



Food Safety, Foodborne Illness & Kitchen Sanitation

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Introduction

Overview and Course Objectives

Welcome to **Food Safety, Foodborne Illness & Kitchen Sanitation**.

As a school employee, you need to understand the importance of your role in protecting yourself and the students. This course provides strategies for reducing the potential for illness from two ways food illnesses can spread: food-to-human infection and human-to-human infection.

Foodborne illnesses affect the health of students and staff, causing symptoms that range from mild discomfort to chronic illness and death. If either students or staff become ill with a foodborne illness, they are likely to miss school.

By minimizing potential outbreaks, a food-safe school can prevent lawsuits and loss of reputation. Emphasized in the course is the fact that handwashing is one of the most important means of preventing the spread of infectious illnesses.

As you continue in this course, know that the term “food” refers to anything that is intended for consumption — both food and drink.

Course Objectives

After successfully completing this course, you will be able to:

- List four common foodborne illnesses
- Explain the importance of a Food Safety Program and its required components
- Describe how to safely receive food item deliveries
- Discuss ways to prepare and handle food safely, including keeping food out of the temperature danger zone and how to properly label foods
- Describe the elements of personal hygiene, handwashing, and proper cleaning and sanitizing procedures
- List the food service documentation that must be maintained

Legal Responsibilities

Guidelines and Inspections

All schools participating in the National School Lunch and/or School Breakfast Program are required to implement a Food Safety Program, per the Child Nutrition and WIC Reauthorization Act of 2004, reauthorized in 2010. This Food Safety Program must conform to the principles of Hazard Analysis and Critical Control Point (HACCP) and guidelines issued by the U.S. Department of Agriculture (USDA).

The increased media and public interest in the safety of school meals, has caused Congress to establish inspections and statutory requirements.

The legal requirements include:

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- Have two food safety inspections per year.
- Post the inspection reports.
- Release the inspection reports to the public.

The content of the inspections is determined by the state or local public health agency, and the data is reported to the USDA. Normally, two inspections are conducted per year.

As food service staff, you should be familiar with your roles and responsibilities in complying with these requirements.

Common Foodborne Illnesses

Spread and Symptoms

There are two ways foodborne illnesses can spread: food-to-human infection and human-to-human infection.

Food-to-human infection may be the result of improper cooking. Human-to-human infection may result from lack of handwashing or personal hygiene, which can also contaminate food and then infect persons who consume that food.

Foodborne illnesses can be caused by harmful pathogens or toxins. Harmful pathogens — such as bacteria, viruses, or parasites — can cause more than 250 different kinds of foodborne illnesses.

There are many different symptoms that can indicate an infection. Symptoms may include one or more of the following:

- nausea
- diarrhea
- vomiting
- abdominal cramps

Harmful Pathogens

As a school foodservice employee, it is important for you to be familiar with the most commonly-recognized foodborne infections.

Campylobacter

Campylobacter is the most commonly identified cause of bacteria-inducing diarrhea throughout the world. Infection often comes from eating undercooked chicken or food that has been contaminated by juices from raw chicken. Symptoms include fever, diarrhea, and abdominal cramps.

Salmonella

Salmonella can be traced to poultry, but can come from mammals and reptiles. It normally produces similar symptoms to campylobacter; however, the infection can be life-threatening if it passes into the bloodstream, which is bad for persons with weakened immune systems.

E. coli O157:H7

E. coli O157:H7 is most often traceable to beef and other livestock products. Symptoms can be severe, including: bloody diarrhea and painful abdominal cramps; there's generally not much fever.

Norwalk-like virus (calicivirus)

Norwalk-like virus (calicivirus) often goes undetected due to the requisite laboratory test availability. Unlike other common foodborne infections that typically pass to the host as a result of consuming contaminated food or drink, Norwalk-like virus is usually spread from person-to-person contact or from person-to-food. Symptoms last approximately 48 hours and include diarrhea and vomiting.

Harmful Toxins

Though pathogens are the most common cause of foodborne illness, not every case of foodborne illness is caused by pathogens. Toxins in the food can also lead to serious symptoms of foodborne illness. Toxins can be caused by toxin-producing microbes, man-made chemicals, and natural organisms.

Toxin-producing microbes occur in staphylococcus aureus and botulism. Staphylococcus aureus, a bacterium, can grow in some foods and produce a toxin that produces intense vomiting. Botulism, a deadly, rare disease, can be traced to paralyzing toxins produced by clostridium botulinum bacteria in food. It should also be noted that toxins can remain in food, even after the microbes are removed.

