



This Study Guide will help you prepare for your ServSafe class. You are now enrolled in a Manager ServSafe Food Safety Certification course.

This course will meet the required 8-hour state requirements that may be required for your jurisdiction. Mike's Food Safety Class have put together this study guide to help you have a general food safety knowledge prior to attending class. We cover a lot of information in this course. This study guide is just a summary of the information that we cover. We highly recommend you use this study guide prior to taking the class. There is no guarantee of passing this exam. There are no refunds issued.

Chapter 1 Study guide

Who needs to be Certified?

The requirement is that the person in charge must become a Certified Food Protection Manager.

The FDA Food Code requires that the person in charge of a foodservice operation become a Certified Food Protection Manager. That person must always be onsite 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?

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.

Challenges to Food Safety

A food borne 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.

The biggest challenges we must overcome in food safety are:

- Time and Money – Pressure to work quickly can make it hard to take the time to follow food safety practices

- Language and Culture - Your staff may speak a different language than you do, which can make it difficult to communicate. Cultural differences can also influence how food handlers view food safety.
- Literacy and Education - Staff often have different levels of education, making it more challenging to teach them food safety
- Pathogens - Illness-causing microorganisms are more frequently found on food that once was considered safe.
- Unapproved suppliers - Food that is received from suppliers that are not practicing food safety can cause a foodborne-illness outbreak.
- High-risk customers - The number of customers at high risk for getting a foodborne illness is increasing. An example of this is the growing elderly population.
- Staff turnover - Training new staff leaves less time for food safety training

Costs of foodborne illness

Loss of customers and sales
 Loss of reputation
 Negative media exposure
 Lowered staff morale
 Lawsuits and legal fees
 Staff missing work
 Increased Insurance Premiums, Staff retraining, and even death.

The ServSafe program will provide the tools needed to overcome the challenges in managing a good food safety program.

If food is not handled correctly, it can become unsafe. These are the five most common food-handling mistakes, or risk factors, that can cause 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

Except for purchasing food from unsafe sources, each risk factor for foodborne illness is related to four main factors:

Time-temperature abuse - When food has stayed too long at temperatures good for pathogen growth. Food has been time-temperature abused when:

- It has not been held or stored at correct temperatures
- It is not cooked or reheated enough to kill pathogens
- It is not cooled correctly

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

- Contaminated ingredients are added to food that receives no further cooking
- Ready-to-eat food touches contaminated surfaces
- A food handler touches contaminated food and then touches ready-to-eat food
- Contaminated cleaning cloths touch food-contact surfaces

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

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

Poor cleaning and sanitizing - 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 • Sanitizer solution was not prepared correctly

TCS foods are foods that do need time and temperature to keep them safe
TCS = Temperature Control for Safety.

- The list of TCS food includes the following:
- Milk and dairy products
- Shell eggs (except those treated to eliminate *Salmonella* spp.)
- Meat: beef, pork, and lamb
- Poultry
- Fish
- Shellfish and crustaceans

- Baked potatoes
- Heat-treated plant food, such as cooked rice, beans, and vegetables
- Tofu or other soy protein; synthetic ingredients, such as textured soy protein in meat alternatives
- Sprouts and sprout seeds
- Sliced melons; cut tomatoes; cut leafy greens
- Untreated garlic-and-oil mixtures

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

- Preparation
- Washing
- Cooking

Ready-to-eat food includes:

- Cooked food
- Washed fruit and vegetables
- Deli meat
- Bakery items
- Sugar, spices, and seasonings

Populations at High Risk for Foodborne Illnesses

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

1. **Elderly people** - Elderly people are at high risk because their immune systems have weakened with age.
2. **Preschool-age children** - Very young children are at high risk because they have not built up strong immune systems.
3. **People with compromised immune systems** - People with compromised immune systems include:
 - People with cancer or on chemotherapy
 - People with HIV/AIDS
 - Transplant recipients
 - People taking certain medications

Managers must set up standard operating procedures that focus on the measures listed above. Then they must train their staff on these procedures and monitor them to make sure the procedures are followed.

Keeping Food Safe

Focus on these measures:

- Controlling time and temperature
- Preventing cross-contamination
- Practicing personal hygiene
- Purchasing from approved, reputable suppliers
- Cleaning and sanitizing

Training and monitoring:

- Train staff to follow food safety procedures
- Provide initial and ongoing training
- Provide all staff with general food safety knowledge
- Provide job specific food safety training
- Retrain staff regularly
- Monitor staff to make sure they are following procedures
- Document training

Government agencies:

- **The Food and Drug Administration (FDA)** - The Food and Drug Administration (FDA) inspects all food except meat, poultry, and eggs. The agency also regulates food transported across state lines. In addition, the agency issues the *FDA Food Code*, which provides recommendations for food safety regulations
- **U.S. Department of Agriculture (USDA)** - The U.S. Department of Agriculture (USDA) regulates and inspects meat, poultry, and eggs. It also regulates food that crosses state boundaries or involves more than one state.
- **Centers for Disease Control and Prevention (CDC)** - conduct research into the causes of foodborne-illness outbreaks.
- **U.S. Public Health Service (PHS)** - conduct research into the causes of foodborne-illness outbreaks.
- **State and local regulatory authorities** - State and local regulatory authorities write or adopt code that regulates retail and foodservice operations.
- **OSHA** - Regulate your MSDS / SDS

Chapter 2 Study guide

There are three categories that food contamination falls in **Biological**, **Chemical**, and **Physical**.

How Contamination Happens

Contaminants come from a variety of places:

- Animals we use for food
- Air, contaminated water, and dirt
 - Contaminants can cause foodborne illness or result in physical injury. Contaminants are found in the animals we use for food, the air, water, dirt; and they occur naturally in food, such as bones in fish

People

- Deliberately - Food can be contaminated on purpose.
- Accidentally - Most food is contaminated accidentally.

Examples of accidental contamination include food handlers who do not wash their hands after using the restroom, and then contaminate food and surfaces with feces from their fingers; and food handlers who pass contaminants through illness.

People can contaminate food when:

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

There are three categories that food contamination falls in Biological, Chemical, and Physical.

Biological Contamination

Biological contamination occurs when harmful microorganisms, referred to as pathogens, contaminate food.

Microorganism:

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

Pathogen:

- Harmful microorganism
- Makes people sick when eaten or produces toxins that cause illness

Toxin:

- Poison

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

- Bacteria
- Viruses
- Parasites
- Fungi

Common symptoms of foodborne illness:

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

The symptoms of a foodborne illness vary depending on which illness a person has. But most victims of foodborne illness share some common symptoms.

Not every person who is sick from a foodborne illness will have all these symptoms. Nor are the symptoms of a foodborne illness limited to this list.

Onset times:

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

How quickly foodborne-illness symptoms appear in a person is known as the onset time of the illness. Onset times depend on the type of foodborne illness a person has. They can range from 30 minutes to as long as six weeks. How severe the illness is can also vary, from mild diarrhea to death.

Bacteria: Basic Characteristics

Location:

- Found almost everywhere Detection:
- Cannot be seen, smelled, or tasted Growth:
- Will grow rapidly if FAT TOM conditions are correct

Prevention:

- Control time and temperature

Bacteria live in our bodies. Some types of bacteria keep us healthy, while others cause illness.

