Food Safety Education Services

Mark Bakos
& Associates, Inc

Since 2012

www.foodsafetypa.com

1-866-826-2682

Food Safety Training Manual

Updated June 2022

This manual is used as a supplement to any other study materials that has been provided to you through email and/or the introduction letter provided to you upon registration. If you have and questions, please feel free to email us at foodsafetytpa@gmail.com

TABLE OF CONTENTS

Definitions

Bacteria: Living single-celled organisms. They can be carried by water, wind, insects, plants, animals, and people. Bacteria survive well on skin and clothes and in human hair. They also thrive in scabs, scars, the mouth, nose, throat, intestines, and room-temperature foods.

Biological hazard: Refers to the danger of food contamination by disease-causing microorganisms (bacteria, viruses, parasites, or fungi) and their toxins and by certain plants and fish that carry natural toxins.

Contamination: The unintended presence of potentially harmful substances, including microorganisms in food.

Certified Food Protection Manager: An individual who has successfully completed a food safety examination for food managers from an accredited program. If your agency is preparing food for public consumption, you must have one person on site while cooking who is a Certified Food Protection Manager.

Cross-contamination: The transfer of harmful substances or disease-causing microorganisms to food by hands, food-contact surfaces, sponges, cloth towels, and utensils that touch raw food, are not cleaned, and then touch ready-to-eat foods. Cross-contamination can also occur when raw food touches or drips onto cooked or ready-to-eat foods.

Demonstration of Knowledge: The ability to show through words or actions that an individual understands how to store, prepare, and serve food safely.

Foodborne Illness or Disease: Disease or illness that resulted from eating one or more contaminated foods.

Food contact surface: Any equipment or utensil that normally meets food or that may drain, drip, or splash on food or on surfaces normally in contact with food. Examples: cutting boards, knives, sponges, countertops, and colanders.

Fungi: A group of microorganisms that includes molds and yeasts.

Highly Susceptible Population: Those who are more likely than the general population to experience a foodborne illness. Pre-school children, the elderly, and those with weak immune systems are highly susceptible to foodborne illness.

Incidence: The number of new cases of foodborne illness in a given population during a specified period (e.g., the number of new cases per 100,000 population per year).

Microorganism: A small life form, seen only through a microscope, which may cause disease. Examples: bacteria, fungi, parasites, or viruses.

Outbreak: An incident in which two or **more people experience the same illness after eating the same food.**

Parasite: A microorganism that needs a host to survive. Examples: Cryptosporidium, Toxoplasma.

Pathogen: A microorganism that is infectious and causes disease.

Potentially Hazardous Food: A food that requires time or temperature control to limit bacterial growth. These foods are also referred to as Time/Temperature Control for Safety Foods. **(Dairy, poultry, meat, shellfish, fish, alfalfa, cut melon, eggs, cook rice, pasta, beans, baked potato, and tofu)**

Ready to Eat: Food that can be consumed without further washing, cooking, or processing.

Spore: A thick-walled protective structure produced by certain bacteria and fungi to protect their cells. Spores often survive cooking, freezing, and some sanitizing measures.

Toxins: Poisons that are produced by microorganisms, carried by fish or released by plants.

Virus: A protein-wrapped genetic material which is the smallest and simplest life-form known. Example: Norovirus, Hepatitis A.

Welcome to Food Safety

Thank you! We appreciate that you are taking an active role in learning to prepare and serve safe food. As a person who handles and serves food, you will be taking an active role in ensuring that it has been safely handled and served. People, especially the young, elderly, and ill 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.

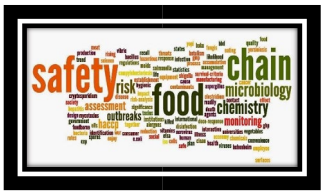
The information in this manual will give you tips on how to safely store, prepare, and serve food at work and home. The manual is divided into two parts: **Part 1** - Introduction to foodborne illness **Part 2** - How to keep food from causing illness **Part 3 –** Prevention of cross contamination

By the time you have finished this manual you will:

- Understand there are many causes of foodborne illness.
- Identify the importance of clean hands and healthy food workers.
- Know how avoiding the Danger Zone helps prevent foodborne illness.
- Learn several tips to help you remember food safety basics.

Food safety knowledge can help you protect yourself and others. Please take what you learn from this manual and use it at your facility and in your home. If you have any questions after this training, please ask your instructor for additional resources.

Remember that food workers using proper food safety practices are the most important ingredients in safe food!



Part One: Intro to Foodborne Illness

Foodborne Illness

A foodborne illness is a disease caused by consuming contaminated food or drink. Most foodborne illnesses are common referred to as food poisoning or the "stomach flu." Chemicals, bacteria, or certain foods like poisonous mushrooms can cause food poisoning.

