

STUDY GUIDE
for
SERVSAFE MANAGER
EXAM
7TH Edition

Includes 10/2019 Food Code Updates

For Personal Use Only



Providing Safe Food

Objectives:

By the end of this section, 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

The requirement that the person in charge become a Certified Food Protection Manager was added. The FDA Food Code requires that the person in charge of a foodservice operation become a Certified Food Protection Manager. That person must be onsite at all times during operating hours. A Certified Food Protection Manager must show that he or she has the required knowledge by passing a test from an accredited program. The program must be accredited by an agency approved by a Conference for Food Protection. Completing the ServSafe Manager Course and passing the ServSafe Food Protection Manager Certification Examination meets this requirement.

Why is it so important to become certified? A Centers for Disease Control and Prevention study suggests that the presence of a Certified Food Protection Manager reduces the risk of a foodborne illness outbreak for an establishment. The study also suggests that it was a distinguishing factor between restaurants that experienced a foodborne illness outbreak and those that had not. In addition, the FDA's Retail Food Risk Factor Studies suggest that the presence of a certified manager has a positive correlation with more effective control of certain risk factors, such as poor personal hygiene, in different facility types.

A requirement was added that managers ensure food handlers are regularly monitoring food temperatures during hot and cold holding. The Food and Drug Administration (FDA) recommends that regulatory authorities hold the person in charge of a foodservice operation responsible for ensuring the following standards are met:

Food handlers are regularly monitoring food temperatures during hot and cold holding.

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 include:

- | | | |
|--------------------------|------------------------|------------------|
| • Time | • Pathogens | • Staff turnover |
| • Language and culture | • Unapproved suppliers | |
| • Literacy and education | • High-risk customers | |

Costs of Foodborne Illness

Costs of a foodborne illness to an operation:

1. Loss of customers and sales
2. Loss of reputation
3. Lowered staff morale
4. Negative media exposure
5. Costs of Foodborne Illness
6. Lawsuits and legal fees
7. Staff missing work
8. Staff retraining
9. Increased insurance premiums

How Foodborne Illnesses Occur

Unsafe food is the result of biological, chemical, physical contamination

Biological Contaminants	Chemical Contaminants	Physical Hazards
Bacteria Viruses Parasites Fungi	Cleaners Sanitizers Polishes	Metal shavings Staples Bandages Glass Dirt Natural objects 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

1. Time-temperature abuse
2. Cross-contamination
3. Poor cleaning and sanitizing
4. Poor personal hygiene

Time-temperature abuse is when food has stayed too long at temperatures good for pathogen (germ) growth. Food has been time-temperature abused when it

- has not been held or stored at the correct temperature.
- is not cooked or reheated enough to kill pathogens.
- is not cooled correctly.

Cross-contamination happens when pathogens (germs) are transferred from one surface or food to another. Cross-contamination can cause a foodborne illness when:

1. Contaminated ingredients are added to food that receives no further cooking
2. Ready-to-eat food touches contaminated surfaces.
3. Contaminated food touches or drips fluids onto cooked or ready-to-eat food.
4. A food handler touches contaminated food and then touches ready-to-eat food.
5. Contaminated wiping cloths touch food-contact surfaces.

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

1. Fail to wash their hands correctly after using the restroom
2. Cough or sneeze on food
3. Touch or scratch wounds and then touch food
4. Work while sick

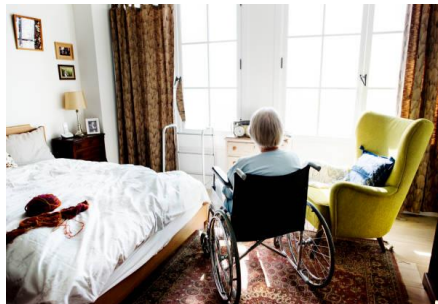
Poor cleaning and sanitizing can spread pathogens from equipment to food when:

- 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.

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



Food Most Likely to Become Unsafe

TCS food:



Ready to Eat Food:



1-22

The two types of food that are most likely to become unsafe are **TCS** food and **Ready-To-Eat** food. A TCS food is one requiring time and temperature control to limit pathogen growth: **Time and Temperature Control for Safety**"

Ready-to-eat food is food that can be eaten without further preparation, washing, or cooking.

Examples of ready to eat food:

1. Cooked food
2. Washed fruit and vegetables
3. Deli meat
4. Bakery items
5. Sugar, spices, and seasonings

Keeping Food Safe

Focus on these measures

1. Purchasing from approved, reputable suppliers
2. Controlling time and temperature
3. Preventing cross-contamination
4. Practicing personal hygiene
5. Cleaning and sanitizing

Training and Monitoring

Training

1. Train staff to follow food safety procedures.
2. Provide initial and ongoing training.
3. Provide all staff with general food safety knowledge.
4. Provide job-specific, food safety training.
5. Retrain staff regularly.
6. Document training.

Monitoring

1. Monitor staff to make sure they are following procedures.
2. If a task is done incorrectly, take corrective action immediately.
3. **Retrain** an employee or multiple employees if they often complete a task incorrectly.

Government Agencies

1. The Food and Drug Administration (FDA)
2. U.S. Department of Agriculture (USDA)
3. Centers for Disease Control and Prevention (CDC)
4. U.S. Public Health Service (PHS)
5. State and local regulatory authorities

Responsibilities of Regulatory Authorities

1. **Inspecting** operations
2. **Enforcing** regulations
3. **Investigating** complaints and illnesses
4. Issuing **licenses** and **permits**
5. **Approving** construction
6. **Reviewing** and approving **HACCP plans**

Forms of Contamination

Objectives

You should be able to identify the following:

1. Biological, chemical, and physical contaminants and ways to prevent food from being contaminated
- How to prevent the deliberate contamination of food
2. The correct response to a foodborne-illness outbreak
3. The most common food allergens and how to prevent exposure to food allergens

How Contamination Happens

Contamination is the presence of harmful substances in food. Contaminants can:

1. Be biological, chemical, or physical
2. Cause foodborne illness
3. Result in physical injury

Contaminants come from many 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

People can contaminate food when:

1. They don't wash their hands after using the restroom.
2. They are in contact with a person who is sick.
3. They sneeze or vomit onto food or food contact surfaces.
4. They touch dirty food-contact surfaces and equipment and then touch food.

Simple mistakes can cause contamination. Here are a few examples:

1. Allowing ready-to-eat food to touch a surface that contacted raw meat, seafood, or poultry
2. Storing food or cleaning products incorrectly
3. Failing to spot signs of pests

Biological Contamination

A **microorganism** is a small, living organism that can be seen only with a microscope. A **pathogen** is a harmful microorganism that can make people sick when eaten or produce toxins that cause illness. A toxin is a poison made by a microorganism that is in the food when it is eaten or when it grows inside a person.

Four types of pathogens can contaminate food and cause foodborne illness:

1. Bacteria
2. Viruses
3. Parasites
4. Fungi

The Big Six Pathogens

1. **Hepatitis A**
2. **E. coli** - also called Shiga toxin-producing *Escherichia coli* (STEC)
3. **Shigella spp.**
4. **Salmonella Typhi**
5. **Salmonella (NTS) Nontyphoidal**
6. **Norovirus**

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 and can range from 30 minutes to six weeks

Basic Characteristics of Bacteria

Location	Found almost everywhere
Detection	Cannot be seen, smelled, or tasted
Growth	Grow rapidly if <i>FAT TOM</i> conditions are correct
Prevention	Control time and temperature

What Bacteria Need to Grow

F	Food	Most bacteria need nutrients to survive. TCS food supports the growth of bacteria better than other types of food
A	Acidity	Bacteria grow best in food that contains little or no acid.
T	Temperature	Bacteria grow rapidly between 41°F and 135°F (5°C and 57°C). This range is known as the temperature danger zone . Growth of bacteria is limited when food is held <u>above</u> or <u>below</u> the temperature danger zone.
T	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.
O	Oxygen	Some bacteria need oxygen to grow. Other bacteria grow when oxygen isn't there
M	Moisture	Bacteria grow well in food with high levels of moisture. aw = water activity; the amount of moisture available in food for bacterial growth. aw scale ranges from 0.0 to 1.0. Water has a water activity of 1.0.

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FAT TOM 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:

1. Salmonella typhi
2. Salmonella Nontyphoidal
3. Shigella spp.
4. E. coli (STEC) Shiga toxin-producing

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

Basic Characteristics of Viruses

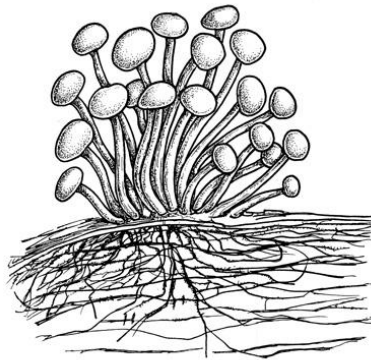
Location	Carried by human beings and animals Require a living host to grow Do not grow in food Can be transferred through food and remain infectious in food
Sources	Food, water, or any contaminated surface Typically occur through fecal-oral routes
Destruction	Not destroyed by normal cooking temperatures Good personal hygiene must be practiced when handling food and food-contact surfaces Quick removal and cleanup of vomit is important
Major Viruses	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

Basic Characteristics of Parasites

Location	Require a host to live and reproduce
Sources	Seafood, wild game, and food processed with contaminated water, such as produce
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.

Basic Characteristics of Fungi

Description	Yeasts, molds, and mushrooms. Some molds and mushrooms produce toxins
Prevention	Throw out moldy food, unless mold is a natural part of the food Purchase mushrooms from approved, reputable suppliers.



Biological Toxins

Naturally occur in certain plants, mushrooms, and seafood.

Seafood toxins are produced by pathogens found on certain fish. For example, histamine is produced when fish is time-temperature abused. Examples are:

- Tuna
- Bonito
- Mahi-mahi

Toxins also occur in certain fish that eat smaller fish that have consumed a toxin. Ciguatera toxin is an example and is found in these fish:

- Barracuda
- Snapper
- Grouper
- Amberjack

Illness	Symptoms and onset times vary with illness. People will experience illness within minutes.
General Symptoms	Diarrhea or vomiting Neurological symptoms Tingling in extremities Reversal of hot and cold sensations Flushing of the face Difficulty breathing Burning in the mouth Heart palpitations Hives
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: hand lotions, hairsprays etc. Certain types of kitchenware and equipment made from Pewter Copper Zinc Some types of painted pottery
Symptoms	Vary depending on chemical consumed. Most illnesses occur within minutes. Vomiting and diarrhea are typical
Prevention	1. Use chemicals approved for use in foodservice operations. 2. Purchase chemicals from approved, reputable suppliers. 3. Store chemicals away from prep areas, food-storage areas, and service areas. 4. Separate chemicals from food and food-contact surfaces by <u>spacing</u> and <u>partitioning</u>. 5. NEVER store chemicals above food or food-contact surfaces. 6. Use chemicals for their intended use and follow manufacturer's directions. 7. Only handle food with equipment and utensils approved for foodservice use. 8. Make sure the manufacturer's labels on original chemical containers are readable 9. Follow the manufacturer's directions and local regulatory requirements when throwing out chemicals

Physical Contaminants

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
Symptoms	Mild to fatal injuries Cuts, dental damage, and choking Bleeding 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 or activists
- ✓ Disgruntled current or former staff
- ✓ Vendors
- ✓ Competitors

A.L.E.R.T. is the FDA defense tool to prevent deliberate contamination of Food

A ssure	Make sure products received are from safe sources.
L ook	Monitor the security of products in the facility.
E mployees	Know who is in your facility.
R eports	Keep information related to food defense accessible.
T hreat	Develop a plan for responding to suspicious activity or a threat to the operation.

Responding to a Foodborne-Illness Outbreak

1. Gather information
2. Notify authorities
3. Segregate product
4. Document information
5. Identify staff
6. Cooperate with authorities
7. Review procedures

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.