The most important way to prevent bacteria from causing foodborne illness is to control time and temperature.

Bacteria need six conditions to grow. You can remember these conditions by thinking of the words **FAT TOM**.

- **Food** - Most bacteria need nutrients to survive. TCS food supports the growth of bacteria better than other types of food
- **Acidity** - Bacteria grow best in food that contains little or no acid. The pH scale ranges from 0 to 14.0. A value of 0 is highly acidic, while a value of 14 is highly alkaline. A pH of 7 is neutral. Bacteria grow best in food that is neutral to slightly acidic. The Range for Bacteria growth is 4.6 to 7.5 on the PH scale.
- **Temperature** - **Bacteria grow rapidly between 41°F and 135°F (5°C and 57°C)** **This range is known as the temperature danger zone.** Bacteria growth is limited when food is held above or below the temperature danger zone. **Bacteria grow even more rapidly from 70° F to 125° F (21° C to 52° C).**
- **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
- **Oxygen** - Some bacteria need oxygen to grow, while others grow when oxygen is not there
- **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. The amount of moisture available in food is called water activity (aw). The aw scale ranges from 0.0 to 1.0. The higher the value, the more available moisture in the food.

Temperature and time are the two important conditions for growth that can be controlled in the operation

Now we need to know about the **BIG SIX**.

- Salmonella Typhi - Bacteria
- Nontyphoidal Salmonella - Bacteria
- Shigella - Bacteria
- Shiga toxin producing Escherichia coli (aka E. Coli) - Bacteria
- Hepatitis A - Virus
- Norovirus - Virus

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

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none"> • Ready-to-eat food • Beverages 	<ul style="list-style-type: none"> • Exclude food handlers diagnosed with an illness caused by <i>Salmonella</i> Typhi from the operation
	<ul style="list-style-type: none"> • Wash hands
	<ul style="list-style-type: none"> • Cook food to minimum internal temperatures

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

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none"> • Poultry and eggs • Meat • Milk and dairy products • Produce 	<ul style="list-style-type: none"> • Cook poultry and eggs to minimum internal temperatures
	<ul style="list-style-type: none"> • Prevent cross-contamination between poultry and ready-to-eat food
	<ul style="list-style-type: none"> • Keep food handlers who are vomiting or have diarrhea and have been diagnosed with an illness from nontyphoidal <i>Salmonella</i> out of the operation

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

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none">Food easily contaminated by hands, such as salads containing TCS food (potato, tuna, shrimp, macaroni, chicken)	<ul style="list-style-type: none">Exclude food handlers who have diarrhea and have been diagnosed with an illness caused by <i>Shigella</i> spp. from the operationExclude food handlers who have diarrhea from the operation
<ul style="list-style-type: none">Food that has made contact with contaminated water, such as produce	<ul style="list-style-type: none">Wash hands
	<ul style="list-style-type: none">Control flies inside and outside the operation

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

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none">Ground beef (raw and undercooked)Contaminated produce	<ul style="list-style-type: none">Exclude food handlers who have diarrhea and have been diagnosed with a disease from the bacteriaCook food, especially ground beef, to minimum internal temperatures
	<ul style="list-style-type: none">Purchase produce from approved, reputable suppliers
	<ul style="list-style-type: none">Prevent cross-contamination between raw meat and ready-to-eat food

Virus: Hepatitis A (HEP-a-TI-tiss)**Source: Human feces**

Food Linked with the Virus	Prevention Measures
<ul style="list-style-type: none">• Ready-to-eat food• Shellfish from contaminated water	<ul style="list-style-type: none">• Exclude staff who have been diagnosed with hepatitis A from the operation.
	<ul style="list-style-type: none">• Exclude staff who have jaundice for seven days or less from the operation.
	<ul style="list-style-type: none">• Wash hands.
	<ul style="list-style-type: none">• Avoid bare-hand contact with ready-to-eat food.
	<ul style="list-style-type: none">• Purchase shellfish from approved, reputable suppliers.

Virus: Norovirus (NOR-o-VI-rus)**Source: Human feces**

Food Linked with the Virus	Prevention Measures
<ul style="list-style-type: none">• Ready-to-eat food• Shellfish from contaminated water	<ul style="list-style-type: none">• Exclude staff who are vomiting or have diarrhea and have been diagnosed with Norovirus from the operation.
	<ul style="list-style-type: none">• Wash hands.
	<ul style="list-style-type: none">• Avoid bare-hand contact with ready-to-eat food.
	<ul style="list-style-type: none">• Purchase shellfish from approved, reputable suppliers.

Viruses: Basic Characteristics

Location:

- Carried by human beings and animals
 - Require a living host to grow Do not grow in food
 - Can be transferred through food and remain infectious in food

Sources:

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

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

Viruses are the leading cause of foodborne illness.

Parasites: Basic characteristics

Location:

- Require a host to live and reproduce Source:
- 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 frozen correctly by the manufacturer

Fungi: Basic Characteristics

Yeasts, molds, and mushrooms:

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

Biological Toxins

Origin:

- Naturally occur in certain plants, mushrooms, and seafood toxins:

Produced by pathogens found on certain fish

- Tuna, bonito, mahi-mahi

Histamine produced when fish is time-temperature abused. Histamines cannot be cooked out.

Occur in certain fish that eat smaller fish that have consumed the toxin

- Barracuda, snapper, grouper, amberjack
- Ciguatera toxin is an example

Illness:

- Symptoms and onset times vary with illness
- People will experience illness within minutes General symptoms:
- Diarrhea or vomiting
- Neurological symptoms
- Tingling in extremities
- Reversal of hot and cold sensations
- Flushing of the face and/or hives
- Difficulty breathing
- Heart palpitations

Toxins cannot be destroyed by cooking or freezing. The most important way to prevent a foodborne illness is to purchase plants, mushrooms, and seafood from approved, reputable suppliers. It is also important to control time and temperature when handling raw fish.

Chemical Contaminants

Sources:

- Certain types of kitchenware and equipment (items made from pewter, copper, zinc, and some types of painted pottery) – It is the acid levels in the food that causes this type of containers to cause the chemical contamination.
- Cleaners, sanitizers, polishes, machine lubricants, and pesticides
- Deodorizers, first-aid products, and health and beauty products (hand lotions, hairsprays, etc.) Symptoms:
- Vary depending on chemical consumed
- Most illnesses occur within minutes
- Vomiting and diarrhea are typical

If an illness is suspected, call the emergency number in your area and the Poison Control number. Consult the chemical's Material Safety Data Sheet (MSDS), which contains important safety information about the chemical.

Prevention:

- Only use chemicals approved for use in foodservice operations
- Purchase chemicals from approved, reputable suppliers
- Store chemicals away from prep areas, food-storage areas, and service areas
 - Chemicals must be separated from food and food-contact surfaces by spacing and partitioning
- Chemicals must NEVER be stored above food or food-contact surfaces
- Use chemicals for their intended use and follow manufacturer's directions
- Only handle food with equipment and utensils approved for foodservice use
- Make sure the manufacturer's labels on original chemical containers are readable
- Keep MSDS current, and make sure they are accessible to staff at all times
- Follow the manufacturer's directions and local regulatory requirements when throwing out chemicals

Physical Contaminants

A physical contamination is any solid object that is not eatable naturally accruing or not.

