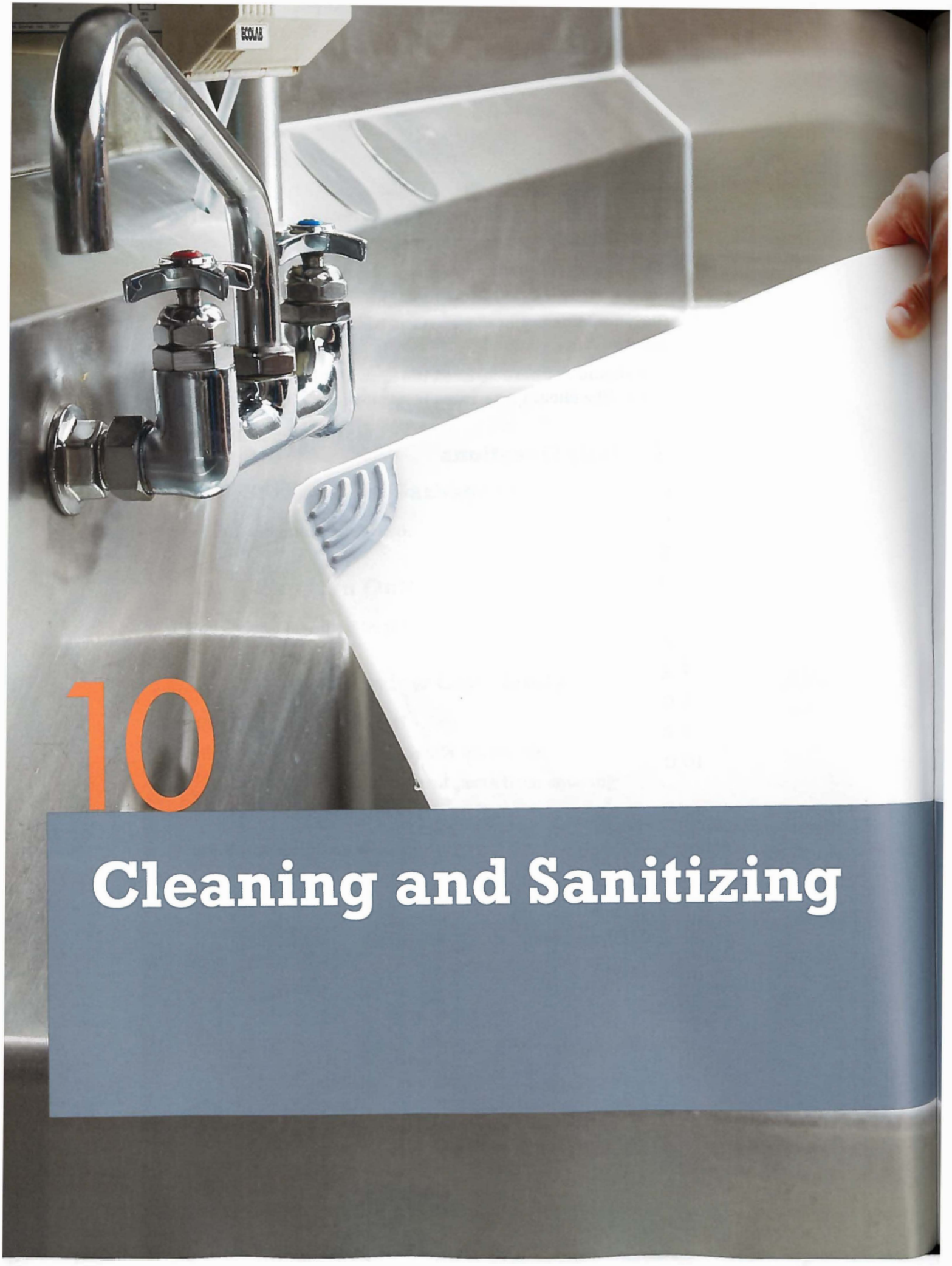


10

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. Cleaning of nonfood-contact surfaces also reduces the risk of foodborne-illness outbreaks. Cleaners, sanitizers, and cleaning tools should also be stored correctly to avoid contaminating food and food-contact surfaces.

