Food Safety Is Everybody's Business

Your Guide to Preventing Foodborne Illness
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INTRODUCTION

This manual is based on the FDA Food Code. It does not cover every topic included in the Code, but contains the core concepts that are most relevant to food workers. You should work closely with the Person in Charge (PIC) to make sure they understand how to best implement proper food safety practices at your workplace. If you have specific questions about your operation, job requirements or specific food handling procedures, contact your local Environmental Health department. They can also assist with any questions surrounding certification/licensing at your workplace.

Thank you.

You are one of the most important links in the food safety chain. What you do and don’t do are equally critical to the safety of the food at your work. If you study this material carefully, you will be prepared to take your place in making our nation’s food safe for consumers.

We appreciate that you are taking an active role in learning to prepare and serve safe food. As a food worker, you will be making food for other people. They trust you to do all that you can to keep their food safe. It is your responsibility to safely prepare and serve food to them so they will not get sick. This manual will give you tips to safely store, prepare, and serve food at work and home.
LEARNING OBJECTIVES

This manual is divided into two parts:
Part 1  Introduction to foodborne illness
Part 2  How to keep food from causing illness

By the time you have finished this manual you will:
1. understand that there are many causes of foodborne illness
2. be able to identify the importance of clean hands and healthy food workers
3. know how avoiding the Danger Zone helps prevent foodborne illness
4. learn several tips to help you remember food safety basics
5. recognize your responsibilities as a food worker

Food safety knowledge can help you protect yourself and others. Please use what you learn from this manual and apply it at your workplace and in your home. If you have any additional questions, please call your local health department.

Remember, when you use proper food safety practices you are the most important ingredient in safe food. Become a part of the food safety team.
**PART 1: FOODBORNE ILLNESS**

Foodborne illness does not just happen at restaurants. Anyone who handles food can spread illness, from grocery clerks to cooks at casual parties.

People can get sick if the food they eat has harmful chemicals or germs. This is called foodborne illness. Most foodborne illnesses are either food poisonings or foodborne infections.

When people talk about foodborne illness, they often call it food poisoning. Chemicals, poisons, bacteria, or certain foods like poisonous mushrooms can cause food poisoning. Symptoms of food poisoning are usually noticed within hours after eating and often include vomiting.

Germs that cause foodborne illness are usually bacteria, viruses, or parasites.

The most common foodborne illnesses, however, are not caused by food poisoning. They are foodborne infections caused by germs that grow in food or inside of our bodies. Symptoms of foodborne infections include diarrhea, vomiting, fever, headache, and stomach aches. Symptoms may be noticed from several hours to several weeks after eating the food.

In the U.S., the Centers for Disease Control estimates that about 48 million Americans get sick, 128,000 are hospitalized and about 3,000 die each year from unsafe food. Following the food safety practices in this manual can help you prevent the most common causes of foodborne illness.

**PERSON IN CHARGE**

A person at each establishment must be in charge for all hours of operation. This “person in charge” must make sure all food safety steps are followed. He or she must know the Food Code and procedures used in the establishment. If you have questions, ask this person. If you are the person in charge, you should be able to give food workers training or information needed to perform their jobs correctly.
HIGHLY SUSCEPTIBLE POPULATIONS

Although anyone can get sick from food handled unsafely, some people are more likely to get sick or get sicker than others. These people are called the Highly Susceptible Population.

They are:

In order to remember the people in the group, the group is sometimes called by the name YOPI.

1. Younger than 5 years old
2. Older than 65 years old
3. Pregnant
4. Immune-compromised (due to cancer, AIDS, diabetes, certain medications, or other conditions)
Certain foods are more likely to cause foodborne illness in highly susceptible people. These foods include:

- undercooked meats
- raw oysters
- undercooked eggs
- sprouts
- unpasteurized milk or juices

Facilities like hospitals, child care centers, preschools, nursing homes, and adult care homes that provide food and services to a Highly Susceptible Population have additional food safety requirements. Several of these requirements are highlighted in this manual. For more information, talk to the person in charge or call your local health department.
HAZARDS IN FOOD

The goal of food safety is to prevent the hazards that cause foodborne illness or injury. Most of the hazards in food are things you cannot see, smell, or taste. A foodborne hazard is a physical, chemical, or biological object in food or drink that can cause injury or illness. Most foodborne illnesses are caused by biological hazards (germs).

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Examples</th>
<th>It happens...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Hard or soft objects in food that can cause injury. Examples include broken glass, jewelry, adhesive bandages, staples, and fingernails.</td>
<td>Several staples were found in a birthday cake from a bakery in Eastern Colorado. The cake was prepared below papers stapled to a memo board.</td>
</tr>
<tr>
<td>Chemical</td>
<td>Poisonous substances that occur naturally or are added during food handling. Examples include cleaning agents, pesticides, and certain metals.</td>
<td>Due to a broken valve in a soda machine, several Western Wisconsin customers got copper poisoning within minutes after drinking soft drinks.</td>
</tr>
<tr>
<td>Biological</td>
<td>Germs that cannot be seen without a microscope. Examples include parasites, bacteria, and viruses.</td>
<td>Several customers became infected with hepatitis A after eating sandwiches prepared by an ill food worker in Western Oregon.</td>
</tr>
</tbody>
</table>
PHYSICAL HAZARDS

Physical hazards are objects in food that may cause injury if eaten. Physical hazards usually happen because of unsafe food handling practices or accidental contamination. To prevent physical contamination:

- Look closely at the foods you prepare.
- Wash fruits and vegetables carefully.
- Keep the food preparation area free of things that can fall into the food.

CHEMICAL CONTAMINATION

Chemicals may cause foodborne illness if they get into food. All chemicals such as soaps, cleaners, sanitizers, and pesticides must be stored away from food, utensils, and food preparation areas.

