

SECTION 3

PERSONAL HYGIENE

- Hair restraint
- Only plain wedding band
- No nail polish
- Properly covered abrasions and skin disease
- When sick with norovirus, hepatitis A virus, enterohemorrhagic or shiga-toxin-producing *E. coli*, *Shigella* spp., or *Salmonella typhi* – STAY HOME.
- If spouse or children are ill, GET HEALTH DEPARTMENT OR DOCTOR'S PERMISSION to work with food.



826
11/2/2005

1908

42

826

Personal Hygiene

Employee personal hygiene is important for food safety and customer satisfaction.

Hair

All people lose up to 100 hairs daily from their heads. Hair that falls into food does not add enough pathogens to make people ill, but it does cause immediate customer dissatisfaction. Hair on the arms is also a problem.

Many types of hair restraints are unreliable. Concerned food production and foodservice personnel recognize their responsibility to keep their hair out of food. Personnel must wear chef hats or equivalent covering to keep hair out of food. People with long hair should wear hairnets. People with beards and mustaches should use beard or mustache nets or bags. People who mix salad or dough with their arms should wear gauntlet-length plastic gloves. Anyone, including managers and inspectors, who handles or is around open food should show the courtesy of wearing hair restraints.

Personal Cleanliness

Employees should bathe daily to control body odor. Customers do not like to smell or see dirty, untidy employees. Employees should be permitted to wear only light perfumes or colognes. Strong perfumes hide the food's aroma. Employees' hands should be kept free of all foreign odors. Perfumed hand lotions and heavy perfumes, etc., can change the perception of a food's flavor and should not be used by foodservice personnel when working.

Uniforms

Foodservice employees should wear clean, closed-toe shoes and clean uniforms or full aprons or smocks over street clothing. Aprons should be removed before using the bathroom and put back on after leaving the bathroom. Dirty uniforms or aprons have never been shown to be a food safety problem. However, customers are not impressed by employees who wear heavily soiled clothing.

Physical Hazards (Hard Foreign Objects)

Employees should not keep hard foreign objects such as pens and pencils in outside pockets where they might easily fall into food. Jewelry, nail polish, and artificial fingernails are also hazardous when they fall into food. Wedding bands are the only jewelry acceptable for wear in a foodservice. Stones may fall out of jewelry and into food, causing customers to break their teeth. Fingernails should be kept clean and trimmed to less than $\frac{1}{16}$ inch of the fingertip.

Foodservice employees should not chew gum while working. It could fall from the mouth into food. Smoking should not be allowed in the kitchen or serving areas because butts and ashes may get into food. Employees should not eat or drink while handling foods.

Cuts and Abrasions

Employees should inform manager(s) / supervisor(s) of any skin infections or abrasions. Infected cuts, abrasions, and skin disease must be cleaned with soap and disinfectant, bandaged, and gloved before any employee is allowed to prepare or serve food. Many serious illnesses have resulted from pus-filled cuts under finger bandages or by someone squeezing a pimple and then touching food without thoroughly washing the hands.

PREVENTING PREPARED FOOD CROSS-CONTAMINATION BETWEEN MONEY, USED DINNERWARE AND RAW FOOD

1. Do not directly handle food.
Use paper, wrap, utensils.
2. Touch non-food surfaces, edges of plates, utensil handles.
3. Separate jobs such as warewashing, raw and cooked food utensils, food tasting.



1266
11/4/2005

1908

43

1266

Cross-contamination

Cross-contamination can occur when prepared food is handled after an employee has handled raw food or soiled dinnerware. Food being served to customers should not be touched with hands. Tongs, knives, plastic gloves, or interleaf paper should be used to serve food.

Note, the FDA has declared that handling money and then food is not a safety problem. Money has been shown to have so few pathogens on the surface that it is not considered to be a source of cross-contamination. However, customers are still upset when they see employees serving food and handling money without washing their hands or changing gloves.

Employees must also be aware that touching knife handles, refrigerator doors, and drawer handles can transfer pathogens. To avoid cross-contamination between raw and cooked foods, use separate cutting boards and utensils for these types of food.

To avoid contaminating food contact surfaces, tableware and utensils should always be handled on the "touch areas" of plate rims, cup handles and glass bottoms, and utensil handles.

Food contact surface wiping cloths should be used to wipe food contact surfaces only. Towels used to wipe drips on plate edges should not be used for anything else. Food cloths should never be used to wipe the body.

Fingers should never be used to taste food. To taste food during cooking or preparation, put some of the food into a clean saucer with a clean spoon. Use a clean spoon and clean saucer each time the food is sampled.

Cleaning and Storage of Dishware

If only one employee is responsible for dish washing, that person must be careful to wash his/her hands after handling dirty dishes in order to avoid leaving fingerprints on clean dishes. It is better to have two people to wash dishes; one to handle soiled dishes and one to handle the clean ones. Nonetheless, fingerprints on clean dishes and tableware are filth problems, not safety problems.

Dishware should be checked for a clean, spot-free appearance before it is used. Unsatisfactory dishware should be returned to

the dishwashing area. Chipped, cracked, or surface-scarred dishware should never be used.

Clean glasses, cups, and other utensils should be stored covered or in an inverted position and at least 6 inches above the floor in a clean, dry location. Clean equipment and utensils should not be stored under exposed sewer lines, waste lines, or water lines, except fire protection sprinkler heads. Clean equipment and utensils should never be stored in toilet rooms, vestibules, lockers or dressing rooms, janitorial areas, or soiled or unapproved areas. Knives, forks, and spoons should be loaded onto the holders with handles up, on approved, nonabsorbent surfaces.

