by Melissa Vaccaro, MS, CHO, CP-FS

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Manual Warewashing

FOOD PROTECTION CONNECTION

UNDERSTANDING THE FIVE STEPS IN THE MANUAL WAREWASHING PROCESS

Cleaning and sanitizing are the basic components of good food safety techniques. If cleaning and sanitizing don't happen correctly, public health could be at risk. In the Nov/Dec 2017 Edge magazine we discussed the use of warewashing machines. Now it's time to address manual warewashing. Do you understand how to clean and sanitize properly using a three-compartment sink? Do you realize there are five steps in the manual warewashing process?

WASHING AND RINSING IN A THREE-COMPARTMENT SINK

Before any washing and rinsing happens, all wares should be pre-scraped. This means removing significant food residue and food particles from dishware to prepare them for the cleaning or wash step. Cleaning is the process of removing food and other types of visible filth from surfaces such as countertops, dishware, glasses, and equipment. The water temperature for the wash step must be not less than 110°F, or as specified on the manufacturer's instructions on the cleaner.

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Use the right cleaning chemical for the job. Not all cleaning chemicals can be used on food contact surfaces. For example, you should not use glass cleaners, some metal cleaners, tub/tile cleaners, and similar on food contact surfaces. By doing so, you risk the chance of that toxic chemical getting into your food and making someone ill.

Generally, there are four categories of cleaners:

Detergents

All detergents contain surfactants. Surfactants reduce the surface tension between the soil and the surface, so the detergent can penetrate quickly and soften the soil. Examples include dishwashing detergent, like Dawn, and automatic dishwasher detergents.

Solvent Cleaners

Solvent cleaners are often called degreasers. They are alkaline (basic) detergents that contain a grease-dissolving agent. These cleaners work best in areas with burned-on grease. Examples include Fantastik and oven cleaners.

Acid Cleaners

Acid cleaners are used on mineral deposits and other soils that alkaline cleaners cannot remove. These cleaners are often used to remove scale in warewashing machines and steam tables. An example is CLR.

Abrasive Cleaners

Abrasive cleaners are used to remove heavy accumulations of soil often found in small areas. The abrasive action is provided by small mineral or metal particles, fine steel wool, copper, or nylon particles. Some abrasive cleaners also disinfect. Examples include Ajax and Comet.

As with any chemical, all cleaners should be used following the manufacturer's written label instructions. Choose the cleaner you need based on the outcome you are trying to accomplish. If you are trying to remove lime from your glassware, you might choose an acid cleaner. This may include use of various water temperatures. If no temperature for use is listed, any water temperature will do.

Additionally, it is very important to rinse off any detergent before sanitizing the equipment you have just cleaned. Why? Because any residual detergent could interact poorly with the sanitizing compound you are using and cause a health hazard or make it ineffective. There are options for non-rinse cleaners/sanitizers, but we will not address those in this article. They are referred to as two-compartment sink cleaning and sanitizing methods with no distinct rinse.

It is important for your wash and rinse water to be kept relatively clean. When the water becomes too full of particles and food debris, you take the chance of having an ineffective cleaning step and moving organic material to the sanitizing compartment, making the sanitizer less effective. Change your wash water often.

SANITIZING IN A THREE-COMPARTMENT SINK

Sanitizing is the process of reducing pathogens to safe levels. Sanitizing is not the same as disinfection or sterilizing. If done correctly, sanitizing will give you a 99.999 percent reduction in the number of pathogens. This is also known as a five-log reduction. There are three primary methods of sanitizing: heat, radiation, and chemicals. We will not address radiation as it is not likely to be used in foodservice operations.

Continued on page 8

Continued from page 7

Heat sanitizing in foodservice facilities using a three-compartment sink is not very common but can be used. No chemicals are used in this step, only heat. Manual heat sanitizing using a three-compartment sink would require that the water temperature reach and be constantly held at 171°F (77°C) or above. That is pretty hot water, so you need racks, gloves, and other equipment to move the dishes in and out of the sink compartment. All dishes must be able to be fully immersed in the water.

The more common way for foodservice operations to sanitize using a three-compartment sink is to utilize an approved chemical sanitizer. The FDA Model Food Code allows for three basic sanitizers: chlorine, iodine, and quaternary ammonia. Various factors influence the effectiveness of chemical sanitizers:

Concentration

The presence of an insufficient amount of a sanitizing agent will result in an inadequate decrease of microorganisms. Too much can be toxic.

Temperature

Chemical sanitizers generally work best at temperatures between 55°F (13°C) and 120°F (49°C).

