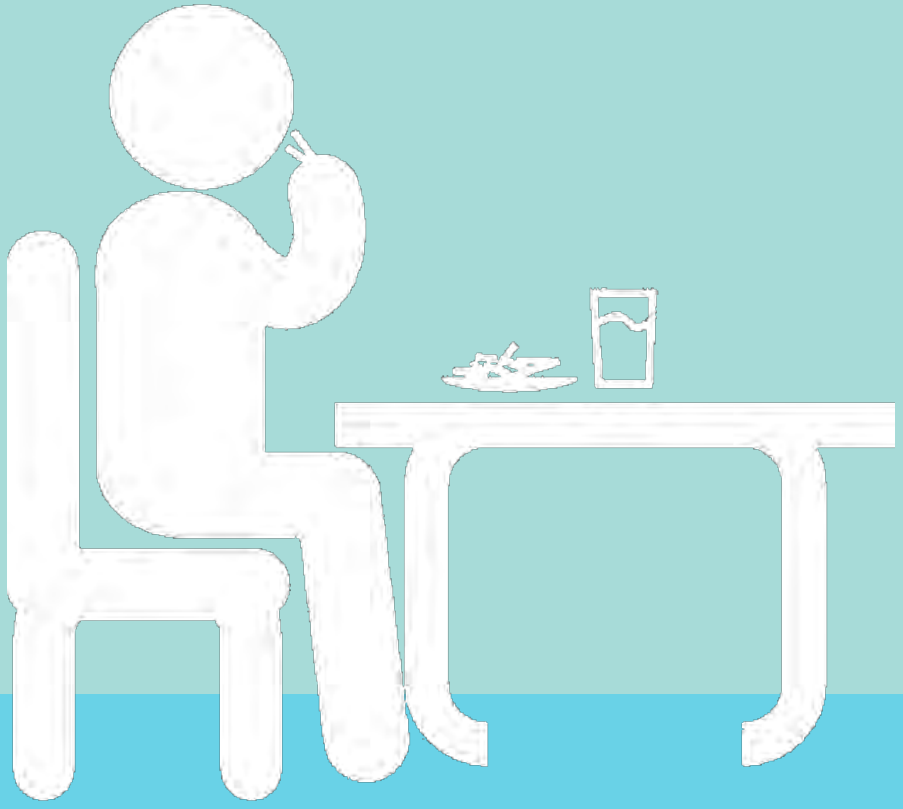
HEALTH CERTIFICATE

FOOD SAFETY COURSE
STUDY MANUAL



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FOREWORD

Food safety is an important part of public health. If the food we eat is not handled properly, it can make us ill or, in some cases, kill us. This is why, if you handle food, it is important that you understand your role in preventing the contamination of foods that you prepare, cook, and/or serve to your family, friends, or customers so you do not make them sick from foodborne illness (also called foodborne disease, foodborne infection, and food poisoning).

The information presented in this manual is designed to give you the basic understanding of food safety, and the most significant requirements of the Guam Food Code, in very simple, straightforward language. It is meant primarily for non-managers of food establishments who are seeking a Health Certificate in preparation for the *Health Certificate Food Safety Course* that they are required to attend and pass in order to receive such certificate from the Division of Environmental Health of the Department of Public Health and Social Services. Managers, or persons-in-charge, of food establishments are required to attend a different course designed specifically for them.

The Guam Food Code (GFC) is the governing regulations for the sanitary operation of retail food facilities on Guam. Only the most relevant requirements of food-handlers are presented in this manual. You are encouraged to review the GFC or speak to your manager for more detailed or comprehensive requirements of the code. GFC may be viewed or downloaded at www.dphss.guam.gov.

The examination for the *Health Certificate Food Safety Course* consists of 25 multiple choice questions. The passing score is 70%. If you pass the exam, you will be given a Health Certificate that shall be renewed every year. A copy of your Health Certificate must be in your possession at all times while working and must be presented when requested during an inspection of your workplace by the staff of the Division of Environmental Health.

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DEFINITIONS

"Approved source" means a facility that has been inspected by the Division of Environmental Health of the Department of Public Health and Social Services and has received a Sanitary Permit.

