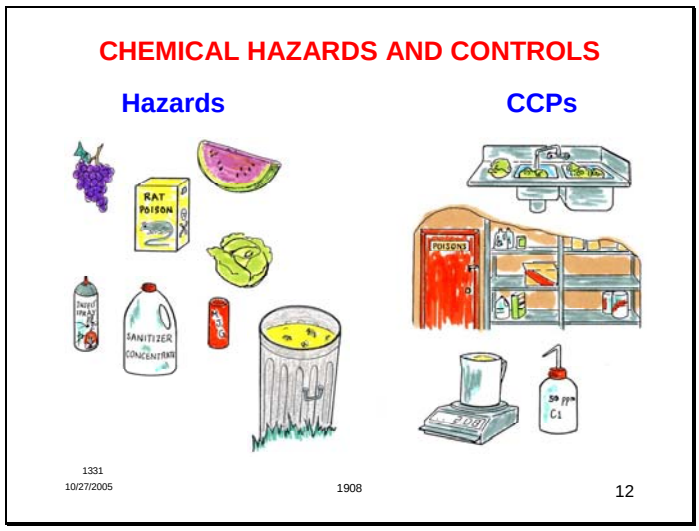


1331

Chemical Hazards

The accidental or intentional addition of excessive amounts of toxic chemicals to food can cause illness or even death. No poisonous or toxic materials should be used that are not immediately necessary or appropriate for the maintenance of the establishment, the cleaning or sanitizing of equipment or utensils, or the control of insects or rodents. Chemicals must be used in accordance with manufacturers' recommended instructions. No poisonous or toxic materials should be used in a way that contaminates food or that constitutes a hazard to employees or others.

Chemical Contamination in Food

Chemical compounds that may contaminate incoming food products are herbicides, pesticides, growth-limiting chemicals (such as sprout retardant on potatoes), and fertilizers. The critical control procedure is to immediately wash all incoming produce to remove these chemicals and to dilute these chemicals to a safe level.

Cleaning Compounds

In-house cleaning supplies and pesticides are chemical hazards. Detergents, sanitizers, polishes, caustics, acids, and other cleaning supplies must be stored in an area, cupboard, or room that is separate from any food supplies.

Detergents, bleaches, etc., should never be stored in a food container nor measured in a food container. These products should always be labeled prominently and distinctly, clearly indicating the contents. Detergents, sanitizers, or related compounds should not be stored above sinks used for food preparation.

Culinary Chemicals

All chemicals used in food should be weighed or very carefully measured before being added to food products. People have become very ill when too much MSG (monosodium glutamate), nitrates, and sulfates have been added to food.

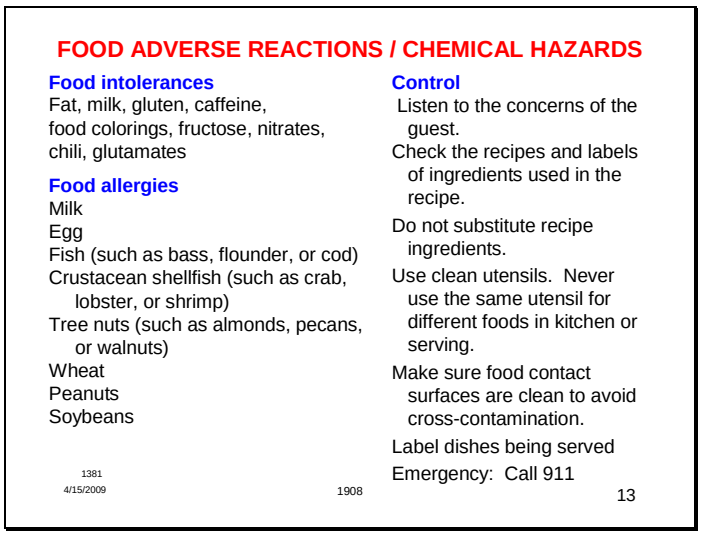
Right-To-Know

All employees should be informed about the presence and use of any hazardous chemicals in the foodservice facility. They should know:

- What the chemical is.
- What its use is and how to mix and handle it.
- How it should be used.
- Where it should be used.
- Where it should be stored.
- What to do if contamination of a food product is suspected.
- What to do if they have been harmed by using the chemical product.

Pest Control and Materials Used

The key to pest control is cleanliness, not chemicals. The interior and exterior of the building should be maintained according to the cleaning schedule and doors must fit tightly. Open poison bait stations should not be used. Instead, trap rodents and insects so that the bodies can be disposed of properly. Vapona strips and automatic intermittent aerosol insecticide dispenser should not be used in foodservice facilities.