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.

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 and/or identify if standards are not working.

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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.

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

Allergic reactions

- Symptoms can become serious quickly.
- A severe reaction, called **anaphylaxis**, can lead to death.

The Big Eight Common Food Allergens

- 1 Milk
- 2 Soy
- 3 Eggs
- 4 Wheat
- 5 Fish, such as bass, flounder, and cod
- 6 Crustacean shellfish, such as crab, lobster, and shrimp
- 7 Peanuts
- 8 Tree nuts, such as walnuts and pecans

Preventing Allergic Reactions

- ✓ Check food labels for allergens
- ✓ **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.



✓ 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.
- 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.

The Safe Food Handler

Objectives:

By the end of this section, 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

1. Have a foodborne illness
2. Have wounds or boils that contain a pathogen
3. Sneeze or cough
4. Have contact with a person who is sick
5. Use the restroom and do not wash their hands
6. Have symptoms such as diarrhea, vomiting, or jaundice—a yellowing of the eyes or skin
7. Actions that can contaminate food
 - Scratching the scalp
 - Running fingers through hair
 - Wiping or touching the nose
 - Rubbing an ear
 - Touching a pimple or infected wound/boil
 - Wearing and touching a dirty uniform
 - Coughing or sneezing into the hand
 - Spitting in the operation



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Managing a Personal Hygiene Program

Managers must focus on the following:

1. Creating personal hygiene policies
2. Training food handlers on personal hygiene policies and retraining them regularly
3. Modeling correct behavior at all times
4. Supervising food safety practices
5. Revising personal hygiene policies when laws or science change

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 Procedure

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.
6. Avoid contaminating clean hands. Consider using a paper towel to turn off the faucet and to open the door.

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 needed

Hand Antiseptics

Liquids or gels used to lower the number of pathogens on skin. If used they

- 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

Hand Care Requirements for Food Handlers

- Keep fingernails short and clean.
- Do NOT wear false nails.
- Do NOT wear nail polish.



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When to Wash Hands

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

- Preparing food
- Working with clean equipment and utensils
- Putting on single-use gloves

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
- 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

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 or wrist wounds cover with an impermeable (waterproof) 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

Which Gloves to Buy

- Approved gloves
- Disposable gloves
- Multiple sizes
- Latex alternatives

How to Use Gloves

- Wash hands before putting on gloves when starting 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.



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
- 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 handlers 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.

Food handlers 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.

Food handlers must handle **aprons** correctly

- Remove aprons when leaving prep areas.
- NEVER wipe your hands on your apron.

Food handlers 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.

- Signed statements in which staff have agreed to report illness
- Documentation showing staff have completed training, which includes information on the importance of reporting illness
- Posted signs or pocket cards that remind staff to notify managers when they are sick

Reporting Illnesses

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:
 - Norovirus
 - Hepatitis A
 - Shigella spp.
 - Shiga-toxin producing E. coli (STEC)
 - Salmonella Typhi
 - Nontyphoidal Salmonella



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)

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

<i>IF</i>	<i>THEN</i>
Food handler has vomiting or diarrhea	• Exclude them from work. • Employee can return to work when they have no symptoms for 24 hours OR have a written release from a medical practioner
Food handler has sore throat with fever	• Exclude from work if you serve a high-risk population. • Work with medical practioner and regulatory authority to determine when the employee can return to work • Restrict from working with food if you do not serve a high-risk population
Food handler has jaundice	• Report to regulatory authority • Exclude if the employee has jaundice for less than 7 days • Need medical release AND permission from regulatory authority before they can come back to work
Food handler has been diagnosed with foodborne illness caused by: • Hepatitis A • <i>E. coli</i> Enterohemorrhagic and shiga- toxin producing (STEC) • <i>Shigella</i> spp. • <i>Salmonella typhi</i> • Nontyphoidal <i>Salmonella</i> • <i>Norovirus</i>	• Report to regulatory authority. • Exclude the employee from work. • Work with medical practitioner and regulatory authority to determine when they can return to work.

The Flow of Food

Objectives

1. How to prevent cross-contamination
2. How to prevent time-temperature abuse
3. How to use and maintain thermometers correctly

The Flow of Food

The flow of food is the path that food takes through your operation. To keep food safe throughout the flow of food:

- ✓ Prevent cross-contamination.
- ✓ Prevent time-temperature abuse.

A requirement was added regarding the separation of raw meat, poultry, and seafood from unwashed and ready-to-eat fruits and vegetables. Separate raw meat, poultry, and seafood from unwashed and ready-to-eat fruits and vegetables. Do this during storage, preparation, holding, and display to prevent cross-contamination.

Preventing Cross-Contamination

1. Separate equipment
2. Clean and sanitize
3. Use separate equipment for raw and ready-to-eat food.
4. Buy prepared food

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

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.
- Prep ready-to-eat food before raw food when possible.
- Buy prepared food items that don't require much prepping or handling.

Preventing Time-Temperature Abuse

Time-temperature control

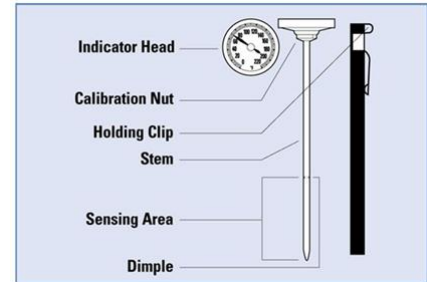
- Food held in the range of 41°F and 135°F (*Temperature Danger Zone*) has been time-temperature abused.
- Food is being temperature abused whenever it is handled in the following ways:
 - Cooked to the wrong internal temperature
 - Held at the wrong temperature
 - Cooled or reheated incorrectly

How to 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
 - ✓ The entire sensing area must be inserted into the food.
 - ✓ Has a calibration nut to keep the thermometer accurate
- **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
- **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.
- **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:
 - ✓ After they have been bumped or dropped
 - ✓ After they have been exposed to extreme temperature changes
 - ✓ Before deliveries arrive
 - ✓ Before each shift
- Make sure they are accurate:
 - ✓ If used to check food, thermometers must be accurate to $\pm 2^{\circ}\text{F}$
 - ✓ If used to check air temperature, thermometers must be accurate to $\pm 3^{\circ}\text{F}$
- 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 32°F (0°C).

The Flow of Food: Purchasing, Receiving, and Storage

Objectives

- 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.

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

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.

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).

Checking the temperature of ROP Food

Examples of Reduced Oxygen Packaging (ROP) are MAP, vacuum-packed, and sous vide

- Insert the thermometer stem or probe between two packages.
- As an alternative, fold packaging around the thermometer stem or probe.

Checking the temperature of other packaged food

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

Temperature Criteria for Deliveries

<i>FOOD TYPE</i>	<i>RECEIVING TEMPERATURE</i>
Meat Poultry Fish Dairy Prepared shellfish Prepared crustacea Packaged refrigerated food Cut produce	41°F
Eggs Milk Shucked shellfish	45°F Cool to 41°F within 4 hours
Live shellfish Oysters, mussels, clams, scallops	Air temperature 45°F Internal temperature 50°F Cool to 41°F within 4 hours
Hot TCS food	135°F or higher

Receiving and Inspecting 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

Receiving and Inspecting Packaged Items

- Reject packaged items with
 - ✓ Tears, holes, or punctures in packaging
 - ✓ Cans with severe dents in the seam or body, missing labels, swollen or bulging ends, holes, leaks, rust
 - ✓ Bloating or leaking ROP food
 - ✓ Broken cartons or seals
- Other packaged items to reject:
 - ✓ 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 Seafood Documents

- Shellfish must be received with **shell stock** identification tags:
- Tags indicate when and where the shellfish were harvested.
- Store shellfish in their original container:
 - ✓ Do **NOT** remove the shell stock tag until the last shellfish is used.
 - ✓ Write the date the last shellfish was used on the shell stock tag.
 - ✓ Keep the shellstock tag on file for 90 days after the last shellfish was used.
- 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.
- Reject meat, fish, or poultry if texture is:
 - ✓ It is slimy, sticky, or dry.
 - ✓ It has soft flesh that leaves an imprint when touched.
- Reject food with an abnormal or unpleasant odor.

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 sub-ingredients 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

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 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.
- 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.
- If a commercially processed food has a use-by date that is less than seven days from the date the container was opened.
- Mark container with this use-by date as long as the date is based on food safety.
- 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 or lower or 135°F 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
 - ✓ Put it in the warmest part of refrigerated units or the coldest part of hot-holding units

Maintaining Storage Temperatures

- Do NOT overload coolers or freezers.
- Frequent opening of the cooler lets warm air inside, which can affect food safety.
- Use open shelving:
 - ✓ Lining shelving restricts circulation.
- Monitor food temperatures regularly:
 - ✓ Randomly sample food temperatures.
 - ✓ If the food is not at the correct temperature, throw it out.

FIFO: First in First Out

Rotate food to use the oldest inventory first.

- Identify the food item's use-by or expiration date.
- Store items with the earliest use-by or expiration dates in front of items with later dates.
- Once shelved, use those items stored in front first.
- Throw out food that has passed its manufacturer's use-by or expiration date.

Preventing Cross-Contamination

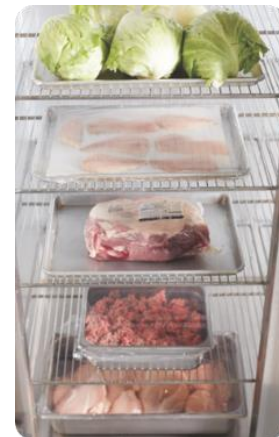
- Store all items in designated storage areas.
 - ✓ Store items away from walls and at least six inches (15 centimeters) off the floor.
 - ✓ Store single-use items (e.g., sleeve of single-use cups, single-use gloves) in original packaging.
- Store food in containers intended for food.
- Use containers 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.
- 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.
- 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.

Storage to Prevent Cross-Contamination

Store food items in this top-to-bottom order:

1. Ready-to-eat food
2. Seafood
3. Whole cuts of beef and pork
4. Ground meat and ground fish
5. Whole and ground poultry

Storage order is based on the minimum **internal cooking temperature** of each food



- 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

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- Handling damaged, spoiled, or incorrectly stored food
 - **Corrective Action:** Discard food that has become unsafe:
 - ✓ Expired, damaged, spoiled, or incorrectly stored food.
 - ✓ Food missing a date mark.
 - ✓ Ready-to-eat TCS food that has exceeded its date mark.
 - ✓ Food that has exceeded time/temperature requirements.
- If food will be **returned to the vendor:**
 - ✓ Store the food away from other food and equipment.
 - ✓ Label the food so it will not be used.

Preparation

Objectives

- 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

- 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 helps prevent time-temperature abuse.
- Return prepped food to the cooler or cook it as quickly as possible.

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.

When to throw food away

Food must be thrown out (**Corrective Action**) 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

General Guidelines for Thawing TCS food

- Thaw food in a cooler, keeping its temperature at 41°F or lower.
- Submerge food under running, drinkable water at 70°F 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 for longer than four hours.
- 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 may be supplied in reduced-oxygen packaging (ROP). This fish should usually remain frozen until ready for use. If this is stated on the label, the fish must be removed from the packaging at the following times:

- Before thawing it under refrigeration
- Before or immediately after thawing it under running water

If you are **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.

