

Cleaning and Sanitizing

- Cleaning vs. sanitization

- Cleaning : physical removal of soil and food residues

- Sanitation: treatment of previously cleaned surface to reduce # of MO

Definitions of cleaning and sanitizing

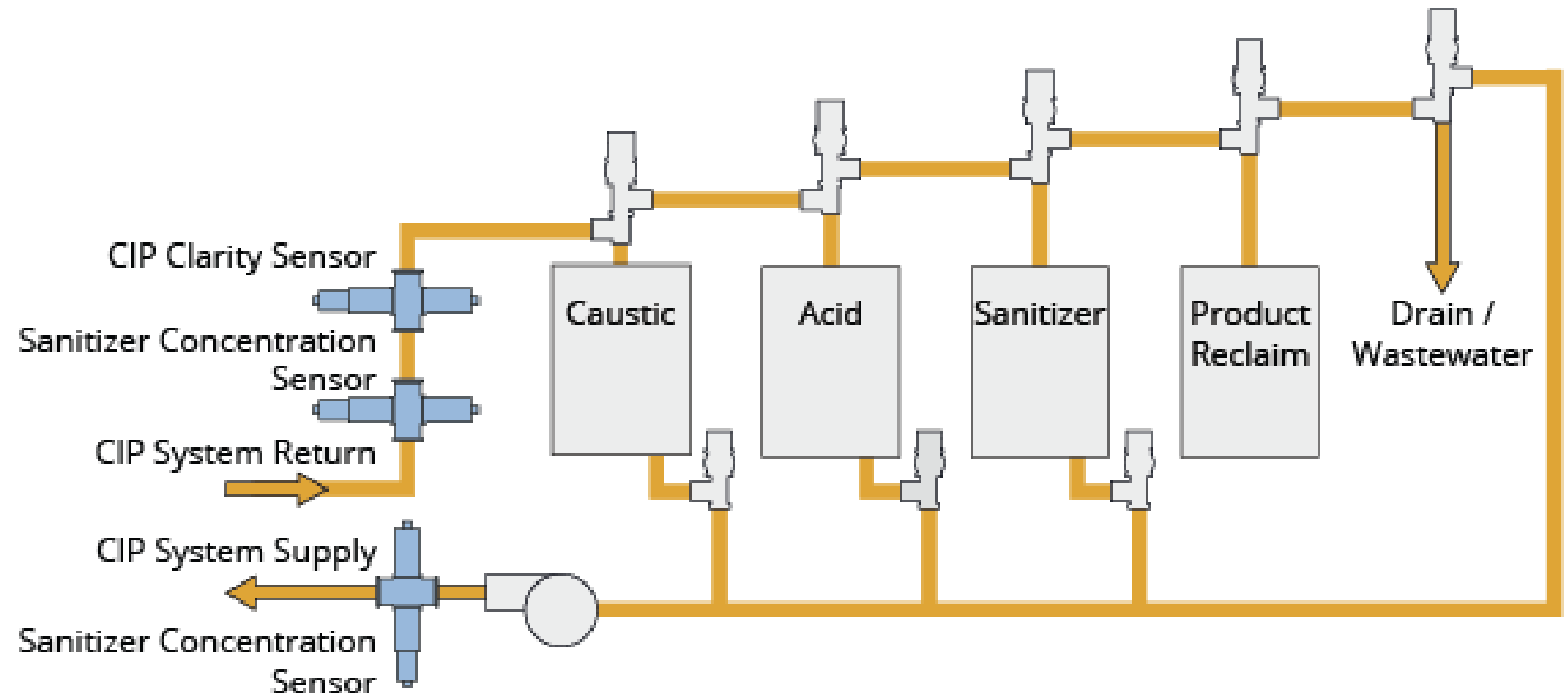
- Clean: free from dirt and soil
- Cleaning: removing dirt by use of energy
 - heat
 - detergent
 - physical effort
- Sanitary: safe for health/free from dangerous levels of pathogens and spoilage organisms
- Sanitizing: reduction of bacteria to a safe level
 - very hot water
 - steam
 - chemicals
- Sterilizing: elimination of all bacteria and their spores

