vomiting and diarrhea**<br>Before returning to work, food handlers must have either:<br>● Had no symptoms for at least 24 hours.<br>Or<br>● A written release from a medical practitioner.<br><br>**Jaundice**<br>Report food handlers to the regulatory authority. Exclude food handlers who have had jaundice for seven days or less.<br><br>Before returning to work, food handlers must have both:<br>● A written release from a medical practitioner<br>And<br>● Approval from the regulatory authority |

# Restricting or Excluding Staff for Medical Conditions

| If | Then |
|---|---|
| The food handler is vomiting or has diarrhea and has been diagnosed with an illness caused by one of these pathogens:<br><br>● Norovirus<br><br>● *Shigella* spp.<br><br>● Nontyphoidal *Salmonella*<br><br>● Shiga toxin-producing *E. coli* (STEC)<br><br>The food handler has been diagnosed with an illness caused by one of these pathogens:<br><br>● Hepatitis A<br><br>● *Salmonella* Typhi | ● **Exclude** the food handler from the operation.<br><br>● **Report** the situation to the regulatory authority.<br><br>● Work with the medical practitioner and the local regulatory authority. |

**4**

**The Flow of Food:
An Introduction**

ServSafe
National Restaurant Association

# The Flow of Food: An Introduction

**Objectives:**

By the end of this chapter, you should be able to identify the following:

- How to prevent cross-contamination

- How to prevent time-temperature abuse

- How to use and maintain thermometers correctly

# The Flow of Food

## The flow of food:

The path that food takes through your operation

## To keep food safe throughout the flow of food:

- Prevent cross-contamination.

- Prevent time-temperature abuse.
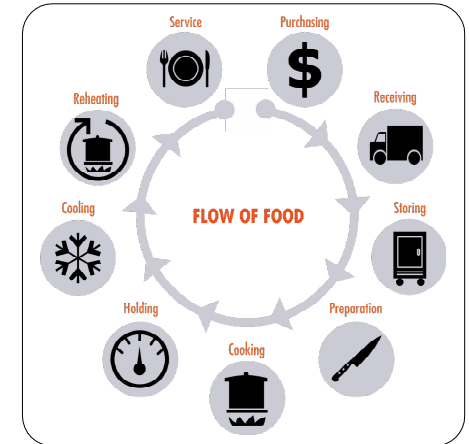
# Preventing Cross-Contamination

## Separate equipment:

- Use separate equipment for raw and ready-to-eat food.



## Clean and sanitize:

- Clean and sanitize all work surfaces, equipment, and utensils before and after each task.

# Preventing Cross-Contamination

**Prep raw and ready-to-eat food at different times:**

- If using the same prep table, prep raw meat, fish, and poultry at a different time than ready-to-eat food.

- When possible, prep ready-to-eat food before raw food.

# Preventing Cross-Contamination



**Prep raw and ready-to-eat food at different times:**

- Separate raw meat, poultry, and seafood from unwashed and ready-to-eat fruits and vegetables.

**Buy prepared food:**

- Buy food items that don't require much prepping or handling.

# Preventing Time-Temperature Abuse

**Time-temperature control:**

- Food held in the range of 41˚F and 135˚F (5˚C and 57˚C) has been time-temperature abused.

- Food is being temperature abused whenever it is handled in the following ways:

  ○ Cooked to the wrong internal temperature

  ○ Held at the wrong temperature

  ○ Cooled or reheated incorrectly
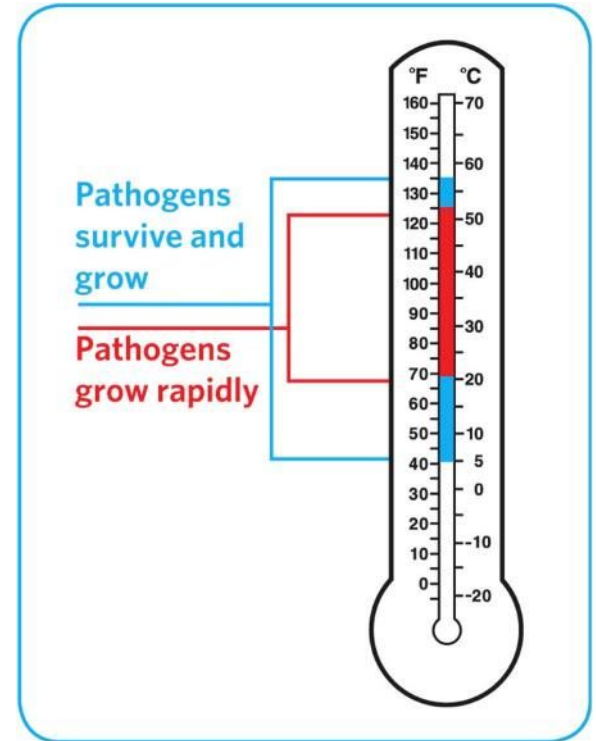
# Preventing Time-Temperature Abuse

**Avoid time-temperature abuse:**

- Monitor time and temperature.

- Make sure the correct kinds of thermometers are available.

- Regularly record temperatures and the times they are taken.

- Minimize the time that food spends in the temperature danger zone.

- Take corrective actions if time-temperature standards are not met.

# Monitoring Time and Temperature

## Bimetallic stemmed thermometer

- Measures temperature through a metal stem

- Has a sensing area from the tip to the dimple

  o The entire sensing area must be inserted into the food.

- Has a calibration nut to keep the thermometer accurate



Indicator Head

Indicator nut

Stem

Dimple
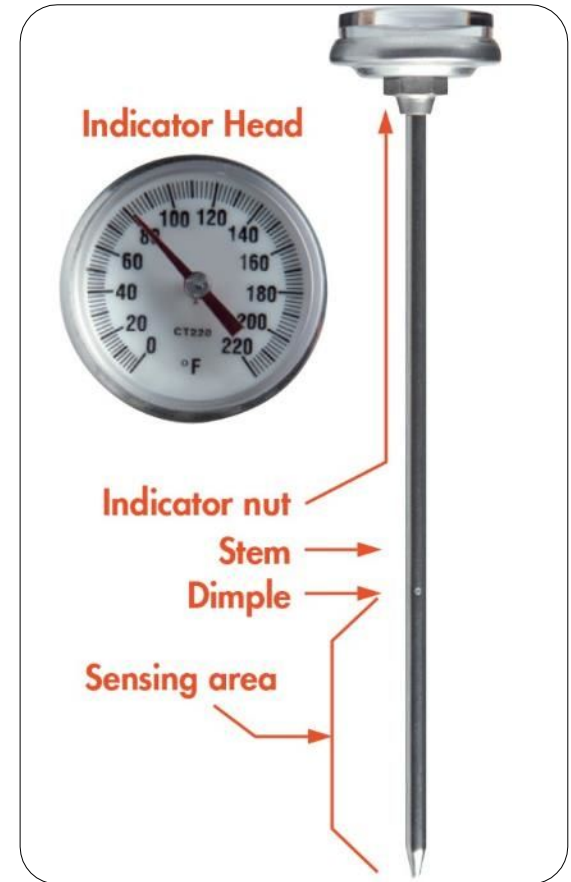
Sensing area

# Monitoring Time and Temperature

**Thermocouples and thermistors:**

- Measure temperature through a metal probe

- Display temperatures digitally

- Have a sensing area on the tip of their probe

- Come with interchangeable probes:

  - Immersion probe

  - Surface probe

  - Penetration probe

  - Air probe

# Monitoring Time and Temperature

## Infrared (laser) thermometers:

- Used to measure the surface temperature of food and equipment.

- Hold as close to the food or equipment as possible.

- Remove anything between the thermometer and the food, food package, or equipment.

- Follow manufacturers' guidelines.

# Monitoring Time and Temperature

**Maximum registering thermometer:**

- Indicates the highest temperature reached during use

- Used where temperature readings cannot be continuously observed

**Time-temperature indicators (TTI):**

- Monitor both time and temperature

- Are attached to packages by the supplier

- A color change appears on the device when time-temperature abuse has occurred

# General Thermometer Guidelines

**When using thermometers:**



- Wash, rinse, sanitize, and air-dry thermometers before and after using them.