Contact Time

In order for the sanitizer to destroy microorganisms, the cleaned item must be in contact with the sanitizer (either heat or approved chemical) for the recommended length of time.

There are several advantages and disadvantages when deciding on a chemical sanitizer. Here are a few factors to consider:

THE MORE COMMON WAY for foodservice operations to sanitize using a three-compartment sink is to utilize an approved chemical sanitizer such as chlorine, quaternary ammonia, or iodine.

Chlorine

50 ppm in water between 75-100°F (7 seconds)

Advantages— Effective on a wide variety of bacteria; highly effective; not affected by hard water salts; generally inexpensive.

Disadvantages— Corrosive; irritating to the skin; effectiveness decreases with increasing pH of solution; deteriorates during storage and when exposed to light; dissipates rapidly; loses activity in the presence of organic matter.

Iodine

12.5-25 ppm in water at least 75°F (30 seconds)

Advantages— Forms brown color that is indicative of the germicidal strength; not affected by hard water salts; less irritating to the skin than chlorine; active against a wide variety of non-spore forming bacteria; activity not lost as rapidly as chlorine in the presence of organic matter.

Disadvantages— Bactericidal effectiveness decreases greatly with an increase in pH (most active at pH 3.0 and very low acting at pH 7.0); less effective against bacterial

spores and bacteriophage than chlorine; should not be used at temperatures greater than 120°F; may discolor equipment and surfaces.

Quaternary Ammonium Compounds

Varies by chemical brand. Read and follow manufacturer's instructions. *Up to 200 ppm in water at least 75°F (30 seconds) and for some brands 150-400 ppm in water at least 75°F.*

Advantages— Nontoxic, odorless, colorless, noncorrosive, nonirritating; stable to heat and relatively stable in the presence of organic matter; active over a wide pH range; quite active against thermoduric (survive at high temperatures) organisms.

Disadvantages— Slow destruction of coliform and psychrophilic (grows at any temperature) organisms; non-compatible with anionic detergents and hard water salts; water hardness should be 500 MG/L hardness or less (unless the label says otherwise).

AIR-DRYING AFTER USING A THREE-COMPARTMENT SINK

The final step in the three-compartment style of cleaning is air-drying. This is often the forgotten step, although it's very important for several reasons.

According to the FDA Food Code, equipment and utensils shall be air-dried or used after adequate draining before they come in contact with food. Why? The first reason is that you have just applied a chemical to your wares. The air-drying or adequate drainage will allow the chemical to be reduced to safe levels before coming in contact with food. This is a federal requirement. Secondly, items must be allowed to drain and to air-dry before being stacked or stored. Stacking wet items such as pans prevents them from drying and may allow an environment where microorganisms can begin to grow; this is often referred to as wet nesting. Cloth drying of equipment and utensils, with the exception of polishing utensils, is prohibited to prevent the possible transfer of microorganisms to equipment or wares.

SUMMING IT UP

As you can see, there is science involved in cleaning and sanitizing dishes, equipment, and any food contact surfaces. The parameter and procedures laid out are intended to reduce potential pathogens on the surfaces of these items to safe levels. Use of unclean and/or unsanitized equipment, utensils, dishware, and food contact surfaces of any kind may lead to foodborne illness. Protect your clients by using proper warewashing techniques. E

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This Level I article assumes that the reader has entry level knowledge of the topic. The desired outcome is to ensure a foundation of basic concepts of the subject matter.

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1. The process of removing food and other types of visible filth from surfaces such as countertops, dishware, glasses, and equipment is:
   A. Sanitizing
   B. Cleaning
   C. Air drying
2. The process of reducing pathogens to a safe level is:
   A. Disinfecting
   B. Cleaning
   C. Sanitizing
3. Stacking wet pans together is referred to as:
   A. Wet stacking
   B. Wet nesting
   C. Water nesting
4. The three basic options for chemical sanitizers in foodservice facilities are:
   A. Chlorine, iodine, quaternary ammonia
   B. Chlorine, radiation, quaternary ammonia
   C. Comet, iodine, quaternary ammonia
5. Step one in the warewashing process is:
   A. Cleaning
   B. Sanitizing
   C. Pre-scraping
6. When manually heat sanitizing dishware, the water temperature must reach and be held at:
   A. 165˚F or above
   B. 171˚F or above
   C. 181˚F or above
7. Which cleaner should be used in the first compartment of the sink?
   A. Any cleaner of your choice
   B. Only cleaners with surfactants
   C. A cleaner that is right for the outcome you are trying to accomplish

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