

Certified Professional Food Managers Course

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Presented by:



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In this section we will:

- Learn the Ten Rules of Safe Food Handling
- Describe the link between personal hygiene and Foodborne illness. Set up basic standards for personal hygiene.
- Show support for good personal hygiene by setting an example.

Ten Rules of Safe Food Handling

1. Require strict personal hygiene from **all** employees.
Public Enemy #1 = YOUR HANDS
2. Identify potentially hazardous foods on your menu and write out your food handling procedures. Make these written procedures part of the employee training, everyday tasks, and regular self-inspection.
3. Obtain foods and other supplies from reputable, approved sources.
4. Observe the rules for time and temperature and for preventing cross-contamination in strong and handling food prepared in advance of service.
5. Keep raw products separate from ready-to-eat-foods.
6. Avoid cross-contamination of raw and ready-to-eat foods from hands, equipment, and utensils. Clean and sanitize food-contact surfaces and equipment before and after every use, after an interruption, and at least every four hours during continual use.
7. Cook or heat-process food to above the recommended minimum temperature.
8. Keep hot foods hot and cold foods cold. Store or hold foods at **135°F** or higher or at **41°F** or lower.
9. Chill cooked food to **41°F** within four hours.
10. Reheat food to an internal temperature of at least **165°F** for at least 15 seconds within two hours.

EVERYTIME you eat you put yourself in the hands of the Preparer

Proper Hand Washing

Train your employees to properly wash their hands and make sure that they have proper hand washing stations and supplies.

****Outside of the Restroom****

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Hand Washing Stations and Supplies

There should be at least one sink set aside *only for hand washing*—*never to be used for cleaning or for preparing food*, make sure that hand washing sinks also are conveniently located in preparation and ware washing areas. Stations immediately outside restrooms let you observe employee hand washing habits.

Hot-and-Cold Faucets

Each faucet shall allow employees to mix hot and cold water to a temperature of at least **110°F (43.3°C)**. This temperature is hot enough for proper cleaning but it will not scald.

Hand Soap

Install dispensers that allow employees to touch only the soap that is given out, not the enclosed supply. Provide nailbrushes to clean fingernails and a sanitizing solution to soak the brushes between uses.

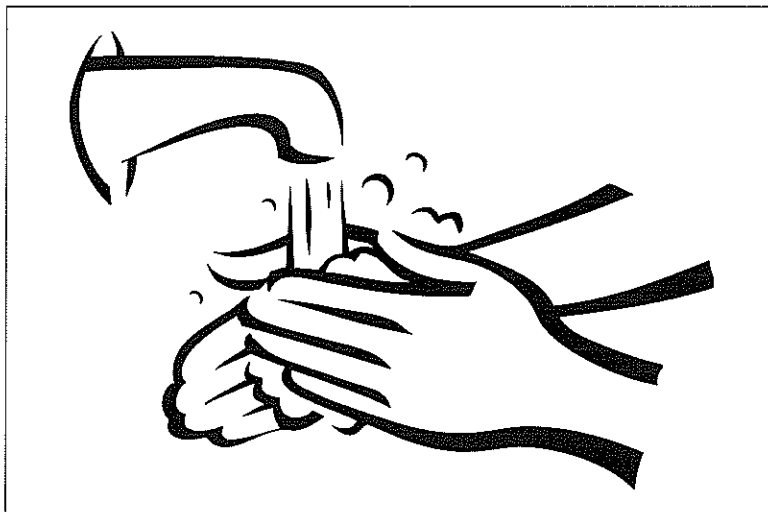
Sanitizing Lotions

Sanitizing lotions or hand dips may be used after washing, but may never be used in place of washing. All lotions must be stored in sealed dispensers. Train employees not to touch food with bare hands until the sanitizing lotion has dried.

Single-Use Paper Towels and Dryers

Hand-drying equipment must be in food preparation areas so employees are not tempted to use their aprons or wiping cloths to dry their hands. Single-use paper towels or air-blowing hand dryers must be provided at each hand sink.

The waste can for used paper towels must be kept clean and set to the side or at a distance from the wash stand. Restrooms, used by female employees must include a covered container for sanitary napkins.



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Hand Washing

Employees must ***always*** wash their hand and arms thoroughly after using the toilet. The FDA's 1993 *Food Code* recommends washing hands **twice**, using a ***nailbrush*** as part of the first wash. Employees must also thoroughly wash their hands and arms up to the **elbow** before starting work and after the following:

- Handling raw food. (cross contamination)
- Touching their hair, face, or body. (What is the hazard?)
- Sneezing or coughing. (droplets)
- Smoking and chewing tobacco or gum. (saliva)
- Eating or drinking. (saliva)
- Cleaning. (chemical hazard)
- Taking out the garbage. (It's here for a reason!)
- Touching anything that may contaminate their hands. After washing their hands, employees should *never*. Use their aprons to dry their hands.
- Do anything that could re-contaminate their hands before returning to work, such as touching their hair.

Proper Hand Washing Technique

1. Use warm water to moisten hands.
2. Apply soap.
3. Rub hands together for 20 seconds.
4. Rinse thoroughly.
5. Dry.

Hand Care

Basic hand care includes:

- Keeping nails short and clean. Not wearing fingernail polish or artificial nails.
- Not touching hair, clothes, or skin-especially sores, cuts, or infections.
- Covering *all* cuts and sores with bandages and plastic gloves.

Train employees never to:

- Stack plates to carry several of them at one time-their hands may touch the food.
- Handle place settings or food without washing their hands after they have cleared tables or bussed dirty dishes.
- Touch the insides of glasses or the eating surfaces of tableware.

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Gloves

Employees may use several kinds of gloves-mesh gloves for cutting, rubber gloves for Dish washing, and disposable, plastic gloves for food handling.

Employees **must always**:

- Wash their hands before putting on gloves and when changing into a fresh pair of gloves.
- Change gloves as soon as they become soiled or torn and before beginning a different task.
- Change gloves at least every four hours during continual use and - more frequently when necessary.

Other Rules of Good Employee Personal Hygiene

While personal hygiene may be a sensitive subject, it is vital to food safety. Illness can be spread by almost every part of the human body.

Employees should:

- Wash their hair and bathe daily.
- Wear clean clothing on the job. Work clothes should be worn only on the job, not for personal use. If unable to change clothes at the restaurant, employees should not make any stops on the way to work.
- Wear comfortable closed-toed shoes. *Never* wear platform, high heeled, absorbent-soled, or open-toed shoes.
- Wear hair restraints. These are required by local, state, or federal health codes.
- Nets, hats, and caps may be used. Employees with beards should also wear beard restraints.
- *Never* wear jewelry. All rings (except for a plain wedding band), bracelets, watches, and necklaces must not be worn while preparing food. They are hard to keep clean, and pose a safety hazard if they catch on equipment or accidentally fall into the food.
- Wear PPE - Aprons/Gloves/Hair restraints. These are **required** by the local Health Department.