Cleaning steps

- Removal of food particles
 - Scrape, flush , warm water (very hot water tend to bake dirt)
- Application of cleaning agents
 - Soaking or spray method or clean in place CIP or abrasive cleaning
- Rinsing
 - Hot potable water
 - **Very important step!!**
- Sanitation

CIP : clean in place

- Strength and velocity of cleaning solution



Factors affecting cleaning efficiency

- Type of soil to be removed
 - Type of soil affect physical and chemical method to remove it
- Water quality
 - Hard vs soft
- Type of detergent
- Water temperature
 - 54 – 71 C work best , high temp decrease the bonds between soil and surface
- Velocity or force
- Contact time between detergent and surface
- Concentration of detergent

Hard

VS

Soft



Type of detergents

- Soaps
 - Warm water . Hand washing
- Alkaline detergents
 - Mostly used
 - Can cause corrosion for galvanized metals, aluminum, tin
 - Sodium hydroxide, sodium carbonate
- Acid detergents
 - Dissolve mineral deposits
 - Inorganic , and organic
- Degreasers
 - basic ingredient : Surfactants
 - Penetrate and break up grease and oil
- Abrasives
 - Mixed with detergents → for scouring and scrubbing
 - Pumice , quartz, sands
 - Can cause scratches
- Detergent sanitizer
 - Must be applied 2 times

(a)
Soap or
detergent
dissolves
in water



(b)
Surfactant
ions orientate
themselves in
grease and water



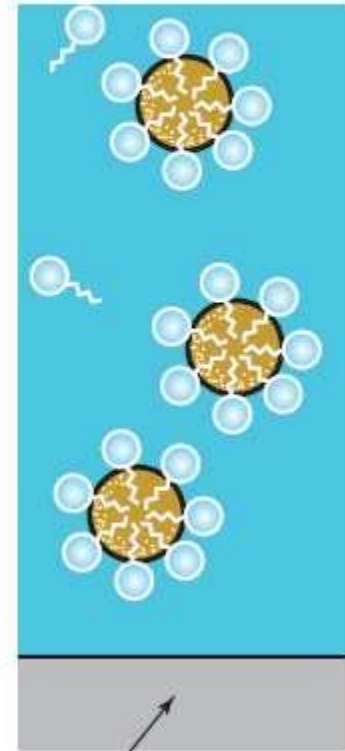
(c)
Agitation
begins to
separate
grease from
surface



