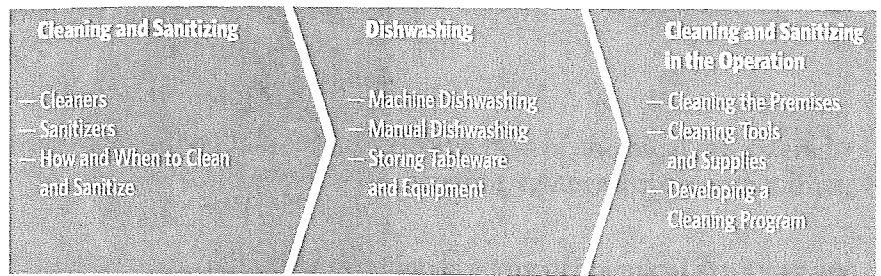




chapter 10

Cleaning and Sanitizing



Incorrectly Cleaned Yogurt Machine Makes Soldiers Sick

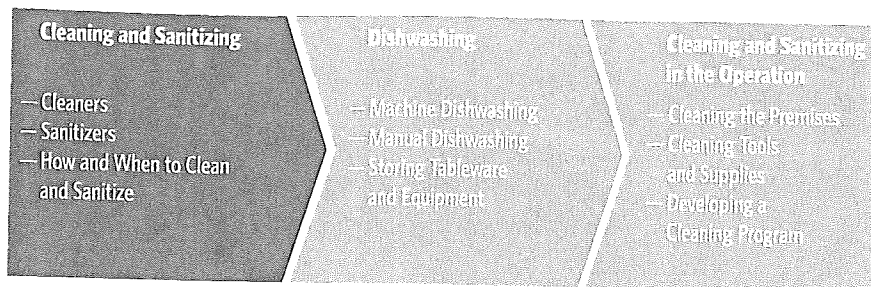
Several soldiers and their family members got sick at a military base in the northeastern United States. The victims had eaten frozen yogurt at a popular snack bar on the base. They suffered from vomiting, diarrhea, and chills. A child was admitted to the base hospital for severe dehydration.

An investigation showed that the yogurt machine was the culprit. It seems that food handlers at the snack bar did not break down the machine before cleaning it. They also failed to sanitize surfaces after cleaning them. This led to the outbreak. The local regulatory authority worked with the snack bar manager to put procedures in place to prevent any future incidents.

You Can Prevent This

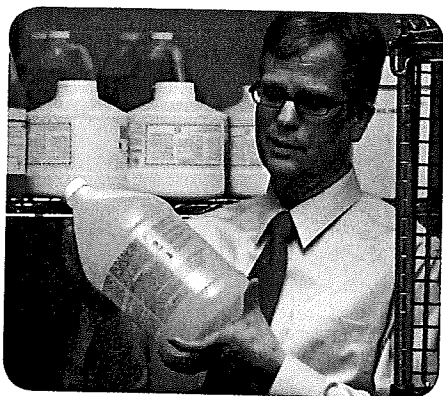
In the story you just read, people got sick because the operation did not clean and sanitize equipment correctly. Cleaning and sanitizing food-contact surfaces can help you avoid foodborne-illness outbreaks. To do it correctly, you need to know about the following topics.

- The different methods of sanitizing and how to make sure they are effective
- How and when to clean and sanitize surfaces
- How to wash items in a dishwasher or a three-compartment sink and then store them
- How to use and store cleaning tools and supplies
- How to develop a cleaning program



Cleaning and Sanitizing

Food can easily be contaminated if you don't keep your facility and equipment clean and sanitized. Cleaning removes food and other dirt from a surface. Sanitizing reduces pathogens on a surface to safe levels.



Cleaners

Cleaners must be stable, noncorrosive, and safe to use. Ask your supplier to help you pick cleaners that meet your needs. To use cleaners correctly, follow these guidelines.

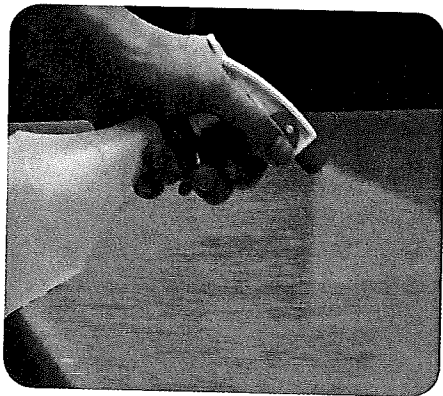
- Follow manufacturers' instructions carefully, as the manager in the photo at left is doing. If not used the correct way, cleaners may not work and can even be dangerous.
- Do **NOT** use one type of cleaner in place of another unless the intended use is the same.