Supporting Good Personal Hygiene

A manager's or supervisor's responsibilities also include reporting certain illnesses to the health department as required by law, scheduling tasks to avoid cross-contamination, and setting a good example with their own personal hygiene practices.

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When an Employee is Ill or Injured

Employees must report health problems before starting a shift. If they become ill or injured during a shift, they must report it immediately to a manager or supervisor. If an employee's condition may contaminate food or utensils, the employee should stop working for the day and visit a doctor. All medication must be stored with the employee's personal belongings away from food preparation areas.

Bandage cuts, burns, boils, sores, and infections.

Bandages should be clean, dry, and prevent leakage from the wound. Waterproof, disposable plastic gloves should be worn over bandages on the hand. Employees wearing bandages may need to be switched to tasks away from food.

Employees with the following conditions should stay at home:

- Fever.
- Diarrhea.
- Upset stomach, nausea, or vomiting.
- Sore throat or sinus infection.
- Coughing or sneezing.
- Dizziness.

Employees need to feel comfortable about talking with a manager or supervisor when they do not feel well.

Because:

- People can carry and spread a disease without showing any signs of the disease.
- Even after symptoms disappear, disease-causing micro-organisms can remain in the carrier's body.

Employees may hide an illness to avoid losing pay.

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In this section we will:

- Discuss how to properly taste food and handle/report illnesses required by law.
- Discuss contamination: foods most likely to be contaminated, how foods may become contaminated and cross-contamination.
- Describe how foods become unsafe and the three types of hazards: biological, chemical, and physical.

Tasting Food During Preparation

The safest and most sanitary way to taste food is to ladle a small amount of food into a small dish. Taste the food with a clean spoon. Remove the tasting dish and spoon from the area and have them cleaned and sanitized.

Reporting Illness as Required by Law

Foodservice managers are required by the FDA's 1993 Food Code to notify health authorities if an employee has or carries the contagious diseases Salmonella typhi, hepatitis A, Shigella, or E. coli O157:H7. Employees may be allowed to continue working under some restrictions, such as wearing gloves or working away from food. On the other hand, employees may be excluded from work for a considerable time or even permanently depending on the disease that they have or carry.

However, a manager or supervisor should not act hastily in excluding employees from work. In some cases, the Americans with Disabilities Act (ADA) and other laws protect employees from being fired or transferred because of illnesses, such as AIDS or testing positive for HIV. The law also protects the confidentiality of employees who report having an illness.

"OSHA - treat all blood and bodily fluids as if they're contaminated"

As a manager, you face challenges for preventing outbreaks because of the:

- Number and types of foods at risk.
- Multiple chances for food to become contaminated. Food is at risk at every stage in the *flow of food*, the path from receiving through storing, preparing, cooking, holding, serving, cooling, and reheating that foods in your operation follow.
- Type of customer you are serving. Children, elderly people, and people with weakened immune systems are at the greatest risk for food borne illness.
- These people are less able to fight off disease and, therefore, are more likely to become ill.
- Shortage of trained employees.
- The bottom line is that foodservice leaders must carry most of the burden for serving safe food. A good food safety system and a strong training program are vital.

HIPPA - Confidentiality Law

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The Foods Most Likely to Become Contaminated

Although any food can be contaminated, the moist, high-protein foods on which bacteria which can grow most easily are classified as *potentially hazardous foods*. The U.S. Public Health Service identifies potentially hazardous foods as any foods that consist in whole or part of: "milk or milk products, shell eggs, meats, poultry, fish, shellfish, edible crustaceans (such as shrimp, lobster, and crab), baked or boiled potatoes, tofu or other soy-protein foods, garlic-and-oil mixtures, plant foods that have been heat-treated (such as beans), raw seeds and sprouts, sliced melons, and synthetic ingredients (such as textured soy protein in hamburger supplement).

According to the FDA, *ready-to-eat foods* are properly cooked potentially hazardous foods and raw, washed, cut and whole fruits, and vegetables (including those that had rinds, peels, husks, or shells removed).

As Chef Donnie would say, "ALL FOOD"

Contamination

Contamination is the unintended presence of harmful substances or micro-organisms in food.

There are three main types of hazards.

- Biological hazards: Bacteria, viruses, parasites, and fungi. Contamination by bacteria is the greatest threat to food safety.
- Chemical hazards: Pesticides, food additives and preservatives, cleaning supplies, and toxic metals that leach through worn cookware and equipment, (sulfite agents).
- Physical hazards: Foreign matter-such as dirt, broken glass and crockery, and other objects-that accidentally get into the food.

Cross Contamination

Disease can also be spread by cross-contamination. *Cross-contamination* is the transfer of harmful substances or micro-organisms to food by:

- Hands that touch raw foods and then touch cooked or ready-to-eat foods.
- Food-contact surfaces that touch raw food, are not cleaned and sanitized, and then touch food that is ready-to-eat.
- Cleaning cloths and sponges that touch raw food, equipment, or utensils; are not cleaned and sanitized; and are then used on surfaces, equipment, and utensils for ready-to-eat foods.
- Raw or contaminated foods that touch or drip fluids on cooked or ready-to eat foods.
- *Food-contact* surfaces include any equipment or utensil surface which normally comes in contact with food or which may drain, drip, or splash in food or on surfaces. Cutting boards, knives, and splash areas are examples of food-contact surfaces.

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Clean vs. Sanitary

Clean means free of visible soil, Sanitary means free of harmful levels of contamination. Clean food, equipment, and utensils may not be sanitary. For example, a glass may look sparkling clean but may carry harmful bacteria and chemicals. After being washed in boiling water, the same glass may appear cloudy and water-marked, but it is sanitary. For these reasons, the FDA defines sanitization as the use of heat or chemicals to destroy 99.999% of the disease causing Micro-organisms on a food-contact surface. *Hot Water Sanitation* is used when there is no sanitary solution present to use, submerge the cooking utensils in water **171°F or higher for 30 seconds, rinse and the air dry.**

Factors Most Often Named in Foodborne Outbreaks

The following is a list of the most common factors that cause food borne outbreaks. All these factors need to be controlled when designing your food safety system. Reported cases of foodborne illness usually involve more than one of these factors.

