KCHD

Kanawha-Charleston Health Department

Our Mission: Your Health
Our Vision: A Healthy Community

Introduction

All food service workers are responsible for making sure that the foods they serve are safe and wholesome. This study guide is designed to give you a basic understanding of how you can store, prepare and serve food safely. It does not take the place of reading and knowing the 2005 FDA Food Code. Almost all food borne illnesses can be prevented by following the procedures outlined in this guide. Please take what you learn here and use it in your workplace.

Part A of this guide examines how to prevent bacteria, viruses, toxins, and chemical poisons from **transferring into** food while it is under you control. Part B examines ways you can **control the growth** of harmful bacteria and viruses that may already be present in the foods you prepare.

Part A: Keeping the Contamination Out

Four Causes of Food borne Illnesses

There are different kinds of germs: **bacteria** are the most common. They are everywhere, they can grow fast and they can spoil food or cause food borne illness. Some **bacteria** produce toxins which are poisonous and may get people sick. These toxins will not be destroyed even if the food is heated to the proper temperature. One kind of **bacteria** that you may have heard about is ***Salmonella***; it is in dairy foods, poultry and eggs and it can cause very serious food borne illness.

A **Virus** is another kind of **germ** that causes **food borne illness. Hepatitis A** is spread by a **virus**. Someone can have the **virus** and not know it. When a food worker with the **virus** does not wash his or her hands well after using the toilet, the **virus** can get on the food workers hands. This is one reason why there is a law that all food workers must wash their hands. Touching food with your bare hands is not allowed when handling **ready-to-eat food**. Suitable utensils such as spatulas, tongs, deli tissue, single-use gloves, or dispensing equipment shall be used.

Parasites are tiny worms or bugs that live in fish and meat. They die if they are frozen at a specific temperature for a long enough time, or if the food is cooked to the proper temperature.

Chemicals, such as rat bait or cleaners can cause some **food borne illness**. You must be sure to keep all chemicals away from food.

Personal Hygiene and Cleanliness

Good personal hygiene practices are an essential part of providing safe food to your customers. Among these hygiene practices, the most important is hand washing.

Personal Cleanliness

Washing your hands thoroughly and frequently is the most important thing you can do to keep harmful germs out of the foods you prepare. Most of us first learned how to wash our hands as small children. Unfortunately, many food service workers fail to put what they've learned into effective practice.
Teach yourself to be aware of where your hands are at all times. Avoid bad habits like touching your hair or face, or wiping your hands on your clothes or apron. When you wash your hands, wash them thoroughly. Use hot water and soap, and scrub vigorously for at least 20 seconds, including forearms and under the nails. Use a paper towel or an air dryer to dry your hands.

