

Section 2: Sanitary Surroundings - Setting up for Safe Food

Are safe facilities important?

Bacteria need favorable time, temperature and moisture to grow and reproduce in food. Controlling these factors will be the focus of Section 4, Safe Food Handling.

Before we discuss controlling bacterial growth, however, it is important to understand how food becomes contaminated. There are three ways that contamination may occur in food programs.



- ♦ **Contaminated Products.** Some bacteria are already present in the food that is taken into the food program. Contamination may originate in the raw materials or it may be introduced during processing or by food workers hands.
- ♦ **Cross-Contamination.** One of the major sources of bacterial and viral contamination in any food establishment is lack of handwashing. Cross-contamination may also come from dishes, utensils, work surfaces or other food. For example, foods stored under raw hamburger could become contaminated by dripping juices.
- ♦ **Other Transport Mechanisms.** Bacteria can also be transmitted to food by insects, rodents, airborne dust and water.

How you set up and maintain your food program will determine how many routes bacteria have to invade and thrive. The following pages give guidelines to facility construction, organization, cleaning and maintenance.

Note: Guidelines in this manual focus on food sanitation concerns. Local building codes and OSHA regulations may impose additional requirements on your facility. These requirements rarely conflict with sanitary concerns.

Building and Grounds

The area surrounding a food program should be:

- ♦ Kept clean and clear of debris,
- ♦ Mowed frequently, with weeds removed and vegetation no closer than 2 feet to the building,
- ♦ Clear of standing water,
- ♦ Free of any evidence of insects and rodents,
- ♦ Free of trash, with trash containers covered, on a paved surface and properly secured.

The building exterior should be:

- ♦ Free of holes or cracks,
- ♦ Fitted with tight doors and windows.

These precautions help eliminate areas where pests and dirt can enter your building.

Water and Sewer

Any establishment providing food must have hot and cold water which is:

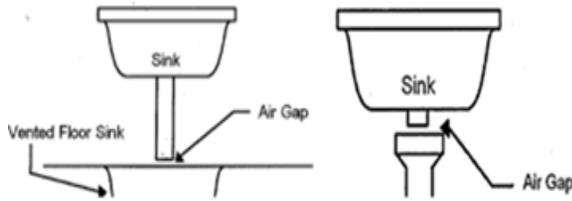
- ♦ **Safe and uncontaminated.** If the food program is on a public water supply, bacterial tests are periodically taken by the water company. Food programs on private wells should contact their county health department for more information on sampling requirements.
- ♦ **Adequate** to supply all processing, cleaning and support services.

Sanitary sewer services are also essential (and required in most counties). These services may be provided by a town or city, or may be a private system (such as a septic tank and drainfield). All wastewaters, including “gray” water from refrigerator condensing units, sinks and washing machines, must go into the sewer system.

There should be no cross-connections between the water supply and sewer. Examples of cross-connections include:

- ♦ direct plumbing connections between the two systems
- ♦ hoses which hang down into a mop sink or remain connected to an outside faucet.. (This practice is acceptable only if you install a vacuum breaker or other backflow prevention device.

- ♦ Ice machines and vegetable preparation sinks should be air-gapped in one of the following ways:



Cleaning Equipment Organization

A closet or room which is separate from all food handling and storage activities should be designated for the storage of all cleaning equipment and chemicals. This would include:

- ♦ mops, mop buckets, and wringers
- ♦ brooms and vacuum cleaners
- ♦ detergents, sanitizers and other chemicals

Cleaning cloths may be stored with cleaning equipment or in another part of the food program. In either case, clean cloths should be stored protected and separate from dirty cloths.

Whenever possible, a mop sink should be located near the cleaning storage closet. **In no case should dirty mop water be emptied into food or utensil sinks.**

Floor, Walls and Ceiling

The materials used to construct floors, walls and ceilings should be easily cleanable, non absorbent, durable and smooth (see"ENDS" in this Section). The examples below cannot cover all situations. If your building is constructed of different materials, ask yourself if it meets the ENDS criteria.