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. Germs that cause foodborne illness are usually bacteria, viruses, or parasites. 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 United States, the Centers for Disease Control estimates that about 48 million Americans get sick and up to 3,000 people 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.

Certified Food Protection Manager

Person in Charge: Someone at each establishment must be in charge during all hours of operation and must make sure that all food safety steps are followed. The person in charge must know the procedures used in the establishment. If you have questions, ask the person in charge. If you are the person in charge, you should be able to give food workers training or information needed to perform their jobs correctly. When open to the public, every permitted food establishment must have a Certified Food Protection Manager (CFPM) or a Person in Charge (PIC) onsite. • The PIC will promote food safety practices to prevent foodborne illnesses, follow state rules and regulations, monitor employees and answer questions by environmental health officers during facility walk-throughs. The Person in Charge performs these duties: • Identifies hazards in the daily operation of the food establishment; • Develops and implements policies and procedures to prevent foodborne illness; • Trains employees about food safety and sanitation; • Directs food preparation activities and corrective actions to protect the health of the consumer; and, • Monitors daily operations to ensure that food safety policies and procedures are followed.

Become a Person in Charge by complying in one of three areas:

1. Compliance: When there are no risk factor/intervention violations noted during the environmental health officer's walk-through of the facility; or

2. Certification: The PIC is certified as a food protection manager; or

3. Knowledge: The PIC correctly responds to food safety practices and principles questions asked by the environmental health officer.

Person in Charge responsibilities:

- Enforces proper handwashing.
- Prevents hand contact with ready-to-eat foods and cross contamination.
- Maintains a clean, well-repaired food establishment.
- Identifies employees with infectious diseases or poor hygiene.
- Knows the hazards of raw/undercooked meat, poultry, eggs, and fish.
- Understands safe cooking temperatures and times for hazardous foods.
- Manages safe refrigerated storage, hot-holding, cooling, and reheating of foods.
- Cleans and sanitizes utensils and food contact surfaces correctly.
- Ensure water sources are protected from contamination.
- Properly handles hazardous chemicals and substances.

Consumer Advisory

A consumer advisory is a publicly posted written notice which informs consumers that food of animal origin, such as beef, eggs, lamb, milk, pork, or shellfish that are served raw or undercooked poses a health risk because the foods are not processed to eliminate pathogens.

A consumer advisory has two parts: DISCLOSURE and REMINDER. DISCLOSURE Food establishments must identify in writing foods of animal origin that are served raw or undercooked, even if they are made to order. Identification must be at the point where the food is selected by the consumer and may be on a MENU, table tent, placard, or other printed means. This can be done in two ways:

1. In the description of the food item on the menu, such as • "oysters on the half-shell (raw oysters)" • "raw-egg Caesar salad" • "hamburgers (can be cooked to order)" OR 2. Placing an asterisk by the name of the food and using a footnote that states that the items: • are served raw or undercooked, or • contain (or may contain) raw or undercooked ingredients REMINDER Food establishments must also remind consumers of the health risk associated with eating these foods. This can be done by using an asterisk by the description or identification of the animal-derived food to a footnote that states one of the following: "Regarding the safety of these foods, written information is available upon request" "Consuming raw or undercooked meats, poultry, seafood, shellfish, or eggs may increase your risk of foodborne illness. ""Consuming raw or undercooked meats, poultry, seafood, shellfish, or eggs may increase your risk of foodborne illness, especially if you have certain medical conditions." Food establishments may choose to use a separate consumer advisory document as a REMINDER. If a separate document is used it must meet the following: • Refer to the document on the MENU; or • Make the document readily accessible to consumers prior to ordering. Readily accessible means the consumer can get it without asking for it.

Labeling Packaged Food

When a food such as a sandwich, a salad or pastry is wrapped up or PACKAGED ahead of time for customer self-service (an aisle deli case in a supermarket, an open top cooler in a convenience store, a grab 'n go in a restaurant or deli or snack cooler in the dining room of a nursing home), labeling is required. This is because the food is not requested or ordered through a food employee who can knowledgeably answer questions about ingredients, allergens, salt content, or other nutrients. The cashier or checkout person in a restaurant or food store is not trained as a food employee and is likely unable to answer those types of questions. The very same type of food could be wrapped up or PACKAGED ahead of time for convenience during a busy mealtime and the food is held behind the counter to be provided to a consumer upon request. When a customer orders the food from a food employee, that employee can answer questions about it; therefore, no labelling information is necessary. This reasoning applies to all food establishments, whether they are restaurants, fast food cafeterias, delis, supermarkets, convenience stores, small grocery stores, or institutions

