



ServSafe® Food Managers Certification Class

7th Edition

Modules:

- I. Providing Safe Food**
- II. Forms of Contamination**
- III. The Safe Food Handler**
- IV. The Flow of Food: An Introduction**
- V. The Flow of Food: Purchasing, Receiving, and Storage**
- VI. The Flow of Food: Preparation**
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Module 1: Providing Safe Food



Challenges to Food Safety

A **foodborne illness** is a disease transmitted to people by 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 a laboratory analysis.

How foodborne illnesses occur

Unsafe food is usually the result of contamination, which is the presence of harmful substances in food. To prevent foodborne illnesses, you must recognize the contaminants that can make food unsafe. These can come from pathogens, chemicals, or physical objects. They might also come from certain unsafe practices in your operation.

Contaminants are divided into three categories

	<p>Biological Pathogens are the greatest threat to food safety. They include certain viruses, parasites, fungi, and bacteria. Some plants, mushrooms, and seafood that carry harmful toxins (poisons) are also included in this group.</p>	<p style="text-align: center;">How food becomes unsafe</p> <p>If food handlers do not handle food correctly, it can become unsafe. These are the five most common food-handling mistakes, or risk factors, that can cause foodborne illness:</p> <ol style="list-style-type: none"> 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
	<p>Chemical Foodservice can contaminate food if they are used incorrectly. The photo at left shows one example of how chemicals may contaminate food. Chemical contaminants can include cleaners, sanitizers, and polishes.</p>	
	<p>Physical Foreign objects such as metal shavings, staples, and bandages can get into food. So can glass, dirt, and even bag ties. Naturally occurring objects, such as fish bones in fillets, are another example.</p>	

Each of these contaminants is a danger to food safety. But biological contaminants are responsible for most foodborne illness.

Practices related to Foodborne illness

Time-temperature abuse

Food has suffered **time-temperature abuse** when it has stayed too long at temperatures that are good for the growth of pathogens. A foodborne illness can result if food is time-temperature abused. This can happen in many ways:

- Food is not held or stored at the correct temperatures.
- Food is not cooked or reheated enough to kill pathogens.
- Food is not cooled correctly.

Cross-contamination

Pathogens can be transferred from one surface or food to another. This is called cross-contamination. It can cause a foodborne illness in many ways:

- Contaminated ingredients are added to food that receives no further cooling.
- Ready-to-eat food touches contaminated surfaces.
- Contaminated food touches or drips fluids onto cooked or ready-to-eat food.
- A food handler touches contaminated food and then touches ready-to-eat food.
- Contaminated wiping cloths food-contact surfaces

Poor personal hygiene

Food handlers can cause a foodborne illness if they do any of the following actions:

- Fail to wash their hands correctly after using the restroom
- Cough or sneeze on food
- Touch or scratch wounds and then touch food, as shown in the photo at left
- Work while sick

Poor cleaning and sanitizing

Pathogens can be spread to food if equipment has not been cleaned and sanitized correctly between uses. This can happen in the following ways:

- Equipment and utensils are not washed, rinsed, and sanitized between uses.
- Food-contact surfaces are wiped clean rather than being washed, rinsed and sanitized, as shown in the photo at left.
- Wiping cloths are not stored in a sanitizer solution between uses.
- Sanitizing solutions are not at the required levels to sanitize objects.

Food most likely to become unsafe

TCS and ready-to-eat food are the most likely types of food to become unsafe.

TCS food

Pathogens grow well in TCS food. These items need time and temperature control to limit pathogen growth. For this reason, this food is called **TCS food** – food requiring **t**ime and **t**emperature **c**ontrol for **s**afety.




<ul style="list-style-type: none"> ➤ Milk and dairy products ➤ Meat: beef, pork and lamb ➤ Fish ➤ Baked potatoes ➤ Tofu or other soy protein ➤ Sliced melons, cut tomatoes and leafy greens 	<ul style="list-style-type: none"> ➤ Shell eggs ➤ Poultry ➤ Shellfish and crustaceans ➤ Heat-treated plant food, such as cook rice, beans and vegetables ➤ Sprouts and sprout seeds ➤ Untreated garlic and oil mixtures
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Ready-to-eat Food

Like TCS food, ready-to-eat food also needs careful handling to prevent contamination. Ready-to-eat food is exactly what it sounds like: food that can be eaten without further preparation, washing, or cooking. Ready-to eat food includes cooked food, washed fruit and vegetables (whole and cut), and deli meat. Bakery items and sugar, spices, and seasonings are also included.

Population at High Risk for Foodborne Illnesses

Certain groups of people have higher risk of getting a foodborne illness. These are:

<p>Elderly people People’s immune systems weaken with age. The immune system is the body’s defense against illness.</p>	<p>Preschool-age children Very young children have not built up strong immune systems.</p>	<p>People with compromised immune systems Certain medical conditions and medications can weaken a person’s immune system. These include: • Cancer • HIV/AIDS • Transplants</p>
		

Keeping Food Safe

Now that you know how food can become unsafe, you can use this knowledge to keep food safe. Focus on these measures:

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

Train your staff to follow safe food handling procedures. Train staff when they are hired and retrain them on an ongoing basis. Watch to make sure they follow procedures. If you see unsafe food handling practices, take corrective action to keep food safe. Retrain employees as needed.

Government Agencies Responsible for prevention of Foodborne Illness

Several government agencies take leading roles in the prevention of foodborne illness in the United States. The Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) inspect food and perform other critical duties.

State and local regulatory authorities create regulations and inspect operations.

Agencies such as the Center for Disease Control and Prevention (CDC) and the U.S. Public Health Service (PHS) help with food safety as well.

The FDA

The FDA inspects all food except meat, poultry, and eggs. The agency also regulates food transported across state lines. In addition, the FDA issues the Food Code. This science-based code provides recommendations for food safety regulations. The Food Code was created for city, county, state, and tribal agencies. These agencies regulate foodservice for the following groups:

- Restaurants and retail food stores
- Vending operations
- Schools and day care centers
- Hospitals and nursing homes

Although the FDA recommends that states adopt **The Food Code**, it cannot require it. The FDA also provides technical support and training. This is available for industry and regulatory agencies.

Other Agencies

Several other agencies have an important role in food safety and the prevention of foodborne illness.

USDA The U.S. Department of Agriculture regulates and inspects meat, poultry, and eggs.

CDC and PHS These agencies assist the FDA, USDA, and state and local health departments. They conduct research into the causes of foodborne illness outbreaks. They also assist in investigating outbreaks.

State and local regulatory authorities

Regulatory authorities write or adopt codes that regulate retail and foodservice operation. Codes may differ from the FDA Food Code, because these agencies are not required to adopt it.

Regulatory authorities have many responsibilities:

- Inspecting operations
- Enforcing regulations
- Investigating complaints and illnesses
- Issuing licenses and permits
- Approving construction
- Reviewing and approving HACCP plans

Module 2: Forms of Contamination

Contamination is the presence of harmful substances in food. Those substances can be biological, chemical, or physical. Most contaminants cause foodborne illness. Other can result in physical injury.

How contamination happens

Contaminants come from a variety of places. Many contaminants are found in the animals we use for food. Others come from air, contaminated water, and dirt and from chemicals we use in our operations. Others occur naturally in food, such as the bones in fish.

Food handler can pass on contaminants when they are in contact with a person who is sick, or when food handlers who do not wash their hands after using restroom may contaminate food and surfaces with feces from their fingers, once this food is eaten, a foodborne illness may result. This is call fecal-oral route.

Some contaminants are passed very easily in any of this ways:

- From person to person
- Through sneezing or vomiting onto food or food-contact surfaces
- From touching dirty food-contact surfaces and equipment, and then touching food.

Biological Contamination

Biological contamination occurs from microorganisms. These are small, living organisms that can be seen only through a microscope. Many microorganisms are harmless, but some can cause illness. Harmful microorganisms are called pathogens. Some pathogens make you sick when you eat them. Other produce poison or toxins.

There are four types of pathogens that can contaminate food and cause foodborne illness. These are bacteria, viruses, parasites, and fungi (which includes molds and yeast)

According to the Food and Drug Administration (FDA), there are over 40 kinds of bacteria, viruses, parasites, and molds that can occur in food and cause foodborne illness. Of these, six have been singled out by the FDA. These have been dubbed the Big Six because they are highly contagious and can cause severe illness.

