# Food Safety Manual for the Food Service Worker

(Revised March 2013)

## Portsmouth Health Department

Acknowledgments

Maricopa County Food Protection Program – Environmental Health Services Division of Seattle and King County and the USDA, FSIS Cooperative Agreement FSIS-C-05-2003.

## Why Read this Manual?

According to the Center for Disease Control, it is estimated that each year in the United States alone there are 48 million cases of foodborne illness resulting in 128,000 hospitalizations and 3,000 deaths. This is why all food service workers must learn how to prevent illness by following the methods used in this book to serve safe food.

## What Makes People Sick from Food?

People can get sick when they eat food contaminated with one of the three major hazards. These hazards include:

Physical—objects in food that cause injury, like glass, jewelry, bandages, staples, hair, and fingernails.
Biological—germs that cannot be seen, like parasites, bacteria and viruses
Chemical—poisonous substances, like cleaning agents and pesticides.

Bacteria and viruses are too tiny to see with your eyes. If you do not wash your hands the proper way or keep food at the correct temperature, your customers may get sick. This is called food-borne illness, which is commonly called food poisoning. Some foods are more likely than others to support the rapid growth of bacteria that cause foodborne illness; these are called potentially hazardous foods (time/temperature control for safety foods). Potentially hazardous foods (time/temperature control for safety foods) are foods that require time/temperature control for safety to limit the rapid growth of bacteria. These include meat, fish, poultry, eggs, dairy products, sliced melons, cut lettuce and tomatoes, bean sprouts, and garlic-in-oil mixtures. The term also includes many other cooked foods such as rice, refried beans, soups, gravies, sauces and potatoes. These foods must be held at the proper temperature to avoid rapid multiplication of bacteria.

## Four Causes of Food-borne Illness

1. Bacteria are the most common causes of food-borne illness. Bacteria grow fastest when they are kept in the "Danger Zone". Bacteria are alive and need different conditions to survive and multiply, but in general they need the following conditions to grow: food, moisture, temperature and time. Some bacteria produce toxins which are poisonous and may make people sick. One kind of bacteria that you may have heard about is Salmonella; it is found in dairy foods, poultry and eggs and it can cause very serious foodborne illness.

2. Viruses can also cause 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 their hands well after using the toilet, the virus can get on the food workers hands and then into the food. This is one reason why the food code requires that all food workers must wash their hands and wear single-use, non-latex gloves.

3. Parasites are tiny worms or bugs that live in fish and meat. If they are frozen at a specific temperature long enough or cooked long enough, parasites will be destroyed.

4. Chemicals, such as rat bait or cleaners can cause some foodborne illnesses. Keep all chemicals in labeled containers and store chemicals away from food and food preparation areas.

Unlike parasites, bacteria and viruses are not always killed by freezing. They will survive and start growing again under the right conditions. It is important to understand when a food is contaminated with bacteria or viruses, the food will usually smell fine, look safe and taste good but can still make someone very sick.

# Major Food Allergens

Each year, millions of people in the United States have allergic reactions to food. Most food allergies cause minor symptoms. However, some food allergies can cause severe, even life-threatening reactions. Around 90% of serious food allergies are caused by contact with the proteins in these eight foods: milk, eggs, fish, Crustacean shellfish, tree nuts, wheat, peanuts, or soybeans.

Food manufacturers must clearly identify any major food allergens on food labels. In an eating establishment, as a food service worker you should follow the four R's when dealing with a guest with a disclosed food allergy:

1. Refer guest food allergy concerns to the person-in-charge, manager, or chef.
2. Review the food allergy with the guest and check ingredient labels and menu items.
3. Remember to check for cross-contact during food preparation. Cross-contact is when the protein of a possible food allergy causing food comes in contact with another food. Cross-contact can happen when using the same cooking oil, utensils, cutting boards, food containers, gloves, fryers, and grills for both items of food.
4. Respond to the guest and inform them of your findings.

* If a guest has an allergic reaction, notify the management and call 911 immediately.

# Keeping Contamination Out

## Personal Hygiene and Cleanliness

Good personal hygiene practices are an essential part of providing safe food to your customers. Hand washing is the most important practice. Washing your hands thoroughly and frequently will prevent harmful bacteria and viruses from entering the foods you prepare.

Employees must wash their hands and forearms for at least 20 seconds in an approved and dedicated hand washing sink by:

1. Moisten hands with warm water
2. Apply hand soap
3. Vigorously rub hands together scrubbing between your fingers, under your fingernails, your forearms, and the back of your hands. You must continue scrubbing for at least 10-15 seconds. It is the hand soap combined with the scrubbing action that removes the dirt, bacteria, and viruses from your hands.
4. Completely rinse your hands under warm running water for the remaining 5-10 seconds.
5. Dry hands with a disposable paper towel.
6. Turn off the faucet with the same paper towel used to dry your hands. It is a good idea to use the paper towel to open the door when leaving the bathroom.