Man-made chemicals include pesticides and other harmful chemicals that may be absorbed by food sources and then consumed by unsuspecting children.

Certain natural organisms, such as particular species of mushrooms or fish, can lead to food poisoning.

Diagnosis and Medical Treatment

Initially, a foodborne illness may produce no immediate symptoms. This is because of the incubation period of the organism. The onset of symptoms may be delayed as little as a few hours to as long as several days, depending on the type of pathogen and the concentration of pathogens in the food.

Many foodborne pathogens can produce similar symptoms — like nausea, diarrhea, and abdominal cramps. Determining which pathogen is responsible can be very difficult without laboratory tests.

Medical Treatment

Because foodborne illnesses can quickly lead to dehydration and other complications, it is important to seek medical help, as soon as possible, if the onset of diarrhea symptoms is accompanied by:

- a high fever (oral temperature over 101.5° F)
- bloody stools
- severe vomiting (i.e., if even liquids are rejected)
- signs of dehydration (e.g., infrequent urination, dry mouth and throat, dizziness)
- diarrhea lasting more than 3 days

A doctor may not prescribe an antibiotic for a foodborne illness, especially if it is caused by a virus rather than bacteria. Even mild bacterial infections may not require antibiotics, if it is believed the person's health will improve in two or three days. One reason for this is so that the bacteria will not have a chance to develop a resistance to the antibiotics, which can have serious long-term effects.

Regardless, of whether antibiotics are prescribed, however, the illness should be taken seriously, and measures should be taken to prevent the symptoms from causing further complications, such as dehydration, and to prevent spreading the illness to others, such as through handwashing.

Food Safety Program

Purpose of a Food Safety Program

Schools are required by law to have a Food Safety Program, if they are participating in the National School Lunch and/or Breakfast Program. It is important to glimpse a broad overview of the purpose and scope of a Food Safety Program so that it is easier to understand how all the individual elements fit together.

The purpose of a school Food Safety Program is to ensure the delivery of safe food to children in the school meals programs, by controlling hazards that may occur or be introduced into foods anywhere along the process, from receiving to service — in other words, during the food flow.

An effective Food Safety Program will help control food safety hazards in the delivery process of food service, including:

- receiving
- storing
- preparing
- cooking
- cooling
- reheating
- holding
- assembling

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- packaging
- transporting
- serving

Legal Requirements

In accordance with USDA guidance, a school Food Safety Program must be based on written documents of at least two types.

The first written document is Standard Operating Procedures (SOPs). These documents specify safety. The SOPs are specific to the school or food prep site's own facilities and must conform to state and local requirements.

The second written document is a Food Safety Plan. This document provides an overall picture of the school's Food Safety Program strategy and how it is implemented. It must include:

- menu items
- critical control points of food production
- corrective actions (i.e., what secondary safety measures should be implemented)
- record logs (e.g., temperature logs, cleaning & sanitizing log, etc.)
- Food Safety Program assessment

Note that, per the USDA, critical control points are "points in food preparation and processing where controlling a step (such as cooking) is essential to assure food safety."

Three-Pronged Approach to Food Safety

There are essentially three components that must be implemented in a Food Safety Program: sanitation, temperature control, and standard operating procedures.

Sanitation means that all surfaces that may come into contact with food, including kitchen counters, equipment, cafeteria tables, workers' hands, and utensils, should be kept clean and sterilized.

Temperature control calls for cold foods and hot foods to stay at appropriate temperatures, from the moment they are received, to when they are served. It is important to record cooking, storage, and serving temperatures.

Standard Operating Procedures (SOPs) make explicit, with specific instructions, how food-related tasks, such as cooking and storing food, will be performed.

Ongoing Assessment

The final, critical element for an effective Food Safety Program is continual improvement — a Food Safety Program is not static. In order for it to be effective, the program must be assessed at least monthly.

Several program elements must be evaluated, such as:

- employees' compliance with the food safety SOP
- the overall effectiveness of the Food Safety Program
- any cases of illness or incidents that occurred since the implementation of the Food Safety Program
- new federal, state, or local regulations that require changes to the program
- new food safety research that may require revisions to SOPs
- any new food or drink items incorporated into the menu
- any new equipment
- any staff changes
- any facility changes

Receiving Deliveries

SOPs for Deliveries

Establishing SOPs for receiving deliveries will help ensure that no contamination enters the food cycle. The USDA recommends that an SOP for deliveries specify:

- **Training:** All workers assigned to receive deliveries must be properly trained.
- **Delivery schedule:** The deliveries schedule should be standardized so that food is delivered at set times.
- **Notification:** Information should be posted and shared with all food service employees.
- **Rejection policy:** A written rejection policy should be available, to ensure quality standards.
- **Organization:** Freezer and refrigeration space, loading docks, and store rooms should all be kept organized. This should especially be checked before deliveries arrive.
- **Materials:** All materials needed at the time of deliveries should be readied prior to delivery. This includes product specification lists, purchase orders, temperature logs, calibrated thermometers, pens, flashlights, and clean loading carts.
- **Cleanliness:** The receiving area should be kept clean and well-lit.
- **No bare-handed handling:** Ready-to-eat foods should never be touched with bare hands.
- **Date foods:** All foods must be dated with the date of arrival or "use-by" date upon receipt.
- **Double-check delivery:** The delivery invoice should be checked to make sure products delivered match exactly what was ordered.
- **Quick transfer:** Upon delivery, foods should be moved as quickly as possible to storage locations.

Rejecting Food Items

An SOP for receiving deliveries should also make explicit what criteria is used to determine an acceptable condition.

It is important for you to check the condition of food items. If certain signs of potential health risks are noted, those food items should be rejected.

You should reject food items if:

- the food item has expired
- packaging is torn
- frozen foods show signs of previous thawing
- the temperatures are outside of the safe temperature zone
- canned goods have swollen sides or ends, flawed seals or seams, dents, or rust
- the item does not pass the facility's established criteria

Food Preparation

Safe Food Preparation

Safe food preparation is critical to ensuring that the foods served have no potential to cause foodborne illness. The first step is to go through the menu and assess each item, one-by-one. For each menu item, you will need to decide which preparation process it involves, and then which practical steps to implement to keep it hot or cold while it is being stored, prepared, transported, held, and served.

The preparation process for each item will involve preparing the food according to the following processes:

- **Process Type 1 (No Cooking):** food is kept cold from preparation through service
- **Process Type 2 (Same-Day Service):** food is prepared hot and served the same day hot
- **Process Type 3 (Complex Food Preparation):** food is prepared hot and served cooled, or possibly reheated

Here is a sample of the proper steps in food preparation for each of the three processes. These steps include receiving, storing, preparing, cold holding, cooking, cooling, reheating, hot holding, and serving, though not every step applies to all three processes.

Be sure to view the course Resources for a more in-depth view of this table.

Danger Zones

In order to protect foods from any hazards, it is important for you to keep hot foods hot and cold foods cold.

It is most important to keep food out of the temperature danger zone. The danger zone exists from 41°F to 135°F.

The primary difference between the three food preparation processes is how many times the food passes through the danger zone during the preparation process.

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Process Type 1 (No Cook): During preparation, the food does not pass completely through the danger zone in either direction; in other words, food temperature does not rise above 41°F.

Process Type 2 (Same-Day Service): During preparation, the food makes one complete trip through the danger zone; that is, food temperature rises above 41°F and/or drops below 135°F.

Process Type 3 (Complex Food Preparation): During preparation, food goes through both heating and cooling, taking two or more complete trips through the danger zone; that is, food temperature rises above 41°F and drops below 135°F multiple times.

Satellite Kitchens and Leftovers

In some school districts, food may be prepared at one location, such as a central kitchen, and then delivered for consumption to another, such as a satellite kitchen. In such a situation, you must take extra care to ensure that the food stays at a safe temperature at all times, from delivery until it is served. Both the central kitchen and the satellite kitchen are responsible for adhering to SOPs.

If state or local authorities permit the use of leftovers, specific SOPs for preparing leftovers must be established. Generally, the preparation process for leftovers will be categorized as Process Type 3, because the food has most likely been cooked and cooled prior to being stored and used again.

Food Temperature

Proper Cooking Temperatures

One way of preventing foodborne illness is by making sure all foods are cooked to the appropriate internal temperature. State or local health departments may specify certain food temperatures.

The Food and Drug Administration (FDA) has specific guidelines. The following foods must meet the listed temperatures for the time indicated.

- 165°F for 15 seconds
- 155°F for 15 seconds
- 145°F for 15 seconds
- 135°F for 15 seconds

Reheating

In the process of reheating, food may be brought into the temperature danger zone. For this reason, it is important that policies be in place to control the risks, especially when leftovers are reheated.

When you reheat food in a microwave, it is important to rotate or stir and cover foods. This provides for better heat distribution. Also, after heating in a microwave, you should set food aside for 2 minutes before serving.

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If an oven is used for reheating, it is important that you do not let the food sit in the oven too long. The total time at which the food may remain within the danger zone (41°F to 165°F) must not be longer than 2 hours.

Local or state health departments may have specific reheating policy requirements.