Sanitizers

Food-contact surfaces must be sanitized after they have been cleaned and rinsed. This can be done by using heat or chemicals.

Heat Sanitizing

One way to sanitize items is to soak them in hot water. For this method to work, the water must be at least 171°F (77°C). The items must be soaked for at least 30 seconds. Another way to sanitize items is to run them through a high-temperature dishwasher.



Chemical Sanitizing

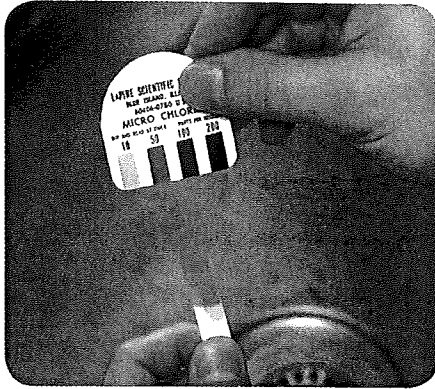
Tableware, utensils, and equipment can be sanitized by soaking them in a chemical sanitizing solution. Or you can rinse, swab, or spray them with sanitizing solution, as shown in the photo at left.

Three common types of chemical sanitizers are chlorine, iodine, and quaternary ammonium compounds, or quats. Chemical sanitizers are regulated by state and federal environmental protection agencies (EPAs). For requirements, check with your local regulatory authority.

In some cases, you can use detergent-sanitizer blends to sanitize. Operations that have two-compartment sinks often use these. If you use a detergent-sanitizer blend, use it once to clean. Then use it a second time to sanitize.

Sanitizer Effectiveness

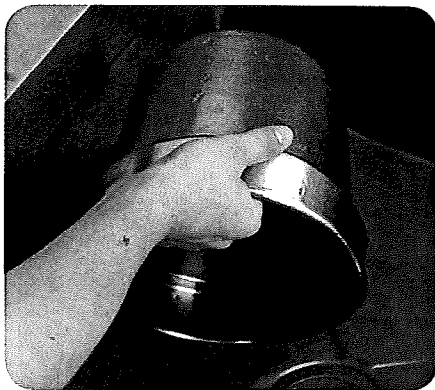
Several factors influence the effectiveness of chemical sanitizers. The most critical include concentration, temperature, contact time, water hardness, and pH.



Concentration Sanitizer solution is a mix of chemical sanitizer and water. The concentration of this mix—the amount of sanitizer to water—is critical. Too little sanitizer may make the solution weak and useless. Too much sanitizer may make the solution too strong and unsafe. It can also leave a bad taste on items or corrode metal.

Concentration is measured in parts per million (ppm). To check the concentration of a sanitizer solution, use a test kit, as shown in the photo at left. Make sure it is made for the sanitizer being used. These kits are usually available from the chemical manufacturer or supplier.

Hard water, food bits, and leftover detergent can reduce the solution's effectiveness. Change the solution when it looks dirty or its concentration is too low. Check the concentration often.



Temperature The water in sanitizing solution must be the correct temperature. Follow manufacturers' recommendations.

Contact time For a sanitizer solution to kill pathogens, it must make contact with the object being sanitized for a specific amount of time. The bain in the photo at left is being sanitized in an iodine sanitizing solution. It must be in contact with the solution for at least 30 seconds.

Water hardness Water hardness can affect how well a sanitizer works. Water hardness is the amount of minerals in your water. Find out what your water hardness is from your municipality. Then work with your supplier to identify the correct amount of sanitizer to use for your water.

pH Water pH can also affect a sanitizer. Find out what the pH of your water is from your municipality. Then work with your supplier to find out the correct amount of sanitizer to use for your water.

General Guidelines for the Effective Use of Chlorine, Iodine, and Quats

	Chlorine		Iodine	Quats
Water temperature	≥100°F (38°C)	≥75°F (24°C)	68°F (20°C)	75°F (24°C)
Water pH	≤10	≤8	≤5 or as per manufacturer's recommendation	As per manufacturer's recommendation
Water hardness	As per manufacturer's recommendation		As per manufacturer's recommendation	≤500 ppm or as per manufacturer's recommendation
Sanitizer concentration	50-99 ppm	50-99 ppm	12.5-25 ppm	As per manufacturer's recommendation
Sanitizer contact time	≥7 sec	≥7 sec	≥30 sec	≥30 sec

How and When to Clean and Sanitize

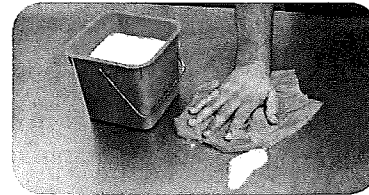
All surfaces must be cleaned and rinsed. This includes walls, storage shelves, and garbage containers. However, any surface that touches food, such as knives, stockpots, cutting boards, or prep tables, must be cleaned and sanitized.