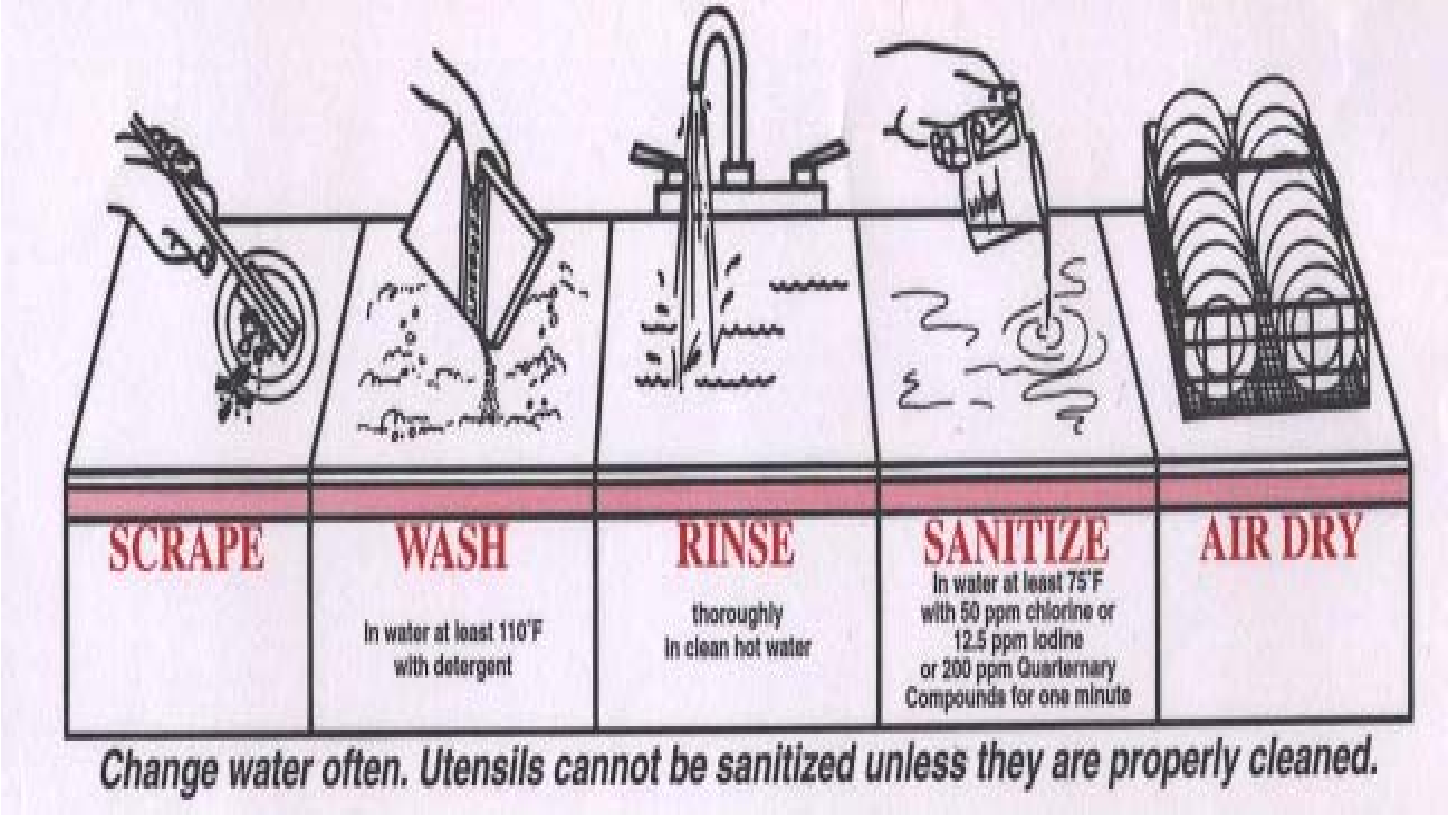
WHEN:
When you first arrive at work, and when you return to work after breaks
Before you touch clean utensils or work surfaces
After you touch your face or mouth, after sneezing or coughing
After you touch raw eggs, meat, fish, or poultry
After you touch dirty dishes, garbage, or any other unclean surface
After you use the toilet
After you smoke

Direct hand contact is not allowed for ready to eat foods. Ready to eat foods are most often foods that **will not** receive further washing or cooking prior to consumption (Examples: salads, sandwich ingredients, cut or sliced fruit). Use gloves, deli papers or utensils when you work with these foods. Gloves must be worn if you wear nail polish, fake nails, or have sores, burns or cuts on your hands.

Please be aware that neither gloves nor hand sanitizers are a substitute for proper hand washing. **When you use gloves, you must still wash your hands** in all the same situations you would if you were not using gloves, and you must switch to clean gloves whenever they become soiled. Before gloves are put on, your hands must be washed.

Smoking or eating in food preparation, service or storage areas is prohibited. Drinking is allowed only if the cup has a tight fitting lid and straw. You must wear a hat or hair restraint when working with open foods.

Finally, if you are ill, you should not go to work. You may pose a danger of infecting others through the foods you prepare, especially if you are sick with vomiting, fever or diarrhea. For some illnesses your employer will require you to stay home until a doctor tells you it is okay to work again.



Cleaning and Sanitizing

Keeping kitchens and equipment clean is important for food safety. Clean kitchens will discourage unwanted pests like cockroaches and mice. But even surfaces that look clean may still have harmful germs on them that you can't see. Sanitizing kills these germs.

Improper use of sanitizers is dangerous, so make sure you know how and when to use them.
Bleach is the most common kitchen sanitizer. If you use other types of sanitizers, you must follow the directions for safe use noted on the label. If you are unsure how to use a sanitizer, ask your supervisor.