(d)
Process
continues



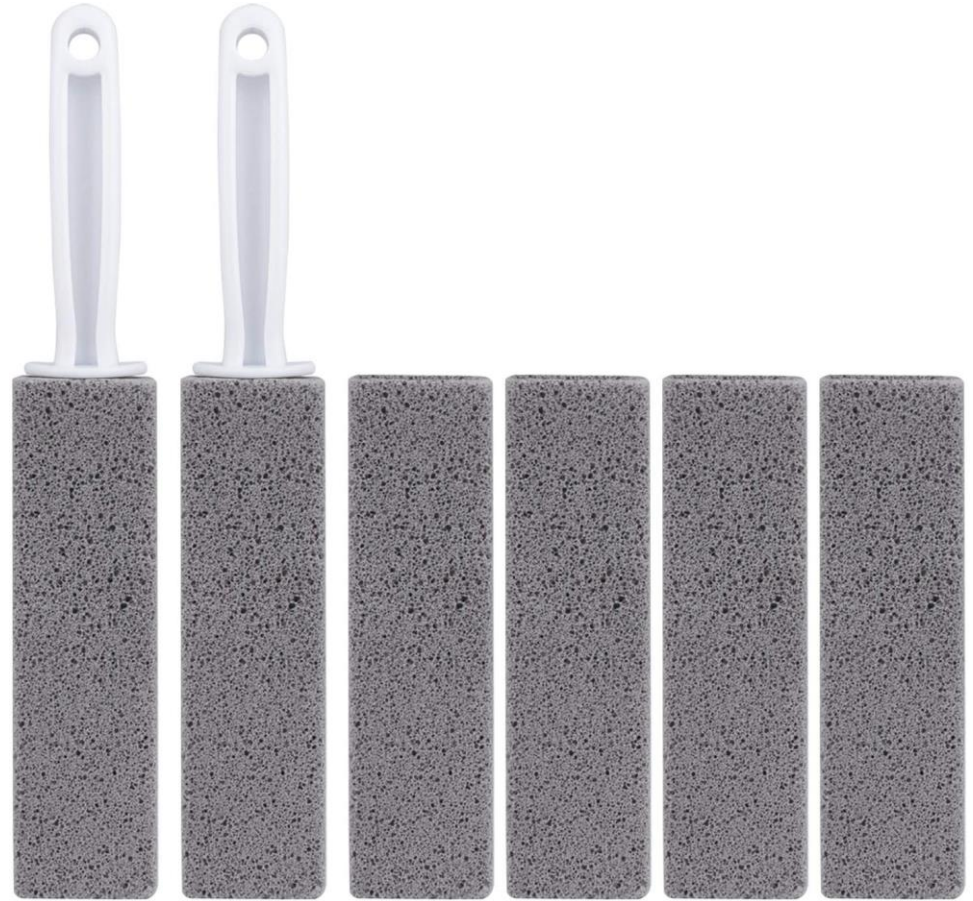
(e)
Cleaning
complete



 Surfactant ions

Clean surface

Pumice



Cleaning frequency

- Surfaces of potentially hazardous foods should be cleaned every 4 hours
- Other specific guidelines:
 - Book page 257
- Some exceptions for the 4 hours rule:

Sanitizing

- Heat sanitizing
 - Chemical sanitizing
-
- Sanitization is not sterilization . What can survive after sanitizing?

Heat sanitizing

- Has several advantages over mechanical
- Moist heat is more efficient than dry heat
- Immersing cleaned equipment for at least 30 seconds in hot water (77 C or above)
- employee safety !!!
- Mechanical > manual in temperatures
- Temperature on the **equipment surface**

Steam cleaning system

low amount of water, without chemicals



chemical sanitization

- Immerse equipment in sanitizing solution
- Swabbing , brushing, pressure spray with sanitizing solution
- The effectiveness of chemical sanitizing weakens as microbes destroy

Factors affecting the action of chemical sanitizing

- Contact of the sanitizer → must be intimate contact
- Selectivity of the sanitizer
 - Chlorine → non selective
 - Iodophores are selective
- Conc. Of the sanitizer
 - High conc. → increase microbial destruction
 - Increase to a certain maximum , any further increase has no additional benefit
 - Sometimes high conc. Can be toxic

Factors affecting the action of chemical sanitizing

- Temperature of solution
 - Chemical reactions are speeded up by increasing temp.
 - 24 -49 degrees
 - Higher than this temperature may lead to evaporation and lost of chlorine
- pH of solution
 - Water hardness can affect the ph
 - Some sanitizers decrease in effectiveness with an increase in pH
 - This is why most alkaline soaps must be rinsed off before sanitizing
- Time of exposure
 - Depending on the other factors
 - Susceptibility of the sanitizer
 - Amount of microbial violation

Sanitizers

- Not all types are suitable for food contact surfaces
- Some may be corrosive , stain, leave residues
- Most common and suitable ones:
 - Chlorine
 - Iodine
 - Quaternary ammonium compounds (quats)

Chlorine

- Chemical component of hypochlorite's
- Advantages:
 - Wide range of MO
 - Deodorize , sanitize
 - Nontoxic to humans
 - Colorless
 - Easy to handle
 - Economical



Chlorine

- Powders or liquid
- Sodium hypochlorite's (household bleach) : 2-6% of available chlorine
- Germicidal effectiveness depends on:
 - Water temp.
 - Ph of solution
 - Reduced by small amount of food soils

Iodine

- Iodophores
- Effective against wide range of MO surfaces and hands
- Quicker than chlorine
- Less influenced by organic soils
- More expensive
- Discolor and stain
- Slippery



Quaternary ammonium compounds (quats)

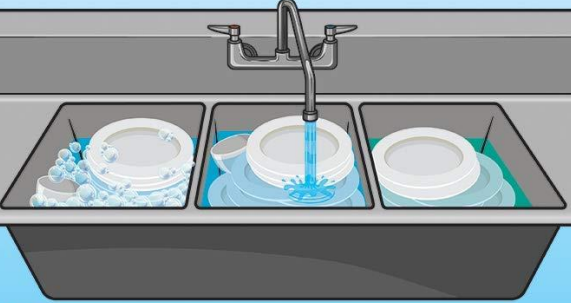
- Ammonia salts
 - Effective , but do not destroy wide range of MO
 - Non corrosive, non staining
-
- Summary of advantages and disadvantages page265



Manual vs mechanical dishwashing



DISHWASHING
Manual Dishwashing Using a
3 Compartment Sink



The diagram shows a three-compartment sink with a central faucet. The left compartment contains a plate and a glass being washed with blue bubbles. The middle compartment shows a plate being rinsed under a stream of water from the faucet. The right compartment contains a clean plate and glass.