Study Questions

- What are the different ways of sanitizing and the requirements for each?
- How and when should surfaces be cleaned and sanitized?
- How should items be washed in a dishwasher or a three-compartment sink and then stored?
- How should cleaning tools and supplies be used and stored?
- How do you develop an effective cleaning program?

Cleaning and Sanitizing

Food can easily be contaminated if you do not 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. There are a variety of cleaners available, each with a different purpose. These include:

- Detergents
- Degreasers
- Delimers
- Abrasive cleaners

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.
- Only use cleaners for their intended purpose. **NEVER** 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 with heat 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.

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 right. Make sure it is made for the sanitizer being used. These kits are usually available from the chemical manufacturer or supplier. Make sure they are available at all times and easily accessible to employees.

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. This is called contact time. For example, the bain in the photo at right is being sanitized in an iodine sanitizing solution. The bain 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 determined by 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.

Table 10.1 summarizes some guidelines for using different types of sanitizers.

Table 10.1: **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 seconds	≥7 seconds	≥30 seconds	≥30 seconds

How and When to Clean and Sanitize

Surfaces that do not touch food only need to be cleaned and rinsed to prevent the accumulation of dirt. However, any surface that touches food must be cleaned, rinsed, and sanitized.

Cleaning and Sanitizing Surfaces

To clean and sanitize a surface, follow the steps detailed here. If surfaces have not been cleaned and sanitized properly, take corrective action immediately.

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 working with a different type of food, for example between prepping raw chicken and cutting lettuce
- After handling different raw TCS fruits and vegetables, for example between cutting melons and leafy greens
- Any time there is an interruption 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.

Something to Think About

Deli slicers pose a risk of cross-contamination if not cleaned and sanitized properly. They can be a source of listeriosis, a pathogen that is often linked to deli meats and cheeses and that can cause a foodborne illness. This is why it is important to clean and sanitize slicers every four hours.

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. Because many of them hold and dispense TCS food, they must be cleaned and sanitized every day unless otherwise indicated by the manufacturer.

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. **Jack mixed a quat 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 plates 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 hotel pan in the solution for 30 seconds. Was the hotel 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 mixing bowl in the solution for 7 seconds. Was the mixing bowl sanitized correctly? Yes No**

5. **Marc filled a sink with 165°F (74°C) water. He put the slicer parts in the hot water to soak for 30 seconds. Were the slicer parts sanitized correctly? Yes No**

For answers, please turn to page 10.24.

Apply Your Knowledge

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. _____ **Wash 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 has finished deboning chicken and wants to use the same cutting board to fillet fish.**

3. _____ **Kristen has returned to the slicer to continue slicing cheese after being called away to help with the lunch rush.**

4. _____ **Amanda has been slicing turkey on the same slicer from 8:00 a.m. to 12:00 p.m.**

For answers, please turn to page 10.24.

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 right. 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. This is where the water sprays into the tank.

Chemical-Sanitizing Machines

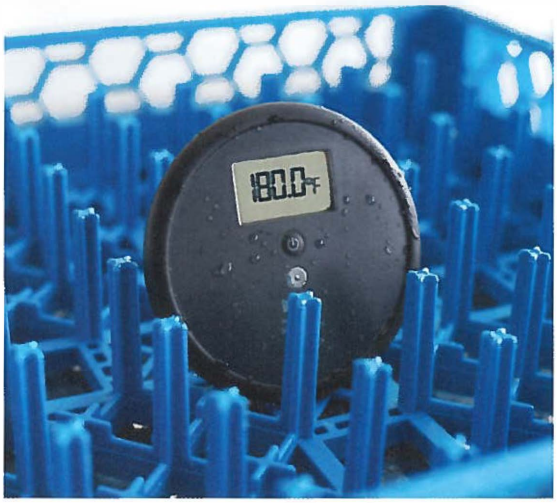
Chemical-sanitizing machines can clean and sanitize items at much lower temperatures. Follow the dishwasher manufacturer's guidelines.

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 items before washing them. If necessary, items can be rinsed or presoaked. This may be necessary when handling 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 (top) left. **NEVER** overload dish racks.