Prepping 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:
 - ✓ Use running water a little warmer than the produce.
 - ✓ Pull apart leafy greens and rinse thoroughly.
- Certain chemicals may be used to wash produce.
- When soaking or storing produce in standing water or an ice-water slurry, do NOT mix:
 - ✓ Different items
 - ✓ Multiple batches of the same item
- Refrigerate and hold sliced melons, cut tomatoes, and cut leafy greens at 41°F or lower.
- Do NOT serve raw seed sprouts if primarily serving a high-risk population

Prepping Eggs and Egg Mixtures

- Handle pooled eggs (if allowed) with care:
 - ✓ Cook promptly after mixing or store at 41°F or lower.
 - ✓ Clean and sanitize containers between batches.
- Use pasteurized shell eggs or egg products when prepping dishes that need little or no cooking.
- Serving Eggs to High Risk Populations
 - ✓ Use pasteurized eggs or egg products when serving raw or undercooked dishes.
 - ✓ Unpasteurized shell eggs can be used if the dish will be cooked all the way through (For example, omelets, cakes).
 - ✓ Use pasteurized shell eggs if eggs will be pooled.

Prepping 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 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

A **variance** is a document issued by your regulatory authority that allows a regulatory requirement to be waived or changed. You will need a variance if your operation plans to prep food in any of these ways:

- Packaging fresh juice on-site for sale at a later time, unless the juice has a warning label that complies with local regulations.
- Smoking food to **preserve** but not to enhance flavor.
- Using food additives or adding components such as vinegar to preserve or alter the food so that it no longer needs time and temperature control for safety.
- Curing food.
- Custom-processing animals for personal use. For example, a hunter brings a deer to a restaurant for dressing and takes the meat home for later use.
- Packaging food using a reduced-oxygen packaging (ROP) method. This includes MAP, vacuum-packed, and sous vide food, as shown in the photo at left.
- Sprouting seeds or beans.
- Offering live shellfish from a display tank.

Variance

A HACCP plan must be submitted when applying for a variance to prepare food in specific ways. When applying for a variance, your regulatory authority may require you to submit a HACCP plan.

- The HACCP plan must account for any food safety risks related to the way you plan to prep the food.
- You must comply with the HACCP plan and procedures submitted.
- **Maintain and provide records** requested by the regulatory authority which show that you are regularly:
 - ✓ Following procedures for monitoring Critical Control Points
 - ✓ Monitoring the Critical Control Points
 - ✓ Verifying the effectiveness of the operation or process
 - ✓ Taking the necessary corrective actions if there is a failure at a critical control point

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
- 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.

Internal Cooking Temperatures

Food Type	Minimum Internal Temperature	Time to Hold
Poultry—including 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 Raw ingredients should be cooked to their required minimum internal temperatures	165°F	<1 second
Microwaved TCS foods	165°F	15 seconds
• Ground meat—beef, pork, and other meat • Injected meat—brined ham and flavor-injected roasts • Mechanically tenderized meat • Ground meat from game animals commercially raised and inspected • Ratites - ostrich and emu • Ground seafood—chopped or minced seafood • Shell eggs that will be hot held for service	155°F	17 seconds
• Eggs served immediately • Fish, commercially raised game • Pork, beef, lamb steaks and chops	145°F	15 seconds
• Food from plants that will be hot held for service Fruits, vegetables, grains, rice, pasta, legumes, beans, refried beans • Commercially prepared RTE food and hot held	135°F	No minimum time

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

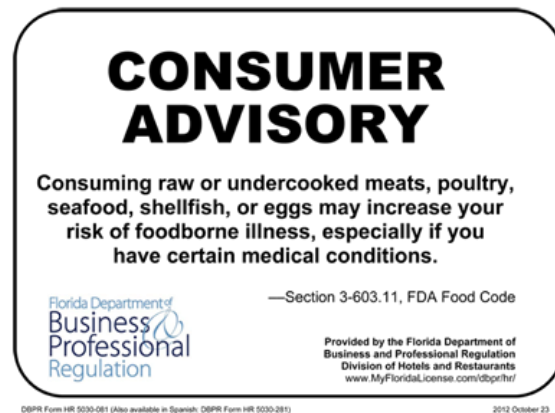
- If partially cooking meat, seafood, poultry, or eggs or dishes containing these items:
- NEVER cook the food longer than 60 minutes during initial cooking.
- Cool the food immediately after initial cooking.
- Freeze or refrigerate the food after cooling it:
 - ✓ If refrigerating, hold it at 41°F or 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.

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Procedures for partial cooking should describe

- How to monitor and document requirements
- Which corrective actions will be taken if requirements are not met
- How par cooked items will be marked after initial cooking
- How par cooked food will be stored separately from ready-to-eat food



- 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.
- **Advise customers** that raw or undercooked TCS food **increases the 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

Should NEVER serve:

- Raw seed sprouts
- Raw or undercooked eggs (unpasteurized), meat, or seafood
 - ✓ Over-easy eggs
 - ✓ Raw oysters on the half shell
 - ✓ Rare hamburgers
- Unpasteurized milk or juice

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Cooling Food

Temperature Requirements for Cooling Food

1. Cool food from 135°F to 70°F within **two hours**.
2. Cool it from 70°F to 41°F or lower in the next **four hours**.

If you cool food from 135°F to 70°F in less than two hours

- The remaining time can be used to cool it to 41°F or lower.
- The total cooling time cannot be longer than **six hours**.

Example

- If you cool food from 135°F to 70°F in one hour.
- Then you have five hours to get the food to 41°F or lower.

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.

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**.

When storing food for further cooling

- Loosely cover food containers before storing them.
- Food can be left uncovered if protected from contamination.
 - 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 for 15 seconds
- Reheat commercially processed and packaged ready-to-eat food to an internal temperature of at least 135°F.

Service

Objectives

By the end of this section, 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

The requirement that managers ensure food handlers are regularly monitoring food temperatures during hot and cold holding was added.

Make sure that food handlers are regularly monitoring food temperatures during hot and cold holding. Food temperatures should be checked at least every four hours. Follow these guidelines:

- Throw out food that is not 41°F or lower or 135°F or higher
- Check the temperature every two hours. This will leave time for corrective action. An example of a **corrective action**: Hot TCS food that has been held below 135°F can be reheated and then placed back in the hot-holding unit.

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

Temperature

- Hold TCS food at the correct temperature:
 - ✓ Hot food: 135°F or higher
 - ✓ Cold food: 41°F 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.

Time Guidelines for Holding Food

- Check temperatures at least every **four hours**:
 - ✓ Throw out food not at 41°F (5°C) or lower or 135°F (57°C) or higher.
 - ✓ Optional: Check temperatures every **two hours** to leave time for **corrective action**.

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 food can be held without temperature control for up to **six hours** if:

- It was held at 41°F or lower before removing it from refrigeration.
- It has a **label** specifying:
 1. Time it was removed from refrigeration.
 2. Time it must be thrown out.
- It does not exceed 70°F (21°C) during service.
 - ✓ Throw out food that exceeds this temperature.
- It is sold, served, or thrown out within **six hours**.

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

- It was held at 135°F (57°C) 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.

If your operation displays or holds TCS food without temperature control, it must do so under certain conditions. This includes:

- preparing written procedures and getting written approval in advance by the regulatory authority
- maintaining those procedures in the operation
- making sure those procedures are made available to the regulatory authority on request.

There are other conditions that may apply. Also note that the conditions for holding cold food are different from those for holding hot food. Before using time as a method of control, check with your local regulatory authority for specific requirements.

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**.
- 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
- **Take-home containers** can be refilled only when the containers are:
 - ✓ Designed for reuse
 - ✓ Provided to guest by the operation
 - ✓ Cleaned and sanitized correctly

- **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

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.

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 or higher
 - ✓ Cold food: 41°F or lower
- 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

- 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.

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

- 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.
 - ✓ 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.
- 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.

Vending Machines

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.

Food Safety Management Systems

Objectives

By the end of this section, 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

- 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:

1. Personal hygiene program
2. Food safety training program
3. Quality control and assurance program
4. Supplier selection and specification program
5. Cleaning and sanitation program
6. Standard operating procedures (SOPs)
7. Pest control program
8. Facility design and equipment maintenance program

Operation During Water or Electrical Interruption

The regulatory authority may allow an operation to continue operating in the event of a water or electrical interruption under the following conditions:

- The operation has a written emergency operating plan approved in advance by the regulatory authority
- An immediate corrective action is taken to prevent, eliminate, or control any food safety risk and imminent health hazard associated with the interruption
- The regulatory authority is informed upon implementing the emergency operating plan

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

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

- ✓ Training programs
- ✓ Manager supervision
- ✓ Standard operating procedures (SOPs)
- ✓ HACCP

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.

The **FDA public health** interventions

1. Demonstration of knowledge
2. Staff health controls
3. Controlling hands as a vehicle of contamination
4. Time and temperature parameters for controlling pathogens
5. Consumer advisories

Hazard Analysis Critical Control Point (HACCP)

The HACCP Program

- Identifies significant hazards at points within a product's flow through an operation
 - ✓ Biological, chemical, and physical hazards
- Identifies how to prevent, eliminate, or reduce hazards to safe levels
- Is documented in a written plan
 - ✓ The plan is specific to the facility's menu, customers, equipment, processes, and operations.

Safe Facilities and Pest Management

Objectives

- 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 that comes in contact with food

- Nonabsorbent, smooth, and corrosion resistant
- Easy to clean
- Durable
- Resistant to damage

Installing equipment

- Floor-mounted equipment must be either
 - ✓ Mounted on legs at least six inches
 - ✓ Sealed to a masonry base
- Tabletop equipment should be either
 - ✓ Mounted on legs at least four inches
 - ✓ Sealed to the countertop
- 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.

Selecting Dishwashing Machines

- Make sure they can measure
 - ✓ Water temperature
 - ✓ Water pressure
 - ✓ Cleaning and sanitizing chemical concentration
- Post information about the correct settings on the machine.

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
 - ✓ Restrooms or directly next to them
 - ✓ Food-prep areas
 - ✓ Service areas
 - ✓ Dishwashing areas
- Used only for handwashing
- Installed with adequate barriers or distance from food and food-contact surfaces
- Available at all times. They should NEVER be blocked.

Handwashing stations must have

1. Hot and cold running water
2. Soap
3. A way to dry hands
4. Garbage container
5. Signage
6. 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
- **Cross-connection**
 - ✓ Physical link between safe water and dirty water from
 - Drains
 - Sewers
 - Other wastewater sources
- **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
 - ✓ Can occur when high water use in one area of the operation creates a vacuum.
 - ✓ A running hose in a mop bucket can lead to backsiphonage.
- **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.
- Indoor containers must be:
 - ✓ Leakproof, waterproof, and pest proof.
 - ✓ 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.
- 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

Maintaining the Facility

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

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**

- **How to respond to a crisis that affects 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.

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).

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.
- 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.
 - ✓ Refuse shipments if pests or signs of pests are found.
- Make sure all of the points where pests can access the building are secure:
 - ✓ Screen windows and vents
 - ✓ Seal cracks in floors and walls, and around pipes
 - ✓ 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.

Cleaning and Sanitizing

Objectives

- 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 must be:
 - ✓ Stable
 - ✓ Noncorrosive
 - ✓ Safe to use

Types of cleaners include

- ✓ Detergents
 - ✓ Degreasers
 - ✓ Delimers
 - ✓ Abrasive 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.

Sanitizing Methods

- **Heat sanitizing**
 - ✓ Immerse the item in water that is 171°F 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.
- Commonly used chemical sanitizers include:
 - ✓ Chlorine.
 - ✓ Iodine.
 - ✓ Quats (quaternary ammonium compounds)
- Detergent-sanitizer blends can be used in some cases:
 - ✓ Use it once to clean.
 - ✓ Use it a second time to sanitize.



What Changes Sanitizer Effectiveness

- **Concentration:**
 - ✓ Sanitizers should be mixed with water to the correct concentration:
 - Not enough sanitizer may make the solution weak and useless.
 - Too much sanitizer may make the solution too strong, unsafe, and corrode metal.
- **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.
- **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.

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.

Sanitizer Concentration			
Characteristics	Chlorine	Quats Quaternary Ammonium	Iodine
Water Temperature			
Sanitizer Concentration	ppm	ppm	ppm
Sanitizer Contact Time	seconds	seconds	seconds



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Guidelines for the Effective Use of Sanitizers

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.