- Calibrate them at these times:

  o After they have been bumped or dropped

  o After they have been exposed to extreme temperature changes

  o Before deliveries arrive

  o Before each shift

# General Thermometer Guidelines

## When using thermometers:

- Make sure they are accurate:

    o  If used to check food, thermometers must be accurate to +/- 2˚F or +/- 1˚C.

    o  If used to check air temperature, thermometers must be accurate to +/- 3˚F or +/- 1.5˚C.

- Only use glass thermometers if they are enclosed in a shatterproof casing.

- Insert the thermometer stem or probe into the thickest part of the food.

- Take more than one reading in different spots.

- Wait for the thermometer reading to steady.

# Calibrating Thermometers

**Ice-point method:**



1. Fill a large container with ice, and add tap water.



2. Submerge the sensing area, and wait 30 seconds.



3. Adjust the thermometer so it reads 32ºF (0ºC).

**5**
**The Flow of Food:**
**Purchasing,**
**Receiving,**
**and Storage**

ServSafe
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# The Flow of Food: Purchasing, Receiving, and Storage

**Objectives:**

By the end of this chapter, you should be able to identify the following:

- What is an approved, reputable supplier

- Criteria for accepting or rejecting food during receiving

- How to label and date food

- How to store food and nonfood items to prevent time-temperature abuse and contamination

# General Purchasing Principles

**Purchase food from approved, reputable suppliers:**

- They have been inspected.

- They meet all applicable local, state, and federal laws.

**Arrange deliveries so they arrive:**

- When staff has enough time to do inspections.

- When they can be correctly received.

# Receiving and Inspecting

## General principles

- Make specific staff responsible for receiving:

  - Train them to follow food safety guidelines.

  - Provide them with the correct tools.

- Have enough trained staff available to receive food promptly:

  - Inspect deliveries immediately upon receipt.

  - Inspect delivery trucks for signs of contamination.

  - Visually check food items and check temperatures.

- Store items promptly after receiving.

# Receiving and Inspecting

**Key drop deliveries:**

- Supplier is given after-hours access to the operation to make deliveries.

- Staff must inspect the deliveries upon arrival at the operation.

- Deliveries must meet the following criteria:

  - From an approved source

  - Placed in the correct storage location to maintain the required temperature

  - Protected from contamination in storage

  - NOT contaminated

  - Presented honestly

# Receiving and Inspecting

**Rejecting items:**

- Separate rejected items from accepted items.

- Tell the delivery person what is wrong with the item.

- Get a signed adjustment or credit slip before giving the rejected item to the delivery person.

- Log the incident on the invoice or receiving document.

# Receiving and Inspecting

**Recalls:**

- Identify the recalled food items.

- Remove the item from inventory.

- Store the item separately.

- Label the item to prevent it from being placed back in inventory.

- Inform staff not to use the product.

- Refer to the vendor's notification or recall notice for what to do with the item.

**Checking the temperature of meat, poultry, and fish:**

- Insert the thermometer stem or probe into the thickest part of the food (usually the center).

# Receiving and Inspecting

**Checking the temperature of ROP Food (MAP, vacuum-packed, and *sous vide* food):**

- Insert the thermometer stem or probe between two packages.

- As an alternative, fold packaging around the thermometer stem or probe.

# Receiving and Inspecting

**Checking the temperature of other packaged food:**

- Open the package and insert the thermometer stem or probe into the food.

# Receiving and Inspecting

## Temperature criteria for deliveries:

- **Cold TCS food:** Receive at 41˚F (5˚C) or lower, unless otherwise specified.

- **Live shellfish (oysters, mussels, clams, and scallops):** Receive at an air temperature of 45˚F (7˚C) and an internal temperature no greater than 50˚F (10˚C).

  - Once received, the shellfish must be cooled to 41˚F (5˚C) or lower in four hours.

- **Shucked shellfish:** Receive at 45˚F (7˚C) or lower.

  - Cool the shellfish to 41˚F (5˚F) or lower in four hours.

# Receiving and Inspecting

**Temperature criteria for deliveries:**

- **Milk:** Receive at 45˚F (7˚C) or lower.

    o   Cool the milk to 41˚F (5˚C) or lower in four hours.

- **Shell eggs:** Receive at an air temperature of 45˚F (7˚C) or lower.

- **Hot TCS food:** Receive at 135˚F (57˚C) or higher.

# Receiving and Inspecting

## Temperature criteria for deliveries:

- **Frozen food:** Receive frozen solid.

- Reject frozen food if there is evidence of thawing and refreezing:

    - ○ Fluids or water stains in case bottoms or on packaging

    - ○ Ice crystals or frozen liquids on the food or packaging

**Reject packaged items with:**

- Tears, holes, or punctures in packaging

- Cans—Severe dents in the seam or body, missing labels, swollen or bulging ends, holes, leaks, rust

- ROP food—Bloating or leaking

- Broken cartons or seals

# Receiving and Inspecting

**Reject packaged items with:**

- Dirty and discolored packaging

- Leaks, dampness, or water stains

- Signs of pests or pest damage

- Signs of tampering

- Missing or incorrect labels

- Expired use-by/expiration dates

## Required documents:

- Shellfish must be received with shellstock identification tags:

  ○ Tags indicate when and where the shellfish were harvested.

- Store shellfish in their original container:

  ○ Do NOT remove the shellstock tag until the last shellfish is used.

  ○ Write the date the last shellfish was used on the shellstock tag.

  ○ Keep the shellstock tag on file for 90 days after the last shellfish was used.
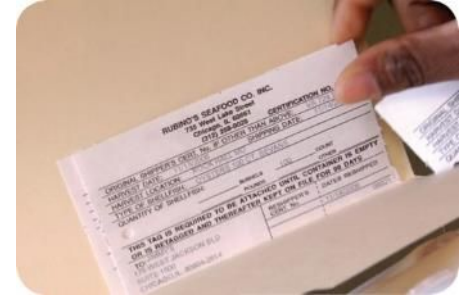
# Receiving and Inspecting

**Required documents:**

- Fish that will be eaten raw or partially cooked:

  - Documentation must show the fish was correctly frozen before being received.

  - Keep documents for 90 days from the sale of the fish.

- Farm raised fish:

  - Must have documentation stating the fish was raised to FDA standards.

  - Keep documents for 90 days from the sale of the fish.

## Assessing food quality:

- **Appearance:** Reject food that is moldy or has an abnormal color.

- **Texture:** Reject meat, fish, or poultry if:

  - It is slimy, sticky, or dry.

  - It has soft flesh that leaves an imprint when touched.

- **Odor:** Reject food with an abnormal or unpleasant odor.

# Storage

## Labeling food for use on-site:

- All items not in their original containers must be labeled.

- Food labels should include the common name of the food or a statement that clearly and accurately identifies it.

- It is not necessary to label food if it clearly will not be mistaken for another item.

# Storage

**Labeling food packaged on-site for retail sale:**

- Common name of the food or a statement clearly identifying it

- Quantity of the food

- If the item contains two or more ingredients, list of the ingredients and subingredients in descending order by weight

- List of artificial colors and flavors and chemical preservatives

- Name and place of business of the manufacturer, packer, or distributor

- Source of each major food allergen contained in the food

# Storage

## Date marking:

- Ready-to-eat TCS food must be marked if held for longer than 24 hours:

  - Date mark must indicate when the food must be sold, eaten, or thrown out.

- Ready-to-eat TCS food can be stored for only seven days if it is held at 41˚F (5˚C) or lower:

  - Day 1 is the day the food was prepared or a commercial container was opened.

  - For example, potato salad prepared and stored on October 1 would have a discard date of October 7 on the label.

# Storage

## Date marking:

- Operations use different systems for date marking:

    ○ Some write the day or date the food was prepared on the label.

    ○ Others write the use-by day or date on the label.

# Storage

**Date marking:**

**If:**

- A commercially processed food has a use-by date that is less than seven days from the date the container was opened.

**Then:**

- The container should be marked with this use-by date as long as the date is based on food safety.

## Date marking:

- When combining food with different use-by dates in a dish, base the discard date of the dish on the earliest use-by date of ingredients.

- Consider a shrimp and sausage jambalaya prepared on December 4:

  - The shrimp has a use-by date of December 8.

  - The sausage has a use-by date of December 10.

  - The use-by date of the jambalaya is December 8.