Single-service Items

Single-service (disposable) items should be stored in a closed carton or plastic bag. In-use boxes may be stored open, if the box is placed on its side with one end opened and not stored under or adjacent to cleaning agents or toxic materials. Utensils should be dispensed in a sanitary manner so that surfaces that come in contact with food or the mouth are protected from contamination. Handles should be presented to the user. Sanitary straw dispensers should be used for wrapped straws. Sanitary disposable cup dispensers should be used for customer service.

INFECTED PERSONS AND/OR PERSONAL HYGIENE

One in 50 persons working in retail food operations each day is shedding pathogens. They may not feel ill. They:

- May not have symptoms and do not stay home.
- Contaminate foods that do not receive further cooking with fecal, nose, mouth, and skin pathogens.
- Cough and sneeze over food or into hands touching prepared food.
- Fail to control bacteria from infected cuts, burns, and skin diseases.



1288
10/27/2005

1908

44

1288

The Body as a Source of Pathogens

Transmission of bacteria and viruses to food from human feces or the body is caused by contaminated hands. People with diarrhea are embarrassed to tell the manager or do not want to miss a day's pay, so they go to work. Infected people and poor personal hygiene cause a significant number of reported foodborne illness outbreaks.

The FDA Food Code says that employees who are diagnosed by a health practitioner with norovirus, enterohemorrhagic or shiga-toxin-producing *E. coli*, *Salmonella typhi*, *Shigella* spp., or hepatitis A should call their supervisor and should not come to work until cleared by a health practitioner.

Shedding Pathogens when Feeling Fine

People do not always know when they are carrying infective pathogens because they do not feel sick. For example, people can shed hepatitis A virus for 21 or more days before they feel ill, and may also shed pathogens for days to months after their symptoms are gone, as can be the case with *Salmonella*. One in every 50 people in foodservice sheds high levels of pathogens in his/her feces each day and never reports feeling ill.

Controlling Bacteria and Viruses in Sneezes and Coughs

Sneezing or coughing into hands or tissue and then touching food can cause pathogen transfer. Pathogens can survive on tissues and handkerchiefs for 30 days. Facial tissue and handkerchief use should be restricted to the area by the hand sink. When employees need a tissue, they must get it at the hand sink where they can wash their hands after using it.

If people must sneeze or cough, they can direct the sneeze or cough away from food toward the floor or into their shoulders to assure that a hazardous number of bacteria do not get onto the food. If employees do sneeze or cough into their hands, they must wash their hands immediately.

Skin Infections

If an employee has a cut on his/her hand, the employee must first wash and disinfect the wound and secondly, cover it with a bandage and glove. Since the wound is clean and disinfected, the main purpose of the glove is to keep the wound clean and dry, and to keep the bandage on the hand. The employee who

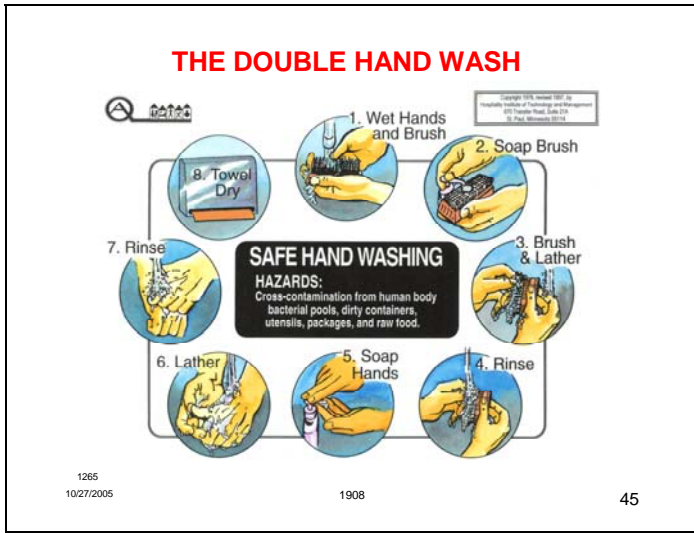
uses this procedure is ready to begin work. If the cut cannot be scrubbed and disinfected to eliminate the pathogens, the person must not be allowed to work around food preparation. Gloves break and leak, and are not an assured control method. Only one glove should be worn so that as the employee feels the ungloved hand getting dirty, he/she will wash his/her hands and keep them clean.

Transmission Prevention

The critical control point for preventing the spread of bacteria from infectious employees is the kitchen hand sink. **Proper fingertip and hand washing by all foodservice and food production personnel is critical to the safety of food being prepared and served.**

Plastic gloves are not the solution to food safety, unless the gloves are changed every time before an employee touches ready-to-eat food. It is best for the employee to work without gloves and only wash hands and put on gloves immediately before handling ready-to-eat food. If people wear plastic gloves, they must be trained to realize that the gloves get dirty, just as hands do. When gloves are worn, millions of bacteria multiply on the warm, wet skin inside the glove.

When gloves are used to serve or prepare food, the gloves must be changed often and hands must be washed and dried prior to putting gloves on and after the gloves are removed. Food should be prepared and served using equipment and/or methods that prevent direct hand contact with the food as much as possible.