If a chemical needs to be stored in the kitchen area, the chemical must be stored below food and food-contact surfaces so that it cannot drip onto food. If a chemical is not needed in the establishment, then that chemical should not be there at all.

All chemical containers must have easy-to-read labels and easy-to-follow directions.
Galvanized containers have a layer of zinc to minimize rust. They should not be used to store food.

Food Storage Containers

Some containers are not approved for food storage. You cannot use garbage bags, galvanized cans, and containers once used for chemicals to store food. Food must not be stored in these containers because chemicals can get into the food.

To keep your food safe from chemicals:
- only keep chemicals in the establishment that are approved for use near food
- store all chemicals below or away from food and work surfaces
- label all chemical containers
- only use approved containers to store food
- make sure equipment is working properly
- make sure food is protected when you clean the kitchen

BIOLOGICAL CONTAMINATION

We live in a world with lots of germs. Most germs are good for us, but some can make us sick. This manual focuses on the harmful germs that cause most foodborne illnesses: parasites, viruses, and bacteria.

Parasites

Parasites in food are usually tiny worms that live in fish, pork, or meat. They can be killed if frozen or cooked to the right temperatures.

Different kinds of parasites may be found in contaminated water.

To keep your food safe from parasites:
- cook all pork, beef, and fish to the proper temperatures
- use fish that has been treated to kill parasites for raw dishes like sushi
- use only approved sources of water
Viruses

Although viruses are small, it only takes a few to make you sick. Unlike parasites, viruses are not destroyed by freezing. We've all had an illness from a virus. Chickenpox, the common cold, and influenza are all caused by viruses spread from people coughing or sneezing. The viruses that we get through food usually come from the unclean hands of someone that touched our food. Unfortunately, the person’s hands were probably not washed well enough to remove germs from coughing, vomit, or contact with feces. We call it the fecal-oral route of transmission. Everyone else calls it gross.

As gross as it might be, you’ve probably heard of a few of the viruses spread this way, like hepatitis A and Norovirus. To prevent these common illnesses, you must be careful about personal hygiene, especially when working with food.

To keep your food safe from viruses:

- do not work with food when you have diarrhea, vomiting, or fever
- wash your hands twice after using the toilet once in the restroom, and then again when you get back in the kitchen
- use gloves or utensils instead of bare hands when handling ready-to-eat food

Bacteria

Unlike viruses, bacteria can grow in food. They are found everywhere and can grow when you are not careful about time, temperature, and cleanliness. Bacteria can spoil food or cause foodborne illness. Bacteria that cause foodborne illness come from sources like soil, animals, raw meat, and people. Although they can come from lots of places, these bacteria usually only grow in certain foods. These foods are called potentially hazardous foods.

You will find a list of potentially hazardous foods on the next page.
POTENTIALLY HAZARDOUS FOODS

Potentially hazardous foods include:

Animal Products

- Meat, fish, poultry, seafood, eggs
- Dairy products

Cooked Starches

- Cooked rice, beans, pasta, potatoes

Fruits and Vegetables

- Cooked vegetables
- Tofu
- Sprouts (such as alfalfa or bean sprouts)
- Cut melons
- Garlic or herbs bottled in oil
To keep your food safe from bacteria:

- keep potentially hazardous foods out of the Danger Zone (41°F-140°F)
  
  *Note*: Effective with FDA Code 2009, Danger Zone changes to (41-135 degrees F)

- do NOT work with food when you are ill (diarrhea, vomiting, or fever)

- wash your hands twice after using the toilet: once in the restroom, and then again when you get back in the kitchen

- use gloves or utensils instead of bare hands when handling ready-to-eat food
  
  *Note*: Bare hand contact with ready-to-eat foods may be allowed in some jurisdictions.

- wash, rinse, and sanitize all equipment used for food preparation

Keep potentially hazardous foods HOT or COLD to keep bacteria from growing.
PART 2: THE TOP 3 FOOD SAFETY DEFENSES

PREVENTING ILLNESS

Now that you know germs cause most foodborne illnesses, let’s talk about what you must do to keep germs from causing illness through food. Since people cannot usually see, smell, or taste the presence of germs in food, it is important to practice food safety even when the food looks fine.

The next few pages will go over the top three food safety concepts — personal hygiene, temperature control, and cross contamination — that must be combined to keep food safe from germs.

THE TOP 3 FOOD SAFETY DEFENSES

- Food workers with good personal hygiene
- Food cooked to or held at correct temperatures
- Prevention of cross contamination
DEFENSE #1: PERSONAL HYGIENE

Even if you look and feel healthy, you may accidentally spread harmful germs to food if you do not have good hygiene. With good personal hygiene you help keep germs from getting into food. Proper food worker hygiene includes:

- not working with food when you are sick
- washing your hands the right way and at the right times
- using clean gloves and utensils when handling food
- keeping fingernails trimmed so hands can be more easily cleaned

FOOD WORKER HEALTH

A healthy food worker is one of the most important factors in preventing foodborne illness. When you feel sick, you should not work with food. The germs making you sick may be spread to the food and then to other people.

TOO SICK TO WORK WITH FOOD

You must not work with food if you have:

1. diarrhea, vomiting, or jaundice
2. diagnosed infections that can be spread through food such as Salmonella, Shigella, E. coli, or hepatitis A
3. infected, uncovered wounds
4. continual sneezing, coughing, or runny nose

You must tell the Person in Charge when you are sick. If you are sick, you should go home. If you cannot go home when you may be given duties that do not involve handling food or clean food-contact surfaces. These other duties include taking out the trash, mopping, sweeping, cleaning restrooms, or bussing tables.
HIGHLY SUSCEPTIBLE POPULATIONS

If you work in a facility that serves a Highly Susceptible Population (YOPI group) you must not work anywhere in the facility if you have diarrhea, vomiting, or jaundice. If sick, you MUST NOT COME TO WORK until all symptoms are gone.