"Bacteria" mean germs that are found in and on food that can make you very sick.

"Clean" means free from dirt or unwanted food.

"Contamination" means when something dangerous or unwanted gets into food.

"Cross-contamination" means when germs are transferred from a food or surface to another food.

"Foodborne illness" means when someone gets sick from something that they ate or drank; also called foodborne disease, foodborne infection, or food poisoning.

"Germs" means harmful bacteria or viruses that can make people sick if eaten.

"Guam Food Code" means the rules and regulations that address the safety and protection of food offered at food establishments.

"Highly susceptible population (HSP)" means persons who are more likely than other people in the general population to experience foodborne disease because they are immunocompromised, preschool age children, or older adults.

"Good Hygiene" means being clean and behaving in a cleanly manner.

"Jaundice" means a medical condition with yellowing of the skin and eyes caused by the hepatitis virus.

"Pathogens" means bacteria, viruses, fungi, and parasites that cause disease and sickness.

"Potentially hazardous foods (PHF)" means food that can grow bacteria which must be kept under temperature control.

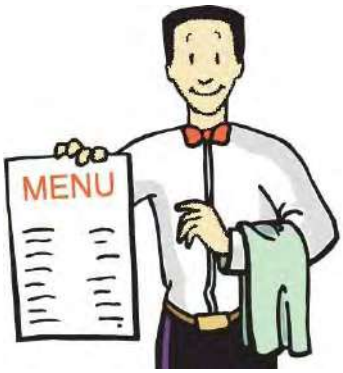
"Parts-per-million (ppm)" means the number of parts of chemical, such as a sanitizer, that would be added to a million parts of water.

"Ready-to-eat (RTE)" means foods that are ready for consumption without any further cooking.

"Sanitize" means to kill germs using chemicals or heat.

"Temperature danger zone (TDZ)" means the temperature range between 41^{o}F and 140^{o}F where bacteria will grow the quickest.

"Toxin" means poison produced by pathogens.



LEARNING OBJECTIVES

The *Health Certificate Food Safety Course* will cover personal hygiene, contamination, and temperature control to prevent foodborne illnesses. The following objectives will enable the applicant to better understand the basics of food safety and prepare him/her for the quiz that is given at the conclusion of the course:

Foodborne Illness

The food-handler will be able to describe foodborne illness as a sickness resulting from eating contaminated food.

1) The food-handler will know that foodborne illness symptoms vary, and may include diarrhea, vomiting, fever, cramping, jaundice, and/or nausea.

2) The food-handler will know that symptoms of foodborne illness may develop in a few minutes or several days later. These symptoms may last for many days, and foodborne illness can result in death.

3) The food-handler will know that foodborne illness can be caused by germs, toxins, and foreign objects.

4) The food-handler will be able to identify the five risk factors that can cause foodborne illness.

5) The food-handler will be able to identify individuals who are considered highly susceptible population and why they are more likely to get sick from foodborne illness than others.

Temperature Control

Workers will understand why hot and cold holding temperatures are important factors in preventing foodborne illness.

1) The food-handler will be able to identify potentially hazardous foods as foods that can support bacterial growth when kept at the incorrect temperatures known as the “temperature danger zone” or TDZ.

2) The food-handler will be able to identify the temperature danger zone as any temperature between 41^0F and 140^0F.
3) The food-handler will be able to identify that food being cooled or heated must move through the temperature danger zone as quickly as possible.

4) The food-handler will be able to identify 140^0F or hotter as the correct temperature for hot holding potentially hazardous foods.

5) The food-handler will be able to identify 41^0F or colder as the correct temperature for cold holding potentially hazardous foods.

6) The food-handler will know that you cannot make food safe to eat when food has been in the danger zone for four hours or more.

7) Food-handler will understand why cooking foods to proper temperatures are important for preventing foodborne illness. The food-handler will be able to identify that cooking foods to the recommended temperature will kill disease-causing germs.

Food Storage with Protection

Workers will understand why cross-contamination of foods can be dangerous and know ways to prevent it.