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 are possible
- Cuts, dental damage, and choking
- Bleeding and pain

Prevention:

- Purchase food from approved, reputable suppliers
- Closely inspect food received
- Take steps to prevent physical contamination, including practicing good personal hygiene

Deliberate Contamination of Food

Groups who may attempt to contaminate food:

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

FDA defense tool: A.L.E.R.T.

- **Assure** Make sure that products you receive are from safe sources. Supervise product deliveries. Use approved suppliers who practice food defense. Request that delivery vehicles are locked or sealed.
- **Look** Monitor the security of products in the facility. Limit access to prep and storage areas. Locking storage areas is one way to do this. Create a system for handling damaged products. Store chemicals in a secure location. Train staff to spot food defense threats.
- **Employees** Know who is in your facility. Limit access to prep and storage areas. Identify all visitors and verify credentials. Conduct background checks on staff.
- **Reports** Keep information related to food defense accessible: receiving logs, office files and documents, staff files, and random food defense self-inspections.
- **Threat** Identify what you will do and who you will contact if there is suspicious activity or a threat at your operation. Hold any product you suspect to be contaminated. Contact your regulatory authority immediately. Maintain an emergency contact list.

Responding to a Foodborne-Illness Outbreak

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

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

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 of the body, including the face, eyes, hands, or feet
- Vomiting and/or diarrhea
- Abdominal pain

Allergic reactions:

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

Common food allergens:

- Milk
- Eggs
- Fish

- Shellfish, including lobster, shrimp, and crab
- Wheat
- Soy
- Peanuts
- Tree nuts, such as almonds, walnuts, and pecans

Prevent Allergic Reactions

Know How to Read Food Labels

- Check food labels for allergens

Service staff:

- Describe how the dish is prepared
- Identify ingredients
- Suggest simple menu items
- Hand-deliver food to customers with food allergies

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
- Avoid cross-contact
 - Wash, rinse, and sanitize cookware, utensils, and equipment after handling an allergen
 - Wash your hands and change gloves before prepping food
 - Prep food for customers with food allergies in a separate area from other food
 - Label food packaged on-site for retail use

Staff must make sure that allergens are not transferred from food or food contact surfaces containing an allergen to the food served to the customer. This is called cross- contact.

Chapter 3 Study guide

How Food Handlers Can Contaminate Food

Food handlers can contaminate food when they:

- Have a foodborne illness
- Have wounds that contain a pathogen
- Sneeze or cough
- Have contact with a person who is sick
- Touch anything that may contaminate their hands and do not wash them
- Have symptoms such as diarrhea, vomiting, or jaundice—a yellowing of the eyes or skin

Actions that can contaminate food:

- A. Scratching the scalp
- B. Running fingers through hair
- C. Wiping or touching the nose
- D. Rubbing an ear
- E. Touching a pimple or infected wound
- F. Wearing a dirty uniform
- G. Coughing or sneezing into the hand
- H. Spitting in the operation

Managing a Personal Hygiene Program

Managers must focus on the following:

- Creating personal hygiene policies
- Training food handlers on personal hygiene policies and retraining them regularly
- Modeling correct behavior at all times
- Supervising food safety practices
- Revising personal hygiene policies when laws or science change

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

1. **Wet hands and arms.** Use running warm water.
2. **Apply soap.** Make sure there is enough soap to build up a good lather. Follow the manufacturer's recommendations.
3. **Scrub hands and arms vigorously for 10 to 15 seconds.** Clean the 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. Consider using a paper towel to turn off the faucet and open the restroom door.

When to Wash Hands

Food handlers must wash their hands *before* they start work and *after*:

- Using the restroom
- Handling raw meat, poultry, and seafood (before *and* after)
- Touching the hair, face, or body
- Sneezing, coughing, or using a tissue
- Eating, drinking, smoking, or chewing gum or tobacco
- Handling chemicals that might affect food safety
- Taking out garbage
- Clearing tables or busing dirty dishes
- Touching clothing or aprons
- Handling money
- Leaving and returning to the kitchen/prep area
- Handling service animals or aquatic animals
- Touching anything else that may contaminate hands

Hand antiseptics:

- Liquids or gels used to lower the number of pathogens on skin
- 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, and Do NOT wear nail polish. No jewelry may be worn except ONLY a plain band metal ring. No other jewelry is allowed.**

- Long fingernails may be hard to keep clean and can rip gloves. They can also chip and become physical contaminants.
- Fingernails should be kept trimmed and filed. This will allow nails to be cleaned easily. Ragged nails can be hard to keep clean. They may also hold pathogens and break off—becoming physical contaminants.
- Do not wear false fingernails. They can be hard to keep clean. False fingernails also can break off into food. However, false fingernails can be worn if the food handler wears single-use gloves.
- Do not wear nail polish. It can disguise dirt under nails and may flake off into food. However, nail polish can be worn if the food handler wears single-use gloves.

Nail polish may be used only if your jurisdiction allows it, but Gloves must be on.
Infected wounds or cuts:

- Contain pus
- Must be covered to prevent pathogens from contaminating food and food-contact surfaces

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

- Cover wounds on the hand or wrist with an impermeable cover, (i.e. bandage or finger cot) and then a single-use glove
- Cover wounds on the arm with an impermeable cover, such as a bandage
- Cover wounds on other parts of the body with a dry, tight-fitting bandage

Single-use gloves:

- 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
- Must NEVER be used in place of handwashing
- Must NEVER be washed and reused
- Must fit correctly

How to use gloves:

- Wash and dry hands before putting gloves on
- 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

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

Bare-Hand Contact with Ready-to-Eat Food

Bare-hand contact with ready-to-eat food must be avoided:

- Some jurisdictions allow it but require:
 - Policies on staff health
 - Training in handwashing and personal hygiene practices
- NEVER handle ready-to-eat food with bare hands when you primarily serve a high-risk population

Work Attire

Food handlers must:

- Wear a clean hat or other hair restraint
- Wear clean clothing daily
- Remove aprons when leaving food-preparation areas
- Remove jewelry from hands and arms before prepping food or when working around prep areas

Eating, Drinking, Smoking, and Chewing Gum or Tobacco

Food handlers must not:

- 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

Reporting Illness

Restriction or Exclude:

When food handlers are sick, you may need to restrict them from working with exposed food, utensils, and equipment. Sometimes you may even need to exclude sick employees 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)

Staff must also tell you when they have 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

They must also tell you if they live with someone who has been diagnosed with any of these illnesses, except nontyphoidal Salmonella. If a food handler is diagnosed with an illness from any of these pathogens, you must report the illness to your regulatory authority

Handling Staff Illnesses

If:

The food handler has a **sore throat with a fever** **Then:**

- **Restrict** the food handler from working with or around food
- **Exclude** the food handler from the operation if you primarily serve a high-risk population

Before Returning to work:

- A written release from a medical practitioner is required before returning to work

If:

The food handler has at least one of these symptoms

- **Vomiting**
- **Diarrhea** **Then:**

Exclude the food handler from the operation

- Before returning to work, food handlers who vomited or had diarrhea must meet one of these requirements
- Have had no symptoms for at least 24 hours
- Have a written release from a medical practitioner

If:

The food handler has **jaundice**

Then:

- Food handlers with jaundice must be reported to the regulatory authority
- **Exclude** food handlers who have had jaundice for less than 7 days from the operation
- Food handlers must have a written release from a medical practitioner and approval from the regulatory authority before returning to work

If:

The food handler has been diagnosed with a foodborne illness caused by one of these pathogens and has symptoms

- Hepatitis A
- *Salmonella* Typhi
- Nontyphoidal *Salmonella*
- Enterohemorrhagic and shiga toxin-producing *E. coli*
- Norovirus
- *Shigella* spp.