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 Clean-in-Place Equipment

- Equipment that holds and dispenses TCS food:
 - ✓ Must be cleaned and sanitized every day unless otherwise indicated by the manufacturer



Follow the manufacturer's directions. General steps:

1. Unplug the equipment.
2. Take off the removable parts.
3. Wash, rinse, and sanitize them by hand or run the parts through a dishwasher if allowed.
4. Scrape or remove food from the equipment surfaces.
5. Wash the equipment surfaces.
6. Rinse the equipment surfaces with clean water.
7. Sanitize the equipment surfaces.
8. Make sure the sanitizer comes in contact with each surface.
9. Allow all surfaces to air-dry.
10. Put the unit back together.

Machine Dishwashing

- **High-temperature machines**
 - ✓ Final sanitizing rinse must be at least 180°F
 - ✓ Stationary rack, single-temperature machines final rinse must be at least 165°F
 - ✓ Provide tools to check the temperature of the items being sanitized, such as:
 - ✓ Maximum registering thermometers.
 - ✓ Temperature sensitive tape.
- **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.
 - ✓ Check the machine's water temperature, water pressure, and sanitizer levels.
 - ✓ Take **corrective action** if necessary.

Manual Dishwashing

Setting up a three-compartment sink:

- Clean and sanitize each sink and drain board.
- Fill the sinks:
 1. First sink—detergent and water at least 110°F
 2. Second sink—clean water
 3. Third sink—water and sanitizer
- Provide a clock with a second hand.

Steps for Cleaning and Sanitizing in Three-Compartment Sinks

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 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.
- 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. There are two types:
 - ✓ Wet wiping cloths
 - ✓ Dry wiping cloths
- NEVER use cloths that are meant for wiping food spills for any other purpose.
- Wet wiping cloths:
 - ✓ For wiping counters and other surfaces.
 - ✓ Store in sanitizer solution between uses.
- 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 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 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.



Storing Cleaning Tools and Chemicals

- Place in a separate area away from food and prep areas.
- The storage area should have:
 1. Good lighting so chemicals can be easily seen
 2. Hooks for hanging cleaning tools
 3. Utility sink for filling buckets and washing cleaning tools
 4. Floor drain for dumping dirty water
- **NEVER** clean tools in sinks used for
 - ✓ Handwashing
 - ✓ Food prep
 - ✓ Dishwashing
- Dump mop water or other liquid waste into toilets or urinals.

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Using Foodservice Chemicals

- Only use chemicals approved for foodservice operations.
 - ✓ **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.

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.

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.
- 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

Train your staff and monitor the cleaning program:

1. Supervise daily cleaning routines.
2. Check cleaning tasks against the master schedule every day.
3. Change the master schedule as needed.
4. Ask staff for input on the program.



ServSafe Glossary

Abrasive cleaner: Cleaners containing a scouring agent that helps scrub off hard-to-remove soils such as baked-on food. They may scratch some surfaces, if not used properly.

Acid cleaner: Acid cleaners (pH below 7.0) are used on mineral deposits and other soils that alkaline cleaners can't remove, such as scale, rust, and tarnish. These cleaners may damage surfaces if not used properly.

Acidity: Level of acid in food. Food with a pH range from 4.6 to 7.5 (slightly acidic) is called potentially hazardous food. See High-acid food.

Active managerial control: Proactive approach for addressing the 5 most common risk factors responsible for foodborne illness as identified by the CDC. By continuously monitoring and verifying procedures responsible for preventing these risks, establishments can ensure they are being controlled.

ADA: See Americans with Disabilities Act.

Air curtains: Ventilation unit that blows a steady stream of air across an open door (or outward) to discourage flying insects from entering. Also called air doors or fly fans.

Air gap: Air space used to separate a water-supply outlet from any potentially contaminated source. The air space between the floor drain and the drain pipe of a sink is an example. An air gap is the only completely reliable method for preventing backflow.

Air temperature: Used to describe the temperature surrounding food, whether in a transportation vehicle, a container, or storage area.

Alkalinity: The alkaline quality of a food. An alkaline substance has a pH above 7.0. Most types of food are not alkaline.

Allergen: A substance, usually a protein, that is seen as foreign by the body, which then produces antibodies in response.

Americans with Disabilities Act (ADA): Federal law requiring reasonable accommodation for access to a facility by both patrons and employees with disabilities.

Amnesic shellfish poisoning (ASP): Illness caused by the ingestion of shellfish, including clams, mussels, oysters, and scallops that have filtered toxic marine algae from the water. The toxin involved in the illness

associated with ASP is domoic acid, which cannot be destroyed through cooking or freezing. It is critical to purchase shellfish from reputable, approved suppliers.

Anisakis simplex: An anisakid nematode (roundworm) that has been implicated in human infections caused by the consumption of raw or undercooked fish. Illness caused by the parasite has two different forms: invasive or noninvasive. Symptoms vary by type of illness. To prevent illness, cook food, particularly herring, cod, halibut, mackerel and Pacific salmon to minimum internal temperatures or if it will be served raw, be sure seafood is purchased from approved, reputable suppliers.

Application: A key element of training; practice by the learner.

Approved suppliers: See Suppliers, approved (certified).

Assessing hazards: See Hazard analysis.

Bacillus cereus: Bacteria, which cause two distinct illnesses: a diarrheal type of illness and a vomiting (emetic) type of illness. A wide variety of food including cooked corn, potatoes, and other vegetables as well as meat products have been associated with diarrheal-type food poisoning. The vomiting-type outbreaks have generally been associated with cooked rice dishes, such as fried rice and rice pudding.

Backflow: Type of cross-connection that can occur in a potable water system. Backflow is the unwanted reverse flow of contaminated water through a cross-connection into a potable water system. It can occur whenever the pressure in the potable water supply drops below the pressure of the contaminated supply. See Air gap.

Bacteria: Common foodborne microbial contaminant. Bacteria are living, single-celled microorganisms that can cause food spoilage and illness. Some form spores, which can survive freezing and very high temperatures. Bacteria that cause disease are pathogenic. See Pathogens; Pathogenic bacteria.

Bacterial growth: Bacteria reproduce (or grow) by splitting into two (2). When conditions are favorable, bacteria can grow and multiply very rapidly, doubling the population as often as every 20 minutes, in some cases. Three phases of bacterial growth are the lag phase (slow growth), log phase (rapid growth), stationary phase (equilibrium between growth and die-off), and death phase (decrease in population). See FAT TOM.

Behavioral objectives: Specific actions a learner will be able to perform upon completion of training.

Bimetallic stemmed thermometer: A common type of thermometer that measures temperature through a metal probe with a sensor toward the end. It is easy to recalibrate. These thermometers have scales measuring temperatures from 0° to 220°F; accurate to within +/-2°F, and are useful for measuring the temperature of many food items.

Biological, chemical, and physical hazards: See Hazards, biological; Hazards, chemical; Hazards, physical.

Biological contaminant: Microbial contaminant that may cause foodborne illness. These contaminants include bacteria, viruses, parasites, fungi, and biological toxins.

Biological contamination: Includes bacteria and the toxins they produce—viruses, parasites, and fish and plant toxins. Biological contamination from microorganisms or microbial contamination is the leading cause of foodborne illness throughout the world. See Contaminants, contamination; Hazards, biological.

Biological toxins: Type of biological contamination that causes foodborne illness. Many biological poisons, or toxins, occur naturally (in some fish, plants, mushrooms); others are caused by the diets of certain animals. Heating or freezing cannot destroy most toxins.

Blast chiller: Piece of equipment used to cool food quickly. Blast chillers can move food through the temperature danger zone quickly. Most cool food from 135°F to 37°F within 90 minutes.

Bodily fluids: Fluid secretions of the human body, such as mucus, saliva, feces, perspiration, and oily secretions in skin and hair. Microorganisms in those fluids can be transmitted to customers via food if employees do not practice good personal hygiene.

Boiling-point method: Method of calibrating a thermometer by submerging the thermometer's sensor in boiling water and adjusting the read-out until the thermometer reads 212°F (100°C) at sea level.

Botulism: Severe type of foodborne illness caused by the ingestion of food containing the potent neurotoxin produced by *Clostridium botulinum*.

Brevetoxin: A toxin found in certain toxic marine algae in warmer waters. Shellfish become contaminated as they filter these algae from the water. Neurotoxic Shellfish Poisoning (NSP) is the illness that results when these shellfish are eaten. See Neurotoxic Shellfish Poisoning.

Calibration: Process of ensuring that a thermometer gives accurate readings by adjusting it to a known

standard, such as the freezing point or boiling point of water.

Campylobacter jejuni: Bacteria that causes the illness Campylobacteriosis. It is commonly associated with poultry. It is sometimes known to contaminate water. To reduce the risk of illness from this bacteria, it is important to cook food to minimum cooking temperatures, especially poultry, and prevent cross-contamination.

Cantilever-mounted: Also called wall-mounted. Equipment attached to the wall with a bracket to allow for easier cleaning behind and underneath it.

Carrier: An animal, insect, or human that carries a pathogenic microorganism, often without showing symptoms of the illness. These carriers may infect others with the disease, yet never become ill themselves. The carrier state cannot be cured with antibiotic treatment. Carriers of foodborne disease may not work as foodhandlers.

Catering: Establishments mainly engaged in providing food for single event-based foodservice. These establishments often have equipment and vehicles to transport and hold meals and snacks to events and/or prepare food at an off-premise site. Banquet halls with catering staffs are included in this industry.

CCP: See Critical Control Point; HACCP (Hazard Analysis Critical Control Point).

CDC: See Centers for Disease Control and Prevention.

Celsius: International temperature scale that registers the freezing point of water as 0° and the boiling point of water as 100° under normal atmospheric pressure—abbreviation C.

Centers for Disease Control and Prevention (CDC): Agencies of the U.S. Public Health Service that investigate outbreaks of foodborne illness, study the causes and control of disease, and publish statistical data.

Ceramic tile: Hard, nonresilient, nonporous, porcelain-type tile, installed with grout, commonly used for floors and walls in establishments.

Chemical agent: Chemical agents often used in establishments include cleaning products, polishes, lubricants, sanitizing chemicals, and pesticides. All can be dangerous to customers and employees if not properly used or stored.

Chemical bait: Type of bait that contains an attractant to draw pests, such as insects or rodents, to

it, as well as a poison that will kill the pest when they eat it. Chemical bait is often preferred over sprays or powders because the facility does not have to be prepared for treatment and employees do not have to be evacuated.

Chemical contaminant: Chemical substance that can cause a foodborne illness. Food can become contaminated by a variety of chemical substances normally found in restaurant and foodservice establishments, including toxic metals, pesticides, cleaning products, sanitizers, and lubricants.

Chemical contamination: One type of contamination that causes foodborne illness. Food can become contaminated by chemical substances normally found in establishments, including cleaning chemicals; utensils and equipment that leach toxic metals into food; pesticides; and food additives and food preservatives, even those generally recognized as safe (GRAS), if not used correctly. See Hazards, chemical.

Chemical hazard: See Hazards, chemical.

Chemical sanitizing: Using an approved chemical solution to reduce the number of microorganisms on a clean surface to safe levels. Items can be sanitized by immersing them in a specific concentration of sanitizing solution for a required period of time, or by rinsing, swabbing, or spraying the items with a specific concentration of sanitizing solution. Common sanitizing chemicals are chlorine, iodine, and quaternary ammonia. See Heat sanitizing.

Chlorine: Most commonly used sanitizer due to its low cost and effectiveness. Chlorine kills a wide range of microorganisms. However, soil can quickly inactivate chlorine solutions, and they can be corrosive to some metals when used improperly.