HANDWASHING

Clean hands are the most important food safety tool, but just because your hands look clean doesn’t mean they don’t have germs on them. Proper handwashing gets rid of the germs on hands that can make people sick. It is important to wash your hands often throughout the day, even when they look clean.

Washing your hands often is the most important thing you can do to keep germs out of your body and out of the food you prepare. You must know when and how to wash your hands.
When to Wash

You are required to wash your hands before you begin food preparation and any you're your hands may be contaminated. The times of heaviest contamination include:

- after using the toilet
- after handling raw meat, fish, or poultry
- after handling garbage or dirty dishes
- after taking a break, eating, or smoking
- after touching your face or nose
- after sneezing, coughing, or blowing the nose
- after handling animals or using chemicals
How to Wash

You must wash your hands at a handwashing sink that has hot and cold running water, soap, and paper towels (or other single-use drying method). From start to finish, you must wash your hands for at least 20 seconds.

Step 1: Get your hands wet so the soap will work. This only takes a second or so.

Step 2: Apply soap and scrub. Be sure to scrub under the fingernails, between the fingers, and all the way up to the lower arm. Hands need to be scrubbed for at least 15 seconds. Time yourself until you get used to it. This scrub time is longer than most people wash!

Step 3: Rinse hands to send the soap suds and germs down the drain. Rinse for about 5 seconds to thoroughly remove the soap.

Step 4: Dry hands completely with a paper towel, or other single-use method. Paper towels are preferred because scrubbing with the towel helps remove more germs. Be sure your hands are completely dry.

Double Handwash

There are times when a double handwash is required. A double handwash is accomplished by following Steps 1 through 3 above, then repeating Steps 1 through 3 again before drying your hands.

Here is when a double handwash is required:

- before starting work
- after using the toilet and again when entering the work area
• after sneezing, coughing, or blowing the nose
• after taking a break, eating, or smoking
• any time your hands come into contact with your body

Hand Sanitizers

Hand sanitizers work best on hands that are clean. In food service, you may use hand sanitizers after washing your hands if you’d like, but you may not use them instead of washing your hands.
Even when you wash your hands well, you are not allowed to touch ready-to-eat foods with your bare hands. This is to keep germs that might remain on the hands from getting onto ready-to-eat foods.

Ready-to-eat foods are foods that are served without additional washing or cooking to remove germs.

Ready-to-eat foods include:

- Washed produce that is eaten raw such as sliced fruit, salads, and garnishes
- Bakery or bread items such as breads, cakes, pies, and tortilla chips
- Foods that have already been cooked such as pizza, hamburgers, hot dogs, and tacos
- Foods that will not be cooked such as sandwiches, sushi, and deli salads
- Ice that may be used in drinks

Note: In a limited number of jurisdictions, bare hand contact with ready-to-eat foods may be allowed. Check with the person in charge for clarification.
Gloves

You must use utensils such as tongs, scoops, deli papers, or single-use gloves to keep from touching ready-to-eat foods. For example, tongs should be used to put sliced vegetables into salads and scoops should be used to get ice out of an ice bin.

Single-use gloves may be used to prepare foods that need to be handled a lot, such as when making sandwiches, slicing vegetables, or arranging food on a platter. It is important to remember that gloves are used to protect the food from germs, not to protect your hands from the food. Gloves must be changed often to keep the food safe.

Gloves must be worn if you have sores, bandages, or cuts on your hands, and you’re working with food.

Important Rules for Using Gloves:

1. Wash your hands before putting on gloves
2. Change gloves that get ripped
3. Change gloves that might be contaminated
4. Never wash or reuse gloves
5. Change gloves between working with raw and ready-to-eat foods
6. Throw gloves away after use
7. Wash your hands after taking gloves off

Note: In a limited number of jurisdictions, bare hand contact with ready-to-eat foods may be allowed. Check with the person in charge for clarification.
Eating, Drinking and Smoking
You may not eat, drink, or use any type of tobacco in food preparation areas. This is to prevent spills onto food and to reduce the chance of contamination.

Exception: You may drink from a covered container with a straw. The drink must be stored so that it cannot spill onto food or food-contact surfaces.

PERSONAL HABITS AFFECT FOOD SAFETY

Hair Restraints
Hair restraints are intended to keep hands out of hair and hair out of food. Hair must be effectively restrained whenever you are working around food or food preparation areas. Hair restraints include hairnets, hats, barrettes, ponytail holders, and tight braids. Long beards must also be restrained.

Fingernails
Fingernails must be trimmed so they are easy to clean. If nail polish or artificial nails are worn, you must wear gloves when preparing all foods, not just ready-to-eat foods. For example, if you wear artificial nails, you would need to wear gloves when mixing batter with a spoon.

Jewelry
Jewelry can hide germs that cause foodborne illness and make it hard to effectively wash your hands. Jewelry can also fall into food. While preparing food, you must remove watches, rings, bracelets, and all other jewelry on your arms or hands. Exception: Wedding rings may be worn if they are covered with a glove when the food worker is preparing food.

Personal Items
Personal items like medicine, coats, and purses must be stored away from food, dishes, and linens.
1. What does it mean to have a person in charge (PIC) in your facility?

2. What should you do at work when you are sick?

3. What are the five symptoms (if you were to have any one of them) that you must tell your manager?

4. What is it called when someone gets sick from eating food contaminated with germs or toxins?

5. How long must you wash your hands?

6. When must you wash your hands?

7. What is a double handwash?

8. When must you do a double handwash?
DEFENSE #2: TEMPERATURE CONTROL

Proper temperatures are required for the safety of potentially hazardous foods. A thermometer must be used to make sure that food is delivered, cooked, cooled, and stored at the correct temperature.