- Failure to properly cool food. (This is the *leading cause of* foodborne outbreaks.)
- Failure to thoroughly heat or cook food.
- Infected employees who practice poor personal hygiene at home and work.
- Preparing food a day or more in advance of being served.
- Adding raw, contaminated ingredients to food that receives no further cooking.
- Allowing foods to stay too long at temperatures favorable to bacteria growth.
- Failure to reheat cooked foods to temperatures that kill bacteria.
- Cross-contamination of cooked food by raw food; improperly cleaned and sanitized equipment, or employees who mishandle food.
- All these factors can be divided into three categories: - time and temperature abuse, poor personal hygiene, and cross-contamination.

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MAJOR FOODBORNE ILLNESSES (CONT'D)

Disease	Salmonellosis	Shigellosis	Listeriosis	Staphylococcus	Clostridium Perfringens Enteritis
Pathogen	<i>Salmonella</i>	<i>Shigella</i>	<i>Listeria monocytogenes</i>	<i>Staphylococcus aureus</i>	<i>Clostridium perfringens</i>
Incubation Period	6-48 hours	12-50 hours	few days-3 weeks	rapid	8-22 hours
Duration of Illness	1-2 days (may last longer)	Indefinite, depends on treatment	Indefinite, depends on treatment; high fatality rates in immuno-compromised individuals	2-3 days	24 hours (may last 1-2 weeks)
Symptoms	Abdominal pain, headache, nausea, vomiting, fever, diarrhea	Diarrhea (sometimes bloody), abdominal pain, fever, vomiting, chills, lassitude, dehydration	Nausea, vomiting, diarrhea, headache, persistent fever, chills, backache, meningitis	Nausea, vomiting, abdominal cramps; in more severe cases, headache, muscle cramping, changes in blood pressure and pulse rate	Abdominal pain, diarrhea, dehydration
Source	Domestic and wild animals, humans (intestinal tract)—especially as carriers	Humans (intestinal tract), flies	Soil, water, mud, humans, domestic and wild animals, fowl, damp environments	Humans (skin, hair, nose, throat, infected sores), animals	Humans (intestinal tract animals, soil)
Foods Involved	Poultry and poultry salads, meat and meat products, fish, shrimp, sliced melons, sliced tomatoes, milk, shell eggs, egg custards and sauces, and other protein foods	Salads (potato, tuna, shrimp, chicken, and macaroni), lettuce, raw vegetables, milk and dairy products, poultry, moist and mixed foods	Unpasteurized milk and cheese, ice cream, raw vegetables, poultry and meats, seafood, and prepared, chilled, ready-to-eat foods	Ham and other meats, poultry, warmed-over foods, egg products, milk and dairy products, custards, potato salads, cream-filled pastries, and other protein foods	Cooked meat, meat products, poultry, gravy beans that have been cooled slowly
Spore Former	No	No	No	No	Yes
Prevention	Avoid cross-contamination, refrigerate food, thoroughly cook poultry to at least 165°F (73.9°C) for 15 seconds (for other foods, see Exhibit 2.8 for minimum safe internal cooking temperatures), rapidly cool cooked meats and meat products, avoid contamination from foodservice employees by practicing good personal hygiene	Avoid cross-contamination, avoid fecal contamination from foodservice employees by practicing good personal hygiene, use sanitary food and water sources, control flies, rapidly cool foods	Use only pasteurized milk and dairy products, cook foods to proper internal temperatures (see Exhibit 2.8), avoid cross-contamination, clean and sanitize surfaces, avoid pooling water	Avoid contamination from bare hands, practice good personal hygiene, exclude foodservice employees with skin infections from food preparation, properly refrigerate food, rapidly cool prepared foods	Use careful time and temperature control in cooling and reheating cooked meat, poultry, or bean dishes and products 165°F (73.9°C) for at least 15 seconds within two hours
Type of Illness	Infection	Infection	Infection	Intoxication	Toxin-Mediated Infectious

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In this section we will:

- Identify biological, chemical, and physical hazards.
- Describe how bacteria reproduce and grow.
- Discuss the factors needed for bacteria to grow.
- Know why it is important to keep foods out of the temperature danger zone.
- Discuss receiving meat, poultry, fish and seafood.

Biological Hazards

Biological hazards are disease-causing micro-organisms, certain plants, and fish carry toxins, which are poisonous. Once in food, some of these hazards may be very hard to **kill** or control because some are able to survive freezing and high cooking temperatures. Although *micro-organisms* have many good uses, such as ripening cheese and leavening bread, those covered in this section cause diseases.

Bacteria

Of all micro-organisms, bacteria are the greatest concern to food service managers. *Bacteria are 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, scabs, scars, the mouth, nose, throat, and intestines. Once they contaminate human hands, bacteria may end up in food.

Bacteria may be:

- *Pathogenic* (infectious, disease-causing). They feed on potentially hazardous foods and can multiply quickly. A disease-causing micro-organism is often referred to as a *pathogen*.
- *Toxigenic* (poisonous). These bacteria produce harmful toxins as they multiply, die, and break down; these bacteria are also pathogenic.

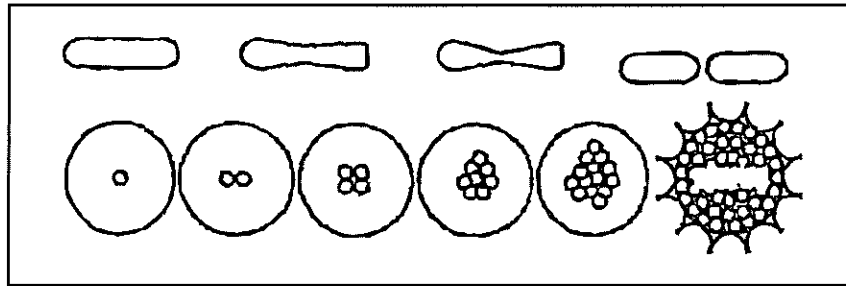
Bacteria and the toxins they produce do not have an odor or taste to help you detect them. You cannot tell if they are in food. This is why it is so important to keep them out of food or from growing in the first place.

How Bacteria Reproduce

Bacteria normally *exist* as *vegetative cells*, which are cells that can grow and reproduce. These cells reproduce by dividing in two. Each of these cells then divides into two more cells, and so on. As a result, bacteria can multiply to huge numbers very quickly. This rapid rate of reproduction increases the risk of foodborne illness.

Certain bacteria also produce thick-walled protective structures called *spores* inside their cells. Spores may often survive cooking or freezing temperatures and some' sanitizing mixtures. Spores do not reproduce, but when conditions around the spores improve, the bacteria become vegetative. This means the bacteria can grow and reproduce.