Ciguatera fish poisoning: Foodborne illness that occurs when a person eats fish that has consumed the ciguatoxin. This toxin accumulates in the fish when they consume smaller fish that have eaten toxic algae. Ciguatoxin is commonly associated with predatory reef fish from the Pacific Ocean, western Indian Ocean, and the Caribbean sea including barracuda, grouper, jacks, and snapper.

Ciguatoxin: A toxin found in certain marine algae, commonly associated with predatory reef fish. The toxin accumulates in these fish when they consume smaller fish that have eaten the toxic algae. Ciguatera fish poisoning is the illness that results when these fish are eaten. See Ciguatera fish poisoning.

Clean: Free of visible soil; refers only to outward appearance of a surface. See Soil.

Cleaning: Process of removing food and other types of soil from a surface. Surfaces must first be cleaned and rinsed before being sanitized.

Cleaning agent: Chemical compounds that remove food, soil, rust, stains, minerals, or other deposits from surfaces.

Clostridium botulinum: Spore-forming bacteria that can be found in almost any food, but is commonly associated with produce grown in the soil, such as onions, potatoes, and carrots. This type of bacteria does not grow well in refrigerated or highly acidic food, nor food with low water activity. It grows without oxygen and can produce a deadly neurotoxin when food is time-temperature abused. Proper holding, cooling, and reheating food prevents the growth of the bacteria.

Clostridium perfringens: A spore-forming bacteria that is widely distributed in the environment and frequently occurs in the intestines of humans and many domestic and feral animals. Spores of the organism persist in soil, sediments, and areas subject to human- or animal-fecal pollution. In most instances, the actual cause of illness by *Clostridium perfringens* is temperature abuse of prepared food. Small numbers of the organisms are often present after cooking and multiply to foodborne-illness levels during improper cooling and storage of prepared food. Meat, meat products, and gravy are the types of food most frequently implicated.

Cold-holding equipment: Equipment specifically designed to keep cold food at 41°F or lower.

Cold paddle: Utensils that can be filled with water and frozen. Stirring food products with a cold paddle chills food very quickly. See Ice paddle.

Contact spray: Liquid or powder insecticide that must come into direct contact with insects to kill them.

Contaminants, contamination: Presence of harmful substances in food. Some food safety hazards occur naturally, while others are introduced by humans or the environment.

Control measures: Steps taken, usually by a pest control operator (PCO), to control or eliminate pests that have infested a building. These include chemical and nonchemical treatment methods.

Control point: Any step in the flow of food where a physical, chemical, or biological hazard can be controlled. See HACCP (Hazard Analysis Critical Control Point).

Cooling coils: The coils in a refrigerator or freezer that carry refrigerant. The coils should be kept clean and condensation from the coils should not be allowed to drip on food.

Corrective action: Predetermined action taken when food doesn't meet a critical limit. For example, when the temperature of a hot food falls below 135°F (57°C), the proper corrective action is to reheat the food to 165°F for 15 seconds within 2 hours. See Critical limit; HACCP (Hazard Analysis Critical Control Point).

Coving: Curved, sealed edge between the floor and wall that makes cleaning easier and eliminates hiding places for insects.

Critical control point (CCP): Point in the processing of food where identified hazards can be prevented, eliminated, or reduced to safe levels. See HACCP (Hazard Analysis Critical Control Point).

Critical limit: Maximum or minimum value a critical control point must meet (usually time, temperature, water activity, pH, or oxygen) to prevent, eliminate, or reduce a hazard to a safe level. See HACCP (Hazard Analysis Critical Control Point).

Cross-connection: Physical link through which contaminants from drains, sewers, or other wastewater sources can enter a potable water supply. A hose connected to a faucet and submerged in a mop bucket is an example.

Cross-contamination: Occurs when microorganisms are transferred from 1 food or surface to another.

Cryptosporidium parvum: Parasite that is transmitted by ingestion of oocysts excreted in the feces of infected humans or animals. The infection can be transmitted from person-to-person, through ingestion of contaminated water or food, from animal to person, or by contact with fecally contaminated environmental surfaces.

Cyclospora cayetanensis: Parasite spread by people ingesting food or water that was contaminated with infected stool. Outbreaks of cyclosporiasis have been linked to various types of fresh produce. It is unlikely that Cyclospora is passed directly from 1 person to another.

Death phase: Period of bacterial growth when the number of microorganisms dying exceeds the number of microorganisms being produced and the total number declines.

Demonstration: Process of illustrating a skill or task in front of another person or a group.

Detergent: Water-soluble preparation, chemically different from soap, used in cleaning to break down oils, hold dirt in suspension, and act as a wetting agent. General purpose detergents are mildly alkaline.

Digital thermometer: Digital thermometers measure temperature through a metal probe or sensing area. When you press a button, the thermometer produces a digital readout. Digital thermometers use either a thermocouple or thermistor sensor to sense temperatures.

Dishwashing machine: Equipment designed to automatically wash, rinse, and sanitize utensils, pots, pans, and some equipment.

Domoic acid: A toxin found in certain toxic marine algae in cooler coastal waters. Shellfish become contaminated as they filter these algae from the water. Amnesic Shellfish Poisoning (ASP) is the illness that results when these shellfish are eaten. See Amnesic Shellfish Poisoning.

Droppings: Feces of insects, birds, rodents, or other animals.

Dry storage: Storage used to hold dry and canned food at temperatures between 50° to 70°F and at a relative humidity of 50 to 60 percent.

Duckboard: Rubber floor mat.

E. coli O157:H7: A type of E. coli which produces 1 or more related potent toxins that cause severe damage to the lining of the intestine. The bacteria is naturally found in the intestines of cattle, which can contaminate meat during the slaughtering process. Undercooked or raw ground beef has been implicated in many outbreaks, and has also been associated with contaminated produce. It is critical to cook food properly and avoid cross-contamination to prevent illness. See Shiga-toxin producing E.coli.

Electrocutor trap ("zapper"): Mechanical device that attracts flying insects to a light. Insects flying inside are then killed by electricity.

Environmental Protection Agency (EPA): Government agency that sets standards for environmental quality, including air and water quality, and regulates the use of pesticides and the handling of waste.

EPA: See Environmental Protection Agency.

Evaluation: Judging the performance of training participants against learning objectives.

External temperature: See Air temperature.

Facility layout: Floor plan of a building.

Fahrenheit: Temperature scale that registers the freezing point of water as 32°F and the boiling point of water as 212°F at 1 atmosphere pressure—abbreviation F. This scale is commonly used in the United States.

FAT TOM: Acronym that lists the six conditions that support the growth of foodborne microorganisms: Food, Acidity, Temperature, Time, Oxygen, Moisture.

FDA: See Food and Drug Administration.

FDA Food Code: (Also referred to as the Food Code) Recommendations issued by the FDA to assist state health departments in developing regulations for a foodservice inspection program.

Feedback: Evaluation given to employees about their performance. This may be constructive criticism given to an individual to correct a mistake, or praise given to reinforce proper performance of a skill or procedure.

FIFO: See First in, first out.

Finger cot: Protective covering used to cover a properly bandaged cut or wound on the finger.

First in, first out (FIFO): Method of stock rotation in which food items are shelved based on their use-by or expiration dates, so the oldest products are used first.

Fish: As defined in this course and by the FDA. Fresh or saltwater fin fish, crustaceans and other forms of aquatic life (including alligator, frog, aquatic turtle, jellyfish, sea cucumber, sea urchin, and the roe of such animals) and all mollusks, intended for human consumption.

Flood rim: Spill-over point on a sink. An air gap exists between the top of the flood rim and the sink faucet.

Flow of food: Path food takes through an establishment from purchasing and receiving through storing, preparing, cooking, holding, cooling, reheating, and serving.

Food: Foodborne microorganisms need nutrients to grow, specifically protein or carbohydrates. These are usually found in food such as meat, poultry, dairy products, and eggs. See FAT TOM.

Food additive, food preservative: Common food additives and preservatives such as sulfites.

Food allergy: The body's negative reaction to a particular food.

Food and Drug Administration (FDA): Federal agency that issues the FDA Food Code working jointly with the USDA and the CDC. The FDA also inspects foodservice operations that cross state borders—such as food manufacturers and processors, foodservice on planes and trains—because they overlap the jurisdictions of 2 or more states. In addition, the FDA shares responsibility with the USDA for inspecting food-processing plants to ensure standards of purity, wholesomeness, and compliance with labeling requirements.

Food bar: Also self-service bar or buffet. Self-service buffet where patrons can choose what they want to eat and serve themselves. Self-serve areas should be monitored by employees trained in food safety procedures to prevent contamination of food by customers. See Self-service operations

Food defense: Food Defense is the effort to protect food from acts of intentional adulteration. A.L.E.R.T. is the FDA's food defense tool.

Food quality: Proper appearance, flavor, texture, consistency, and nutritional value in food. Food that is stored, prepared, and served properly is more likely to have high quality.

Food safety: Unsafe food usually results from contamination due to biological hazards, chemical hazards, or physical hazards. To ensure food safety, establish standards that focus on controlling time and temperature, practicing good personal hygiene, maintaining a sanitary facility, preventing cross-contamination, and purchasing food supplies from approved suppliers.

Food Safety and Inspection Service (FSIS): Agency of the USDA that deals with all food safety issues concerning meat and poultry, their products, and produce shipped across state boundaries.

Food safety management system: System or program for keeping food safe that includes policies and procedures for receiving, storing, preparing, and serving safe food. Having a well designed food safety system in place can prevent foodborne illness; protect employees, customers, and your business; lower costs; reduce liability; and possibly lower insurance costs and avoid medical claims.

Food security: Prevention or elimination of the deliberate contamination of food.

Foodborne illness: Illness carried or transmitted to people by food.

Foodborne-illness outbreak: The Centers for Disease Control and Prevention (CDC) define a foodborne-illness outbreak as an incident in which 2 or more people experience the same illness after eating the same food.

Foodborne infection: Result of a person eating food containing pathogens, which then grow in the intestines and cause illness. Typically, symptoms of a foodborne infection do not appear immediately.

Foodborne intoxication: Result of a person eating food containing toxins (poisons) that cause an illness. The toxins may have been produced by pathogens found on the food or may be the result of a chemical contamination. The toxins might also be a natural part of the plant or animal consumed. Typically, symptoms of foodborne intoxication appear quickly, within a few hours.

Foodborne toxin-mediated infection: Result of a person eating food containing pathogens, which then produce illness causing toxins in the intestines.

Food-contact surface: Any surface or utensil that normally touches food. See Nonfood-contact surface.

Food-grade sealant: A substance used to fill gaps or cracks on kitchen equipment or utensils.

Foot-candle: A unit of measure of the intensity of light falling on a surface, equal to one lumen per square foot.

Frozen storage: The holding of frozen, perishable food items at temperatures that will keep product frozen. Frozen storage extends the shelf life of food. Freezers should not be used to hold room-temperature food.

FSIS: See Food Safety and Inspection Service.

Full-service operation: Establishments engaged in serving prepared food and beverages. These establishments provide waiter/waitress service while the patron is seated. The food is paid for after consuming the meal. Food sales should exceed alcohol sales (if alcohol is served) to be considered a full-service restaurant.

Fungi: Fungi range in size from microscopic, single-celled microorganisms to very large, multi-cellular organisms. Molds, yeasts, and mushrooms are examples of fungi. Some microscopic molds and yeasts can damage food quality and cause foodborne illness.

Garbage: Wet waste matter, usually containing food, that cannot be recycled.

Gastrointestinal illness: Illness relating to the stomach or intestine.

General-purpose detergent: All detergents are mildly alkaline (pH above 7.0) and are used to clean fresh soil from floors, walls, ceilings, prep surfaces, and most equipment and utensils.

Generally recognized as safe (GRAS): The federal government publishes a list of substances GRAS (generally recognized as safe) that are safe to use in food.