Teach yourself to be aware of where your hands are at all times. You must wash your hands every time your hands or gloves become dirty or contaminated. Here are some examples of when to wash:

- when you first arrive at work
- when you return to work after breaks
- before you touch food, clean utensils or work surfaces
- after you touch your face, mouth or hair
- after covering a sneeze or a cough with your hands
- 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 and before you start working with food again
- after you smoke, drink, eat, or handle money
- after wiping your hands on your clothes or apron

Touching ready-to-eat foods with your bare hands is not allowed. Ready-to-eat foods are foods that will not receive further washing or cooking prior to consumption (Examples: salads, sandwich ingredients, fruit, bread, tortillas, cold salads, garnishes, chips and ice, pizza, hot dogs, etc). A barrier such as non-latex gloves, deli papers, tongs, spatulas or utensils is required when working with these foods. Non-latex gloves must be worn if you wear nail polish, fake nails, have sores, burns or cuts on your hands. It is important to guard these foods against contamination because they will not be cooked to remove bacteria.

Be aware that neither gloves nor hand sanitizers are a substitute for proper hand washing. Before you put gloves on, 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 dirty or contaminated.

### Do Not Work If You Are Sick

If you feel sick you should let your boss know and not go to work. Not only can you infect the people you work with, but you may also pose a danger of infecting others through the foods you prepare. This is especially true if you are sick with vomiting, fever, diarrhea, jaundice, sore throat with a fever. For illnesses such as one of the BIG FIVE: Hepatitis A virus, Salmonella typhi, Shigella spp., Escherichia coli $_{0157:H7}$ (E. coli $_{0157:H7}$), or Norovirus, you are required to stay home until a doctor tells you it is okay to go back to work again.

Do not work with food and tell your boss if you have an infected cut, burn or sore on your hand. If the sore or cut is not infected, cover it with an impermeable bandage and wear a non-latex glove over the bandage.

### Personal Appearance and Behavior

You want to look clean and be clean when you are at work:

- Your clothes and apron must be clean.
- Fingernails must be cut and trimmed.
- All jewelry, with the exception of a simple wedding band, must be removed prior to handling food.
- Keep your hair clean and wear an effective hair restraint, such as a hat or hair net.
- Smoking, eating or drinking in food preparation, service or storage areas is prohibited
- Use a lid and straw on your drink cup

## Temperature Control

### The Danger Zone

Many of the foods you serve are ready-to-eat making it important to prevent the growth of bacteria that may already be in the food. Temperature can be used to control the rapid growth of harmful bacteria.

The range of temperatures between 41º F and 135º F is called the Danger Zone. Bacteria 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, you must do it in such a way that food passes through the danger zone quickly.

### Cold Holding

Bacteria do not grow well at cold temperatures. This is why we store potentially hazardous food (time/temperature control for safety food) in the refrigerator, salad bar, refrigerated display case, in ice or another approved method. Cold foods must be held at 41º F or below. Use a calibrated metal stem thermometer to check the food's temperature. If you use ice to keep the food cold on a salad bar or food display, be sure the ice comes up to the level of the food in the pan or dish. Be sure to replace the ice as it melts. If the food temperature is maintained below 41° F, then it must be discarded after seven (7) days.

## Hot Holding

Hot cooked foods must be held at 135º F. Some establishments use a steam table, oven or other approved equipment to keep the food hot. Be sure to stir the food periodically in a steam table to ensure the food is maintained hot throughout.

## Thawing Foods

Improper thawing allows bacteria to rapidly grow in the outer layers while the core is still frozen. Do not thaw food at room temperature or in warm water. The three acceptable steps for thawing foods are:

1. When possible, transfer the food from the freezer and place it in the refrigerator. This method is the safest since the food will be kept at 41ºF and out of the Danger Zone. It will take several hours or days depending on the amount (be sure to put different raw meats in separate containers to prevent the juices from transferring or dripping onto other foods).
2. Thaw the food under cold running water; never in warm or hot.
3. Thawing food in a microwave is appropriate only if the food is cooked immediately.

Don't be tempted to cook a large roast or whole turkey when it is still partially frozen. The core will not reach a safe cooking temperature by the time the outer layer is done. The use of a thermometer is the best way to verify that meat is cooked sufficiently.