THE DANGER ZONE: 41°F - 140°F

Most bacteria do not grow in very hot or cold temperatures. To keep food safe, cold foods must be kept 41°F or colder. Hot foods must be kept 140°F or hotter. The range of temperatures between 41°F and 140°F is called the Danger Zone.

When potentially hazardous foods are left in the Danger Zone, bacteria can grow fast or make poisons that can make people sick.

Time is ticking...

By the time you begin to prepare food, it has been through a lot of steps. It has been grown, shipped, purchased, received, and stored before you begin preparation. You may thaw, mix, cook, cool, serve, or reheat it. All of the time that the food spends in these steps adds up and helps bacteria grow to dangerous numbers. Work with food quickly to keep it out of the Danger Zone.

Potentially hazardous food may be at room temperature for up to two hours while you are preparing it. When you are preparing food, only work with a little of the food at a time. Keep the rest of the food hot (140°F or above) or cold (41°F or below) until you're ready to prepare it. If the food has been left out at room temperature or you do not know how long it has been in the Danger Zone, you should throw the food away. It may not be safe to eat.

Note: Effective with FDA Code 2009, the Danger Zone will change to 41-135 degrees F.
THERMOMETERS

Two types of food thermometers are usually used in food service: metal stem and digital thermometers.

Metal Stem Dial Thermometer

The metal stem or “dial” thermometer is the most common thermometer used in food service. Dial thermometers work well for taking temperatures of thick foods. The stem must be pushed several inches into the food and left in for at least 20 seconds. Because they need to go deep into the food to be accurate, dial thermometers should not be used for thin foods such as hamburger patties.

Digital Thermometer

Digital thermometers are also used to measure food temperatures. They have a metal stem too, but have digital numbers instead of a dial. Digital thermometers are easy to read and are better for measuring temperatures in thin foods. They can read temperatures quickly and should be used to take temperatures of thin foods such as hamburger patties.

ACCURACY

Thermometers should be checked often to make sure they read the correct temperature. One way to check for accuracy is to put the thermometer’s sensor in a cup of crushed ice and water. The mixture should be 32°F. If the thermometer doesn’t read 32°F, the thermometer needs to be adjusted or replaced. Read the thermometer package or call your local health department for more information.
USING A THERMOMETER:

- Make sure it is clean, sanitized, and accurate.
- Insert into the thickest part of the food, usually the center of the food.
- Take the temperature for several seconds until the number stops changing.

KEEP HOT FOODS HOT

Hot Holding (140°F or hotter)

Because cooking does not kill all bacteria, cooked potentially hazardous food must be kept hot until served. This way the surviving bacteria will not grow back again. Steam tables, soup warmers, and other hot holding units must be turned on and heated up before hot food is put into them. Use a thermometer to check the temperature of the food. HOT food must be kept 140°F or hotter.

Tips for keeping food hot:
- Cover pans
- Stir food often to distribute heat
- Never mix cold foods with cooked foods

COOKING

Cooking food to the right temperature is the best way to kill germs.
that might be in the food.

Temperatures must be taken with a food thermometer that is inserted into the thickest part of the food. Cooking temperatures depend on the type of food and the cooking time. For proper cooking times and temperatures, see the chart on the next page.

**Microwave**

All raw animal products cooked in a microwave oven must be heated to at least 165°F. The food must be covered to maintain moisture, stirred at least once during cooking, and allowed to stand covered for two minutes before serving.

Because microwave ovens do not cook food evenly, it is important to measure the food's temperature in several places. These procedures are also used for foods that are reheated in a microwave.
## Cooking Temperatures

The following table shows the proper temperatures for meat products.

<table>
<thead>
<tr>
<th>Animal Product</th>
<th>Minimum Temperature</th>
<th>What to Know?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poultry, Ground Poultry</td>
<td>165°F (74°C) for 15 seconds</td>
<td>Stuffing should be cooked outside of poultry.</td>
</tr>
<tr>
<td>Stuffing, Stuffed Meats, Casseroles and dishes combining raw and cooked food</td>
<td>165°F (74°C) for 15 seconds</td>
<td>Stuffing acts as an insulator, preventing heat from reaching the meat's center. Stuffing should be cooked separately.</td>
</tr>
<tr>
<td>Ground or Flaked Meats hamburger, ground pork, flaked fish, ground game animals, sausage, injected and pinned meats</td>
<td>155°F (68°C) for 15 seconds</td>
<td>Grinding meat mixes the organisms from the surface into the meat.</td>
</tr>
<tr>
<td>Alternative minimum internal temperatures for ground meats:</td>
<td>150°F (66°C) for 1 minute</td>
<td>145°F (63°C) for 3 minutes</td>
</tr>
<tr>
<td>Pork, Beef Steaks, Veal Lamb, Commercially Raised Game Animals</td>
<td>145°F (63°C) for 15 seconds</td>
<td>This temperature is high enough to destroy Trichinella larvae that may have infested pork.</td>
</tr>
<tr>
<td>Beef or Pork Roasts</td>
<td>145°F(63°C) 3 minutes</td>
<td>Alternative minimum internal cooking temperatures for beef and pork roasts: 130°F (54°C) for 121 minutes 134°F (57°C) for 47 minutes 138°F (59°C) for 19 minutes 140°F (60°C) for 12 minutes 142°F (61°C) for 8 minutes 144°F (62°C) for 5 minutes.</td>
</tr>
<tr>
<td>Fish, Foods containing fish, and Seafood</td>
<td>145°F(63°C) 15 seconds</td>
<td>Stuffed fish should be cooked to 165°F (74°C) for 15 seconds.</td>
</tr>
<tr>
<td>Fish that has been ground, chopped, or minced should be cooked to 155°F (68°C) for 15 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shell Eggs for immediate service</td>
<td>145°F(63°C) 15 seconds</td>
<td>Only take out as many eggs as you need. Never stack egg flats near the grill or stove. Eggs cooked for later service must be cooked to 155°F for 15 seconds and held at 140°F.</td>
</tr>
<tr>
<td>Foods cooked in Microwave Meat, Poultry, Fish, Eggs</td>
<td>165°F (74°C) let it stand for 2 minutes after cooking</td>
<td>Cover food, rotate or stir it halfway.</td>
</tr>
</tbody>
</table>
Note: Additional cooking times and temperatures are available. Beef or pork roasts have additional cooking requirements. Please see the Food Rule or contact your local health department for more information.