The Big Six include:

<ul style="list-style-type: none">• Shigella spp.• Salmonella Typhi• Nontyphoidal Salmonella (NTS)	<ul style="list-style-type: none">• Shiga toxin-producing Escherichia coli (STEC)• Hepatitis A• Norovirus
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Symptoms of Foodborne Illness

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

<ul style="list-style-type: none">• Diarrhea• Vomiting• Fever	<ul style="list-style-type: none">• Nausea• Abdominal cramps• Jaundice (a yellowing of the skin and eyes)
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Not every person who is sick with foodborne illness will have all of these symptoms. Nor are the symptoms of a foodborne illness limited to the list. How quickly foodborne-illness 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

Bacteria that cause foodborne illness have some basic characteristics.

Location Bacteria can be found almost everywhere. They live in and on our bodies. Some type of bacteria keep us healthy, while others cause illness.

Detection Bacteria cannot be seen, smelled, or tasted.

Growth Bacteria needs six conditions to grow, if this conditions are correct, bacteria will grow in rapid numbers.

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

Conditions for Bacteria to Grow:

Food	Most bacteria need nutrients to survive. TCS food supports the growth of bacteria better.
Acidity	Bacteria grow best in food that contains little or no acid. pH is the measure of acidity. The pH scale ranges from 0 to 14. 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.
Temperature	Bacteria grow rapidly between 41°F and 135°F. This range is known as the temperature danger zone. Bacteria grow even more rapidly from 70°F to 125°F. Bacteria growth is limited when food is held above or below the temperature danger zone.
Time	Bacteria needs time to grow. The more time bacteria spend in the temperature danger zone, the more opportunity they have to grow to unsafe levels.
Oxygen	Some bacteria need oxygen to grow. Others grow when oxygen is not there.
Moisture	Bacteria grow well in food with high levels of moisture. The amount of moisture available in food for this growth is called water activity (a_w). The a_w scale ranges from 0.0 to 1.0. The higher the value, the more available moisture in the food. For example, Water has a water activity of 1.0

Major Bacteria that cause Foodborne Illness: Food handlers diagnosed with illnesses from these bacteria must **NEVER** work in a foodservice operation while they are sick.

Bacteria	Source	Food linked with bacteria	Prevention Measures
Salmonella Typhi	Salmonella Typhi lives only in humans. People with typhoid fever carry the bacteria in their bloodstream and intestinal tract. Eating only a small amount of these bacteria can make a person sick. The severity of symptoms depends on the health of the person and the amount of bacteria eaten. The bacteria are often in a person's feces for weeks after symptoms have ended.	<ul style="list-style-type: none"> • Ready-to-eat food • Beverages 	<ul style="list-style-type: none"> • Exclude from the operation food handlers who have been diagnosed with an illness caused by Salmonella Typhi • Wash hands • Cook food to minimum internal temperatures
Nontyphoidal Salmonella	Many farm animals carry nontyphoidal Salmonella naturally. Eating only a small amount of these bacteria can make a person sick. The severity of symptoms depends on the health of the person and the amount of bacteria eaten. The bacteria are often in a person's feces for weeks after symptoms have ended.	<ul style="list-style-type: none"> • Poultry and eggs • Meat • Milk and dairy products • Produce, such as tomatoes, peppers, and cantaloupes 	<ul style="list-style-type: none"> • Cook poultry and eggs to minimum internal temperatures • Prevent cross-contamination between poultry and ready-to eat food. • Exclude from the operation food handlers who are vomiting or have diarrhea and have been diagnosed with an illness caused by nontyphoidal Salmonella.

Bacteria	Source	Food linked with bacteria	Prevention Measures
Shigella spp.	<p>Shigella spp. Is found in the feces of humans with the illness. Most illnesses occur when people eat or drink contaminated food or water.</p> <p>Flies can also transfer the bacteria from feces to food.</p> <p>Eating only a small amount of these bacteria can make a person sick. High levels of the bacteria are often in a person's feces for weeks after symptoms have ended.</p>	<ul style="list-style-type: none"> • Food that is easily contaminated by hands, such as salads containing TCS food (potato, tuna, shrimp, macaroni, and chicken) • Food that has made contact with contaminated water, such as produce 	<ul style="list-style-type: none"> • Exclude from the operation food handlers who have diarrhea and have been diagnosed with an illness caused by Sheila spp. • Wash hands • Control flies inside and outside the operation
<p>Shiga toxin-producing Escherichia coli</p> <p>Also known as E.coli</p>	<p>Shiga toxin-producing E. coli can be found in the intestines of cattle. The bacteria can contaminate meat during slaughtering.</p> <p>The bacteria is also found in infected people.</p> <p>Eating only a small amount of the bacteria can make the person sick. Once eaten, it produces toxins in the intestine, which cause the illness. The bacteria are often in a person's fences for weeks after symptoms have ended.</p>	<ul style="list-style-type: none"> • Ground beef (raw and undercooked) • Contaminated produce 	<ul style="list-style-type: none"> • Exclude from the operation food handlers who have diarrhea and have been diagnosed with a disease from the bacteria. • Cook food, especially ground beef, to minimum internal temperatures. • Purchase produce from approved, reputable suppliers. • Prevent cross-contamination between raw meat and ready-to eat food.

Viruses

Viruses share some basic characteristics.

Location Viruses are carried by human beings and animals. They require a living host to grow. While viruses do not grow in food, they can be transferred through food and still remain infectious in food.

Sources People can get viruses from food, water, or any contaminated surface. Foodborne illnesses from viruses typically occur through fecal-oral routes. Norovirus is one of the leading causes of foodborne illness. It is often transmitted through airborne vomit particles.

Destruction Viruses are not destroyed by normal cooking temperatures. That is why it is especially important to practice good personal hygiene when handling food and food-contact surfaces. The quick removal and cleanup of vomit is also important.

Major viruses that cause foodborne illness

Virus	Source	Food linked with Virus	Prevention Measures
Hepatitis A	<p>Hepatitis A is mainly found in the feces of people infected with it. The virus can contaminate water and many types of food. It is commonly linked with ready-to-eat food. However, it has also been linked with shellfish from contaminated water. The virus is often transferred to food when infected food handlers touch food or equipment with fingers that have feces on them. Eating only a small amount of the virus can make a person sick. An infected person may not show symptoms for week but can be very infectious. Cooking does not destroy Hepatitis A.</p>	<ul style="list-style-type: none"> • Ready-to-eat food • Shellfish from contaminated water 	<ul style="list-style-type: none"> • Exclude from the operation food handlers who have been diagnosed with Hepatitis A • Exclude from the operation food handlers who have had jaundice for seven days or less. • Wash hands. • Avoid bare-hand contact with ready-to-eat food • Purchase shellfish from approved, reputable suppliers.

Virus	Source	Food linked with Virus	Prevention Measures
Norovirus	Like Hepatitis A, Norovirus is commonly linked with ready-to-eat food. It has also been linked with contaminated water. Norovirus is often transferred to food when infected food handlers touch food or equipment with fingers that are contaminated by feces. Eating only a small amount of Norovirus can make a person sick. It is also very contagious with a few hours after eating it. The virus is often in a person's feces for days after symptoms have ended.	<ul style="list-style-type: none"> • Ready-to-eat food • Shellfish from contaminated water 	<ul style="list-style-type: none"> • Exclude from the operation food handlers are vomiting or have diarrhea and have been diagnosed with Norovirus. • Wash hands. • Avoid bare-hand contact with ready-to-eat food • Purchase shellfish from approved, reputable suppliers.

Parasites and Fungi Parasites require a host to live and reproduce. They are commonly associated with seafood and food processed with contaminated water. The most important measure for preventing parasites from causing a foodborne illness is to purchase food from approved, reputable suppliers. Fungi include mold, yeasts, and mushrooms. Like parasites, they are best prevented by purchasing food from approved, reputable suppliers.