The requirement for labeling food items in a food establishment is not affected by the location of consumption of the food (on premises or offsite). When is food considered packaged? Food is considered PACKAGED and requires labeling when the food establishment wraps or bags the product and makes it available for selfservice to the customer without ordering or requesting the food through a food employee. This packaging adequately protects the food from contamination when customers pick up or examine the package before choosing to purchase it. The information on the label provides general information about that packaged food product (name, ingredients, allergens, weight) that could have been provided by the food employee when it was ordered or requested. Why label packaged food? Proper labeling of food allows consumers to make informed decisions about what they eat. Many consumers, because of an existing medical condition, may be sensitive to specific foods or food ingredients. This sensitivity may result in dangerous medical consequences should certain foods or ingredients be unknowingly consumed.

Federal labeling regulations require the following information on every food label: Common or usual name of the food • If a food product has a standard of identity, the food must meet the standard to be offered for sale under that product name. • All ingredients listed in descending order of predominance by weight, and a complete listing of sub-ingredients. Example of a sub-ingredient: Flour (bleached wheat flour, malt barley, flour, niacin, iron, potassium thiamine, thiamine mononitrate, riboflavin). • Net contents or quantity Dual declaration of net weight in both metric and U.S. customary system. Example: 1 lb (450 g) Name and address of the manufacturer, packer, or distributor. If the company is not listed in the current edition of the local telephone book under the name printed on the label, the street address must also be included on the label. • Nutritional labeling (exemptions may apply for small firms) • "Keep Refrigerated" or "Keep Frozen" (if product is perishable) • All colors Example: FD&C Yellow #5, FD&C Red #3 If a non-certified color, list as artificial coloring or artificial color or by their common or usual names such as "caramel coloring". • Food Processors must include a lot # or another code that will allow production lots to be identified if the food is recalled.

Food Allergen Labeling the Food Allergen Labeling and Consumer Protection Act (FALCPA) of 2004 addresses the labeling of foods that contain any of the eight MAJOR FOOD ALLERGENS. All ingredients that contain a MAJOR FOOD ALLERGEN must be labeled, even if they are exempted from labeling by being a spice, flavoring, coloring or incidental additive. FALCPA requires the labeling of MAJOR FOOD ALLERGENS in one of two ways: 1. In the ingredient statement includes the common or usual name of the food source, followed by the name of the allergen in parentheses. For example: Ingredients: Flour (wheat), whey (milk) 2. After the ingredient statement, place the word, "Contains:" followed by the food allergen. For example: Contains: Wheat, Milk

Highly Susceptible Populations

Although anyone can get sick from food handled unsafely, certain people usually get sick more often or have more serious illnesses. These people are called the Highly Susceptible Population. They are:

•Preschool-aged children

•Elderly

•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, childcare 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 throughout this manual. For more information, contact your local health department.

If an employee or volunteer is suffering from a foodborne illness that person may not enter the facility, and the health department should be notified.

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).

Physical Hazards

Physical hazards are hard or soft 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:

•Wash fruits and vegetables carefully.

•Look closely at the foods you prepare.

•Keep the food preparation area free of things that can fall into the food.

Examples of physical hazards include broken glass, jewelry, adhesive bandages, staples, and fingernails.

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 product needs to be stored in the kitchen area, the chemical must be stored below food or food-contact surfaces so that it does not drip onto food. If a chemical is not needed in the establishment, then the chemical should not be there at all. All chemical containers must have easy-to-read labels and easy-to-follow directions.

Examples of chemical contaminants include cleaning agents, pesticides, and certain metals.

Food Storage Containers – Some containers are not approved for food storage. Unapproved containers include garbage bags, galvanized cans, and containers once used for chemicals. Food may not be stored in these containers because chemicals can get into the food. Galvanized containers have a layer of zinc so the container will not rust. They should not be used to store 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 chemicals.

•Only use approved containers to store food.

•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, bacteria, and viruses are good examples of biological contamination that cannot be seen without a microscope.

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 frozen to kill parasites for raw dishes like sushi.

•Use 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 have all had an illness from a virus. Chicken pox, 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 vomit or feces. We call it the fecal-oral route of transmission. Everyone else calls it gross.

As gross as it might be, you have probably heard of a few of the viruses we spread this way, like hepatitis A and Norovirus. To prevent these common illnesses, we 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 food workers are not careful about time, temperature, and cleanliness. Bacteria can spoil food or cause foodborne illness.