1265

Contamination of the Hands

When employees use the toilet, it must be assumed that the toilet paper slipped and millions of pathogens get on their fingertips and under their fingernails. Pathogenic microorganisms can also be brought to work from home. Changing diapers, cleaning up vomit, or cleaning up after pets can put billions of pathogens on the fingers. People can also transfer pathogens when they touch pimples or let cuts on the hands become infected. Employees' hands also become contaminated with lower numbers of pathogens when they handle raw food, particularly raw meat, fish, and poultry products. The critical control is proper hand and fingertip washing.

Resident and Transient Bacteria

There are two kinds of bacteria on the hands: **resident** and **transient**. Resident bacteria exist within the surface layer of the skin and must not be disturbed because they keep the skin healthy.

Transient bacteria are the problem. Transient bacteria on hand surfaces are a result of contact with anything the hands and fingers touch. Transient bacteria include pathogenic microorganisms from feces, skin infections, nasal discharges, and contaminated raw food.

Hand Washing Procedures

To ensure removal of high levels of pathogens from hands, the **double hand wash method (2x)** must be used.

1. Turn on the water at a temperature of 75 to 110°F at 2 gallons per minute. A lot of water must be used to wash the detergent with microorganisms from the fingertips and hands. Wet the hands and brush. Friction and dilution are critical controls.
2. Put 2 to 3 ml of plain, not medicated, hand soap or detergent on a fingernail brush. Medicated soaps and detergents are no more effective than regular soap for eliminating high levels of pathogenic transient bacteria. In fact, they can reduce the resident bacteria and thus make the skin vulnerable to infection. Bar soap and liquid soap are equally effective, but liquid soap is easier to use.
3. Produce a lather by using the fingernail brush on the fingertips. Use the fingernail brush to scrub the fingernails. Special attention must be made to the fingertips that held

the toilet paper. The purpose of using the fingernail brush is to ensure safe removal of any fecal material and any other material that harbors pathogens from the fingertips and under the fingernails.

4. Rinsing is also a critical step. The microorganisms in the lather are not dead; they are just loosened from the skin and fingertips and are suspended in the lather. The soap does not kill the microorganisms. It merely moves them into the foam. Rinsing in flowing water removes the lather and produces a 1,000 to 1 microbial reduction. Rinse the fingernail brush and put it down, placing the bristles up to dry.
5. Again, apply 2 to 3 ml of detergent to the hands.
6. Lather the hands and skin of arms up to the tips of sleeves.
7. Thoroughly rinse the lather from the hands and arms in warm, flowing water.
8. Dry hands thoroughly with clean paper towels. The second hand washing produces another 100 to 1 microbial reduction, and the paper towel about 100 to 1 reduction.

The **single hand wash method (1x)** is the same as the second part of the double wash procedure (steps 5 through 8). This single hand wash method is used by employees at work during preparation and service of food to keep food safe. The single hand wash method is sufficient to remove the transient pathogens from the hands that result from touching foods during preparation.

Hands should not be washed in a basin of water because there is no diluting and removal effect of lots of water flowing over the hands.

Examples of hand washing standards are:

- Beginning a shift, use the double hand wash method (2x) to remove pathogenic microorganisms from home
- After using the bathroom, use the double hand wash method (2x) to reduce fecal pathogens.
- After squeezing a pimple, use the double hand wash method (2x) to reduce *Staphylococcus aureus*.
- Other times, when preparing and serving food, use the single hand wash method (1x).

CLEAN, SANITIZED AND STERILIZED

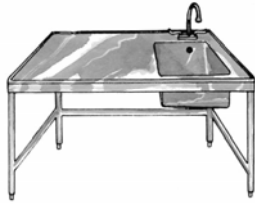
CLEAN: Surface has been scrubbed and washed with water (>110°F) and detergent to loosen biofilm (grease and dirt) and rinsed with clean water (>110°F).

SANITIZED: Sanitizing agent or solution has reduced pathogens to safe level.

A safe standard is 100 or less non-specific aerobic organisms per 8 sq. in. (50 sq. cm.).

STERILIZED: The chance of pathogenic organism is < 1 in 1,000,000,000 (trillion) grams of food. (Commercially canned foods are processed to this standard.)

Visual cleanliness is not a reliable indicator of surface sanitization.
Clean-looking surfaces can have millions of microorganisms stuck in the surface



965
10/27/2005

1908

46

965

decreases its effectiveness. When wiping clothes are kept in sanitizing solutions, the solutions become contaminated with microorganisms. Wiping cloths should be stored in detergent and water. The sanitizing solution should be kept clean by placing it in a squirt bottle and applying it to surfaces after they have been cleaned and rinsed.

Visual Cleanliness

Visual cleanliness has been shown in studies to be of no value as an indicator of microbiological contamination of the surface. Microorganisms cannot be seen with the eye. If raw food is placed on a surface, removed from the surface, and the surface is wiped with a dry or moist rag, the surface will look clean but it will have thousands of microorganisms per square inch. The four-step **wash, rinse, sanitize, air dry** procedure must be used.

Cleaning and Sanitizing

Clean means free of dirt, soil, and grease. Warm to hot water (110 to 120°F) and detergents and/or acid cleaners are essential in dissolving grease and removing dirt from surfaces. Cleaning is critical to sanitizing because a greasy surface protects pathogens, and dirt will neutralize the sanitizing agent, making it ineffective. Proper cleaning removes microorganisms to less than 100 per 8 square inches.

Sanitizing

Sanitizing agents and solutions should be used after washing as a safety factor to reduce the number of microorganisms on surfaces as much as possible. **Sanitize means to reduce the general population of microorganisms to a safe level.** While this has not been specified, it is generally considered to be less than 100 organisms per 8 square inches. This is a safe level compared to the number of organisms already present in food, which are the real problem.