**Keep Cold Foods Cold**

**Cold Holding**

Remember, bacteria grow quickly when food is in the Danger Zone. Keep cold food cold in a refrigerator, in ice, or other approved method to keep bacteria from growing. When using ice to keep food cold, the ice must surround the container to the top level of the food. COLD food must be kept 41°F or colder.

**Thawing**

Frozen foods must be thawed safely to keep bacteria from growing. Unsafe thawing can let bacteria grow in the outside layers of the food while the inside layers are still frozen. There are three safe methods for thawing food:

- **In the refrigerator**
  Put frozen food in the refrigerator until it is thawed. This method is the slowest and the safest. Be sure that raw meats are on the bottom shelf or in a container so they do not drip onto other foods.

- **Submerged under cold running water**
  Keep the food covered in cold (70°F or colder), running water until it is thawed.

- **As part of the cooking process or in the microwave**
  Small items, such as frozen burritos, may be thawed while they cook.
Cold salads

Potentially hazardous salads made from food at room temperature (such as canned tuna) must be cooled to 41°F within 4 hours of preparation. It is better to make salads and sandwich fillers with cold ingredients when possible.

Cooling

Cooked leftovers that were not served to customers may be cooled to be served again. Because bacteria can grow quickly in cooling food, cooling is often the riskiest step in food preparation. It is important to cool food through the Danger Zone as fast as possible to keep bacteria from growing. Please take cooling seriously; certain bacteria can make poisons called toxins that are not destroyed by reheating temperatures.

Improper cooling is a leading contributor to foodborne illness.

There are three approved cooling methods:

1. shallow pan method (food no more than 2 inches deep)
2. size reduction (cutting solid food into smaller pieces)
3. time and temperature monitored (forcing food to cool in a short time)

**Cooling Method 1: Shallow Pan**

Divide large containers of food into several shallow pans to cool. This method works well for foods like refried beans, rice, potatoes, casseroles, ground meat, meatloaf, and chili. The steps for the shallow pan method are:

1. Put hot food into shallow pans. Make sure the food is not more than two (2) inches thick or deep.
2. Put the pans on the top shelf of the refrigerator where nothing can drip into them.
3. Let the air move around the pans. Do not stack or cover them.
4. Cover the pans after the food is 41°F or colder.
Cooling Method 2: Size Reduction

A large whole food like turkey or ham may be cut into slices or pieces to be cooled quickly. This method may not be used for meat that is ground or restructured such as meatloaf or gyro meat. Here are the steps for the size reduction method:

1. Cut the cooked meat into pieces no more than 4 inches thick. Be sure to wear gloves if you handle the food.

2. Spread the slices out on a tray so they are not touching each other.

3. Put the pans in the refrigerator on the top shelf where nothing can drip into them.

4. Let air move around the pans, do not stack or cover the pans.

5. Cover the pans after the food is 41°F or colder.
Cooling Method 3: Time and Temperature Monitored

1. Step 1: Food must cool to 70°F in 2 hours (required first)
2. Step 2: Food must finish cooling from 70-41°F in 4 hours (6 hours total)

An example of the 2-step method is called an ice bath. An ice bath works well for soups, sauces, and gravy. Here are the steps for an ice bath.

1. Close the drain in the sink. Put the pot of hot food in the sink.
2. Fill the sink with ice up to the level of the food in the pot. Add cold water to the ice.
3. Stir the food often. Make sure it cools down to 70°F within 2 hours.
4. Add more ice as the ice melts.
5. Finish cooling the food to 41°F within 4 hours.
6. Once the food is 41°F, cover it and put it in the refrigerator.
Reheating
Food that is cooked and then cooled may be reheated later to be served again. Properly cooled foods that will be served immediately may be reheated to any temperature. Pre-cooked, cold food that will be hot held must be reheated to at least 165°F quickly (within two hours).

**Review Questions: Temperature Control**

1. What is the temperature for holding food hot?
2. What is the temperature for holding food cold?
3. What are some ways to help keep food hot?
4. Why use a metal-stem probe thermometer?
DEFENSE #3: PREVENTION OF CROSS CONTAMINATION

Cross contamination is the spread of bacteria from raw meat to other foods.

Cross contamination happens when bacteria from raw foods get onto other foods. Raw meat is the main source of cross contamination. When blood or juice from raw chicken or other meat gets onto a counter, cutting board, utensils, or hands, bacteria can spread to other food.

It is important to keep raw meat away from other food.