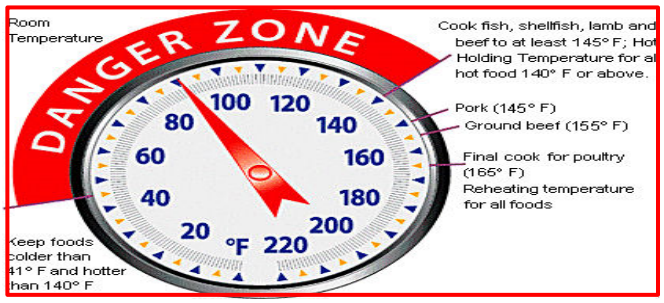
Bacteria that cause foodborne illness come from sources like soil, animals, raw meat, and people. Although they can come from lots of places, these bacteria usually only grow in certain foods. These foods are called POTENTIALLY HAZARDOUS FOODS. Keep potentially hazardous foods hot or cold to keep bacteria from growing.

Potentially Hazardous Foods include:

•Animal products such as meat, fish, poultry, seafood, eggs, and dairy products.

•Cooked starches such as cooked rice, beans, pasta, and potatoes

•Fruits and vegetables such as cooked vegetables, tofu, sprouts (such as alfalfa or bean sprouts), cut melons, cut tomatoes, cut leafy greens, and garlic or herbs bottled in oil



To keep your food safe from bacteria:

•Keep potentially hazardous foods out of the Danger Zone between 41°F and 135°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.

•Wash, rinse, and sanitize all equipment used for food preparation.

Food Allergens

An allergic reaction to food can sometimes cause serious illness and/or death. If handling these items and a client has an allergy, please wash your hands, and change glove to ensure cross contamination does not happen.

The "BIG 9" (pictured below):

1. Peanuts
2. Tree Nuts
3. Fish
4. Crustacean (Shellfish)
5. Eggs
6. Milk
7. Wheat
8. Soy
9. Sesame Seeds

Sesame Seeds

Part Two: Preventing Foodborne Illness

Top 3 Food Safety Defenses

Now that you know germs cause almost all foodborne illnesses, let us review about what you must do to keep germs from causing illness through food. Because people cannot usually see, smell, or taste germs in food, it is important to practice food safety even when the food looks fine.

Next, we 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.

1. Personal Hygiene

Food workers, even if they look and feel healthy, may accidentally spread harmful germs to food if they do not have good hygiene. Food workers with good personal hygiene 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 time.

•Using clean gloves and utensils when handling food.

•Keeping fingernails trimmed so hands can be easily cleaned.

Food Worker Health

A healthy food worker is one of the most important ingredients 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 other people.

Too Sick to Work with Food

Food workers may not work with food if they have:

- Diarrhea, vomiting, or jaundice.
- Diagnosed infections that can be spread through food such as Salmonella, Shigella, E. coli, or hepatitis A.
- Infected, uncovered wounds.
- Continual sneezing, coughing, or runny nose.

Food workers must tell the Person in Charge when they are sick. Sick food workers should go home. If sick food workers cannot go home, they 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

Food workers that work in facilities that serve a Highly Susceptible Population may not work in the facility if they have diarrhea, vomiting, or jaundice. Sick food workers 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 does not mean they do not have germs on them. 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. Food workers must know when to wash their hands.

When to Wash

Food workers are required to wash their hands before they begin food preparation, and any time hands may be contaminated. The times of heaviest contamination include:

- After using the restroom.
- After handling raw meat, fish, or poultry.
- After handling garbage or dirty dishes.
- After taking a break, eating, or smoking.
- After sneezing, coughing, or blowing the nose.
- After handling animals or using chemicals.

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 would like, but you **may not** use them instead of washing your hands.

How to Wash your hands

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, all food workers must wash their hands for at least 20 seconds.

Step 1: Get your hands wet so the soap will work.

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 10-15 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.

Step 4. Dry hands completely with a paper towel, or other single-use method. Paper towels are preferred because rubbing them with the towel helps remove more germs.

The temperature of the water to wash your hands should be at least 85°F

Preventing Bare Hand Contact

Even when food workers wash their hands well, they are not allowed to touch ready-to-eat foods with their 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:

•Rinsed fruit and vegetables that are eaten raw such as sliced fruit, salads, and garnishes.

•Bakery or bread items such as cakes, pies, breads, tortilla chips.

•Foods that have already been cooked such as pizza, hamburgers, hot dogs, tacos.

•Foods that will not be cooked such as sandwiches, sushi, and deli salads.

Exception: When washing produce and cooking food as described in the food safety training presentation

Gloves

Food workers 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 are working with food.

Important Rules for Using Gloves:

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

Personal Habits

Eating, Drinking and Smoking

Food workers 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: Food workers 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.