Sterilized

Practically speaking, **sterilized means no pathogenic microorganisms.** Sterilized surfaces and utensils are found in medical facilities such as hospitals. There are no sterile surfaces in foodservice, only sanitized surfaces.

Detergents

Proper detergents are used in specified proportions according to the cleaning and sanitizing schedule for each cleaning task. Aluminum articles should never be washed with a highly alkaline or acidic solution because these solutions will corrode the surface. Adequate supplies of detergents and other cleaning compounds must always be available. Supplies should be checked regularly and reordered when necessary.

Employees must be very careful when they use foodservice cleaning compounds. Many are toxic if swallowed. Eyes and skin can be burned if the chemicals get on them. Cleaning agents and sanitizers should never be mixed together because toxic gas is released and the sanitizer is neutralized.

Cleaning Cloths

While regulations currently state that wiping cloths should be stored in an approved sanitizing solution, this is truly ineffective. The dirt from the wiping cloth neutralizes the sanitizer and



1291

Wash, Rinse, Sanitize, Air Dry

Effective cleaning and sanitizing of surfaces involves four steps. (A preliminary step is to pre-rinse / remove loose debris. This will reduce pathogens about 1,000 to 1.) The steps are washing, rinsing, sanitizing, and air drying. These four steps should be used to clean and sanitize work stations and food preparation areas every 4 hours or more often, if necessary.

- **Wash.** Clean as you go. Rinse as much soil from the surface as possible. Use a paper towel to wipe large pieces of soil from the surface. Next, use a warm detergent solution (90 to 110°F) and cleaning cloth and/or scrub brush to loosen the soil and surface film and deposit the scraps into a disposal or waste can. Wash water should be discarded as soon as it becomes dirty and/or becomes too cool.

It is important to remember that sanitizers cannot penetrate food-soiled surfaces. Cleaning and sanitizing solutions must be applied separately to food contact surfaces and equipment. Surfaces must be washed and rinsed before sanitizer is applied.

- **Rinse.** Use clean warm water (90 to 120°F) and another cloth with the rinse water to remove the detergent solution and soil. If possible, flush the counter or equipment with hot water. This is a critical step. The microorganisms and surface contaminants must be washed off; otherwise, they will reduce the effectiveness of the sanitizer. Rinse water should be changed as it becomes dirty or when it becomes cool (less than 75°F).
- **Surface Sanitize.** Use a pre-mixed sanitizing solution, in a plastic squirt bottle. Sanitizing solutions (e.g., a 50 ppm chlorine solution, approximately 1 teaspoon bleach per gallon of water) should be mixed daily, or more often if necessary. The sanitizing solution can be dispensed easily from the squirt bottle. A clean paper towel should be used to spread the solution. Tables and counter surfaces should be cleaned and sanitized every 4 hours or at the end of the meal to keep microbial counts on food contact surfaces low.

Separate, freshly cleaned and sanitized cutting boards and knives should be used for raw and cooked foods. Equipment used for raw food preparation should always be cleaned and sanitized before it is used to prepare cooked food.

- **Air Dry.** Allow surfaces to air dry thoroughly. Microorganisms multiply on wet surfaces because low levels of organic material still remain on the surface. Air drying prevents the multiplication of the few microorganisms left on the surface.

USING A SANITIZING SOLUTION

- Measure chemicals carefully.
- Never mix detergent and chemical sanitizer
- Water must be $\geq 75^{\circ}\text{F}$.
- Use a clean towel to spread the sanitizer.
- Keep towels in sanitizer solution.



Surface Sanitizing: 50 ppm hypochlorite =
Approx. 1 teaspoon bleach per gallon of water



1295
10/27/2005

1908

48

1295

Sanitizing Solution

Sanitizing chemicals normally require dilution with water, according to label instructions, before use. Too much sanitizing chemical can be a toxic hazard. Measure chemicals carefully.

Sanitizing Chemicals

Three primary sanitizing chemicals are used in food service facilities: **chlorine**, **iodine**, and **quaternary ammonium compounds**. The permitted concentrations are as follows.

Chemical	Immersion (1 min., 75°F)	Surface	Maximum
Chlorine	50	50	200
Iodine	12.5	12.5	25
Quaternary Ammonium Compound	150 to 400	150 to 400	400

Chlorine

Chlorine is the best broad-spectrum microbiological agent. It is also inexpensive because household bleach can be used. A guide to mixing various concentrations of chlorine sanitizing solutions is as follows.

- 200 ppm = 1 tablespoon 5.25% bleach/gallon of water
- 100 ppm = $\frac{1}{2}$ tablespoon bleach/gallon of water
- >50 ppm = $\frac{1}{4}$ tablespoon bleach/gallon of water (approx. 1 teaspoon/gallon of water)

Use newly manufactured chlorine bleach that is less than 6 months old, because it loses strength in storage. Do not use too much or increase the amount of bleach in the sanitizing solutions, because chlorine can corrode metal and cause skin irritation. Change sanitizing solution often.

Do not mix a chlorine sanitizer with any other cleaning compound. Deadly chlorine gas will be given off.

Iodine

Iodine is not quite as effective a sanitizer as chlorine and it is more expensive. However, it is less irritating to skin and hands. Sometimes it is used in bars to sanitize glasses because it leaves less flavor on glasses. Iodine sanitizers tend to leave objectionable stains on porous equipment such as cutting boards and plastic.