# Storage

## Temperatures:

- Store TCS food at an internal temperature of 41˚F (5˚C) or lower or 135˚F (57˚C) or higher.

- Store frozen food at temperatures that keep it frozen.

- Make sure storage units have at least one air temperature measuring device:

  - ○ It must be accurate to +/- 3˚F or +/- 1.5˚C.

  - ○ Put it in the warmest part of refrigerated units or the coldest part of hot-holding units

**Temperatures:**



- Do NOT overload coolers or freezers.

- Frequent opening of the cooler lets warm air inside, which can affect food safety.

- Use open shelving:

  o Lining shelving restricts circulation.

- Monitor food temperatures regularly:

  o Randomly sample food temperatures.

  o If the food is not at the correct temperature, throw it out.

# Storage

**Rotate food to use the oldest inventory first:**

- One way to rotate products is to follow FIFO:

    1. Identify the food item's use-by or expiration date.

    2. Store items with the earliest use-by or expiration dates in front of items with later dates.

    3. Once shelved, use those items stored in front first.

    4. Throw out food that has passed its manufacturer's use-by or expiration date.

# Storage

**Preventing cross-contamination:**

- Store all items in designated storage areas.

  - Store items away from walls and at least six inches (15 centimeters) off the floor.

  - Store single-use items (e.g., sleeve of single-use cups, single-use gloves) in original packaging.



6" (15 cm)
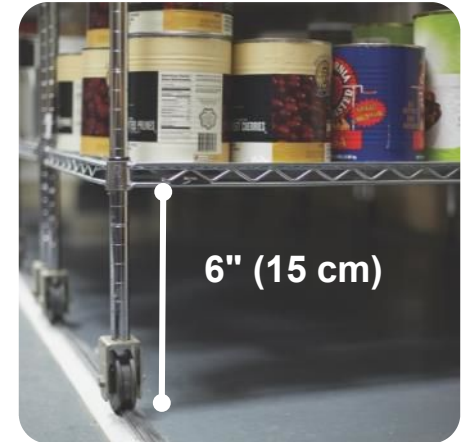
# Storage

**Preventing cross-contamination:**

- Store food in containers intended for food.

- Use containers that are durable, leakproof, and able to be sealed or covered.

- NEVER use empty food containers to store chemicals; NEVER put food in empty chemical containers.

# Storage

**Preventing cross-contamination:**

- Keep all storage areas clean and dry.

- Clean up spills and leaks promptly.

- Clean dollies, carts, transporters, and trays often.

- Store food in containers that have been cleaned and sanitized.

- Store dirty linens in clean, nonabsorbent containers or washable laundry bags.

# Storage

**Preventing cross-contamination:**

- Wrap or cover food.

- Store raw meat, poultry, and seafood separately from ready-to-eat food.

  - If this is not possible, store ready-to-eat food above raw meat, poultry, and seafood.

  - This will prevent juices from raw food from dripping onto ready-to-eat food.

## Preventing cross-contamination:

- Store food items in the following top-to-bottom order:

  A.  Ready-to-eat food

  B.  Seafood

  C.  Whole cuts of beef and pork

  D.  Ground meat and ground fish

  E.  Whole and ground poultry

- This storage order is based on the minimum internal cooking temperature of each food.

# Storage
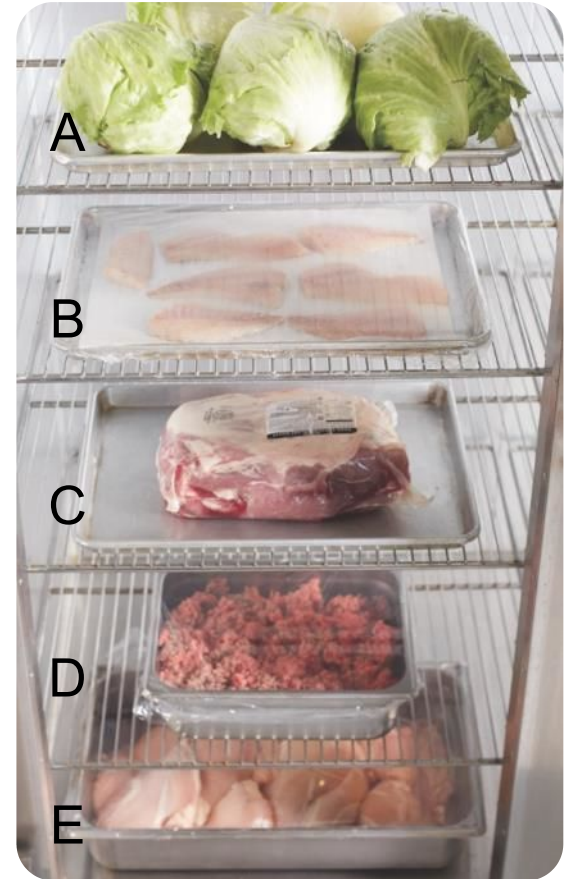
**Food should be stored in a clean, dry location away from dust and other contaminants:**

- To prevent contamination, NEVER store food in these areas:
  - Locker rooms or dressing rooms
  - Restrooms or garbage rooms
  - Mechanical rooms
  - Under unshielded sewer lines or leaking water lines
  - Under stairwells

# Storage

**Handling damaged, spoiled, or incorrectly stored food:**

- Discard food that has become unsafe:

  o Expired, damaged, spoiled, or incorrectly stored food.

  o Food missing a date mark.

  o Ready-to-eat TCS food that has exceeded its date mark.

  o Food that has exceeded time/temperature requirements.

- If food will be returned to the vendor:

  o Store the food away from other food and equipment.

  o Label the food so it will not be used.



DO NOT USE
RETURN TO VENDOR

# 6
# The Flow of Food: Preparation

# The Flow of Food: Preparation

**Objectives:**

By the end of this chapter, you should be able to identify the following:

- Ways to prevent cross-contamination and time-temperature abuse

- Ways to thaw food correctly

- Minimum internal temperatures for cooking food safely

- Ways to cool and reheat food correctly

# General Preparation Practices

**When prepping food:**

- Make sure workstations, cutting boards, and utensils are clean and sanitized.

- Only remove as much food from the cooler as you can prep in a short period of time.

  - This help prevent time-temperature abuse.

- Return prepped food to the cooler or cook it as quickly as possible.

# General Preparation Practices

**Food and color additives:**

- Only use additives approved by your local regulatory authority.

- NEVER use more additives than are allowed by law.

- NEVER use additives to alter the appearance of food.

- Do NOT sell produce treated with sulfites before it was received in the operation.

- NEVER add sulfites to produce that will be eaten raw.

# General Preparation Practices

**Present food honestly:**

- Do NOT use the following to misrepresent the appearance of food:
  - Food additives or color additives
  - Colored overwraps
  - Lights
- Present food in the way it was described.
  - For example, if a menu offers "Fried Perch," another fish cannot be substituted.
- Food not presented honestly must be thrown out.

# General Preparation Practices

**Corrective actions:**

- Food must be thrown out in the following situations:

  ○ When it is handled by staff who have been restricted or excluded from the operation due to illness

  ○ When it is contaminated by hands or bodily fluids, such as from sneezing

  ○ When it has exceeded the time and temperature requirements designed to keep food safe

# Thawing

**General guidelines for TCS food:**

- Thaw food in a cooler, keeping its temperature at 41˚F (5˚C) or lower.

- Submerge food under running, drinkable water at 70˚F (21˚C) or lower.

  - Use a clean and sanitized food-prep sink.

  - Use water flow strong enough to wash away food bits.

  - NEVER let the temperature of the food go above 41˚F (5˚C) for longer than four hours.

**General guidelines for TCS food:**

- Thaw food in a microwave.
  - Cook it in conventional cooking equipment immediately after thawing.
- Thaw food as part of the cooking process.

# Thawing

## ROP Fish:



- Frozen fish received in ROP packaging must be thawed carefully.

- If the label states that the product must remain frozen until use, then remove fish from packaging:

  o Before thawing under refrigeration

  o Before or immediately after thawing under running water

# Prepping Specific Food

**If packaging fish using a reduced-oxygen packaging method the fish must:**

- Be frozen before, during, or after packaging

- Include a label that states the fish must be frozen until used

**Produce:**



- Make sure produce does not touch surfaces exposed to raw meat, seafood, or poultry.