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, the food worker must wear gloves when preparing all foods, not just ready-to-eat foods. For example, a food worker with artificial nails 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 wash hands. Jewelry can also fall into food. While preparing food, food workers must remove watches, rings, bracelets, and all other jewelry on the arms or hands.

Exception: Wedding rings (plain-band) may be worn if they are covered with a glove when the food worker is preparing food.

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.

Most bacteria do not grow in hot or cold temperatures. To keep food safe, cold foods must be kept 41°F or colder. Hot foods must be kept 135°F or hotter. **The range of temperatures between 41°F and 135°F is called the Temperature 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 it, food 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 between 41°F and 135°F.

Potentially hazardous food may be at room temperature for up to two hours while you are preparing it. When you are preparing food, only take a little of the food at a time. Keep the rest of the food hot or cold 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.

Thermometers

Two types of food thermometers are usually used in food service:

1. **Bimetallic Stem Thermometer**
   - **a.** The metal stem "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.*

2. **Digital Thermometer**
   - **a.** 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 does not 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 numbers stop changing.

Keeping Hot Foods Hot

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 cooked 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.

Hot Holding (135°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 135°F or hotter.

Tips for keeping food hot:

•Cover pans.

•Stir food often to distribute heat.

•Never mix cold foods with cooked foods.

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.

Cold food that will be hot held must be reheated to at least 165°F quickly (within two hours).

Cooking Temperatures Table

Holding Temp for Cooked Food	135°F

Beef, Pork, Lamb, Roasts, Steaks, Chops	145°F
Egg Dishes and Ground Meat	155°F
Poultry, Stuffing, Casseroles, Reheat Leftovers	165°F

Keeping 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.

Cooling Hot Foods

Use a thermometer to check that foods are cooled: • From 135° F to 70° F within 2 hours; then – • From 70° F to 41° F within 4 more hours. • Pre-chill salad ingredients (such as tuna, mayonnaise, etc.) OR cool from room temperature to 41° F within 4 hours

Methods to cool foods

Reduce the size of poultry, fish and meat roasts. Shallow pans (soups, sauces, gravies, etc.):

1. Put a 2-inch layer of food in a shallow pan.

2. Do not cover.

3. Put the pan in the cooler where cold air can blow across it.

4. Stir to help release heat.

5. Cover the food after it has cooled.

6. Can also be used for small to medium sized pieces of meat.

Ice bath:

1. Put the food container into an ice water bath.

2. Stir the food every 30 minutes - more often if possible.

Chilling wands or paddles (for large containers):

1. Place the clean, frozen wand in the food and stir.

2. May be used in combination with another rapid cooling method - such as ice bath or pouring into shallow pans to finish.

Adding ice instead of water (soups, stews, etc.):

1. Add only half of the water before cooking.

2. After cooking, add the other half as ice

3. Prevention of Cross Contamination

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 foods.

What is cross contamination?

Transferring germs from soiled hands, utensils, or equipment to clean equipment, or to food that will not receive additional cooking. • EXAMPLE: You used a knife to cut up raw chicken then used the same knife to cut up salad ingredients.

Cutting boards and prep tables: Wash, rinse, and sanitize between raw and ready-to-eat (RTE) food and between different types of raw meat, fish, and poultry.

• Keep cutting boards and prep tables easy to clean by replacing them as needed.

Hands: When handling ready-to-eat (RTE) food, use utensils or gloves. • Wash hands often and always between tasks.

Storage: Store raw meat, fish, and poultry below RTE. Keep food that does not require further washing or cooking separate from food that does.

Tips to avoid cross contamination:

•Wash 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.

Good-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.

Sanitizers

Sanitizers are chemicals used to kill germs. Sanitizers must be mixed by following the directions on the label. Soap should not be added to sanitizers. Use test strips to make sure the sanitizer is not too strong or too weak.

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

Wiping Cloths

Wet wiping cloths can be used to sanitize work surfaces that have been cleaned and rinsed. 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.

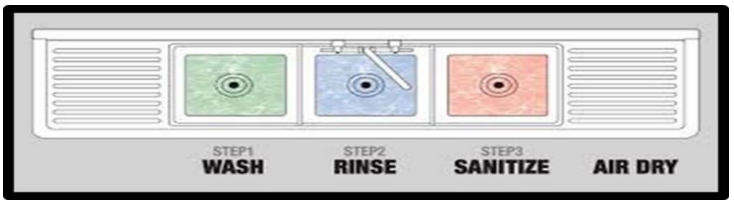
Tips for using wiping cloths:

- Store wiping cloths in clean sanitizer.
- Use different wiping cloth for cleaning up after raw meat.
- Use different cloths for food and nonfood-contact areas.
- Clean 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:

- Clean and sanitize the sink.
- Scrape leftover food into the garbage.
- Wash dishes in hot, soapy water in the first sink.
- Rinse dishes with clean, hot water in the second sink.
- Sanitize by soaking the dishes in the third sink filled with warm water and an approved sanitizer.
- 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. Food workers that use the dishwasher must be trained on how to make sure the machine is washing and sanitizing properly. Temperature gauges and sanitizer levels must be monitored.

