To promote food safety through good personal hygiene and keeping a clean and sanitary environment
To explain how to prevent food borne illness
Introduce the Hazard Analysis and Critical Control Point (HACCP)

Note: This is a continuation of Serving it Safe: Part I
In this chapter, you will find answers to the following questions:

How can food safety be promoted through personal hygiene and work attire?
- Know why personal hygiene and work attire are important
- Use guidelines for good personal hygiene
- Dress for food safety success
- Use common sense as a guide when working with food

How can a food-safe facility be operated?
- Know the characteristics of a food-safe facility
- Maintain clean floors, walls, and ceilings
- Maintain a clean and sanitary service line and serving stations
- Maintain good ventilation
- Maintain clean employee restrooms
- Maintain clean and neat trash collection areas
- Maintain an effective pest control program

How should small-ware be cleaned and sanitized?
- Select from two methods of sanitizing
- Sanitize small-ware in a three-compartment sink
- Sanitize small-ware in a mechanical dishwasher

How should large equipment be cleaned and sanitized?
- Use the chemical method to sanitize equipment
- Follow the steps to sanitize in-place equipment

Who is responsible for food safety?
- Manager’s responsibilities
- Employees’ responsibilities

Summary
Every person who works in the foodservice facility is responsible for having good personal hygiene and clean work attire. This is important for the manager, cook, servers, dishwashers, and cashiers. Full-time and part-time employees are equally responsible for food safety. In fact, food safety begins with each person.

**Know why personal hygiene and work attire are important**

Bacteria are present on and in human bodies: hands, hair, throat, and intestines. They are also on clothing and on common items that are handled regularly, such as money, pens, and pencils. The simple act of patting one’s hair or rubbing one’s ear can contaminate hands with *staphylococci* bacteria and, if not washed, hands can contaminate a food and cause foodborne illness. Anyone can contaminate food with a harmful microorganism and not even know it! The personal hygiene, attire, and general health habits of foodservice employees play a crucial role in keeping harmful microorganisms away from the food.

A food service employee can contaminate food by hands
- After touching anything that could contaminate hands
- By being sick with a stomach or intestinal “bug” that includes vomiting and/or diarrhea or other symptoms
- After caring for a person with a stomach or intestinal “bug”
- By having an infected burn, wound, or other injury, and not covering it properly
- When taking prescribed or over-the-counter medicines (the medicine can get into the food or on hands)

A person who feels completely healthy may be the host of a harmful microorganism and not know it. Some foodborne illnesses do not cause symptoms until the most infectious stage has passed (Hepatitis A), and some harmful organisms remain in a person’s body after the symptoms have disappeared (*Salmonella* bacteria).
Use guidelines for good personal hygiene
Food handlers must have the highest standards of personal hygiene because they have the potential of making many people sick when their standards are lowered.

- Wash hands properly, frequently, and at appropriate times
- Keep fingernails trimmed, filed, and maintained so the edges and surfaces are cleanable and not rough. Best practice is not to wear fingernail polish or artificial fingernails
- Keep hair and body clean; bath every day
- Wash hands before putting on single-use gloves and change gloves frequently
- Avoid bare-hand contact with ready-to-eat food
- Maintain good health
- Treat and bandage wounds and sores. When hands are bandaged, single-use gloves should be worn at all times to protect the bandage and keep it from falling into food
- When feeling ill, alert the foodservice manager and avoid working with food

Did you know?
Washing hands correctly and frequently is one of the most important ways that foodservice employees can promote food safety.

Dress for food safety success
An important part of good personal hygiene is clean and appropriate dress. Every foodservice employee should wear a uniform made of a material that can withstand hot water during laundering.

It is important to

- Wear a clean, appropriate uniform every day. Change uniforms as often as necessary to prevent bacteria on soiled clothing from spreading to the hands and then to food
- Wear a clean apron when preparing food and take it off when leaving the food preparation area. An apron should be removed to go on break, eat lunch, smoke, or use the restroom
- Change an apron if it becomes soiled
- Avoid wearing jewelry other than a plain ring, such as a wedding band, when preparing or serving food. For the use of medical information jewelry follow the recommendations from the State or local public health department.
- Wear a hair restraint to keep hair and particles in the hair from falling into food
- Wear comfortable, low-heeled, close-toe shoes with soles that prevent slipping
Use common sense as a guide when working with food
Guidelines for foodservice employees working with or near food

- Know when and how to wash hands; avoid using a food preparation sink or a three-compartment sink to wash hands
- Taste food the correct way. Place a small amount of food from the food container into a small bowl, step away from the food container, and taste the food with a teaspoon. Remove the used bowl and teaspoon to the dish room. Never reuse a bowl or spoon already used for tasting. Wash hands immediately after tasting.
- Never taste a food that includes a raw ingredient of animal origin. For example, never taste cookie dough that includes raw eggs.
- Follow the foodservice rules for when to eat, smoke, and chew gum. Do not eat, smoke, chew gum, or use tobacco when preparing foods.
- When feeling ill, alert the foodservice manager and avoid working with food.
- Do not work with food when experiencing nausea, vomiting, diarrhea, fever, a sore throat, or jaundice (yellow skin and eyes), or after caring for someone at home with those symptoms.
- Do not work with food after being diagnosed with a foodborne illness.

The manager should not allow foodservice employees to work with or around food if they have any of the following symptoms: fever; diarrhea; vomiting; sore throat; jaundice (yellow skin and eyes); and persistent sneezing, coughing, or runny nose. The Food Code explains that the foodservice manager must exclude from the establishment any food employee who has been diagnosed with illness due to Salmonella Typhi, Shigella spp., Shiga toxin-producing E. coil, or Hepatitis A virus, and must notify the local regulatory agency.
How can a food-safe facility be operated?

A food-safe foodservice begins with a facility that is clean and in good repair. The entire facility (including both work areas and equipment) should be designed for easy cleaning and maintenance.

It is important to eliminate hard-to-clean work areas as well as faulty or overloaded refrigerators or other equipment. Also, get rid of dirty surroundings and any conditions that will attract bugs or other pests. Remember, the easier the workplace is to clean, the more likely it will stay that way.

Know the Characteristics of a Food-safe Facility

- It is designed for easy cleaning and maintenance. The workflow prevents clean and soiled items from crossing paths during food production and service.
- The floors, walls, and ceilings are free of dirt, litter, and moisture.
- The service line and serving stations are clean and neat.
- The exhaust fans and hoods are clean and operating properly.
- All types of storage areas (the dry storage room, the refrigerators, and the freezers) are in excellent condition. There is NO damage or spoilage, NO broken or torn packages, and NO bulging or leaking cans. Floors are clean, dry, and uncluttered.
- Cleaning supplies and chemicals are stored AWAY from food supply areas. Measuring utensils used for chemicals are stored with the chemical and are never used with or near food.
- Restrooms are convenient, clean, adequately stocked with soap and paper towels, and have warm running water.
- Garbage is kept away from food preparation areas.
- Garbage containers are leak-proof, waterproof and pest-proof, durable, easy to clean and sanitize, and have tight-fitting lids.
- Spills are cleaned immediately.
- Garbage is disposed of properly and promptly.
- There is no evidence of infestation from bugs or other pests.

A food-safe facility has scheduled procedures for cleaning and maintaining

- floors, walls, and ceilings
- service lines and dispensers
- ventilation
- restrooms
- trash collection areas
- pest control
Maintain Clean Floors, Wails, and Ceilings
Establish routine cleaning procedures for walls, floors, and ceilings. The facility should be free of dirt, litter, and moisture. Corners and hard-to-reach places should also have routine cleaning.

- Clean walls around food preparation and cooking areas daily with a cleaning solution or by spraying with a pressure nozzle.
- Sweep or vacuum floors daily, then clean them using a spray method or by mopping. Mark the area being cleaned with signs or safety cones to prevent an accident. Avoid creating dust or water splashes during food preparation times. Set aside a routine cleaning time after the main hours of food preparation. Spills should be cleaned immediately.
- Swab ceilings—instead of spraying them—to avoid soaking lights and ceiling fans. Clean light fixtures with a sponge or cloth. Establish a routine cleaning schedule based on the needs of the foodservice.

Maintain a Clean and Sanitary Service Line and Serving Stations
Establish a routine daily cleaning schedule for the service lines and serving stations.

- Assign an employee to set up and maintain each service line or serving station for each meal service.
- Clean and sanitize the hot and cold wells of the service line after every meal.
- Clean and sanitize dispensers, such as beverage dispensers or coffee machines after every use. Follow equipment cleaning guidelines.
- Clean and sanitize milk coolers. Follow equipment cleaning guidelines.
- Clean up spills immediately.

Maintain Good Ventilation
Good ventilation is a critical factor in maintaining a clean foodservice environment. Ventilation removes steam, smoke, grease, and heat from food preparation areas and equipment, helps maintain indoor air quality, and reduces the possibility of fires from accumulated grease.

Good ventilation eliminates condensation and other airborne contaminants. It also
- reduces the accumulation of dirt in the food preparation area
- reduces odors, gases, and fumes
- reduces mold growth by reducing humidity

To promote good ventilation, be sure to
- Use exhaust fans to remove odors and smoke.
- Use hoods over cooking areas and dishwashing equipment.
- Check the exhaust fans and hoods regularly to make sure they are clean and operating properly.
- Clean hood filters routinely according to the instructions provided by the hood manufacturer.
Maintain Clean Employee Restrooms
Restrooms should be convenient, sanitary, and adequately stocked with the following:

- warm water at 100 °F for hand washing
- liquid soap
- nail brush (*Follow State and local public health department recommendations*)
- 4 disposable paper towels and/or air blowers
- toilet paper
- covered trash container that opens with a foot pedal
- Clean restrooms daily and keep the doors closed
- Remove trash daily

Maintain Clean and Neat Trash Collection Areas

- Garbage must be *kept away* from food preparation areas. It should not be allowed to accumulate anywhere except in designated garbage storage areas.
- Garbage containers must be leak-proof, waterproof, pest-proof, durable, and easy to clean and sanitize.
- Garbage containers should be cleaned and sanitized frequently and thoroughly, inside and out.
- Trash receptacles should be emptied often so garbage does not overflow from containers.
Did you know?
In the event of infestation, the foodservice manager should alert the licensed pest control operator so immediate steps can be taken to eliminate the pests.

Maintain an Effective Pest Control Program
Cleanliness and good maintenance are keys to preventing pest infestation. By its nature, the foodservice environment is prone to problems with bugs and other pests. Pests may be brought in when food and other supplies are delivered, or they may enter the building through gaps in floors or walls. Prevention is critical in pest control.

- Have an ongoing pest prevention program and regular pest control by a licensed pest control operator. This is best practice for every institutional foodservice operation.