- Wash the produce thoroughly before cutting, cooking, or combining it with other ingredients.

- To wash produce:

  o Use running water a little warmer than the produce.

  o Pull apart leafy greens and rinse thoroughly.

- Certain chemicals may be used to wash produce.

# Prepping Specific Food

**Produce:**

- When soaking or storing produce in standing water or an ice-water slurry, do NOT mix:

    o Different items

    o Multiple batches of the same item

- Refrigerate and hold sliced melons, cut tomatoes, and cut leafy greens at 41˚F (5˚C) or lower.

- Do NOT serve raw seed sprouts if primarily serving a high-risk population

# Prepping Specific Food

**Eggs and egg mixtures:**

- Handle pooled eggs (if allowed) with care:

  ○ Cook promptly after mixing or store at 41°F (5°C) or lower.

  ○ Clean and sanitize containers between batches.

- Consider using pasteurized shell eggs or egg products when prepping dishes that need little or no cooking.

# Prepping Specific Food

## Eggs and egg mixtures:

- Take special care when serving a high-risk population:

    o Use pasteurized eggs or egg products when serving raw or undercooked dishes.

    o Unpasteurized shell eggs can be used if the dish will be cooked all the way through (e.g., omelets, cakes).

    o Use pasteurized shell eggs if eggs will be pooled.

## Salads containing TCS food:

- Only use leftover TCS food if it was cooked, held, cooled, and stored correctly.

- Do NOT use leftover TCS food that has been held for more than seven days.

# Prepping Specific Food

## Ice:

- Make ice from water that is safe to drink.

- NEVER use ice as an ingredient if it was used to keep food cold.

- Use clean and sanitized containers and scoops:

    - ○ Store scoops outside of the ice machine in a clean, protected location.

    - ○ NEVER hold ice in containers that held chemicals or raw meat, seafood, or poultry.

    - ○ NEVER touch ice with hands or use a glass to scoop ice.

# Preparation Practices That Have Special Requirements

**You need a variance if prepping food in these ways:**

- Packaging fresh juice on-site for sale at a later time, unless the juice has a warning label

- Smoking food to preserve it but not to enhance flavor

- Using food additives or components to preserve or alter food so it no longer needs time and temperature control for safety

- Curing food

# Preparation Practices That Have Special Requirements

**You need a variance if prepping food in these ways:**

- Custom-processing animals for personal use (e.g., dressing a deer)

- Packaging food using a reduced-oxygen packaging (ROP) method

- Sprouting seeds or beans

- Offering live shellfish from a display tank

# Preparation Practices That Have Special Requirements

**A HACCP plan may be required when applying for a variance:**

- The plan must account for food safety risks

- The establishment must comply with the plan and procedures

- All associated documents must be maintained and provided upon request

# Preparation Practices That Have Special Requirements

**Records must show that you:**

- Have procedures for monitoring Critical Control Points

- Are regularly monitoring the Critical Control Points

- Are taking the necessary corrective actions if there is a failure at a Critical Control Point

- Are verifying the effectiveness of the procedures or process

# Cooking Food

**When cooking TCS food, the internal portion must:**

- Reach the required minimum internal temperature

- Hold that temperature for a specific amount of time

# Cooking Food

## When checking temperatures:

- Pick a thermometer with a probe that is the correct size for the food.

- Check the temperature in the thickest part of the food.

  - Take at least two readings in different locations.

# Cooking Requirements for Specific Food

**Minimum internal cooking temperature:**

**165˚F (74˚C) for <1 second (Instantaneous)**



- Poultry—whole or ground chicken, turkey or duck

- Stuffing made with fish, meat, or poultry

- Stuffed meat, seafood, poultry, or pasta

- Dishes that include previously cooked TCS ingredients

# Cooking Requirements for Specific Food

**Minimum internal cooking temperature:**

**155˚F (68˚C) for 17 seconds**

- Ground meat—beef, pork, and other meat

- Meat mechanically tenderized with needles or blades or by injecting it with brine or flavors (e.g. brined ham or flavor-injected roasts)

- Meat vacuum-tumbled with marinades or other solutions

- Ground meat from game animals commercially raised and inspected

# Cooking Requirements for Specific Food

**Minimum internal cooking temperature:**

**155˚F (68˚C) for 17 seconds**



- Ratites—including ostrich and emu

- Ground seafood—including chopped or minced seafood

- Shell eggs that will be hot-held for service

# Cooking Requirements for Specific Food

**Minimum internal cooking temperature:**

**145˚F (63˚C) for 15 seconds**

- Seafood—including fish, shellfish, and crustaceans

- Steaks/chops of pork, beef, veal, and lamb

- Commercially raised game

- Shell eggs that will be served immediately

# Cooking Requirements for Specific Food

**Minimum internal cooking temperature:**

**145˚F (63˚C) for four minutes**

- Roasts of pork, beef, veal, and lamb

- Alternate cooking times/temperatures
  - 130˚F (54˚C)     112 minutes
  - 131˚F (55˚C)     89 minutes
  - 133˚F (56˚C)     56 minutes
  - 135˚F (57˚C)     36 minutes
  - 136˚F (58˚C)     28 minutes
  - 138˚F (59˚C)     18 minutes
  - 140˚F (60˚C)     12 minutes
  - 142˚F (61˚C)     8 minutes
  - 144˚F (62˚C)     5 minutes

# Cooking Requirements for Specific Food

**Minimum internal cooking temperature:**

**135°F (57°C) (no minimum time)**



- Food from plants, including fruits, vegetables, grains (e.g., rice, pasta), and legumes (e.g., beans, refried beans) that will be hot-held for service

# Cooking TCS Food in a Microwave

**Minimum internal cooking temperature:**

**165°F (74°C)**

- Meat

- Seafood

- Poultry

- Eggs

# Cooking Food

## Cooking TCS food in the microwave oven:

● Cover the food to prevent drying.

● For even cooking:

  ○ Rotate or stir food halfway through the cooking process.

  ○ Let the covered food stand for at least two minutes after cooking.

● Check the temperature in at least two places.

# Partial Cooking during Preparation

**If partially cooking meat, seafood, poultry, or eggs or dishes containing these items:**

- NEVER cook the food longer than 60 minutes during initial cooking.

- Cool the food immediately after initial cooking.

- Freeze or refrigerate the food after cooling it:

  - If refrigerating, hold it at 41°F (5°C) or lower and store it away from ready-to-eat food.

- Heat the food to its required minimum internal temperature before selling or serving it.

- Cool the food if it will not be served immediately or held for service.

# Partial Cooking during Preparation

**Procedures for partial cooking should describe:**

- How to monitor and document requirements

- Which corrective actions will be taken if requirements are not met

- How parcooked items will be marked after initial cooking

- How parcooked food will be stored separately from ready-to-eat food

# Consumer Advisories

## Disclosure:

- Disclose any raw or undercooked TCS items on the menu.

- Note it on the menu next to the items:

  ○ An asterisk with a footnote can be used.

  ○ The footnote must state that the item is raw or undercooked, or contains raw or undercooked ingredients.
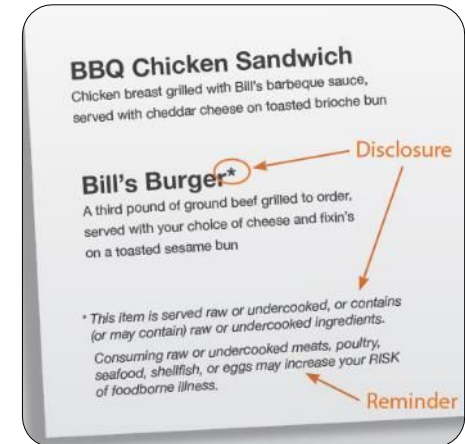
# Consumer Advisories

**Reminder:**

- Advise customers who order raw or undercooked TCS food of the increased risk of foodborne illness:

  ○ Post a notice in the menu.