Biological Toxins occur naturally in certain plants, mushrooms, and seafood. When seafood is **time/temp abused**, bacteria on the fish make the toxin. It can't be destroyed by cooking, freezing, smoking or curing. *Food linked with the toxin:* tuna, bonito, mackerel, and mahi-mahi. *Prevention measures:* prevent **time/temp abuse** during storage and preparation. Symptoms of biological toxin illnesses are diarrhea or vomiting, and neurological symptoms such as tingling in extremities, reversal of hot and cold sensations, flushing of the face and/or hives, difficulty breathing, and heart palpitations. Symptoms and onset times vary with illness, and people can experience illness within minutes.

Chemical contaminants occur when chemicals get into food and beverages. Chemical contaminants include toxin metals, cleaners, sanitizers, polishes, and machine lubricants. To help prevent chemical contamination, store chemicals away from prep areas, food storage areas, and service areas. Always follow the manufacturer's direction when using chemicals. Sources of **toxic-metal poisoning** include: certain types of kitchenware and equipment (items made from pewter, copper, zinc, and some types of painted pottery. Consult the chemical's **Material Safety Data Sheet (MSDS)**, which contains important safety information about the chemical

Physical Contaminants Food can become contaminated when objects get into it. It can also happen when natural objects are left in food, like bones in a fish fillet. Some common objects that can get into food include metal shavings from cans, wood, fingernails, staples, bandages, glass, jewelry, and dirt. Naturally occurring objects, such as fruit pits and bones, can also be contaminants. Purchase food from approved, reputable suppliers to prevent physical contamination. Closely inspect the food you receive. Make sure no physical contaminants can get into it at any point during the flow of food.

Deliberate Contamination of Food

So far, you have learned about methods to prevent the accidental contamination of food. But you also must take steps to stop people who are actually trying to contaminate it. This may include the following groups:

<ul style="list-style-type: none"> • Terrorists or activists • Disgruntled current or former staff • Vendors • Competitors 	These people may try to tamper with your food using biological, chemical, or physical contaminants. They may even use radioactive materials. Attacks might occur anywhere in the food supply chain. But they are usually focused on a specific food item, process, or business.
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The best way to protect food is to make it as difficult as possible for someone to tamper with it. For this reason, a food defense program should deal with the points in your operation where food is at risk. The FDA has created a tool that can be used to develop a food defense program. It is based on the acronym A.L.E.R.T.

Assure	Make sure that products you receive 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: Receiving logs, staff files, office files
Threat	Identify what you will do and who you will contact if there is suspicious activity at your operation: <ul style="list-style-type: none"> • Hold any product you suspect to be contaminated • Contact your regulatory authority immediately • Maintain an emergency contact list

Responding to a Foodborne-Illness Outbreak

Despite your best efforts, a foodborne-illness outbreak may occur. Here are some things you should consider when responding to an outbreak.

Gathering information	Ask the person making the complaint for general contact information and to identify the food that was eaten. Also ask for a description of symptoms and when the person became sick.
Notifying authorities	Contact the local regulatory authority if you suspect an outbreak
Segregating product	Set the suspected product aside if any remains. Include a label with “Do Not Use” and “Do Not Discard” on it, as shown in the photo at left.
Documenting information	Log information about the suspected product. This might include a product description, production date, lot number, and the sell-by date.
Identifying staff	Maintain a list of food handlers scheduled at the time of the suspected contamination. They should also be interview immediately by management about their health status.
Cooperating with authorities	Cooperate with regulatory authorities in the investigation. Provide appropriate documentation like HACCP documents , staff files, etc.
Reviewing procedures	Review food handling procedures to identify if standards are not being met or procedures are not working.

Food Allergens

A **food allergen** is a protein in a food or ingredients that some people are sensitive to. These proteins occur naturally. When enough of an allergen is eaten, an allergic reaction can occur. This is when the immune system mistakenly considers the allergen to be harmful and attacks the food protein. To protect your customers, you should be able to recognize these signs and know what to do. You also should know the types of food that most often cause allergic reactions to help prevent them from happening.

Allergy Symptoms

Depending on the person, an allergic reaction can happen just after the food is eaten or several hours later. This reaction could include some or all of these symptoms:

- Nausea
- Wheezing or shortness of breath
- Hives or itchy rashes
- Swelling of various parts of the body, including the face, eyes, hands, or feet
- Vomiting and/or diarrhea
- Abdominal pain
- Itchy throat

Initially symptoms may be mild, but they can become serious quickly. In severe cases, anaphylaxis - a severe allergic reaction that can lead to death – may result. If a customer is having a severe allergic reaction to food, call the emergency number in your area and inform them of the allergic reaction.

Common Food Allergens

You and your staff must be aware of the most common food allergens and the menu items that contain them.

While more than 160 food items can cause allergic reactions, just eight of those account for 90 percent of all reactions in the United States. These eight food items are known as the Big Eight.

Preventing Allergic reactions

Fifteen millions Americans have food allergy, and allergic reactions result in 200,000 emergency room visits every year. Both service staff and kitchen staff needs to do their part to avoid serving food containing allergens to people with food allergies. These precautions also apply to any food sensitivities that a customer might mention, such as gluten intolerance.

Food labels

Food labels are an important tool used to identify allergens in the products that you purchase. Federal law requires manufactured products containing one or more of the Big Eight allergens to clearly identify them on the ingredient label. The allergen may be included in the common name of the food, such as buttermilk, or it may be shown in parentheses after the ingredient.

Service Staff

Your staff should be able to tell customers about menu items that contain potential allergens. At minimum, have one person available per shift to answer customer's questions about menu items. When customers say they have a food allergy, your staff should take it seriously and must be able to do the following:

Describe Dishes	Tell customers how the item is prepared
Identify Ingredients	Tell customers if the food they are allergic to is in the menu item
Suggest items	Suggest items that do not contain the food that the customer is allergic to.
Identify the allergen special order	Clearly mark or otherwise indicate the order for the guest with the identified food allergy.
Deliver food	Confirm the allergen special order with the kitchen staff when picking up the food. Food should be hand-delivered to guest with allergies. Delivering food separately will help prevent contact with food allergens.

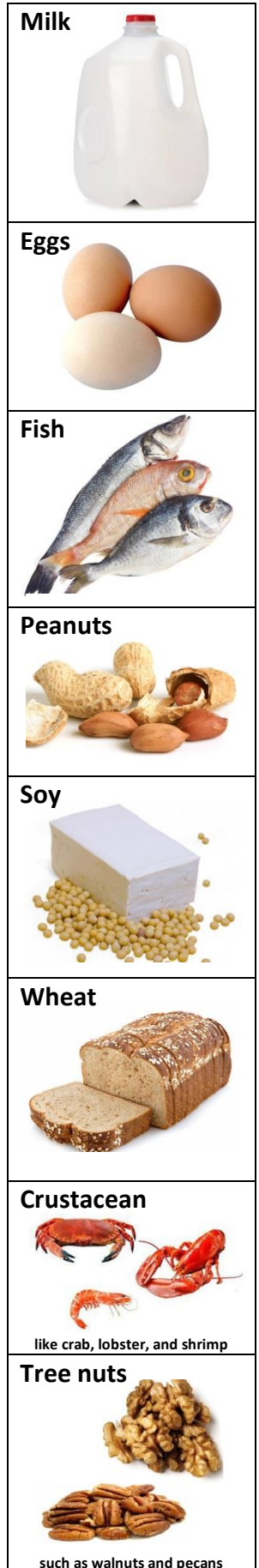
Kitchen Staff

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**. Here are examples of how it can happen:

- Cooking different types of food in the same fryer oil.
- Letting food touch surfaces, equipment, or utensils that have touched allergens.

How to avoid Cross-Contact

- Check recipes and ingredients labels to confirm that allergen is not present
- Wash, rinse, and sanitize cookware, utensils, and equipment before prepping food.
- Make sure the allergen does not touch anything for customers with food allergies
- Wash your hands and change gloves before prepping food
- Use separate fryers and cooking oils when frying food for customers with food allergies.
- Label food package on-site for retail sale. Name all major allergens.



Module 3: The Safe Food Handler

At every step in the flow of food, food handlers can contaminate food. They might not even realize it when they do it. Something as simple as touching the face while prepping a salad could make a customer sick. Even a food handler who appears to be healthy may spread foodborne pathogens. As a manager, you need to know the many ways food handlers can contaminate food.