- Keep pests out by doing the following:

  1) Fill openings or cracks in walls and floors with putty, plastic wood, or a similar product.
  2) Fill openings around pipes or equipment fittings.
  3) Screen all windows, doors, and outer openings, and keep them in good repair.
  4) Use self-closing doors that open outward.
  5) Inspect food supplies before storing or using them.
  6) Keep food in labeled containers approved for food storage. These containers should have tight-fitting lids.
  7) Do not store food or containers directly on the floor.
  8) Remove and destroy any food that is infested.
  9) Maintain proper temperatures in storage areas.
  10) Clean grease traps regularly to prevent a grease build-up that could cause a drain blockage. Drain blockage could lead to overflow which causes an unpleasant odor, contamination, and attracts pests.
  11) Install an air door at food service entrances to prevent bugs from flying in.
What kinds of pests are seen most often in a foodservice facility?
In a foodservice environment, the three most common pests are cockroaches, flies, and rodents.

**Cockroaches** live and breed in holes, damp places, behind boxes, in seams of bags, and in folds of paper. They like any place that is dark, warm, moist, and hard to clean.

Cockroaches’ hairy legs are full of debris and disease-causing organisms such as bacteria, fungi, parasite eggs, and viruses. One female cockroach produces millions of offspring in her lifetime.

Since cockroaches generally search for food at night, seeing one in the daytime is a sign of a major infestation. Other signs of infestation include
- a strong, oily odor
- feces that look like large grains of pepper
- brown, dark brown, dark red, or black capsule-shaped egg cases

**Flies** feed on human and animal wastes and garbage and can transport a wide range of foodborne illnesses. They can enter a building through holes the size of a pinhead and can contaminate food with their mouth, footpads, hair, or feces. One female can produce thousands of offspring in one breeding season.

Flies are attracted to places protected from the wind and to edges such as garbage can rims. They lay their eggs in warm decaying material protected from sunlight and are fond of human waste areas. In warm summer weather, flies can mature from larvae to adults in only 6 days.

**Rodents** carry many disease-causing organisms and parasites. In fact, one fecal dropping from a rat can contain *several million* bacteria. When rodents leave feces, urine, and other filth on food products and around the facility, these organisms can be easily transmitted to people.

Rodents are prolific breeders, producing as many as 50 offspring in a span of 1 year. They tend to hide during the day, but can be spotted by telltale signs. These signs include the following:
- droppings
- gnawing
- tracks on dusty surfaces
- nesting materials
- holes in baseboards, wall board, and in other wood
How should small-ware be cleaned and sanitized?

Small-ware is a collective term used to include dishes, flatware, preparation and serving utensils, measuring devices, cooking pots and pans, and small equipment that can be moved to the three-compartment sink or dishwasher for cleaning and sanitizing. Follow State public health department regulations on how to clean and sanitize small-ware. The information below is general guidance.

All surfaces that come in contact with food must be clean and sanitized. To clean a surface means to remove visible food particles—what can be seen on the surface. To sanitize a surface means to use either a chemical or heat to reduce the number of microorganisms or other contaminants to a level that is not harmful. The first step is cleaning; the second step is sanitizing.

Select from Two Methods of Sanitizing

Chemical sanitizing can be accomplished by immersing an object in, or wiping it down with, a sanitizing solution and allowing the solution to remain in contact with the surface for a specified amount of time. Use only EPA-approved (Environmental Protection Agency) chemical sanitizers for food-contact surfaces. Household bleach can be used as a sanitizer only if the label indicates it is EPA registered.

Mix, test, and use the sanitizing solution as recommended by the State and local public health department. Refer to the manufacturer’s directions for specific mixing, storing, and first aid instructions.

The three most common chemical sanitizers are:

- **Chlorine** – This sanitizer is the most commonly used and is the cheapest. It is effective in hard water, but is inactivated by hot water above 120 °F. Chlorine bleach solutions must be tested regularly and changed as necessary to ensure that the solution is working to sanitize. Using too much chlorine in a solution can pit stainless steel and aluminum surfaces, while using too little will not sanitize the surface.

- **Iodine** – Iodine is more expensive and less effective than chlorine. However, an iodine sanitizing solution is not as quickly inactivated by food particles as a chlorine solution.

- **Quaternary ammonium compound (Quats)** – The sanitizer is not as quickly inactivated by food particles as a chlorine solution, is noncorrosive to metal surfaces, and nonirritating to skin. It leaves a film on surfaces and does not kill certain types of microorganisms.
## Chlorine Sanitizing Solution for Equipment, Food-content Surfaces, and Utensils

### Rule-of-thumb mixtures for chlorine sanitizing solutions

<table>
<thead>
<tr>
<th>Solution</th>
<th>Recipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 PPM solution</td>
<td>1 tablespoon (1/2 fluid ounce) 5% chlorine commercial bleach mixed with four gallons of water. The solution should be in contact with the surface to be sanitized for seven seconds at temperatures between 75 °F and 115 °F. Be aware that very hot water may prevent chlorine bleach from sanitizing. This sanitizing solution can be used to sanitize a food thermometer after every use.</td>
</tr>
<tr>
<td>100 PPM solution</td>
<td>1 tablespoon (1/2 fluid ounce) 5% chlorine commercial bleach mixed with two gallons of water</td>
</tr>
<tr>
<td>200 PPM solution</td>
<td>1 tablespoon (1/2 fluid ounce) 5% chlorine commercial bleach mixed with one gallon of water</td>
</tr>
</tbody>
</table>

Use the manufacturer's label directions for specific information on mixing, storing, and first aid. Test with a test kit.

**Heat sanitizing** involves exposing equipment to high heat for an adequate length of time. This may be done manually by immersing equipment into water maintained at a temperature of 171 °F to 195 °F for at least 30 seconds. In a dishwashing machine, a good rule of thumb is to wash at 150 °F and rinse at 180 °F. But remember, temperature may vary depending on the type of machine used and requirements of the State and local public health department.

Thermometers and heat-sensitive tapes and labels are available for determining whether adequate sanitation temperatures have been achieved.

### Sanitize Small-ware in a Three-Compartment Sink

- To properly clean and sanitize small-ware, the kitchen must have a sink with at least three separate compartments for manually cleaning, rinsing, and sanitizing, or a mechanical dishwasher that functions properly.

- There should be a separate area for scraping and rinsing food and debris into a garbage container or disposal before washing and a separate drain board for clean and soiled items.
Manually Sanitize Small-ware in a Three-Compartment Sink

1) Clean and sanitize sinks that will be used for washing and sanitizing small-ware.
2) Scrape and rinse food into garbage container or disposal. Pre-soak items, such as flatware, as necessary. Then...

**In the first sink**, immerse and **Wash** the small-ware in a clean detergent solution at 110 °F or the temperature specified on the cleaning agent manufacturer’s label instructions. Use a brush or a cloth to loosen and remove any remaining visible food particles.

**In the second sink**, **Rinse** using clear, clean hot water (110 °F) to remove all traces of food, debris, and detergent.

**In the third sink**, **Sanitize**.

**CHEMICAL**: Immerse the clean items in a chemical sanitizing solution at the appropriate temperature for the correct amount of time. Be sure all surfaces of the clean items are covered with hot water or the sanitizing solution. Follow manufacturer’s label directions for mixing the sanitizing solution and using the required contact time for sanitizing. Check the concentration of the chemical sanitizer at regular intervals using a test kit.

Be aware that hot water inactivates some chemical sanitizers, so read and correctly follow the manufacturer’s directions for using the chemical. Always read the Material Safety Data Sheet (MSDS) before using a chemical.

**OR**

**HEAT**: Immerse or spray rinse clean items in hot water at 171 °F to 195 °F for at least 30 seconds. Some State public health department codes require a temperature of 180 °F.

**While you wash, rinse, and sanitize...** If soapsuds disappear in the first compartment or remain in the second, the water temperature cools, or water in any compartment becomes dirty with food particles or cloudy from grease, empty the compartment and refill it.

3) **Air-dry all items on a drain board**. Wiping can re-contaminate equipment and can remove the sanitizing solution from the surfaces before it has finished working.

4) **Store**. Make certain all small-ware is dry in order to avoid retaining moisture that fosters bacterial growth.
Sanitize Small-ware in a Mechanical Dishwasher
When sanitizing small-ware (dishes, trays, flatware, glasses, etc.) in a dishwasher, follow the manufacturer’s procedures. Check the temperature of the water in the wash and rinse cycle.

Wash at 150 °F
Rinse at 180 °F

The temperature may vary depending on the type of dishwashing machine used and requirements of the State and local public health department.

Check Dishwasher Temperatures
Although dishwashers have temperature gauges for each compartment, it is useful to confirm that the gauge is accurate using another type of thermometer. There are two types of thermometers that can be used to confirm the accuracy of dishwasher thermometer gauges.

- Waterproof maximum/minimum-registering thermometer
- Self-adhering temperature-sensitive label

A waterproof maximum/minimum-registering thermometer is a type of thermometer that is placed in a dish rack to go through the dishwasher cycle with soiled trays and flatware. It is set to register the highest temperature of the cycle to confirm that the required temperature is reached in a sanitizing rinse cycle.

Another tool for checking the temperature is a self-adhering temperature-sensitive label. This type of sensor attaches to the surface of a clean dish/tray and changes color to record the dishware surface temperature during dishwashing. Labels are available for various temperatures. For example, to determine whether the temperature in the final sanitizing rinse of a dishwasher reaches 180 °F, a single temperature 180 °F label could be attached to a clean tray to go through the cycle. When the temperature has been reached, the label changes color. The label can be removed from the tray at the end of the dishwasher cycle and placed in a log to document temperature.

Before using or purchasing either of these types of thermometers to confirm the temperature in a dishwasher, check with the State and local public health department on what is recommended. Be knowledgeable about the correct use of each thermometer to decide which one best meets the needs of the foodservice operation.
To keep large or in-place equipment free of harmful levels of bacteria or other contaminants, it is necessary to clean and sanitize all surfaces that will come into contact with food. This is especially important after any possible contamination such as slicing a deli meat on a slicer or mixing a meat salad in a mixer.

**Wash, rinse, and sanitize** tables, stoves, sinks, slicers, choppers, mixers, and large cooking utensils after each use. This rule also applies to equipment used to clean other food-contact surfaces.

**Scrub surfaces**, such as cutting boards, with a detergent solution and a stiff-bristled nylon brush. Then rinse in clear, clean water, and sanitize solution after every use. For the use and care of wooden cutting boards, surfaces, or utensils, follow State and local public health department recommendations. Synthetic cutting boards can be sanitized in a three-compartment sink or in a dishwasher, depending on their size. Follow the State and local public health department recommendations.
Use the Chemical Method to Sanitize Equipment

*Using a Sanitizer*—immerse or wipe down with commercial sanitizer. Follow manufacturer’s label instructions for mixing and using the sanitizer. Use a test kit to test for correct concentration. Always read the Material Safety Data Sheet (MSDS) before using a chemical.

