

2.1 Introduction to Food Safety

- What is a foodborne illness?
- Forms of contamination
- Biological contamination
- Chemical contamination
- Physical contamination
- Food defense
- Allergens
- U.S. regulation of food safety

2.2 Good Personal Hygiene

- How foodhandlers can contaminate food
- Personal cleanliness and work attire
- Handwashing
- Bare-hand contact with ready-to-eat food
- Work requirements related to illness

2.3 Preventing Hazards in the Flow of Food

- Cross-contamination
- Time-temperature abuse
- Purchasing
- Receiving
- Storage
- Preparation
- Cooking
- Holding, storing, and reheating
- Serving

2.4 Food Safety Management Systems

- The HACCP plan

2.5 Cleaning and Sanitizing

- How to clean effectively
- Sanitizing
- Developing a cleaning program
- Controlling pests

SECTION 2.5 CLEANING AND SANITIZING

In the previous section, you learned that a good food safety management system depends on food safety programs. A cleaning program is one of the most important of these programs.

Food is less likely to become contaminated in a clean and sanitary kitchen. However, if not done correctly, cleaning and sanitizing can be just as harmful to customers and employees as the illnesses it helps prevent.

Study Questions

After studying Section 2.5, you should be able to answer the following questions:

- What is the difference between cleaning and sanitizing?
- What are the proper procedures for cleaning and sanitizing surfaces?
- What factors affect the effectiveness of sanitizers?
- What are the elements of a master cleaning schedule?
- What organizations certify that equipment meets sanitation standards?
- What is the proper procedure for managing pests?

How to Clean Effectively

Food can be contaminated easily if equipment and kitchen surfaces aren't kept clean and sanitized. **Cleaning** removes food and other dirt from a surface. **Sanitizing** reduces pathogens on a surface to safe levels.

All surfaces must be cleaned and rinsed, including walls, storage shelves, and garbage containers. However, any equipment or surface that touches food, such as knives, stockpots, preparation tables, and cutting boards, must be cleaned and sanitized.

Essential Skills

Cleaning and Sanitizing a Surface

- ① Clean the surface. See Figure 2.38a.
- ② Rinse the surface.
- ③ Sanitize the surface. See Figure 2.38b.
- ④ Let the surface air-dry.

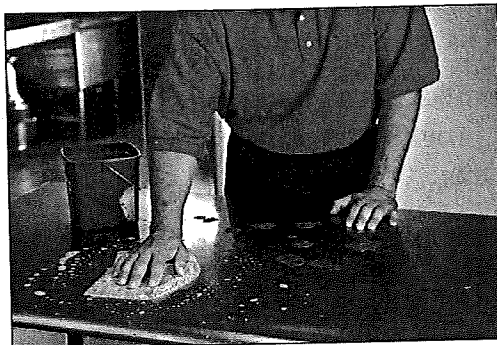


Figure 2.38a: Step 1—Clean the surface.

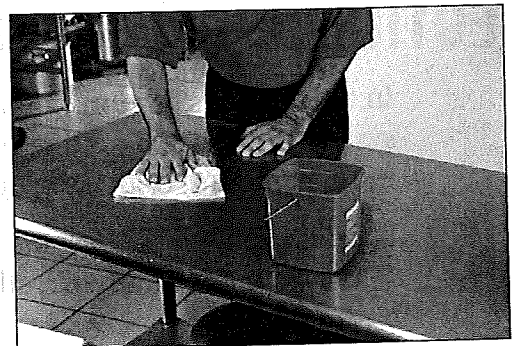


Figure 2.38b: Step 3—Sanitize the surface.

All food-contact surfaces need to be cleaned and sanitized at the following times:

- After they are used
- Before foodhandlers start working with a different type of food
- Any time foodhandlers are interrupted during a task and the items being used may have been contaminated
- After four hours, if items are in constant use

Whatever you are cleaning, never use cloths or towels meant for cleaning food spills. Store cloths or towels for general cleaning in a sanitizer solution between uses. Keep towels that come in contact with raw meat, seafood, or poultry separate from other cleaning towels.