1381

Adverse Reactions to Food

If you have a customer with a serious adverse food reaction, immediately call 911. Some adverse food reactions are due to **food intolerances**, which are genetic deficiencies. For example, lactose intolerance is caused by a deficiency of the intestinal enzyme, lactase. As a result, lactose, the predominant sugar in milk, cannot be broken into its two component sugars, glucose and galactose. Phenylketonuria is caused by an inability of some individuals to metabolize and clear the amino acid, phenylalanine. Too much phenylalanine in the blood affects the central nervous system and leads to mental retardation in infants and children. Individuals with phenylketonuria must control their intake of phenylalanine. Therefore, they must consume minimally required amounts of protein and must avoid food containing significant amounts of phenylalanine (e.g., foods containing aspartame).

Examples of ingredients that create food intolerances in some people include: acids, antioxidants, caffeine, food colorings, fructose, capsaicin, nitrates, phenolic substances, sorbital / natural sugars, alcohol, benzoates, chili, aza dyes, glutamates, histamine, pepper, fat, milk, and gluten.

Idiosyncratic reactions to foods include celiac disease (occurs in some individuals when they ingest any food containing wheat gluten); asthma induced in some individuals as a result of ingesting sulfites or FD&C Yellow No. 5. Other idiosyncratic reactions to foods reported to occur are: hyperkinetic behavior in children as a result of the consumption of food coloring agents and sugar; migraine headaches due to consumption of chocolate or aspartame; and "Chinese restaurant syndrome" due to consumption of excessive amounts of monosodium glutamate.

An example of a drug-induced metabolic disorder occurs in individuals taking monoamine oxidase inhibitors (MAOI). These drugs interfere with the metabolism and clearance of tyramine. Too much tyramine in the blood can cause severe headaches, increased heartbeat, and elevated blood pressure. In severe situations, heart failure and intercranial hemorrhages have occurred. People taking monoamine oxidase inhibitors are instructed not to consume fermented or ripened foods (e.g., ripened cheeses, olives, pickles, sauerkraut, wine, beer, salami, and other fermented sausages).

Food allergy is a term that should be used to identify adverse reactions to certain foods that have an immunologic basis. These reactions are characterized by the presence of larger amounts of immunoglobulin E in individuals with allergies. Some reactions (e.g., anaphylactic shock) occur almost immediately following ingestion of offending foods and are of a severe, life-threatening nature. Anaphylactoid reactions include scombroid fish poisoning and reactions of individuals after consumption of certain types of cheeses, due to ingestion of large amounts of histamine in these foods. Some allergic reactions occur 4 to 6 hours after ingestion of a specific food, while other reactions may take more than 6 hours for the development of any adverse reaction or condition.

Allergic reactions are characterized by any one or a number of the follow conditions: hives; red, inflamed skin; difficulty in breathing; cardiac seizure or arrest; increase in blood pressure; gastrointestinal disturbances; ear infections; dizziness; ringing of the ears; tearing of eyes; pain and swelling in muscles and joints; headaches; drowsiness; learning disorders; restlessness; hyperactivity; allergic epilepsy; chilling and fever (Jones, 1992).

Common Allergenic Foods

The following is a list of common allergenic foods that must be clearly listed on labels.

Milk: Includes ice cream; powdered milk; evaporated milk; yogurt; butter; cheese; cream and sour cream; non-dairy products and any other food products containing lactose, caseinate, potassium caseinate, casein, lactalbumen, lactoglobulin, curds, whey, milk solids.

Egg: Egg is present in most processed food and is present if the label indicates any of the following additions: constituent egg proteins or their derivatives (e.g., albumen, ovalbumen, globulin, ovomucoid, vitelin, ovovitelin, silico albuminate).

Fish (such as bass, flounder, or cod): Any type of fin fish; any food product containing fish.

Crustacean shellfish (such as crab, lobster, or shrimp): Also includes any food product containing these crustacea.

Tree nuts (such as almonds, pecans, or walnuts): Also includes any food containing tree nuts (e.g., salads, entrees, cookies, cakes, candies, pastries, or breads).

Wheat: All types of wheat flour; any baked products and any prepared products containing wheat flour, wheat gluten, or wheat starch.

Peanuts: Also includes any food product containing peanuts.

Soybeans: Also includes any food product containing soybeans.