Giardia duodenalis: Protozoa parasite that has been found in improperly treated water. It can be found in the feces of infected people. Foodhandlers can transfer the parasite to food when they touch it with fingers contaminated with feces. Proper handwashing is essential to prevent the illness. Also, it is critical to use water that has been properly treated.

Glue board: Mice are trapped by the glue on these pest-control devices, and then die from exhaustion or lack of water or air.

Glue trap: Contact paper-like strip with a sticky glue on the bottom that traps roaches.

Grading stamp: Mark or stamp found on meat, poultry, and eggs to indicate the quality of the product. Grading for quality is voluntary, and the service is requested and paid for by meat and poultry producers/processors. Grading for quality of meat means evaluation of traits related to tenderness, juiciness, and flavor. Grading for quality of poultry is based on a normal shape that is fully fleshed and meaty and free of defects. USDA grades are based on nationally uniform, federal standards of quality. Grading for eggs defines and measures quality in terms of appearance and condition of the shell as well as interior quality of the yolk and albumen (white).

GRAS: See Generally recognized as safe.

HACCP (Hazard Analysis Critical Control Point): Food safety management system based on the idea that if significant biological, chemical, or physical hazards are identified at specific points within a product's flow through the operation, they can be prevented, eliminated, or reduced to safe levels.

HACCP plan: Written document based on HACCP principles, which describes the procedures a particular establishment will follow to ensure the safety of the food served.

Hair restraint: Device such as a cap, net, or hat used to keep foodhandlers' hair away from food and to keep them from touching it.

Hand antiseptic: Liquid or gel used to lower the number of microorganisms on the skin surface. Hand antiseptics should be used after proper handwashing, not in place of it. These substances must comply with FDA standards.

Handwashing station: Sink set aside only for handwashing, never used for mixing cleaning chemicals or for washing food or utensils. Handwashing stations must be located in restrooms, and must be located in other convenient locations throughout the food-preparation and dishwashing areas as well.

Hang-type thermometer: Bimetallic coil thermometers intended to remain in an oven, refrigerator, or freezer to determine air temperature.

Harborage: Shelter for pests.

Hard water: Water that contains minerals such as calcium and iron in concentrations of more than 120 parts per million (ppm). Concentrations of 61 to 120 ppm are considered moderately hard.

Hazard analysis: Determining where hazards may occur in the flow of food if care is not taken to prevent or control them. This is part of the HACCP process. See HACCP (Hazard Analysis Critical Control Point).

Hazard Analysis Critical Control Point: See HACCP (Hazard Analysis Critical Control Point).

Hazards: Biological, chemical, or physical agents that may cause illness or injury if not reduced, controlled, or prevented.

Hazards, biological: Pathogenic microorganisms that contaminate food, such as certain bacteria, viruses, parasites, and fungi. Biological hazards also exist in certain plants, mushrooms, and fish in the form of harmful toxins. See Contaminants, contamination; Biological contamination.

Hazards, chemical: Chemical substances that may contaminate food, such as pesticides, food additives, preservatives, cleaning supplies, and toxic metals that leach from worn cookware and equipment. See Contaminants, contamination; Chemical contamination.

Hazards, physical: Foreign objects that accidentally get into food and contaminate it, such as dirt, metal staples, and broken glass as well as naturally occurring objects, such as bones in filets. See Contaminants, contamination; Physical contamination.

HCS (Hazard Communication Standard) of OSHA: Also known as Right-to Know or HAZCOM. Standard

that requires employers to inform employees of chemical hazards that they may be exposed to in the workplace. See Occupational Safety and Health Administration.

Health inspector: City, county, or state employee who conducts foodservice inspections. Health inspectors are also called sanitarians, health officials, and environmental health specialists. They generally are trained in food safety, sanitation, and public health principles and methods.

Hearing: An official meeting held between the local health department and an establishment to discuss sanitation inspections and possible enforcement activities. Either party may request the hearing.

Heat sanitizing: Using heat to reduce the number of microorganisms on a clean surface to safe levels. The most common way to heat-sanitize tableware, utensils, or equipment is to submerge them in or spray them with hot water.

Heavy-duty detergents: Highly alkaline cleaners used to remove wax, aged or dried soil, and baked-on grease. Dishwashing detergents also are highly alkaline.

Hepatitis A: Virus primarily found in the feces of ill people. Water and many types of food can become contaminated by the virus, but ready-to-eat food and shellfish are most common. The virus is often transferred to food when infected foodhandlers touch food with fingers containing feces. Proper handwashing is critical to preventing the illness.

High-acid food: High-acid food has pH values below 4.6; examples include sauerkraut, tomatoes, and citrus products. Such food, if stored in unapproved metal containers, can cause chemical contamination.

Highly susceptible population: (Also high-risk population, immunosuppressed persons.) Groups of people at high risk for foodborne illness due to age or health status, such as very young children, pregnant women, older people, people taking certain medications, and those with certain diseases or weakened immune systems. Establishments with a highly susceptible population may include hospitals, nursing homes, and day-care centers.

High-risk population: See Highly susceptible population.

Histamine: Biological toxin typically formed in temperature-abused scombroid fish and other species of fish that causes a foodborne illness, scombroid poisoning (intoxication).

Holding (hot and cold) food: Maintaining food at a temperature either at or above 135°F (57°C) or at or below 41°F (5°C).

Host: Person, animal, plant, or cell on or in which another organism lives and takes nourishment.

Hot-holding equipment: Equipment designed to hold hot food for service at 135°F (57°C) or higher. Hot-holding equipment includes steam tables, baines, chafing dishes, double boilers, and heated cabinets. Hot-holding equipment should not be used to reheat food.

Hygrometer: Instrument that measures relative humidity in the air. Hygrometers are used in dry-storage areas.

Ice paddle: Water-filled containers that, when frozen, can be placed into a hot food to assist in cooling the food rapidly. See Cold paddle.

Ice-point method: Method to calibrate a thermometer by submerging the thermometer's sensor in a half-water, half-ice slush and adjusting the calibration until the thermometer reads 32°F (0°C).

Ice-water bath: Method of cooling food in which a container holding hot food is placed into a larger container of ice water.

ICSSL: See Interstate Certified Shellfish Shippers List.

Illness-causing bacteria: Those bacteria that cause illness in humans. See Pathogenic bacteria; Pathogens.

Immune system: The bodily system that protects the body from illness. Persons with compromised immune systems are more susceptible to foodborne illness. See Highly susceptible population.

Infected lesion: Wound or injury contaminated with a pathogen.

Infection: See Foodborne infection.

Infestation: Situation when pests overrun or inhabit an establishment in large numbers.

Infrared thermometer: Infrared or laser thermometers use infrared technology to produce accurate temperatures of food and equipment surfaces. Infrared thermometers are not capable of measuring internal temperatures of food.

In-service: Short training session held for current employees (those already "in service"). May be used to update employees on a new procedure or practice, to reinforce appropriate behaviors, or to motivate.

Inspection stamp: Mark or stamp on meat and poultry indicating that the product and processing plants have been inspected for sanitary standards by the U.S. Department of Agriculture (USDA) or state department of agriculture. The inspection and grading of meat and poultry are 2 separate programs within the USDA. Inspection for wholesomeness is mandatory and is paid for out of tax dollars. Under the Federal Meat Inspection Act and the Poultry Products Inspection Act, the Food Safety and Inspection Service (FSIS) inspects all raw meat and poultry sold in interstate and foreign commerce, including imported products. Meat that has been federally inspected and passed for wholesomeness is stamped with a round purple mark.

Institutional operation: Business, educational, governmental, and institutional organizations that operate their own restaurant service.

Integrated pest management (IPM): System of preventive measures and control measures to prevent pests from entering a facility, and to eliminate existing pest infestations.

Internal temperature: Temperature of the inside of a food usually taken with an appropriate thermometer in the center or thickest part of the food.

Interstate Certified Shellfish Shippers List (ICSSL): A list published monthly for the information and use by food control officials, the seafood industry, and the restaurant and foodservice industry. Foreign and U.S. firms currently certified for interstate sales of shellfish can be viewed at: www.issc.org

Interstate establishments: Establishments that operate across state borders. Examples include foodservice operations on trains, planes, and ships.

Intoxication: See Foodborne intoxication.

Iodine: Sanitizer effective at low concentrations and not as quickly inactivated by soil as chlorine. It is somewhat corrosive to surfaces and is less effective than chlorine.

IPM: See Integrated pest management.

Jaundice: Yellowing of the skin and eyes that could indicate a person is ill with hepatitis A.

Job aids: Materials or visual reminders that are used to deliver training content to employees.

Jurisdiction: Geographical limits or territory within which authority may be exercised.

Knowledge domains: Areas of food safety information a restaurant and foodservice manager responsible for the safety of food served in an establishment should know.

Lag phase: Phase in bacterial growth when bacteria are first introduced to a new environment. They may go through an adjustment period in which their numbers are stable and they are preparing for growth. To control the growth of bacteria, it is important to prolong the lag phase as long as possible.

Leach: Under some circumstances, potentially toxic metals can be leached, or drawn out of equipment, storage containers, and certain tableware, cookware, and glassware and mixed into food, causing chemical contamination and foodborne illness. See High-acid food.

Lecture: Prepared oral presentation used to deliver content to a group of participants.

Liability: The position of being responsible according to the law. For example, a restaurant may be legally liable or responsible for injury caused by a foodborne illness contracted from food served at the restaurant.

Listeria monocytogenes: Bacteria that is naturally found in soil, water, and plants. It can grow in cool, moist environments. It is commonly associated with ready-to-eat products, such as deli meat, hot dogs, and soft cheese. Illness is uncommon in healthy people; high-risk populations are especially vulnerable to illness—particularly pregnant women. To prevent illness, discard food that has passed its use-by or expiration date, cook food to minimum internal cooking temperatures, and avoid cross-contamination.

Log phase: Phase in bacterial growth. When conditions are favorable, bacteria can multiply very rapidly. This type of population growth is called exponential growth, or the log phase of the bacterial growth curve. Food rapidly becomes unsafe during the log phase.

MAP: See Modified Atmosphere Packaging.

Master cleaning schedule: A detailed schedule that lists all cleaning tasks in an establishment, when and how the establishment is to be cleaned, and who will do the cleaning.

Material Safety Data Sheets (MSDS): Sheets supplied by the chemical manufacturer listing the chemical and its common names, its potential physical and health hazards, information about using and handling it safely, and other important information. OSHA requires employers to store these sheets so they are accessible to employees.

Meat: Flesh of animals used for food including the dressed flesh of cattle, swine, sheep, goats, or other edible animal—except fish and poultry.

Microbial contamination/Microbial contaminant: See Biological contamination.

Microorganisms: Also microbes. Small, living organisms that can be seen only with the aid of a microscope. Four kinds of microorganisms have the potential to contaminate food and cause foodborne illness: bacteria, viruses, parasites, and fungi.

Minimum internal cooking temperature: The minimum cooking temperature the internal portion of food must reach in order to sufficiently reduce the number of microorganisms that might be present. This temperature is specific to the type of food being cooked. Food must reach and hold its minimum internal temperature for a specified amount of time.

Mobile unit: Portable foodservice facility. Mobile units range from simple vending carts that hold and display prepackaged food to full field kitchens capable of preparing and cooking elaborate meals.

Model Food Code: See FDA Food Code.

Modified Atmosphere Packaging (MAP): A packaging method by which the air inside of a package is altered using gases, such as carbon dioxide and nitrogen. Many fresh-cut produce items are packaged this way.

Moisture: In relation to food safety, moisture refers to water activity, which is the amount of water in the food available for foodborne microorganisms to use for growth. It is measured on a scale from 0.0 to 1.0, with water having a value of 1.0. Most foodborne microorganisms grow best in food with water-activity levels above 0.85. Some dry food, such as rice and beans, can allow microorganisms on the food to grow if it is cooked in water. See FAT TOM; Water activity.