1) The food-handler will be able to define and identify physical contamination as foreign objects accidentally introduced into food.

2) The food-handler will be able to define and identify cross-contamination as an event when germs or other contaminants are transferred from one food or surface to another food.

3) The food-handler will be able to identify methods to prevent cross–contamination, such as washing, rinsing, and sanitizing utensils, work surfaces, and equipment in between uses.

4) The food-handler will be able to identify storage conditions that will minimize the potential for cross-contamination:
    - Storing raw meats below and completely separate from ready-to-eat foods in refrigeration units
    - Storing chemicals, cleansers, and pesticides completely separate from foods, utensils, and single service items
    - Properly labeling all chemicals, cleansers, pesticides, and other dangerous materials

Employee Health

1) The food-handler will know to call the person-in-charge at the food establishment when ill with diarrhea, vomiting, jaundice, or fever with sore throat.

2) The food-handler will know not to work in the food establishment while ill with symptoms of diarrhea, vomiting, jaundice, or fever with sore throat.

3) The food-handler will know not to work in the food establishment for 24 hours after symptoms of diarrhea or vomiting have gone.

4) The food-handler will know not to handle food with an infected boil, cut, burn, or sore on the hand or wrist. Food may be handled if the injury is covered with a clean bandage and a glove.

Employee Hygiene

Workers will understand the elements of good handwashing.

1) The food-handler will be able to identify the correct technique for handwashing:
    - Wet hands using running, warm water and soap; scrub hands and rinse thoroughly (approximately 20 seconds); and then dry hands with single-use towel or air dryer.

2) The food-handler will be able to identify situations when they must wash their hands:
    - Before starting work
    - After using the toilet and again when entering work area
    - After handling raw food and raw animal products
    - After handling soiled dishes
    - After handling garbage
    - After cleaning or using chemicals
    - After blowing nose, sneezing, coughing, or touching eyes, nose or mouth
    - After smoking, or using tobacco products
    - After eating or drinking
    - Before putting on food service gloves

3) The food handler will know that food service gloves are capable of spreading germs and are not a substitute for proper handwashing.

4) The food handler will know that smoking, eating, and chewing tobacco are prohibited in food preparation areas, including food and utensil storage areas.

FOODBORNE ILLNESS

When someone gets sick from eating (or drinking) food that is contaminated with harmful substance it is called a foodborne illness, or a foodborne disease. Although "food poison" is used often to describe the same problem, it only describes one kind of foodborne illnesses, so foodborne illness or disease is the better description when it's unknown what caused the sickness. Foodborne illness is usually caused by germs, chemicals, or toxins (poisons). Symptoms of foodborne illness may be jaundice, diarrhea, vomiting, fever, cramping, and/or nausea. Depending on the cause of the foodborne illness, these symptoms may happen in a few minutes to several days after eating or drinking the contaminated food or drink. Some symptoms of foodborne illness may last several days and can cause disability and even death.

Every year in the United States, it is estimated that 48 million people get sick from the food they eat that results in about 128,000 to become hospitalized with about 3,000 deaths from foodborne illness. This is why it is important to make sure that the foods we prepare, cook, serve, or eat are safe and not contaminated.

Three Types of Contaminants

Contaminants are unwanted substances that are accidentally or unintentionally added to food that could make someone sick if eaten. There are three types of contamination: physical, chemical, and biological.

1) Physical Contamination – when unwanted, non-living foreign object gets into food

   Examples: dirt, hair, nail polish flakes, broken glass, nails, staples, or bits of packaging

2) Chemical Contamination - when unwanted chemical gets into food

   Examples: cleaners, bug spray, or medication

3) Biological Contamination - when harmful living organisms (germs) get into food

   Examples: bacteria, viruses, parasites, or fungi

Biological contaminants cause more foodborne illness in the United States than any other types of contaminant. Almost all are very small and need a microscope to see them, such as bacteria,

viruses, parasite eggs, and individual fungus; they are commonly referred to as "germs." However, some biological contaminants, like adult parasites, are big enough to be seen without a microscope.