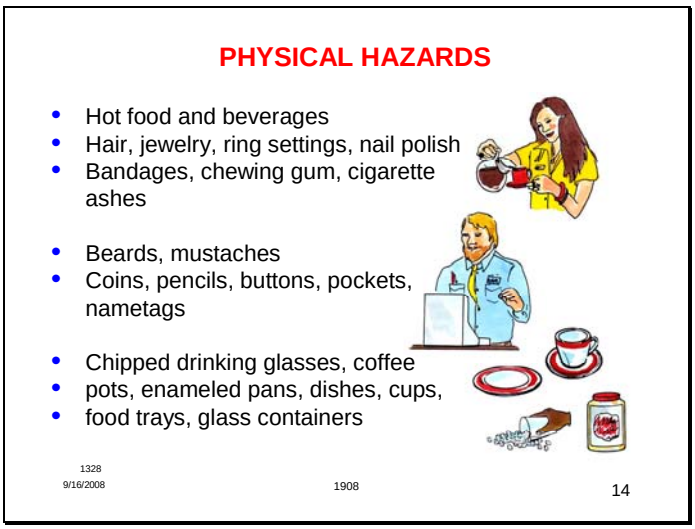
Critical Control

Listen to the concerns of the consumer. Have the cook check the recipe and labels of ingredients used in the recipe in order to determine if there are any ingredients that could be hazardous to the consumer. Do not substitute recipe ingredients without management approval and notification to all employees; change the menu, if necessary, based on any approved changes. Use clean utensils, and never use the same utensil for different foods. Make sure food contact surfaces are clean to avoid cross-contamination. Label dishes being served. Finally, in an emergency, call 911.

References:

FDA. 2005. Food Code. U.S. Public Health Service, U.S. Dept. of Health and Human Services. Washington, D.C. http://www.cfsan.fda.gov/~dms/fc05-toc.html.

Jones, J.M. 1992. Food Safety. Eagan Press. St. Paul, MN.



1328

Physical (Hard Foreign Object) Hazards

Liability

Hard foreign objects in food cost the retail food industry 5 times more in liability than all microbiological and chemical causes. The reason is obvious. When customers discover a foreign material in food, they have the food in their possession and there is no denial of the source.

When foodservice operations fail to keep hard foreign objects out of food, it is a violation of §3-101.11 of the FDA Food Code. If contamination is found in food products obtained from suppliers (e.g., grasshoppers in canned green beans), it is governed by §402 of the Food Drug and Cosmetic Act. Some examples of physical hazards in food are as follows.

Hot food and beverages

The quality temperatures for serving hot food such as soups and hot beverages when the customer eats it is 170°F or hotter, and for casseroles and vegetables is 150°F. Research by Moritz and Henriques (1947) has shown that if hot liquids at 170°F contact skin for as short a time as a few seconds, there can be severe skin burns.

Customer hot liquid skin burns have been a problem in food operations for a long time. At drive-through windows, cups of soup and beverages must have snug-fitting lids and a warning on the container, "CAUTION. Hot Liquid." They must be handed to the customer carefully.

When serving soup and hot beverages, servers must be careful not to spill hot liquid on the bare skin of a customer. When pouring hot coffee and refilling coffee cups, great care must be taken to not let the not coffee spill on the customer.

Hair

A person may lose 100 hairs each day. Clean hair is not a microbiological hazard since it contains so few pathogens. However, hair does carry yeasts and molds, which can contaminate food and cause spoilage and reduced storage life. Although the presence of hair does not present a health hazard, customers become quite disgusted when hair is found in food. Most customers will not return to a foodservice operation after finding hair in one of the products. FDA regulations state that hair must be restrained and prevented from entering food. Hair restraints include the use of hats, scarves, hairnets, etc. Beard bags are required to keep hair from mustaches and beards from falling into food.

Jewelry

In order to keep hard foreign objects out of food, service personnel should wear a minimum of jewelry. Food production employees should wear no jewelry. Jewelry settings can loosen and fall into food, causing hazards to customers. Bracelets, necklaces and watch bands can present hazards for employees if caught on equipment.

Fingernail Polish

Fingernail polish chips are not hazardous to customer's health. However, customers dislike finding this type of material in their food and may not return to the foodservice establishment if they find it in their food.

Small Items

Employees must be careful not to allow small items such as coins, buttons, and name tags to fall into food. Long neckties and scarves should be tied or restrained to prevent them from falling into food or catching in equipment.