Then:

- **Exclude** the food handler from the operation
- Work with the food handler's medical practitioner and/or the local regulatory authority to decide when the person can go back to work

Chapter 4 Study guide

The Flow of Food

1. Purchasing
2. Receiving
3. Storing
4. Preparation
5. Cooking
6. Holding
7. Cooling
8. Reheating
9. Serving

To keep food safe throughout the flow of food we need to Prevent cross-contamination and Prevent time-temperature abuse.

Preventing Cross-Contamination

Separate equipment:

- Use separate equipment for each type of food Clean and sanitize:
- Clean and sanitize all work surfaces, equipment, and utensils after each task

Prep food at different times:

- Prepare raw meat, fish, and poultry at different times than ready-to-eat food (when using the same prep table) Buy prepared food:
- Buy food items that do not require much prepping or handling

Preventing Time-Temperature Abuse

Time-temperature control:

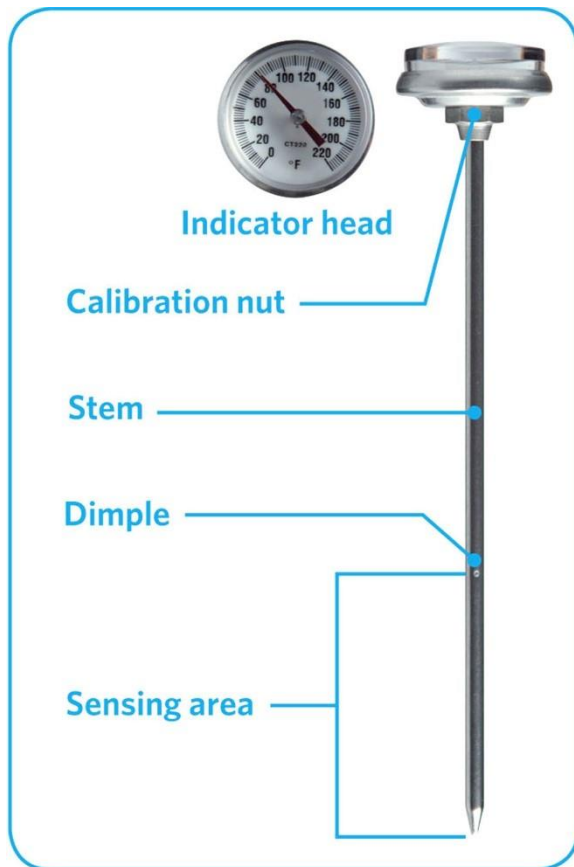
- Food held in the range of 41° F and 135° F (5° C and 57° C) has been time-temperature abused
- Food has been time-temperature abused whenever it is handled in the following ways
 - Cooked to the wrong internal temperature
 - Held at the wrong temperature
 - Cooked or reheated incorrectly

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



- A bimetallic stemmed thermometer can check temperatures from 0°F to 220°F (–18°C to 104°C).
- This thermometer measures temperature through its metal stem. When checking temperatures, insert the stem into the food up to the dimple. You must do this because the sensing area of the thermometer goes from the tip of the stem to the dimple. This trait makes this thermometer useful for checking the temperature of large or thick food. It is usually not practical for thin food, such as hamburger patties.
- The calibration nut is used to adjust the thermometer to make it accurate.

Thermocouples and thermistors:

- Measure temperature through a metal probe
- Display temperatures digitally
- Come with interchangeable probes
 - Immersion probe
 - Surface probe
 - Penetration probe
 - Air probe
- Have a sensing area on the tip of their probe
- The sensing area on thermocouples and thermistors is on the tip of their probe. This means you do not have to insert them into the food as far as bimetallic stemmed thermometers to get a correct reading. Thermocouples and thermistors are good for checking the temperature of both thick and thin food.
- Thermocouples and thermistors come in several styles and sizes. Many come with different types of probes.
- Immersion probes are used to check the temperature of liquids such as soups, sauces, and frying oil.
- Surface probes are used to check the temperature of flat cooking equipment such as griddles.
- Penetration probes are used to check the internal temperature of food. Small diameter probes should be used to check the internal temperature of thin food such as meat patties and fish fillets.
- Air probes are used to check the temperature inside coolers and ovens.

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
- These thermometers cannot measure air temperature or the internal temperature of food.
- Hold the thermometer as close as possible to the food, food package, or equipment without touching it. Do NOT take readings through glass or metal, such as stainless steel or aluminum.
- Always follow the manufacturers' guidelines. This should give you the most accurate readings.

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

Maximum registering tape:

- Indicates the highest temperature reached during use
- Used where temperature readings cannot be continuously observed
- Some devices monitor both time and temperature. The time-temperature indicator (TTI) is an example. These tags are attached to packaging by the supplier. A color change appears in the window if the food has been time temperature abused during shipment or storage. This color change is not reversible, so you know if the food has been abused.
- Some suppliers place temperature-recording devices inside their delivery trucks. These devices constantly check and record temperatures. You can check the device during receiving to make sure food was at safe temperatures while it was being shipped.
- Other tools are available that can help you monitor temperature. A maximum registering thermometer is one type. This thermometer indicates the highest temperature reached during use and is used where temperature readings cannot be continuously observed. It works well for checking final rinse temperatures of dishwashing machines.