After dishes and utensils have been cleaned, they must be sanitized. When washing dishes by hand, use the following procedure:

Start with a clean sink
Fill the first (wash) basin with soap and hot water
Fill the middle (rinse) basin with hot water
Fill the third basin with room temperature water and sanitizer at the proper concentration
Pre-Scrape or pre-rinse dishes
Wash thoroughly
Rinse thoroughly
Immerse in sanitizing solution for 10 seconds if chlorine and 30 seconds if any other chemical sanitizer is used
Air dry
Store dry dishes in a clean protected place

You must be careful to use the right concentration of sanitizer. If you are using bleach, use a paper test strip to verify 50 to 100 parts per million (about one tablespoon per gallon). The strip will turn a medium blue. If you are using a different type of sanitizer (such as iodine or quaternary ammonium), use the test strips supplied by the product vendor, **even if** the system mixes the solution automatically.

Work surfaces that come into direct contact with foods must also be sanitized. Bacteria grow very quickly in damp cloths. When you use a cloth to wipe down work surfaces, set up a large container of sanitizing solution just as you would at the dish wash sink. Rinse and return all idle clothes to the solution between uses. Change the solution frequently; food debris uses up the sanitizer quickly.

Cross-Contamination and Food Storage

When storing or preparing raw foods be aware that bacteria and viruses can easily transfer into foods that may not be cooked or reheated. This accidental transfer is called **cross-contamination**. You must avoid it by properly sanitizing all utensils, cutting boards, and work surfaces after handling raw foods, especially raw meats. Use the methods outlined above for sanitizing, and make sure you also carefully wash your hands after handling raw foods.

The same accidental transfer can occur if raw foods are improperly stored. Never store raw meat, poultry or eggs over ready-to-eat foods in a refrigerator or freezer. Reserve the lowest shelves for storing raw meat and eggs. Raw meats must also be stored in leak-proof bins with sides high enough to prevent raw meat juice from spilling out.

All foods must be stored at least six inches off the floor. Stored foods should always be kept covered. The only exception is foods that are cooling, which should be left uncovered in the refrigerator until cooled.

Food Storage Limits

Foods should always be used in the order they were received. All arriving foods should be marked with a date so that you know which inventory to use first and always use the FIFO (First In, First Out) method.

In addition, any ready-to-eat potentially hazardous food *(see below for definition) must be marked with a discard date at the time of opening or preparation. The discard date must not be more than seven days if refrigerated at 41 degrees or less.

**Potentially hazardous foods are moist, protein-rich foods that support the rapid growth of harmful bacteria. These include meat, fish, poultry, eggs and dairy products. But the term also includes many other cooked foods such as rice, refried beans, soups , gravies and potatoes. To keep the these foods safe they must be held at the right temperature.*

Unacceptable Foods

Any foods served in your workplace or at a special event must come from an approved source. It is illegal to serve foods prepared at home or from any unlicensed kitchen. Packaged food must carry a label indicating from where it comes.

Meat, poultry and dairy products must come from facilities regularly inspected by Health authorities. All foods arriving at your workplace must be free of spoilage. Canned foods must have an intact seal and be discarded if swollen or badly dented. Potentially hazardous foods should be rejected if they arrive at an unsafe temperature. Packaged foods should be rejected or discarded if they arrive damaged.

Shellfish like raw clams, oysters, scallops or mussels must come from legal sources and carry a tag that says from where it came. These tags must be saved and kept for at least 90 days after the products is sold or eaten.

Vacuum packed foods must be held at a safe temperature and consumed by the date indicated on the package.

Toxic Chemicals and Pest Control

Accidental poisonings from careless use of chemicals in food operations happen frequently. All items such as lotions, medicines, soaps, detergents, sanitizers and other chemicals must be stored separately from food, utensils and food work areas. If the chemical is not necessary to the functioning of the food business, it should not be kept there at all. Any container used for chemicals must be labeled. If the chemical is transferred into another container, such as a spray bottle, this container must be labeled too.

Pesticide use in food facilities is very restricted. **No pesticide may be applied except by a licensed pesticide applicator**. Any pesticide the licensed applicator uses must be specifically approved for food service use. No pesticides or pesticide equipment can be stored at the food business.

Any pesticide used should only be used as a last resort, after every available preventive step has been taken. **The best way to control cockroaches, mice, flies and other pests is to keep the establishment and garbage areas clean, and to eliminate hiding places and routes of entry.**

Part B: Food Temperatures

The first part of this study guide covers ways to keep food clean and free of contamination. But food that arrives at your workplace may sometimes already be contaminated with germs or parasites. So Part B of this booklet focuses on how to kill or prevent the growth of these harmful organisms.