Follow the Steps to Sanitize In-Place Equipment

Read and follow the manufacturer’s directions for cleaning and sanitizing the piece of equipment. Follow the general steps described below.

1) **Unplug electrically powered equipment**, such as meat slicers and mixers.

2) **Remove loose food** particles and scraps.

3) **Wash, rinse, and sanitize** any removable parts using the manual immersion method.

4) **Wash the remaining food-contact surfaces and rinse** with clean water. Wipe down with a chemical sanitizing solution mixed according to the manufacturer’s directions.

5) **Clean surfaces that do not come in contact with food** using a clean wiping cloth. Allow all parts to air dry before reassembling. Clean the wiping cloth before and during use by rinsing it in a sanitizing solution.

6) **Re-sanitize the external food-contact surfaces** of the parts that were handled when the equipment was reassembled.

**CAUTION:** All equipment should be kept clean and sanitized. Although some equipment is not used for food preparation, all equipment that has any contact with food should be cleaned and sanitized on a routine basis. Follow manufacturer’s directions to clean and sanitize proof cabinets, shelf racks, dish dollies, dish and tray dispensers, pan racks, bakery racks, food holding equipment, equipment used to transport foods, and ice machines. Remember to keep all food preparation equipment and utensils free from dirt, dust, and other forms of contaminations.
Who is responsible for food safety?

Food safety is everybody's business. This chapter has presented guidelines for maintaining a safe environment for food preparation and service. To have a safe environment for food preparation and service, every person in foodservice must be committed to high standards of sanitation.

Manager’s Responsibilities
- Know requirements for maintaining a sanitary foodservice.
- Use a daily, weekly, and monthly cleaning schedule to assign routine cleaning tasks.
- Establish standard procedures for cleaning specific areas of the foodservice facility such as the restroom, storeroom, refrigerators and freezers, preparation area, dining area, and service line.
- Teach and coach employees on how to maintain a sanitary foodservice.
- Hold employees responsible for cleaning and sanitizing assigned areas using the procedures that have been established.
- Have routine inspections to ensure that sanitation standards are met. Use the Food Safety Checklist in Chapter 5 or an inspection form developed specifically for the foodservice organization.
- Take pride in operating a clean and food-safe foodservice.

Employees’ Responsibilities
- Follow standard procedures for cleaning and sanitizing specific areas of the foodservice facility.
- Ask the manager for help as needed to know how to clean and sanitize assigned areas.
- Take pride in operating a clean and sanitary foodservice.
CHAPTER 4, “A Clean and Sanitary Foodservice,” describes how to operate a food-safe operation. Food safety begins with the foodservice personnel who demonstrate good personal hygiene habits. A food-safe operation has procedures for cleaning and maintaining floors, walls, and ceilings; service lines and dispensers; ventilation; restrooms; and trash collection areas. An effective pest control program is necessary for cleanliness and maintenance of a safe operation. The foodservice must have procedures for cleaning and sanitizing small-ware and large equipment. A test kit designed for a specific sanitizer should be used to check the concentration of the sanitizing solution. A foodservice supplier who sells sanitizers may also have the test kits for each type of sanitizer. Mix, use, and test the sanitizing solution as recommended by the State and local public health department. Refer to the manufacturer’s directions for specific mixing, storing, and first aid instructions. When a sanitizing solution is exposed to air, detergent, and food particles, the solution becomes less effective. Sanitizing solutions should be tested frequently. The manager and employees share responsibilities for knowing and using standard procedures for a clean and sanitary foodservice.

Food Safety Checklist

- Personal Dress and Hygiene
- Food Preparation
- Hot Holding
- Cold Holding
- Refrigerator, Freezer, and Milk Cooler
- Food Storage and Dry Storage
- Cleaning and Sanitizing
- Utensils and Equipment
- Large Equipment
- Garbage Storage and Disposal
- Pest Control
In this chapter, find answers to the following question:
How can foodborne illness be prevented in the eight steps of the foodservice process?

**Step 1: Purchasing**
- Know How Purchasing Affects Food Safety
- Follow Food Safety Guidelines for Purchasing

**Step 2: Receiving**
- Know How Receiving Affects Food Safety
- Follow Food Safety Guidelines for Receiving
- Evaluate Meat and Poultry During Receiving
- Evaluate Eggs and Dairy Products During Receiving
- Evaluate Milk and Yogurt During Receiving
- Evaluate Butter and Ice Cream During Receiving
- Evaluate Fresh and Frozen Foods During Receiving
- Evaluate Canned and Dry Foods During Receiving
- Evaluate Specially Packaged Foods During Receiving

**Step 3: Storing**
- Know How Storing Affects Food Safety
- Follow Food Safety Guidelines for Storing
- Use Dry Storage Safely
- Use Refrigerated Storage Safely
- Use Deep Chilling Safely
- Use Frozen Storage Safely

**Step 4: Preparing**
- Know How Preparing Affects Food Safety
- Follow Food Safety Guidelines for Pre-Preparation
- Follow Food Safety Guidelines for Panned Foods to Be Cooked Later
- Follow Food Safety Guidelines for Cold Foods That Will Not Be Cooked
Step 5: **Cooking**
- Know How Cooking Affects Food Safety
- Follow Food Safety Guidelines for Cooking Foods
- Minimum Safe Internal Temperatures

Step 6: **Holding and Serving**
- Know How Holding and Serving Affect Food Safety
- Follow Food Safety Guidelines for Holding and Serving
- Follow Food Safety Guidelines for Employees on the Service Line
- Follow Food Safety Guidelines for Sanitary Self-service
- Follow Food Safety Guidelines for Transporting and Receiving Food for Off-site Feeding

Step 7: **Cooling**
- Know How Cooling Affects Food Safety
- Follow Steps for Safe Cooling

Step 8: **Reheating**
- Know How Reheating Affects Food Safety
- Follow Guidelines for Reheating Food

Summary

Food Safety Checklist
The foodservice manager and employees should understand what needs to be done at each step of the foodservice process to keep food safe. This chapter explains how each step of the foodservice process affects food safety and provides guidelines for insuring food safety in that step. The guidelines can be used to implement a food safety program in each step of the process. Always follow State and local public health department regulations and the policies and procedures of the State agency, district, and individual school sites.

**Eight steps of the foodservice process**
1) Purchasing
2) Receiving
3) Storing
4) Preparing
5) Cooking
6) Holding and serving
7) Cooling
8) Reheating

**Purchasing**

**Know How Purchasing Affects Food Safety**
The goal of purchasing is to obtain wholesome, safe foods to meet menu requirements. Safety in this step is primarily the responsibility of the food vendors. It is the job of the person responsible for purchasing to choose the vendors wisely.

**Follow Food Safety Guidelines for Purchasing**

**Guidelines for the Vendor**
- Meet Federal and State health standards.
- Use a standardized procedure for food sanitation in the operations.
- Train employees in sanitation.
- Have clean delivery trucks with adequate refrigeration and freezer units.
- Deliver foods packaged in protective, leak-proof, durable packaging.
- Deliver foods at the correct temperatures.
- Organize deliveries to separate raw products from processed foods and produce.
- Provide a written policy/procedure on handling returns/recalls related to food safety upon request.
Guidelines for the Purchaser

- Work with the vendor to establish a food delivery schedule for each site.
- Tell the vendor what is expected.
- Request the vendor to provide a print copy of the standardized procedure for food sanitation to ensure the safety of the products they sell.
- Include food safety standards in the purchase specification agreement.
- Request a copy of the vendor’s most recent health sanitation report.
- Inform the vendor that the purchaser will conduct unannounced sanitation inspections of trucks. Good vendors will cooperate with inspections and should adjust their delivery schedules to avoid busy periods at schools so that incoming foods can be received and inspected properly.
- Visit the warehouse periodically, if possible, to see that it is clean and organized.
- Reject all products that do not meet requirements.

In FNS Child Nutrition Programs, children less than or equal to 9 years of age must be served only prepackaged, pasteurized juice when juice is on the breakfast, lunch, or snack menu. Juice with a warning label (because it is unpasteurized) is not allowed to be served.

If juice is squeezed on site (unpackaged juice prepared on the premises), a HACCP plan is needed per Food Code specifications in ¶ 8-201.14 (B) — (E) and as specified under 21 CFR PART 120— HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP) SYSTEMS, Sec. 120.24 Process controls.

Refer to Chapter 6 for more information on HACCP.
Did You Know?

The person who receives a food delivery is responsible for controlling the quality and the safety of the foods that are accepted. To ensure food safety and food quality, employees who are responsible for receiving deliveries must be trained to accept only the products that meet specifications, quality standards, and sanitation requirements.
**Organize the physical space used for receiving.**
- Have a pen and hard surface on which to write.
- Have a food thermometer for documenting temperatures on delivery.
- Have a clean cart or hand truck for transporting goods from the receiving area to storage.
- Have the receiving ticket or market order ready when the delivery is scheduled.
- Have the Product Specification List, if this is used by your organization.
- Keep the receiving area well lighted and clean to discourage pests.

**Inspect the delivery truck when it arrives.**
- Make sure the truck looks and smells clean.
- Check the interior temperature to see if it is appropriate for the foods being delivered. Some suppliers have temperature-recording monitors in their delivery trucks.

**Inspect foods immediately upon delivery.**
- Inspect food items to be sure they meet temperature requirements, food specifications, and food quality standards. Guidance for evaluating foods during receiving is provided in the next section.
- Mark all items for storage with the date of arrival or the “use-by” date.
- Check expiration dates of milk, eggs, and other perishable goods.
- Check to be sure shelf dates have not expired.
- Make sure frozen foods are in airtight, moisture-proof wrappings.
- Reject foods that have been thawed and refrozen. Signs of thawing and refreezing include large ice crystals, solid areas of ice, or excessive ice in containers.
- Reject cans that have any of the following signs of deterioration: swollen sides or ends, flawed seals or seams, dents, or rust.
- Use a food thermometer to check the temperature of refrigerated and frozen foods including dairy products, fresh meat, fish, and poultry products. When eggs are delivered, the interior temperature of the truck should be 45 °F or lower.
- Examine packaging for content damage and insect infestations.
- Reject dairy, bakery, and other foods delivered in flats or crates that are dirty.
- Remove empty containers and packing material immediately to a separate trash or recycling area.
Evaluate Meat and Poultry during Receiving

☑ Check Meat
Quality, Appearance, Texture
☑ USDA Inspected Stamp (ask vendor for proof for packaged meats)
☑ Firm and elastic to the touch
☑ Should not feel slimy, sticky, or dry
☑ Beef should be bright red; pork, light pink.