General Thermometer Guidelines

When using thermometers:

- Wash, rinse, sanitize, and air-dry thermometers before and after using them
- Calibrate them before each shift to ensure accuracy
- Make sure thermometers used to measure the temperature of food are accurate to +/- 2°F or +/- 1°C
- Only use glass thermometers if they are enclosed in a shatterproof casing
- Insert the thermometer stem or probe into thickest part of the product (usually the center)
- Take more than one reading in different spots
- Wait for the thermometer reading to steady before recording the temperature

Chapter 5 Study guide

General Purchasing and Receiving Principles

Purchase food from approved, reputable suppliers:

- Have been inspected
- 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 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 delivery trucks for signs of contamination
 - Visually check food items and check temperatures
- Store items promptly after receiving

Receiving and Inspecting

Key drop deliveries:

- Supplier is given after-hour access to the operation to make deliveries
- Deliveries must meet the following criteria
 - Be inspected upon arrival at the operation
 - Be from an approved source
 - Have been placed in the correct storage location to maintain the required temperature
 - Have been protected from contamination in storage
 - Is NOT contaminated
 - Is honestly presented

Rejecting deliveries:

- 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, and place it in a secure and appropriate location
- Store the item separately from food, utensils, equipment, linens, and single-use items
- Label the item in a way that will prevent it from being placed back in inventory
- Inform staff not to use the product
- Refer to the vendor's notification or recall notice to determine 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
(MAP, vacuum-packed, and *sous vide* food):**

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

Checking the temperature of other packaged food:

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

Temperature criteria for deliveries:

- Cold TCS food: Receive at 41°F (5°C) or lower, unless otherwise specified
- Live shellfish: Receive oysters, mussels, clams, and scallops at an air temperature of 45°F (7°C) and an internal temperature no greater than 50° F (10° C)
 - Once received, the shellfish must be cooled to 41°F (5°C) or lower in four hours
- Shucked shellfish: Receive at 45°F (7°C) or lower Cool the shellfish to 41°F (5°C) or lower in four hours:
- Shell eggs: Receive at an air temperature of 45°F (7°C) or lower
- Milk: Receive at 45°F (7°C) or lower ○ Cool the milk to 41°F (5°C) or lower in four hours
- Hot TCS food: Receive at 135°F (57°C) or higher
- Frozen food: Receive frozen solid

Reject frozen food if there is evidence of thawing and refreezing

- Fluids or water stains in case bottoms or on packaging
- Ice crystals or frozen liquids on the food or packaging

Reject packaged items with:

- Tears, holes, or punctures in packaging; reject cans with swollen ends, rust, or dents
- Bloating or leaking (ROP food)
- Broken cartons or seals
- Dirty and discolored packaging
- Leaks, dampness, or water stains
- Signs of pests or pest damage
- Expired use-by/expiration dates
- Evidence of tampering

Likewise, reject cans if they have any of these problems:

- Severe dents in the can seams
- Deep dents in the can body
- Missing labels
- Swollen or bulging ends
- Holes and visible signs of leaking
- Rust

Required documents:

- Shellfish must be received with shell stock identification tags
 - Tags indicate when and where the shellfish were harvested
 - Must be kept on file for 90 days from the date the last shellfish was used from its delivery container
- Fish that will be eaten raw or partially cooked
 - Documentation must show the fish was correctly frozen before being received
 - Keep documents for 90 days from the sale of the fish
- Farm raised fish
 - Must have documentation stating the fish was raised to FDA standards
 - Keep documents for 90 days from the sale of the fish

Assessing food quality:

- Appearance: Reject food that is moldy or has an abnormal color
- Texture: Reject meat, fish, or poultry if
 - It is slimy, sticky, or dry
 - It has soft flesh that leaves an imprint when touched
- Odor: Reject food with an abnormal or unpleasant odor

Storage

Labeling food for use on-site:

- All items not in their original containers must be labeled
- Food labels should include the common name of the food or a statement that clearly and accurately identifies it
- It is not necessary to label food if it clearly will not be mistaken for another item

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 the ingredients in descending order by weight
- List of artificial colors and flavors in the food including 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 (5°C) or lower
 - The count begins on the day that 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
 - Some operations 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 Then:
- The container should be marked with this use-by date as long as the date is based on food safety

When combining food in a dish with different use-by dates, the discard date of the dish should be based on the earliest prepared food.

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

Temperatures:

- Store TCS food at an internal temperature of 41°F (5°C) or lower or 135°F (57°C) or higher
- Store frozen food at temperatures that keep it frozen
- Make sure storage units have at least one air temperature measuring device; it must be accurate to +/- 3°F or +/- 1.5°C
- Place the device in the warmest part of refrigerated units, and the coldest part of hot-holding units
- Do NOT overload coolers or freezers
 - Prevents airflow
 - Makes unit work harder
- 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

Rotate food to use the oldest inventory first:

- One way to rotate products is to follow FIFO
 1. Identify the food item's use-by or expiration date
 2. Store items with the earliest use-by or expiration dates in front of items with later dates
 3. Once shelved, use those items stored in front first
 4. Throw out food that has passed its manufacturer's use-by or expiration date

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, leak proof, 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 immediately
- 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

Preventing cross-contamination:

- Store food items in the following top-to-bottom order
 - A. Ready-to-eat food
 - B. Seafood
 - C. Whole cuts of beef and pork
 - D. Ground meat and ground fish
 - E. Whole and ground poultry
- This storage order is based on the minimum internal cooking temperature of each food

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

Chapter 6 Study guide

General Preparation Practices

When prepping food:

- Only remove as much food from the cooler as you can prep in a short period of time
 - This limits time-temperature abuse
- Return prepped food to the cooler or cook it as quickly as possible
- Make sure workstations, cutting boards, and utensils are clean and sanitized

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

Present food honestly:

- Do NOT use the following to misrepresent the appearance of food
 - Food additives or color additive
 - Colored overwraps
 - Lights
- Food not presented honestly must be thrown out

Corrective actions:

- Food must be thrown out in the following situations
 - When it is handled by staff who have been restricted or excluded from the operation due to illness
 - When it is contaminated by hands or bodily fluids from the nose or mouth
 - When it has exceeded the time and temperature requirements designed to keep food safe

Thawing

Four methods for thawing food:

1. Thaw food in a cooler, keeping its temperature at 41°F (5°C) or lower
2. Submerge food under running water at 70°F (21°C) or lower
 - Never let the temperature of the food go above 41°F (5°C) or lower for longer than four hours
3. Thaw food in a microwave, only if cooked immediately after thawing
4. Thaw as part of the cooking process

Storing ROP Fish

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.

Thawing ROP Fish

- Frozen fish received in ROP packaging must be thawed carefully.
- If the label states that the product must remain frozen until use, then remove fish from packaging:
 - Before thawing under refrigeration.
 - Before or immediately after thawing under running water.

Prepping Specific Food

Produce:

- Make sure produce does not touch surfaces exposed to raw meat, seafood, or poultry
- Wash it thoroughly under running water before
 - Cutting
 - Cooking
 - Combining with other ingredients
- Produce can be washed in water containing ozone to sanitize it
 - Check with your local regulatory authority
- 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 (5° C) or lower
- Do NOT serve raw seed sprouts if primarily serving a high-risk population

Eggs and egg mixtures:

- Handle pooled eggs (if allowed) with care
 - Cook promptly after mixing or store at 41° F (5° C) or lower
 - Clean and sanitize containers between batches
- Consider using pasteurized shell eggs or egg products when prepping dishes that need little or no cooking

Eggs for high-risk populations:

- Use pasteurized shell eggs if eggs will be pooled
- 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 (i.e. omelets, cakes)

Salads containing TCS food:

- Make sure leftover TCS ingredients (i.e. pasta, chicken, potatoes) have been handled safely by ensuring that they were
 - Cooked, held, and cooled correctly
 - Stored for less than seven days at 41° F (5° C) or lower

Ice:

- NEVER use ice as an ingredient if it was used to keep food cold
- Transfer ice using clean and sanitized containers and scoops
- NEVER hold ice in containers that held chemicals or raw meat, seafood, or poultry
- Store ice scoops outside ice machines in a clean, protected location
- NEVER use a glass to scoop ice or touch ice with hands