## Cooking Temperatures

Cooking foods to the proper temperature is the best way to destroy any harmful bacteria that may be present in food. The table below shows safe minimum cooking temperatures.

| FOOD | TEMPERATURE | EXAMPLES |
|---|---|---|
| poultry | 165º F | chicken, turkey, stuffed meats |
| ground meats | 155º F | hamburger, meat loaf, sausage, chorizo, gyros |
| eggs not consumed right away | 155º F | custard, scrambled eggs on a buffet line |
| non-ground meats | 145º F | steak, roasts, pork chops, corned beef |
| seafood | 145º F | fish filet, shrimp, mussels |
| eggs consumed right away | 145º F | eggs over easy, scrambled eggs to order |

Any food cooked in a microwave oven must be cooked to 165º F, stirred at least once during cooking, and then left to stand covered for a minimum of two minutes prior to serving. The only way to know that the food has been cooked to the proper temperatures is to use a calibrated stem thermometer.

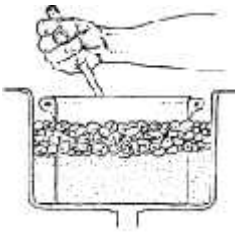
## Cooling Foods

Cooling is a risky step in food preparation since the temperature of the food will be exposed and pass through the Danger Zone. Most refrigerators and equipment are not capable of rapidly cooling large volumes of food. It is very difficult to cool foods fast enough to keep them safe, especially during the summer. Food should not be left out to cool at room temperature. Once the temperature of the food falls below 135º F, it should be cooled on ice or in the refrigerator.

The best approach to cooling is to avoid it whenever possible. Food commonly cooked in two or more steps (like chicken wings, deep fried tacos and eggs rolls) are much safer if the steps are combined into just one longer cooking step.

To avoid the risk of cooling, businesses should attempt to 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, businesses should prepare only enough to last through that day, and hold it hot until served. Businesses could also 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 will minimize rapid bacterial growth and the risk of potential spoilage:



- Splitting large containers of hot food into multiple, small, shallow, metal containers, no greater than 4 inches deep, uncovered and stirring allows for faster cooling in the refrigerator. Place containers in an area in the refrigerator with good air circulation.
- For large solid food like meat loaf or turkey, cut the food into smaller pieces and spread it out on a tray, place it uncovered into the refrigerator in an area with good air circulation.
- For foods you can stir like soups, gravy or refried beans, placing the container of food into an ice bath with the ice at the product line will greatly speed up cooling.

- Ice wands, which are filled with water and then frozen, can be placed into hot food. By combining ice wands with an ice bath, it creates a very effective cooling process for soups, gravies and sauces.
- If you are preparing a cold salad, like potato salad or egg salad, from hot ingredients, cool all the ingredients first in the refrigerator, prior to mixing.

Whatever the method used, the food must be cooled down from 135°F to 70°F within two (2) hours and from 70°F down to 41°F within another four (4) hours.

Six (6) hours may seem like a long time to cool foods, but most foods will not cool this quickly unless you assist in the process. Use a calibrated stem thermometer to make sure the cooling methods you are using are adequate.

## Reheating Food

Food that has been cooked and then cooled may need to be heated again. When you reheat food, do it quickly (within one hour) to 165° F, regardless of its original cooking temperature. For example, if you cook meatloaf on Monday to 155º F and you cool it down properly; now you want to serve leftovers on Tuesday's buffet line, you must reheat the meatloaf to 165º F.

The right way to do this is using stove burners, microwave ovens, convection ovens or steamers. Stir the food to be sure that all parts of it are hot. Then use your calibrated metal stem thermometer to check the temperature.

IMPORTANT: Do not place cold foods onto a steam table; as the food will not be reheated quickly enough allowing it to be exposed to the "Danger Zone" for a long time. Food should only be reheated once.

## Thermometers

Any refrigeration equipment you use must be equipped with a thermometer that measures the internal temperature. Use a metal stem thermometer to check foods you are cooking, holding hot or cold, or cooling. It is a good idea to keep logs as a way of making sure that someone will actually be checking on the temperature regularly.

Make sure the thermometer's range includes the temperature you are looking for. You cannot use a cooking 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 of ice water for a couple of minutes. If it does not give you a reading of 32º F, 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. Do not insert a dirty thermometer into the food as it may introduce bacteria into the food.

## The Importance of Time

Most (but not all) harmful bacteria need time to grow to dangerous levels. This is why holding food at safe temperatures is important. This is also why cooling and reheating should take place as quickly as possible.