Internal Temperature
☑ Fresh meat—at or below 41 °F
☑ Frozen meat—delivered frozen solid

Signs of Spoilage
☑ Brown, green, or purple discoloration
☑ Black, white, or green spots indicating mold
☑ Freezer burn

☑ Check Poultry
Quality, Appearance, Texture
☑ USDA Inspected Stamp
☑ Soft, flabby flesh indicates inferior product

Internal Temperature
☑ Fresh poultry—at or below 41 °F
☑ Fresh poultry should be surrounded by crushed ice when delivered.
☑ Frozen poultry—delivered frozen solid

Signs of Spoilage
☑ Purplish or greenish discoloration
☑ Abnormal odor
☑ Stickiness under wings and around joints
☑ Dark wing tips
☑ Freezer burn
Evaluate Eggs and Dairy Products during Receiving

☑ Check Eggs
Quality, Appearance, Texture
☐ USDA inspected (USDA Inspection Shield)
☐ Clean, dry shells without cracks

Internal Temperature
☐ Truck interior at or below 45 °F
☐ Do not check the internal temperature of the eggs themselves.

Signs of Spoilage
☐ Cracked, checked, or dirty shells

☑ Check Dairy Products
Quality, Appearance, Texture
☐ Pasteurized
☐ Sweet smell
☐ Packaging is clean and intact

Internal Temperature
☐ At or below 41 °F
☐ Should be delivered refrigerated

Signs of Spoilage
☐ Sour, moldy odor
☐ Check the sell-by date; reject dairy products delivered after that date.
Evaluate Milk and Yogurt during Receiving

✅ Check Milk

Quality, Appearance, Texture
- Pasteurized or ultra-pasteurized
- Smooth and fluid
- Tightly sealed cartons

Internal Temperature
- At or below 41°F
- Should be delivered refrigerated

Signs of Spoilage (Reject delivery)
- Putrid odor
- Curdled consistency
- Check the sell-by date stamped on cartons; reject milk delivered after that date.

✅ Check Yogurt

Quality, Appearance, Texture
- Pasteurized or ultra-pasteurized
- Tightly sealed cartons
- No evidence of crystals that form when frozen

Internal Temperature
- At or below 41°F
- Should be delivered refrigerated

Signs of Spoilage
- Sour smell
- Mold
Evaluate Butter and Ice Cream during Receiving

☑ Check Butter/Margarine
  Quality, Appearance, Texture
  ✓ Smooth, firm texture
  ✓ Uniform color
  ✓ Clean packaging or containers

  Internal Temperature
  ✓ 33°F to 41°F
  ✓ May be successfully frozen

  Signs of Spoilage
  ✓ Mold
  ✓ Rancid odor

☑ Check Ice Cream
  Quality, Appearance, Texture
  ✓ Tightly sealed cartons
  ✓ No ice crystals indicating thawing and refreezing
  ✓ Individual products are not misshapen due to thawing and refreezing.

  Internal Temperature
  ✓ Should be delivered and stored at 6 °F to 10 °F

  Signs of Spoilage or Poor Quality
  ✓ Large ice crystals indicate loss of quality.
☐ Check Fresh Produce
Quality, Appearance, Texture
☐ Little or no dirt
☐ Reasonably unblemished
☐ No evidence of mold
☐ Firm texture

Internal Temperature
☐ Refrigerated produce should have an internal temperature of 33 °F to 41 °F.
☐ Non-refrigerated produce (bananas, tomatoes, sweet potatoes, dry onions, and potatoes) should have an internal temperature from 50 °F to 60 °F.
☐ Fresh-cut produce should have a temperature of 33 °F to 41 °F—insert the stem of the food thermometer between packages; do not insert into a package.
☐ Cut melons should have an internal temperature of 41 °F or below.

Signs of spoilage
☐ Signs of insect infestation
☐ Mold
☐ Mushiness, wateriness, or wilting
☐ Discoloration or blemishes
☐ Cuts

☐ Check Frozen Foods
Quality, Appearance, Texture
☐ Packaging intact and clean

Internal Temperature
☐ Frozen foods should be frozen solid.
☐ Insert stem of food thermometer between the packages in the case; do not pierce the packaging.

Signs of spoilage
☐ Signs of thawing (liquids at bottom of carton)
☐ Signs of thawing and refreezing (large ice crystals on packages and blocks of ice in boxes)
Evaluate Canned and Dry Foods during Receiving

✔ Check Canned Foods
   Quality, Appearance, Texture
   ☐ Packaging intact

   Signs of spoilage
   ☐ Flawed seals
   ☐ Swollen, leaking, rusty, or dented cans
   ☐ Reject any can without a label.

✔ Check Dry Foods
   Quality, Appearance, Texture
   ☐ Packaging intact
   ☐ Dry and undamaged

   Signs of spoilage
   ☐ Damp or moldy container
   ☐ Insect infestation

Evaluate Specially Packaged Foods during Receiving

✔ Check Modified Atmosphere Packaged (MAP) Foods and Vacuum-Packed Foods
   ☐ Insert a food thermometer between two packages, being careful not to puncture the wrap. The temperature should be the temperature specified by the manufacturer.
   ☐ Examine color indicators on the package to see if the product was kept at a proper temperature. If the color indicators do not match, reject the shipment.
STORING

Know How Storage Affects Food Safety
Food storage affects both quality and safety. Food stored improperly will lose its quality, spoil more rapidly, and can cause a foodborne illness when harmful microorganisms are allowed to grow.

Follow Food Safety Guidelines for Storing
Dry storage — longer holding of less perishable items
Refrigerator — short-term storage of perishable items
Deep-chilling unit — specific foods for short periods
Freezer — long-term storage of perishable foods

Use Dry Storage Safely
The following foods are typically stored in dry storage:
- Canned goods, baking supplies (such as salt and sugar), grain products (such as rice and cereals), and other dry items;
- Some fruits (such as bananas, avocados, and pears) which ripen best at room temperature;
- Some vegetables (such as onions, potatoes, and tomatoes) which store best in dry storage.

Like all areas of the facility, storerooms for dry storage must be kept clean and litter-free. Follow the suggestions below to maintain sanitary dry storage for food and supplies.

Follow State public health regulations.
- Maintain the storage room temperature between 50 °F and 70 °F. Use a wall thermometer to check the temperature of the dry storage area.
- Keep the storerooms clean and dry.
- Sweep and scrub walls, ceiling, floors, shelves, light fixtures, and racks on a routine basis.
- Have a regular cleaning schedule for all surfaces and floors.
- Store all food and paper supplies 6 to 8 inches off the floor (follow State public health regulations).
- Keep food in labeled containers approved for food storage; containers should have tight-fitting lids.
- Label all food with name and delivery date.
- Take cans out of cardboard cases and write the delivery date on the can. If a code number from the case needs to be recorded on the can, write it on the top of the can or keep the needed portion of the cardboard case. Cardboard boxes attract roaches and other pests.
- Use the FIFO (First In, First Out) method of inventory. Store new products behind older products and use the older products first.
- Protect food from contamination with regular pest control.
- Store chemicals away from food and other food-related supplies.
- Check all storage areas frequently.
- Look for damaged or spoiled foods, broken or torn packages, and bulging or leaking cans.
- Remove any potentially spoiled foods, bulging cans, or infested packages and foods immediately and clean the area thoroughly. Discard or destroy contaminated food according to State, district or school procedures.
**Use Refrigerated Storage Safely**
Foods stored in refrigerators include fresh meat, poultry, seafood, dairy products, most fresh fruit and vegetables, and leftovers. Follow the State and local public health department regulations for the temperature setting for refrigerators. The Food Code requires cold food temperatures to be maintained at 41°F or below.

- Arrange food in refrigerators to allow for maximum air circulation. Refrigerators should contain open, slotted shelving to allow cold air to circulate around food. Do not line shelves with foil or paper or overload the refrigerator; leave space between items to provide air circulation.
- For best practice, all refrigerated foods should be labeled with the name of the food item, date, time, and temperature. Store food in clean, non-absorbent, covered containers that are approved for food storage. Be sure all containers are properly sealed.
- Cool hot foods by putting into shallow pans or small containers before refrigeration. Some commonly used safe cooling methods include dividing the food into smaller batches for cooling in the refrigerator, cooling in shallow pans in the refrigerator, using an ice-water bath, and stirring with cold paddles.
- Store dairy products separately from foods with strong odors like onions, cabbage, and seafood.
- Store fruits in a separate section of the refrigerator from vegetables. The ethylene gas that some fruits generate during ripening causes some vegetables to deteriorate more rapidly.
- To avoid cross-contamination, store raw or uncooked food away from and below prepared or ready-to-eat food, such as deli meat or cheese.
- Never allow fluids from raw poultry, fish, or meat to come into contact with other foods. Change the drip pan at the first sight of raw juices in the pan.
- Check the temperature of all refrigeration units regularly to make sure they stay at or below 41°F or at State or district required temperature settings. Keeping potentially hazardous foods at the proper temperature is a key factor in preventing foodborne illness.
- Record the temperature of each refrigerator at the same time every day. Keep the temperature form on file to document that foods have been stored at correct temperatures.
- Have at least two hanging thermometers located at different locations inside each refrigerator to confirm the reading of the mounted or built-in thermometers. Place one thermometer in the coldest part and one in the warmest part in the refrigerator.
Use Deep Chilling Safely
- Storing foods at temperatures between 26 °F and 32 °F has been found to decrease bacterial growth. This method can be used to increase the shelf life of fresh foods such as poultry, meat, seafood, and other protein items without compromising their quality by freezing.
- Some foods will form ice crystals during deep chilling.
- Certain foods can be deep chilled in specially designed units or in a refrigerator set to deep chilling temperature.

Use Frozen Storage Safely
Frozen meats, poultry, seafood, fruits and vegetables, and some dairy products, such as ice cream, should be stored in a freezer at 0 °F to — 10 °F to keep them fresh and safe for an extended period of time.

As a rule, a freezer should be used primarily to store foods that are frozen when they are received. Freezing refrigerated food can lower the quality of some items.

- Arrange food in freezers to allow for maximum air circulation. Freezers should contain open, slotted shelving to allow cold air to circulate around food. Do not line shelves with foil or paper or overload the freezer; leave space between items to provide air circulation.
- Store frozen foods in moisture-proof material or containers to minimize loss of flavor and to avoid discoloration, dehydration, and odor absorption.
- Monitor freezer temperature regularly, using several thermometers to ensure adequacy and consistent temperatures. Record temperatures of each freezer on a temperature log.
- Avoid raising the temperature of the freezer by frequently opening and closing the freezer door or placing large amounts of hot foods in the freezer. A freezer “cold curtain” on the door can help maintain the required cold temperature.
- Never refreeze thawed food unless it has been thoroughly cooked.