Bacteria, viruses, and parasites make people sick by infecting the body and damaging or killing the cells. Some bacteria and fungi produce toxins (poisons) which make people sick.

Highly Susceptible Population

Certain groups of people are more likely to get sick from foodborne illness than others because their bodies have weakened from old age or other illnesses, or not yet fully developed. They are called highly susceptible population (HSP), and include the elderly, babies, preschool children, and people who are already sick with other disease(s). Special care is needed to ensure that food served to these people is safe.

Five Risk Factors That Cause Foodborne Illness

The following are the five major mistakes that often cause foodborne illness:

- Improper holding temperatures
  - Food is not kept at the right temperature
- Inadequate cooking temperatures
  - Food is not cooked to the right temperature
- Contaminated equipment
  - The equipment that touches the food is contaminated
- Food from unsafe sources
  - Food is prepared, cooked, and provided from an unapproved kitchen
- Poor personal hygiene
  - The food-handler transfers contaminants to food because he or she is sick or not clean

TEMPERATURE CONTROL

Cooking raw food to the proper temperature will kill germs and parasites that cause people to become sick. Also, keeping food hot or cold at the correct temperature will stop bacteria from growing rapidly. This is called temperature control for bacteria growth. Cold or freezing temperature may not kill germs but it will stop or slow down their growth.

Bacteria need food, moisture, time, and a favorable temperature to grow. Foods that are moist and have other characteristics that allow bacteria to grow rapidly under the right condition are called "potentially hazardous foods," or PHF. Some examples of PHF are meat, poultry, seafood, dairy products, and eggs.

Temperatures above 140ºF will either kill or stop the rapid growth of germs, and temperatures below 41ºF will also prevent germs from growing. Temperatures between 140ºF and 41ºF allow bacteria to grow rapidly and this range is called the "temperature danger zone" or TDZ.

Temperature Danger Zone allows bacteria to grow fast, and some of these bacteria make toxins. Room temperature, even air-conditioned room, is in the TDZ so food cannot be stored in room temperature. See Figure 1. Reheating food to high temperature will kill bacteria, but any toxin that was produced will remain unaffected and still cause foodborne illness.

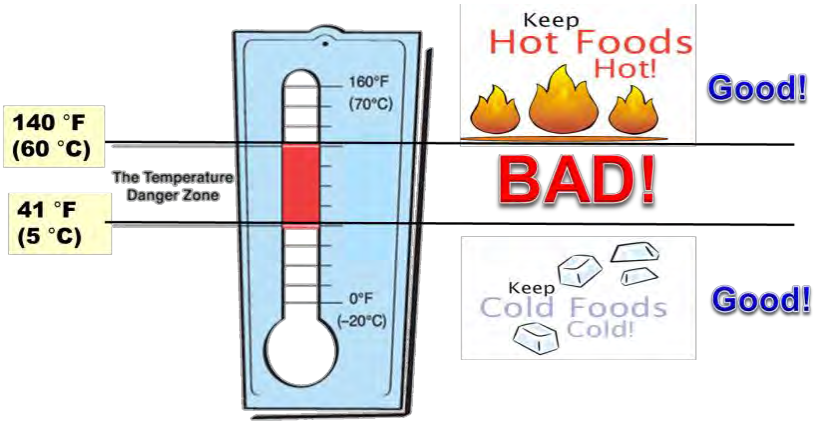


Figure 1. Temperature Danger Zone.

Cooking

All parts of the food, even the inside, must reach a temperature of 135°F, 145°F, 155°F, or 165°F depending on the type of food, and must move through the temperature danger zone as quickly as possible. See Figure 2. You can use a probe thermometer to check the internal temperature of the food. This is done by sticking the thermometer into the thickest part of the food to make sure that it is cooked all the way through.

Figure 2. Internal cooking temperatures of different types of food.

As Figure 2 shows, the correct temperature must be met for at least 15 seconds.

Hot Holding

After the food is properly cooked and ready to serve, you will need to keep it hot to stop germs from growing. Therefore, you should turn on heating equipment, such as steam tables, soup warmers, and other heating surfaces before you need them so this equipment will be ready for use. Keep hot food at 140˚F or hotter.