  ○ Provide this information using brochures, table tents, or signs.
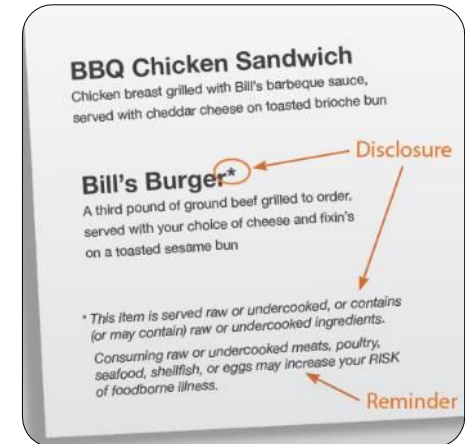
# Children's Menus

**The FDA advises against offering these items on a children's menu if they are raw or undercooked:**

- Meat

- Poultry

- Seafood

- Eggs

# Operations That Mainly Serve High-Risk Populations

**NEVER serve:**

- Raw seed sprouts

- Raw or undercooked eggs (unpasteurized), meat, or seafood

  o Over-easy eggs

  o Raw oysters on the half shell

  o Rare hamburgers

- Unpasteurized milk or juice

# Temperature Requirements for Cooling Food

1. **Cool food from 135˚F to 70˚F (57˚C to 21˚C) within two hours.**



2. **Cool it from 70˚F to 41˚F (21˚C to 5˚C) or lower in the next four hours.**
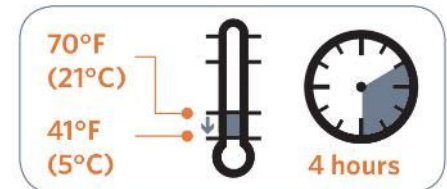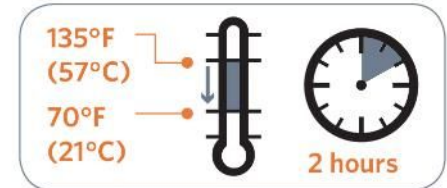
# Temperature Requirements for Cooling Food

**If you cool food from 135˚F to 70˚F (57˚C to 21˚C) in less than two hours:**

- The remaining time can be used to cool it to 41˚F (5˚C) or lower.

- The total cooling time cannot be longer than six hours.

**Example:**

- If you cool food from 135˚F to 70˚F (57˚C to 21˚C) in one hour.

- Then you have five hours to get the food to 41˚F (5˚C) or lower.

# Cooling Food

**Factors that affect cooling:**

- Thickness or density of the food

- Size of the food

  - Cut larger items into smaller pieces.

  - Divide large containers of food into smaller containers or shallow pans.

- Storage container

  - Stainless steel transfers heat away from food faster than plastic.

  - Shallow pans let the heat from food disperse faster than deep pans.

# Cooling Food

**Methods for cooling food:**

- Place food in an ice-water bath.

- Place it in a blast chiller.

- Stir it with an ice paddle.

- Use ice or cold water as an ingredient.

# Cooling Food

## When storing food for further cooling:

- Loosely cover food containers before storing them.

- Food can be left uncovered if protected from contamination.

    o Storing uncovered containers above other food, especially raw seafood, meat, and poultry, will help prevent cross-contamination.

# Reheating Food

**Food reheated for immediate service:**

- Can be reheated to any temperature if it was cooked and cooled correctly

**Food reheated for hot-holding:**

- Must be reheated within two hours to an internal temperature of 165˚F (74˚C) for 15 seconds

- Reheat commercially processed and packaged ready-to-eat food to an internal temperature of at least 135˚F (57˚C).

**7**

# The Flow of Food: Service

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**Objectives:**

By the end of this chapter, you should be able to identify the following:

- Guidelines for holding cold food and hot food

- When and how food can be held without temperature control

- How to prevent contamination when serving food and in self-serve areas

- How to prevent contamination and time-temperature abuse when serving food off-site or through vending machines

# Guidelines for Holding Food

**Policies:**

- Create policies about how long the operation will hold food and when it will be thrown out

**Food covers and sneeze guards:**

- Cover food and install sneeze guards to protect food from contaminants

- Covers protect food from contamination and help maintain food temperatures

# Guidelines for Holding Food

**Temperature:**

- Hold TCS food at the correct temperature:

  ○ Hot food: 135˚F (57˚C) or higher

  ○ Cold food: 41˚F (5˚C) or lower

**Thermometer:**

- Use a thermometer to check a food's internal temperature:

  ○ NEVER use the temperature gauge on a holding unit to check the food's temperature.

# Guidelines for Holding Food

## Time:

- Make sure staff are monitoring holding temperatures regularly.

- Check temperatures at least every four hours:

    o Throw out food not at 41˚F (5˚C) or lower or 135˚F (57˚C) or higher.

    o Optional: Check temperatures every two hours to leave time for corrective action.

# Guidelines for Holding Food

**Reheating food:**

- NEVER use hot-holding equipment to reheat food unless it's built to do so.

- Reheat food correctly, and then move it into a holding unit.

# Holding Food without Temperature Control

**Cold ready-to-eat TCS food can be held without temperature control for up to six hours if:**

- It was held at 41ºF (5ºC) or lower before removing it from refrigeration

- It does not exceed 70ºF (21ºC) during service
  - Throw out food that exceeds this temperature

- It has a label specifying:
  - Time it was removed from refrigeration
  - Time it must be thrown out

- It is sold, served, or thrown out within six hours

# Holding Food without Temperature Control

**Alternatives for holding cold ready-to-eat TCS food without temperature control:**

- If discarded within four hours, the food can be allowed to reach *any* temperature

  - o The food must be held at 41°F (5°C) or lower before removing it from temperature control

  - o The discard time must be four hours from the time it was removed from temperature control

  - o The food must be sold, served, or thrown out within four hours

# Holding Food without Temperature Control

**Produce that becomes TCS when cut, chopped, or sliced and hermetically sealed containers of food that become TCS when opened:**

- Can have an initial temperature of 70°F (21°C) or lower

  - Must be discarded within four hours

  - Cannot exceed 70°F (21°C) within the four-hour period

  - Must be labeled with a discard time four hours from the time the product became a TCS food

# Holding Food without Temperature Control

**Hot ready-to-eat TCS food can be held without temperature control for up to four hours if:**

- It was held at 135ºF (57ºC) or higher before removing it from temperature control

- It has a label specifying when the item must be thrown out

- It is sold, served, or thrown out within four hours

# Holding Food without Temperature Control

**To get regulatory approval:**

- Prepare written procedures.

- Get written approval in advance.

- Maintain procedures.

- Make procedures available.

# Kitchen Staff Guidelines for Serving Food

**Prevent contamination when serving food:**

- Avoid bare-hand contact with ready-to-eat food:

  - Wear single-use gloves.

  - Use spatulas, tongs, deli sheets, or other utensils.

- Use clean and sanitized utensils for serving:

  - Use separate utensils for each food.

  - Clean and sanitize utensils after each task.

  - If using them continuously, clean and sanitize them at least every four hours.

# Kitchen Staff Guidelines for Serving Food

## Prevent contamination when serving food:

- Store serving utensils correctly between uses:

    - Leave them in the food with the handle extended above the container rim.

    - Place them on a clean and sanitized food-contact surface.

    - Optional: Store spoons or scoops under running water or in a container of water at least 135˚F (57˚C).

# Kitchen Staff Guidelines for Serving Food

**Prevent contamination when serving food:**

- Take-home containers can be refilled only when the containers are:

  - Designed for reuse

  - Provided to guest by the operation

  - Cleaned and sanitized correctly

# Kitchen Staff Guidelines for Serving Food

**Prevent contamination when serving food:**

- Take-home beverage containers can be refilled if the:
  - Beverage is not a TCS food.
  - Container is refilled for the same guest.
  - Container can be effectively cleaned.
  - Container is rinsed with fresh, hot water under pressure before refilling.
  - Container is refilled by staff in the operation or by the guest using a process that prevents contamination.

## Handling dishes and glassware

**Correct**



**Incorrect**

# Service Staff Guidelines for Serving Food

**If you preset tableware:**

- Wrap or cover the items to prevent contamination.

**Table settings do not need to be wrapped or covered if extra settings are either:**

- Removed when guests are seated.

- If left on the table, cleaned and sanitized after guests have left.