TIPS TO AVOID CROSS CONTAMINATION:

- wash your hands after handling raw meat
- wash and sanitize all food-contact surfaces that touch raw meat
- prepare raw meat in an area away from other foods
- use a separate cutting board for raw meat
- store raw meat below other foods in the refrigerator and freezer
- store meat with a higher cooking temperature (like chicken) below meat with a lower cooking temperature (like fish)

CLEANING AND SANITIZING

Cleaning and sanitizing are not the same. Cleaning uses soap and water to remove dirt and food from surfaces. Sanitizing uses chemicals or heat to kill germs. It is important to remember that surfaces that look clean may still have germs on them that you can’t see. Sanitizing reduces these germs to safer levels.

Sanitize: To use chemicals or heat to reduce germs on surfaces to safe levels, food-contact surfaces should be washed, rinsed, and sanitized after each use to remove germs that can cause illness.

Other areas in food establishments, like the floors and walls, should also be kept clean. Keeping equipment and kitchens clean will help reduce workplace accidents and the potential for food contamination. Changing the wash water often helps ensure dishes will not be contaminated by dirt or food particles floating in the water.
Sanitizers

Sanitizers are hot water or chemicals used to kill germs. Chemical sanitizers must be mixed by following the directions on the label. Soap should never be added to sanitizers. Use test strips to make sure the sanitizer is not too strong or too weak.

The most common chemical sanitizer used in food establishments is a bleach solution made by mixing 1 teaspoon unscented bleach with 1 gallon of cool water.

Wiping Cloths

Wiping cloths should be stored in sanitizer when they are not in use. The sanitizer should be changed often because grease, dirt, and food pieces make the sanitizer less effective.

Tips for using wiping cloths:
- store wiping cloths in clean sanitizer
- use a different wiping cloth for cleaning up after raw meat
- use different cloths for food and non food-contact areas
- wash and rinse dirty wiping cloths before putting them back into the sanitizer
- use test strips to check the sanitizer strength
Washing Dishes by Hand

All dishes and food-contact surfaces must be washed, rinsed, and sanitized between uses. When washing dishes by hand, follow this procedure:

1. Clean and sanitize the sink
2. Scrape leftover food into the garbage
3. Wash dishes in hot, soapy water in the first sink
4. Rinse dishes with clean, hot water in the second sink
5. Sanitize by soaking the dishes in the third sink filled with warm water and an approved sanitizer
6. Air Dry all dishes and utensils instead of using a towel

Washing Dishes in a Dishwasher

Some establishments have a mechanical dishwasher that will wash, rinse, and sanitize the dishes. When using a dishwasher, you must scrape
leftover food from the dishes before putting the dishes on the rack. Dishwashers use chemicals or heat to sanitize. If you are going to use the dishwasher, you must be trained on how to make sure the machine is washing and sanitizing properly. Temperature gauges and sanitizer levels must be monitored.

**FOOD SOURCES**

All food served to customers must come from a source approved by the health department. You may not serve food prepared at home. Meat, poultry, and dairy products must be inspected by the United States Department of Agriculture or the Department of Agriculture.

**Shellfish**

Shellfish like clams, oysters, or mussels must have an identification tag attached to the container. The tags must be kept for 90 days after the shellfish is sold.

**Receiving Food**

When food is received, it should be inspected to be sure it is not spoiled. Packaged or canned foods must be returned or thrown away if they are opened, rusty, or severely damaged. Potentially hazardous food should be refrigerated at arrival at 41ºF. Do not accept food delivered at an unsafe temperature or in an unsafe condition.

**Consumer Advisory**

Animal foods such as chicken, hamburger, seafood, and pork are more likely to cause foodborne illness if they are not cooked to the right temperature. Customers must be told which menu items can be ordered undercooked, and that the undercooked food can cause illness. Talk with the person in charge or your local health department for more information.

**Food Allergies**

Just as some people are allergic to bee stings, some people have allergies to food. Food allergies are often serious and can cause sudden, life-threatening reactions. Symptoms of an allergic reaction include a tingling sensation, hives, swelling of the mouth and throat, difficulty breathing, and loss of consciousness. Get the person in charge immediately if you see any customers with any of these symptoms.

Foods that cause the most allergies are milk, soy, eggs, wheat, peanuts, nuts, fish, and shellfish. Even a small amount of the
food can make an allergic person very ill.

People that have food allergies must AVOID any source of the food that makes them sick. For example, someone that is allergic to eggs must avoid cakes, pastas, mayonnaise, or even foods that are prepared on equipment used with eggs. Customers may ask you about menu items, how the food is prepared (to make sure the equipment used for their meal is not used with the foods that they are allergic to), and information from the labels on the food. Their safety depends on accurate answers from you and safe preparation steps in the kitchen. Talk with the person in charge if you have questions.

**PEST CONTROL**

Pests like rodents, cockroaches, and flies must be kept out of food areas, because they may spread germs. Pesticides should only be used as a last resort and applied by licensed pesticide applicators when the food is carefully protected. It is easier to keep pests out than to use pesticides once they are there.

To keep pests out of food establishments:

- keep doors closed or screened and cover holes in walls
- cover garbage cans with lids and throw away used boxes
- keep food covered and clean all spills quickly
Food businesses must stop serving food and call the health department whenever there is a health hazard that might make the food not safe.

Health hazards include:

- fire, flood, or sewage backup
- no hot water or electricity
- possible foodborne illness outbreak or chemical contamination

Food Protection during Service

Unwrapped, ready-to-eat foods that are on display for customer self service must be protected from contamination. Protection includes:

- condiment dispensers or single-use packets
- utensils at each separate item on the salad bar or buffet
- display cases or sneeze guards
- extra plates at buffets so customers can use a clean plate for each trip
- employees monitoring the self-service area
Re-service of Food

When a customer leaves unpackaged food on the table, you must throw it away. Uneaten food such as rolls, tortilla chips, and breadsticks may not be re-served.