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What Bacteria Need to Grow

Bacteria can live anywhere a human can live. In fact, they can often survive extreme temperatures better than people. Generally, bacteria live well in potentially hazardous foods because these foods are often warm, moist, protein-rich, and neutral or low in acid.

*How to remember these conditions:

FAT TOM

F	Food	High Protein foods are likely to be received already contaminated or may be easily contaminated later.
A	Acidity	Acidity is measured on a scale from 0 (very acid) to 14.0 very alkaline [basic]. A solution with a pH (acid-alkaline measurement) of 7.0 is neutral. Most potentially hazardous foods have a pH level between 4.6 and 7.0. However, high acid foods, such as citrus fruit, rarely allow the growth of harmful bacteria. Adding vinegar or lemon juice to food items will help slow bacterial growth - but it does not insure control and should not be used as the only defense against bacterial growth.
T	Time	Potentially hazardous foods should not remain in the temperature danger zone for more than two hours during food the handling process.
T	Temperature	The temperature danger zone for potentially hazardous foods is 41°F to 135°F. However, since bacteria can survive at (and some bacteria can grow at) lower temperatures, refrigerating food is not total protection against bacterial growth. Discard food if it is past its expiration date. * The FDA's 1993 Food Code States that the temperature danger zone is 41°F to 135°F. Some health codes specify 45°F to 140°F while other codes use 40° to 140°F as the temperature danger zone. This area uses 41°F to 135°F .
O	Oxygen	Some bacteria require oxygen to grow, while others require no oxygen. However, most of the bacteria that cause food borne illness can grow either with or without oxygen.
M	Moisture	The amount of available water in food is called the <i>water activity</i> (a). A food with an (aw) of 0.85 or lower is not considered potentially hazardous. Most potentially hazardous foods have water activity values of 0.97-0.99, which is ideal for bacteria growth. Water activity can be reduced to safer levels by freezing, dehydrating (removing the water), adding sugar or salt, or cooking. Dry foods, such as beans and rice, become potentially hazardous when water is added.

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Parasites

Parasites are micro-organisms that need a host to survive. Perhaps the best known parasite is *Trichinella spiralis*, a roundworm found in pigs and certain other game animals. If not killed by thorough cooking or freezing for specified time periods, its larvae can cause trichinosis, a disease that causes painful abdominal and muscular cramps. Another parasite is the *Anisakis* roundworm that lives in fish. People who eat raw, marinated, or partially cooked fish may be at risk.

Fungi

Fungi are micro-organisms that range from single-celled plants to mushrooms. Fungi are found in air, soil, and water.

Molds

Single *mold* cells are usually microscopic, but mold colonies may be seen as fuzzy growths on food. The main damage caused by molds is food spoilage, but some molds also produce toxins that can cause illness, infections, and allergic reactions. Molds can grow on almost any food, at any storage temperature, and under any condition: moist or dry, high or low pH, salty or sweet. Freezing prevents the growth of molds but will not kill those already present in food. The toxins of some molds can withstand cooking. A key food safety control is to throw out foods with mold that are not a natural part of the food. For example, bleu cheese has a natural mold, but many cheeses do not.

Yeasts

Yeasts require sugar and moisture to survive, which they often find in foods such as jellies and honey. Yeasts spoil such products by slowly eating the food. Contamination appears as bubbles, an alcoholic smell or taste, pink discoloration, or slime.

Fish Toxins

The best food safety controls for fish are to buy them only from a reputable and certified supplier and to carefully select the kinds of fish you will serve, noting the following:

- Puffer fish, moray eels, and freshwater minnows contain natural toxins.
- Certain species of amberjacks, barracuda, and snapper may eat smaller fish that have eaten algae carrying ciguatera toxin, a naturally occurring toxin. The disease ciguatera is caused by eating fish which through their diet have accumulated elevated levels of ciguatera toxin. Symptoms include vomiting, itching, nausea, dizziness, hot and cold flashes, temporary blindness, hot and cold sensory reversal, and sometimes hallucinations. Ciguatera toxin is not destroyed by cooking.
- Tuna, bluefish, or mackerel that have been kept too long in the temperature danger zone may cause *scombroid intoxication* (from *histamine*, a chemical produced in these temperature-abused fish). Symptoms include flushing and sweating, a burning or peppery taste, nausea, and headache. Other symptoms may include facial rash, hives, edema, diarrhea, and abdominal cramps. Histamine is odorless, tasteless, and not destroyed by cooking.

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Plant Toxins

The following plants and foods made from plants have been involved in outbreaks of Food borne illness:

- Fava beans, rhubarb leaves, jimson weed, and water hemlock.
- Honey from bees that have gathered nectar from mountain laurel, milk from cows that have eaten snakeroot, and jelly made from apricot kernels.
- Some varieties of mushrooms. Since poisonous and nonpoisonous mushrooms often look alike, use only mushrooms that are bought from a reliable and approved source.
- Cooking and freezing do not destroy all plant toxins.

Chemical Hazards

Chemical contamination can be caused by hazards, such as pesticides, food additives and preservatives, cleaning and sanitizing supplies, and toxic metals that leach through worn cookware and equipment. Lubricants used on equipment, personal care products, such as hair sprays, and paints or petroleum products can also contaminate food.

Food safety controls include:

- Keep food covered.
- Wash all fruits and vegetables before preparation.
- Clean and sanitize all equipment and utensils that may have come in contact with any pesticides.
- Only allow trained professionals to apply pesticides on your premises.
- If you store pesticides, keep them in their original containers, If you put them in a different container, label the new container with the contents and store them away from food, food-contact surfaces, and other chemicals.

Additives and Preservatives

Sulfating agents, nitrites, and the smoking process are common preservatives. Monosodium glutamate (MSG) is a common chemical additive. Use only approved preservatives and additives and follow all manufacturers' instructions. *Never use* additives or preservatives to cover spoilage.

Sulfating Agents

These chemicals are legally used by food processors to preserve freshness and color in certain vegetables, fruits, frozen potatoes and other processed food, and certain wines. Overuse of sulfites has been linked to a number of serious allergic reactions among sensitive individuals, especially asthma sufferers. Some states forbid restaurants from adding sulfites to food.

Food safety controls include:

- Know which of your processed foods and baking items contain sulfites.
- If a customer asks about sulfites, tell him or her which menu items contain them. Do not claim foods are sulfite-free unless you know it to be true.
- *Never* add sulfites to food.

Monosodium Glutamate (MSG)

This flavor enhancer is on the Generally Recognized As Safe (GRAS) list published by the federal government. However, in some people it may cause flushing dizziness,

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headache, dry and burning throat, and nausea. In recipes that do have MSG, use only the called-for amount.