Drying items Air-dry all items. **NEVER** use a towel to dry items. Doing this could contaminate the items. Make sure they are completely dry before stacking or storing them.

Monitoring Check water temperature, pressure, and sanitizer levels. Take appropriate corrective action if necessary.

Operations using high-temperature dishwashing machines must provide staff with an easy and quick way to measure the surface temperatures of items being sanitized. The method used must provide an irreversible record of the highest temperature reached during the sanitizing rinse. This ensures that the dishwasher can reach correct sanitizing temperatures during operation. Maximum registering thermometers, as shown in the picture at (middle) left, or heat-sensitive tape are good tools for checking temperatures.

Manual Dishwashing

Operations often use a three-compartment sink to clean and sanitize large items.

Preparing a Three-Compartment Sink

The sink must be set up correctly before use, as shown in the photo at (bottom) 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 the 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 10.4 and the manufacturer's recommendations.
- Provide a clock with a second hand. This will let food handlers time how long items have been in the sanitizer.

Cleaning and Sanitizing in a Three-Compartment Sink

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

1 Scrape items before washing them. If necessary, items can be rinsed or soaked.

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.

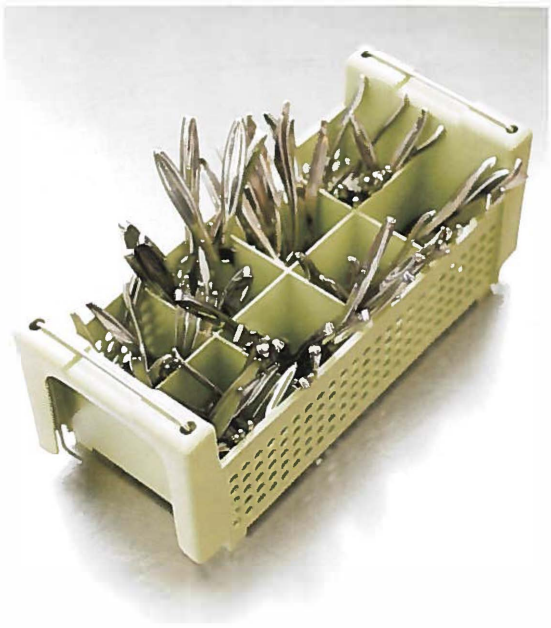
Change the sanitizing solution when the temperature of the water or the sanitizer concentration falls below requirements.

NEVER rinse items after sanitizing them. This could contaminate their surfaces.

5 Air-dry items on a clean and sanitized surface. Place the items upside down so they will drain. **NEVER** use a towel to dry items, as it could contaminate them.

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 List the missing or wrong steps in the story below.

Chris 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 Chris 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, Chris 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, Chris worked on the pans until they were clean. As he finished each one, he dipped it in the sanitizing solution. Because customers had complained of an iodine flavor on tableware, Chris 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 Chris do wrong?

For answers, please turn to page 10.24.

Apply Your Knowledge

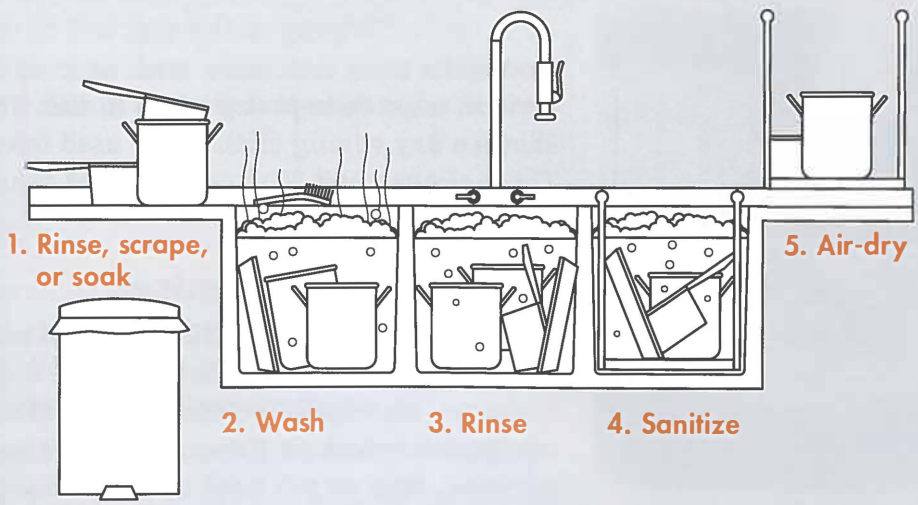
Sarah's Dilemma List the missing or wrong steps in the story below.