For **floors**, ENDS means seamless, sealed concrete, tile or linoleum. Carpet would not be a good choice for floor covering since it is absorbent and difficult to clean. In high traffic areas, floors should also be slip-resistant.

Walls may be painted wood or drywall, or covered with stainless steel or aluminum. If tile is used, all junctures and seams (as well as junctures between walls, ceilings, and any other panels) should be sealed with an epoxy or silicone grout. The edges of equipment attached to walls should also be sealed. This is an extension of "smooth and easily cleanable". If dirt can get into cracks and under tiles or panel, the area is not easy to clean, Coving may be used where the floor and walls connect. In all cases where paint is used, it should be light colored, such as a white latex enamel.

Ceiling tiles should be non-perforated, smooth and coated with a material that makes them non-absorbent. Ceiling and wall studs, joists and rafters should not be exposed.

The Standard: Easily cleanable, Non-absorbent, Durable, Smooth (ENDS)



The criteria of easily cleanable, non-absorbent, durable and smooth, (ENDS) applies to all ceiling, wall and floor materials as well as the surfaces of all equipment, shelving and containers. For example, a storage shelf could be made of stainless steel or wood, painted with latex enamel. Raw wood would not meet the criteria since it is absorbent, difficult to clean and not smooth. Shelf paper would not meet the criteria because it is not durable or easy to clean. As shelf paper ages, it curls and retains cuts where food debris and bacteria can accumulate which may harbor bacterial growth.

Ventilation

Good ventilation can help control temperature and humidity in your dry storage areas. These controls will in turn reduce bacteria, molds, mustiness and rusting of metal containers.

An optimal ventilation system will keep the temperature between 50o and 70o F and the humidity low. This may be accomplished with natural or mechanical ventilation, adequate insulation, and planning.

To reduce heat and moisture, storerooms should be away from uninsulated steam and hot water pipes, water heaters, refrigeration condensing units, heaters, and other heat or moisture producing devices.

Windows and doors which are part of your ventilation system should be screened and in good repair to discourage insect and rodent entry.

Windows which allow dust to enter your building should not be left open.

Doors which are used frequently (for delivery or clients) should be on vacuum springs which close automatically to keep unwanted visitors such as dogs, insects and mice out.

Lighting

Lighting should be bright enough to maintain clean and safe conditions (at least 20 Lumens Per Square Foot, or 20 foot-candles;).

Lights over food preparation and storage areas should be shielded to prevent contamination if light bulbs burst. Inexpensive plastic sleeve shields can be obtained from a hardware store.

Work Space Organization

Visitors to the kitchen area should be discouraged (clients, kids, dogs, and other beings not essential to your food operation.)

If smoking is allowed in your food program, set up a clearly marked smoking area that is away from all food or dish handling areas. Post a sign reminding workers to wash their hands before going back to work.

A separate area should also be designated for worker breaks and for storing personal items (coats, purses, employee food, etc.).

Repackaging and food preparation should be separated from other food program operations. If possible, designate a separate room for food handling. This room or area should be close to a hot water source for handwashing and cleaning. If physical separation is not possible, separate the activities by time.

Prepare food when the room is not being used for anything else and sanitize all surfaces and equipment before and after working

Garbage cans should be stored away from food handling and storage areas and should be tightly covered and emptied frequently to avoid attracting insects and rodents.

Storage Facilities

Food programs may store certain foods for up to one year before distribution. Safe food storage facilities are needed to:

- ◆ keep insects and rodents away from food
- ◆ discourage bacterial and mold growth
- ◆ maintain optimal shelf life
- ◆ ensure that food inventory is rotated so that older supplies are used first
- ◆ ensure clean supplies of dishes and single use items (paper products).