Toxic Metals

Chemical contamination can occur during cooking or storage when certain metals touch high-acid foods. Potentially toxic metals include lead, copper, brass, zinc coating, antimony, and cadmium. Some foods involved in metal poisoning are sauerkraut, tomatoes, fruit gelatins, lemonade, and fruit punches.

The following are food safety controls:

- Use only food-grade containers.
- Use metal and plastic containers and items only for their intended uses. For example, do not use refrigerator shelves that may contain cadmium as makeshift grills or to store unwrapped meat.
- Use only proper foodservice brushes on food, *never* wire brushes or ordinary paint brushes.
- Do not use enamelware, which may chip and expose the underlying metal.
- **Do not allow carbonated water in soft-drink mix systems to flow back into copper water intake lines.** The carbonation may leach the copper into the water used to mix drinks.
- Do not use galvanized (zinc-coated) containers for preparing or storing juices, lemonade, tea, or salad dressing.
- Do not use lead or lead-based products, including lead-glazed ceramics, in food preparation areas.

Foodservice Chemicals

Detergents, polishes, caustics, cleaning and drying agents, and other similar products are poisonous to humans. Keep them away from food.

The following are food safety controls:

- Follow label directions for storing and using chemicals.
- Carefully measure chemicals.
- Store chemicals in their original containers. Keep them in dry, locked cabinets or areas away from food, food-contact surfaces, and other chemicals that may react with them.
- If chemicals are transferred to different, smaller containers or spray bottles, each new container must be properly stored and labeled with the contents and hazards. According to the Occupational Safety and Health Administration (OSHA), all gloves, funnels, measuring cups, and other supplies used to transfer chemicals must also be labeled and stored properly.
- Food Handlers who use chemicals must wash and dry their hands before returning to food preparation duties.
- If you suspect that any food or supplies have been tampered with, label the item and safely set it away from other products, then investigate the situation.
- Alert your supplier and, if necessary, the health department and the police.

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Physical Hazards

Physical hazards include dirt, hair, broken glass and crockery, nails, staples, metal fragments, and other objects that accidentally enter food.

The following are food safety controls:

- Do not use glasses to scoop ice. Use only commercial food grade plastic or metal scoops with handles.
- Do not chill glasses or any food items in ice that will be used for drinks.
- Do not store toothpicks or non-edible garnishes on shelves above food storage or preparation areas.
- Place and maintain protective shields on lights over food storage and preparation areas.
- Clean can openers before and after each use and replace or rotate blade as often as necessary.
- Remove staples, nails, and similar objects from boxes and crates when food is received so these materials do not later fall into the food.
- To control contamination, set up barriers, such as adding lemon juice or pre-chilling recipe ingredients that will reduce the conditions of FAT-TOM. The goal is to lower the risk that a single food handling error will let bacteria grow enough to cause an illness.

The most important factors to control are temperature and time.

Foodborne Illnesses Caused by Bacteria

Review the following terms:

Foodborne infection: A disease that results from eating food containing harmful micro-organisms. Diseases, such as salmonellosis, shigellosis, and listeriosis, are foodborne infections.

Foodborne intoxication: A disease that results from eating food containing toxins from bacteria, molds, or certain plants or animals, such as mushrooms or puffer fish. Staphylococcus and botulism are foodborne intoxications.

Clostridium perfringens, Bacillus cereus, and Escherichia coli 0157:H7 have characteristics of both infections and intoxications.

Incubation period: The time between when an individual consumes contaminated food and when his or her symptoms are present.

Duration of illness: How long the illness lasts.

Symptoms: The physical signs of the disease.

Source: A host, carrier, or vehicle for disease-causing micro-organisms. A host is a person, animal, or plant which another organism lives and feeds. A carrier is a person or animal whose body carries a disease-causing microorganism. A vehicle is an item, such as wind, water, human hands, or dirty utensils that carries or transports disease-causing micro-organisms.

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Foods Involved: Foods that are known to carry or transmit the disease.

Spore Former: States if the bacteria form spores.

Prevention: How the spread of the disease may be stopped.

Viruses

Viruses are protein-wrapped genetic material, the smallest and simplest life-form known. Unlike bacteria, viruses are not complete cells and do not reproduce in food. Like bacteria, however, some viruses may survive cooking or freezing. Also like bacteria, viruses can be transmitted to a human host by food or food-contact surfaces.

Receiving Meat, Poultry, Fish, and Seafood

Fresh Meat

(Fresh meat includes beef, lamb and pork.)* Accept Fresh meat at temperature of 41°F or lower. The color of beef should be bright, cherry red, the color of lamb should be light red, and pork should have white fat and a pink lean portion. The texture of fresh meat should be firm and spring back when touched.

Reject Meat if the color is a brown or greenish; brown, green, or purple blotches; black, white or green spots. If the texture is slimy, sticky, or dry, and if cartons are broken, meat wrappers are dirty and/or packaging is torn.

Fresh Poultry

Fresh Poultry should be accepted at 41°F or lower, the color can have no discolorations and the texture is firm and springs back when touched. It should also be surrounded by crushed, self-draining ice. Reject poultry if it has a purplish or greenish or green discoloration around the neck, and/or darkened wing tips. Also reject if there is an abnormal odor or if the under wings and around the joints fill sticky, and/or are soft and flabby.

Fresh Fish

Fresh Fish should be accepted at 41°F or lower, there should be no fishy odor, and the eyes should be bright, clear and full. The texture of the flesh and belly should be firm and spring back when touched. Fish should also be packed in self draining ice. Reject Fish if they have gray or gray-green gills, if the fish have a fishy and/or ammonia odor and if the eyes are sunken, cloudy, or red-bordered. Also reject if the gills are dry, the flesh is soft and gives, and if a finger is pressed on the flesh and the fingerprint stays.

Fresh Shellfish

(Fresh shellfish include clams, mussels, oysters, etc.) Fresh Shellfish should be accepted at a temperature of 41°F or lower for live shellfish and 0°F for frozen products. There should be no strong odor. The shells should be closed and the product should be shipped alive. The products should be identified by a shell stock tag and lots should not be mixed up. Record the delivery information, including the dates on the tags. Tags must be kept for 90 days. Reject Shellfish with shells that are partly open

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and do not close when tapped. This means the clams, mussels, and oysters are dead.

Fresh Crustacean

(Fresh crustacean include lobsters and shrimp.) Fresh Crustacean should be accepted at a temperature of 41°F or lower for live lobsters, or 0°F for frozen products. The products should be shipped alive and not contain a strong odor. The lobster shell should be hard and heavy. Reject crustacean if the shell is soft and the product has a strong odor.

