



FOOD SAFETY MANAGER CERTIFICATION

Study Guide

How to study before the class and/or exam

This study guide can be used to prepare for the Food Safety Manager Exam. Here are some tips to help you review:

- As you review the study guide use the  sections to help test yourself.
- Whenever you see the  symbol, remember it's an important topic.

Chapter 1 - Providing Safe Food

A foodborne illness is a disease transmitted to people through food. An illness is considered an outbreak when:

1. Two or more people have the same symptoms after eating the same food
2. An investigation is conducted by state and local regulatory authorities
3. The outbreak is confirmed by laboratory analysis

Challenges include:

Time and money, language and culture, literacy and education, pathogens, unapproved suppliers, high-risk customers and staff turnover.

Costs of Foodborne Illness

- | | | |
|-------------------------------|---------------------------|--------------------------------|
| ✓ Loss of customers and sales | ✓ Lower staff morale | ✓ Increased insurance premiums |
| ✓ Loss of reputation | ✓ Lawsuits and legal fees | ✓ Staff retraining |
| ✓ Negative work exposure | ✓ Staff missing work | |

 **There are 5 top 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.

 **Q. How Does Food Become Unsafe?**

1. Time-Temperature Abuse
2. Cross Contamination
3. Poor Personal Hygiene
4. Poor cleaning and sanitizing

Foods Most Likely to Become Unsafe

 The Food & Drug Administration calls these foods, TCS foods. They consist of: Dairy products, eggs, meats, poultry, fish, shellfish, cooked potatoes, cooked rice, soy and soy products, bean sprouts, cut tomatoes and melons & garlic and oil mixtures.

 **Q. What is Ready-to-Eat Food?**

 **A. 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 and Sugar, spices, and seasonings

 **Some Populations are at a High Risk for Foodborne Illnesses:** Elderly people, preschool-age children, and people with compromised immune systems

How Foodborne Illnesses Occur - Unsafe food is the result of these 3 contaminations:

Biological Contaminants	Chemical Contaminants	Physical Contaminants
<ul style="list-style-type: none">✓ Bacteria✓ Viruses✓ Parasites✓ Fungi	<ul style="list-style-type: none">✓ Cleaners✓ Sanitizers✓ Polishes	<ul style="list-style-type: none">✓ Metal shavings✓ Staples✓ Bandages✓ Glass✓ Dirt✓ Natural Objects (fish bones)

Contaminants come from a variety of places:

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



People can contaminate food when:

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

Chapter 2 - Forms of Contamination

Biological Contaminants



Remember These Terms...

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

Pathogen: Harmful microorganism and makes people sick when eaten or produce toxins that cause illness

Toxin: Poison

Common symptoms of foodborne illness: Diarrhea, Vomiting, Fever, Nausea, Abdominal cramps, Jaundice (yellowing of skin and eyes)

Onset times: Depend on the type of foodborne illness can range from 30 minutes to six weeks



Q. What 4 types of pathogens can contaminate food and cause foodborne illness?

A. Bacteria, Viruses, Parasites & Fungi

BACTERIA

Location: Found almost everywhere

Detection: Cannot be seen, smelled, or tasted

Growth: Will grow rapidly if FAT TOM conditions are correct (see page 3)

Prevention: Control time and temperature



Use FATTOM to help you remember the conditions in which bacteria grows rapidly

F A T T O M

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; what Bacteria Need to Grow

Temperature - Bacteria grow rapidly between 41°F and 135°F (5°C and 57°C; temperature danger zone)

Time - Bacteria needs time to grow

Oxygen - Some bacteria need oxygen to grow, while others grow when oxygen isn't there

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



Control FAT TOM - The conditions you can control:

Temperature - Keep TCS food out of the temperature danger zone

Time - Limit how long TCS food spends in the temperature danger zone

Major Bacteria That Cause Foodborne Illness

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

Bacteria	Source	Linked Food	Prevention Method
<i>Salmonella</i> Typhi	People	<ul style="list-style-type: none"> ✓ Ready to eat food ✓ Beverages 	<ul style="list-style-type: none"> ✓ Wash Hands ✓ Cooking food to min. temp.
<i>Shigella</i> spp.	Human Feces	<ul style="list-style-type: none"> ✓ Hands touching TCS foods ✓ Produce 	<ul style="list-style-type: none"> ✓ Exclude food handlers with diarrhea ✓ Control flies
<i>Escherichia coli</i> (E-coli)	Intestines of cattle	<ul style="list-style-type: none"> ✓ Ground beef ✓ Produce 	<ul style="list-style-type: none"> ✓ Exclude food handlers with diarrhea ✓ Prevent cross contamination
<i>Nontyphoidal Salmonella</i>	Farm Animals, People	<ul style="list-style-type: none"> ✓ Poultry & Eggs ✓ Dairy products ✓ Produce 	<ul style="list-style-type: none"> ✓ Cook poultry & eggs to minimum temperatures ✓ Prevent cross-contamination ✓ Exclude foodhandlers who are vomiting or have diarrhea

VIRUSES

Location: Carried by human beings and animals, require a living host to grow, do not grow in food and can be transferred through food and remain infectious in food.

Sources: Food, water, or any contaminated surface and 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 that Cause Foodborne Illnesses

Viruses	Source	Linked Food	Prevention Method
Hepatitis A	Human Feces	<ul style="list-style-type: none"> ✓ Ready to eat food ✓ Shellfish 	<ul style="list-style-type: none"> ✓ Exclude staff with Hep. A and/or jaundice ✓ Wash hands ✓ Buy shellfish from reputable supplier
 Norovirus	Human Feces	<ul style="list-style-type: none"> ✓ Ready to eat food ✓ Shellfish 	<ul style="list-style-type: none"> ✓ Exclude staff with Norovirus and/or vomiting or diarrhea ✓ Wash hands ✓ Buy shellfish from reputable

PARASITES

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 and fish that will be served raw or undercooked, must be frozen correctly by the manufacturer.

FUNGI

Location: 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: Naturally occur in certain plants, mushrooms, and seafood

Seafood toxins: Produced by pathogens found on certain fish (Tuna, bonito, mahi-mahi). Histamine produced when fish is time-temperature abused. Occurs in certain fish that eat smaller fish that have consumed the toxin. Barracuda, snapper, grouper, amberjack i.e Ciguatera toxin.

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 and heart palpitations.

Chemical Contaminants

 **Sources:** Certain types of kitchenware and equipment (copper, pewter, zinc and galvanized pans when used to prepare acidic food- Toxic Metal Poisoning), cleaners, sanitizers, polishes, machine lubricants, and pesticides and deodorizers, first-aid products, health and beauty products.

Symptoms: Vary depending on chemical consumed, illnesses occur within minutes, vomiting and diarrhea are typical

Prevention: Only use chemicals approved for use in foodservice operations, purchase chemicals from approved, reputable suppliers and store chemicals away from prep areas, food-storage areas, and service areas.

Physical Contaminants

Sources: Common objects that get into food (Metal shavings from cans, wood, fingernails, staples, bandages, glass, jewelry, dirt)

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

A.L.E.R.T

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 products received are from safe sources

Look Monitor the security of products in the facility

Employees Know who is in your facility

Reports Keep information related to food defense accessible

Threat Develop a plan for responding to suspicious activity or a threat to the operation



Steps to Respond 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



Food Allergens

Food allergen: A protein in a food or ingredient some people are sensitive to. These proteins occur naturally.

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, a severe reaction, called anaphylaxis, can lead to death

Common food allergens:

- ✓ Milk
- ✓ Eggs
- ✓ Fish
- ✓ Shellfish
- ✓ Wheat
- ✓ Soy
- ✓ Peanuts
- ✓ Tree nuts

Prevent Allergic Reactions

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 with food items containing allergens in the kitchen

The Safe Food Handler

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 don't wash them
- ✓ Have symptoms such as diarrhea, vomiting, or jaundice

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
- ✓ Wearing a dirty uniform
- ✓ Coughing or sneezing into the hand
- ✓ Spitting in the operation

Managers must focus on the following:

- ✓ Creating personal hygiene policies
- ✓ Training food handlers on personal hygiene policies
- ✓ Modeling correct behavior at all times
- ✓ Supervising food safety practices
- ✓ Revising personal hygiene policies regularly

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.