Situations that can lead to contaminating food

Food handlers can contaminate food in any of the following situations:	Actions that can contaminate food
<ul style="list-style-type: none">• When they have a foodborne illness.• When they have wounds or boils that contain a pathogen.• When sneezing or coughing.• When they have contact with a person who is ill• When they use the restroom and do not wash their hands• When they have symptoms such as diarrhea, vomiting, or jaundice.	<p>To avoid causing a foodborne illness, pay close attention to what you do with your hands. Some actions to avoid:</p> <ul style="list-style-type: none">• Scratching the scalp• Running fingers through the air• Wiping or touching the nose• Rubbing an ear• Touching a pimple or an infected wound/boil• Wearing and touching dirty uniform• Coughing or sneezing into the hand• Spitting in the operation

Some people carry pathogens and infect others without ever getting sick themselves. These people are called **carriers**.

Managing a personal hygiene program

To keep food handlers from contaminating food, your operation needs a good personal hygiene program.

Some things to support a personal hygiene program include:

- Creating personal hygiene policies.
- Training food handlers on those policies and retraining them regularly.
- Modeling the correct behavior at all times (lead by example).
- Supervising food safety practices at all times.
- Revising personal hygiene policies when laws or science change.

Handwashing and hand care

Proper handwashing and hand care are critical to preventing the spread of pathogen.

Handwashing is the most important part of personal hygiene. And many food handlers do not wash their hands correctly or as often as they should. You must train your food handlers to wash their hands, and then you must monitor them.

Where to wash hands

Hands must be washed in a sink designated for handwashing. Monitor food handlers to make sure they do this. They should **NEVER** wash their hands in sinks designated for food prep or dishwashing or sinks used for discarding waste water.



When to wash Hands

Food handlers must wash their hands before preparing food or working with clean equipment and utensils. They must also wash their hands before putting on single-use gloves. Also after the following activities:

<ul style="list-style-type: none"> • Using the restroom. • Touching the body or clothing. • Coughing, sneezing, blowing nose, or using a handkerchief or tissue. • Eating, drinking, smoking, or chewing gun or tobacco. • Handling soiled items. • Handling war meat, seafood, or poultry. • Taking out garbage. 	<ul style="list-style-type: none"> • Handling service animals or aquatic animals. • Handling chemicals that might affect food safety. • Changing task (before beginning new task). • Leaving and returning to the kitchen/prep area. • Handling money. • Using electronic devices (like cellphones). • Touching anything else that may contaminate hands, such as dirty equipment, work surfaces, or cloths.
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Corrective Action

If you see food handlers who are not following proper handwashing procedures, correct the situation immediately. If they have touch food or food-contact surfaces with unclean hands:

Dispose of the contaminated food

Clean potentially contaminated equipment and utensils

Retrain o coach food handlers who are or following proper handwashing procedures if necessary.

Hand antiseptics

Hand antiseptics, also called hand sanitizers, are liquids or gels that are used to lower the number of pathogens on skin. If used, they must comply with the Code of Federal Regulations (CFR) and Food and Drug Administration (FDA) standards.

Only use hand antiseptics after handwashing. **NEVER** use them in place of it. Wait for a hand antiseptic to dry before you touch food or equipment.

Hand care

In addition to washing, hands need other care to prevent spreading pathogens.

Fingernail length	Keep fingernail short and clean. Long fingernails may be hard to keep clean and can rip gloves. They can also chip and become physical contaminates.
False fingernails	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 wear single-use gloves.
Nail polish	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.

Infected wounds or boils

Infected wounds, cuts and boils contain pus. They must be covered if they are open or draining to prevent pathogens from contaminating food and food-contact surfaces. How and infected wound o boil is cover depends on where it is located.

Located on the hand	Then cover it with an impermeable cover like a finger cot. Impermeable means that liquid cannot pass through the cover. Examples include bandages and finger cots. Place a single-use glove over the cover.
Located on the arm	Then cover it with an impermeable cover, such as a bandage. The wound must be completely covered.
Located on another part of the body	Then cover it with a dry, durable tight-fitting bandage.

Single-use gloves

Single-use gloves must be worn when handling ready-to-eat food. Wash hands before putting on gloves. Wear the right size glove. Avoid touching the gloves when you put them on. Change your gloves when they are dirty or torn; before starting a new task; after an interruption in your task; after handling raw meat, seafood, or poultry and before handling ready-to-eat food and after four hours of continuous use.

NEVER wash and reuse gloves.

NEVER roll gloves to make them easier to put on.

NEVER blow into gloves.

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

However, there may be exceptions. It may be acceptable to handle ready-to-eat food with bare hands in these situations:

- The food will be added as an ingredient to a dish that does not contain raw meat, seafood, or poultry, but will be cooked to at least 145F. For example, adding cheese to pizza dough.
- The food will be added as an ingredient to a dish containing raw meat, seafood, or poultry, and the dish will be cooked to the required minimum temperature of the raw items. For example, adding salt and pepper to raw duck breast.

<p>Personal Hygiene Practices Wearing dirty clothes or neglecting to shower probably will not go over well with your guests. But there are real food safety concerns, too. Keeping food safe means paying attention to personal hygiene. The entire staff needs to know the basics.</p>	<p>Personal Cleanliness Pathogens can be found on hair and skin. There is a greater risk of these pathogens being transferred to food and food equipment if the food handler does not follow a personal hygiene program. Make sure food handlers shower or bathe before work.</p>
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Work Attire

Food handlers in dirty clothes may carry pathogens that can cause foodborne illness. These pathogens can be transferred from the clothing to the hands and to the food being prepared. Set up a dress code, and make sure all staff follows it.

Eating, drinking, smoking, and chewing gum or tobacco

Small droplets of saliva can contain thousands of pathogens. In the process of eating, drinking, smoking, or chewing gum or tobacco, saliva can be transferred to hands or directly to food being handled.

To prevent this, employees should only eat, drink, smoke, and chew gum or tobacco in designated areas.

NEVER do these things when:

<ul style="list-style-type: none"> • Prepping or serving food • Working in pre areas • Working in areas used to clean utensils and equipment 	<p>Employees can drink from a covered container if they handle the container carefully to prevent contamination of their hands, the container, and exposed food, utensils, and equipment. A correctly covered container will include a lid with a straw, or a sip-lid top.</p>
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Work attire guidelines

<p>Hair restraints</p>	<p>Wear a clean hat or other hair restraint when in food-prep area. Do NOT wear hair accessories that could become physical contaminants. Do NOT wear false eyelashes. Food handler with facial hair should also wear a beard restraint.</p>
<p>Clean clothing</p>	<p>Wear clean clothing daily Change soiled uniforms, including apron, as needed to prevent contamination If possible, change into work clothes at work Store street clothing and personal belongings in designated areas. Keep dirty clothing that is store in the operation away from food and prep areas.</p>
<p>Aprons</p>	<p>Remove when leaving prep areas, for example before taking out garbage or using the restroom. NEVER wipe your hands on your apron.</p>
<p>Jewelry</p>	<p>Remove jewelry from hands and arms before prepping food or when working around prep areas. Food handlers cannot wear any of the following: rings, bracelets and watches.</p>

Policies for reporting health issues

Staff must report health problems to managements before working with food. Managers should also watch for staff illnesses. Food handlers must be excluded from work if they are vomiting or have diarrhea and have been diagnosed with a foodborne illness from certain pathogens, such as nontyphoidal Salmonella. Food handlers also must not come to work if they have symptoms that included diarrhea, vomiting of jaundice. Staff who has persistent sneezing, coughing, or a runny nose or a sore throat and a fever should not work with exposed food, utensils, or equipment.