Modified Atmosphere (MAP) and Sous Vide Packaged Foods

Receiving is a CCP for processed packaged foods. Reject all packages that do not meet the following standards:

- Packages should not have any holes or tears, bubbles, slime or discolored contents.
- Frozen packages should arrive at 0°F (-17.8°C) or lower.
- Measure package temperatures by holding the thermometer tightly between two packages, being careful not to poke a hole in them. These foods must be received at the temperature on the package specified by the manufacturer or supplier.
- Check any TTI on the package to see if it has changed color.
- Check the expiration date or use-by date on the package.

Aseptically and Ultra-Pasteurized Packaged Foods

Ultra-pasteurized foods include milk products and fruit juices in carton that have been heat-treated to kill disease-causing micro-organisms. Foods labeled *UHT* have been *ultra-pasteurized* (high temperature/short time), then *aseptically packaged* (hermetically sealed).

- UHT foods may be received unrefrigerated.
- UHT milk products must be refrigerated at 41°F or lower after opening.

Frozen Foods

Carefully check incoming frozen foods:

- Frozen foods should arrive in air-tight, moisture-proof wrappings at 0 F (-7.8°C). Ice cream may be received and stored at 6°F to 10°F.
- Check the temperature of frozen foods by opening one case and inserting the entire sensing area of the thermometer between two packages, being careful not to poke a hole in them. Reseal, date and initial the case so other employees know it was opened and checked.
- Thawing and freezing are major dangers for frozen food. Look for large ice crystal, solid areas of ice, discolored or dried-out food, or misshapen cartons or products. Reject any food that may have been thawed and refrozen.

Fresh Produce

Before tasting fruits and vegetables, wash them to remove contamination and insecticides. Also check for insect infestation. Train your employees not to damage produce by squeezing or pinching it.

Canned Foods

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Never accept any home-canned foods. The risk for botulism is too great. Reject all cans with swollen sides or ends, flawed seals or seams, rust, dents, leaks, or foamy or bad smelling contents. Also reject any can without a label. Never taste a can's contents to test them - botulism can result from even one small taste.

Methods for Safe Thawing

Thaw food **only** by these four methods:

1. In a refrigerator.
 - Store raw foods on the lowest shelves to prevent them from dripping or splashing or other foods.
 - Allow a day or more for large items, such as turkeys and roast to thaw.
 - Carefully uses the slacking process. Slacking involves allowing food to gradually warm from frozen to unfrozen so that it cooks more evenly. For example, you might allow a large block of frozen spinach to warm from -10°F to 25°F. Slacking frozen foods should be done just before cooking, and the food must become no warmer than 41°F.
2. Under running potable (drinkable) water at a temperature of 70°F or lower. The product should be thawed within two hours, then prepped and cooked.
 - Use a large cleaned and sanitized sink used only for thawing.
 - Use a stream of water strong enough to wash off loose particles of skin or dirt. Do not let the water splash on other food or food contact surfaces.
 - Remove the food from the sink as soon as it is thawed. Sanitize the sink and all utensils used in thawing.

Note: This method does not work for turkeys and large cuts of meat.
3. As part of the cooking process. This method works well with vegetables, seafood (such as shrimp), hamburger patties, pie shells, and similar foods - but not with large items. Allow longer than normal cooking time because the items are frozen.
4. In a microwave. This method only if the food will be moved immediately to other cooking equipment or finished immediately in the microwave. This method is **not** effective for large items.

Preparing Food for Cooking

Detailed recipes, time and temperature controls, and sanitary procedures are the keys to safety.

- Use properly cleaned and sanitized utensils and practice good personal hygiene.
- Use recipes that specify fat content, size, and thickness of each portion - this helps predict cooking time.

Minimum Safe Internal Cooking Temperatures

- Poultry, stuffing, stuffed meat, and stuffed pastas - 165°F (73.9°C) for 15 seconds; cook stuffing and meat first, then stuff the food.
- Ground meats (including ground beef and ground pork) - 155°F (68.3°C) for 15 seconds.
- Pork, game animals, comminuted fish and meats, injected meats, and eggs in multi-serving batches -155°F (68.3°C) for 15 seconds; 150°F (65.6°C) for 1 minute; or 145°F (62.8°C) for 3 minutes.

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- Beef roasts - 145°F (62.5°C) for 3 minutes; 140°F (60°C) for 12 minutes; or 130°F (54.4°C) for 112 minutes.
- Fish, seafood, beef (cubes, slice, etc.), veal, lamb, mutton, shell eggs for immediate service for a customer's order, and all other potentially hazardous foods not listed in this exhibit - 145°F (62.5°C) for 15 seconds.

Eggs and Egg-Based Mixtures

To prepare eggs safely:

- Do not pool eggs if they will not be prepared in small batches and used immediately.
- Do not stack egg trays near the grill.
- Do not allow shells to touch or mix with egg contents.
- Do not use processing equipment that grinds entire eggs and separates out the shells.
- Use Cleaned and sanitized bowls, whisks, blenders, and other utensils for each new order or batch.
- Use pasteurized eggs in all recipes:
 - In which eggs are not cooked or cannot be cooked to 165°F or higher. This meringues and mousses, Caesar salad dressings, hollandaise and béarnaise sauces, eggnog, and mayonnaise.
 - Served to the elderly, ill, pregnant women, infants, and other diners with weakened immune systems.
 - Cook eggs to 165°F for at least 15 seconds. Cook whole eggs until white is completely set and the yolk begins to thicken. Cook
 - Scrambled eggs and omelets until they are firm and no liquid egg is visible.

Protein Egg Salads and Sandwiches

Salads and sandwiches containing meat, poultry, eggs, or fish require careful handling. This is especially true when you make large quantities or prepare these items several hours before service.

- Use properly cleaned and sanitized utensils and practice good personal hygiene.
- Prepare pasta, meat, egg, and fish salads less than 24 hours before service.
- Chill all sandwich and salad ingredients (including bread) 41°F or lower before making the meal.
- Wash all vegetables and fruits. Blanch items such as celery and carrots.
- Use commercially made mayonnaise, not homemade.
- Make only small batches for large orders. Refrigerate each batch before service.

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In this section we will discuss:

- Proper procedures for holding hot and cold food.
- Proper serving procedures to Safeguard Customers.
- Proper cooling and reheating procedures.
- The General Guidelines for Chemical Sanitizers

Holding

General Procedures

- Make only small batches. Breaded, fried, and baked foods should be held only for very short time periods.
- Regularly stir held foods and measure their temperatures with a thermocouple or bi-metallic stemmed thermometer every two hours. Do not rely on the thermostat on the holding equipment that measures the temperature of the equipment, not of the food.
- Always Record the temperatures in a log.
- Use covered holding pans and provides long-handled spoons or tongs so human hands do not touch the food. Place spoons and tongs in the food with their handles pointed toward the user or store these utensils in drinkable running water.
- *Never* mix new food with old or raw food with cooked food.
- Use properly cleaned and sanitized utensils and practice good personal hygiene.