PREPARING

Know How Preparing Affects Food Safety
The preparation step of the foodservice process includes many opportunities for the safety of food to be compromised. Food handlers must be on alert to
- Prevent contamination of food
- Avoid time in the temperature danger zone
- Use safe food handling practices.
Thaw Food Safely
Freezing food keeps most bacteria from multiplying but it does not kill them. NEVER thaw food at room temperature.

Some foods, such as frozen vegetables, pre-formed hamburger patties, and chicken nuggets, can be cooked from the frozen state. It is important to note, however, that this method depends on the size of the item. Cooking from the frozen state it is not recommended for large foods such as a whole turkey.

Four Safe Methods to Thaw Frozen Foods
1) Thaw frozen food in refrigeration at a temperature at or below 41 °F. Place the food in a pan on the lowest shelf so juices cannot drip on other foods. The drip pan should be changed when the first sign of juices appears.
2) Thaw frozen food under clean, drinkable running water at a sufficient water velocity to float off loose particles in an overflow and at a temperature of 70 °F or less. Remember that a food cannot remain in the temperature danger zone for more than four hours. The four hours includes the thawing time under running water and the preparation time.
3) Thaw frozen food in a microwave oven only if it will be cooked immediately. This method is not considered best practice in school foodservice.
4) Thaw frozen food as part of the cooking process. This method is typically used for frozen patties, nuggets, pizzas, and some other convenience foods.

Complete Pre-Preparation Safely
This stage of food preparation includes
- Assembling ingredients using the recipe,
- Weighing or measuring ingredients, and
- Assembling small equipment and utensils needed.

During this stage, there are several cautions for food handlers because
- Pre-preparation usually takes place at room temperature.
- This stage is one of the most common points of contamination and cross-contamination.
Follow Food Safety Guidelines for Pre-Preparation

- Wash hands correctly before beginning preparation.
- Prepare foods no further in advance than necessary.  
- Prepare foods in small batches and place in cold storage immediately. This will prevent holding food too long in the temperature danger zone.
- Always hold prepared cold foods at or below 41 °F.
- Wash fresh fruits and vegetables with cold, running water to remove surface pesticide residues and other impurities, such as soil particles; wash regardless of whether the produce will be served whole, peeled, or cooked.
- Use a brush to scrub thick-skinned produce.
- Avoid CROSS-CONTAMINATION.
- Wash hands correctly before beginning preparation.
- Keep raw products separate from ready-to-serve foods.
- After each contact with a food, wash, rinse, and sanitize cutting boards, knives, equipment, and all other food contact surfaces. Wash hands.
- Use batter, breading, or marinade for one product (recipe) and then discard. Follow the recipe to use the product as planned.
- When a can is opened, if contents are foamy or bad smelling, do not use the contents and report this to the manager and then the purchaser. Keep the can until the purchaser has been notified and has notified the vendor. If possible, save the can lid and cardboard box if they have numbers that will help track the product. Secure the can and mark “Do not use.” Discard according to district and State procedures when notified.
- Be aware of those foods that are potentially hazardous and pay special attention to food handling practices during their preparation.

Mix Food Safely

The mixing stage of food preparation is when ingredients are combined. For many recipes, the ingredients are combined, pans are prepared and the food is cooked immediately (see Step 5: Cooking); but some foods are panned and stored in the refrigerator for cooking later. Some recipes are for cold foods that will not be cooked. Each situation has special considerations for food safety, and that is why it is important to document temperature throughout food preparation.

Follow Food Safety Guidelines for Panned Foods to Be Cooked Later

- Wash hands and properly use single-use gloves.
- Keep food out of the temperature danger zone—move panned food to the refrigerator for holding as soon as possible. Best practice is to set a time limit of 20 minutes for preparing a batch of food so that ingredients are at room temperature only 20 minutes before cooking or storing in the refrigerator.
- Because food will be held before cooking or serving, be especially careful about cross-contamination.
- Cover food to prevent contamination during storage.
- Document the internal temperature of the food during this step.
Follow Food Safety Guidelines for Cold Foods That Will Not Be Cooked

Some examples of cold foods not cooked after preparation include chicken salad, tuna salad, potato salad with eggs, other protein-rich salads, and sandwiches prepared in advance.

Because cold foods such as these receive no further cooking, it is essential that all ingredients used in them are properly cleaned, prepared, and, where applicable, cooked. It is a good idea to chill meats and other ingredients and combine them while chilled.

- Wash hands and use single-use gloves.
- Properly clean, prepare, or cook ingredients for cold mixed foods that will receive no further cooking. Wash fresh fruits and vegetables with cold, running water; use a brush to scrub thick-skinned produce.
- Chill cooked or canned meats and other ingredients and combine while chilled.
- Prepare foods in small batches and place in cold storage immediately.
- Hold prepared cold foods at or below 41 °F and document temperature. Prepare foods no further in advance than necessary.
- Beware of cross-contamination.
- After each contact with a potentially hazardous food, wash, rinse, and sanitize cutting boards, knives, and other food-contact surfaces.
COOKING

Know How Cooking Affects Food Safety
Even when foods are handled correctly up to this step in the food preparation process, bacteria and other contaminants may still be present. Cooking foods to the safe internal temperature will destroy any existing bacteria but may not kill toxins or bacterial spores.

Follow Food Safety Guidelines for Cooking Foods
- Follow equipment manufacturer’s directions and standardized recipes to avoid overloading baking pans.
- Stir foods cooked in deep pots frequently to ensure even heat distribution and thorough cooking.
- Avoid overloading fryers. Allow the oil temperature Food Safety and Inspection Service, USDA to return to the required level between batches.
- Regulate size and thickness of each portion to make cooking time predictable and uniform. Cook like-size portions together.
- Never interrupt the cooking process. Partially cooking poultry or meat, for example, may produce conditions that encourage bacterial growth.
- Use a food thermometer to monitor the accuracy of heating equipment.
- Use a food thermometer to check that food reaches the required safe internal temperature during cooking.
- Check food temperature in several places, especially in the thickest parts, to make sure the food is thoroughly cooked.
- To avoid getting a false reading, be careful not to touch the pan or bone with the food thermometer.
- Always cook food to the required safe internal temperature and appropriate time.
- Use a serving utensil or single-use glove to avoid cross-contamination.
- Taste foods correctly to avoid cross-contamination. Place a small amount of food from the food container into a small bowl, step away from the food container, and taste the food with a teaspoon. Remove the used bowl and teaspoon to the dishroom. Never reuse a bowl or spoon already used for tasting. Wash hands after tasting.
### Minimum Safe Internal Temperatures

<table>
<thead>
<tr>
<th>Product</th>
<th>Internal Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poultry, stuffing, stuffed meats, stuffed pasta, casseroles, leftovers</td>
<td>165 °F for 15 seconds</td>
</tr>
<tr>
<td>Pork, bacon</td>
<td>145 °F for 15 seconds</td>
</tr>
<tr>
<td>Injected meats</td>
<td>155 °F for 15 seconds</td>
</tr>
<tr>
<td>Ground or flaked meats including hamburger, ground pork, flaked fish</td>
<td>155 °F for 15 seconds*</td>
</tr>
<tr>
<td>(patties or sticks), sausage, gyros</td>
<td></td>
</tr>
<tr>
<td>Beef and pork roasts</td>
<td>145 °F for 4 minutes*</td>
</tr>
<tr>
<td>Ham (a cured pork roast)</td>
<td>145 °F for 4 minutes</td>
</tr>
<tr>
<td>Beef steaks, veal, lamb, commercially raised game animals</td>
<td>145 °F for 15 seconds</td>
</tr>
<tr>
<td>Fish</td>
<td>145 °F for 15 seconds</td>
</tr>
<tr>
<td>Shell eggs for immediate service</td>
<td>145 °F for 15 seconds</td>
</tr>
<tr>
<td>Any potentially hazardous food cooked in a microwave oven</td>
<td>165 °F for 15 seconds; Let food stand for 2 minutes after cooking to obtain temperature equilibrium</td>
</tr>
<tr>
<td>Vegetables to be served hot</td>
<td>140 °F or above</td>
</tr>
<tr>
<td>Leftovers to be reheated (example: leftover spaghetti with meat sauce)</td>
<td>165 °F for 15 seconds; Let food stand for 2 minutes after cooking</td>
</tr>
<tr>
<td>Convenience products that include a potentially hazardous food, such</td>
<td>165 °F for 15 seconds</td>
</tr>
<tr>
<td>as hamburger patties, chicken nuggets, burritos, and pizza</td>
<td></td>
</tr>
<tr>
<td>Ready-to-eat food taken from a commercially processed, hermetically</td>
<td>140 °F (heat rapidly to this temperature for hot holding)</td>
</tr>
<tr>
<td>sealed container or from an intact package (examples: hot dogs, chicken</td>
<td></td>
</tr>
<tr>
<td>nuggets)</td>
<td></td>
</tr>
</tbody>
</table>

- For alternative times and temperatures, see the FDA Food Code 2001

**Do not serve *wild game* in FNS Child Nutrition Programs.**
*All game must be purchased from a USDA meat inspected establishment. Wild game is not allowed for use in FNS Child Nutrition Programs.*
HOLDING AND SERVING

Know How Holding and Serving Affect Food Safety
Foodborne outbreaks have occurred because improper procedures were used after cooking was completed. To handle food safely, it is necessary to hold and serve foods at safe temperatures, either above or below the temperature danger zone. Specifically this means:
- Always keep HOT foods in hot holding equipment at or above 140 °F.
- Always keep COLD foods in a refrigeration unit or surrounded by ice at or below 41 °F.

Best practice to ensure good food quality as well as safety is to prepare foods just-in-time for service. Just-in-time food preparation is also known as batch cooking or cooking to the line.

Follow Food Safety Guidelines for Holding and Serving
- Use hot holding equipment, such as steam tables and hot food carts during service but never for reheating. Hot foods should be cooked to the required temperature and placed in holding cabinets or on a steam table to be held at or above 140 °F.
- Keep COLD foods at or below 41 °F in a refrigeration unit or surrounded by ice.
- Stir foods at reasonable intervals to ensure even heating or cooling.
- Check internal food temperatures with a food thermometer every 30 minutes. Sanitize the food thermometer after each use.
- During any point in the food production process when food could be in the temperature danger zone, the internal temperature must be documented. Follow State and local public health department recommendations to control time and temperature at each stage of food production.
- Cover hot holding equipment to retain heat and to guard against contamination.
- Monitor the temperature of hot holding equipment with each use.
- Avoid cross-contamination that can occur when an undercooked food is added to another food that is not cooked further. Example: Freshly made scrambled eggs are added to an existing pan of scrambled eggs on a steam table.