Optimal dry storage conditions are:

- ◆ **Cool** - (50 to 70°F) to prevent spoilage and bacterial growth. In no case should the temperature drop below 32°F since cans may burst or rust.
- ◆ **Dry** - to prevent food spoilage, growth of micro-organisms, infection by non-potable water or sewage, and container rust.
- ◆ Well ventilated - to maintain a cool, dry area.
- ◆ Designed to be cleanable

Storage Plan

Planning for your storage shelves should take several things into account:

- ◆ Free-standing metal shelves are ideal since they can be easily moved for cleaning or inspection.
- ◆ All food should be stored at least 6 inches off the floor and at least 2 inches away from the wall to reduce contact with rodents, insects and water
- ◆ Food should be stored separate from non-food items and above or away from poisons, toxins (such as shampoo, cough syrup or bleach) to reduce risk of spill or contamination.
- ◆ Food, dishes and single use items (paper products) should be stored away from water and sewer lines.
- ◆ Shelves should be set up to accommodate storage of individual cans or boxes (instead of shipping cartons whenever possible. Cartons may harbor pests.
- ◆ Garbage and recyclable goods (cardboard, cans, etc.) should be stored away from preparation and storage areas.

Equipment

Commercial food preparation equipment (approved by the National Sanitation Foundation, often stainless steel) is designed to pull the heat out of food and to be less easy to break and easier to clean than residential home-style equipment. If you have a choice, obtain new or used commercial refrigerators, freezers and ovens.

Since most food programs operate by donations, however, and since most donated appliances are residential-style, cooling and heating equipment should meet the following criteria.

Refrigerators, Freezers and Ice Machines should be :

- ◆ in good repair
- ◆ free of leaks
- ◆ reliable
- ◆ free of ice build-up
- ◆ plumbed correctly (air gaps for ice bins and ice machines, direct plumbing connections for refrigerators and freezers)
- ◆ able to maintain safe temperatures (34^o to 40^oF for refrigerators), (-10^o to 0^oF for freezers.)

The effectiveness of food preservation is dependent on maintaining a constant temperature.

Refrigerated Storage

As the temperature drops, bacteria and other microbes lose their ability to multiply. Even below freezing, however, most microbes can lay dormant, waiting for temperatures to rise to begin reproduction. It is therefore important to maintain constant and correct food storage temperatures.

- ◆ Keep refrigerators at a consistent temperature: between 34^oF and 40^oF.
- ◆ Keep freezers at a consistent temperature: between -10^o and 0^oF
- ◆ Place thermometers in the warmest parts of all refrigerators and freezers (often on the top shelf or near the door).
- ◆ Monitor and record temperatures daily.
- ◆ Occasionally move the thermometer around to make sure that cooling is even. If not, rearrange the food for better air circulation.
- ◆ Allow at least an inch of space at the back and sit shelves and around items. When food is jammed the interiors take longer to cool and may spoil.
- ◆ Store all food off the floor of walk-in coolers or freezers.

Refrigerators and freezers should be stocked in order to make cooling and air now more even.

A well-packed, full refrigerator or freezer is more efficient because the mass of food helps maintain cooler temperatures.

Remember not to overfill it, though. Leave room for good air flow

Thermometers

You can't monitor food quality or make good decisions on product safety without information on temperature. Thermometers should be used and placed as follows:

- ◆ Attach a small metal or plastic thermometer (available at restaurant supply shops) inside each refrigerator where it is in plain view and easy to read, in the warmest area, usually near the door.
- ◆ Place a wall-mounted thermometer at eye level, in plain view and in the most isolated part of your storeroom (where heat build-up is most likely). A large storeroom may need more than one thermometer.
- ◆ Use stem probe thermometers to measure product temperatures and for any activity where food is cooked or kept warm (sample meals, cooking classes, etc.). Stem probe thermometers can also be used for cold foods (not frozen foods though) and should be used to check product temperatures upon arrival to the food program.
- ◆ Keep a daily log of temperatures for refrigerators and freezers. Keep a weekly log for storeroom temperature.