In general, four hours is the longest possible time you want to hold potentially hazardous foods (time/temperature control for safety foods) in the temperature danger zone. Remember that this limit of four hours is "additive". For example, if it takes three hours for the cooked potatoes in your potato salad recipe to cool down to 41º F, you do not want the potato salad to sit out above 41 degrees for more than one additional hour.

Many refrigeration units now in use cannot keep foods at 41 degrees. This is particularly true of "prep tables" with trays of foods arranged in the top. Often these tables are on hot cook lines and the food in the trays will not stay cold enough. If this is true of your kitchen, make sure that all foods are pre-chilled before placing them into the prep table and then remove all trays on a strict time schedule discarding the contents. Do not hold any potentially hazardous food (time/temperature control for safety food) in the danger zone for more than 4 hours. Approval and proper documentation is required by the department to use this control. If you discover that a food has been held at an unsafe temperature, but you're not sure how long, discard it. The rule is "When in doubt, throw it out!"

## Food Storage Limits

Food should always be used in the order it was received. All arriving foods should be marked with a date, so that you know which inventory to use and always use the FIFO method; First In, First Out.

In addition, any ready-to-eat potentially hazardous food (time/temperature control for safety food) must be marked with a discard date at the time of opening or preparation. These foods should be maintained at 41º F or less and the discard date should be no more than seven days after opening, cooking or preparing.

## Foods From Approved Sources

Use food that comes from sources that are approved by the Health Department. Meat, poultry and dairy products must come from facilities regularly inspected by the "USDA". Look for "Pasteurized" on milk. Shellfish, such as raw clams, oysters, scallops, and mussels, must come from approved sources and carry a tag that states where it came from. These shellfish tags must be saved and kept on file for at least 90 days after the product is sold or consumed. Canned foods, fresh foods and dairy products must come from companies, brokers or dairies that have been inspected by a regulatory agency. All packaged food must have a label or seal on the packaging that says the name of the processor or distributor, the name of the food, and the ingredients.

It is illegal to serve or sell foods prepared at home or from any unlicensed kitchen. Food for the public must be prepared in a licensed kitchen approved for that purpose. Health Inspectors (people trained by the Health Department) must check the kitchen to ensure food is prepared and stored in a safe manner.

All foods arriving at your workplace must be free of spoilage. All foods served in your workplace or at a special event must come from an approved source and cannot be adulterated. Packaged food must carry a label indicating where it comes from. Canned foods must have an intact seal and be discarded or returned if swollen. Potentially hazardous foods (time/temperature control for safety foods) should be rejected if they arrive at an unsafe temperature. Packaged foods should be rejected or discarded if they arrive damaged. Vacuum packed foods must be held at a safe temperature and consumed by the date indicated on the package.

## Food Left At The Table

Once customers have eaten and they leave food like chips, rolls and bread on a plate or at the table, you must throw it away. You CANNOT serve it again. Unopened packages of crackers, jelly, butter, candy or sugar may be served again.

## Cross Contamination and Food Storage

As a food handler you must prevent cross-contamination. Cross-contamination happens when bacteria and viruses are spread or transferred from one place to another, such as when raw or unclean foods get into foods that are ready-to-eat foods. Here are some important ways that you can prevent cross-contamination:

- In the refrigerator: Don't let raw meat, fish, poultry or eggs drip onto foods that will not be cooked before serving; store raw meat, fish, and poultry in separate containers on the lowest shelves of the refrigerator. Raw meats should be stored according to their cooking temperature.
- Wash your hands immediately after handling raw meat, fish, poultry, or eggs.
- Never store foods that will not be cooked before serving in the same container as raw meat, fish, poultry or eggs.
- Use a hard cutting surface or a board that is smooth and non-absorbent, with no splits or holes where bacteria can collect.
- Wash, rinse and sanitize the cutting or work surface and all the utensils and knives after cutting raw meat, fish or poultry.
- Properly wash your hands after handling raw foods.

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. All foods must be stored at least six inches off the floor.

## Sanitizing

Using a sanitizer improperly can be dangerous. Using too much sanitizer can be toxic to humans and having too little will not sanitize or destroy bacteria and viruses, so make sure you know how to prepare and use sanitizers in your establishment.

You should always use clean wiping cloths to sanitize counter tops, tables, cutting boards and equipment. Bacteria can grow very quickly in damp cloths. That is why all wiping cloths should be stored in the sanitizing solution that is mixed to proper concentration between uses. Use the appropriate test strips to verify the concentration of the sanitizer. Chlorine sanitizing solution should be between 50 and 100 parts per million (ppm); Quaternary Ammonia should be used according to the manufactures specifications.