Sarah noticed that the dirty dishes had started to pile up. She quickly unloaded the dishwashing machine and got a dish cart for the clean dishes. Sarah saw a few crumbs on the cart. To clean it, she dipped a cloth towel in the dishwater in her three-compartment sink and wiped off the crumbs.

In the meantime, the carts of dirty dishes had grown. Sarah quickly loaded a dish rack with as many dishes as she could fit into it. She glanced into the dishwasher before pushing in the rack. She noticed a heavy buildup of mineral deposits on the spray arm and inside the compartment. She closed the door and started the dishwasher.

What did Sarah do wrong?

What's Wrong with This Picture? There are several things wrong with this three-compartment sink. Identify as many as you can in the space provided.



For answers, please turn to page 10.24.

Cleaning and Sanitizing in the Operation

Keeping your operation clean means using the correct tools, supplies, and storage to prevent contamination. Many of the chemicals you will use are hazardous, so you also have to know how to handle them to prevent injury.

For all of your cleaning efforts to come together, you need a master cleaning schedule. Making this schedule work also means training and monitoring your staff to be sure they can follow it.

Wiping Cloths

Wiping cloths are often used in operations to wipe up food spills and to wipe down equipment surfaces. There are two types of wiping cloths used in operations—wet cloths and dry cloths. Each has its own requirements. **NEVER** use cloths that are meant for wiping food spills for any other purpose.

Wet cloths Store wet wiping cloths used for wiping counters and other equipment surfaces in a sanitizer solution between uses, as shown in the photo at left. Change the solution when it no longer meets requirements for the sanitizer being used. Always keep cloths that come in contact with raw meat, fish, and poultry separate from other cleaning cloths.

Dry cloths Wiping cloths that will be used to wipe food spills from tableware, such as from a plate during service, must be kept dry while in use. The photo at left shows a dry wiping cloth being used for this purpose. These cloths must **NOT** contain food debris or be visibly dirty during use.

Cleaning the Premises

Many surfaces in the operation do not normally come in contact with food. These are called **nonfood-contact surfaces**. Examples include floors, walls, ceilings, and equipment exteriors. Because they are not food-contact surfaces, they do not need to be sanitized. However, they do need to be cleaned regularly. This prevents dust, dirt, and food residue from building up. Not only will this prevent the growth of pathogens, but it will also prevent pests.

Cleaning up after People Who Get Sick

If vomit or diarrhea contacts surfaces in the operation, it must be cleaned up correctly. These substances can carry Norovirus, which is very contagious. Cleaning these surfaces correctly can prevent food from becoming contaminated. It will also keep others from becoming sick.

To be effective, operations must have procedures for cleaning up vomit and diarrhea. These procedures must address specific actions that employees must take to minimize contamination and exposure to food, surfaces, and people. It is critical that employees be trained on these procedures.

Using and Storing Cleaning Tools and Supplies

Your staff needs many tools and supplies to keep the operation clean. However, these items can contaminate food and surfaces if they are not used and stored correctly.

Storing Cleaning Tools and Supplies

Cleaning tools must be stored so that they do not contaminate food and equipment. It is a best practice to store these items in a designated area away from food. Cleaning tools should also be stored in a way that makes it easy to clean the area they are stored in. The storage area should have the following:

- Good lighting so staff can see chemicals easily
- Hooks for hanging mops, brooms, and other cleaning tools
- Utility sink for filling buckets and washing cleaning tools
- Floor drain for dumping dirty water, as shown in the photo at right

To prevent contamination, **NEVER** clean mops, brushes, or other tools in sinks used for handwashing, food prep, or dishwashing. Additionally, **NEVER** dump mop water or other liquid waste into toilets or urinals.

When storing cleaning tools, consider the following:

- Place mops in a position to air-dry without soiling walls, equipment, or supplies.
- Clean and rinse buckets. Let them air-dry, and then store them with other tools.