- 1 Sort and Scrape** dishes.
- 2 Wash** with detergent in hot water at least **110°F**.
- 3 Rinse** in clean water to remove detergent.
- 4 Sanitize** in hot water **171°F** for at least **30 seconds** or chemical sanitizer **75°F**.
- 5 Air Dry**. Do not towel dry.

LAVAR DE PLATO

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Warewashing – sanitization guidelines

Agent	Minimum concentration	Temperature	Contact time
Chlorine	50mg/L	38°C (100°F) at pH10 or less 24°C (75°F) at pH8 or less	at least 7 seconds
Iodine	between 12.5mg/L and 25mg/L	24°C (75°F) at pH5 or less	at least 30 seconds
Quats	200ppm	24°C (75°F) at about pH7, but affected by water hardness above 500mg/L	at least 30 seconds
Hot water sanitizing		77.2°C (171°F) 72.2°C (180°F)	manual immersion: 30 seconds (may vary in some jurisdictions) mechanical: final rinse cycle

Hand washing and personal hygiene



When to wash your hands (1)

Including but not limited to the following:

- Before:
 - starting work
 - handling any food
- Regularly during food preparation tasks
- When switching between:
 - handling raw and cooked or ready-to-eat food
 - handling raw and TCS food

When to wash your hands (2)

- After:
 - preparing raw food
 - visiting the restroom
 - coughing, sneezing or blowing your nose
 - touching your face, hair or other parts of the body
 - cleaning and sanitizing, or handling containers of cleaning chemicals
 - wearing gloves (protective or disposable)
 - dealing with garbage or trash
 - taking a meal or rest break
 - any other activity that could contaminate hands

How to wash your hands

- Moisten hands, wrists and lower forearms with warm-to-hot water
- Apply soap
- Rub the soap into hands, wrists and forearms briskly for at least 10 to 15 seconds
- Don't forget to clean between fingers and under fingernails
- Rinse thoroughly with clean, warm, running water
- Dry hands thoroughly in the approved manner

Hand and arm hygiene

Requirements for food employees

- Keep hands and exposed portions of arms clean
- Keep fingernails in good condition
 - trimmed, filed and kept so that the edges are cleanable and not rough
- Wash hands before donning gloves for working with food
- Do not wear fingernail polish or artificial fingernails when working with exposed food (unless wearing intact gloves in good repair)
- Do not wear jewelry on hands and arms while preparing food

Protective clothing

Employee responsibilities

- Wear the correct clothing for the work
- Change clothing as soon as it becomes soiled, torn or damaged
- Tell manager if protective clothing is torn or damaged
- Wash hands before putting on protective or disposable gloves
- Wash hands after removing protective or disposable gloves
- Follow workplace rules for storing, disposing of or laundering protective clothing

Proper Work Attire

Foodhandlers should:

- A** Wear a clean hat or other hair restraint
- B** Wear clean clothing daily – dirty clothes must be kept away from food and prep areas
- C** Remove aprons when leaving food-preparation areas
- D** Remove jewelry from hands and arms
- E** Wear appropriate, clean, and closed-toe shoes



Never wear an apron to the restroom or on break



Reporting illness

Responsibility of the person in charge

- *Salmonella* Typhi
- Nontyphoidal *Salmonella*
- *Shigella* species
- Shigatoxin-producing *Escherichia coli*
- Hepatitis A virus
- Norovirus

Food employee – personal habits (1)

- Do:
 - cover cuts with a waterproof bandage
 - keep nails short and clean
 - wash hands regularly
 - report illnesses

Food employee – personal habits (2)

- Do not:
 - wear jewelry or watches
 - cough or sneeze over food
 - pick nose
 - spit
 - bite nails or lick fingers
 - scratch
 - touch face or hair
 - eat in a food preparation or storage area
 - smoke