Be sure the sanitizing solution is always at the proper concentration by changing the sanitizing solution as needed, usually every 2-3 hours depending on usage. Do not let it become dirty; food debris uses up the sanitizer quickly. Do not mix in other chemicals or soap because it changes the effectiveness of the sanitizer.

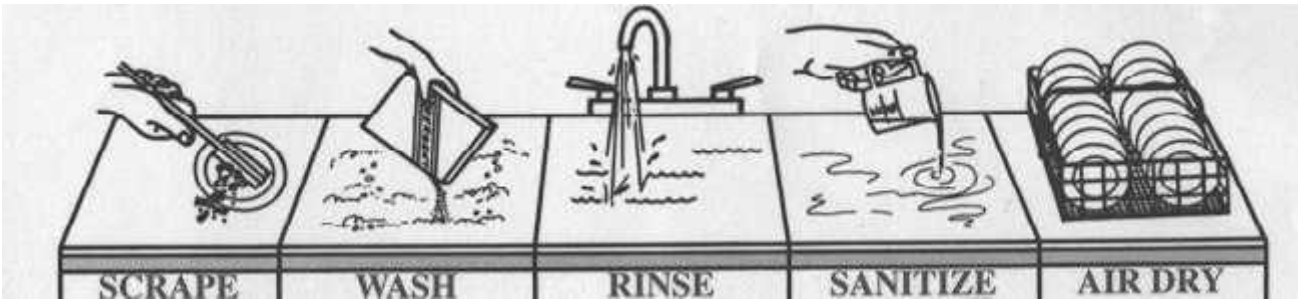
Clean and sanitize to prevent cross-contamination. Wash, rinse and sanitize each surface that comes in contact with food such as slicers, grinders and cutting boards. Breakdown and sanitize all equipment and machines after each use for proper washing and sanitizing.

### Manual Dish Washing

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

Dishes, utensils, and equipment that touch food must be washed using the following five steps:

1. Pre-scrape. Remove leftover food and grease from the dishes and throw it away.
2. Wash. In the 1st sink, thoroughly wash the dishes with detergent and hot water.
3. Rinse. In the 2nd sink, rinse the dishes in clean hot water to remove the soap. (Mixing detergent with sanitizer can prevent the disinfectant from killing the bacteria and viruses.)
4. Sanitize. In the 3rd sink, the dishes must be sanitized in warm water. The sanitizer shall be at the right concentration per manufacturer specification by using the appropriate test strip. The dishes should remain completely submerged in the solution for at least 30 seconds.
5. Air-dry. Place all dishes and utensils on the drain board or rack and let them air-dry. Do not use a towel to dry them because a towel will put bacteria and viruses back on your clean dishes.




## 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 either in a locked storage cabinet or below a sink. 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.

### Pest Control

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.

The best way to control cockroaches, mice, ants, flies and other pests is to keep the establishment and garbage areas clean, eliminate hiding places and routes of entry, and seal all cracks and crevices. Cockroaches, flies, weevils, ants, mice and rats are some of the pests that can get into a food business. Don't let them in and don't let them eat.

A permit holder shall immediately discontinue operations and notify the Department if an imminent health hazard exists, such as:

*Flood *Sewage backup *Fire

*Gross insanitary occurrence or condition

*Misuse of poisonous or toxic materials

*Extended interruption of electrical or water service

*Onset of an apparent foodborne illness outbreak

*Other circumstance that may endanger public health.

## Review Questions

1. What is a foodborne illness?
2. What are potentially hazardous foods (time/temperature control for safety foods)?
3. What conditions are needed for potentially hazardous foods (time/temperature control for safety foods) to grow?
4. What four things can cause foodborne illness? Which one is the most common?
5. What are the (8) eight major food allergens?
6. What is the most important personal hygiene practice?
7. When is it necessary to wash your hands?
8. What is the definition of “ready-to-eat” foods?
9. What are some ready-to-eat foods that are served in your establishment?
10. When must you stay home from work?
11. What is the “Danger Zone?”
12. Why potentially hazardous foods must be kept out of the “Danger Zone?”
13. What is the proper cooking temperature for chicken, pork, hamburger, and fish?
14. What is the right way to cool foods?
15. What is the right way to thaw foods?
16. What is the right way to reheat foods?
17. From what source should you get your food?
18. How do you store raw meat in a refrigerator?
19. How can you prevent food from being contaminated?
20. What is cross-contamination and how can it be prevented?
21. What is the difference between washing and sanitizing?
22. What is the right concentration for chlorine sanitizing water?
23. What are some of the critical food contact surfaces that must always be washed and sanitized?
24. What are the five (5) steps for washing dishes by hand?
25. How can you prevent pests from getting into your food business?

## Acknowledgments – adapted from:

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