Quats

Quaternary ammonium compound sanitizer solutions do not inactivate pathogens as well as chlorine or iodine sanitizing solutions and may leave an oily film on surfaces. They are ineffective against viruses. They are quite useful for sanitizing floors, walls, and non-food contact surfaces. They are less corrosive than iodine and chlorine sanitizers. Quaternary ammonium compound sanitizer solutions are often used for sanitizing the inside surfaces of refrigerators and walk-in coolers to control spoilage microorganisms.

171°F Water

Another method of sanitizing surfaces is simply using hot water or steam at hotter than 171°F for a 30-second contact with the surface to be sanitized. This is the simplest and most effective of all methods. It is useless to put sanitizer chemicals in 171°F water. The temperature of the hot water makes it sufficient for use as a sanitizer alone, and the chemicals evaporate rapidly from hot water.

Sanitizer Temperature

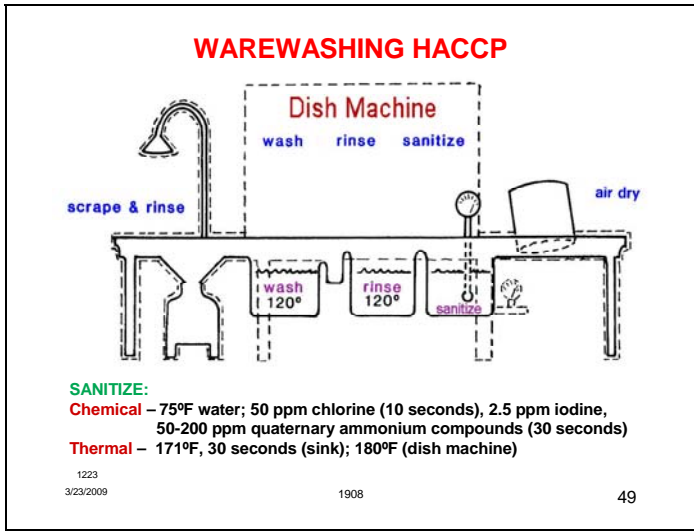
The contact time of 1 minute for immersion sanitizing is based on 75°F water. If the water is cooler, contact time must be extended. Also, the hotter the water up to 120°F (at which point the chemicals are less stable), the faster the chemicals inactivate microorganisms.

Surface Sanitizing

FDA regulations currently state to keep the sanitizer wiping clothes in sanitizer solution. However, it was not the intention of the regulation that the sanitizing solution used for storing with wiping clothes be used to sanitize surfaces. Keeping wiping clothes in solution that is used to sanitize surfaces is a poor procedure because wiping clothes pick up dirt and food soil that neutralize all sanitizers. Wiping clothes should be stored in a warm detergent solution so that surfaces can be cleaned to remove soil before sanitizing. The detergent solution must be changed when it becomes even slightly dirty, about every hour.

The squirt bottle and clean paper towel method is the best way to apply a sanitizing solution. Fresh sanitizing solutions should be prepared by the manager each day (because they deteriorate with time) and put into squirt bottles. Squirt bottles are better than spray bottles because the surface must be flooded with sanitizer.

Sponges should not be used for cleaning and sanitizing purposes because they are essentially impossible to clean and sanitize and hence, spread microorganisms.



1223

Warewashing HACCP

Whether done by hand or by machine, dish washing and pot and pan washing procedures should follow the same steps:

- **Scrape and rinse.** Without this step, food contaminates the washing water at a high rate and decreases the detergent effectiveness. Plastic scrub brushes and pads should be used. Metal scrubbers tend to break apart. The metal fragments remain on equipment surfaces and get into food.
- **Wash.** An accurately measured detergent solution in the first compartment of the 3-compartment sink must be kept clean and at 110 to 120°F to dissolve and suspend greasy soil.
- **Rinse.** Rinse equipment, cutting boards, utensils, etc., by immersion in the second compartment of the sink using clean water at a temperature of 120°F. Change the rinse water as it cools or shows the presence of detergent suds. If the detergent and dirty water from the first sink are not washed off thoroughly in the second sink, the sanitizer will be neutralized by the soap and dirt.
- **Sanitize.** Surfaces can be chemically sanitized in the third sink by placing them in a sanitizing solution such as 50-ppm chlorine for 10 seconds, or 12.5 ppm iodine or 150 to 200 ppm quaternary ammonium compounds for 30 seconds. The solution should be between 75 and 120°F, and the proper proportion of chemical to water must be maintained.
 As an alternative to using chemical sanitizers, items can also be sanitized in the third sink by immersion in very hot (171°F) water for 30 seconds in order to get the surface of utensils up to 165°F.
- **Air dry.** Allow surfaces to air dry thoroughly. Microorganisms do not multiply on wet surfaces. Towels should never be used to dry utensils and pots and pans because of possible recontamination of surfaces. If it is necessary to remove excess water from surfaces to promote rapid air drying, use a clean towel dipped and wrung out in 50-ppm chlorine sanitizer solution.