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

Hand washing and Glove Use



Q. What is the right way to wash your hands?

A.

1. Wet hands with running water as hot as you can comfortably stand (at least 100°F/38°C)
2. Apply soap
3. Vigorously scrub hands and arms for ten to fifteen seconds Clean under fingernails and between fingers
4. Rinse thoroughly under running water
5. Dry hands and arms with a single-use paper towel or warm-air hand dryer Use a paper towel to turn off the faucet.



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

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

- ✓ 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

Something else you should know...

Hand antiseptics: Must comply with the CFR and FDA standards and must NEVER be used in place of hand washing

Requirements for food handlers: Keep fingernails short and clean, do NOT wear false nails, do NOT wear nail polish.

Infected Wounds or Cuts: Contain pus and must be covered

 **Single-use gloves:**

- ✓ Should be used when handling ready-to-eat food (Except when washing produce and when handling ready-to-eat ingredients for a dish that will be cooked)
- ✓ Must NEVER be used in place of hand washing
- ✓ Must NEVER be washed and reused
- ✓ Must fit correctly

 **When to change gloves:**

- ✓ As soon as they become dirty or torn
- ✓ Before beginning a different task
- ✓ After an interruption i.e phone call
- ✓ After handling raw meat, seafood, or poultry and before handling 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 hand washing and personal hygiene practices. NEVER handle ready-to-eat food with bare hands when you primarily serve a high-risk population

 **Handling Staff Illnesses**

If	Then
The food handler has sore throat and fever	✓ Restrict from working with food ✓ Exclude from work if serving a high risk population
The food handler has vomiting and/or diarrhea	✓ Exclude the food handler from the operation
The food handler has jaundice	✓ Report to the regulatory authority ✓ Exclude the food handler from the operation
The food handler has been diagnosed with a foodborne illness	✓ Work with a regulatory authority ✓ Exclude the food handler from the operation

Chapter 3 - An Introduction

 **Q. How do you keep food safe throughout the flow of food?**

A. Prevent cross-contamination & 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

Buy prepared food: Buy food items that don't require much prepping or handling

Preventing Time-Temperature Abuse

Time-temperature control: Food held in the range of 41F and 135°F (5 and 57°C) has been time-temperature abused

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 – Using Thermometers



Remember these terms...

Bimetallic stemmed thermometer – Most basic thermometer

Thermocouples and Thermistors – measures through a metal probe, displays temps digitally and has sensing area on the tip of the probe.

Infrared thermometers – Used to measure surface area. Follow manufactures guidelines.

Time-temperature indicators (TTI): Monitor both time and temperature, are attached to packages by the supplier

Maximum registering tape: Indicates the highest temperature reached during use

Thermometer Guidelines: Wash, rinse, sanitize, and air-dry thermometers before and after using them. Calibrate them before each shift to ensure accuracy. Only use glass thermometers if they are enclosed in a shatterproof casing

When using thermometers: 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 4 - Purchasing, Receiving, and Storage

Purchasing and Receiving

 **Purchase food from approved, reputable suppliers:** Have been inspected and meet all applicable local, state, and federal laws.

Arrange deliveries so they arrive: When staff has enough time to do inspections and when they can be correctly received.

Receiving principles: Make specific staff responsible for receiving and train them to follow food safety guidelines. Store items promptly after receiving.