Holding Hot Food

To provide control during holding, you should:

- Use only hot-holding equipment that can keep foods at 135°F or higher. Holding equipment includes steam tables, double boilers, bain maries, heated cabinets, and chafing dishes.
- Never use hot-holding equipment to cook or reheat food - only to keep food hot.
- Measure food temperatures every two hours. Record them in a log.

Holding Cold Food

Cold cooked and raw foods must also be kept safe from temperature abuse and contamination. To provide control during holding, you should:

- Use only cold-holding equipment that can keep foods at 41°F or lower.
- Hold ready-to-eat cold foods in pans or on plates, never directly on ice. Make sure ice used to surround chilled foods drains away from the food. Drip pans should be sanitized after each use.
- Measure food temperatures every two hours. Record them in a log.

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Serving

Set up serving procedures to help employees safeguard food and customers. Stagger employee assignments so that an employee does not serve food, and clear dirty dishes during a single shift.

Train employees to:

- Use properly cleaned and sanitized utensils and to practice good personal hygiene.
- *Never* touch the food-contact areas of glasses, cups, plates, and tableware.
- *Never* stack cups or bowls before serving them - the bottom of one will touch the rim of the one below it and possibly contaminate it.
- Use plastic or metal tongs or scoops to get ice - *never* use glass that may break in the ice.

Safeguarding Customers

Prepare in advance for customers' requests and problems and train your employees to respond to customers' needs with care. For example, if a customer with a food allergy asks if a certain ingredient is in one of the menu items, an employee should be able to answer the question or as the chef or cook for the answer. The employee need to reply to the customer honestly, even if it is an, "I'm sorry, but I asked and we really aren't sure. Although the chef did suggest you try..... At no time should the employee ignore a customer's question or give an answer that may be wrong.

Cooling

Food must be cooled to 41°F or lower in less than four hours total after cooking or hot holding. Many state and local health department use other codes that permit 45°F or lower in less than four hours. This area is 41°F in four hours.

FDA's Food Code recommends cooling in two stages:

1. From 135°F to 70°F in two hours, and
2. To 41°F in four hours for a total of six hours cooling time.

Cooling Procedures

When cooling large pieces or batches of hot food, begin by cutting large items into smaller pieces or dividing large batches into several smaller ones. Place the smaller amounts in re-chilled stainless steel pans.

Then, use one of the following methods:

- Place the pans in larger pans of ice. Stir foods as they cool.
- Then:
 - Put the food in shallow stainless steel pans on the upper shelves of a refrigerator. Thick foods, such as chili and stew, should be in pans with a product depth no more than two inches. Thinner liquids, such as broth and soup, may be in pans with a product depth of no more than three inches deep.
 - Place the pans so air circulates around them. Put uncover pans on top shelves to cool further, then over them loosely to maintain air flow. (Some health departments require pans to be covered at all times.)

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- If food is not cooled to 41°F after four hours, take corrective action. Reheat it to 165°F for at least 15 seconds in two hours. If food is not served immediately, discard it.
- Label properly cooled and stored foods with the date and time they were prepared. If food is not used within 5 days, discard it.
- Place the pans in a quick-chill unit, tumbler chiller, or cold jacketed kettle. Never use storage refrigerators or freezers to cool foods. Hot foods can raise the temperature of the unit and endanger the other foods stored there.

Record the cooling items required for each type of food and add these items to your recipes and flowcharts.

Reheating

To keep food safe:

- Reheat all previously cooked food to an internal temperature of at least 165°F (73.9°C) for at least 15 seconds within two hours.
If the food cannot be reheated within two hours, discard it.
- Food reheated in a microwave must be heated to at least 190°F (87.8°C). Let the food stand for two minutes after reheating so the heat spreads evenly throughout all parts of the food.
- Ready-to-eat food taken from a commercially processed, hermetically sealed container or from an intact package from a processing plant must be reheated (often called re-thermalized) to 135°F or higher.
- Transfer reheated food to holding equipment only when the food is at 165°F (73.9°C).
- Use cooking ranges, ovens, steamer, and microwaves to reheat food - never use hot-holding equipment because it is not designed to reach and maintain the necessary temperatures.
- Reheat food in small batches to shorten reheating time.
- Reheat food only once.

Record the reheating times for each type of food and add these items to your recipes and flowcharts.

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General Guidelines for Chemical Sanitizer

	CHLORINE	IODINE	QUATERNARY AMMONIUM
Minimum Concentration For Immersion	50 parts per million (ppm)	12.5-25.0 ppm	220 ppm*
For Power Spray or Cleaning or Cleaning in Place	50 ppm	12.5-25.0 ppm	220 ppm*
Temperature of Solution	75°F (23.9°C)+	75°F-120°F (23°9-48.9°C) Iodine will leave solution at 120°F (48.9°C)	72°F (23.9°C)+
Time for Sanitizing For Immersion For Power Spray or Cleaning in Place	1 minute Follow manufacturer's instructions	1 minute Follow manufacturer's instructions	1 minute; however, some products require longer contact time r e e d label
pH (detergent residue pH of solution so rinse thoroughly first)	Must be below 8.0	Must be below 5.0	Most effective around 7.0 but varies with compound
Corrosiveness	Corrosive to some substances	Noncorrosive	Noncorrosive
Response to Organic Contaminants in Water	Quickly inactivated	Made less effective	Not easily affected
Response to Hard Water	Not affected	Not affected	Some compounds inactivated but varies with formulation-read label; hardness over 500 ppm is undesirable for some quats
Indication of Solution	Test kit required	Amber color indicates effective solution, but test kits must also be used	Test kit required; Closely follow label instructions

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HACCP System for Chili

Operational Step	Hazard	CCP	Standard (Criteria)	Type of Monitoring	Corrective Action if Standards not Met	Records
Purchasing and receiving frozen ground beef	Bacterial growth and survival; chemical or physical contamination	CCP	Product obtained from approved source	Shift manager checks purchase specifications upon receipt of product and invoice	Reject Delivery; obtain product from an approved source	Certificate of conformance at invoices
Receiving frozen vegetables	Contamination and spoilage		Accept product at 0°F or lower	Shift manager measures temperature with a thermocouple or thermometer	Reject Delivery	Receiving log
Receiving cans of chili base	Contamination		Packaging intact Cans sealed properly, undented, no signs of rust, seams intact and no signs of bulging	Observation Shift manager checks for signs of thawing and ice crystals Observation Observation and inspection of a random number of cans	Reject Delivery Reject Delivery	