Preparation Practices That Have Special Requirements

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 item.
- You must comply with the HACCP plan and procedures submitted.
- You must 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

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

- Packaging fresh juice on-site for sale at a later time, unless the juice has a warning label
- Smoking food to preserve it but not to enhance flavor
- Using food additives or components to preserve or alter food so it no longer needs time and temperature control for safety
- Curing food

- Packaging food using a reduced-oxygen packaging (ROP) method
- Sprouting seeds or beans
- Offering live shellfish from a display tank
- Custom-processing animals for personal use (i.e. dressing a deer)
- You will need a variance when prepping food in certain ways. A variance is a document issued by your regulatory authority that allows a regulatory requirement to be waived or changed.
- When applying for a variance, your regulatory authority may require you to submit a HACCP plan. The plan must account for any food safety risks related to the way you plan to prep the food item.
- *Clostridium botulinum* and *Listeria monocytogenes* are risks to food packaged using a reduced-oxygen packaging method. This includes MAP, vacuum-packed and *sous vide* foods.

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

Cooking Requirements for Specific Food

Minimum internal cooking temperature:

165°F (74°C) for 1 seconds

- Poultry—whole or ground chicken, turkey, or duck
- Stuffing made with fish, meat, or poultry
- Stuffed meat, seafood, poultry, or pasta
- Dishes that include previously cooked, TCS ingredients

155°F (68°C) for 17 seconds

- Ground meat—beef, pork, and other meat
- Injected meat—including brined ham and flavor-injected roasts
- Mechanically tenderized meat
- Ratites including ostrich and emu
- Ground seafood—including chopped or minced seafood
- Shell eggs that will be hot held for service

145°F (63°C) for 15 seconds

- Seafood—including fish, shellfish, and crustaceans
- Steaks/chops of pork, beef, veal, and lamb
- Commercially raised game
- Shell eggs that will be served immediately

145°F (63°C) for four minutes

- Roasts of pork, beef, veal, and lamb

135°F (57°C)

- Fruit, vegetables, grains (rice, pasta), and legumes (beans, refried beans) that will be hot held for service

Cooking TCS Food in a Microwave

Minimum internal cooking temperature:

165°F (74°C)

- Meat
- Seafood
- Poultry
- Eggs

Guidelines for microwave cooking:

- Cover food to prevent the surface from drying out
- Rotate or stir it halfway through cooking so heat reaches the food more evenly
- Let it stand for at least two minutes after cooking to let the food temperature even out
- Check the temperature in at least two places to make sure the food is cooked through

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
- Heat the food to at least 165°F (74°C) for 1 seconds before selling or serving it
- Cool the food if it will not be served immediately or held for service

Consumer Advisories

If your menu includes raw or undercooked TCS items, you must:

- Note it on the menu next to the items
 - Asterisk the item
 - Place a footnote at the menu bottom indicating the item is raw, undercooked, or contains raw or undercooked ingredients
- Advise customers who order this food of the increased risk of foodborne illness
 - Post a notice in the menu
 - Provide this information using brochures, table tents, or signs

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

- Meat
- Poultry
- Seafood
- Eggs

Operations That Mainly Serve High-Risk Populations

NEVER serve:

- Raw seed sprouts
- Raw or undercooked eggs, meat, or seafood
 - Over-easy eggs
 - Raw oysters on the half shell
 - Rare hamburgers

Cooling Food

- As you know, pathogens grow well in the temperature danger zone. However, they grow much faster at temperatures between 125°F and 70°F (52°C and 21°C). Food must pass through this temperature range quickly to reduce this growth.
- Cool TCS food from 135°F (57°C) to 41°F (5°C) or lower within six hours.
- First, cool food from 135°F to 70°F (57°C to 21°C) within two hours.
- Then cool it to 41°F (5°C) or lower in the next four hours.
- If food has not reached 70°F (21°C) within two hours, it must be reheated and then cooled again.

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

- Use the remaining time to cool it to 41°F (5°C) or lower
- The total cooling time cannot be longer than six hours Example:
- If you cool food from 135°F to 70°F (57°C to 21°C) in one hour
- Then you have five hours to get the food to 41°F (5°C) or lower

Methods for Cooling Food

Before cooling food, start by reducing its size:

- Cut larger items into smaller pieces
 - Divide large containers of food into smaller containers or shallow pans
- Methods for cooling food safely and quickly:

- Place food in an ice-water bath
- Stir it with an ice paddle
- Place it in a blast chiller

Storing Food for Further Cooling

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 to an internal temperature of 165°F (74°C) for 1 seconds within two hours
- Reheat commercially processed and packaged ready-to-eat food to an internal temperature of at least 135°F (57°C)

Chapter 7 Study guide

Guidelines for Holding Food

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(57°C) or higher
 - Cold food: 41°F(5°C) or lower
- Check temperatures at least every four hours
 - Throw out food not at 41°F (5°C) or lower
 - Check temperatures every two hours to leave time for corrective action
- NEVER use hot-holding equipment to reheat food unless it is designed for it
 - Reheat food correctly, and then move it into a holding unit

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

Holding Food Without Temperature Control

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.

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

- It was held at 41°F (5°C) or lower before removing it from refrigeration
- It does not exceed 70°F (21°C) during service
 - Throw out food that exceeds this temperature
- It has a label specifying
 - Time it was removed from refrigeration
 - Time it must be thrown out
- It is sold, served, or thrown out within six hours

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

Kitchen Staff Guidelines

Prevent contamination when serving food:

- Wear single-use gloves whenever handling ready-to-eat food
 - As an alternative use spatula, 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
 - At minimum, clean and sanitize them at least once every four hours
- Store serving utensils correctly between uses
 - In the food with the handle extended above the rim of the container
 - If you are serving a non-TCS food item, you can place them on a clean and sanitized food-contact surface

Service Staff Guidelines for Serving Food

- Carry glasses in a rack or on a tray to avoid touching the food-contact surfaces. Do not stack glasses when carrying them.
- Hold dishes by the bottom or edge. Hold glasses by the middle, bottom, or stem. Do not touch the food-contact areas of dishes or glassware.