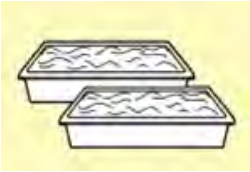
Cold Holding

Always keep cold food at 41˚F or colder. Fish, shellfish, poultry, milk and red meat will stay fresh longer if you hold them at this temperature. If using ice, you must only use water that is clean and drinkable that comes from an approved source. Do not put uncovered food directly on ice, and any ice used for chilling cannot be used for drinking and must be drained and discarded.

Chilling

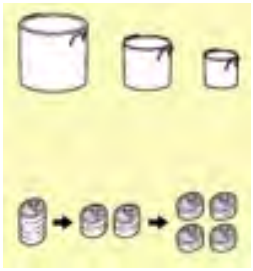
Cooked food that is being cooled must move through the temperature danger zone (140ºF - 41ºF) as quickly as possible so bacteria do not have enough time to grow in large numbers. You can take as long as six hours to cool hot foods down to 41^{o}F, as long as they are cooled to 70^{o}F within the first two hours. This is sometimes hard to do especially for large batches of food. Below are some ways you can accomplish this:

- Place food in shallow pans
- Separate food into smaller or thinner portions
- Use rapid cooling equipment such as a chill paddle
- Place food in an ice water bath
- Use containers that facilitate heat transfer such as metal pans
- Add ice as an ingredient



Shallow pans

Chill paddle



Reduce portion size

Metal pan

Ice water bath

Reheating

Foods that have already been cooked and cooled can be reheated and then served again. Make sure that the food reaches 165ºF for 15 seconds when it is reheated. But don't forget, reheating foods that have been in the temperature danger zone (TDZ) for long period of time (4 hours) will not destroy the toxins (poison) that may have been produced by the bacteria that were growing on the food, so throw it out if it's been kept in the TDZ.

Thawing

Food shall not be thawed at room temperature, which is the temperature danger zone since bacteria may rapidly grow as it thaws. The following are the acceptable ways of thawing potentially hazardous food (PHF):

- In the refrigerator at 41ºF or below
- Under cool running water
- In the microwave, as long as the food is cooked immediately
- As part of the cooking process

FOOD STORAGE AND PROTECTION

As a food handler, you must help make sure that the food you use is safe and healthy from the moment it comes into the facility until it is served to the customer. When food is delivered to your food establishment, check for damage, contamination, and tampering. After received, all foods must be properly stored away. If placed in containers it should be covered, labeled, and stored at least six inches off the floor.

Cold foods should be immediately stored in the refrigerator. See Figure 3 for the proper way to store food in the refrigerator to prevent cross-contamination that may occur from contaminated food or juice falling onto the food stored below.

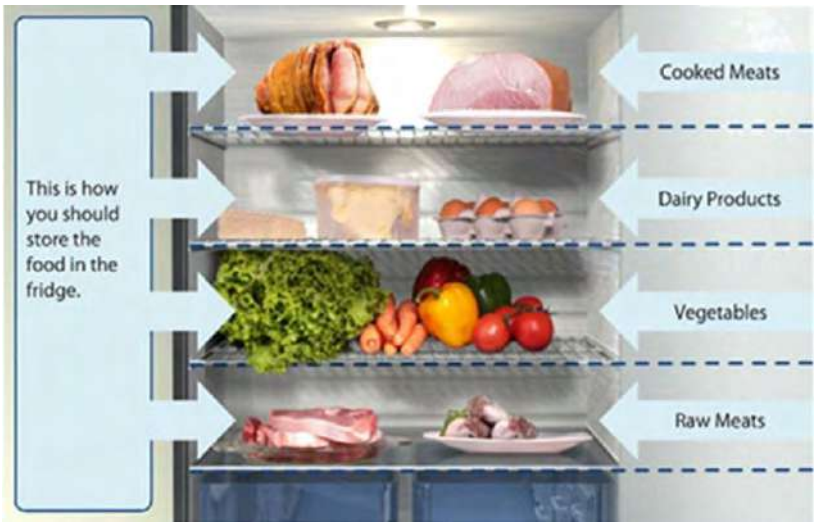


Figure 3. Proper storage of food in the refrigerator or chiller to prevent cross-contamination.