Dishes, tableware, and pots and pans should be stored according to food safety principles. Cups, glasses, pots, and pans should be stored upside down on a sanitized surface to prevent insects and objects from falling into them. Tableware and utensils

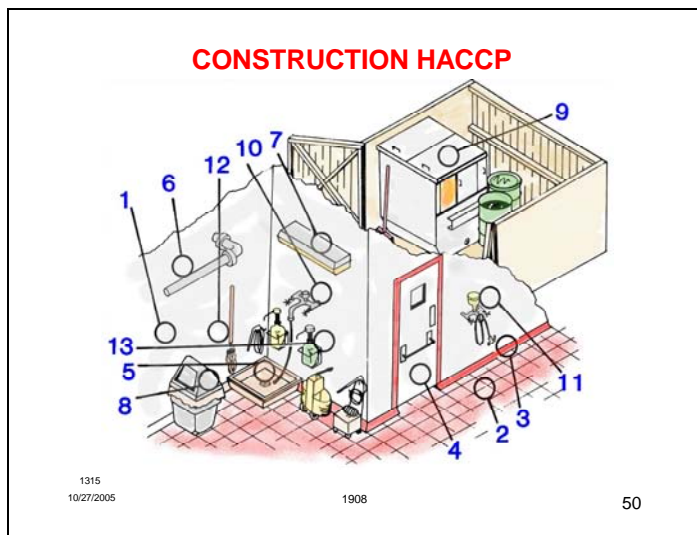
should be stored so that food contact surfaces are not touched when someone reaches for them.

Washing Equipment Cleaning and Maintenance

Washing machinery, sinks, and storage equipment must be kept clean to avoid contaminating sanitized dishes, utensils, pots, and pans. Machine strainers and wash nozzles should be cleaned every shift. Rinse nozzles should be cleaned every day or as prescribed by the manufacturer. Soap and sanitizer supply systems must be filled, and the audible or visual warning device for replenishing the supply should be in working order. Machine strainers and nozzles should be delimed according to the cleaning schedule.

Tableware should soak in a detergent solution prior to washing and must be racked flat to run through the dishwasher.

Water should be at the machine-specified temperature and at 15 to 25 pounds pressure for adequate sanitizing. A chemical test kit should be used to check chemical levels. An accurate thermometer must be used in the dish machine to indicate all wash and final rinse temperatures. The pressure gauge and valve for checking pressure on the final rinse line must be maintained. Washed dishes should be inspected to make sure they have been cleaned before they are put away or used for service.



1315

Facility Construction, Fixtures, Lighting, and Cleanliness

Facility and Utility Construction

Properly constructed and maintained facilities and utilities increase safe production and efficiency. These specifications reflect FDA recommended standards. Local codes may vary.

Construction

Walls. Walls made of glazed cinderblock are recommended (1). The FDA recommends walls that are a light, pleasant color, smooth and nonabsorbent, and easily cleaned. Some jurisdictions add "durable" to their recommendations. Utility installations, covered studs, joists, and rafters must not be exposed.

Many people use glassboard in smaller kitchens. This is acceptable in a medium-duty environment. In this case, there must be a cement riser 6 inches above the floor, so that the studs will not rest on the floor. If studs rest on the floor, they become rotted within 2 years due to normal floor mopping in a properly cleaned kitchen.

Floor. Non-slip quarry tile or brick floors are recommended (2). Epoxy-poured floor are hard to repair and do not last long. Sandpaper-type strips are sometimes used to attain a non-slip surface. They are effective for a limited period of time and can become a hazard themselves when they begin to peel from the floor surface.

The FDA allows some other types of floor materials. Mats and duckboards are acceptable, but no carpeting is allowed in food preparation area. Hardwood floors are approved in bakeries because these floors are vacuumed. Junctures between floors and walls must be closed to 1/32 of an inch.

Base Coving. Floors should be sealed at wall junctures (3). "Sealed" means sufficiently tight to prevent moisture transmission for the life of the wall. A cement riser with a 3-inch painted or tiled white strip for rodent and dirt detection is best.

Ventilation. Outside vents must be sufficient to remove undesirable odors, heat, steam, prevent condensation, and minimize escape of grease from under the hood during frying. Air intakes must prevent dust and contamination from entering.

There should be a filter in the air intake system to trap dust and filth.

The exhaust system and hood over deep-fat frying areas must be degreased at regular intervals. If a kitchen is used to prepare a lot of broiled or fried foods, this system should be cleaned every 3 months.

Fixtures

Doors. Doors to the outside must be rugged, self-closing and tight fitting, with gaps of less than 1/4 inch to prevent entrance of rodents. Hinges must be in good working condition (4). Openings to the outside must be appropriately screened or otherwise protected to prevent entrance of insects or vermin. Any screens must be made of #16 mesh (16 wires per inch) for insect control. A small window to see people coming from the other side should also be provided.

Utility Floor Basin. There must be a separate utility sink or floor basin (5) for dirty cleaning and mop water. This water must not be poured into food sinks or other plumbing fixtures, since contamination will result.

Drains. Floors must be sloped and graded about 1/4 inch per foot to drain properly. There can be no direct connection between foodservice equipment and the sewer. Drains must be trapped. Water must be kept in them to maintain a seal. The drains should be capped to prevent backflow of sewage and sewer gas, and to prevent insects and rodents from entering. There must be a surface drain to eliminate standing puddles of water inside and outside of the preparation areas.

Overhead pipes. Food must not be stored under overhead pipes or beams (6). A stainless steel "V"-shaped trough should be placed under overhead pipes in food areas to catch condensation and dirt and to help direct sewage away from food areas, should any leaks or breaks develop.