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

Handling 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 received foods

Meat Poultry and Fish – Insert probe into the thickest part of the meat

ROP Food – Insert the probe between 2 packages or fold package around the probe

Other packaged food – Open the package and insert the 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)
- ✓ **Shucked shellfish:** Receive at 45°F (7°C) or lower
- ✓ **Shell eggs:** Receive at an air temperature of 45°F (7°C) or lower
- ✓ **Milk:** Receive at 45°F (7°C) or lower
- ✓ **Hot TCS food:** Receive at 135°F (57°C) or higher
- ✓ **Frozen food:** Receive frozen solid



Reject delivery 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
- ✓ Tears, holes, or punctures in packaging
- ✓ 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



Required documents to be collected when receiving food:

- Shellfish must be received with shellstock 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



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

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

FIFO

One way to rotate products correctly 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 While Storing Food

- ✓ 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 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
- ✓ 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 5 - Preparation, Thawing, Cooking, Cooling and Reheating

Prepping

When prepping food:

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

Prepping Specific Foods

Produce – Make sure it doesn't touch surfaces exposed to raw meats, poultry or seafood, wash produce thoroughly and when soaking or storing in water do not mix different items or multiple batches of the same item. Refrigerate sliced melons and do not serve raw seed sprouts to a high risk population.

Egg and Egg Mixtures – Handle pooled eggs with care by cooking promptly or storing at 41°F or lower. Clean and sanitize between batches. Note: For high risk populations use pasteurized eggs if they are pooled or not fully cooked.

Salads containing TCS Foods – Make sure leftover TCS ingredients have been handled safely.

Ice – Never use ice as an ingredient if it was used to keep food cold. Transfer ice using clean and sanitized scoops. Store ice scoops outside ice machines. NEVER use glass to scoop ice.

Preparation Practices That Have Special Requirements. You need a variance if prepping food in these ways:

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

Thawing

 **Q. What are the 4 Acceptable methods for thawing food?**

Answers

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
3. Thaw food in a microwave, only if cooked immediately after thawing
4. Thaw as part of the cooking process

Cooking Food

When cooking TCS food, the internal portion must: Reach the required minimum internal temperature and 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 and check the temperature in the thickest part of the food.



Cooking Requirements for Specific Food

Food	Minimum Internal Cooking Temperature	Length of Time at this Temperature
Poultry: (including whole or ground chicken, turkey, and	165°F (74°C)	0 seconds (immediately)
Ground Meat (including beef, pork, other meat)	155°F (68°C)	17seconds
Injected Meat	155°F (68°C)	17seconds
Pork, Beef, Veal, Lamb	Steaks/Chops:145°F (63°C) Roasts: 145°F	15 seconds 4 minutes
Fish	145°F (63°C)	15 seconds
Ground, chopped, minced fish	155°F (68°C)	15 seconds
Eggs for immediate service	145°F (63°C)	15 seconds
Eggs that will be hot-held	155°F (68°C)	15 seconds
Commercially processed, ready-to-eat food that will be hot-held for service (cheese sticks, fried vegetables, chicken wings, etc.)	135°F (57°C)	15 seconds
TCS Food in a Microwave Meat, Seafood, Poultry and Eggs.	165°F (74°C)	0 seconds immediate

Guidelines for microwave cooking: Cover food, rotate or stir it halfway through cooking, let it stand for at least two minutes after cooking and check the temperature in at least two places to make sure the food is cooked through.

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) 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 item
- ✓ 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

Consumer Advisories - The FDA advises against offering these items on a children's menu if they are raw or undercooked: Meat, Poultry, Seafood and Eggs.

Operations That Mainly Serve High-Risk Populations must NEVER serve: Raw seed sprouts or Raw or undercooked eggs, meat, or seafood i.e Over-easy eggs, Raw oysters on the half shell, Rare hamburgers.



Cooling Food

Cool food from **135°F to 70°F (57°C to 21°C) within two hours: then from 70°F to 41°F within 4 hours**: The total cooling time cannot be longer than six hours

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
- ✓ Place it in a blast chiller
- ✓ Stir it with an ice paddle



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

Remember...

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

Chapter 6 – Service

Holding Food

Food Holding Temperatures:

- ✓ 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's designed for it
- ✓ Reheat food correctly, and then move it into a holding unit

Q. Can you Hold Food without Temperature Control?

Answer.