Dishwashing

Equipment and Utensils:

5 Steps for washing and sanitizing

1st Scrape and remove food and dirt

2nd WASH in hot water with detergent, the temperature of the water should be at least 110°F

3rd RINSE with clean, warm water,

4th SANITIZE in warm water with an approved sanitizer,

5th AIR DRY

Dishwashing Machines

Using A Dish machine

• Flush, scrape, or soak items to remove food particles.

• Load machines correctly so all surfaces of each item are sprayed. Never overload machine.

• Be sure machine is meeting the manufacturer's recommended wash and rinse temperatures, and times.

• Air-dry all items

Dish machines Using Hot Water for Sanitizing

• Check final rinse temperature gauge, generally 180°F.

• Check periodically with temperature sensitive tape to ensure plate temperature reaches 165°F.

Dish machines Using Chemicals for Sanitizing

• Machine sanitizer concentration should be checked throughout the day, using the proper chemical test kit. When using chlorine sanitizer, the concentration should measure 50 parts per million.

Repackaging

Food repackaging only can occur in a facility with handwashing facilities and ware washing facilities (3-comp sink or approved dish machine), approved area for food processing. Labels are required with the name of food, manufacturer, dates, ingredients, net quantity.

If you are working with frozen food keep track of your temperature control, avoid the item being in jeopardy of the danger zone.

FOOD STORAGE

Practice FIFO (first in, first out). When stocking your food storage areas, place recently purchased items behind existing food. This will help ensure food is consumed before spoilage occurs and before the best if used by date passes.

Canned Goods

o Be wary of bulged or swollen ends, loss of seal, fracture points and serve denting that could impact the rut, or missing label.

- **Produce**
  - o Discard if you see mold, mushiness, bad smells, discoloration, wilting or signs of insects. DIRT IS OK!
- **Refrigerated/Frozen Food** o
- Chill items should be received at or below 41°F. o Frozen items should be received at or below 32°F.
  - o Discard if you see large ice crystals, thawed & refrozen, water stains, mold, bad smell, discoloration, food exposed, no label.
- **Food Leaks**
  - o o Throw out the leaking item.
  - o Clean nearby items if they are in glass, plastic, or metal containers.

        - Clean in warm, soapy water, let air dry, <u>do not</u> submerge items with screw tops!
    - Throw out nearby items if they are in cardboard.
-
- **Food Boxes & Bags**
    -
    - Damaged boxes or bags likely indicate pest contamination which could also cause mold growth. If you receive a box of cereal damaged but the bag inside the box is not damaged, you could keep the cereal and discard the box.

<u>When in doubt throw it out!</u>

Refrigerated and Frozen Storage Do's and Don'ts

- Temperature
    - ○ Refrigerator: 32 to 41º ○ Freezer: 0º or less
- FIFO (First In, First Out)
- Do not overload or line shelves with foil.
- Do not refreeze.
- Keep doors closed.

Temperature Logs

- Number each unit/door
- Number each log
- Separate log for each unit
- Log daily or as often as someone is there.
- Note repairs and adjustments. **Important Dates**

- Use by or Best By date ○ Dated by which a product is at peak quality
- Sell By date ○ Date in which it is the last day for retailers to sell
- Manufacturer Date ○ Used to track recalls

-

- Expiration Date FoodKeeper Website

This website was developed by the USDA's Food Safety and Inspection Service with Cornell University and the Food Marketing Institute. It will help you understand proper storage and maximize freshness and quality.

www.foodsafety.gov/keep/foodkeeperapp

Consumer Advisory

Animal products such as chicken, hamburger, seafood, and pork are more likely to cause foodborne illness if they are not cooked to the right temperature. Clients 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.

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 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.

Temperatures Explained

The Temperature Danger Zone is 41°F to 135°F.
The zone that pathogens (bacteria) grow the fastest is between 70°F to 125
All cold TCS foods must be stored at 41°F or lower and all hot foods must maintain at least 135° of higher.

As the temperature rises from 41°F and reaches 70°F, bacteria start growing faster and faster until it reaches 125°F and then it will start dying off until it reaches 135°F.
This is the reason you need to keep cold foods cold and hot foods hot.

Remember, to control Bacteria, you must control the temperatures and keep foods out of the temperature danger zone.
The longer foods stay in the temperature danger zone, the more time pathogens must grow.