Per policies, the following foods must meet the listed temperatures for the time indicated.

- 135°F for 15 seconds
- 165°F for 15 seconds

Cooling Procedures

When cooling food, the goal is to minimize the amount of time the food spends in the danger zone. To lower food temperature safely, it is important to:

- place food in shallow containers (no more than 4 inches deep) and uncovered on the top shelf, in the back of a walk-in or reach-in cooler
- use a quick-chill unit, like a blast chiller
- stir the food in a container, placed in an ice water bath
- add ice as an ingredient
- separate food into smaller or thinner portions
- pre-chill ingredients and containers used for making bulk items like salads

For cold, prepared, ready-to-eat foods, such as tuna salad or fruit, the food should be chilled from 70°F to 41°F or below, within 4 hours.

For cooked hot food, the food should be cooled from 135°F to 70°F, within 2 hours, and from 70°F to 41°F or below, within 4 hours. The total cooling process from 135°F to 41°F may not exceed 6 hours.

Safe Temperatures for Serving and Refrigeration

The serving temperature of food is the final checkpoint for verifying food temperature before consumption, and as such it is an important step that is all too often overlooked, since the food is considered finished.

The main safety goal in terms of food temperature at this stage is for you to minimize the potential for food temperature to fall within the danger zone.

Thus, hot foods should be held at 135°F or above before serving, and cold foods should be held at 41°F or below. Steam tables and hot boxes should be preheated to ensure that hot food stays hot.

When stored, at all times, you must keep cold foods below 41°F in a clean, sealed environment. An employee should be assigned to check refrigerators daily to verify that foods are labeled with the correct date and that any foods older than 7 days are discarded.

Food Labeling

Labeling Requirements and Procedures

Food labeling is an important part of ensuring food safety and minimizing the risk of foodborne illness. A school foodservice facility should have an established date marking system, and all employees should be trained in labeling requirements and procedures.

Food items should be labeled to show the product name and the day or date and time it is prepared or opened.

Procedures for labeling food properly include: labeling ready-to-eat, potentially hazardous foods prepared on-site and held for more than 24 hours; and affixing an additional label on leftover food with date prepared, date frozen, and date thawed.

Hygiene

Hygiene and Handwashing Requirements

In order to keep food from being contaminated, all foodservice employees should:

- receive training on food safety
- be in good health, clean, and dressed in clean attire whenever they are working
- change their apron when it becomes soiled
- wash hands properly, frequently, and at the appropriate times
- keep fingernails trimmed, filed, and maintained so that the edges are cleanable
- avoid wearing artificial fingernails and fingernail polish
- not wear any jewelry
- treat and bandage wounds and sores immediately; when hands are bandaged, single-use gloves must be worn
- cover a lesion containing pus with a bandage; if the lesion is on a hand or wrist, cover with an impermeable cover or single-use glove
- do not eat, drink, use tobacco, or chew gum where food or contact surfaces may become contaminated
- wear hair restraints where food or contact surfaces may become contaminated

Handwashing

According to The Centers for Disease Control and Prevention (CDC), handwashing is "the single most important method of preventing infectious diseases."

As such, you should wash your hands:

- before starting work
- when moving from one food preparation area to another
- before putting on or changing gloves
- after using the bathroom

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- after sneezing, coughing, or using a handkerchief or tissue
- after touching your hair, face, or body
- after handling raw meats, poultry, or fish
- after smoking, eating, drinking, or chewing gum or tobacco
- after any clean-,up activity such as sweeping, mopping, or wiping counters
- after touching dirty dishes, equipment, utensils, trash, or money
- after any time your hands may have become contaminated

Hand sanitizers should not be considered a substitute for handwashing. They should only be used after your hands have been properly washed and dried.

Food Handling

Food Washing and Using Utensils

When you are preparing fruits and vegetables, there are several important considerations:

- Wash your hands before handling fruits and vegetables.
- Use a designated brush for scrubbing, if the fruit or vegetable has a firm surface.
- Wash fruits and vegetables thoroughly before combining with other ingredients.
- Wash food items under running water.
- When washing lettuce or cabbage, remove and throw away the outer leaves.
- If fruits and vegetables are packaged and labeled as being previously washed and ready-to-eat, they are not required to be washed.

When using utensils for food item preparation:

- Your hands should always be washed thoroughly before working with food, even when utensils are used.
- Never use your bare hands to handle ready-to-eat foods.
- Use a clean, sanitized utensil for food preparation.
- Never use a utensil for more than one kind of food item .