# Service Staff Guidelines for Serving Food

**NEVER re-serve:**

- Food returned by a guest

- Uncovered condiments

- Uneaten bread

- Plate garnishes

**Generally, only unopened, prepackaged food in good condition can be re-served:**

- Condiment packets

- Wrapped crackers or breadsticks

# Self-Service Areas

**Prevent time-temperature abuse and contamination:**



- Use sneeze guards, display cases, or packaging.

- Use labels to identify food items.

- Hold food at the correct temperature:

  ○ Hot food: 135˚F (57˚C) or higher

  ○ Cold food: 41˚F (5˚C) or lower

# Self-Service Areas

**Prevent time-temperature abuse and contamination:**

- Keep raw meat, fish, and poultry separate from ready-to-eat food.

- Do NOT let customers refill dirty plates or use dirty utensils at self-service areas.

- Stock displays with the correct utensils.

- NEVER use ice as an ingredient if it was used to keep food or beverages cold.

# Labeling Bulk Food in Self-Service Areas

**Label bulk food in self-service areas:**

- Make sure the label is in plain view of the customer.

- Include the manufacturer or processor label provided with the food.

    ○ As an alternative, provide the information using a card, sign, or other labeling method.

# Labeling Bulk Food in Self-Service Areas

**A label is not needed for bulk unpackaged food, such as bakery products, if:**

- The product makes no claim regarding health or nutrient content.

- No laws require the item to be labeled.

- The food is manufactured or prepared on the premises.

- The food is manufactured or prepared at another operation or processing plant owned by the same person.

  o The operation must also be regulated.

# Off-Site Service

**When transporting food off-site:**

- Use insulated, food-grade containers designed to keep food from mixing, leaking, and spilling.

- Label food with a use-by date and time, and reheating and service instructions.

- Clean the inside of delivery vehicles regularly.

- Check internal food temperatures.

# Off-Site Service

**When transporting food off-site:**

- Make sure the service site has the correct utilities:

  ○ Safe water for cooking, dishwashing, and handwashing

  ○ Garbage containers stored away from food-prep, storage, and serving areas

- Store raw meat, poultry, and seafood separate from ready-to-eat items.

**To keep vended food safe:**

- Check product shelf life daily:

  ○ Throw away food past its expiration or use-by date.

  ○ Throw away refrigerated food prepped on-site and not sold in seven days.

- Keep TCS food at the correct temperature.

- Dispense TCS food in its original container.

- Wash and wrap fresh fruit with edible peels before putting it in the machine.

# 8

# Food Safety Management Systems

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# Food Safety Management Systems

**Objectives:**

By the end of this chapter, you should be able to identify the following:

- What is a food safety management system

- What is active managerial control and how it can be applied

- What is a Hazard Analysis Critical Control point (HACCP) system

# Food Safety Management Systems

**Food safety management system:**

- Group of practices and procedures intended to prevent foodborne illness

- Actively controls risks and hazards throughout the flow of food

# Food Safety Programs

**These are the foundation of a food safety management system:**



Personal hygiene
program



Food safety
training program



Supplier selection and
specification program



Quality control and
assurance program

# Food Safety Programs

**These are the foundation of a food safety management system:**


Cleaning and
sanitation program


Standard operating
procedures (SOPs)


Facility design and
equipment maintenance
program


Pest control program

# Active Managerial Control

**Focuses on controlling the five most common risk factors for foodborne illness:**

1. Purchasing food from unsafe sources

2. Failing to cook food adequately

3. Holding food at incorrect temperatures

4. Using contaminated equipment

5. Practicing poor personal hygiene

# Active Managerial Control

**There are many ways to achieve active managerial control in the operation:**

- Training programs

- Manager supervision

- Standard operating procedures (SOPs)

- HACCP

# Active Managerial Control

**Steps for implementing active managerial control:**

1. Identify and document potential risks and ways to control or eliminate them.

2. Monitor critical activities.

3. Correct improper procedures or behaviors.

4. Verify that policies, procedures, and corrective actions are followed.

5. Ensure employees are trained and retrained as needed.

6. Periodically assess the system to make sure it is working.

# Active Managerial Control

**The FDA public health interventions:**

- Demonstration of knowledge

- Staff health controls

- Controlling hands as a vehicle of contamination

- Time and temperature parameters for controlling pathogens

- Consumer advisories

# Hazard Analysis Critical Control Point (HACCP)

**HACCP program:**

- Identifies significant hazards at points within a product's flow through an operation

    o Biological, chemical, and physical hazards

- Identifies how to prevent, eliminate, or reduce hazards to safe levels

- Is documented in a written plan

    o The plan is specific to the facility's menu, customers, equipment, processes, and operations.

# 9

# Safe Facilities and Pest Management

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# Safe Facilities and Pest Management

**Objectives:**

By the end of this chapter, you should be able to identify the following:

- How to pick materials and equipment that are safe for use in foodservice operations

- Ways to install and maintain equipment

- Ways to avoid food safety hazards caused by utilities

- Ways to maintain your facility

- Best ways to handle emergencies

- Ways to prevent and control pests

# Interior Requirements for a Safe Operation

**Floors, walls, and ceilings:**

- Made from smooth and durable materials for easier cleaning

- Maintained regularly

- Have coving where the floors and walls meet

- Promptly cleared of any standing water

# Equipment Selection

**Food equipment must be:**

- Smooth

- Easy to clean

- Durable

- Resistant to damage

# Equipment Selection

**Some organizations:**

- Develop standards for sanitary design and construction of equipment

- Certify equipment meeting these standards

- Must be accredited by ANSI

**Other organizations:**

- Classify equipment meeting standards developed by others

- Must be accredited by ANSI

# Equipment Selection

**When purchasing equipment look for the:**

- NSF mark

- UL EPH classified mark

- ETL sanitation mark

# Interior Requirements for a Safe Operation

**Installing equipment:**

Floor-mounted equipment must be either:

- Mounted on legs at least six inches (15 centimeters) high

- Sealed to a masonry base

# Interior Requirements for a Safe Operation

**Installing equipment:**

Tabletop equipment should be either:

- Mounted on legs at least four inches (10 centimeters) high

- Sealed to the countertop

# Interior Requirements for a Safe Operation

**Once equipment has been installed:**

- It must be maintained regularly.

- Only qualified people should maintain it.

- Set up a maintenance schedule with your supplier or manufacturer.

- Check equipment regularly to make sure it is working correctly.

# Dishwashing Machines

**Installing and using dishwashing machines:**

- Install them in a way that:

  - Makes them reachable and conveniently located

  - Keeps utensils, equipment, and other food-contact services from becoming contaminated

- Use detergents and sanitizers approved by the local regulatory authority.

- Follow the manufacturer's instructions.

# Dishwashing Machines

**Selecting dishwashing machines:**

- Make sure they can measure:

  o Water temperature

  o Water pressure

  o Cleaning and sanitizing chemical concentration

- Post information about the correct settings on the machine.

# Dishwashing Machines

**Cleaning dishwashing machines:**

- Clean them as often as necessary.

- Follow manufacturer's recommendations.

- Follow local regulatory requirements.

# Three-Compartment Sinks

**Purchase sinks large enough to accommodate large equipment and utensils.**

# Handwashing Stations

## Handwashing stations must be:

- Conveniently located

- Located in:

  - Restrooms or directly next to them

  - Food-prep areas

  - Service areas

  - Dishwashing areas

# Handwashing Stations

## Handwashing stations must be:

- Used only for handwashing

- Installed with adequate barriers or distance from food and food-contact surfaces

- Available at all times

  - Do not block them.