If chemicals or cleaning tools have not been used or stored correctly, take corrective action immediately.

Using Foodservice Chemicals

Many of the chemicals used in an operation can be hazardous, especially if they are used or stored the wrong way. One of the biggest dangers is cross-contamination. To reduce your risk, follow these guidelines.

Use Only chemicals approved for use in a foodservice operation should be used. **NEVER** keep chemicals that are not required to operate or maintain the establishment. To prevent contamination, always cover or remove items that could become contaminated before using chemicals. After using chemicals, make sure to clean and sanitize equipment and utensils. Always follow the law and manufacturers' directions when using chemicals.

Storage Chemicals must be stored in their original containers. Some operations also designate specific areas for storing chemicals. Whether or not this is done, chemicals must be kept separate from food, equipment, utensils, and linens. This separation can be done either of these ways:

- By spacing chemicals apart from other items
- By partitioning off chemicals from other items stored in the same area

Regardless of the method used, chemicals must always be stored below food, equipment, utensils, and linens.

Labels Chemicals stored in their original container should have a manufacturer's label. That label must include the directions for use and be clear enough to read. If chemicals are transferred to a new working container, the label on that container must list the common name of the chemical. The photo at left shows a working container labeled with the common name of the chemical.

Developing a Cleaning Program

To develop an effective cleaning program for your operation, you must focus on three things:

- Creating a master cleaning schedule
- Training your staff to follow it
- Monitoring the program to make sure it works

Creating a Master Cleaning Schedule

Create a master cleaning schedule with the following information.

What should be cleaned List all cleaning jobs in one area, or list jobs in the order they should be performed. Include both food and nonfood surfaces as items that need to be cleaned.

Who should clean it Assign each task to a specific individual.

When it should be cleaned Staff should clean and sanitize as needed. Schedule major cleaning when food will not be contaminated or service will not be affected. Schedule work shifts to allow enough time.

How it should be cleaned Have clear, written procedures for cleaning. List cleaning tools and chemicals by name. Post cleaning instructions near the item. Always follow manufacturers' instructions when cleaning equipment.

Training Your Staff to Follow the Program

Schedule time for training. Work with small groups or conduct training by area, as shown in the photo at right.

Monitoring the Cleaning Program

Make sure the cleaning program is working.

- Supervise daily cleaning routines.
- Check all cleaning tasks against the master schedule every day.
- Change the master schedule as needed for any changes in menu, procedures, or equipment.
- Ask staff during meetings for input on the program.

Apply Your Knowledge

Was It Done Correctly? Write an X next to the situation if the food handler used or stored the cleaning tool or chemical the wrong way.

1. _____ **Gail was in a rush to put a delivery away. She placed the cleaning chemicals on the top shelf of the shelving rack above the canned goods.**

2. _____ **Raul filled three spray bottles with sanitizer. Since the chemical looked red, he did not label the spray bottles.**

3. _____ **Jasmina was about to take a plate out to a table and she noticed some drips on the edge of the plate. She grabbed a clean, dry cloth and wiped off the plate.**

4. _____ **Sasha emptied a bucket of dirty mop water into the floor drain. He rinsed the mop and hung it to dry. Then he cleaned and rinsed the bucket.**

5. _____ **Laura washed, rinsed, and sanitized a table by spraying it with sanitizer and allowing it to air dry. She then placed the bottle of sanitizer on the prep table.**

6. _____ **Andy used a chemical cleaner on the dishwashing machine. The sprayer on the bottle stopped working when it was only half empty, so he threw it in the garbage.**

What's Wrong with This Picture? There are many things wrong with this storage area. Identify as many as you can in the space provided.

For answers, please turn to page 10.25.