How to handle medical conditions

If	Then
The food handler has an infected wound or boil that is not properly covered.	Restrict the food handler from working with exposed food, utensils, and equipment
The food handler has a sore throat with a fever	Restrict the food handler from working with exposed food, utensils, and equipment Exclude the food handler from the operation if you primarily serve a high-risk population
The food handler has persistent sneezing, coughing, or a runny nose that causes discharges from the eyes, nose or, mouth	Restrict the food handler from working with exposed food, utensils, and equipment
The food handler has at least one of these symptoms from an infectious condition: <ul style="list-style-type: none"> • Vomiting • Diarrhea • Jaundice 	<p>Exclude the food handler from the operation</p> <p>Vomiting and diarrhea Food handlers must meet one of these requirements before they can return to work:</p> <ul style="list-style-type: none"> • Have had no symptoms for at least 24 hours • Have a written release from a medical practitioner <p>Jaundice Food handlers with jaundice must be reported to the regulatory authority. Food handlers who have had jaundice for seven days or less must be excluded from the operation.</p> <p>Food handlers must have a written release from a medical practitioner and approval from the regulatory authority before returning to work.</p>
The food handler is vomiting or has diarrhea and has been diagnosed with an illness caused by one of these pathogens: <ul style="list-style-type: none"> • Norovirus • Shigella spp • Nontyphoidal Salmonella • Shiga toxin-producing E. coli (STEC) • Hepatitis A • Salmonella Thyphi 	<p>Exclude the food handler from the operation</p> <p>Report the situation to the regulatory authority.</p> <p>Some food handlers diagnosed with an illness may not experience symptoms, or their symptoms may have ended. Work with the medical practitioner and the local regulatory authority to determine whether the food handlers must be excluded from the operation or restricted from working with exposed food, utensils, and equipment. The medical practitioner and regulatory authority will also determine when the employees can safely return to the operation and/or carry out their regular food handling duties.</p>

Module 4: The Flow of Food: An Introduction

- To prevent **cross contamination**, use separate equipment, such as colored cutting boards and utensil handles, for each type of food. Clean and sanitize all work surfaces, equipment, and utensils after each task.
- To prevent **cross contamination**, 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), or buy prepared food that don't require much prepping or handling.
- **Holding** food in the range of 41°F to 135°F (5°C to 57°C) results in **time-temperature abuse**. Food is also **time-temperature abused** whenever it is **cooked** to the wrong **internal temperature** and **cooled** or **reheated** incorrectly.
- To avoid **time-temperature abuse**: monitor **time and temperature**; make sure the correct kinds of thermometers are available; regularly record temperatures and the times they are taken; minimize the time that food spends in the **temperature danger zone**; and take **corrective actions** if **time-temperature standards** are not met.

Monitoring Time and Temperature:

Bimetallic Stemmed Thermometer: scaled to measure temps from 0°F – 220°F; sensing area to +/- 2°F.

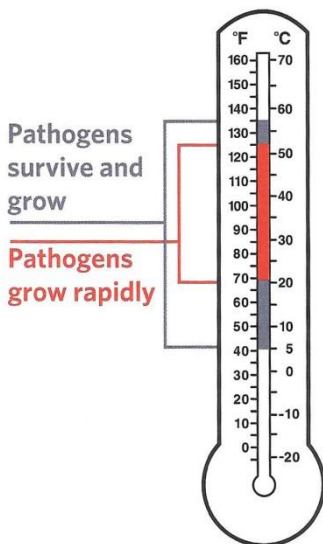
Thermocouples and Thermistors: have a sensing area on the tip of their probe. This means you don't have to insert them into the food as far as a bimetallic stemmed thermometer to get a correct reading. They come with different types of probes. For example:

- **Immersion probe** – used to check liquids (sauces); **surface probe** – check flat cooking equipment; **penetration probe** – check **internal temperature** of thin food, such as hamburger patties or fish fillets; **air probe** – check temperature inside refrigerators and ovens.

- **Infrared**: measures the surface of food and equipment but cannot measure **air temperature** or the **internal temperature** of food. Hold as close to the food or equipment as possible, and remove anything between the thermometer and the food, food package, or equipment.

- **Time-Temperature Indicator (TTI)**: these are attached to packaging by the supplier. A color appears in the window if the food has been time-temperature abused during shipment or storage.

- **Maximum Registering Tape**: indicates the highest temperature reached during use. Tape is used where temperature readings cannot be continuously observed, such as the final rinse temperature in dishwashing machines.



- When using thermometers: wash, rinse, sanitize, and air-dry them before and after use; calibrate (adjust) them before each shift and when they fall onto the floor 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.

- To calibrate a **bi-metallic stemmed thermometer** using **the ice point method**: 1) fill a glass with ice and water; 2) insert the thermometer into the water; 3) the temperature must read 32°F when steady; if it doesn't, then 4) adjust the probe from the nut until it reads 32°F. Then it is properly calibrated.

- When using thermometers: insert the thermometer stem or probe into the thickest part of the product (usually the center); take more than one reading in different spots; and wait for the thermometer reading to steady before recording the temperature.

Food Danger zone: **41°F to 135°F**
Pathogens rapid grow: **70°F to 125°F**

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

- An approved, reputable supplier is one that has been inspected, meets all applicable local, state, and federal laws, and has documentation of a Good Manufacturing Practice (GMP) and/or a Good Agriculture Practice (GAP) program.
- Arrange deliveries so they arrive when staff has enough time to do inspections and they can be correctly received.
- **Receiving principles:** make specific staff responsible for **receiving** (train them to follow food safety guidelines and provide them with the right tools – purchase orders, thermometers, scales, etc.); have enough trained staff available to **receive** food promptly (inspect delivery trucks for signs of contamination and visually check food items and check temperatures); and **store items promptly after receiving**.
- In **key drop deliveries:** the supplier is given after-hour access to the operation to make deliveries. Deliveries must meet the following criteria: must be inspected upon arrival at the operation; must be from an **approved source**; must have been placed in the correct storage location to maintain the required temperature; must have been protected from contamination in storage; is NOT contaminated; and, must be honestly presented.
- To **reject 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; and log the incident on the invoice or receiving document.
- For **food items recalled by the manufacturer:** identify the recalled food items; remove the item from inventory, and place it in a secure and appropriate location (such as a cooler or dry storage); 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; and refer to the vendor's notification or recall notice to determine what to do with the item.
- To check the temperature of **Reduced Oxygen Packaging (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; avoid puncturing the package. ^ROP = **Reduced-Oxygen Packaging**; *MAP = **Modified Atmosphere Packaging** (oxygen is replaced with other gases); and **sous vide food is vacuum sealed and cooked in a water bath.
- To **check the temperature of other packaged food:** open the package and insert the thermometer stem or probe into the food (stem/probe must not touch package).
- **Temperature criteria for deliveries:** reject frozen food if there is evidence of **thawing** and **refreezing (time-temperature abuse)**; fluids or water stains in case bottoms or on packaging; and ice crystals or frozen liquids on the food or packaging.
- **Reject food and nonfood 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; and evidence of tampering.