Properly handled food stored in a freezer at 0 °F will be safe. Freezing keeps food safe by slowing the movement of molecules, causing bacteria to enter a dormant stage. Once thawed, these bacteria can again become active and multiply to levels that may lead to foodborne illness. Because bacteria on these foods will grow at about the same rate as they would on fresh food, thawed foods should be handled as any other perishable food.

A temperature of 41°F or lower should be maintained in the refrigerator. In contrast to freezer storage, perishable foods will gradually spoil in the refrigerator. Spoilage bacteria will make themselves known in a variety of ways. The food may develop an uncharacteristic odor, color and/or become sticky or slimy. Molds may also grow and become visible. Bacteria capable of causing foodborne illness either do not grow or grow very slowly at refrigerator temperatures. An appliance thermometer should always be used to verify that the temperature of the unit is correct.

Safe food-handling practices are a good defense against foodborne illness. Because we know how different temperatures affect the growth of bacteria in our food, we can protect customers from foodborne illnesses by properly handling, cooking, and storing foods at safe temperatures.

Handwashing. The temperature to wash your hands is at least 85°F. This was a change from previous versions of the FDA Food Code. This new minimum temperature aligns with the Uniform Plumbing Code and seems to be a comfortable temperature because it's close to the same temperature as the surface of people's skin.

Thermometer Accuracy. The bimetallic stem thermometer to measure the temperature of food must be accurate to within ±2°F. For the thermometer that measures the air temperature of coolers and ovens, they must be accurate to within ±3°F.

Receiving Temperatures. All cold TCS foods must be received at (think about the temperature danger zone), 41°F unless otherwise specified. For Example,
live shellfish, such as live oysters, mussels, clams, and scallops can be received at an air temperature of 45°F and an internal temperature of 50°F. However, once they are received, the shellfish must be cooled to 41°F within 4 hours.
Shucked shellfish can be received at 45°F and once it had been received, then it must be cooled to 41°F or lower within 4 hours.
Milk can be received at 45°F and once it has been received, then it must be cooled to 41°F or lower within 4 hours.

Shell eggs can be received and stored at an air 45°F. You do not have to reduce the temperature because the shell will protect the eggs. This temperature is considered safe to prevent the rapid growth of bacteria like Salmonella, which can contaminate eggs, while still maintaining the quality of the eggs; it is the optimal cold storage temperature to minimize food safety risks without compromising the egg's freshness.
Hot TCS foods must be received at 135°F or higher. For example, a school has a central kitchen and prepares meals for another location and when the foods are shipped to that other location, the receiving location must receive their hot foods are 135°F or higher.

Storage Order (based upon minimum cooking temperatures).

Storage order, top to bottom	Minimum Internal Cooking Temperature
Ready-to-eat food	N/A
Seafood	145°F for 15 seconds
Whole cuts of beef, pork, and lamb	145°F for 4 minutes
Ground Meats and Ground Fish	155°F for 17 Seconds
Whole and ground poultry	165°F Instantaneous

This storage order is based on the minimum cooking temperatures of each one of these items to prevent cross-contamination. The minimum cooking temperature is stored from lowest to highest. Ready-to-eat foods are stored above all food products so that contaminants will not drip onto the ready-to-eat foods. Also, why foods are stored with the lowest temperature above and then increases as they are stored below, because if anything drips onto the product below, then the minimum cooking temperature of that product will kill any contaminants that may have dripped onto the product.

Thawing Foods. The best and safest way to thaw foods is to thaw the foods in the refrigerator at 41°F or lower. You can also thaw foods under running, drinkable (potable) water at 70°F or lower, but never let the temperature of the food to go able 41°F for longer than 4 hours. Remember, bacteria grow to unsafe levels after 4 hours. You can also thaw foods in the microware, but you will have to cook it immediately after thawing. You cannot thaw the food in the microwave and then store it in the refrigerator. You can also thaw foods as part of the cooking process such as on a grill or in a fryer.

Minimum Cooking Temperatures

165°F (instantaneous)
Poultry – including whole or ground chicken, turkey, or duck.
Stuffing made with fish, meat, or poultry.
Stuffed meat, seafood, poultry, or pasta
Dishes that include previously cooked TCS ingredients.