Chapter Summary

- Cleaning removes food and other dirt from a surface. Sanitizing reduces the number of pathogens on a surface to safe levels. You must clean and rinse a surface before it can be sanitized. Then the surface must be allowed to air-dry. Surfaces can be sanitized with hot water or a chemical sanitizing solution. Each sanitizing method and sanitizer chemical has specific requirements for use.
- All surfaces should be cleaned and rinsed. Food-contact surfaces must be cleaned and sanitized after every use. You should also clean and sanitize each time you begin working with a different type of food or after handling different, raw TCS fruits and vegetables. Also clean and sanitize surfaces when a task is interrupted. If items are in constant use, they must be cleaned and sanitized every four hours.
- To clean and sanitize a surface, first remove any food from the surface. Then wash and rinse the surface. Finally, sanitize the surface, and let it air-dry.
- Tableware and utensils can be washed in dishwashers or by hand in a three-compartment sink. Always follow manufacturers' instructions when using dishwashers. Make sure your machine is clean and in good working condition. Check the temperature and pressure of wash and rinse cycles daily.
- Before washing items in a three-compartment sink, clean and sanitize the sinks and drain boards. Scrape, rinse, or presoak items before washing them. Then wash them in a detergent solution, and rinse them in clean water. Next, sanitize them for a specific amount of time in either hot water or a chemical sanitizing solution. Finally, they should be air-dried. Once cleaned and sanitized, tableware and equipment should be protected from contamination.
- Wet and dry wiping cloths may be used to wipe up food spills and wipe down equipment surfaces. Wet cloths may be used for wiping equipment surfaces. They should be stored in a sanitizer solution between uses. Clean, dry wiping cloths may be used to wipe food spills from tableware.
- Operations must have procedures for cleaning up vomit and diarrhea. Make sure employees are trained on these procedures and know what to do.
- Chemicals can contaminate food and equipment if the chemicals are not used or stored correctly. Use only chemicals approved for use in foodservice operations. Before using chemicals, cover or remove items to prevent them from being contaminated. Clean and sanitize equipment and utensils after using chemicals.
- Make sure chemicals are clearly labeled. Store cleaning supplies and tools away from food and equipment.
- Create a master cleaning schedule listing all cleaning tasks. Train staff to follow it. Monitor the cleaning program to keep it effective and supervise cleaning procedures. Make adjustments as needed.

Chapter Review Case Study

Keeping an operation clean and sanitized involves using the correct tools and products for a cleaning job; cleaning and sanitizing items the correct way at the right time; storing items so they remain safe to use; handling chemicals the correct way; and developing and following a cleaning program.

Now, take what you have learned in this chapter and apply it to the following case study.

Andy was just hired as the new general manager at the Twin Trees Family Restaurant. One of his first projects was to create a new cleaning program. He started by taking a walk through the operation. His first stop was the storage area for cleaning tools and supplies. It had a utility sink and a floor drain, but the hot water in the sink was not working. He also noticed two sets of mops and brooms stored on the floor. The storage area was small, but it was well organized and well lit. All the containers were clearly labeled.

1 **Should Andy suggest any changes to the storage room, tools, or chemicals?**

Yes No **If yes, what changes should he suggest?**

Chapter Review Case Study

Next, Andy watched Clara, a new prep cook, to see how she cleaned and sanitized her areas. Clara cut some melons on a cutting board. Then she wiped it down with a cloth towel. Clara put the cloth towel in a bucket of sanitizing solution to soak while she chopped some fresh spinach. Using the same cloth towel, she wiped down the board after she finished the spinach. Then, she butterflied some pork chops on the same board. Afterward, Clara wiped the board a third time with the same cloth towel.

2 Did Clara do anything wrong?

Yes No If yes, what changes should Andy suggest?

Andy also watched many other staff members perform cleaning and sanitizing tasks that week. With the help of some senior staff, Andy created a master cleaning schedule.

3 What steps should Andy take to make sure everyone follows the master cleaning schedule?

For answers, please turn to page 10.25.

Study Questions

Circle the best answer to each question.

1 **What is required for measuring the sanitizing rinse temperature in a high-temperature dishwashing machine?**

A Infrared thermometer
B Time-temperature indicator
C Maximum registering thermometer
D Thermocouple with immersion probe

2 **What is the acceptable contact time when sanitizing food-contact surfaces?**

A Soak the item in very hot water for 7 seconds.
B Soak the item in an iodine solution for 7 seconds.
C Soak the item in a chlorine solution for 7 seconds.
D Soak the item in an ammonia solution for 7 seconds.