Cleaning Products

Cleaning products are strong chemicals. They must be stored for use in or near the commercial kitchen, but safely away from food. A separate janitor's supply closet or room can serve this purpose. Cleaning products and equipment can be stored there in preassigned and labeled shelves.

Certain cleaners cannot be mixed. A good example is ammonia solution, which should never be mixed with chlorine bleach. This can produce chlorine gas, a toxic fume that can be fatal. Ammonia solutions have harmful fumes of their own and should be kept covered. Only use them in well-ventilated areas.

Chlorine bleach must also be kept covered. Wear protective gloves when pouring or using, because it can burn skin. Store all cleaning supplies in their original containers or in smaller labeled containers. Store Material Safety Data Sheets (MSDS) for every chemical where anyone can find them quickly.

Large foodservice operations can hire a HazMat (hazardous materials) service team to come and help establish a storage system for cleaning products. These service teams can professionally design and set up chemical-storage areas. Operations can also set storage areas up according to a professionally predesigned system. Such plans for systems are available from many chemical-supply companies. They show you how to find and use the chemicals you need while also addressing these issues:

- Keeping volatiles safe
- Protecting from burns
- Controlling for any fume-producers
- Isolating poisonous products

Cleaners

Cleaners are chemicals that remove food, dirt, rust, stains, minerals, and other deposits. They must be stable and safe to use. Always use cleaners as directed. Cleaners can be divided into the following four groups:

- **Detergents** are either general purpose or heavy duty. General-purpose detergents remove fresh dirt and can be used on almost anything. Heavy-duty detergents remove wax, dried-on dirt, and baked-on grease. Dishwasher detergents are an example of a heavy-duty detergent.
- **Degreasers** dissolve grease and work well where grease has burned on, such as on oven doors and range hoods.
- **Delimers** are acid cleaners used on mineral deposits and dirt that other cleaners can't remove. For example, they are designed to clean scaling (mineral deposits such as those left by hard water), rust stains, and tarnish. Delimers must be applied carefully.

- **Abrasive cleaners** have a scouring agent that helps scrub hard-to-remove dirt. Dishwashers often use abrasive cleaners to remove baked-on foods in pots and pans. They must be applied carefully to avoid damaging smooth surfaces.

Sanitizing

Food-contact surfaces must be sanitized after they have been cleaned and rinsed. Sanitizing can be done either by using chemicals or heat. Both methods have specific requirements that must be followed for the sanitizing to be effective.

Heat Sanitizing

One way to sanitize items, such as tableware, utensils, or equipment, is to soak them in hot water. For this method to work, the water must be at least 171°F and items must be soaked for at least 30 seconds. Be sure to check the water with a thermometer.

Chemical Sanitizing

Tableware, utensils, and equipment can be sanitized by soaking them in a sanitizing solution. Employees can also rinse, swab, or spray items with the solution. Different types of sanitizer have different requirements for how long an item must be in contact with the solution. Be sure to read the manufacturer's directions.

Three common types of chemical sanitizers are chlorine, iodine, and quaternary ammonium compounds (or quats). Each type has to be mixed with water to create a sanitizer solution. Make sure to follow the manufacturer's directions when creating the solution. The concentration must be correct, or the sanitizer won't work. To make sure the concentration is right, use a test kit. These are usually available from the sanitizer manufacturer or supplier. Figure 2.39 is an example of a sanitizer test kit.

Factors That Influence the Effectiveness of Sanitizers

Several factors influence the effectiveness of chemical sanitizers:

- **Contact time:** Objects being sanitized must be immersed in the solution for a specific period of time. This is called **contact time**. The contact time depends on the type of sanitizer being used.

- **Temperature:** The water in sanitizing solutions must be the correct temperature.
- **Concentration:** Mixing sanitizer with the proper amount of water is important. The concentration of this mix (the amount of sanitizer to water) is critical. Concentrations that are too high can be unsafe and leave an odor or bad taste on objects. Concentrations that are too low may not be effective in killing pathogens.



Figure 2.39: Sanitizer test kit.