Thermometer Calibration

Because thermometers are bumped even when used correctly, they should be calibrated frequently. To calibrate a dial stem thermometer:

- ◆ fill a glass with ice
- ◆ add water to form a slush or wait until the water has time to get cold
- ◆ insert the sensing stem of the thermometer into the glass without touching the sides or bottom of the container
- ◆ after a few minutes check the temperature and use a small wrench to adjust the calibration nut (on the underside of the indicator) so that the thermometer reads 32°F.

Digital thermometers should be checked for accuracy but are not easily calibrated.

Cutting Boards

Cutting boards are especially dangerous sources of bacterial contamination. The tiny grooves made by knives hide food and water sources which are perfect for bacterial growth. These grooves can occur on wood, plastic or ceramic cutting boards. Stainless steel cutting surfaces are more impervious but are often not available. To make cutting board use safe:

Use separate cutting boards for different types of food. For example, use a yellow cutting board for chicken, a green cutting board for vegetables, etc.

Clean cutting boards after each use by:

1. scrubbing in hot, soapy water
2. rinsing
3. dipping in a sanitizer solution of 1 - 2 teaspoons of bleach per gallon of water (100 ppm chlorine). Using more bleach does not increase the effectiveness of the sanitizer. Stick to the recipe!
4. allowing the board to air dry.

Dishwashing Equipment

Dishwashing equipment should be either:

- ◆ a three-compartment sink (to wash, rinse and sanitize), or
- ◆ a dishwasher with a 180°F final rinse or chlorination capacity (50 ppm residual chlorine).
- ◆ dishwashing procedure is explained later in this Section.

Sink

Food program facilities should include dish sinks, food preparation sinks and handwash sinks. Handwashing sinks should not be used for washing food or dishes. Combining these uses dramatically increases the potential for contamination and often leaves

the handwashing sink unavailable. Dish and food preparation sinks can be combined only if they are sanitized between uses.

Handwashing sinks should be placed in each room in which food handling occurs. All re-packaging and food preparation areas should have a handwash sink.

Dishwashing Process

Dishes may be washed manually (in a three compartment sink or with a dishwasher.)

Manual Washing:

1. **Scrape and pre-rinse** dishes. Soak only if absolutely necessary. Soaking allows time, temperature and water for bacteria build-up.
2. **Prepare** all dishwashing sinks by washing, rinsing and disinfecting them.
3. **Wash** dishes in hot, soapy water (120°F). Follow label directions when adding soap - adding too much could make your sanitizer ineffective. Change the wash water as often as it become cold or dirty.
4. **Rinse** in clean hot water (120°F). Change rinse water when it becomes cold, soapy or cloudy.
5. **Sanitize** dishes by immersion for at least 30 seconds in very hot water (170°F) or for 1 minute in lukewarm water (75°F) with 50 ppm chlorine. One teaspoon of chlorine bleach per gallon of water is approximately equal to 50 ppm chlorine.
6. **Air Dry** dishes, then store them in a clean area.

Dishwashers

Dishwashers may be used in place of steps 2-6 above.

Dishwashers must reach 180°F in the final rinse or must leave a residual of 50 ppm chlorine on the dishes.

Handwashing Facilities

Unclean employee practices are the culprit in many food-borne illnesses (such as hepatitis). **Don't underestimate the importance of safe and adequate handwashing facilities! Handwashing is not an option - it is absolutely required and may be the single most important thing you can do to control food-borne illness.**

- Handwashing sinks should be located in a place that is convenient to all food preparation activities. Depending on the size, number and design of your food preparation areas, you may need more than one designated handwash sink.
- Handwashing sinks must have hot and cold water and a mixing faucet.
- Handwashing sinks should not be combined with food or dish sinks.
- Handwashing sinks should have paper towels in a dispenser or on a mounted roll holder. Paper towels should be used rather than cloth towels to prevent the spread of bacteria.
- Liquid hand soap (available at department or grocery stores) should be kept in dispensers at every handwash sink. Anti-bacterial soap is acceptable but not necessary.