Overhead Lights. All overhead lights must be shielded to prevent glass in food if breakage occurs (7). When infrared lights are used, only the sides must be covered. Overhead lights must provide a minimum of 20 foot candles of light, but more are recommended. The light intensity should be 30 foot candles for permanently fixed, artificial light in walk-in refrigerator units, dry food storage, and other areas as measured 30 inches from the floor. The light intensity should be 70 foot candles for permanently fixed, artificial light in utensil and equipment storage areas, and in lavatory and toilet areas, as measured 30 inches from the floor. The light intensity should be 100 foot candles of light on all food preparation surfaces and at equipment or utensil washing work levels. High intensity lights (100 foot candles) are recommended for cleaning. They can be turned off for regular operations.

Waste Disposal

Inside Trash Containers. Trash containers must be insect- and rodent-proof, cleanable, leak-proof, and non-odor absorbent (8). The operation must have a sufficient number of correctly sized trash containers. If these containers are outside, they must be covered. If the containers are inside and not in everyday use, they should also be covered. Push-lids should be used for inside trash containers. It is acceptable to allow trash containers in dish scraping areas to remain open during mealtime cleanup. Garbage containers must be cleaned daily.

Outdoor Disposal Units. Outdoor disposal units must be covered with properly fitting lids to exclude birds, insects, and rodents, and prevent odors from escaping (9). The doors of dumpsters must stay closed. Garbage containers should be placed on a hard surface made of concrete or asphalt. These areas should be cleaned often to prevent an accumulation of debris. A supply of hot water, a hose, and a drain in the middle of the concrete pad are features that allow this area to be cleaned easily. Disposal units must be emptied frequently enough to prevent a nuisance.

Cleaning System

All faucets with hose attachments (10) in the cleaning supply area must have backflow prevention valves.

A pressurized cleaning wand can be used to clean floors, walls, and behind equipment (11).

The best way to clean a floor is to spray on the cleaner under pressure, let it soak the dirt loose, and mop with a clean mop (12). Additional agitation can be applied with a floor brush. Pressure washing alone is often insufficient to remove dirt and grease; elbow grease is necessary. After the floor is rinsed thoroughly, the floor should be squeegeed or wet vacuumed and allowed to air dry.

The second best way to clean a floor is to use one mop to remove the dirt and another mop to rinse. A third mop is used to sanitize the floor. Using one mop to both clean and rinse floors is essentially worthless.

Splash surfaces are most effectively cleaned by using a detergent solution and agitating the surface with a brush or scrubbing pad, followed by hot water rinse.

All bulk cleaning and sanitizing chemicals must be stored in areas separate from food supplies (13). They must be measured carefully when used, for safety as well as cost considerations.

WOOD: HARD MAPLE OR NON-ABSORBENT



841
10/27/2005

1908

51

841

Wooden Equipment

Usually, stainless steel is required as a food contact surface. Hard maple and other non-absorbent, FDA acceptable materials may be used for cutting blocks, cutting boards, salad bowls, and bakers' tables. Wood may be used for single-service articles such as chopsticks, stirrers, or ice cream spoons. Once used, single-service wooden items must be discarded.

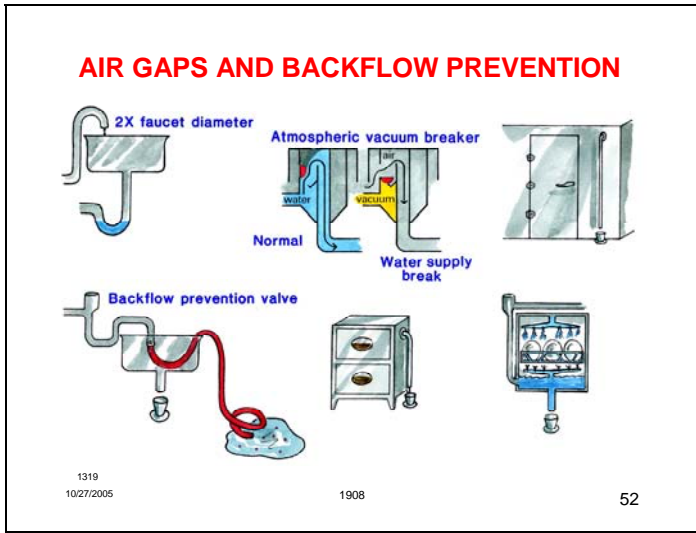
Wood may also be used for flooring and tables in a bakery because, while a flour-water dough may contain some pathogens, they do not grow due to competitive inhibition by yeast.

Wooden equipment must be non-toxic, and should be smooth, free of faulty seams, crevices, and cracks that could harbor pathogens. If wood is solid and dense, it is an acceptable material to use in food preparation.

In the past, cutting boards were cleaned effectively by placing salt on the surface and then scraping the surface with a metal scraper or brush. This scraping caused salt to penetrate the surface of the wood and remain at a concentration that inhibited microbial growth. Lemon juice was also used in combination with salt to sanitize wood surfaces effectively.

HITM research has shown that wooden cutting boards can be effectively sanitized in a properly operating dishwashing machine. When wooden cutting boards become worn, they can be planed and sanded until their surfaces are smooth. However, this procedure does not guarantee hazard control because the cutting boards become scratched as soon as they are placed back in operation.

To control hazards on cutting boards, all cutting boards must be cleaned with a stiff brush and hot, clean water to remove grease and debris (potential sources of microorganisms) in the grooves.