Cleaning and Sanitizing in a Three-Compartment Sink

Dishwashing staff clean and sanitize tableware and utensils in a dishwashing machine. They often clean larger items, such as pots and pans, by hand in a three-compartment sink. They must be sure to clean and sanitize each sink and drain board before washing any items. Figure 2.40 shows the steps for cleaning and sanitizing items in a three-compartment sink.

Essential Skills

Washing Kitchen Equipment in a Three-Compartment Sink

Start with carefully cleaned and sanitized drain boards and sink compartments. Then fill each compartment with the appropriate liquid—detergent solution, rinse water, and sanitizing solution or hot water.

- ① Rinse, scrape, or soak items before washing them.
- ② Clean items in the first sink. Wash them in a detergent solution at least 110°F. Use a brush, cloth, or nylon scrub pad to loosen dirt. Change the detergent solution when the suds are gone or the water is dirty.
- ③ Rinse items in the second sink. Spray them with water or dip them in it. Make sure you remove all traces of food and detergent. If dipping the items, change the rinse water when it becomes dirty or full of suds.

- ④ Sanitize items in the third sink. Soak them in hot water or a sanitizer solution. If using heat, remember to check the temperature of the water. If using chemicals, remember to use a test kit.
- ⑤ Air-dry items. Place items upside down so they will drain.

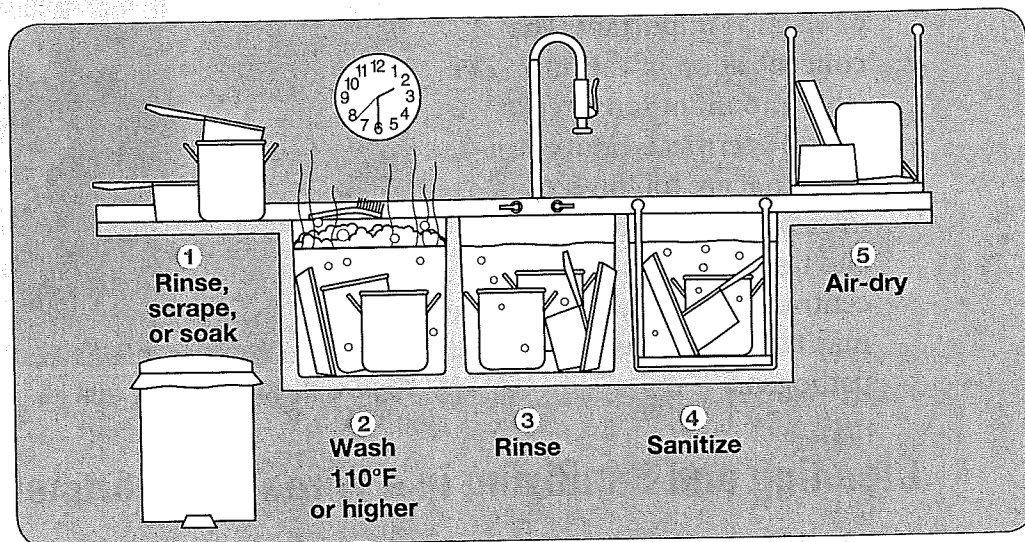


Figure 2.40: Steps 1–5—Washing kitchen equipment in a three-compartment sink.

Cleaning and Maintaining a Dishwasher

It is important to clean and maintain dishwashers frequently throughout the day:

- Clear spray nozzles and food traps of food and other objects.
- Fill tanks with clean water as needed.
- Make sure detergent and sanitizer dispensers are filled.
- Use a delimer to remove mineral deposits when needed.

Always use dishwashers according to the manufacturer's directions. Also, follow these guidelines:

- Scrape, rinse, or soak items before washing.
- Presoak items with dried-on food.
- Never overload the dish racks. See Figure 2.41.
- Use the right rack for the items you are washing.
- Load racks so the water spray will reach all surfaces.
- As each rack comes out of the machine, check for dirty items.
- Rewash dirty items.