How to clean and sanitize To clean and sanitize a surface, follow these steps.



- 1 Scrape or remove food bits from the surface.

 - Use the correct cleaning tool, such as a nylon brush or pad, or a cloth towel.



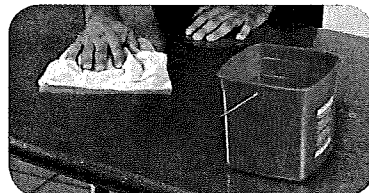
- 2 Wash the surface.

 - Prepare the cleaning solution with an approved cleaner.
 - Wash the surface with the correct cleaning tool, such as a cloth towel.



- 3 Rinse the surface.

 - Use clean water.
 - Rinse the surface with the correct cleaning tool, such as a cloth towel.



- 4 Sanitize the surface.

 - Use the correct sanitizing solution.
 - Prepare the concentration per manufacturer requirements.
 - Use the correct tool, such as a cloth towel, to sanitize the surface.
 - Make sure the entire surface has come in contact with the sanitizing solution.



- 5 Allow the surface to air-dry.

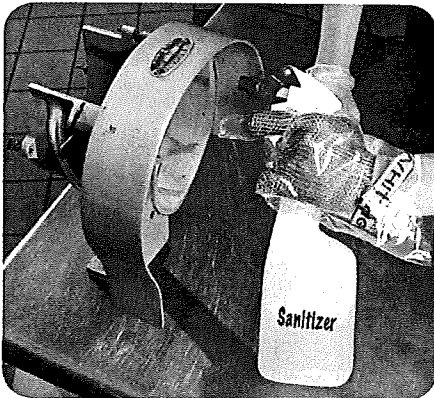
When to clean and sanitize All food-contact surfaces need to be cleaned and sanitized at these times.

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

Cleaning and Sanitizing Stationary Equipment

Equipment manufacturers will usually provide instructions for cleaning and sanitizing stationary equipment, such as a slicer. In general, follow these steps.

- Unplug the equipment.
- Take the removable parts off the equipment. Wash, rinse, and sanitize them by hand. You can also run the parts through a dishwasher if allowed.
- Scrape or remove food from the equipment surfaces.
- Wash the equipment surfaces. Use a cleaning solution prepared with an approved cleaner. Wash the equipment with the correct cleaning tool, such as a nylon brush or pad, or a cloth towel.
- Rinse the equipment surfaces with clean water. Use a cloth towel or other correct tool.
- Sanitize the equipment surfaces as the food handler in the photo at left is doing. Make sure the sanitizer comes in contact with each surface. The concentration of the sanitizer must meet requirements.
- Allow all surfaces to air-dry. Put the unit back together.



Clean-in-Place Equipment

Some pieces of equipment, such as soft-serve yogurt machines, are designed to have cleaning and sanitizing solutions pumped through them. Since many of them hold and dispense TCS food, they must be cleaned and sanitized every day unless otherwise indicated by the manufacturer. You should also check your local regulatory requirements.

Apply Your Knowledge**Was It Sanitized?**

Circle the correct answer for each question. For all situations, assume water hardness and pH are at the correct level.

- ① Lee mixed a quats sanitizer with 75°F (24°C) water. A test kit showed the concentration was correct according to the manufacturer's recommendations. He soaked some utensils in the solution for 30 seconds. Were the utensils sanitized correctly? Yes No
- ② Josh mixed a chlorine sanitizer with 75°F (24°C) water. A test kit showed the concentration was 25 ppm. He soaked some tableware in the solution for 7 seconds. Was the tableware sanitized correctly? Yes No
- ③ Cecelia mixed an iodine sanitizer with 68°F (20°C) water. A test kit showed the concentration was 8 ppm. She put a pan in the solution for 30 seconds. Was the pan sanitized correctly? Yes No
- ④ Jarmin mixed a chlorine sanitizer with 100°F (38°C) water. A test kit showed the concentration was 50 ppm. She put a bowl in the solution for 7 seconds. Was the bowl sanitized correctly? Yes No

Take the Correct Steps

Put the steps for cleaning and sanitizing in order by writing the number of the step in the space provided.