Cross-contamination

Cross-contamination happens when germs are transferred from one food or surface to another food by hands, equipment, or direct contact. A good example of cross-contamination is using the same cutting board and knife for different types of food without washing it in between uses.

Ready-to-eat (RTE) foods are types of foods that have already been prepared for immediate consumption, such as desserts and salads. Because RTEs are ready to be eaten, food-handlers must make sure that it does not become contaminated, especially from raw meats, fish, and poultry.

There are many ways to prevent cross-contamination:

- Store raw meat, fish, and poultry on the lower shelves of the refrigerator;
- Don't let juices of raw meats, fish, or poultry drip onto ready-to-eat food;
- Keep different types of raw meat separate from each other;
- Wash your hands after handling raw meat, seafood, and poultry;
- Never store foods that will not be cooked before serving in the same container as raw meat, fish, or poultry;
- Wash your hands before working with food and before wearing gloves;
- Use utensils or disposable gloves to work with ready-to-eat food;
- Wash, rinse, and sanitize work surfaces, equipment, and utensils every time you finish with a job or between preparing different foods;
- Use one set of cutting boards, utensils, and containers for each type of food; and
- Store foods away from cleaners and poisons.

Cleaning and Sanitizing

Another way to prevent cross-contamination is to be sure that utensils, work surfaces, and equipment are washed, rinsed, and sanitized between uses.

Cleaning and sanitizing is not the same thing. Cleaning is done by using soap and water to remove food, grease, and dirt. Sanitizing is done by using chemicals or heat to kill germs.

When cloths are used to wipe down counters, tables, or food preparation surfaces, they should be stored in a container with sanitizer solution in between uses.

There are different types of sanitizers, and one of the most common is chlorine. Regular, non-scented bleach may be used to make a sanitizing solution. See Figure 4 for making bleach sanitizer (the information in the table is for bleach with 5.25% sodium hypochlorite).

Amount of Bleach Added to 1 Gallon of Water	Total Chlorine Concentration in parts per million (ppm)
1 Teaspoon	65*
1 Tablespoon	200

*Recommended concentration (50-100ppm) for sanitizing food equipment and utensils.

Figure 4. Chart for making chlorine sanitizer using household bleach

A chemical test strip should be used to find out if the sanitizing solution was made to the correct concentration.

Ware-washing by Hand

To wash dishes, utensils, and food equipment by hands, you will need a three-compartment sink that is large enough to properly wash, rinse, and also sanitize the items. Figure 5 shows the correct way to wash items by hands.

Figure 5. Steps for washing utensils, dishes, and food equipment using three-compartment sink.

Step 1 is SCRAPE. Scrape excess food and debris into trash.

Step 2 is WASH. Use hot (100^{o}F) soapy water to wash items in the first compartment.

Step 3 is RINSE. Use clean hot water to rinse in the second compartment.

Step 4 is SANITIZE. The third compartment should be filled with warm water and one of the approved sanitizers below (Figure 6).

Step 5 is AIR DRY. After the items have been washed, rinsed, and sanitized, they should be air dried and then put away. Do not use a dish towel to dry them or you might re-contaminate the items.

APPROVED SANITIZERS FOR WAREWASHING		
Sanitizer	**Concentration**	**Soaking Time** (in seconds)
Chlorine	100 ppm	30
Quaternary Ammonia	200 ppm	60
Iodine	25 ppm	60
Hot Water	171^{O}F	30

Figure 6. Proper concentrations for different sanitizing solutions for washing utensils, dishes, and food equipment.

No matter how you wash the items, you will need to use chemical test strips to ensure that you are using the right amount of chemical sanitizer to kill germs. There are special testing strips to use with the different kinds of sanitizers. The strips that are used are basically small pieces of paper that change color when they are dipped into the sanitizer solution.