Unopened, packaged food such as crackers, sugar, and jelly may be re-served in restaurants. However, these unopened packages may not be re-served in facilities and care centers that serve a Highly Susceptible Population.

Prohibited Foods

Certain foods may not ever be served raw or undercooked in facilities and care centers that serve a Highly Susceptible Population. These foods include:

- undercooked fish, shellfish, beef, eggs, chicken, or pork
- seed sprouts, such as alfalfa sprouts
- packaged juices that are not labeled “pasteurized”
**REVIEW QUESTIONS: CROSS-CONTAMINATION**

1. Where should you store cleaners and poisons in relation to food?
2. Where in the refrigerator should you store raw meat?
3. What is cross contamination?
4. List two ways to prevent cross contamination?
5. What should you do if food becomes contaminated?
SPECIAL REMINDERS FOR FOOD WORKERS

WAITSTAFF
You may be responsible for checking the holding temperatures on the buffet or salad bar (see temperature control on page 23).

Gloves or other utensils must be used for handling all ready-to-eat foods, even if you’re just buttering toast (preventing bare hand contact is on page 19).

Customers may ask you questions about how the food was prepared (read about allergies and consumer advisory on pages 36-37).

CHILDCARE PROVIDERS
Be sure to understand the wash, rinse, and sanitize steps. Many toys and other surfaces in child care facilities require the same cleaning technique.

Handwashing is not only important for you as a food worker, but also important for the children before they eat (handwashing instructions are on pages 17-18).

Many dishes are served family-style. Use utensils that children can handle and be ready to replace utensils that are dropped, licked, or incorrectly used.

Children’s medications that must be refrigerated in the kitchen must be labeled and kept in a water-tight container.

BUSSERS
Dirty dishes need to stay away from all clean food preparation areas and food.

After clearing tables, you must wash your hands before you begin another activity (see more information on handwashing on pages 17-18).

DISHWASHERS
The sinks and your hands might be contaminated. Be sure to wash them before you begin (check out handwashing on page 17-18).

Change the wash water often to better clean the dishes (see page 33).

Routinely measure the sanitizer solution with appropriate test strips.

If you use a mechanical dishwasher, you must know how to use it and how to check that it’s sanitizing properly.

Be sure to read and follow the directions on chemical labels.

BARTENDERS
Bare hand contact is not permitted, even if it’s just squeezing a lemon into a drink. Prepare garnishes like lemon twists and sliced fruits with gloves.
in advance rather than preparing them bare handed for each drink.
Be sure to use an ice scoop rather than handling the ice (read more about preventing bare hand contact on page 21).

GROCERY CLERKS
Cross contamination can happen while you’re bagging groceries. Bag meats separately and clean up meat spills with a sanitizer.
You will likely handle unwrapped produce. Be sure to wash your hands often throughout the day (see pages 15-16).
Be sure potentially hazardous foods that are left at your aisle are returned to proper temperature control immediately or discarded (see which foods are potentially hazardous on page 11).

AT-HOME COOKS
Check your refrigerator temperature. Food should be kept 41°F or colder and cooled properly after cooking to keep your family and friends safe.
Animals are not allowed in food preparation areas of restaurants because of germs. Keep your pets off of the kitchen counters and out of the kitchen sink at home as well.
Hosting parties often means lots of food and people. Be sure to plan ahead so that you will be able to keep foods at proper temperatures, make sure you have enough utensils for serving, and rapidly cool leftovers in shallow pans (see cooling on page 28).

TEMPORARY FOOD VENDORS
Temporary establishments often lack plumbing. Be sure to set up your handwashing station before you begin food preparation.
Temperature control is often difficult at temporary sites. Have a back-up plan ready in case your electricity goes out or your equipment is unable to keep the food at proper temperatures.
Plan your menu carefully to limit the number of potentially hazardous foods (see the list of potentially hazardous foods on page 11).
**FOOD WORKER TOP 10**

1. Only work when you are healthy.
2. Wash your hands often and well.
3. Don’t touch ready-to-eat food with your bare hands.
4. Keep food hot (140°F) or cold (41°F).
5. Cook food to proper temperatures.
6. Cool hot food as quickly as possible (less than 4 hours from 140°F to 41°F).
7. Keep raw meat away from other food.
8. Always follow these 4 steps in order:
   - Wash
   - Rinse
   - Sanitize
   - Air dry
9. Keep food preparation areas and utensils clean and sanitized.
10. Ask your person in charge questions if you have them.

(135 degree with FDA Code 2009)
GLOSSARY

Bacteria – Bacteria are tiny germs with only one cell that can multiply into large numbers when food is in the danger zone for more than 4 hours.

Chemicals – In this book, chemicals are the ingredients in cleaning, sanitizing, or pesticide products that make people sick if eaten.

Clean – Free of any dirt, chemical, impurities, bacteria or anything else that could cause an illness.

Cold Holding – Cold holding is when you keep food cold by using refrigeration or ice. Safe cold holding temperatures are 41°F (5°C) or colder.

Cross Contamination – When germs from one food item get onto another food item, such as through raw meat juices dripping onto salad greens or any raw food touching ready-to-eat food.

Double Handwash – Lather hands with soap and warm water for approximately 20 seconds, rinse, and repeat a second time. Dry hands with paper towel, air dryer, or roll of linen towels.

Danger Zone – The Danger Zone is when the temperature of food is between 41°F (5°C) and 140°F (60°C). This is called the Danger Zone because bacteria will grow quickly between these temperatures.

Date Marking – This is a process of marking the date when food was cooked or opened to assure that the food is discarded before it can become a health hazard. Food that is held cold in a refrigerator must be discarded by the end of the seventh day.

Fecal-Oral Route – Many foodborne illnesses are passed to people through what is termed the fecal-oral route. This is a polite way of saying that infection-laden bits of stool from one person found its way into the mouth of another. This most commonly occurs due to poor hand washing by food handlers.