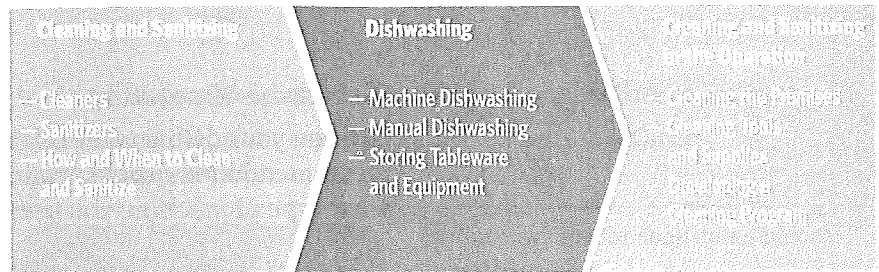
- A _____ Sanitize the surface.
- B _____ Clean the surface.
- C _____ Allow the surface to air-dry.
- D _____ Rinse the surface.
- E _____ Remove food from the surface.

To Sanitize or Not to Sanitize

Write an **X** next to each situation that requires the food handler to clean and sanitize the item being used.

- ① _____ Jorge has used the same knife to shuck oysters for 2 hours.
- ② _____ Bill finishes deboning chicken and wants to use the same cutting board to fillet fish.
- ③ _____ Mary returns to the slicer to continue slicing ham after being called away to help with the lunch rush.
- ④ _____ Maria has been slicing cheese on the same slicer from 8:00 a.m. to 12:00 p.m.

For answers, please turn to page 10.21.



Dishwashing

Tableware and utensils are often cleaned and sanitized in a dishwashing machine. Larger items such as pots and pans are often cleaned by hand in a three-compartment sink. Whichever method you use, you must follow specific practices so items are cleaned and sanitized. Then you must make sure you store the items so they do not become contaminated.

Machine Dishwashing

Dishwashing machines sanitize by using either hot water or a chemical sanitizing solution.

High-Temperature Machines

High-temperature machines use hot water to clean and sanitize. If the water is not hot enough, items will not be sanitized. Extremely hot water can also bake food onto the items.

The temperature of the final sanitizing rinse must be at least 180°F (82°C), as shown in the photo at left. For stationary rack, single-temperature machines, it must be at least 165°F (74°C). The dishwasher must have a built-in thermometer that checks water temperature at the manifold, as shown in the photo at left. This is where the water sprays into the tank.



Chemical-Sanitizing Machines

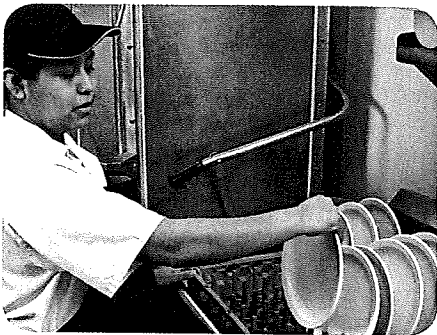
Chemical-sanitizing machines can clean and sanitize items at much lower temperatures. Follow the dishwasher manufacturer's guidelines.

Dishwasher Operation

Operate your dishwasher according to the manufacturer's recommendations, and keep it in good repair. However, no matter what type of machine you use, you should follow these guidelines.

Keeping the machine clean Clean the machine as often as needed, checking it at least once a day. Clear spray nozzles of food and foreign objects. Remove mineral deposits when needed. Fill tanks with clean water, and make sure detergent and sanitizer dispensers are filled.

Preparing items for cleaning Scrape, rinse, or soak items before washing. Presoak items with dried-on food.



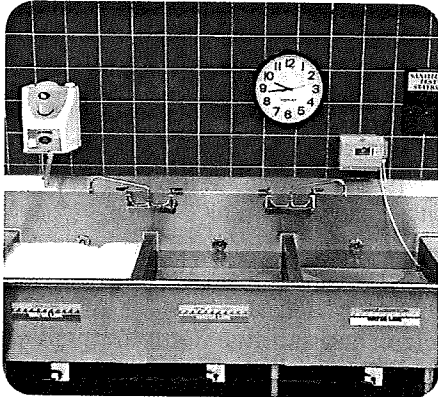
Loading dish racks Use the correct dish racks. Load them so the water spray will reach all surfaces, as shown in the photo at left. **NEVER** overload dish racks.

Drying items Air-dry all items. **NEVER** use a towel to dry items. You could recontaminate them.

Monitoring Check water temperature, pressure, and sanitizing levels. Take appropriate corrective action if necessary. Use heat tape or test strips to monitor the temperature of the sanitizing rinse. You can also use a maximum registering thermometer to do it.