Mold: Type of fungus that often causes food spoilage. Some molds produce toxins that can cause foodborne illness. Moldy food should be discarded, unless the mold is a natural part of the food (e.g., some types of cheese.)

Monitoring: Consistent procedure for observing or measuring a CCP to make sure critical limits are being met and to produce a record useful for verification. See HACCP (Hazard Analysis Critical Control Point).

MSDS: See SDS

Mushroom toxins: Many fungi, such as certain varieties of mushrooms, have naturally occurring toxins (poisons) that may make people ill.

Neurotoxic Shellfish Poisoning (NSP): Illness caused by the ingestion of shellfish, including clams, mussels, and oysters that have filtered toxic marine algae from the water. The toxin involved in the illness associated with NSP is brevetoxin, which cannot be destroyed through cooking or freezing. It is critical to purchase shellfish from reputable, approved suppliers.

Nonfood-contact surface: Surfaces that do not ordinarily come in contact with food, such as tables, walls, floors, legs of equipment, shelves, and drains. See Food-contact surface.

NSF International: Agency that develops and publishes standards of equipment design. The presence of the NSF mark on foodservice equipment means it has been evaluated, tested, and certified by NSF International as meeting international commercial food equipment standards.

Objective: States what a learner will be able to do after training or instruction is finished.

Occupational Safety and Health Administration (OSHA): Federal agency that regulates and monitors workplace safety.

Off-premise catering: Also known as off-site catering. This industry comprises establishments mainly engaged in providing food for single events. These establishments have equipment and vehicles to transport and hold meals and snacks and/or prepare food at an off-premise site.

Off-site service: Service of food to someplace other than where it is prepared or cooked. Examples include home delivery, carry-outs, or deli trays from restaurants or grocery stores; caterers; home-delivery of meals to elderly or ill persons; vending machines; and temporary or mobile units.

OSHA: See Occupational Safety and Health Administration.

Outbreak of foodborne illness: Incident in which 2 or more people experience the same illness after eating the same food.

Outdoor operation: Operation that serves food outdoors, such as at a picnic or outdoor fair. Included in this type of operation are establishments primarily engaged in providing foodservice from vehicles, such as a hot dog cart or ice cream truck.

Oxygen: Depending upon the bacteria, some either require oxygen to grow or cannot grow if oxygen is present. See FAT TOM.

Paralytic shellfish poisoning (PSP): Illness caused by the ingestion of shellfish, including clams, mussels, oysters, and scallops that have filtered toxic marine algae from the water. The toxin involved in the illness associated with PSP is saxitoxin, which cannot be destroyed through cooking or freezing. It is critical to purchase shellfish from reputable, approved suppliers.

Parasite: Organism that needs to live in or on a host organism to survive. Many types live in animals that humans use for food, such as cows, chickens, pigs, and fish. Foodborne parasites range from microscopic, single-celled organisms to larger, multi-cellular organisms. Several parasites pose significant hazards to food and water. Avoiding cross-contamination and practicing proper handwashing can help prevent foodborne illness caused by parasites.

Pasteurization: Partial sterilization of a substance, especially a liquid (such as milk) at a temperature and for a period of exposure that destroys objectionable organisms without major chemical alteration of the substance.

Pathogenic bacteria: See Illness-causing bacteria.

Pathogens: Microorganisms that can cause illness in living organisms.

PCO: See Pest control operator.

Performance measures: Performance measurements are the true measure of successful training. Essentially, performance measurements tell you if your employees can continue to do what they've been trained to do. Performance is best measured by simply observing employees to see if they are doing the job correctly. (That is, if the training objective is "The employee will properly calibrate a thermometer," the employee would show that they could properly calibrate a thermometer by doing it.)

Personal hygiene: Habits that include keeping hands, hair, and body clean, and wearing clean and appropriate uniforms. Avoiding unsanitary actions, and reporting illness and injury are also features of good personal hygiene.

Pest control operator (PCO): Licensed or certified technician who implements and monitors pest-control programs for companies that contract for services.

Pesticide: Chemical used to control pests, usually insects. See Contact spray; Residual spray.

Pests: Animals or insects such as flies and rodents that can infest a food establishment.

pH: Measure of the acidity or alkalinity of a substance. The pH scale ranges from 0 to 14.0. A pH of 7.0 is neutral. Food with a pH between 7.1 and 14.0 is alkaline. Food with a pH between 0.0 and 6.9 is acidic. Foodborne microorganisms grow best in food with a pH between 4.6 and 7.5 (slightly acidic to neutral).

PHF: See Potentially hazardous food.

Physical contaminant: Foreign object that is accidentally introduced into food, or a naturally occurring object, such as a bone in a filet, that poses a physical hazard. Common physical contaminants include metal shavings from cans, staples from cartons, glass from broken light bulbs, blades from plastic or rubber scrapers, fingernails, hair, bandages, dirt, and bones. See Hazards, physical.

Physical contamination: Accidental introduction of foreign particles such as dirt, hair, and glass or metal particles into food. Some physical hazards occur naturally, such as bones in fish or chicken. See Contaminants, contamination; Hazards, physical.

Plant toxins: Some plants have natural toxins that may make some people ill. People may ingest plant toxins by eating toxic plants themselves, or by eating products from animals that have ingested plant toxins.

Pooled eggs: Eggs that have been cracked open and combined in a container for quantity cooking.

Porosity: Extent to which water and other liquids are absorbed by a substance. Term used in relation to flooring material.

Potable water: Water that is safe to drink; an approved water supply.

Potentially hazardous food (PHF): Food that is often moist, contains protein, has a neutral or slightly acidic pH and requires time-temperature control to prevent the growth of microorganisms and the production of toxins.

Poultry: Any domesticated bird (chicken, turkey, duck, geese, or guineas), migratory waterfowl, game bird, or squab such as pheasant, partridge, quail, grouse, or guineas.

Prepared food: See Ready-to-eat food.

Prerequisite programs: Food safety programs that allow food safety management programs to be effective. They address the basic operational and sanitation conditions within the establishment and often include personal hygiene programs, supplier selection and specification programs, sanitation and pest control programs, facility design and equipment maintenance programs, and food safety training programs.

Presentation: A key element of training, the delivery of content to the learner through a variety of methods.

Preventive measures: Steps that can be taken to prevent pests from entering a building, such as keeping the facility clean and sanitary and maintaining the building properly.

Probe: Many digital thermometers come with interchangeable probes (slender metal instrument) that include surface, immersion, penetration, and air probes.

Quarry tile: Type of stone tile, generally reddish brown in color, often used in public restrooms or high-soil areas.

Quaternary ammonium compounds (quats): Group of sanitizers all having the same basic chemical structure. Quats are noncorrosive to surfaces, and remain active for short periods of time after they have dried. However, quats may not kill certain types of microorganisms, and they are easily affected by detergent residue.

Quick-service operation: Sometime referred to as "fast food" or "limited service restaurants", these establishments sell limited lines of refreshments and prepared food for consumption either on or near the premises, or for take-home consumption. The patron pays before consuming the meal. The customer's order is taken and delivered at a counter or drive-through window.

Reach-in cooler: Refrigeration unit designed to have reasonably easy-to-reach access to all items stored within it.

Ready-to-eat food: Any food that is edible without further washing or cooking. It includes whole or cut and washed fruit, vegetables, deli meat, and bakery items. Sugars, spices, seasonings, and properly cooked food items are also considered ready to eat.

Reasonable care defense: Defense against a food-related lawsuit; if you can prove that your establishment did everything that could be reasonably expected to ensure that the food served was safe.

Record keeping: The last step in developing a HACCP system in which all pertinent HACCP information is documented. Records include notebooks, time-temperature logs, and documentation of when critical limits are not met. Record keeping is a great source of daily operations and long-term trends, and is proof that a well-designed food safety system is in place.

Recording thermometers: Often used in refrigerators, freezers, and refrigerated vehicles for keeping a continuous record of temperature over time.

Reduced oxygen packaging (ROP): Packaging methods used to prevent the growth of microorganisms in packaged food by reducing the oxygen in the packaging. ROP methods include MAP, sous vide, and vacuum packaging.

Refrigerated storage: Storage used for holding potentially hazardous food at an internal temperature of 41°F or lower. (Some jurisdictions allow food in refrigerators to be held at an internal temperature of 45°F or lower.) Check with the local regulatory agency for specific regulations.

Regulation: Details how a law will be put into effect by the government agency responsible for that regulation.

Relative humidity: Ratio of the amount of water vapor actually present in the air to the greatest amount possible at the same temperature.

Repellents: Substances such as chemical pastes that can be used on gutters and ledges to repel birds. The paste must be carefully applied by a pest control operator so as to prevent it from falling onto tables or into food.

Residual spray: Type of pesticide spray that leaves a film behind, which eventually kills insects that walk across it. Residue sprays are typically sprayed by a PCO around the perimeter of a facility on a monthly basis to provide continuous protection against insects that might enter. See Contact spray.

Resiliency: Ability of something to react to a shock without breaking or cracking. The term is usually used in relation to flooring materials.

Role-playing: Method in which training participants enact a situation in order to try out new skills or apply what has been learned.

ROP: See Reduced oxygen packaging.

Safe food: Food that will not cause illness due to chemical, physical, or biological hazards.

Salmonella spp.: Many farm animals naturally carry this pathogen. It is often associated with poultry, eggs, dairy products and beef. It has also been found in ready-to-eat food such as produce that has come in contact with these animals or their waste. It is critical to cook food properly and to prevent cross-contamination.

Sanitary, sanitation: A sanitary or sanitized object or surface is free from harmful levels of illness-causing microorganisms and other harmful contaminants. To be effective, sanitation must follow effective cleaning.

Sanitizer: Chemical used to sanitize or lower the level of microorganisms on a surface to levels that do not cause illness. Chlorine, iodine, and quats are the 3 most common types of chemical sanitizer used in the restaurant and foodservice industry. See Chlorine; Iodine; Quaternary ammonium compounds (quats).

Sanitizing: Process of reducing the number of microorganisms on a clean surface to safe levels.

Saxitoxin: A toxin found in certain toxic marine algae in colder waters. Shellfish become contaminated as they filter these algae from the water. Paralytic Shellfish Poisoning (PSP) is the illness that results when these shellfish are eaten. See Paralytic shellfish poisoning.

Scale: Buildup of mineral deposits in pipes or equipment from water hardness. Scale is a problem for equipment that uses hot water, boiling water, or steam (e.g., dishwashing machines and steam tables).

Scombroid poisoning (histamine poisoning): Illness caused by consuming high levels of histamine, a toxin that forms when scombroid and other species of fish are time-temperature abused. Scombroid fish include tuna, bonito, mackerel, and mahi-mahi.

SDS: Chemical manufacturer, distributor, or importer provide Safety Data Sheets (SDSs) (formerly MSDSs or Material Safety Data Sheets) for each hazardous chemical. The SDS includes information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures like fire-fighting). Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information. SDS must also contain Sections 12 through 15, to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Self-service operations: Establishments that serve a variety of prepared food and beverages that the customers serve themselves. Examples of self-service operations include buffets and salad bars.

Service sink: Sink used exclusively for cleaning mops and disposing of wastewater. At least 1 service sink or 1 curbed drain area is required in an establishment.

Shelf life: Recommended period of time that a food may be stored and remain suitable for use.

Shellstock identification tags: The FDA requires that shipments of live molluscan shellfish carry shellstock identification tags to identify the shipper, the date of shipment, date of receipt, and other information. The tags should remain attached to the containers the shellfish came in until the container is empty. Operators then must keep the tags on file for 90 days from the harvest date of the shellfish. Never mix shellfish from 1 shipment with another.

Shiga toxin-producing E. coli: Any E. coli capable of producing shiga toxins, which include E. coli O157:H7, O157:NM, and O157:H-. These toxins cause severe damage to the lining of the intestine. Undercooked or raw ground beef have been implicated in many documented outbreaks.