Food Cutting and Tasting

When cutting foods, you must be sure to:

- remove any damaged or bruised areas
- label, date, and refrigerate fresh-cut items
- discard cut melons older than 7 days, even if held at 41°F or below

If it is necessary for you to taste food prior to serving, you should:

- place a small amount of the food to be tasted into a separate container
- step away from exposed food and food contact surfaces
- use a clean teaspoon to taste the food

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- take the used teaspoon and container to the dish room
- wash hands immediately

Cleaning and Sanitizing

Hazardous Chemicals

There are three primary food safety concerns in the area of cleaning and sanitizing:

- making sure chemicals are strong enough to kill harmful pathogens
- making sure chemicals pose no human hazard
- isolating the chemicals from food

Procedures your school must follow for using hazardous chemicals safely include:

- providing training for foodservice employees; training should include proper use, storage, and first aid for chemical test kits
- designating a location for storing the safety data sheets (SDS)
- mixing, testing, and using sanitizing solutions, as recommended by the manufacturer, state, or local health department
- using the appropriate chemical test kit to measure the concentration of sanitizer each time a new batch of sanitizer is mixed
- following manufacturer's directions for specific mixing, storing, and first aid instructions on chemicals
- never using chemical containers for storing food or water

Recordkeeping

Documents and Recipes

Documenting kitchen activities is a critical aspect of food safety. Nearly every procedure regarding food safety requires a minimal amount of documentation, from the temperature and length of time for which food was cooked, to a dated inventory record of shipping and receiving food items.

Documents you need to keep on file include:

- food safety plan
- records documenting the SOPs
- time and temperature monitoring records
- corrective action records
- verification or review records
- calibration records
- training logs
- receiving logs

Recipes are also a form of records that must be maintained. Following a written recipe can standardize food preparation and can ensure that foods are prepared in accordance with food safety guidelines.

Conclusion

Summary and Implications

Thank you for completing **Food Safety, Foodborne Illness & Kitchen Sanitation**. This course focused on ways of enhancing food safety in school environments.

As a school employee, you must always protect yourself and the students. As such, you must know how to recognize symptoms of foodborne illness and understand how they can affect student and employee attendance.

This course included important strategies for reducing the potential for illness. By minimizing potential outbreaks, a food-safe school can prevent lawsuits and loss of reputation. Handwashing is one of the most important means of preventing the spread of infectious illnesses, but other important strategies you learned include implementing a Food Safety Program, proper procedures for receiving deliveries, food preparation and storage, and cleaning and sanitizing. Finally, you learned the importance of proper recordkeeping.

Resources

Many important points were covered in this course. Review the main points here, and if necessary, select the Table of Contents to review any lessons before taking the test.

Legal Responsibilities	<ul style="list-style-type: none">• What are the three legal requirements for a Food Safety Program?
Common Foodborne Illnesses	<ul style="list-style-type: none">• What are the two ways foodborne illness can be spread?• What are four common foodborne illnesses?
Food Safety Program	<ul style="list-style-type: none">• What is the purpose of a Food Safety Program?• What two written document types must a Food Safety Program be based on?
Receiving Deliveries	<ul style="list-style-type: none">• What does the USDA-recommend that SOPs for food delivery specify?
Food Preparation	<ul style="list-style-type: none">• What are the three food preparation process types?• What is the food temperature danger zone?
Food Temperature	<ul style="list-style-type: none">• What are the temperature and time guidelines for cooking, reheating, and cooling foods?
Food Labeling	<ul style="list-style-type: none">• How should food items and leftovers be labeled?
Hygiene	<ul style="list-style-type: none">• What are the handwashing and hygiene requirements for foodservice employees?
Food Handling	<ul style="list-style-type: none">• What are the important considerations for preparing fruits and vegetables and using utensils for food preparation?
Cleaning and Sanitizing	<ul style="list-style-type: none">• What are the three primary food safety concerns in the area of cleaning and sanitizing?
Recordkeeping	<ul style="list-style-type: none">• What documents must be kept on file for kitchen activities?

Supporting Materials

National Center for Immunization and Respiratory Diseases: Division of Bacterial Diseases (NCIRD). (Oct 2005). Foodborne Illness: Frequently Asked Questions.

<https://www.cdc.gov/foodsafety/foodborne-germs.html>

National Coalition for Food Safe Schools (NCFSS). Food-Safe Schools: Needs Assessment and Planning Guide. <http://www.foodsafeschools.org>

U. S. Department of Agriculture (USDA). (June 2005). Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP

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Principles. <https://www.fns.usda.gov/guidance-school-food-authorities-developing-school-food-safety-program-based-process-approach-haccp>

Subject Matter Expert

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