Follow Food Safety Guidelines for Employees on the Service Line
- Follow rules for good personal hygiene.
- Always wash hands and arms up to the elbow with soap and warm water of at least 100 °F for at least 20 seconds before serving food.
- Use cleaned and sanitized long-handled ladles and spoons so bare hands do not touch food.
- Avoid touching the parts of plates, food trays, or flatware that will come into contact with food or the customer’s mouth.
- Wear single-use gloves when serving food by hand. Follow guidelines for single-use gloves (see Chapter 2).
- When possible, use tongs to dispense rolls and bread, or wear single-use gloves.
- Clean and sanitize equipment and utensils thoroughly after each use.
- Use lids and sneeze guards to protect prepared food from contamination.
AVOID CROSS-CONTAMINATION... Always wash hands between food preparation tasks.

AVOID CROSS-CONTAMINATION... Always clean and sanitize food preparation areas and equipment between food preparation tasks. For example, do not reuse a serving pan used to hold raw chicken to serve the same chicken after it has been cooked unless the pan has been thoroughly cleaned and sanitized.

Throw away garnishes used on pans on the service line.

Follow Food Safety Guidelines for Sanitary Self-service

Monitor self-service lines. Customers — especially children — are generally not educated about food sanitation and can either unintentionally or intentionally contaminate food by

- using the same plate or tray twice;
- touching food with their hands;
- sneezing or coughing into food;
- picking up foods, such as rolls or carrot sticks, with their fingers;
- not using serving utensils;
- eating on the service line;
- dipping their fingers into a container of food to taste it;
- putting head under sneeze guard to reach items in the back; and
- returning food items to avoid waste.

Post signs on self-service lines to encourage customers to be polite and avoid contaminating food.

Observe customer behavior and remove any foods that may have been contaminated.

Package food to prevent contamination: serve sealed packages of crackers, breadsticks, and condiments; pre-wrap sandwiches.

Monitor and document the internal temperature of self-service items every 30 minutes as with other foods on the service lines.
Follow Food Safety Guidelines for Transporting and Receiving Food for Off-site Feeding

Transporting prepared food from a central kitchen to remote sites must be monitored. Special care must be taken to ensure that food is safe when it leaves the central kitchen and is still safe when it is served.

- **Transport food using proper food carriers**
  - Use only food carriers approved by the National Sanitation Foundation International (NSF International) for transporting food. Follow State and local public health department recommendations.
  - Sanitize food carriers daily.
  - Make sure the insulating properties in carriers are adequate to maintain safe food temperature.
  - Equip trucks with equipment designed to keep hot foods hot (at or above 140 °F) and cold foods cold (at or below 41 °F).
  - Clean and sanitize the interior of delivery trucks on a routine basis.

- **Use proper food containers**
  - Food containers should be rigid and sectioned so foods do not mix,
  - tightly closed to retain heat or cold,
  - non-porous to avoid leakage,
  - easy to clean or disposable, and
  - approved to hold food

- **Monitor temperatures**
  - Transport an extra sample of hot and cold foods in order to measure the internal temperature of the sample foods on arrival at the remote site. Hot food should be delivered at or above 140 °F and cold food should be delivered at or below 41 °F.
  - Keep a 48-hour sample (or follow the school district’s requirements) of potentially hazardous foods in case of a foodborne outbreak.
  - Store food immediately upon arrival in order to maintain safe internal temperatures.
COOLING

Know How Cooling Affects Food Safety
In any foodservice, it is often necessary to prepare foods in advance or use leftover foods. This can easily lead to problems unless proper precautions are taken. In fact, problems at the cooling stage contribute to outbreaks of foodborne illness.

Follow Steps for Safe Cooling
In an institutional foodservice, it is often necessary to prepare foods in advance or use leftover foods. This can easily lead to problems unless proper precautions are taken. In fact, problems at this stage may contribute to outbreaks of foodborne illness.

- Protect the food from contamination during the cooling process. To avoid contamination, food that is being chilled in the refrigerator should be loosely covered. Although uncovered foods cool faster, be aware that they are at increased risk for cross-contamination.
- Reduce food mass. Smaller amounts of food will chill more quickly than larger amounts, so cut large items into pieces or divide food among several containers or shallow pans.
- Use shallow, pre-chilled pans (no more than 4 inches deep).
- Stainless steel containers transfer heat better and cool faster than plastic.
- Chill rapidly. Quick-chill large amounts of food (larger than 1/2 gallon or 2 pounds).
  - Use an ice-water bath—water is a much better heat conductor than air. As a result, foods can cool much more quickly in an ice-water bath than they can in a refrigerator.
  - Use a quick-chill unit (26 °F to 32 °F) rather than a refrigerator. These special refrigerators are sometimes used in large, central kitchens for chilling large amounts of food quickly. The typical walk-in or reach-in refrigerator was designed to keep cold foods cold rather than to chill hot foods. They can take too long to cool foods to safe temperatures.
  - Pre-chill foods in a freezer for about 30 minutes before refrigerating. Separate food items so air can flow freely around them. Do not stack shallow pans.
  - NEVER cool food at room temperature.
- Stir frequently. Stirring accelerates cooling and helps to ensure that cold air reaches all parts of the food. Some manufacturers make cold paddles just for cooling food; they can be filled with water and frozen. If a cold paddle is used to stir a food, it should be washed and sanitized after use.
- Measure and document temperature during the cooling process. Chill cooked hot food from 140 °F to 70 °F within 2 hours and from 70 °F to 41 °F in an additional 4 hours for no more than a total cooling time of 6 hours. If the food has not reached 70 °F within 2 hours it must be reheated immediately to 165 °F for 15 seconds.
- When the food has been properly cooled to 41 °F or lower, cover tightly and label with product name, date, and time of preparation.

Store cooked foods on the upper shelves of the refrigerator. Never store them beneath raw foods.
REHEATING

Know How Reheating Affects Food Safety
Reheating is used for previously cooked food, either pre-prepared or leftover. Like the original cooking process, reheating requires precautions to prevent contamination and keep food out of the temperature danger zone. Cooling a contaminated food does not kill harmful microorganisms; it only slows growth. Failure to reheat a previously cooked food to the required temperature within the time limit can result in a foodborne outbreak.

Follow Guidelines for Reheating Food
- Take the food through the temperature danger zone as quickly as possible.
- Reheat all previously cooked food to an internal temperature of 165 °F for 15 seconds.
- If a pre-cooked food is added to a recipe as an ingredient, the whole mixture must be reheated to 165 °F for 15 seconds. For example, if adding pre-cooked ground beef to canned spaghetti sauce, the mixture must reach 165 °F for 15 seconds.
- Heat sauces, soups, and gravies to a minimum of 165 °F within two hours after taking the food out of the refrigerator.
- Never reheat food in hot-holding equipment.
- Never mix a leftover batch of food with a fresh batch of food.
- According to the Food Code, food held at 41 °F or less may be held for seven days. (If a food is held at between 41 °F and 45 °F in existing equipment in place and in use, that cannot maintain the food at 41 °F, a four-day hold is allowed.)
- While storing leftovers, be sure refrigerator temperature is low enough to maintain an internal temperature of foods at 41 °F or below.
CHAPTER 5, “A Process for Preventing Foodborne Illness,” describes the eight steps of the foodservice process with ways to prevent foodborne illness in every step.

**Eight steps of the foodservice process**
1) Purchasing
2) Receiving
3) Storing
4) Preparing
5) Cooking
6) Holding and serving
7) Cooling
8) Reheating

Handling food safely through the foodservice process is the highest priority in any kitchen. It is everyone’s responsibility to
- maintain a clean, sanitary environment;
- control potential sources of food contamination; and
- be vigilant with time and temperature control.

Food can become contaminated and harmful microorganisms can grow and cause a foodborne illness during every step of the foodservice process unless food safety guidelines are followed.

The Food Safety Checklist on the following pages can be used as a weekly self-inspection for each step of the foodservice process.
### PERSONAL DRESS AND HYGIENE

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Yes</th>
<th>No</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees wear proper uniform including proper shoes.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Hair restraint is worn.</td>
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<tr>
<td>Fingernails are short, unpolished, and clean (no artificial nails).</td>
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<tr>
<td>Jewelry is limited to a plain ring, such as a wedding band.</td>
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<tr>
<td>Hands are washed properly, frequently, and at appropriate times.</td>
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<tr>
<td>Burns, wounds, sores or scabs, or splints and bandages on hands are completely covered while handling food.</td>
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<tr>
<td>Eating, drinking, chewing gum, smoking, or using tobacco are observed only in designated areas away from preparation, service, storage, and ware washing areas.</td>
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<tr>
<td>Employees use disposable tissues when coughing or sneezing and then immediately wash hands.</td>
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</tbody>
</table>

### FOOD PREPARATION

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Yes</th>
<th>No</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food preparation equipment and food contact surfaces are properly washed, rinsed, and sanitized after every use.</td>
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<tr>
<td>Frozen food is thawed under refrigeration or in cold running water.</td>
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<tr>
<td>Preparation is planned so ingredients are kept out of the temperature danger zone to the extent possible.</td>
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<tr>
<td>Food is tasted using the proper procedure.</td>
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<tr>
<td>Procedures are in place to prevent cross-contamination.</td>
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</tbody>
</table>
### FOOD PREPARATION (continued)

<table>
<thead>
<tr>
<th>Corrective Action</th>
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<tbody>
<tr>
<td>Yes</td>
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</table>

- **Food is handled with utensils, single-use gloves, or clean hands.**
  - Yes [ ] No [ ]

- **Utensils are used to avoid touching parts that will be in direct contact with food or a person's mouth.**
  - Yes [ ] No [ ]

- **Reusable towels are used only for sanitizing equipment surfaces and not for drying hands, utensils, floor, etc.**
  - Yes [ ] No [ ]

- **Food is cooked to the required safe internal temperature for the appropriate time. The temperature is tested with a calibrated food thermometer.**
  - Yes [ ] No [ ]

- **The internal temperature of food being cooked is monitored and documented.**
  - Yes [ ] No [ ]

### HOT HOLDING

<table>
<thead>
<tr>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

- **Hot holding unit is clean**
  - Yes [ ] No [ ]

- **Food is heated to the required safe internal temperature before placing in hot holding**
  - Yes [ ] No [ ]

- **Temperature of hot food **being held** is at or above 140 °F and internal temperature is monitored and documented every 30 minutes**
  - Yes [ ] No [ ]

- **Food is protected from contamination**
  - Yes [ ] No [ ]