For example, Figure 7 shows that chlorine sanitizer should measure 100 parts per million, or 100 ppm, which can be determined by using a chemical test strip (Figure 7). If the test strip changes color so it matches. If the test strip color matches the reading for 100 ppm, then it's the right concentration. If the reading on the strip is lower than 100 ppm, then you will need to add more sanitizer, and if it is higher than 100ppm, then you should add more water. Keep testing the water until you get the right mixture of water and sanitizer to get 100 ppm.

Figure 7. Chemical test stip.

EMPLOYEE HEALTH

A healthy food-handler is one of the most important elements in preventing foodborne illness. When you feel sick, you should not work with food. The germs that are making you sick may contaminate the food you are handling, which then may sicken other people who eat the food.

Food-handler should report to the person-in–charge of the food establishment if they have any of the following symptoms:

- Diarrhea
- Vomiting
- Jaundice (yellowing of the skin or eyes from hepatitis infection)
- Sore throat with fever
- Infected, uncovered wounds

Depending on the symptom, sick food workers should either be sent home or given duties that do not involve handling of food or food-contact surfaces. These other duties include taking out the trash, mopping, sweeping, cleaning restrooms, or bussing tables.

Food handlers that work in facilities that serve a highly susceptible population may NOT work in the facility at all if they have diarrhea, vomiting, or jaundice.

EMPLOYEE HYGIENE

Good personal hygiene practices, like daily bathing and constant hand-washing, are extremely important. Germs can be spread when food-handlers forget these rules and handle food the wrong way. Below is a list of things you can do to make sure that the foods you are handling stay safe.

Handwashing

One of the most important things you can do to prevent foodborne illness is wash your hands! Figure 8 shows you when you should wash your hands, and Figure 9 shows you how to wash your hands correctly.

Figure 8. When hands are to be washed.

Six Steps to Clean Hands

Figure 9. How to wash hands.

When washing hands, follow these simple steps:

1. First, turn on the warm water (minimum of 100^{o}F) and wet your hands under the running water.

2. Next, put some liquid handwashing soap in your hand.

3. Wash your hands for at least 15-20 seconds. Rub your hands together to make a lather, making sure to get in between all of your fingers and under your finger nails. Also, scrub the backs of your hands and all the way up to your elbows.

4. Rinse the soap off with warm, running water.

5. Dry your hands with a paper towel or hot air blower.

6. Use the paper towel to turn off the water so you don't pick up germs from the faucet!

Jewelry and Fingernails

Except for *a plain ring such as a wedding band,* when preparing food, food employees shall not wear jewelry, including medical information band, on their arms and hands that could get in the way or spread germs. Nails should be kept clean, neatly trimmed, and filed. Food-handlers with long or fake fingernails must wear gloves. Nail polish can chip off and fall into the food, so food-handlers should not wear polish unless they also wear gloves.

Clothes and Hair Restraints

You must wear clean clothes when working with food. Food that is spilled, splashed, or wiped onto clothing will let bacteria multiply. These bacteria could then get onto hands, equipment, or food. Wear an apron to cover your clothes and change it whenever it gets dirty.

All employees should wear hair restraints such as hats, hair coverings, and nets to keep hair from contaminating food.

Gloves

The Guam Food Code requires that food handlers have no bare hand contact with ready to eat foods (foods that won't be fully cooked before serving to a customer). One of the ways that this can be done is by wearing disposable gloves. However, improper glove use can be just as unhealthy as not wearing them at all, or worse, if they are not worn or changed correctly.

Gloves are a single use item and must be thrown away after each use! Always wash your hands after removing gloves or before changing into a new pair!

Remember to change your gloves:

- When they become soiled or torn
- After handling raw meats
- Before handling cooked or ready-to-eat foods
- When changing tasks
- At least every four hours

Smoking and Chewing

Do not smoke or chew tobacco or chew gum or betelnut while you are working or when you are near food or dishwashing areas. Smoke and chew only while you are on a break, and after you smoke or chew, wash your hands before you return to work.

APPROVED FOOD SOURCES

All food made for the public must come from an approved source. An approved source is a place where the food is made that has been inspected by the Department of Public Health and Social Services. Make sure that all food deliveries come from an approved source with a Sanitary Permit.