Step: Purchasing and Receiving

HACCP System for Chili

Operational Step	Hazard	CCP	Standard (Criteria)	Type of Monitoring	Corrective Action if Standards not Met	Records
Storing frozen ground beef	Bacterial growth and survival	CCP	Store frozen patties in freezer unit at unit temperature of 0°F or lower.	Shift manager measures frozen product temperatures with a thermocouple or thermometer.	Move to freezer unit capable of maintaining temperature 0°F or lower until ready to thaw or prepare	Daily inspection audit
Storing frozen vegetables	Contamination		Label, date, and use FIFO method of stock rotation.	Check that product is covered and packaging intact	Discard if maximum storage time is exceeded.	
Storing canned chili base			Store frozen vegetables in freezer at a unit temperature of 0°F or lower Label, date, and use FIFO method of stock rotation	Shift manager checks for signs of thawing and ice crystals Check that product is covered and packaging intact Observation	Move to freezer unit capable of maintaining temperature at 0°F or lower until ready to thaw or prepare Discard if maximum storage time is exceeded Discard if maximum storage time is exceeded	Daily inspection audit Daily inspection audit

Step: Storing

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HACCP System for Chili

Operational Step		Hazard	CCP	Standard (Criteria)	Step: Thawing	Corrective Action if Standards not Met	Records
Thawing frozen ground beef		Bacterial survival and growth	CCP	Keep product at or below 41°F during thawing process	<p>Type of Monitoring</p> Shift manager measures refrigerated product temperatures with a thermocouple or thermometer	Determine maximum length of time held above 41°F; if over two hours, discard	Daily inspection audit
		Cross-Contamination		Store covered away from or below ready-to-eat foods	Observation	If less than 2 hours, move product to a refrigeration unit capable of maintaining product 41°F or lower. Evaluate for signs of contamination Discard contaminated product	
						Move product to lower shelf or another refrigerated unit	

HACCP System for Chili

Operational Step		Hazard	CCP	Standard (Criteria)	Step: Cooking	Corrective Action if Standards not Met	Records
Cooking ground beef		Bacterial survival due to inadequate cooking	CCP	Cook to 155°F or higher for at least 15 seconds	<p>Type of Monitoring</p> Cook will measure end cooked product internal temperature with a thermocouple or thermometer	Continue cooking to 155°F or higher for at least 15 seconds	Cook's log
		Cross-Contamination		Keep raw ground beef away from the nearby or cooked beef on the grill Wash hands after handling raw ground beef Use cleaned and sanitized equipment, utensils and cooking surfaces	Observation Supervision and one-on-one training	Discard contaminated product	
Cooking Chili		Bacterial survival due to inadequate cooking	CCP	Cook all ingredients to 165°F or higher	Cook will measure end cooked product internal temperature with a thermocouple or thermometer	Continue cooking chili to 165°F or higher for at least 15 seconds	Cook's log
		Contamination from cook's hands or mouth		Use proper tasting procedures	Observation	Discard contaminated products	
		Cross-Contamination		Use clean and sanitized utensils for stirring	Supervision and one-on-one training	Review proper tasting procedures with cook and check cook's training record Wash, rinse, and sanitize all utensils Review proper procedures with cook and check cook's training record	



CPFM TRAINING

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HACCP System for Chili

Step: Hot Holding and Serving						
Operational Step	Hazard	CCP	Standard (Criteria)	Type of Monitoring	Corrective Action if Standards not Met	Records
Holding Chili for Service	Bacterial growth	CCP	Hold chili at an internal temperature of 135°F or higher, stir often to maintain even temperature throughout product.	Cook measures hot-holding product temperatures with a thermocouple or thermometer	Determine maximum length of time that chili was held below 135°F; if more than 2 hours, discard.	Hot-holding time-temperature log
	Cross-Contamination		Preheat hot-holding unit	Cook measures temperature of water with a thermocouple or thermometer	If less than 2 hours, reheat chili or range to an internal product temperature of 165°F or higher for at least 15 seconds	
	Bacterial survival and growth		Use cleaned and sanitized equipment and utensils to transfer chili to hot-holding pans Prepare chili only for same day service	Observation Supervision and one-on-one training Observation	Continue heating hot-holding unit Wash, rinse, and sanitize equipment and utensils following standard operating procedures Review proper procedures with employee, and check employee training record Discard leftover product	

HACCP System for Chili

Step: Cooling						
Operational Step	Hazard	CCP	Standard (Criteria)	Type of Monitoring	Corrective Action if Standards not Met	Records
Cooling chili for storage	Bacterial growth	CCP	Cool chili rapidly from 135°F to 41°F or lower within 2 hours	Cook will measure internal product temperature with a thermocouple or thermometer every 2 hours during the cooling process	Discard product that does not cool to 41°F in 4 hours. If product has not cooled to 41°F or lower within 2 hours, reheat to 165°F or higher and serve immediately	Cook's cooling log
	Cross-Contamination		Place chili in shallow pans with a product depth of 2 inches or less	Observation	If product depth exceeds 2 inches, move to shallow pans and provide additional pans as necessary so product depth is 2 inches or less	
	Bacterial growth during prolonged storage		Place shallow pans of chili into ice bath. Immerse pans into ice up to product level with the pan and stir frequently After cooling is achieved, cover pans with plastic wrap and put on top shelf of refrigerated unit Label with date, time and product name	Observation	Prepare ice bath; immerse shallow pans in ice up to the product level with the pan and stir frequently Evaluate for contamination; discard suspect product. Cover and move to upper shelf Label with date, time, and known product name; discard product	

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HACCP System for Chili					
Operational Step	Hazard	CCP	Standard (Criteria)	Step: Reheating Type of Monitoring	Records
Reheating Chili for service	Bacterial survival and growth	CCP	Rapidly heat chili to an internal product temperature of 165°F or higher for at least 15 seconds in 2 hours or less	Cooking measures internal product temperature with a thermocouple or thermometer	Cook's cooking log
Hot-Holding chili	Bacterial survival and growth	CCP	Maintain chili temperature at 135°F or higher in a preheated hot-holding unit. Stir often to maintain even temperature	Shift manager measures internal hot-holding temperature with a thermocouple or thermometer	Hot-Holding time and temperature log.
			Preheat hot-holding unit before chili is placed in the well	Cook measures temperature of water in heat well with a thermocouple	
			Only reheat chili once	Observation	
				Continue heating hot-holding unit	
				Discard all leftover products	