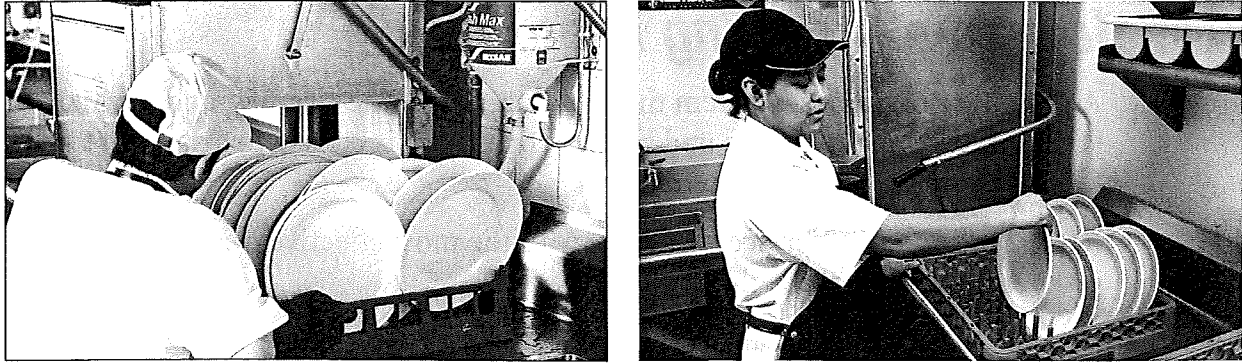


Figure 2.41: Overloaded rack (left) and properly loaded rack (right).

- Air-dry all items; never use a towel to dry items.
- Frequently check water temperature and pressure; change the water when necessary.

Equipment

Equipment must meet certain standards, depending on whether the equipment's surfaces come in direct contact with food.

Fortunately, there are organizations to help with the task of choosing equipment. NSF International develops and publishes standards for sanitary equipment design. Underwriters Laboratories (UL) provides listings of equipment that meet NSF and other public health-related standards. Look for the NSF mark or the UL Classified or UL EPH Listed marks on restaurant and foodservice equipment. Only use equipment designed for use in a restaurant or foodservice operation:

- NSF creates standards for restaurant and foodservice equipment. It also certifies equipment. The NSF mark means an item has been evaluated, tested, and certified by NSF as meeting its food-equipment standards.
- UL provides classification listings for equipment that meets ANSI/NSF standards.
- UL also certifies items that meet its own standards for environmental and public health (EPH). Equipment that meets UL EPH standards is also acceptable for restaurant and foodservice use. This equipment has the UL EPH Listed mark.

[fast fact]

Did You Know...?

Stainless steel sinks are most commonly used in commercial kitchens. Stainless steel offers a good trade-off between cost, usability, durability, and ease of cleaning. They will not be damaged by hot or cold objects and resist damage from impacts. One disadvantage of stainless steel is that, being made of thin metal, it tends to be noisier than most other sink materials. Some of the better sinks include a heavy coating of vibration-damping material to the underside of the sink.

Developing a Cleaning Program

A cleaning program is a system that organizes all of the cleaning and sanitizing tasks in the kitchen. A clean and sanitary operation is critical to a successful food safety management system.

Restaurant and foodservice managers with the most effective cleaning programs focus on three things:

1. Creating a master cleaning schedule
2. Training employees to follow it
3. Monitoring the program to make sure it works

To create a **master cleaning schedule**, you must walk through the facility and look at the way cleaning is done. Then figure out how things need to be cleaned and the ways in which to improve these processes. Next, make a master cleaning schedule. The schedule should have the following information:

- What should be cleaned
- Who should clean it
- When it should be cleaned
- How it should be cleaned

Figure 2.42 is a sample master cleaning schedule.

Once the schedule is created, employees must be trained to follow it. Then managers must make sure the schedule is working by checking that the cleaning is being done. Review and update the schedule as needed, for example, when the menu changes or when new equipment is purchased.

The importance of making sure the schedule is followed cannot be overstated. Effective cleaning helps to keep an operation free of smells, noise, pests, and messiness. It also helps prevent the transfer of pathogens from dirty surfaces to food or to clean surfaces. In addition, it helps customers to feel comfortable and safe in your operation.