They're Alive

Parasites are tiny worms or bugs that live in fish and meat. They can be killed if frozen at a low enough temperature for a long enough time or, cooked to the proper temperature. If your workplace serves raw or under cooked fish like sushi, sashimi, or ceviche, the fish or shellfish must be obtained from an approved source. This supplier must submit a written statement stipulating that the fish has been properly frozen.

Unlike parasites, bacteria and viruses are not always killed by freezing. They will survive and start growing again under the right conditions. Not all bacteria and viruses are the same. Some make you sick by growing inside your body, others make you sick by producing poisons in food if the food is not kept at the right temperature. It is important to understand that **when a food is contaminated with germs, the food will usually look, smell and taste fine**.

Germs are alive and need different conditions to survive and thrive. But in general they need the following conditions to grow: **food, moisture, temperature** and **time**.

As discussed in Part A, foods that are moist and high in protein support very rapid bacterial growth. For this reason they are called potentially hazardous foods. Examples include eggs, milk, meat, fish, poultry, sliced melon, refried beans, potato salad, rice, soups, gravy and sauces. Germs may still be present in or on dry foods like tortilla chips, breads or cereals, but they are unlikely to grow there.

Cooking Temperatures

Cooking foods to the right temperature is the best way to destroy any harmful germ that may be present in foods. Most types of germs are killed through cooking. The chart below shows safe cooking temperatures for many common foods.

FOOD	TEMP, degrees F	EXAMPLES
Poultry	165	chicken, turkey, chicken patties
Ground Meats	155	hamburger, meat loaf, sausage, gyros
Eggs not eaten right away	155	custard, scrambled eggs on a buffet line
Non-ground meats	145	steak, roasts, pork chops, corned beef
Seafood	145	fish filet, shrimp, mussels
Eggs eaten right away	145	eggs over easy, scrambled eggs to order

Any food cooked in a microwave oven must be cooked to 165 degrees, stirred at least once during cooking, and then left to stand covered for a minimum of two minutes prior to serving to allow thermal equalization.

The Temperature Danger Zone

Many of the foods you serve are uncooked when you serve them. Others, like cold cuts, are already cooked when they arrive at your workplace. It is important to guard these foods against contamination because they will not be cooked to remove germs. It is also important to prevent the growth of any germs that may already be there by holding foods at a safe temperature.

Most germs do not grow well at cold temperatures. This is why we refrigerate foods. To be safe, **cold foods must be held at 41 degrees** or less. Most germs do not grow well at hot temperatures either. **Hot cooked foods must be held at 135 degrees** to keep germs from growing. The range of temperature between 41 degrees and 135 degrees is called the **Temperature Danger Zone**. Germs grow very quickly in this temperature range. Whenever possible, you must avoid having foods in the danger zone. If you are cooling or heating foods they must pass through the danger zone quickly.

Reheating Foods

Foods reheated for immediate consumption can be reheated to any temperature, but if you intend to hold a reheated food for any length of time prior to serving, it must be reheated to at least 165 degrees, regardless of the original cooking temperature. For example, if you cook a meat loaf on Monday to a temperature of 155 degrees, but want to serve hot leftovers on Tuesday's buffet line, you must reheat the meat loaf to 165 degrees.

Reheating must be rapid. Do not place cold foods into a steam table. They will not reheat quickly enough. Instead, use a microwave, stove top, or oven to heat the food before placing it in the steam table. A food should only be reheated once.

Cooling Foods

Cooling is usually the riskiest step in food preparation. Germs can grow very quickly in cooling foods. It is very difficult to cool foods fast enough to keep them safe. Most refrigeration equipment is not capable of rapidly cooling large volumes of food.

The best approach to cooling is to avoid it whenever possible. Smart businesses plan and prepare all their menu items on a daily basis, discarding any leftovers. Rather than cooking enough of a particular food to last all week, they prepare only enough to last through that day, and hold it hot until served. They prepare the food as closely as possible to the time they serve it.