Bathrooms

All bathrooms should be supplied with the following items:

1. sinks with mixing faucets
2. hot and cold water
3. paper towels (hung in a dispenser or on a roll holder)
4. soap
5. a sign reminding workers to wash their hands before returning to work
6. toilets which are sealed to the floor with a line of caulk to facilitate cleaning
7. covered waste cans or a sanitary napkin disposal box.

Cleaning Methods

A clean sanitary food preparation and storage environment is critical to food safety. Sanitizing is an important part of cleaning.

Work surfaces such as counters and sinks should be washed with hot, soapy water then rinsed and sanitized frequently. Sinks used for washing both food and dishes should be cleaned between uses by washing, rinsing, spraying or soaking in a 100 ppm chlorine solution, and air drying for at least 3 minutes.



A bucket of sanitizer (100 ppm chlorine) with wiping cloths should be supplied for every work area that is in use. After cleaning a surface with wiping cloths, rinse the cloth under running water to remove any dirt or debris before placing it back in the sanitizing solution. The clean wiping cloths must stay in the sanitizer between use.

Soap should never be added to sanitizer since it forms a film and blocks the disinfecting action of chlorine.

Floors may be disinfected by using 2 1/4 cups of bleach and 3 gallons of warm water. Allow floors to air dry. Mop water should be emptied between each use and the mop should be hung to dry.

All linens should be machine washed in hot water and disinfected whenever dirty. Follow the directions on the bottle of bleach. Dish cloths and towels are notorious sources of contamination. A fresh dishcloth should be used each day.

Sanitizers

Several different types of sanitizers are effective in stopping bacterial growth. One of these, regular chlorine bleach, is the least expensive and most readily available. Check to make sure that the bleach you choose contains chlorine. Some color safe bleaches do not contain chlorine.

When sanitizing counters and appliance surfaces, a bleach solution should at 100 parts per million (ppm) or approximately 1 tablespoon of bleach per gallon of water. Dishes and utensils should be sanitized at 50 ppm or approximately 1 teaspoon of bleach per gallon of water. These concentrations are important since they allow the chlorine to disinfect the surface, then evaporate leaving little residue. Too much chlorine residue on a dish or a utensil can cause chemical poisoning

Because bleach in a bottle gradually loses strength as it ages, the amount of bleach required to reach the correct concentration may vary. To correctly determine the concentration of a sanitizer solution, use chlorine test strips (available at restaurant supply shops) and follow the manufacturers instructions.

Cleaning Frequency

Cleanliness is the first step in keeping foods free of bacterial contamination. Making a cleaning schedule and having one person responsible for this schedule increases cleaning effectiveness. After discussing it with workers, post the schedule and make sure that all necessary cleaning supplies are available.

Cleaning frequency at your food program will depend on how often and for what purposes you use the facility. The following guidelines apply to all food programs:

- Clean food processing or repackaging areas before and after use. Clean counters and cutting boards between each type of food. All counters should be sanitized at least daily during each day of use. Refrigerator and walk-in cooler surfaces should be cleaned with hot, soapy water, periodically. Spills should be cleaned immediately. If heavily used, refrigerators should be cleaned monthly.
- Defrost freezers and refrigerators as often as necessary to prevent ice build-up. When defrosting, sanitize appliance with 100 ppm chlorine and allow to air dry. See information on sanitizers and determining the correct sanitizer concentration previously explained in this Section.
- Walk-in refrigerators (including floors) should be cleaned as often as necessary to prevent ice build-up. When defrosting, sanitize appliance with 100 ppm chlorine and allow to air dry. Cooling unit fans should be cleaned frequently to maximize cooling efficiency and to keep dust from blowing over food.
- Floors should be swept after each day of use and mopped when necessary. Floors should be sanitized at least weekly.
- All spills should be cleaned immediately.
- Dry storage shelves should be dusted and washed as often as necessary to keep them free of crumbs, dust and food particles. At least every six months, storage areas should be thoroughly cleaned, sanitized and inspected for signs of pests, spoiled food, etc.
- Mop water should be changed whenever dirty and emptied between each use. Mops should be hung to dry.