Controlling Pests

How do restaurants and foodservice operations prevent pests, such as rodents and insects, from getting in? Good cleaning and sanitizing will help, but probably won't go far enough. So they need an **integrated pest management program (IPM)**. An IPM program is a system that will prevent, control, or eliminate pest infestations in an operation.

Item	What	When	Use	Who
Floors	Wipe up spills	As soon as possible	Cloth, mop and bucket, broom and dustpan	
	Damp mop	Once per shift, between rushes	Mop, bucket	
	Scrub	Daily, closing	Brushes, squeegee, bucket, detergent (brand)	
	Strip, reseal	January, June	See procedure	
Walls and ceilings	Wipe up splashes	As soon as possible	Clean cloth, detergent (brand)	
	Wash walls	February, August		
Work tables	Clean and sanitize tops	Between uses and at end of day	See cleaning procedure for each table	
	Empty, clean, and sanitize drawers, clean frame, shelf	Weekly, Sat. closing	See cleaning procedure for each table	
Hoods and filters	Empty grease traps	When necessary	Container for grease	
	Clean inside and out	Daily, closing	See cleaning procedure	
	Clean filters	Weekly, Wed. closing	Dishwashing machine	
Broiler	Empty drip pan; wipe down	When necessary	Container for grease; clean cloth	
	Clean grid tray, inside, outside, top	After each use	See cleaning procedure for each broiler	

Figure 2.42: A sample master cleaning schedule.

An IPM program has two parts. First, it uses prevention measures to keep pests from entering the operation. Second, it uses control measures to eliminate any pests that do manage to get inside. There are three basic rules for an IPM program:

1. Deny pests access to the operation.
2. Deny pests food, water, and a hiding or nesting place.
3. Work with a licensed pest control operator to get rid of pests that do enter the operation.

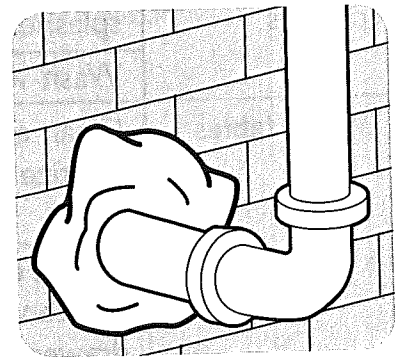
Pests can enter an operation in one of two ways. Sometimes they are brought inside with deliveries. They can also enter through openings in the building. Prevent pests from entering by paying attention to the following areas:

- Check all deliveries before they enter the operation. Refuse shipments that have pests or signs of pests, such as wings or egg cases.
- Screen all windows and vents, and check the screens regularly for holes and dirt.
- Keep all exterior openings closed tightly. For example, drive-thru windows should be closed when not in use.
- Cover floor drains with hinged grates.
- Seal all cracks in floors and walls with a permanent sealant.
- Use concrete to fill holes or sheet metal to cover openings around pipes, as shown in Figure 2.43.

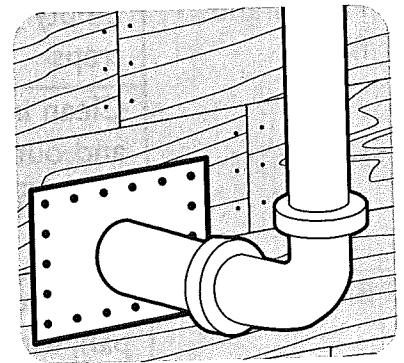
Pests are usually attracted to damp, dark, and dirty places. A clean operation offers them little access to food and shelter. The stray pest that might get in cannot survive or breed in a clean kitchen. In addition to adhering to the master cleaning schedule, follow these guidelines:

- Throw out garbage quickly and correctly. Don't let it pile up.
- Keep garbage containers clean and in good condition. Keep outdoor containers tightly covered.

Concrete



Sheet Metal



Fill openings or holes around pipes with concrete, or cover them with sheet metal.

Figure 2.43: Denying pests entry.