Foodborne Disease Outbreak – Two or more people that have the same laboratory confirmed foodborne illness from the consumption of the same food or meal.

Foodborne Illness – Sickness caused by germs, poisons, or toxins in food.

Food Poisoning – See foodborne illness.

Food Code – The FDA Food Code is released by the US Food and Drug Administration every four years as a guide for state and local health authorities to use to make food safety guidelines. The most recent is the 2009 Food Code.

Food Thermometer – A metal-stem probe thermometer used to take temperatures of food.

Hand Sanitizers – Hand sanitizers, when rubbed on the hands for about 30
seconds, work because of their high concentration of alcohol which kills most bacteria. Hand sanitizers are not a substitute for proper hand washing but may be used after hand washing.

**Highly Susceptible Populations** – People who are more likely to get sick from a foodborne illness. This includes babies, older people, women who are pregnant, and people with a depressed immune system.

**Hot holding** – Holding food hot after it has been properly cooked or reheated. Food must maintain a temperature of 140°F (60°C) or hotter.

**Infected** – A cut or burn that is swollen, red, or has pus.

**Microorganism** – Any living organism that is too small to be seen with the naked eye. Many are harmless or beneficial. Some may cause diseases.

**Parasites** – These are tiny worms that live in fish, meat, water, and animals including humans.

**Poison** – Substances that can cause harm to organisms when a sufficient amount is eaten. Poisons are especially toxic substances; less toxic substances are labeled harmful, irritant, or not labeled at all.

**Person in Charge** – Every food establishment is required to have a person in charge present during all hours of operation. The person in charge must be able to demonstrate knowledge of foodborne disease prevention, application of Hazard Analysis of Critical Control Points, and the requirements in the Food Code. The person in charge is the person who trains employees and can answer any question about food safety.

**Personal Hygiene** – The most important factor in food safety is good personal hygiene or cleanliness, especially regular, vigorous, and proper hand washing.

**Potentially Hazardous Foods** – Moist, nutrient-rich foods such as meats, fish, poultry, vegetables, and more that support the growth of bacteria when the temperature is in the Danger Zone.

**Prohibited Foods** – Foods that are not allowed to be served to a highly susceptible population. These include undercooked fish, shellfish, beef, eggs, chicken, or pork; seed sprouts, such as alfalfa sprouts; and packaged juices that are not labeled pasteurized.

**Ready-to-Eat Food** – Food that is in a form that is edible without additional preparation to achieve food safety, including prepared sandwiches, salads, and more.

**Reheating** – The process of making a cold, already cooked food hot. Food must be heated food from 41°F (5°C) to 165°F (74°C) within two hours to be safe.

**Sanitize** – The final step in removing bacteria from food contact surfaces that have just been cleaned with hot, soapy water. Many places use a solution made up of one to two teaspoons of bleach to one gallon of water to sanitize
equipment and utensils. Other places use very hot water or steam.

**Temperature Control** – The system for keeping food safe to eat which includes cold holding, hot holding, and keeping food out of the danger zone for more than 4 hours.

**Virus** – Viruses are extremely small germs that can only grow inside of a living cell. It only takes a small number of viruses to make someone sick. Many viruses get into food from the lack of handwashing, especially after using the toilet, coughing, or sneezing, and then touching food.

**YOPI** – An acronym from the first letters of the highly susceptible population: Young people, Old people, Pregnant women, and Immune-system-depressed people.
1. Which of the following statements is true? After touching raw ground beef, it is important to:
   A. Wipe your hands on a sanitizer wipe cloth
   B. Use a hand sanitizer before touching anything else
   C. Wash your hands with soap and water
   D. Dip your hands in a bucket of sanitizer

2. When must you double handwash?
   A. After sneezing or coughing
   B. After touching raw meat
   C. After eating or drinking
   D. A and C

3. What is proper handwashing?
   A. Using soap, running water and scrubbing 20 seconds
   B. Using sanitizer, running water and scrubbing for 20 seconds
   C. Using soap, running water and scrubbing for 10 seconds
   D. Using sanitizer, running water and scrubbing for 10 seconds

4. It is okay to wear disposable gloves if:
   A. You wear a pair of gloves to handle money and food
   B. You wash your hands first and discard gloves between activities
   C. You discard the gloves every few hours or at least once a day
   D. You blow into the gloves first to make them easier to put on

5. When you have a sore throat or diarrhea, you should:
   A. Go to work and tell your coworkers to be careful around you
   B. Call your manager and report that you are sick
   C. Take medicine to stop the symptoms and go to work
   D. Not tell anyone and continue working
6. Preparing food several hours in advance can make food unsafe because:
   A. Bacteria can grow if the food temperatures fall into the danger zone
   B. Foods can lose their flavor, color and general quality
   C. Foods can lose their nutritional value
   D. Refrigerators can only hold so much food

7. The most important reason to wash, rinse and sanitize cutting boards is to:
   A. Eliminate odors and tastes from getting into other foods
   B. Make the cutting board look better and last longer
   C. Prevent contamination from one food to another
   D. Prevent flavors and garlic or onion juices from getting onto other foods

8. What is the minimum temperature that hot food must be kept at on the steam table to keep food safe?
   A. Hot – 140°F
   B. Hot – 130°F
   C. Hot – 120°F
   D. Hot – 165°F

9. What is the maximum temperature that cold food must be kept at on the salad bar to keep food safe?
   A. Cold - 51°F
   B. Cold – 65°F
   C. Cold - 41°F
   D. Cold - 55°F
Answers:
1. C
2. D
3. A
4. B
5. B
6. A
7. C
8. A
9. C
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