Chipped Dishware

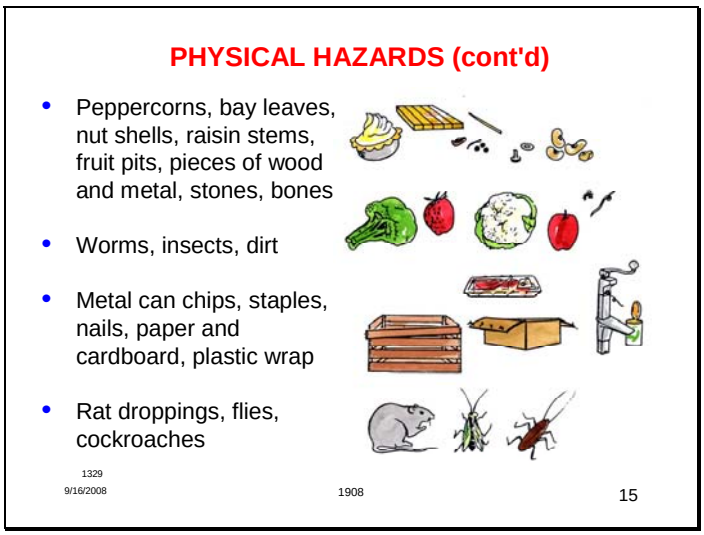
Chipped glasses, cups, and dishes present another physical hazard. Dishes and utensils must be inspected regularly to prevent this from occurring.

Ice Scoops

A metal ice scoop with a handle should be used to scoop ice. Glasses should never be used because they break in the ice and can create a very hazardous condition. Nor should hands, paper cups, bowls, or other non-approved items be used as ice scoops. Ice scoops are not a microbiological food safety problem if stored in the ice bin, in a clean place, or in an approved container. A container being filled with ice should be kept at least 6 inches off the floor on a clean surface so that the bottom of the container does not get dirty.

References:

Moritz, A.R. and Henriques, Jr., F.C. 1947. Studies of thermal injury: II. The relative importance of time and surface temperature in the causation of cutaneous burns. Am. J. Pathol. 23:695-720.



1329

Physical Hazards from Animals and Other Sources

Animal Physical Hazards

Physical hazards often make their way into a foodservice facility in the food that is delivered. Rodents such as rats and mice in warehouses as well as in restaurant storage areas may contaminate food with feces and urine. All food, including incoming food, must be carefully inspected. Commercial flour products have flour weevil eggs, which hatch when these products are kept warm. Flour, mixes, and other cereal products should be stored in tightly covered, labeled containers after opening.

Fruits and vegetables are contaminated with insects (and possibly chemical spray) and should be washed.

Pest Control

Insect and rodent control in the foodservice operation must be accomplished by preventing their entry, quickly removing spills from the floor, and keeping food tightly covered. If the facility, including the floor, is not kept clean, pests cannot be kept out. Garbage cans must be emptied as often as necessary and kept clean and free from odors that attract insects and rodents. Use of chemical pesticides or a professional exterminator can eliminate an infestation problem quickly. Extreme caution should be used during extermination to prevent contamination of food with chemicals being used.

Insect Electrocution Devices

The FDA code allows insect electrocution devices if they are properly used. They must be installed in an area where food is not prepared or stored so that dead insects will not fall into exposed food, on food contact surfaces, or on clean equipment and utensils. The dead insects in the tray are a very concentrated source of bacteria. The bacteria continue to multiply on the dead insects. They must be discarded carefully so as not to cross-contaminate the facility.

Debris

Dirt, sand, small rocks, fruit pits, wood chips, and pieces of processing equipment can also enter the foodservice facility with the food. Products should be inspected and sorted when received so that debris, packaging materials, and unusable food components (rotted areas, cores, pits, outer leaves, etc.) can be separated and discarded.

Equipment Physical Hazards

Pieces of equipment within the foodservice facility are another physical hazard source. Metal chips from tin cans are created by the blade on a can opener after it has been used to open a number of cans and the blade has become sharp or notched. The blade must be checked frequently and replaced to keep it dull. Metal chips and other physical contaminants can be prevented from getting into food through preventive maintenance and continuous upkeep of equipment.

Other Physical Hazards

Whole spices, peppercorns, and bay leaves should be wrapped in cheesecloth bags before adding to food so that they can be removed. People choke on bay leaves and bay leaf stems and break their teeth on whole peppercorns. Big toothpicks with "pants" should be used in foods. Employees should watch for bones and bone chips in foods.

Staples from food packages such as take-out bagged sandwiches are physical hazards that can get into consumers' food. This hazard can be prevented by using a non-hazardous method of sealing the bags.

The only line of defense against packing materials (wood chips, staples, nails, wire) and glass jars is to carefully inspect food products from delivery to service, and to store foods that they are not contaminated by these objects. Metal scrub pads should not be used for cleaning pots and pans and other surfaces, because the fine pieces of metal may get into the food.

Food Defect Action Levels

The FDA has established acceptable limits for natural contamination of foods in manufacturing. These limits pose no threat to health.