3 **If food-contact surfaces are in constant use, how often must they be cleaned and sanitized?**

A Every 4 hours
B Every 5 hours
C Every 6 hours
D Every 7 hours

4 **What must food handlers do to make sure sanitizing solution for use on food-contact surfaces has been made correctly?**

A Test the solution with a sanitizer kit.
B Use very hot water when making the solution.
C Try out the solution on a food-contact surface.
D Mix the solution with equal parts of water.

5 **George is getting ready to wash dishes in a three-compartment sink. What should be his first task?**

A Remove leftover food from the dishes.
B Fill the first sink with detergent and water.
C Clean and sanitize the sinks and drain boards.
D Make sure there is a working clock with a second hand.

Study Questions

6 Which feature is most important for a chemical storage area?

A Good lighting
B Single-use towels
C Nonskid floor mats
D Emergency shower system

7 How should flatware and utensils that have been cleaned and sanitized be stored?

A With handles facing up
B Below cleaning supplies
C Four inches (10 centimeters) from the floor
D In drawers that have been washed and rinsed

8 What is the correct way to clean and sanitize a prep table?

A Remove food from the surface, sanitize, rinse, wash, air-dry
B Remove food from the surface, wash, rinse, sanitize, air-dry
C Remove food from the surface, wash, sanitize, air-dry, rinse
D Remove food from the surface, air-dry, wash, rinse, sanitize

9 Pete the buser poured some cleaner from its original container into a smaller, working container. What else does he need to do?

A Label the working container with its contents
B Read the safety data sheet (SDS) for the cleaner
C Use a new wiping cloth when first using the working container
D Note on the original container that some cleaner was put into a working container

10 What information should a master cleaning schedule contain?

A What should be cleaned, and when
B What should be cleaned, when, and by whom
C What should be cleaned, when, by whom, and how
D What should be cleaned, when, by whom, how, and why

For answers, please turn to page 10.25.

Answers

10.7 Was It Sanitized?

1 Yes

2 No

3 No

4 Yes

5 No

10.8 Take the Correct Steps

4, 2, 5, 3, 1

10.8 To Sanitize or Not to Sanitize

2, 3, and 4 should be marked.

10.12 The New Dishwasher

Here is what Chris did wrong:

- He did not clean and sanitize the sink compartments and drain boards before starting.
- He did not check the water temperature in the first sink compartment.
- He did not rinse the items before sanitizing them. He rinsed the items after sanitizing, which could contaminate them.
- He did not time how long the pots and pans were in the sanitizer.

10.13 Sarah's Dilemma

Here is what Sarah did wrong:

- She did not clean and sanitize the cart for clean tableware.
- She did not rinse, scrape, or soak the dirty dishes before putting them into the dish rack.
- She overloaded the dish rack.
- She did not clean the heavy mineral deposits from the machine before starting the day.

10.13 What's Wrong with This Picture?

- Soap suds from the wash compartment have been carried over into the rinse compartment.
- There is no clock with a second hand. Staff would not be able to time how long an item has been immersed in the sanitizer.
- A cleaned and sanitized pot is not being air-dried correctly. It should be upside down.

Answers

10.18 Was It Done Correctly?

1, 2, 5, and 6 should be marked.

10.18 What's Wrong with This Picture?

- There are no hooks for the brushes and mop to air-dry.
- The chemical spray bottle is not labeled.
- Food is being stored in the area.

10.20 Chapter Review Case Study

1 Yes. Andy should have the hot water fixed. He also should have hooks installed to hang up the mops and brooms.

2 Yes. Clara should have washed, rinsed, and sanitized the cutting board at these times:

- Before cutting the melons
- After cutting the melons and before chopping the spinach
- After chopping the spinach and before butterflying the pork chops
- After butterflying the pork chops

3 For Andy's cleaning program to work, he should do the following:

- Train the staff on the cleaning and sanitizing tasks.
- Supervise daily cleaning routines.
- Check all cleaning tasks against the master cleaning schedule daily.
- Change the master schedule as needed for any changes in the menu, procedures, or equipment.
- Ask staff during meetings for input on the program.

10.22 Study Questions

1	C	6	A
2	C	7	A
3	A	8	B
4	A	9	A
5	C	10	C