155°F for 17 seconds
Meats that are not intact, including
Ground meats – i.e., beef, pork, and lamb.
Meat mechanically tenderized with needles or blades or by injecting it with brine or flavors.
Meat that has been cubed or pounded
Ground meat from commercially raised and inspected game animals.
Ground seafood – including chopped or minced seafood.
Ratites including ostrich or emu.
Shell eggs that will be hot held for service.
145°F for 15 seconds

Seafood – including fish, shellfish, and crustaceans.
Steaks and chops of beef, pork, veal, and lamb
Commercially raised game.
Shell eggs that will be served immediately
145°F for 4 minutes
Roasts of beef, pork, veal, and lamb

135°F (no minimum time)
Food from plants, including fruits, vegetables, grains (e.g., rice, pasta), and legumes (e.g., beans, refried beans), that will be hot held for service.

Cooking TCS Foods in the microwave

The minimum internal cooking temperature when cooking in the microwave is 165°F regardless of the product such as:
Meats
Poultry
Seafood
Eggs

The reason these products need to be cooked to 165°F is because of the uneven cooking process of the microwave.

Cooling Foods
Temperature requirements for cooling foods. This is a two-stage method.

Stage one. Cool the food from 135°F to 70°F within two hours. You need to get foods out of the zone where bacteria grow that fastest. That zone is between 70°F and 125°F.
Stage two. Then cool it from 70°F to 41°F in the next four hours for a total time of six hours.

Reheating Foods
All cold TCS foods must be reheated to 165°F regardless of the product.

Food reheated for hot holding. Must be reheated to 165°F within two hours.

Holding Foods without temperature control (buffet service without temperature control)

Cold Foods can be held without temperature control for up to six hours. The food is held at 41°F before removing it from temperate control. Label the food with the time you removed the food from refrigeration and the time you must throw it out. However, it cannot exceed 70°F, so you have to throw out food that exceeds this temperature, which is because the food will then be held in the zone where pathogens grow that fastest and that zone is between 70°F and 125°f. It is also sold, served out within 6 hours.

Hot food can be held without temperature control for up to four hours if it was held at 135°F before removing it from temperature control. The discard time on the label must be four hours from the time the food was removed from temperature control. The reason hot food must be discarded after 4 hours is that the food will be in that zone where bacteria grow fastest, and that zone is between 70°f and 125°f. So that is why you must throw it out after four hours. Remember, bacteria grow to unsafe levels after four hours.

A**lternatives**
If food is discarded within four hours, it can be allowed to reach any temperature during service.
The food must be held at 41°F or lower before removing it from temperature control.

The discard time on the label must be four hours from the time the food was removed from temperature control.
The food must be sold, served, or thrown out within four hours.
Ready-to-eat fruits and vegetables that become TCS foods when cut, chopped, or sliced and hermetically sealed containers of food that become TCS foods when opened, like a can of tuna, can have an initial temperature of 70°F or lower.
The product must be discarded within 4 hours.
The temperature of the product cannot exceed 70°F within the four-hour period.
The discard time on the label must be four hours from the time when the product became a TCS food.

Handwashing. The temperature of the water for handwashing should be at least 85°F.

Heat Sanitizing. The temperature of the water when using heat as a method for sanitizing should be at least 171°F such as in a three-compartment sink.

Machine Dishwashing
High -temperature dishwashing machines
The final sanitizing rinse must be at least 180°F for the large dishwashing machines that are on a conveyor system and that have curtains on the ends of the machine. The heat may dissipate faster on the conveyor type machine than an enclosed machine.

Stationary -rack single temperature machine, the temperature must be at least 165°F.

Manual Dishwashing (three compartment sinks)
The wash temperature in a three-compartment sink (first sink) must be at least 110°F.

If you are using heat sanitizing in a three-compartment sink, (third sink) the temperature of the water must be at 171°F and you must immerse those items in that third sink for at least 30 seconds.

Scenario

Your special today for lunch will be meatballs. The minimum internal cooking temperature for the meatballs is 155°F because you are using ground meats. So, you prepare the meatballs and prior to lunch will be held in a steam table. The meatballs must maintain at least 135°F. in the steam table. However, once lunch was over, you had some left-over meatballs. You then must cool the meatballs to 41°F according to the two-stage cooling method.
Tomorrow you would like to put them back on the menu to sell the remaining meatballs. When you reheat the meatballs, they must then be reheated to 165°F. The reason the meatballs must be reheated to 165°F is because the meatballs have gone through the temperature danger zone three different times during this scenario. Once to cook them, once to cool them and then once to reheat them. During this cooking, cooling and reheating process, the meatballs may have

picked up some bacteria, so then by reheating them to 165°F will kill any bacteria that may be on the meatballs.

Clarifications
Remember, minimum cooking temperatures will be different from receiving temperatures and some holding temperatures

Resources

https://www.foodsafety.gov – Food Safety

https://www.cdc.gov/foodsafety - Center for Disease Control

FoodKeeper App | FoodSafety.gov – USDA FoodKeeper App