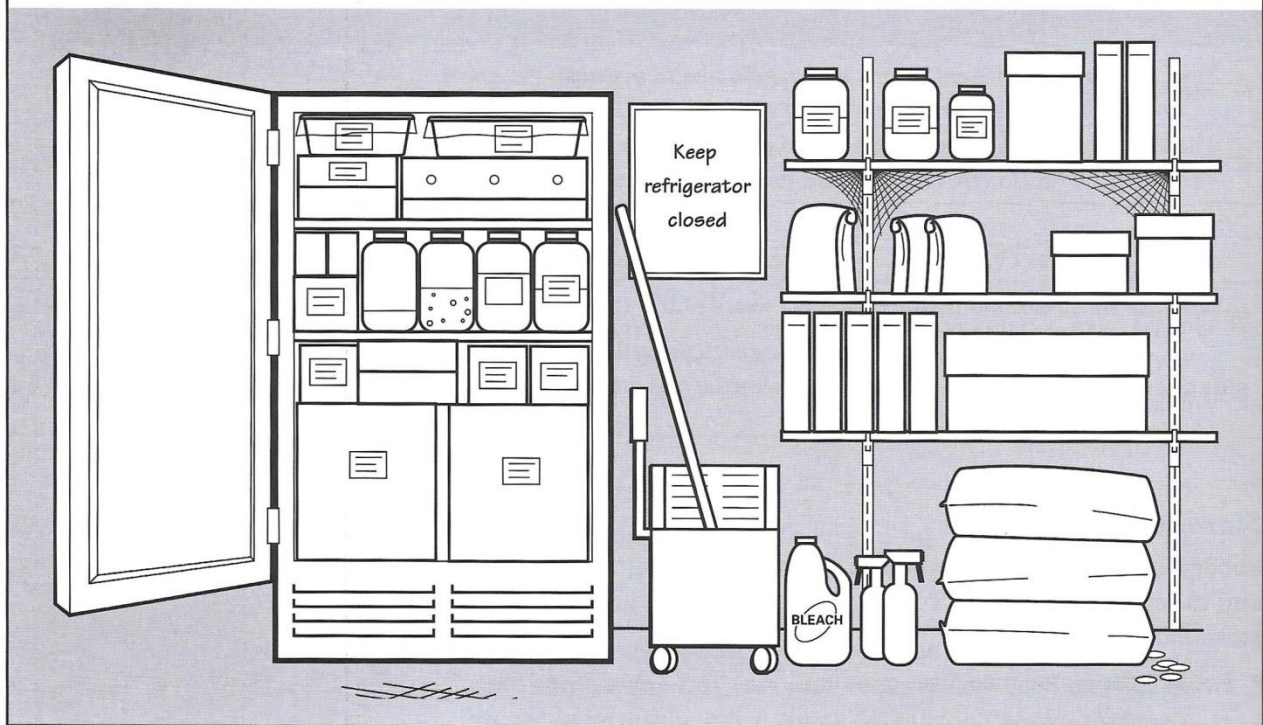


- Required documents: shellfish must be received with shellstock identification tags (tags indicate when and where the shellfish were harvested, and must be kept on file for **90 days** from the date the last shellfish was used from its delivery container).
- Required documents: for fish that will be 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 to consumer. 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 to consumer.
- To assess food quality for **time-temperature abuse**: check its appearance (reject food that is moldy or has an abnormal color); check its texture (reject meat, fish, or poultry if it is slimy, sticky, or dry, or if it has soft flesh that leaves an imprint when touched); and check for odor (reject food with an abnormal or unpleasant odor).
- Labeling food for use on-site: it is not necessary to label food if it clearly will not be mistaken for another item (ex: dry pasta); all other 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.
- Labeling food packaged on-site for retail sale: use the common name of the food or a statement clearly identifying it; label with quantity of the food; if the item contains two or more ingredients, list the ingredients in descending order by weight; list the artificial colors and flavors in the food including chemical preservatives; list name and place of business of the manufacturer, packer, or distributor; and list source of each major food allergen contained in the food.
- Date marking: **ready-to-eat TCS food** must be marked if held longer than 24 hours. The date mark must indicate when the food must be sold, eaten, or thrown out.
- In date marking, **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. Some operations write the day or date the food was prepared on the label; others write the use-by date or date on the label.
- In date marking, if a commercially processed food has a use-by date that is less than seven days from the date the container was opened, the container should be marked with this use-by date, as long as the date is based on food safety.
- In date marking, 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.
- Temperatures for food storage: 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; and place the device in the warmest part of refrigerated units, and the coldest part of hot-holding units.
- Temperatures for food storage: do **NOT** overload coolers or freezers (it prevents airflow and makes unit work harder; also, frequent opening of the cooler lets warm air inside, which can affect food safety); use open shelving (lined shelving restricts circulation); and monitor food temperatures regularly (randomly sample food temperatures).

- **First In, First Out (FIFO):** method of stock rotation in which products are shelved based on their use-by or expiration dates, so oldest products are used first. Throw out food that has passed its manufacturer's use-by or expiration date.
- **Preventing cross-contamination:** Store all items in designated storage areas: store items away from walls and at least six inches (15 centimeters) off the floor; also store **single-use items** (e.g., sleeve of **single-use** cups, **single-use** gloves) in original packaging; store food in durable 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; and **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; clean floors, walls, and shelving in coolers, freezers, dry-storage areas, and heated holding cabinets on a regular basis; 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 and store raw meat, poultry, and seafood separately from **ready-to-eat food**. If this is not possible, store **ready-to-eat food** above raw seafood, meat and poultry (this will prevent juices from raw food from dripping onto **ready-to-eat food**); store food items in the following **top-to-bottom order: ready-to-eat food**, seafood, whole cuts of beef and pork, ground meat and ground fish, and whole and grounded 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, restroom or garbage rooms, mechanical rooms, under unshielded sewer lines or leaking water lines, and under stairwells.

Apply Your Knowledge

What's Wrong with This Picture? Find and circle the unsafe storage practices in this picture.



Here are the unsafe storage practices:	
- Spilled food not cleaned up	- Boxes of food not label
- Food stored on the floor	- Food stored with food
- Chemicals stored with food	- Cooler door open
- Overstocked cooler	- Area not clean
- Unlabeled items in cooler	

Chapter 6: The Flow of Food: Preparation

- 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.
- 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.
- Do NOT use the following to misrepresent the appearance of food: food additives or color additive, colored overwraps, lights. Food not represented honestly must be thrown out.
- Food must be thrown out: when it is handled by staff who have been **restricted** or **excluded** from the **food 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.

Four methods for thawing food:

1. - Thaw food in a cooler, keeping its temperature at 41°F or lower
2. - Submerge food under running water at 70°F or lower. **NEVER** let the temperature of the food go above 41°F 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

Produce:

- Make sure produce does not touch surfaces exposed to raw meat, seafood, or poultry. Wash it thoroughly under running water before cutting, cooking, or combining with other ingredients.
- Produce can be washed in water containing ozone to sanitize it but check with your local regulatory authority.
- When soaking or storing produce in standing water or an ice-water slurry, do not mix different items or 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 sprout if primarily serving a high-risk population.
 - 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. When cooking eggs for high-risk populations use pasteurized shell eggs if eggs will be pooled and 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).
 - For salads containing TCS food, make sure that the leftover TCS ingredients (i.e., pasta, chicken, potatoes, etc.) have been handled safely by ensuring that they were cooked, held, and cooled correctly. Store for less than seven days at 41°F or lower.
 - **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, raw meat, seafood, or poultry.

A **Food Service Operation** needs to obtain a **variance** if it **prepares** food in any of 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)

Cooking Requirements for Specific Types of Food:

- **Cook to 165°F for 15 seconds:** all poultry, whole or ground (i.e., chicken, turkey, or duck); stuffing made with fish and/or other meats; stuffed meats with seafood, poultry, and/or pasta; dishes that include previously cooked TCS ingredients.
- **Cook to 155°F for 15 seconds:** ground meats; beef, pork, and other meats; injected meat including brined ham and flavor-injected roasts; mechanically tenderized meat; ratites including ostrich and emu; ground seafood including chopped or minced seafood. For eggs that will be **hot held** for service: **Hold at 155°F (68°C) for 15 seconds.**
- **Cook to 145°F for 15 seconds:** seafood, including shellfish, fish and crustaceans; steaks and chops of pork, beef, veal, and lamb; and commercially raised game. For eggs that will be served immediately: **serve at 145°F for 15 seconds.**
- Roasts of pork, beef, veal, and lamb: cook to **145°F for 4 minutes.**
- Fruits, vegetables, grains (rice, pasta), and legumes (beans, refried beans) that will be **hot-held** for service: **135°F.** (No minimum time)



Steaks, roasts 145 °F	Fish 145 °F	Pork 145 °F	Ground beef 155 °F	Egg dishes 160 °F	Chicken breasts 165 °F	Whole poultry 165 °F
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Cooking TCS Food in a Microwave: meat, seafood, poultry, and eggs: **cook to 165°F**

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 evenly.

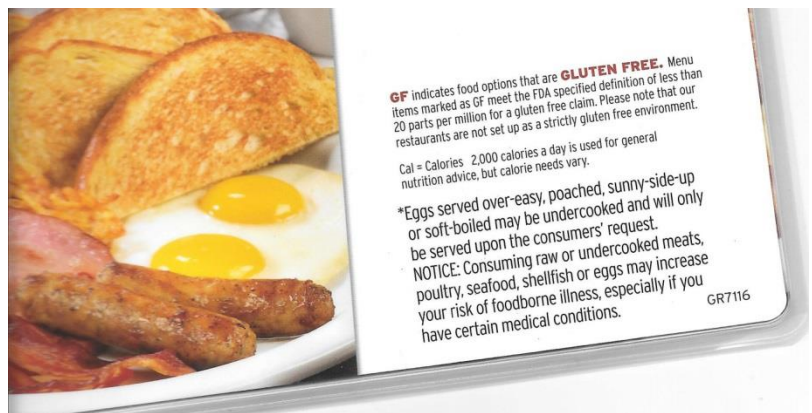
Partial Cooking During Preparation

If partially cooking meat, seafood, poultry, or eggs (or dishes containing any of these items):

- 1) **NEVER** cook the food for longer than 60 minutes during the initial **cooking cycle**.
- 2) **Cool** the food immediately after the initial cooking cycle
- 3) **Freeze** or **refrigerate** the food after **cooling** it properly
- 4) **Reheat** the food to at least 165°F (74°C) for 15 seconds before serving it; or
- 5) **Cool** the food properly if it will NOT be **served** immediately, or **held** for service.