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 and 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

Serving Food

Prevent contamination when serving food:

- ✓ Wear single-use gloves whenever handling ready-to-eat food. As an alternative use spatulas, tongs, deli sheets, or other utensils
- ✓ Use clean and sanitized utensils for serving
- ✓ Store serving utensils correctly between uses
- ✓ On a clean and sanitized food-contact surface
- ✓ 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
- ✓ In the food with the handle extended above the container rim

Preset Tableware - If you preset tableware: Prevent it from being contaminated; Wrap or cover the items

Re-serving Food - NEVER re-serve:

- ✓ Food returned by one customer to another customer
- ✓ Uncovered condiments
- ✓ Uneaten bread
- ✓ Plate garnishes

Self Service Areas

Self-Service Areas Requirements

- ✓ Use sneeze guards - Must be located 14" (36cm) above the counter, must extend 7" (18cm) beyond the food
- ✓ 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 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

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
- ✓ Store raw meat, poultry, and seafood, and ready-to-eat items separately

Vending Machines - To keep vended food safe:

- ✓ Check product shelf life daily
- ✓ 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 7 - Food Safety Management Systems

What is a Food safety management system: Group of practices and procedures intended to prevent foodborne illness. Actively controls risks and hazards throughout the flow of food

These are the foundation of a food safety management system:

- ✓ Personal hygiene program
- ✓ Food safety training program
- ✓ Supplier selection and specification program
- ✓ Quality control and assurance program
- ✓ 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

HACCP – Hazard Analysis Critical Control Point



The HACCP approach:

- ✓ HACCP is based on identifying significant biological, chemical, or physical hazards at specific points within a product's flow through an operation
- ✓ Once identified, hazards can be prevented, eliminated, or reduced to safe levels

To be effective, a HACCP system must be based on a written plan:

- ✓ It must be specific to each facility's menu, customers, equipment, processes, and operations
- ✓ A plan that works for one operation may not work for another

The 7 HACCP principles:

1. Conduct a hazard analysis
2. Determine critical control points (CCPs)
3. Establish critical limits
4. Establish monitoring procedures
5. Identify corrective actions
6. Verify that the system works
7. Establish procedures for record keeping and documentation

These specialized processing methods require a variance and may require a HACCP plan:

- ✓ Smoking food as a method to preserve it (but not to enhance flavor)
- ✓ Using food additives or components such as vinegar to preserve or alter food so it no longer requires time and temperature control for safety
- ✓ Curing food
- ✓ Custom-processing animals
- ✓ Packaging food using ROP methods including
- ✓ Treating (e.g. pasteurizing) juice on-site and packaging it for later sale
- ✓ Sprouting seeds or beans

Chapter 8 - Safe Facilities and Pest Management

Facility Requirements

Interior Requirements for a Safe Operation - Floors, walls, and ceilings:

- ✓ Materials must be smooth and durable for easier cleaning
- ✓ Must be regularly maintained



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

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

Floor-mounted equipment must be either:

- ✓ Mounted on legs at least 6 inches (15 cm) high
- ✓ Sealed to a masonry base

Tabletop equipment should be either:

- ✓ Mounted on legs at least 4 inches (10 cm) 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

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

Handwashing stations must be conveniently located and are required in:

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



Handwashing stations must have:

- ✓ Hot and cold running water
- ✓ Soap
- ✓ A way to dry hands
- ✓ Garbage container
- ✓ Proper Signage

Acceptable sources of drinkable water:

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



Remember these terms...

Cross-connection - Physical link between safe water and dirty water from: Drains, Sewers or Other wastewater sources

Backflow - Reverse flow of contaminants through a cross-connection into the drinkable water supply – Prevent using a Vacuum Break or Air gap.

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

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 light bulbs or protective covers
- ✓ Replace burned out bulbs with correct size bulbs

Ventilation systems: Must be cleaned and maintained to prevent grease and condensation from building up on walls and ceilings.

Garbage: Remove from prep areas as quickly as possible and clean the inside and outside of containers frequently.