Manual Dishwashing

Operations often use a three-compartment sink to clean and sanitize large items. The sink must be set up correctly before use, as shown in the photo at left.



- Clean and sanitize each sink and drain board.
- Fill the first sink with detergent and water. The water temperature must be at least 110°F (43°C). Follow manufacturer's recommendations.
- Fill the second sink with clean water. This is not necessary if items will be spray-rinsed instead of being dipped.
- Fill the third sink with water and sanitizer to the correct concentration. Hot water can be used as an alternative. Follow the guidelines on pages 10.2 through 10.3 and manufacturer's recommendations.
- Provide a clock with a second hand. This will let food handlers time how long items have been in the sanitizer.

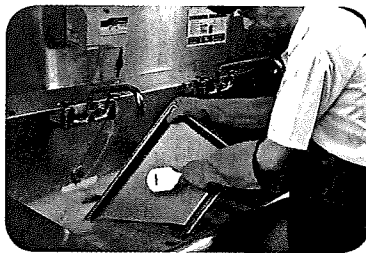
How to Clean and Sanitize in a Three-Compartment Sink

Follow these steps to clean and sanitize items in a three-compartment sink.



- 1 Rinse, scrape, or soak items before washing them.

If items are being soaked in the first sink, change the solution when food bits start to build up or the suds are gone.



- 2 Wash items in the first sink.

Use a brush, cloth towel, or nylon scrub pad to loosen dirt. Change the water and detergent when the suds are gone or the water is dirty.



- 3 Rinse items in the second sink.

Spray the items with water or dip them in it. Make sure to remove all traces of food and detergent from the items being rinsed. If dipping the items, change the rinse water when it becomes dirty or full of suds.



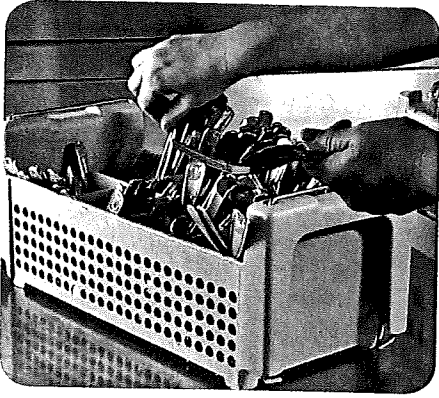
- 4 Sanitize items in the third sink.

Change the sanitizing solution when the temperature of the water or the sanitizer concentration falls below requirements. **NEVER** rinse items after sanitizing them. This could contaminate their surfaces. The only exception to this rule is when you are washing items in a dishwasher that can safely rinse items after they have been sanitized.



- 5 Air-dry items on a clean and sanitized surface.

Place items upside down so they will drain.



Storing Tableware and Equipment

Once utensils, tableware, and equipment have been cleaned and sanitized, they must be stored in a way that will protect them from contamination. Follow these guidelines.

Storage Store tableware and utensils at least six inches (15 centimeters) off the floor. Protect them from dirt and moisture.

Storage surfaces Clean and sanitize drawers and shelves before storing clean items.

Glasses and flatware Store glasses and cups upside down on a clean and sanitized shelf or rack. Store flatware and utensils with handles up, as shown in the photo at left. Staff can then pick them up without touching food-contact surfaces, which will help prevent the transfer of pathogens such as Norovirus.

Trays and carts Clean and sanitize trays and carts used to carry clean tableware and utensils. Check them daily, and clean as often as needed.

Stationary equipment Keep the food-contact surfaces of stationary equipment covered until ready for use.

Apply Your Knowledge

The New Dishwasher

On a separate sheet of paper, list the missing or wrong steps in the story below.

Evan started work just as the breakfast rush had begun. A load of dirty dishes had just been put into the new dishwasher. There already were a lot of pots and pans to wash in the three-compartment sink, so Evan quickly got started. He scraped the dishes into a garbage container and stacked them on the drain board next to the first sink compartment. Then he filled the first compartment with hot water and added dish detergent. He put several pans in the soapy water to soak.

Next, Evan filled the remaining two compartments with warm water. He added iodine sanitizer to the third compartment. He used a thermometer to check the water temperature and then a test kit to check the sanitizer concentration. Both were good.

Using a nylon scrub pad, Evan worked on the pans until they were clean. As he finished each one, he dipped it in the sanitizing solution. Since customers had complained of an iodine flavor on tableware, he wanted to make sure there was no sanitizer left on the pans. As he pulled each pan out of the sanitizer, he placed it into the rinse water to soak for a few seconds. Then he put it on the clean drain board to air-dry.

What did Evan do wrong?

For answers, please turn to page 10.21.