# Handwashing Stations

## Handwashing stations must have:



Hot and cold running water



Soap



A way to dry hands



Garbage container



EMPLOYEES MUST WASH HANDS
BEFORE RETURNING TO WORK

LOS EMPLEADOS DEBEN LAVARSE LAS
MANOS ANTES DE VOLVER A TRABAJO

Signage

# Water and Plumbing

**Acceptable sources of drinkable (potable) water:**

- Approved public water mains

- Regularly tested and maintained private sources

- Closed, portable water containers

- Water transport vehicles

# Water and Plumbing

## Installation and maintenance:

- If using an on-site septic system, make sure it is properly tested and maintained

- Only licensed plumbers should work on the plumbing

# Water and Plumbing

**Cross-connection:**

- Physical link between safe water and dirty water from

    - ○ Drains

    - ○ Sewers

    - ○ Other wastewater sources

# Water and Plumbing

## Backflow:

- Reverse flow of contaminants through a cross-connection into the drinkable water supply

## Backsiphonage:

- A vacuum created in the plumbing system that sucks contaminants back into the water supply:

  o Can occur when high water use in one area of the operation creates a vacuum.

  o A running hose in a mop bucket can lead to backsiphonage.
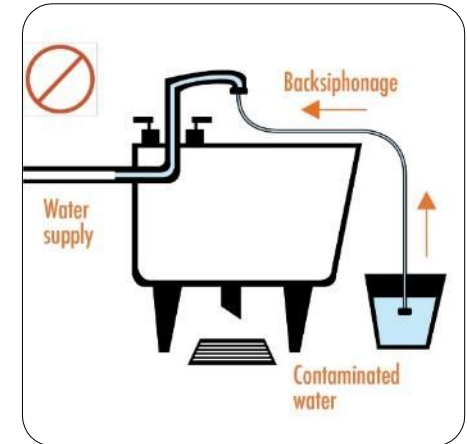
# Water and Plumbing

**Backflow prevention methods:**

Vacuum breaker
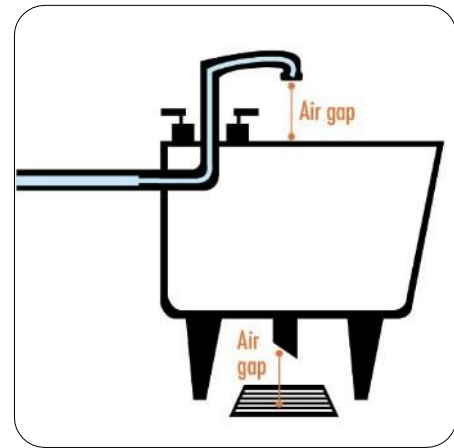
Air gap

# Water and Plumbing

## Grease buildup in pipes:

- Grease traps can be installed to prevent grease from blocking drains.

- Grease traps must be:

  - Installed by a licensed plumber

  - Easy to access

  - Cleaned regularly

# Lighting

**Consider the following when installing and maintaining lighting:**

- Different areas of the facility have different lighting intensity requirements.

- Local jurisdictions usually require prep areas to be brighter than other areas.

- All lights should have shatter-resistant lightbulbs or protective covers.

- Replace burned out bulbs with correct size bulbs.

# Ventilation

**Ventilation systems:**

- Improve air quality

- Reduce grease and condensation buildup

- Must be cleaned and maintained

    - Follow manufacturers' recommendations.

# Garbage

## Removal and cleaning:

● Remove garbage from prep areas as quickly as possible.

   ○ Be careful not to contaminate food and food-contact surfaces.

● Clean the inside and outside of garbage containers frequently.

   ○ Clean them away from food-prep and storage areas.

# Garbage

**Indoor containers must be:**

- Leakproof, waterproof, and pestproof.

- Easy to clean.

- Covered when not in use.

- Included with a cover in women's restrooms.

**Designated storage areas:**

- Store waste and recyclables away from food and food-contact surfaces.

- Storage must not create a nuisance or a public health hazard.

# Garbage

## Outdoor containers must:

- Be placed on a smooth, durable, nonabsorbent surface:

  - Asphalt or concrete

- Have tight-fitting lids

- Be covered at all times

- Have their drain plugs in place

**To prevent food safety problems due to the facility:**

- Clean the operation regularly.

- Check building systems regularly.

- Maintain the building:

  - Repair leaks, holes, or cracks in the floors, foundation, ceilings, or windows.

  - Maintain the outside, including patios and parking lots.

- Control pests.

# Emergencies That Affect the Facility

**Imminent health hazard:**

- A significant threat or danger to health

- Requires immediate correction or closure to prevent injury

**Possible imminent health hazards:**

- Power outages and refrigeration failures

- Security issues

- Fires

- Water supply problems

- Floods and sewage backups

# Emergencies That Affect the Facility

**How to respond to a crisis affecting the facility:**

- Determine if there is a significant risk to the safety or security of your food.

- If the risk is significant:

  - Stop service.

  - Notify the local regulatory authority.

- Throw away contaminated food and food in damaged packaging.

# Emergencies That Affect the Facility

**How to respond to a crisis affecting the facility:**

● Decide how to correct the problem:

      ○ Establish time-temperature control.

      ○ Clean and sanitize surfaces.

      ○ Reestablish physical security of the facility.

      ○ Verify water is drinkable.

# Emergencies That Affect the Facility

**Service *may* be allowed after water/electrical interruptions if the operation:**

- Has a pre-approved written emergency operating plan

- Takes immediate corrective action

- Notifies the regulatory authority when the plan is implemented

# Pest Management

**Three rules of pest prevention:**

1. Deny pests access to the operation.

2. Deny pests food, water, and shelter.

3. Work with a licensed Pest Control Operator (PCO).

# Pest Prevention

**Deny pests shelter:**

- Throw out garbage quickly and correctly.

- Maintain garbage containers and storage areas:

  - Keep containers clean and in good condition.

  - Keep outdoor containers tightly covered.

  - Clean up spills around containers immediately.

- Store recyclables correctly:

  - Keep recyclables in clean, pest-proof containers.

  - Keep containers as far away from the building as regulations allow.

# Pest Prevention

**Deny pests shelter:**

- Store food and supplies quickly and correctly.
    - Keep them away from walls and at least six inches (15 cm) off the floor.
    - Rotate products (FIFO) so pests cannot settle and breed.
- Clean up food and beverage spills immediately.

**Deny pests access:**

- Check deliveries before they enter the operation.

  o Refuse shipments if pests or signs of pests are found.

- Make sure all of the points where pests can access the building are secure:

  o Screen windows and vents

  o Seal cracks in floors and walls, and around pipes

  o Install self-closing doors and air curtains

# Pest Control

**Contact your PCO immediately if you see these or any other pest-related problems:**

- Feces

- Nests

- Damage on products, packaging, and the facility itself

**Poisonous or toxic pest-control materials should only be applied by a certified applicator.**

# 10
## Cleaning and Sanitizing

**ServSafe**
National Restaurant Association

# Cleaning and Sanitizing

**Objectives:**

By the end of this chapter, you should be able to identify the following:

- Different ways of sanitizing and the requirements for each

- How and when to clean and sanitize surfaces

- How to wash items in a dishwasher or a three-compartment sink and then store them

- How to use and store cleaning tools and supplies

- How to develop an effective cleaning program

# Cleaning and Sanitizing

## Cleaning:

- Removes food and other dirt from a surface

## Sanitizing:

- Reduces pathogens on a surface to safe levels

# Cleaners

**Cleaners must be:**

- Stable

- Noncorrosive

- Safe to use

- Available

**Types of cleaners include:**

- Detergents

- Degreasers

- Delimers

- Abrasive cleaners

# Cleaners

**To use cleaners correctly:**

- Follow manufacturers' instructions.

- Only use them for their intended purpose.

  - Do NOT use one type of cleaner in place of another unless the intended use is the same.

# Sanitizers

## Sanitizing methods:

- Heat sanitizing:

  - Immerse the item in water that is 171˚F (77˚C) for at least 30 seconds.

  - Use a high-temperature dishwasher.

- Chemical sanitizing:

  - Soak items in a sanitizing solution.

  - Rinse, swab, or spray items with a sanitizing solution.

# Sanitizers

## Chemical sanitizers:

- Commonly used chemical sanitizers include:

  - Chlorine.

  - Iodine.

  - Quats (quaternary ammonium compounds).

- Sanitizers must be available to employees at all times

- Detergent-sanitizer blends can be used in some cases:

  - Use it once to clean.

  - Use it a second time to sanitize.

# Sanitizer Effectiveness

## Concentration:

● Sanitizers should be mixed with water to the correct concentration:

- o **Not enough sanitizer** may make the solution weak and useless.

- o **Too much sanitizer** may make the solution too strong, unsafe, and corrode metal.

# Sanitizer Effectiveness

## Concentration:

- Check concentration with a test kit:

  - Make sure the kit is made for the sanitizer being used.

  - Make sure kits are always available and employees can easily access them.

  - Check the concentration often.

- Change the solution when:

  - It is dirty.

  - The concentration is too low.