For some foods, cooling is unavoidable. Knowing ways to quickly cool these foods minimizes the risk. For large solid food like meat loaf or turkey, cut food into smaller pieces and spread it out on a tray, placing the tray into the refrigerator with plenty of room for air circulation. For foods you can stir like gravy or refried beans, setting up an ice bath and placing the container of food into it will greatly speed up cooling. Be sure to stir the food often. Splitting large containers of hot food into multiple small shallow containers allows for faster cooling too.

Foods should not be left out to cool at room temperature. As soon as they fall below 135 degrees they should be cooled on ice or in the refrigerator. If you are preparing a cold salad from hot ingredients like potato salad or egg salad, cool all the ingredients first, prior to mixing. Also, when making cold salads, pre-chill all ingredients before preparing (tuna and mayonnaise).

Whatever the method used, the food must cool to 70 degrees within two hours, and from 70 degrees down to 41 degrees within another four hours.

Six Hours may seem like a long time to cool foods, but most foods will not cool this quickly unless you're giving them some help. Use a stem thermometer to make sure the cooling methods you're using are adequate.

Thermometers

Any refrigeration equipment you use must be equipped with a thermometer that measures the internal temperature. It is a good idea to keep logs as a way of making sure that someone will actually be checking on the temperature regularly.

Use a metal stem thermometer to check foods you are cooking, hold hot or cold, or cooling. Keeping a log of these temperatures is also recommended.

Make sure the thermometer's range includes the temperature you are looking for. You cannot use a meat thermometer for cold or cooling foods because the range does not go down to 41 degrees. Test the accuracy of your thermometer by placing it in a glass with plenty of ice and some water for a couple of minutes. If it does not give you a reading of 32 degrees, it needs to be adjusted.

Be aware that stem thermometers usually measure from a point halfway up the stem. To give an accurate reading, the stem must be pushed deep into the food. Thermometers must also be cleaned and sanitized between uses. You don't want a dirty thermometer to put germs into food. Alcohol prep pads are convenient for this purpose.

The Importance of Time

Most (but not all) harmful germs need time to grow to dangerous levels. This is why holding foods at a safe temperature is important. This is also why cooling and reheating should happen as quickly as possible.

In general, four hours is the longest possible time you want to have a potentially hazardous food in the temperature danger zone. Remember that this limit is additive. For example, if it takes three hours for the cooked potatoes in your potato salad recipe to cool down to 41 degrees, you do not want the potato salad to sit out above 41 degrees for more than one additional hour. If you discover that a food has been held at an unsafe temperature, but you're not sure for how long, discard it. The rule is "when in doubt, throw it out!"

Thawing Foods

There is a right way and wrong way to thaw foods. Improper thawing allows germs to grow in the outer layers while the core is still frozen. Do not thaw food at room temperature or in warm water. There are three acceptable ways to thaw foods, and they all require some advance planning:

Place it in the refrigerator. This method is the safest, but it will take longer (be sure to put raw meats in a container below ready-to-eat food to prevent the juices from dripping into other foods).
Hold the food under running water that is 70 degrees or colder.
Thaw it in a microwave, but only if the food will be cooked immediately.

Don't be tempted to cook a large roast or whole chicken or turkey when it is still partially frozen. The core will not reach a safe temperature by the time the outer layer is done.

Emergencies

You should know how to respond to emergency situations at work. If a sewer or waste system backs up in the drains, or if the water supply is cut off or damaged, you should notify the manager and close the business right away. You should also close the business if there is an extended power or hot water outage.

If a piece of equipment fails that you rely on to keep foods hot or cold, you must think and act quickly. Shift food into an alternate refrigerator or warming unit if possible. If you are unsure how long a refrigerator or freezer has been malfunctioning, take the temperature of foods inside using a stem thermometer. If the food is above 41 degrees, discard it. If frozen food has thawed, do not refreeze it, and discard it if the temperature exceeds 41 degrees. If you are unsure how to respond to an emergency, you should call the local health department for advice.

Summary

All of the information you have learned from this study guide will not only help you serve safe food at work, but it will help you and your family stay healthy too. Take this time to review key ideas.

Wash you hands often, and wash them well.

Work only when you are healthy, not when you are sick.

Use only foods from approved sources.

Prevent food borne illness by keeping food out of the "danger zone" between 41 and 135 degrees F.

Cool and reheat foods quickly

Cook foods to the proper temperature.

Keep food safe from cross contamination with careful storage and sanitizing.

Store chemicals away from food, utensils and equipment.

Keep your workplace clean and safe.

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