Shigella spp.: This bacteria accounts for less than 10% of the reported outbreaks of foodborne illness in this country. The organism is frequently found in water polluted with human feces. Associated food includes salads (potato, tuna, shrimp, macaroni, and chicken), raw vegetables, milk and dairy products, and poultry. Contamination of this food is usually through the fecal-oral route. Fecally contaminated water and unsanitary handling by foodhandlers are the most common causes of contamination.

Single-use gloves: Disposable gloves designed for one-time use to provide a barrier between hands and food. Gloves should never be used in place of handwashing. Foodhandlers should wash hands before putting on gloves and when changing to a fresh pair.

Single-use item: Disposable tableware or packaged food designed to be used only once, including plastic flatware, paper or plastic cups, plates and bowls, as well as single-serve food and beverages.

Single-use paper towel: Paper towels designed to be used once, and then discarded. Use minimizes risk of cross-contamination.

Slacking: Process of gradually thawing frozen food in preparation for deep-fat frying or to allow even heating during cooking.

Sneeze guard: Food shield used over self-service displays and food bars, which extends 7 inches (18 centimeters) beyond the food and 14 inches (36 centimeters) above the food counter.

Soap: Cleaning agent used in restaurants and foodservice establishments primarily for handwashing.

Soil: General term for foreign material present on a surface that requires removal. In establishments, soil might consist of food debris on tableware; wax, aged or dried substances; stains and baked-on grease; or scale, rust, and tarnish on other surfaces. See Clean; Cleaning; Cleaning agent.

Solid waste: Dry bulky trash that can be recycled, including glass, plastic, paper, and cardboard.

Solvents cleaner: Solvent cleaners, often called degreasers, are alkaline detergents that contain a grease-dissolving agent. These cleaners work well in areas where grease has been burned on.

Source: The source of a microorganism is an item or organism (often a human being) where the microorganism usually resides. Sources may be referred to as vehicles, carriers, or hosts.

Source reduction: Decreasing the amount of material you receive—such as packaging—so you will have less to dispose of.

Sous vide: A packaging method by which cooked food is vacuum packed in individual pouches and then chilled. This food is heated for service in the establishment. Frozen, precooked meals are typically packaged this way.

Spoilage microorganism: Foodborne microorganisms that cause food to spoil. These microorganisms typically do not cause foodborne illness.

Spore: Alternative form for some bacteria, which provides protection when nutrients are not available. Spores are commonly found in soil and can contaminate food grown there. A spore's outer coating can resist heat allowing it to survive cooking temperatures. It can also turn back into a form capable of growth. This can occur when food is not held or stored at the proper temperature or cooled or reheated properly.

Standard: Measure used as a comparison for quality to determine the degree or level that a requirement should meet.

Standard operating procedure (SOP): See Prerequisite programs.

Staphylococcus aureus: A bacteria capable of producing a highly heat-stable protein toxin that causes the illness Staphylococcus Gastroenteritis in humans. Staphylococcal food poisoning is the name of the condition caused by the enterotoxins that some strains of *S. aureus* produce. The onset of symptoms is usually rapid and in many cases acute, depending on individual susceptibility to the toxin, the amount of contaminated food eaten, the amount of toxin in the food ingested, and the general health of the victim.

Stationary phase: Phase of bacterial growth where just as many bacteria are growing as dying. Follows log phase of bacterial growth.

Steam-jacketed kettle: Cooking vessel that can also be used for cooling or heating food rapidly by circulating cold or hot water through the hollow walls or jacket of the vessel.

Strong alkaline detergents: Detergents used in dishwashing machines to cut through wax, grease, and baked- or burned-on food.

Sulfites: Preservatives added to some food to preserve freshness and color. Some people are allergic to sulfites, and some states forbid restaurants to add them to food.

Suppliers, approved (certified): Reputable and reliable suppliers whose products and practices meet federal and local standards. Reputable suppliers deliver correctly packaged food in adequately refrigerated delivery trucks, train their employees in food safety practices, adjust delivery schedules to meet your needs, and allow you to inspect their delivery vehicles and production facilities.

Surfactants: Agents in all detergents that reduce surface tension between soil and the item being cleaned, making it easier to remove soil.

Susceptible population: Group of persons who are more likely than other segments of the population to experience foodborne illness because they are immunocompromised or older adults and in a facility that provides health care or assisted-living services, such as a hospital or nursing home; or preschool-age children in a facility that provides custodial care, such as a day-care center.

Suspension: Temporary withdrawal of a health department permit for an establishment to operate because the health inspector determined the facility posed an immediate health hazard. Correction of all violations and a satisfactory reinspection may be required for reinstatement of the permit.

Technology-based training: Training programs that are delivered through a computer or other technology.

Temperature: Foodborne microorganisms grow well at temperatures between 41° to 135°F. This range is called the temperature danger zone. It may vary slightly in different jurisdictions, so always check with your local jurisdiction about the range of the temperature danger zone. See FAT TOM; Temperature danger zone.

Temperature abuse: Any time potentially hazardous food is exposed to the temperature danger zone of 41° to 135°F. Food being prepared or cooked should pass through the temperature danger zone as quickly as possible. Temperature abuse of potentially hazardous food can cause the rapid growth of microorganisms, potentially causing foodborne illness.

Temperature danger zone: Temperature range between 41° to 135°F, within which most foodborne microorganisms rapidly grow and reproduce. Foodhandlers must minimize the time potentially hazardous food spends in this range.

Temporary operation (unit): Establishment that operates in 1 location, for no more than 14 consecutive days, in conjunction with a special event or celebration. Temporary units usually serve prepackaged food or food that requires only limited preparation.

Terrazzo: Mixture of marble chips and portland cement used for flooring. An attractive, nonporous, non-resilient surface good for use in the back of the house, dining rooms, and restrooms.

Thermistor: Thermistor-style food thermometers use a resistor (a ceramic semiconductor bonded in the tip with temperature-sensitive epoxy) to measure temperature. The thickness of the probe is approximately 1/8 of an inch and takes roughly 10 seconds to register the temperature on the digital display. Since the semiconductor is in the tip, thermistors can measure temperature in thin food, as well as in thick food.

Thermocouple: Measures temperature at the junction of 2 fine wires located in the tip of the probe. Thermocouples used in scientific laboratories have very fine probes, similar to hypodermic needles, while others may have a thickness of 1/16 of an inch.

Thermometer: Device for accurately measuring the internal temperature of food, the air temperature inside a freezer or cooler, or the temperature of equipment. Bimetallic stemmed thermometers, thermocouples, and thermistors are common types of thermometers used in the restaurant and foodservice industry.

Three-compartment sink: Stainless-steel sink containing 3 compartments for washing, rinsing, and sanitizing dishes, pots, utensils, and some equipment.

Time: Foodborne microorganisms need sufficient time to grow. Given the right conditions, bacteria in particular are capable of doubling their population every twenty minutes. If food spends extended amounts of time in the temperature danger zone, foodborne microorganisms can grow to levels high enough to make someone ill. See FAT TOM.

Time-temperature abuse: Food has been time-temperature abused any time it has been allowed to remain too long at temperatures favorable to the growth of foodborne microorganisms.

Time-temperature indicator (TTI): Monitoring device attached to a food shipment to determine if the product's temperature has exceeded safe limits during shipment or later storage.

Time-temperature monitoring: To maximize food safety and minimize growth of microorganisms in food, time and temperature must be controlled and monitored throughout the flow of food, including receiving, storage, preparation, cooking, holding, cooling, and reheating.

Toxin-mediated infection: Foodborne illness that results when a person eats food containing pathogens, which then produce illness-causing toxins in the intestines.

Toxins: Poisons produced by pathogens and found in some plants and animals. Toxins may be a natural part of the plant or animal or may occur in the animal as a result of its diet.

Training need: Gap between what employees are required to know to perform their job and what they actually know.

Training program: Structured sequence of events that leads to learning.

Traps: Generally used to control flying insects. The most common types of traps are light only electrocutors, or a combination of light and chemical attractant.

TTI: See Time-temperature indicator.

Tumble chiller: Equipment designed to cool food quickly. Prepackaged food is placed into a drum, which rotates inside a reservoir of chilled water. The tumbling action decreases the time it takes the food to cool.

UHT See Ultra-high temperature (UHT) food.

Ultra-high temperature (UHT) food: UHT food is heat-treated at very high temperatures (pasteurized) for a short time to kill microorganisms. It is often also

aseptically packaged under sterile conditions to keep it from being contaminated.

UL See Underwriters Laboratories.

Underwriters Laboratories (UL): Agency that lists equipment that meets NSF International's standards. UL's particular emphasis is on electrical safety requirements; it also has a sanitation mark. See NSF International.

USDA See U.S. Department of Agriculture.

U.S. Department of Agriculture (USDA): Federal government agency responsible for the inspection and grading of meat, meat products, poultry, dairy products, eggs and egg products, and fruit and vegetables shipped across state lines.

"Use-by" date: Last date recommended for the use of the product while at peak quality. The manufacturer of the product usually determines the date.

Vacuum breaker: Device for preventing the backflow of contaminants into a potable water system. See Backflow.

Vacuum packaging: Food packaging in which all of the air is removed around the product.

Variance: Document from the regulatory agency authorizing a modification or waiver of a requirement.

Vehicle: Food, plant, person, or object by which pathogenic microorganisms are transferred to another food, person, plant, or object.

Vending machine: Machine that dispenses hot and cold food, beverages, and snacks. Vending operators must protect food from contamination and temperature abuse during transport, delivery, and service. Vending machines that dispense chilled or hot food must have automatic cutoff controls that prevent food from being dispensed if the temperature stays in the danger zone for a certain amount of time.

Ventilation system: Devices designed to keep rooms free from excessive heat, steam, condensation, vapors, obnoxious odors, smoke, and fumes.

Verification: Activities that determine whether a HACCP system is working as intended.

Vibrio parahaemolyticus: Naturally found in the waters of the Gulf of Mexico, and Atlantic and Pacific coasts. Associated with raw or partially cooked oysters harvested from warmer waters. This type of bacteria grows rapidly at temperatures in the middle of the temperature danger zone. Preventing illness depends upon purchasing oysters from reputable, approved suppliers and cooking them to minimum internal temperatures.

Vibrio vulnificus: Naturally found in the waters of the Gulf of Mexico and Atlantic and Pacific coasts, this bacteria is commonly associated with raw or partially cooked oysters harvested from warmer waters. It causes two different illnesses: primary septicemia and gastroenteritis. The illnesses typically occur when raw or partially cooked oysters are eaten. Preventing these illness depends upon purchasing oysters from reputable, approved suppliers and cooking them to minimum internal temperatures.

Virus: Smallest of the microbial contaminants. Viruses are not complete cells and are not considered to be living organisms. They rely on a living host or cell and do not reproduce in food. Some survive freezing and boiling. They contaminate food via poor personal hygiene, and contaminated food and water supplies. See Bacteria; Fungi; Parasite.

Walk-in cooler: Refrigeration unit large enough for a person to enter.

Warm-air hand dryer: Also hot air or forced air. An acceptable method of drying hands at a handwashing station. Some jurisdictions require the use of these machines instead of towels.

Water activity (a_w): The amount of water in the food available for foodborne microorganisms to use for growth. It is measured on a scale from 0.0 to 1.0, with water having a value of 1.0. Most foodborne microorganisms grow best in food with water-activity levels above 0.85. Some dry food, such as rice and beans, can allow microorganisms on the food to grow if it is cooked in water. See FAT TOM; Moisture.

Work flow: How food flows through an operation from receiving through service and the steps where people need to interact with food. The work flow should be designed to minimize the time food spends in the temperature danger zone and should also minimize the number of times food is handled.

Yeast: Type of fungus that causes food spoilage.

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