Consumer Advisories

If a **food service operation** menu includes raw or undercooked TCS items, it must: note it on the menu next to the items; asterisk the items; 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; and 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, and eggs.**



Cooling Food

- **Step 1:** Cool food from 135°F to 70°F (57°C to 21°C) in less than two hours; **Step 2:** use the remaining time to cool it from 41°F or lower, for a total **cooling** cycle which 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**; stir it with an ice paddle; or place it in a blast chiller. ▪ When **storing** food for further **cooling**, loosely cover the food containers before **storing** them in a cooler. 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 “**prepared in-house**” for immediate service may be consumed at, or **reheated** to *any temperature* if it was **cooked** and **cooled** correctly. ▪ Food “**prepared in-house**” to be **hot-held** must be **reheated** within two hours to an **internal temperature** of **165°F for 15 seconds**. Then it must be **held** at **135°F**. ▪ **Ready to Eat (RTE)** food commercially processed and packaged must be reheated to an **internal temperature** of at least **135°F**.

Chapter 7: The Flow of Food: Service

Guidelines for Holding Food

Food covers and sneeze guards protect food from contaminants. Covers protect food from contamination and help maintain food temperatures.

Hold TCS food at the correct internal temperature.

- Hold hot food at 135°F or higher.
- Hold cold food at 41°F or lower.
- Throw out/discard food that is not 41°F or lower or 135°F or higher

Check food temperatures **every two hours** to leave time for **corrective action**. At a minimum, check temperatures at least **every four hours**.

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**.

Holding Food without Temperature Control

Your operation may want to display or hold TCS food without temperature control. However, if you primarily serve a high-risk population, you **cannot** hold TCS food without temperature control.

- Cold food can be held without temperature control for up to six hours if: it was held at 41°F or lower before removing it from refrigeration; it does not exceed 70°F during **service** (throw out food that exceeds this temperature: 70°F; it has a label specifying the time it was removed from **refrigeration** and the time it must be thrown out – the total time is within six hours; 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 or higher before removing it from temperature control; it has a label specifying the time it was removed from hot-holding and the time it must be thrown out – the total time is within four hours; it is sold, served, or thrown out within four hours.

Prevent contamination when serving food:

Wear single-use gloves whenever handling ready-to-eat food. As an alternative to single-use gloves, use spatulas, tongs, deli sheets, or other utensils when serving food; use clean and sanitized utensils for serving food; use separate utensils for each food; clean and sanitize the utensils after each task; at a minimum, clean and sanitize them at least once **every four hours**. Store serving utensils correctly between uses on a clean and sanitized **food-contact surface** or in the food with the handle extended above the container rim. Or if you are serving a non-TCS food item, you can place them on a clean and sanitized food contact surface. Spoons or scoops used to serve food such as ice cream or mash potatoes can be stored under running water. They can also be stored under running water that is maintained at a temperature of at least 135°F.

Service Staff Guidelines

Service staff must be as careful as kitchen staff. They can contaminate food simply by handling the food-contact areas of glasses, dishes, and utensils. Service staff should use these guidelines when serving food.

	
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Carry glasses in a rack or on a tray to avoid touching the food-contact surfaces. • Do NOT stack glasses when carrying them.
	
<ul style="list-style-type: none"> • Hold flatware by the handle. • Do NOT hold flatware by food-contact surfaces. 	<ul style="list-style-type: none"> • Avoid bare-hand contact with food that is ready to eat.
	
<ul style="list-style-type: none"> • Use ice scoops or tongs to get ice. • NEVER scoop ice with your bare hands or a glass. A glass may chip or break. 	

Present Tableware

If your operation presets tableware on dining table, prevent the tableware from being contaminated by wrapping or covering the items (i.e., in a napkin, etc.). Table settings do not need to be wrapped or covered if the extra settings are removed when guests are seated; are cleaned and sanitized after guests have left.

Re-Serving Food

NEVER re-serve food returned by one customer to another customer (i.e., uncovered condiments, uneaten bread, salsas, chips, or plate garnishes). Generally, unopened prepackaged food in good sanitary condition **can be re-served** (i.e., condiment packets, wrapped crackers or individually wrapped breadsticks).

Self-Service Areas

Prevent **time-temperature abuse** and contamination by using sneeze guards, 14-inches above the food counter and 7 inches beyond the food. **Identify all food items by labeling the food** (i.e., placing salad dressing names on the ladle handles).

To prevent **time-temperature abuse** and/or **cross-contamination** keep hot food at 135°F or higher, and cold food at 41°F or lower; keep raw meat, fish, and poultry separate from **ready-to-eat** food; do **NOT** let customers refill dirty plates or use dirty utensils at **self-service areas**.

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 food 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.

Chapter 8: Food Safety Management Systems

Food safety management systems are a group of practices and procedures intended to prevent foodborne illness. They control the risks and hazards that may be present throughout the **Flow of Food** in a **food service operation**.

The foundation of a **food safety management system** is:

- 1) **Good personal hygiene practices**;
- 2) **Food Safety Training Program**;
- 3) **Supplier Selection and Specification Program**;
- 4) **Quality Control and Assurance Program**;
- 5) **Cleaning and Sanitation Program**;
- 6) **Standard Operating Procedures (SOP)**;
- 7) **Facility Design and Equipment Maintenance Program**; and
- 8) **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.

To achieve **active managerial control** in the **food service operation** use:

- A) Training Programs;
- B) Managerial Supervision;
- C) Incorporation of a Standard Operating Procedure (SOP);
- D) Hazard Analysis and Critical Control Point (HACCP) plan.

These are critical to the success of **active managerial control**: monitoring critical activities in the **food service operation**; taking the necessary **corrective action** when required; verifying that the actions taken control the **risk 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**.

The **HACCP** approach is based on identifying significant biological, chemical, or physical hazards at specific points within a **product's flow through an operation**. Once identified, those 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 the variables within each facility's: a) menu, b) customers, c) equipment, d) processes, and e) operations. A plan that works for one food service operation may not work for another due to those variables.

The seven 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 (wild) animals
- Packaging food using the **Reduced Oxygen Packaging (ROP)** (including: MAP, vacuum packed, and Sous vide) methods
- Treating (e.g., pasteurized) juice on-site and packaging it for later sale
- Sprouting seeds or beans

Chapter 9: Safe Facilities and Pest Management

Interior requirements for a safe operation

- Floors, walls and ceilings must be smooth and durable for easier cleaning and 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 six inches off the floor or sealed to a masonry base.

Tabletop equipment should be four inches off the floor or sealed to the countertop.

Once the **foodservice 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 and check the **foodservice equipment** regularly to make sure it is working correctly.

Dishwashing equipment must be installed so it is reachable and conveniently located; in such a way that keeps utensils, equipment, and other **food-contact surfaces** from becoming contaminated; following the manufacturer's instructions.

When selecting **dishwashing equipment**, make sure that 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; and that information about the correct settings is posted on the machine.

Handwashing stations must be conveniently located.