Indoor containers must be: Leak proof, waterproof, and pest proof, easy to clean and 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, have tight-fitting lids, be covered at all times and have their drain plugs in place.

Emergencies That Affect the Facility

Imminent health hazard: A significant threat or danger to health or requires immediate correction or closure to prevent injury

Possible imminent health hazards: Electrical power outages, fire, flood and sewage backups.

How to respond to a crisis affecting the facility:

1. Determine if there is a significant risk to the safety or security of your food.
2. If the risk is significant stop service then notify the local regulatory authority.
3. Decide how to correct the problem
4. Establish time-temperature control
5. Clean and sanitize surfaces
6. Verify water is drinkable
7. Reestablish physical security of the facility

Pest Management

 **Q. What are the 3 rules of pest prevention?**

Answer.

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

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

Pest Prevention - 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 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
- ✓ 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



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 9 - Cleaning and Sanitizing

Using Cleaners and Sanitizers

Cleaners must be:

- ✓ Stable and noncorrosive
- ✓ Safe to use

When using them:

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

Surfaces can be sanitized using heat or chemicals:

Heat

- ✓ The water must be at least 171F°(77°C)
- ✓ Immerse the item for 30 seconds

Chemicals

- ✓ Chlorine
- ✓ Iodine
- ✓ Quats

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
- ✓

The following factors can change the effectiveness of the sanitizer:

- ✓ **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 and make sure it is designed for the sanitizer used. Check the concentration often. Change the solution when it's dirty or 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

Chlorine – Water temp min 75°F, 50-99ppm, contact time min. 7 sec

Iodine – Water temp min 68°F, 12.5-25 ppm, contact time min 30 sec

Quats – Water temp min 75°F, less than 500 ppm, contact time min 30 sec

How and When to Clean and Sanitize



How to clean and sanitize

1. Scrape or remove food bits from the surface
2. Wash the surface
3. Rinse the surface
4. Sanitize the surface
5. Allow the surface to air-dry.

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
- ✓ Scrape or remove food from the equipment surfaces
- ✓ Wash the equipment surfaces
- ✓ Rinse the equipment surfaces with clean water
- ✓ Sanitize the equipment surfaces
- ✓ 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

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

Chemical-sanitizing machines:

- ✓ Clean and sanitize at much lower temperatures
- ✓ Follow the temperature guidelines provided by the manufacturer
- ✓ Air-dry all items
- ✓ Check the machine's water temperature and pressure

Manual Dishwashing - Three-Compartment Sinks



Setting up a three-compartment sink:

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

Using a three-compartment sink:

1. Rinse, scrape or soak items before washing them
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 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

When cleaning the premises: Clean nonfood-contact surfaces regularly. This includes floors, ceilings, walls, equipment exteriors, etc.

Cleaning up after people who get sick: Diarrhea and vomit in the operation must be cleaned up correctly. Correct cleanup can prevent food from becoming contaminated and keep others from getting sick

Chemical Storage

Storing cleaning tools and chemicals: Place in a separate area away from food and prep areas

The storage area should have:

- ✓ Good lighting so chemicals can be easily seen
- ✓ 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: hand washing, food prep or dishwashing



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 and local regulatory requirements.

Develop a Cleaning Program

To develop an effective cleaning program:

- ✓ Create a master cleaning schedule
- ✓ Train your staff to follow it

To create a master cleaning schedule, identify:

- ✓ What should be cleaned
- ✓ Who should clean it

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

- ✓ Monitor the program to make sure it works

- ✓ When it should be cleaned
- ✓ How it should be cleaned

Additional things you may need to know...

 Q. What are the 3 Government agencies that deal with food?

Answers.

- ✓ The Food and Drug Administration (FDA)
- ✓ U.S. Department of Agriculture (USDA)
- ✓ Centers for Disease Control and Prevention (CDC)

Food and color additives:

- ✓ Only use additives approved by your local regulatory authority
- ✓ NEVER use more additives than are allowed
- ✓ 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