Preset Tableware

If you preset tableware:

- Prevent it from being contaminated
 - Wrap or cover the items

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

- Are removed when guests are seated
- Are cleaned and sanitized after guests have left

Refilling Returnable Take-Home Containers for Food

- Some jurisdictions allow the refilling of take-home food containers.
- Take-home food containers must be:
 - Designed to be reused
 - Provided to the customer by the operation
 - Cleaned and sanitized correctly

Refilling Returnable Take-Home Containers for Beverages

- Some jurisdictions allow the refilling of take-home beverage containers.
- These can be refilled for the same customer with non-TCS food. The container must be:
 - Able to be effectively cleaned at home and at the operation
 - Rinsed with fresh, pressurized hot water before refilling
 - Refilled using a process that prevents contamination

Re-serving Food

NEVER re-serve:

- Food returned by one customer to another customer
- 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
- Identify all food items
 - Label food
 - Place salad dressing names on ladle handles
- Keep hot food at 135°F (57°C) or higher
- Keep cold food at 41°F (5°C) 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 food displays with the correct utensils for dispensing food
- Do NOT use ice as an ingredient if it were used to keep food or beverages cold

Labeling Bulk Food in Self-Service Areas

When 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, if:

- The product makes no claim regarding health or nutrient content
- No laws requiring labeling exist
- The food is manufactured or prepared on the premises
- The food is manufactured or prepared at another regulated food operation or processing plant owned by the same person

Off-Site Service

When delivering food off-site:

- Use insulated, food-grade containers designed to stop food from mixing, leaking, or spilling
- Clean the inside of delivery vehicles regularly
- Check internal food temperatures
- Label food with a use-by date and time, and reheating and service instructions
- 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, and ready-to-eat items separately

Vending Machines

To keep vended food safe:

- Check product shelf life daily
 - Refrigerated food prepped on-site and not sold in seven days must be thrown out
- 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

Chapter 8 Study guide

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

- Personal hygiene program
- Food safety training program
- Supplier selection and specification program
- Quality control and assurance program
- Cleaning and sanitation program
- Standard operating procedures (SOPs)
- Facility design and equipment maintenance program
- Pest control program

Active Managerial Control

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

1. Purchasing food from unsafe sources
2. Failing to cook food adequately
3. Holding food at incorrect temperatures
4. Using contaminated equipment
5. Practicing poor personal hygiene

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

- Training programs
- Manager supervision
- Incorporation of standard operating procedures (SOPs)
- HACCP

These are critical to the success of active managerial control:

- Monitoring critical activities in the operation
- Taking the necessary corrective action when required
- Verifying that the actions taken control the risks factors

The FDA provides recommendations for controlling the common risk factors for foodborne illness:

- Demonstration of knowledge
- Staff health controls
- Controlling hands as a vehicle of contamination
- Time and temperature parameters for controlling pathogens
- Consumer advisories

Chapter 9 Study guide

Interior Requirements for a Safe Operation

Floors, walls, and ceilings:

- Materials must be smooth and durable for easier cleaning

Must be regularly maintained

Equipment Selection

Foodservice equipment must meet these standards if it will come in contact with food:

- Nonabsorbent
- Smooth
- Corrosion resistant
- Easy to clean
- Durable
- Resistant to damage

Installing and Maintaining Equipment

Floor-mounted equipment must be either:

- Mounted on legs at least six inches (15 centimeters) high
- Sealed to a masonry base

Tabletop equipment should be either:

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

Dishwashers must be installed:

- So, they are reachable and conveniently located
- In a way that keeps utensils, equipment, and other food-contact services from becoming contaminated
- Following manufacturer's instructions

When selecting dishwashers make sure:

- The detergents and sanitizers used are approved by the local regulatory authority
- They have the ability to measure water temperature, water pressure, and cleaning and sanitizing chemical concentration
- Information about the correct settings is posted on the machine

Three-Compartment Sinks

Purchase sinks large enough to accommodate large equipment and utensils.

Handwashing Stations

Handwashing stations must be conveniently located and are required in:

- Restrooms or directly next to them
- Food-prep areas
- Service areas
- Dishwashing areas

Handwashing sinks must be used only for handwashing.

Handwashing stations must have:

1. Hot and cold running water - The water must be drinkable and meet temperature and pressure requirements.
2. Soap - The soap can be liquid, bar, or powder.
3. A way to dry hands - Disposable paper towels or a continuous towel system that supplies the user with a clean towel can be used. Hands can also be dried with a hand dryer using either warm air or room-temperature air delivered at high velocity.
4. Garbage container - Garbage containers are required if disposable paper towels are used.
5. Signage - A clearly visible sign or poster must tell staff to wash hands before returning to work.

Some jurisdictions allow the use of automatic handwashing facilities in an operation. Check with your local regulatory authority for more information

Water and Plumbing

Acceptable sources of drinkable water:

- Approved public water mains
- Regularly tested and maintained private sources
- Closed, portable water containers
- Water transport vehicles

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

Back siphonage:

- 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 back siphonage

Backflow prevention methods:

1. Install a Vacuum Breaker (AKA backflow prevention device)
2. Have an Air Gap, one is between the faucet and the flood rim of the sink. The other is between the drainpipe of the sink and the floor drain of the operation.
3. Avoid creating a cross-connection. Do not attach a hose to a faucet unless a backflow prevention device, such as a vacuum breaker, is attached. A vacuum breaker is a mechanical device that prevents back siphonage. It does this by closing a check valve and sealing the water supply line shut when water flow is stopped.

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:

- Must be cleaned and maintained to prevent grease and condensation from building up on walls and ceilings
 - Follow manufacturer's recommendations
 - Meet local regulatory requirements

Garbage

- Remove from prep areas as quickly as possible
 - Be careful not to contaminate food and food-contact surfaces
- Clean the inside and outside of containers frequently
 - Clean them away from food-prep and storage areas

Indoor containers must be:

- Leak proof, waterproof, and pest proof
- Easy to clean
- Covered when not in use

Designated storage areas:

- Store waste and recyclables separately 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

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:

- Electrical power outages
- Fire
- Flood
- 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
- Decide how to correct the problem
 - Establish time-temperature control
 - Clean and sanitize surfaces
 - Verify water is drinkable
 - Reestablish physical security of the facility

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

Pest Management

Three rules of pest prevention:

1. Deny pests access to the operation
2. Deny pests food, water, and shelter
3. Work with a licensed Pest Control Operator (PCO)

Pest Prevention

To keep pests from entering with deliveries:

- Check deliveries before they enter the operation
 - Refuse shipments if pests or signs of pests (egg cases, body parts) are found

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

- Screen windows and vents
- Seal cracks in floors and walls, and around pipes
- Install air curtains (also called air doors or fly fans) above or alongside doors

Deny pests shelter:

- Throw out garbage quickly and correctly
- 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

Deny pests shelter:

- Store food and supplies quickly and correctly
 - Keep them away from walls and at least six inches (15 cm) off the floor
 - Rotate products (FIFO) so pests cannot settle and breed
- Clean the operation thoroughly
 - Clean up food and beverage spills immediately
 - Clean break rooms after use
 - Keep cleaning tools and supplies clean and dry

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

Chapter 10 Study guide

Cleaners

Cleaners must be:

- Stable and noncorrosive
- Safe to use
- They must also be provided and available to employees during all hours of operation.

When using them:

- Follow manufacturers' instructions
- Do NOT use one type of detergent in place of another unless the intended use is the same

There are a variety of cleaners available, each with a different purpose.

These include:

- Detergents
- Degreasers
- Delimers
- Abrasive cleaners

Sanitizing

Surfaces can be sanitized using:

- Heat
 - The water must be at least 171F°(77°C)
 - Immerse the item for 30 seconds
- Chemicals (The three common types)
 - Chlorine
 - Iodine
 - Quats (Quaternary ammonium compounds)

Chemical sanitizers are regulated by state and federal environmental protection agencies. They must be provided and available to employees during all hours of operation.