### COLD HOLDING

<table>
<thead>
<tr>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

- **Refrigerators are kept clean and organized**
  - Yes [ ] No [ ]

- **Temperature of cold food being held is at or below 41 °F and internal temperature is monitored every 30 minutes**
  - Yes [ ] No [ ]

- **Food is protected from contamination**
  - Yes [ ] No [ ]

### REFRIGERATOR, FREEZER, AND MILK COOLER

<table>
<thead>
<tr>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

- **Thermometers are conspicuous and accurate**
  - Yes [ ] No [ ]

- **Temperature is appropriate for piece of equipment**
  - Yes [ ] No [ ]
### REFRIGERATOR, FREEZER, AND MILK COOLER (continued)

<table>
<thead>
<tr>
<th>描</th>
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</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td><strong>No</strong></td>
<td><strong>Corrective Action</strong></td>
<td></td>
</tr>
<tr>
<td>Food is stored 6 inches off floor in walk-in cooling equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerator and freezer units are clean and neat</td>
<td></td>
<td></td>
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<tr>
<td>Proper chilling procedures are used</td>
<td></td>
<td></td>
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<tr>
<td>All food is properly wrapped, labeled, and dated</td>
<td></td>
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<tr>
<td>The FIFO (First In, First Out) method of inventory is practiced</td>
<td></td>
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<tr>
<td>A temperature form is maintained to document storage temperatures</td>
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</tbody>
</table>

### FOOD STORAGE AND DRY STORAGE

<table>
<thead>
<tr>
<th>描</th>
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</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td><strong>No</strong></td>
<td><strong>Corrective Action</strong></td>
<td></td>
</tr>
<tr>
<td>Temperature of dry storage area is between 50 °F and 70 °F or State public health department requirement</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>All food and paper supplies are stored 6 to 8 inches off the floor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All food is labeled with name and delivery date</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The FIFO (First In, First Out) method of inventory management is used</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are no bulging or leaking canned goods or torn bags in storage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food is protected from contamination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All surfaces and floors are clean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemicals are stored away from food and food-related supplies</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>There is a regular cleaning schedule for all surfaces and floors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLEANING AND SANITIZING</td>
<td>Yes</td>
<td>No</td>
<td>Corrective Action</td>
</tr>
<tr>
<td>------------------------</td>
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<td>------------------</td>
</tr>
<tr>
<td>Three-compartment sink is properly set up for ware washing</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Suds are visible only in wash sink</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Water is clean and free of grease and food particles</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>A chemical test kit or thermometer is used to check sanitizing rinse</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Water temperatures are correct for wash and rinse</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>If heat sanitizing, the utensils are allowed to remain immersed in 171 °F water for 30 seconds</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>If using a chemical sanitizer, it is mixed correctly and a sanitizer test strip is used to test chemical concentration</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Small-ware and utensils are allowed to air dry</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Wiping cloths are stored in sanitizing solution while in use</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UTENSILS AND EQUIPMENT</th>
<th>Yes</th>
<th>No</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>All small equipment and utensils, including cutting boards, are cleaned and sanitized between uses</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Small equipment and utensils are washed, sanitized, and air-dried</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Work surfaces are clean to sight</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Work surfaces are cleaned and sanitized between uses</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Thermometers are cleaned and sanitized after each use</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Thermometers are calibrated on a routine basis</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Can opener is clean to sight</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>REFRIGERATOR, FREEZER, AND MILK COOLER <em>(continued)</em></td>
<td>Yes</td>
<td>No</td>
<td>Corrective Action</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
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<td>------------------</td>
</tr>
<tr>
<td>Drawers and racks are clean</td>
<td></td>
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<tr>
<td>Small equipment is stored inverted, covered, or otherwise protected from dust or contamination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LARGE EQUIPMENT</td>
<td>Yes</td>
<td>No</td>
<td>Corrective Action</td>
</tr>
<tr>
<td>Food slicer is clean to sight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food slicer is cleaned and sanitized after each use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All pieces of equipment are clean to sight including equipment on serving lines, storage shelves, cabinets, ovens, ranges, fryers, and steam equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust hood and filters are clean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GARBAGE STORAGE AND DISPOSAL</td>
<td>Yes</td>
<td>No</td>
<td>Corrective Action</td>
</tr>
<tr>
<td>Kitchen garbage cans are clean and covered</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garbage cans are emptied as necessary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boxes and containers are removed from site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loading dock and area around dumpster are clean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dumpster is closed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEST CONTROL</td>
<td>Yes</td>
<td>No</td>
<td>Corrective Action</td>
</tr>
<tr>
<td>Outside doors have screens and are equipped with a self-closing device</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Screens are on open windows and doors are in good repair</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No evidence of pests is present</td>
<td></td>
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<tr>
<td>There is a regular schedule of pest control by a licensed pest control operator</td>
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</tbody>
</table>
**Step 1: Purchasing**
- Buy from reputable vendors
- Include food safety standards in purchasing agreement
- Accept foods only if delivered at proper temperatures in clean, well-equipped trucks

**Step 2: Receiving**
- Inspect foods upon arrival for proper temperature, content damage, and insect infestation
- Reject all products that do not meet requirements
- Store foods immediately
- Keep receiving area clean

**Step 3: Storing**
- Label food with description and delivery date
- Use oldest foods first
- Avoid cross-contamination
- Store chemicals away from foods and other food-related supplies
- Maintain proper refrigerator, freezer and dry storage

**Step 4: Preparing**
- Wash hands frequently, properly, and at appropriate times
- Avoid cross-contamination
- Keep foods out of temperature "danger zone" (41 °F – 140 °F)
- Prepare foods no further in advance than necessary
- Thaw foods properly

**Step 5: Cooking**
- Avoid cross-contamination
- Use a clean food thermometer
- Record internal temperatures
- Cook foods to the proper internal temperature for appropriate time without interruptions

**Step 6: Serving & Holding**
- Avoid cross-contamination
- Hold foods at proper temperatures either below 41 °F or above 140 °F
- Record internal temperature
- Monitor the temperature of hot holding and cold holding equipment
- Follow rules for good personal hygiene
- Maintain a sanitary foodservice operation

**Step 7: Cooling**
- Chill rapidly
- Stir frequently
- Use shallow, pre-chilled pans
- Record internal temperature
- Store appropriately

**Step 8: Reheating**
- Reheat rapidly
- Reheat to internal temperature of 165 °F for 15 seconds
- Record internal temperatures
- Never reheat food in hot-holding equipment
In this chapter, find answers to the following questions:

What is HACCP?

How can the HACCP principles be used to prevent foodborne illness?

- **HACCP Principle 1:** Identify Hazards
- **HACCP Principle 2:** Identify Critical Control Points
- **HACCP Principle 3:** Establish Critical Limits
- **HACCP Principle 4:** Establish Monitoring Procedures
- **HACCP Principle 5:** Establish Corrective Action
- **HACCP Principle 6:** Establish Verification Procedure
- **HACCP Principle 7:** Establish Record Keeping Procedures

How can employees be trained to use HACCP?

Summary
The Hazard Analysis and Critical Control Point (HACCP) system describes a preventative process to reduce the risk of foodborne illness through proper food handling, monitoring of procedures, and record keeping. HACCP is a food safety system that focuses on food. A food safety system should focus on controlling five risk factors. The risk factors are foods from unsafe sources, poor personal hygiene, inadequate cooking, improper holding temperature, and contaminated equipment.

To carry out HACCP successfully, a foodservice operation will need to make an individualized HACCP plan. This plan is developed around seven principles. This chapter presents an introduction and overview of the seven principles of HACCP.

HACCP focuses on prevention of foodborne illness at every step as food flows through the process—from purchasing through serving.

- HACCP helps identify foods and procedures that are most likely to cause foodborne illness.
- HACCP helps develop procedures to reduce the risk of foodborne illness.
- HACCP helps monitor the use of procedures to keep food safe.
- HACCP helps verify that the food served is safe to eat.

Before HACCP can be implemented, every foodservice organization should have basic food safety procedures in place. Using the HACCP principles will improve a food safety program, but HACCP can only be established in a foodservice operation that already has:

- employees who have good personal hygiene,
- a facility that is well designed so it can be kept clean and sanitary,
- vendors who provide safe food when delivered,
- food specifications that require food safety measures,
- a routine cleaning and sanitation program, and
- an equipment maintenance program.

Chapters 1 through 5 provide information that foodservice personnel need to establish basic food safety procedures.
The written HACCP plan for a specific foodservice is developed using the seven basic HACCP principles. To develop the HACCP plan, the foodservice personnel analyze and develop food safety processes beginning with the menu and including the facility and equipment, foodservice processes and operations. A complete explanation of how to develop a HACCP plan is beyond the scope of Serving It Safe, but the seven principles are presented and explained.

**Seven Principles of HACCP**

1. Identify Hazards
2. Identify Critical Control Points
3. Establish Critical Limits
4. Establish Monitoring Procedures
5. Establish Corrective Actions
6. Establish Verification Procedures
7. Establish Record Keeping Procedures

The seven principles of HACCP can be used during the eight-step foodservice process to help prevent foodborne illness. Ways to prevent foodborne illness in each of the eight steps were described in Chapter 5.

**How can the HACCP principles be used to prevent foodborne illness?**

The highest priority for a foodservice manager is the protection of customers by serving safe food. To meet this responsibility, the following tasks are considered best practice.

- Identify the food and procedures that are most likely to cause foodborne illness.
- Develop procedures to reduce the risk of a foodborne illness outbreak.
- Monitor how the procedures are used to keep food safe.
- Verify that the food served is safe to eat.

Using HACCP will help foodservice personnel identify places in the food preparation process associated with potentially hazardous foods where bacterial contamination, survival, and growth can occur. HACCP is based on the understanding that if the raw ingredients are safe and the process is safe, then the finished product is safe.

**HACCP Principle 1: Identify Hazards**

To assess the hazards present at each stage of the preparation process, track each food from purchasing and receiving through serving and reheating.

- Review menus. Identify all potentially hazardous foods on the menu because they are especially vulnerable to food safety problems during the foodservice process. For each food on the menu, think about where and how it could become contaminated (microorganisms, chemical, or physical contaminants) during the foodservice process.
Menu items served on a school menu could be grouped by the way the foods are processed.

**Group 1:** Menu items prepared and served without cooking. School menus include such as items as green salads and other fresh vegetables, meat salads, deli meats, and cheeses.

**Group 2:** Foods that are prepared and cooked just-in-time for service. School menus include such items as hamburgers, hot dogs and corn dogs, pizza, scrambled eggs, and many other items.

**Group 3:** Foods that will be prepared, cooked, held, cooled, reheated, and served. School menus include many items in this group such as scratch-prepared main dishes like spaghetti, tacos, baked turkey, soups, gravies, and sauces.