# Sanitizer Effectiveness

## Temperature:

● Follow manufacturer's recommendations for the correct temperature.

## Contact time:

● The sanitizer must make contact with the item for a specific time.

● Minimum times differ for each sanitizer.

# Sanitizer Effectiveness

**Water hardness and pH:**

- Find out your operation's water hardness and pH from your municipality.

- Work with your supplier to identify the correct amount of sanitizer to use for your water.

# Guidelines for the Effective Use of Sanitizers

|  | Chlorine | |
| --- | --- | --- |
| **Water temperature** | $\geq 100°F$ (38°C) | $\geq 75°F$ (24°C) |
| **Water pH** | $\leq 10$ | $\leq 8$ |
| **Water hardness** | As per manufacturer's recommendations | |
| **Sanitizer concentration range** | 50–99 ppm | 50–99 ppm |
| **Sanitizer contact time** | $\geq 7$ sec | $\geq 7$ sec |

# Guidelines for the Effective Use of Sanitizers

|  | Iodine | Quats |
|---|---|---|
| **Water temperature** | 68˚F (20˚C) | 75˚F (24˚C) |
| **Water pH** | ≤5 or as per manufacturer's recommendations | As per manufacturer's recommendations |
| **Water hardness** | As per manufacturer's recommendations | ≤500 ppm or as per manufacturer's recommendations |
| **Sanitizer concentration range** | 12.5–25 ppm | As per manufacturer's recommendations |
| **Sanitizer contact time** | ≥30 sec | ≥30 sec |

# How to Clean and Sanitize

## How to clean and sanitize:


1. Scrape or remove food bits from the surface.


2. Wash the surface.


3. Rinse the surface.


4. Sanitize the surface.


5. Allow the surface to air-dry.

# When to Clean and Sanitize

**Food-contact surfaces must be cleaned and sanitized:**



- After they are used

- Before working with a different type of food

- After handling different raw TCS fruits and vegetables

- Any time a task was interrupted and the items may have been contaminated

- After four hours if the items are in constant use

# Cleaning and Sanitizing Stationary Equipment

**Follow the manufacturer's directions.**

**General steps:**

- Unplug the equipment.

- Take off the removable parts.

  ○ Wash, rinse, and sanitize them by hand or run the parts through a dishwasher if allowed.

- Scrape or remove food from the equipment surfaces.

# Cleaning and Sanitizing Stationary Equipment

**General steps** (continued)**:**

- Wash the equipment surfaces.

- Rinse the equipment surfaces with clean water.

- Sanitize the equipment surfaces.

    o Make sure the sanitizer comes in contact with each surface.

- Allow all surfaces to air-dry.

- Put the unit back together.

# Cleaning and Sanitizing Clean-in-Place Equipment

**Equipment that holds and dispenses TCS food:**

- Must be cleaned and sanitized every day unless otherwise indicated by the manufacturer

# Machine Dishwashing

**High-temperature machines:**

- Final sanitizing rinse must be at least 180˚F (82˚C).
  - 165˚F (74˚C) for stationary rack, single-temperature machines

**Chemical-sanitizing machines:**

- Clean and sanitize at much lower temperatures.
- Follow the temperature guidelines provided by the manufacturer.

# Dishwasher Operation

**Guidelines:**

- Clean the machine as often as needed.

- Scrape items before washing.

- Use the correct dish racks.

- NEVER overload dish racks.

- Air-dry all items.

# Dishwasher Operation

## Guidelines:

- Check the machine's water temperature, water pressure, and sanitizer levels.

  - Take corrective action if necessary.

- For high-temperature dishwashing machines, provide tools to check the temperature of the items being sanitized, such as:

  - Maximum registering thermometers.

  - Temperature sensitive tape.

**Setting up a three-compartment sink:**

- Clean and sanitize each sink and drain board.

- Fill the sinks:

  - First sink—detergent and water at least 110˚F (43˚C)

  - Second sink—clean water

  - Third sink—water and sanitizer

**Provide a clock with a second hand.**

# Three-Compartment Sinks

## Steps for cleaning and sanitizing:


1. Scrape items.


2. Wash items in the first sink.


3. Rinse items in the second sink.


4. Sanitize items in the third sink.


5. Air-dry items on a clean and sanitized surface.

# Storing Tableware and Equipment

**When storing clean and sanitized tableware and equipment:**

- Store them at least six inches (15 cm) off the floor.

- Clean and sanitize drawers and shelves before items are stored.

- Store glasses and cups upside down on a clean and sanitized shelf or rack.

# Storing Tableware and Equipment

**When storing clean and sanitized tableware and equipment:**

- Store flatware and utensils with handles up.

- Clean and sanitize trays and carts used to carry clean tableware and utensils.

- Cover the food-contact surfaces of stationary equipment until ready for use.

# Cleaning and Sanitizing in the Operation

**Wiping cloths:**

- Used to wipe up food spills and wipe down equipment.

- Two types:

  ○ Wet wiping cloths

  ○ Dry wiping cloths

- NEVER use cloths that are meant for wiping food spills for any other purpose.

# Cleaning and Sanitizing in the Operation

## Wet wiping cloths:

- For wiping counters and other surfaces.

- Store in sanitizer solution between uses.

  o  Change the solution when necessary.

- Keep cloths that contact raw meat, fish, and poultry separate from other cleaning cloths.

**Dry wiping cloths:**

- Used to wipe food spills from tableware

- Must be kept dry while in use

- Must NOT

  - Contain food debris

  - Be visibly dirty

# Cleaning and Sanitizing in the Operation

**Cleaning the nonfood-contact surfaces on the premises:**

- Nonfood-contact surfaces include:
  - Floors, ceilings, walls, equipment exteriors, etc.

- Regular cleaning prevents:
  - Buildup of dust, dirt, food residue and other debris
  - Growth of pathogens
  - Pests

# Cleaning and Sanitizing in the Operation

**Cleaning up after people who get sick:**

- Diarrhea and vomit must be cleaned up correctly.

  - They can carry Norovirus, which is highly contagious.

- Correct cleanup can prevent:

  - Contamination of food.

  - Spreading illness to others.

- Operations must have written procedures for cleaning up vomit and diarrhea:

  - Procedures must be specific.

  - Employees must be trained on these procedures.

# Cleaning and Sanitizing in the Operation

**Storing cleaning tools and chemicals:**

- Place in a separate area away from food and prep areas.

**The storage area should have:**

- Good lighting so chemicals can be easily seen

- Hooks for hanging cleaning tools

- Utility sink for filling buckets and washing cleaning tools

- Floor drain for dumping dirty water

# Cleaning and Sanitizing in the Operation

**NEVER:**

- Clean tools in sinks used for:

  - Handwashing

  - Food prep

  - Dishwashing

- Dump mop water or other liquid waste into toilets or urinals.

# Cleaning and Sanitizing in the Operation

## Using foodservice chemicals:



- Only use chemicals approved for foodservice operations.

    o NEVER keep chemicals that are not used in the operation.

- Cover or remove items that could become contaminated before using chemicals.

- After using chemicals, clean and sanitize equipment and utensils.

- Follow the law and manufacturers' directions.

# Cleaning and Sanitizing in the Operation

**Storing foodservice chemicals:**



- Store chemicals in their original containers.

- Keep chemicals separate from food, equipment, utensils, and linens by either:

  - Spacing chemicals away from other items

  - Partitioning chemicals from other items

- Always store chemicals below food, equipment, utensils, and linens.

# Cleaning and Sanitizing in the Operation

**Labeling foodservice chemicals:**

- Manufacturer's label must:

  ○ Include directions for use.

  ○ Be clear enough to read.

- If chemicals are transferred to a new working container:

  ○ The working container must be labeled with the common name.

# Developing a Cleaning Program

**To develop an effective cleaning program:**

- Create a master cleaning schedule.

- Train your staff to follow it.

- Monitor the program to make sure it works.

# Developing a Cleaning Program

**To create a master cleaning schedule, identify:**

- What should be cleaned

- Who should clean it

- When it should be cleaned

- How it should be cleaned

# Developing a Cleaning Program

**Train your staff and monitor the cleaning program:**



- Supervise daily cleaning routines.

- Check cleaning tasks against the master schedule every day.

- Change the master schedule as needed.

- Ask staff for input on the program.