- Garbage cans should be fitted with tight lids. Lids should be placed back on the can after each use. Cans should be emptied daily and cleaned and sanitized weekly.
- If used often, bathrooms may need to be cleaned daily or every other day.
- If preparing food, food processing equipment, such as meat slicers, grinders and can openers, should be disassembled (if necessary) and thoroughly cleaned and sanitized after each use.
- In a kitchen area, dish cloths should be replaced daily and should be used for only one purpose. Never use the same cloth to clean dishes and counters or chairs and floors.
- Scrubbers and brushes should be replaced often.
- Utensil and food drawers should be cleaned at least every two months.

Pest Control

Pests can cause extensive damage to food supplies and, once established, can be difficult to remove. An active pest control program is recommended for all food programs. This includes:

- Storage of food in covered containers, off floors and out of cardboard shipping boxes.
- Closing off passageways between the food program and outdoors. This may be accomplished by using caulk, putty, insulation and window screens. Regular cleaning and building maintenance to remove pest entry routes and attractive sources of food and water such as food containers, garbage and recyclables.
- A pest control log and preventative pest control measures, like fly strips, glue boards or traps beneath shelving units and at the perimeters of food preparation areas.
- Emergency pest control plans for infestations, such as an agreement with your local pest control specialist. Pesticides used in the food program must be approved by the USDA or EPA for use with commercial food establishments (check the bottle or can for this label). Poison should be applied only by a licensed pest control operator. If poison is applied, food should be removed from the room to be treated. Shelves, counters and equipment should be thoroughly cleaned before food is replaced.

Common Pests and Recommended Treatments:

Cockroaches may enter the food program through shipments of vegetables from warmer climates or through cardboard shipping containers. Although keeping the area clean and restricting the use of cardboard will help control cockroach populations, insecticide is usually needed to get rid of cockroaches.

Mites and weevils may enter the food program in grain products such as flour and cereal. If you discover an infected package, throw it away immediately and clean and sanitize the area. Storing grain products in plastic containers with lids (individual or trash can size with food grade liners) will help deter mites and weevils.

Rodents often enter the food program through holes and cracks in the foundation or walls of the building. Spring traps, baited with peanut butter or similar strongly scented food, work well to control mice. Preventing entry of rodents is critical. Open containers of food and food spills attract rodents so clean up spills and store food in closed containers. Poisons are dangerous and should be used or applied only by a licensed pest control operator.

Flies and ants can be persistent during warm weather and can leave imported bacteria and feces on food contact surfaces. Flies and ants enter the building through cracks and holes. The first step in controlling these insects is sealing the building with caulk, putty, insulation and window screens.

- Small numbers of flies may be controlled with a fly swatter if you immediately sanitize the area where you swat. Place any bug lights or fly strips away from food preparation and storage areas.
- Removal of ants may require pesticides for entry ways and outside hills.



Section 2 Self Test

1. To reduce heat and moisture, food storerooms should be away from:

- a) Uninsulated steam and hot water pipes.
- b) Heaters or water heaters.
- c) Refrigeration condensing units.
- d) All of the above.

2. A fresh wiping cloth should be used:

- a) Every day.
- b) Every other day.
- c) Whenever the old one appears dirty.

3. Light “shields” are used to:

- a) Reduce the glare from florescent lights.
- b) Prevent contamination if light bulbs burst.
- c) Prevent contamination by insects.

4. Dishwashing steps include:

- a) Washing, rinsing and drying.
- b) Washing, rinsing and sanitizing.
- c) Scraping, washing, rinsing, sanitizing and air drying.

5. Handwashing sinks should be located near:

- a) The entry door.
- b) Re-packaging operations.
- c) Food preparation areas.
- d) Both b and c.

6. Which of the following should be found in the kitchen?:

- a) Clients.
- b) Kids.
- c) Dogs.
- d) None of the above.

7. The optimal temperature for refrigerators is:

- a) 0 to 32°F.
- b) 34 to 40°F.
- c) 40 to 45°F.
- d) Anything above 32°F.