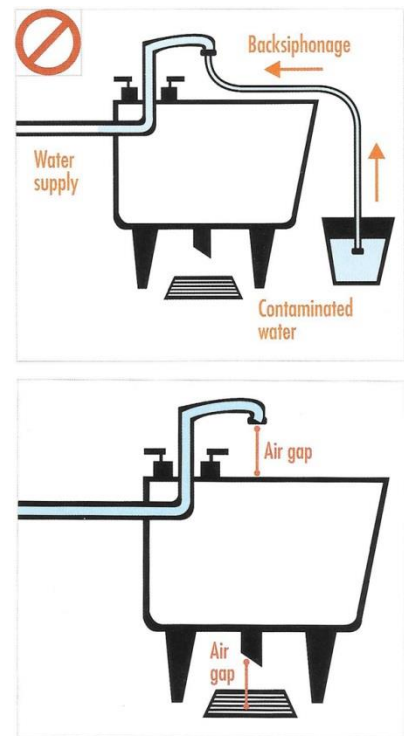
They are required in: restrooms, food-prep areas, service areas, and in the dishwashing area.

Handwashing sinks must be used *only for handwashing*.

Handwashing stations must have: **Hot and cold running water**, soap, a sanitary way to dry hands, a garbage container, and signage (i.e. **"All employees must wash hands before returning to work"**).

Water and Plumbing

- Some acceptable sources of drinkable water are: approved public water mains; regularly tested and maintained private sources; closed, portable water containers; and water transport vehicles.
- **Cross-connection** is the physical contact point or link where contaminated water meets the potable water supply. The physical link is dangerous because it increases the opportunity of **back-flow**, or the unwanted reverse flow of contaminants, such as those from drains, sewers, or other sources of wastewater into the establishment's potable water system. *It occurs when the pressure in the potable water supply drops below the pressure of the contaminated supply.*
- Regarding backflow prevention, an **air gap** is the air space that is needed to maintain the separation of a water supply outlet from any potentially contaminated water source. An **air gap** prevents **Back-flow**.



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 any burned-out bulbs with the correct size light bulbs.

Ventilation systems must be cleaned and maintained to prevent **grease and condensation build-up** on walls and ceilings.

Garbage

Garbage should be removed from **prep areas** as quickly as possible. Clean the inside and the outside of garbage containers frequently. Indoor garbage containers must be leak-proof, waterproof, and pest-resistant; easy to clean and covered when not in use. Outdoor garbage containers must be placed on a smooth, durable, nonabsorbent surface, and have tight-fitting lids for optimal maintenance.

Emergencies that affect the facility

Certain crisis can affect the safety of the food you serve. Some of the common include electrical power outages, fire, flooding, and sewage backups. These are considered by the local regulatory authority to be imminent health hazards. An imminent health hazard is a significant threat or danger to health that requires immediate correction or closure to prevent injury.

Other threats should be considered:

- **Temperature control:** Power failures and refrigeration breakdowns can threaten your ability to control temperature of TCS food. This can result in the growth of pathogens.

- **Physical security:** Unauthorized people inside a facility are risk to food safety.

- **Drinkable water supply:** Broken water main and breakdowns at water at water treatment facilities are a risk to the safety of food.

When faced with any of these crises, you must first determine if there is a significant risk to the safety or security of your food. If the risk is significant, service must be stopped. Then the local regulatory authority must be notified.

Pest Management

Three rules of pest prevention:

- 1) Deny pests access to the operation;
- 2) Deny pests food, water, and shelter; and
- 3) Work with a licensed **pest control operator (PCO)**.
 - To keep pests from entering with food deliveries, check them before they enter the **food service operation**. Refuse shipments if pests or signs of pests (egg cases, body parts) are found. Make sure all of the points where pests can access the building are secure: screen windows and vents, seal cracks in floors and walls and around pipes. Install **air curtains** (also called **air doors** or **fly fans**) above or alongside doors.
 - To deny pests shelter (outside): throw out garbage quickly and correctly; keep garbage containers clean and in good condition; keep outdoor garbage containers tightly covered. Clean up spills around garbage containers immediately; store recyclables correctly. Keep recyclables in clean, pest-proof containers, and then keep the garbage containers as far away from the building as regulations allow.
 - To deny pests shelter (inside): store food and supplies quickly and correctly; keep them away from walls and at least six inches (15 centimeters) off the floor; rotate products **First in First out (FIFO)** so pests cannot settle and breed; clean the food service operation thoroughly; clean up food and beverage spills immediately; clean break rooms after use; keep cleaning tools and supplies clean and dry.

Chapter 10: Cleaning and Sanitizing

Cleaners must be stable, noncorrosive and safe to use.

When using them: follow the 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 (the water must be at least 171F and immerse the item for 30 seconds); or Chemicals (**Chlorine, Iodine, or Quaternary Ammonia (Quats)**).

Chemical sanitizing: **food-contact surfaces** can be **sanitized** by soaking them in a **sanitizing solution** or rinsing, swabbing, or spraying them with a **sanitizing solution**. In some cases a **detergent-sanitizer blend** can be used (use it once to **clean** and 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, toxic, and may 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; or with the **concentration** is too low.

Follow manufacturer's recommendations for the correct temperature.

The **sanitizer** must make contact with the object for a specific amount of time. Minimum times differ for each sanitizer.

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.

General Guidelines for the Effective Use of Chlorine, Iodine, and Quats

	Chlorine		Iodine	Quats
Water temperature	≥ 100°F	≥ 75°F	68°F	75°F
Water pH	≤ 10	≤ 8	≤ 5 or as per manufacturer's recommendation	As per manufacturer's recommendation
Water hardness	As per manufacturer's recommendation		As per manufacturer's recommendation	≤ 500 ppm or as per manufacturer's recommendation
Sanitizer concentration	50-99 ppm	50-99 ppm	12.5-25 ppm	As per manufacturer's recommendation
Sanitizer contact time	≥ 7 seconds	≥ 7 seconds	≥ 30 seconds	≥ 30 seconds

Steps for cleaning and sanitizing surfaces are: scrape or remove food bits, wash, rinse, sanitize, and air dry.

All food contact surfaces need to be **cleaned and sanitized** at these times:

- After they are used
- Before foodhandlers start working with different type of food
- Any time an interruption takes place during a task and the items being used may become contaminated
- After four hours of continual use

When 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.

High temperature dishwashing machines have a **sanitizing** temperature of 180°F in the final rinse cycle.

Chemical-sanitizing machines clean and sanitize items at a much lower temperature (120°F) than other **dishwashing machine**.

Dishwashing 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.

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**.

Steps for **cleaning and sanitizing** in a **three compartment sink**: rinse, scrape, or soak items before washing them; wash items in the first sink; rinse items in the second sink; sanitize items in the third sink; air-dry items on a **clean and sanitized** surface.

When storing clean and sanitized tableware and equipment; **store** them at least six inches (15 centimeters) 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 handle up; cover the **food-contact surfaces** of **stationary equipment** until ready for use; and **clean and sanitize** trays and carts used to carry clean tableware and utensils.

Clean nonfood-contact surfaces regularly (includes floors, ceilings, walls, equipment exteriors, etc.): Prevent dust, dirt, food residue and other debris from building up.

Develop a plan for cleaning up diarrhea and vomit in the operation. It can carry Norovirus, which is highly contagious. Correct cleanup can prevent food from becoming contaminated and others from getting sick. Consider the following when developing a plan for cleaning up of 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 out food that may have been contaminated; what equipment 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; 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; and, how the cleaning plan will be implemented.

Store cleaning tools and chemicals in a separate area away from food and prep areas.

NEVER dump mop water or other liquid waste into toilets or urinals; **NEVER** clean tools in sinks used for handwashing, food prep, dish washing.

The **Occupational Safety and Health Administration (OSHA)** has requirements for using chemicals in **foodservice operations**. **OSHA** requires chemical manufacturers and suppliers to provide **Material Safety Data Sheets (MSDS)** for every hazardous chemical they sell. The sheets contain information about the chemical; safe use and handling; physical, health, fire, and reactivity hazards; precautions; protective equipment to wear; manufacturer's name, address, and phone number; preparation date of MSDS; and hazardous ingredients and identity information. MSDS are usually sent with chemicals delivered. MSDS must be kept visible and available to employees of the operation at all times.

Foodservice 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.

Cleaning Program

To develop an effective **cleaning program**, create a **master cleaning schedule**; train your staff to follow it; and 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; and *how* it should be cleaned.

When monitoring the **cleaning program**: supervise the daily cleaning routines; check the cleaning tasks against the **master schedule** every day; change the **master schedule** as needed; and ask the staff for input on the program.

When developing a **cleaning program for a food operation**, training employees to follow the program is the key to its success.