Chemical sanitizing:

- Food-contact surfaces can be sanitized by either
 - Soaking them in a sanitizing solution
 - Rinsing, swabbing, or spraying them with a sanitizing solution
- In some cases, a detergent-sanitizer blend can be used
 - Use it once to clean
 - Use it a second time to sanitize

Sanitizer Effectiveness

Concentration:

- Sanitizers should be mixed with water to the correct concentration
 - 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 it is designed for the sanitizer used
 - 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 object for a specific amount of time
- Minimum times differ for each sanitizer

Water hardness and pH:

- Find out what your water hardness and pH is from your municipality
- Work with your supplier to identify the correct amount of sanitizer to use

Guidelines for the Effective Use of Sanitizers

<u>Chlorine</u>		
Water temperature	≥100°F (38°C)	≥75°F (24°C)
Water pH	≤10	≤8
Water hardness	As per manufacturer's recommendations	
Sanitizer concentration range	50–99 ppm	50–99 ppm
Sanitizer contact time	≥7 sec	≥7 sec

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

Cleaning and Sanitizing Surfaces

1. Scrape or remove food bits from the surface.
 - Use correct cleaning tool, such as a nylon brush or pad, or a cloth towel.
2. Wash the surface.
 - Prepare the cleaning solution with an approved cleaner.
 - Wash the surface with the correct cleaning tool, such as a cloth towel.
- 3 Rinse the surface.
 - Use clean water.
 - Rinse the surface with the correct cleaning tool, such as a cloth towel.
- 4 Sanitize the surface.
 - Use the correct sanitizing solution.
 - Prepare the concentration per manufacturer requirements.
 - Use the correct tool, such as a cloth towel, to sanitize the surface.
 - Make sure the entire surface has come in contact with the sanitizing solution.
- 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
- Any time a task was interrupted, and the items may have been contaminated
- After four hours if the items are in constant use

Cleaning and sanitizing stationary equipment:

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

Clean-in-place equipment:

- Equipment holding and dispensing TCS food must be cleaned and sanitized every day unless otherwise indicated by the manufacturer
- Check local regulatory requirements

Machine Dishwashing

High-temperature machines:

- Final sanitizing rinse must be at least 180°F (82°C)
 - 165°F (74°C) for stationary rack, single-temperature machines
- Chemical-sanitizing machines:
- Clean and sanitize at much lower temperatures
- Follow the temperature guidelines provided by the manufacturer

Dishwasher Operation

Guidelines:

- Clean the machine as often as needed
- Scrape, rinse, or soak items before washing
- Use the correct dish racks
- NEVER overload dish racks
- Air-dry all items
- Check the machine's water temperature and pressure

Monitoring High Temperature Dishwashing Machines

When using high-temperature dishwashing machines, provide staff with tools to check the temperature of the items being sanitized.

Options include:

- Maximum registering thermometers
- Temperature sensitive tape

Manual Dishwashing

Setting up a three-compartment sink:

- Clean and sanitize each sink and drain board
- Fill the first sink with detergent and water at least 110°F (43°C)
- Fill the second sink with clean water
- Fill the third sink with water and sanitizer to the correct concentration
- Provide a clock with a second hand to let food handlers know how long items have been in the sanitizer

Three-Compartment Sinks

- Step 1: Scrape item before washing them. If necessary, items can be rinsed or soaked.
- Step 2: Wash items in the first sink. Use a brush, cloth towel, or nylon scrub pad to loosen dirt. Change the water and detergent when the suds are gone, or the water is dirty.
- Step 3: Rinse items in the second sink. Spray the items with water or dip them in it. Make sure you remove all traces of food and detergent from the items being rinsed. If dipping the items, change the rinse water when it becomes dirty or full of suds.
- Step 4: Sanitize items in the third sink. Change the sanitizing solution when the temperature of the water or the sanitizer concentration falls below requirements. NEVER rinse items after sanitizing them. This could contaminate their surfaces.
- Step 5: Air-dry items on a clean and sanitized surface. Place items upside down so they will drain. Never use a towel to dry items, as it could contaminate them.

Storing Tableware and Equipment

When storing clean and sanitized tableware and equipment:

- Store them at least six inches (15 cm) off the floor
- Clean and sanitize drawers and shelves before items are stored
- Store glasses and cups upside down on a clean and sanitized shelf or rack
- Store flatware and utensils with handles up
- Cover the food-contact surfaces of stationary equipment until ready for use
- Clean and sanitize trays and carts used to carry clean tableware and utensils

Cleaning and Sanitizing in the Operation

When cleaning the premises:

- Clean nonfood-contact surfaces regularly
 - Includes floors, ceilings, walls, equipment exteriors, etc.
 - Prevents dust, dirt, food residue and other debris from building up

Cleaning up after people who get sick:

If vomit or diarrhea contacts surfaces in the operation, it must be cleaned up correctly. These substances can carry Norovirus, which is very contagious. Cleaning these surfaces correctly can prevent food from becoming contaminated. It will also keep others from becoming sick.

To be effective, operations must have procedures for cleaning up vomit and diarrhea. These procedures must address specific actions that employees must take to minimize contamination and exposure to food, surfaces, and people. It is critical that employees be trained on these procedures.

Consider the following when developing a plan for cleaning up vomit and diarrhea:

- How you will contain liquid and airborne substances, and remove them from the operation
- How you will clean, sanitize, and disinfect surfaces
- When to throw away food that may have been contaminated
- What equipment is needed to clean up these substances, and how it will be cleaned and disinfected after use
- When a food handler must wear personal protective equipment

Develop a plan for cleaning up vomit and diarrhea:

- How staff will be notified of the correct procedures for containing, cleaning, and disinfecting these substances
- How to segregate contaminated areas from other areas
- When staff must be restricted from working with or around food or excluded from working in the operation
- How sick customers will be quickly removed from the operation
- How the cleaning plan will be implemented

To be effective, operations must have written procedures for cleaning up vomit and diarrhea. These procedures must address specific actions that employees must take to minimize contamination and exposure to food, surfaces, and people. It is critical that employees be trained on these procedures.

Storing cleaning tools and chemicals:

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

Cleaning tools must be stored so that they do not contaminate food and equipment. It is a best practice to store these items in a designated area away from food. Cleaning tools should also be stored in a way that makes it easy to clean the area they are stored in. The storage area should have the following:

- Good lighting so chemicals can be easily seen
- Utility sink for filling buckets and washing cleaning tools
- Floor drain for dumping dirty water
- Hooks for hanging cleaning tools

NEVER:

- Dump mop water or other liquid waste into toilets or urinals
- Clean tools in sinks used for
 - Handwashing
 - Food prep
 - Dishwashing

Using Foodservice Chemicals

Chemicals:

- Only purchase those approved for use in foodservice operations
 - Store them in their original containers away from food and food-prep areas
 - If transferring them to a new container, label it with the common name of the chemical
 - Keep MSDS for each chemical
 - When throwing chemicals out, follow
 - Instructions on the label
 - Local regulatory requirements
- 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

Monitoring the cleaning program:

- Supervise daily cleaning routines
- Check cleaning tasks against the master schedule every day
- Change the master schedule as needed
- Ask staff for input on the program