1319

Air Gaps and Backflow Prevention Plumbing Hazards

Plumbing connections and drains are microbiological critical control points. Drains are heavily contaminated with microorganisms, especially *Listeria monocytogenes*. If drainage systems are connected directly to sewage lines, contamination of potable water can occur as a result of backflow and back-siphonage of non-potable water or sewage. The potential for backflow and back siphonage from drains or other non-potable water sources into potable water lines must be prevented with proper plumbing connections and techniques.

If sewage water is allowed to re-enter the kitchen or service area, a number of microorganisms and viruses can be carried into the facility. In some places where municipalities have an old water system or water comes from an underground stream, there are also problems with cockroaches, other insects, and rodents entering through floor drains. Effective plumbing and drainage systems must control this problem.

Certain plumbing regulations apply to all facilities, and local health officials have the ultimate authority for plumbing specifications and requirements. A local regulation which is applied nation-wide to foodservice facilities is that no foodservice equipment can have a direct connection to sewer lines.

Negative pressure can develop in a water line when large volumes of water are pulled out of the system (for example, during fire fighting). An example of this type of occurrence is a sink faucet with a threaded end to which a hose is attached. The end of the hose is immersed in a sink or bucket of dirty water. If a negative pressure develops within a plumbing system containing no backflow or back-siphonage design and devices, the dirty water in the sink or bucket can be suctioned or flow back into the potable water system through the hose connection if the potable water pressure is decreased. As a consequence, the potable water system becomes polluted.

This negative pressure problem is controlled with backflow and back-siphonage plumbing techniques that use air or a mechanical means of blocking gases, water, insects, or other contaminants from entering the potable water system. Plumbing that does not contain backflow and back-siphonage devices or

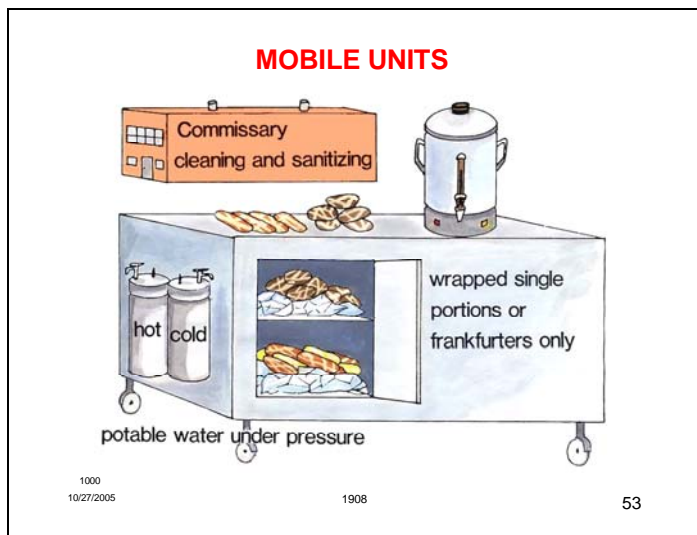
plumbing installation techniques that prevent this problem can become a pathway for the entrance of pollutants or contaminants into the potable water system.

Air Gaps and Backflow and Back-Siphonage Prevention Methods for preventing backflow and backsiphonage are:

1. Air gaps
2. Siphon breakers (must be above water line)
3. Pressure vacuum breakers
4. Atmospheric vacuum breakers.

Examples of Backflow and Back Siphonage Prevention

1. Backflow can be prevented, as shown by the sink illustration, if the distance from the top of the sink to the bottom of the faucet outlet is more than two times the faucet outlet diameter. A backflow valve is not needed in this situation because there is an air gap.
2. The illustration shows an **atmospheric vacuum breaker**. If the water system drops to negative pressure, this mechanical device closes. Thus the vacuum within the water pipe is prevented from suctioning up contaminated liquid. This type of problem can occur in a dishwasher or if hose from a water faucet is connected to a floor drain. If the faucet or pipe is threaded for a hose connection, there must be a backflow prevention valve.
3. Refrigerators that have condensate flowing through an air gap by the door allow drainage of condensation that occurs within the refrigerator. Having the drain just outside the door also allows water to flow to the drain when refrigerators are cleaned.



1000

Mobile Foodservice Units Operating Away from a Commissary

Mobile Foodservice

Mobile food units include human-powered pushcarts and motor-driven vehicles that carry extremely limited preparation and pre-packaged foods. Mobile food units or pushcarts must serve prepared food that is packaged in individual servings, and transported and stored under conditions of safe food handling. Cook-and-serve items such as frankfurters may be prepared and served.

They may serve beverages that are not potentially hazardous and are dispensed from covered urns or other protected equipment.

Potable Water

Water that is safe for human consumption is potable. Greywater is potable water that contains soap or detergent residues, dirt, sanitizers or other chemicals. A mobile food unit requiring water must have a potable water system under pressure and a greywater storage tank that exceeds the capacity of the potable water tank by a specified percentage (usually 15%). There must be sufficient hot and cold potable water available for hand washing, food preparation, and utensil and equipment cleaning and sanitizing. Water and sewage systems are not required if facilities for cleaning and sanitizing exist at the commissary. The mobile food unit must report to the commissary at least daily for supplies and cleaning and servicing operations.

Catering

Catering vehicles are not mobile food units. Catering vehicles simply transport food from the commissary to the serving point. The only requirements, which are not enforced in all jurisdictions, are that the vehicle has approved equipment for maintaining food temperatures below 41°F or above 135°F and that the interior (the "food contact surface") of the vehicle be maintained in a clean and sanitary condition. No food preparation is done within the vehicle and there are no potable water requirements.

The use of a car to transport food that is not below 41°F or above 135°F is not permitted.