For each food, ask, “What are the hazards that could cause a foodborne illness in this step?” Be aware that every step may not be present in every food prepared.

- **Step 1:** Purchasing
- **Step 2:** Receiving
- **Step 3:** Storing
- **Step 4:** Preparing
- **Step 5:** Cooking
- **Step 6:** Holding and Serving
- **Step 7:** Cooling
- **Step 8:** Reheating

When a foodservice routinely serves potentially hazardous food, the risk of foodborne illness can be reduced by clearly identifying hazards at each of the eight steps. Where there is a concern for contamination or violation of the time-temperature relationship principle, plan a control measure to keep food out of the temperature danger zone. For example, since tuna salad sandwiches are a potentially hazardous food and must sometimes be transported and held before being served, consider ways to maintain the food at proper temperature.

After the foods on the menu have been surveyed, evaluate general preparation, cooking, chilling, and holding procedures. Next, rank these hazards in terms of severity (how serious are the consequences) as well as probability (how likely are they to occur).

### EXAMPLE

**Chicken Fajitas (USDA Recipe D-40)**

This example describes potential hazards that could cause foodborne illness during the preparing, cooking, holding and serving, and cooling process of chicken fajitas.
PREPARING
What are the hazards that could cause a foodborne illness during this step?
*Answer(s):*
- Improper thawing of chicken
- Improper temperature control of chicken
- Cross-contamination of chicken juices

COOKING
What are the hazards that could cause a foodborne illness during this step?
*Answer(s):*
- Improper cooking — chicken not cooked to required safe internal temperature for appropriate time (165 °F for 15 seconds minimum)
- A thermometer is not used to check temperature

HOLDING AND SERVING
What are the hazards that could cause a foodborne illness during this step?
*Answer(s):*
- Food left in temperature danger zone (41 °F to 140 °F)
- Hand-to-food contact

COOLING
What are the hazards that could cause a foodborne illness during this step?
*Answer(s):*
- Food is not chilled from 140 °F to 70 °F within 2 hours and is not reheated to 165 °F for 15 seconds.
- Food is not placed in shallow pans for rapid cooling.
- A thermometer is not used to check temperature.

REHEATING
What are the hazards that could cause a foodborne illness during this step?
*Answer(s):*
- Food is not reheated to 165 °F for 15 seconds.
- A thermometer is not used to check temperature.
HACCP Principle 2: **Identify Critical Control Points**
Identify the Critical Control Points in the process where hazards can be controlled or prevented. Develop a flowchart or list the steps involved in preparing each potentially hazardous food. Then, identify procedures to prevent, reduce, and eliminate recontamination hazards at each step. The Food Code defines a Critical Control Point (CCP) as a point or procedure in a specific food system where loss of control may result in an unacceptable health risk.

In the example of Chicken Fajitas, control should be achieved over specific steps such as cooking, cooling, holding, and reheating.

HACCP Principle 4: **Establish Critical Limits**
In order to be sure a food passes safely through a critical control point, Critical Limits should be established. These Critical Limits (CL) are standards that are observable and measurable and are usually specified by using temperature and time. Other Critical Limits that might be used include pH, humidity, salt concentration, or available chlorine.

Specify exactly what should be done to meet each particular standard (Critical Limit). For example, instead of stating that a “food must be thoroughly cooked,” the standard should state, “Heat rapidly to a required safe internal temperature of 165 °F for 15 seconds.”

In addition
- Provide food thermometers, teach employee how to calibrate and use them correctly, and ensure that they use them routinely.
- On recipes: (1) indicate end-state cooking, reheating, and hot-holding temperatures; and (2) specific times for thawing, cooking, and cooling foods.
- Provide directions for handling leftovers.
- Schedule sufficient staff in peak hours to prepare and serve foods safely.

HACCP Principle 4: **Establish Monitoring Procedures**
Using the established Critical Limits for your operations, monitor potentially hazardous foods at every step in the foodservice process. Compare what actually happens during the foodservice process with the standards that have been established. Identify any areas of deficiency outside the limits established. The manager should be actively involved in monitoring as well as selecting employees who should be taught on how to monitor.

In the example of the Chicken Fajitas, monitoring a Critical Control Point would be described as, “When the chicken reaches a required safe internal temperature of 165 °F, it is then held in the holding cabinet at or above 140 °F until time for service. The cook has been taught to monitor this product. The internal temperature of the product will be checked and recorded every 30 minutes on the hour and half-hour during holding.”
HACCP Principle 5: Establish Corrective Action
If the Critical Control Point does not meet the pre-determined Critical Limits, corrective action is needed. The corrective action should be pre-determined as part of the HACCP plan for the foodservice organization.

This HACCP principle can be illustrated with the Chicken Fajitas as follows: “When the internal temperature of the Chicken Fajitas is checked every 30 minutes during holding, if the temperature is 140 °F or above, no action is needed. The food is safe to eat. If the temperature is below 140 °F, corrective action is needed. The length of time out of the proper temperature determines the corrective action. The corrective action would be to reheat the Chicken Fajita mixture to 165 °F for 15 seconds and return it to the holding cabinet or place it on the service line.”

Examples of corrective action:

If... Product temperatures are unacceptable when received —
Reject the shipment.

If... Food is contaminated by hands or equipment —
Re-wash fresh, whole fruit/vegetable or discard the food.

If... Temperature is not high enough after cooking —
Continue cooking to the required safe internal temperature for the appropriate time, and then test with a food thermometer.

HACCP Principle 6: Establish Verification Procedure
Verify that the HACCP process in the foodservice works. If an operation does not have documentation that demonstrates effectiveness of these programs and practices, HACCP cannot be implemented. Below are some ways to verify the HACCP process is effective.

- Be alert to how often corrective actions are needed. If corrective actions are needed frequently, this may indicate a need to change, or at least fine — tune, the HACCP system.
- Think of tests that can be done, like measuring the strength of the sanitizing solution with a sanitizer test strip. Also, examine records and make sure employees are entering actual, valid data.
- Use the routine inspection by the State public health department to provide an assessment of whether the HACCP process is working.
HACCP Principle 7: *Establish Record Keeping Procedures*

Establish a record keeping system to document the HACCP process and monitor results. This may be any simple, quick system, such as a printed temperature forms in which employees can record their compliance with standards at Critical Control Points.

Written records are extremely important and may provide proof that a foodborne illness did not originate in the kitchen. Records will also help continue to improve sanitation procedures and the HACCP system.

The example below describes how HACCP principles can be applied to prevent foodborne illness in each of the eight steps of the foodservice process. For each step, HACCP Application Points are described. Read the example to see how this kind of process could be helpful in a school kitchen to ensure safe food preparation and service. Each HACCP Principle may not be present in every step.
**PURCHASING**

Purchase frozen chicken pieces from a reputable supplier who runs a safe and sanitary operation.

**HACCP Application**

**Principle 1: Identify Hazards** — Determine whether the supplier runs a safe and sanitary operation.

**RECEIVING**

When frozen chicken is unloaded from the truck, make sure it is frozen hard. The chicken should be rejected if there is any evidence of thawing (softness or fluids in the case) or evidence it has been refrozen (excessive ice crystals).

**HACCP Application**

**Principle 1: Identify Hazards** — Visually assess whether the frozen chicken meets safe food requirements.

**Principle 3: Establish Critical Limits** — The chicken should be frozen solid with no visual evidence of previous thawing.

**Principle 4: Establish Monitoring Procedures** — Employee responsible for receiving should document that the chicken is frozen solid with no visual evidence of previous thawing.

**Principle 5: Establish Corrective Action** — If chicken is partially thawed or the box shows evidence of partial thawing and refreezing, the chicken should be rejected.

**STORING**

Store the chicken in the refrigerator to maintain a required safe internal temperature at 41 °F or below while it thaws. Thaw on a shelf below prepared or ready-to-eat foods.

**HACCP Application**

**Principle 2: Identify Critical Control Points** — Refrigerated storage

**Principle 3: Establish Critical Limits** — The required safe internal temperature of the thawed chicken should be at or below 41 °F.

**Principle 4: Establish Monitoring Procedures** — Monitor the internal temperature of the thawed chicken.
PREPARING
Wash hands before and after handling the chicken. Coat the chicken in breading immediately before cooking.

HACCP Application:
Principle 2: Identify Critical Control Points — Refrigerated storage

Principle 3: Establish Critical Limits — The required safe internal temperature of the thawed chicken should be at or below 41 °F.

Principle 4: Establish Monitoring Procedures — Monitor the internal temperature of the thawed chicken.

COOKING
Cook the chicken in the oven to a required safe internal temperature of 165 °F for 15 seconds.

HACCP Application
Principle 2: Identify the Critical Control Points — Cooking process

Principle 3: Establish Critical Limits — The required safe internal temperature of the cooked chicken should be at or above 165 °F for 15 seconds. If the chicken is not at this temperature, continue cooking until the temperature is reached for the required time.

Principle 4: Establish Monitoring Procedures — Monitor the internal temperature for 15 seconds.

HOLDING AND SERVING
Hold the chicken on a service line or a holding cabinet at a required safe internal temperature of 140 °F or above. When serving, use tongs or gloved hands to avoid touching the chicken with bare hands.

HACCP Application
Principle 2: Identify Critical Control Points — Holding and Serving process

Principle 3: Establish Critical Limits — The required safe internal temperature of the cooked chicken should be at or above 140 °F.

Principle 4: Establish Monitoring Procedures — Monitor the internal temperature every 30 minutes during holding and serving.
**COOLING**

Cool leftover chicken in the refrigerator in a shallow container to a required safe internal temperature of 41 °F or less.

**HACCP Application**

**Principle 2: Identify Critical Control Points** — Chilling process

**Principle 3: Establish Critical Limits** — Chill cooked hot food from 140 °F to 70 °F within 2 hours and from 70 °F to 41 °F in an additional 4 hours for no more than a total cooling time of 6 hours. If the food has not reached 70 °F within 2 hours, it must be reheated immediately to 165 °F for 15 seconds.

**Principle 4: Establish Monitoring Procedures** — Monitor the internal temperature at the stated time intervals.

**REHEATING**

Reheat to a required safe internal temperature of at least 165 °F.

**HACCP Application**

**Principle 2: Identify Critical Control Points** — Reheating process

**Principle 3: Establish Critical Limits** — Reheat to a required safe internal temperature of at least 165 °F for 15 seconds.

**Principle 4: Establish Monitoring Procedures** — Monitor the internal temperature for 15 seconds.

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**How can employees be trained to use HACCP?**

Foodservice employees should be trained on all aspects of safe food handling. Using the HACCP process is an added way to ensure optimal food safety. Contact the State or local public health department for further information on implementing HACCP.