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

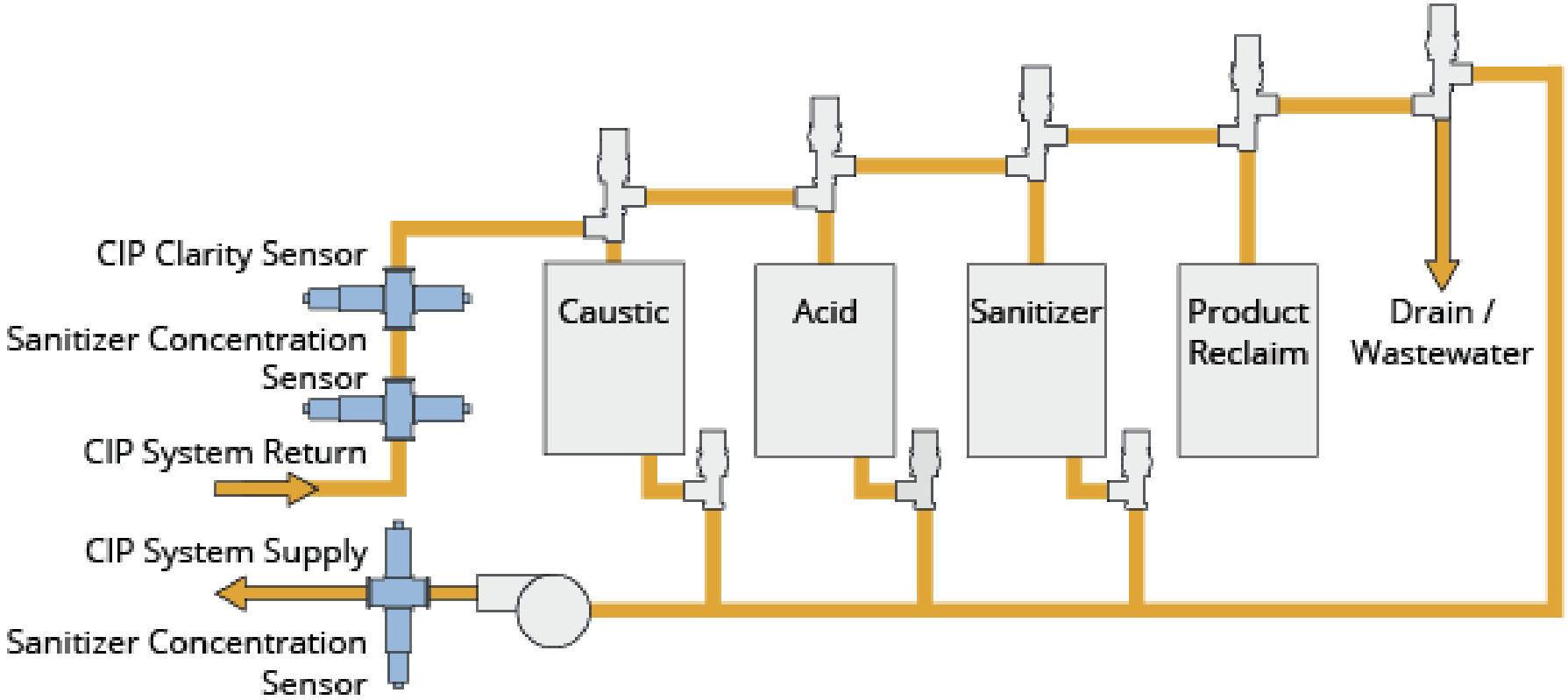
- Clean: free from dirt and soil
- Cleaning: removing dirt by use of energy
  - heat
  - detergent
  - physical effort
- Sanitary: safe for health/free from dangerous levels of pathogens and spoilage organisms
- Sanitizing: reduction of bacteria to a safe level
  - very hot water
  - steam
  - chemicals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

Cleaning steps

- Removal of food particles
  - Scrape, flush , warm water (very hot water tend to bake dirts)
- 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



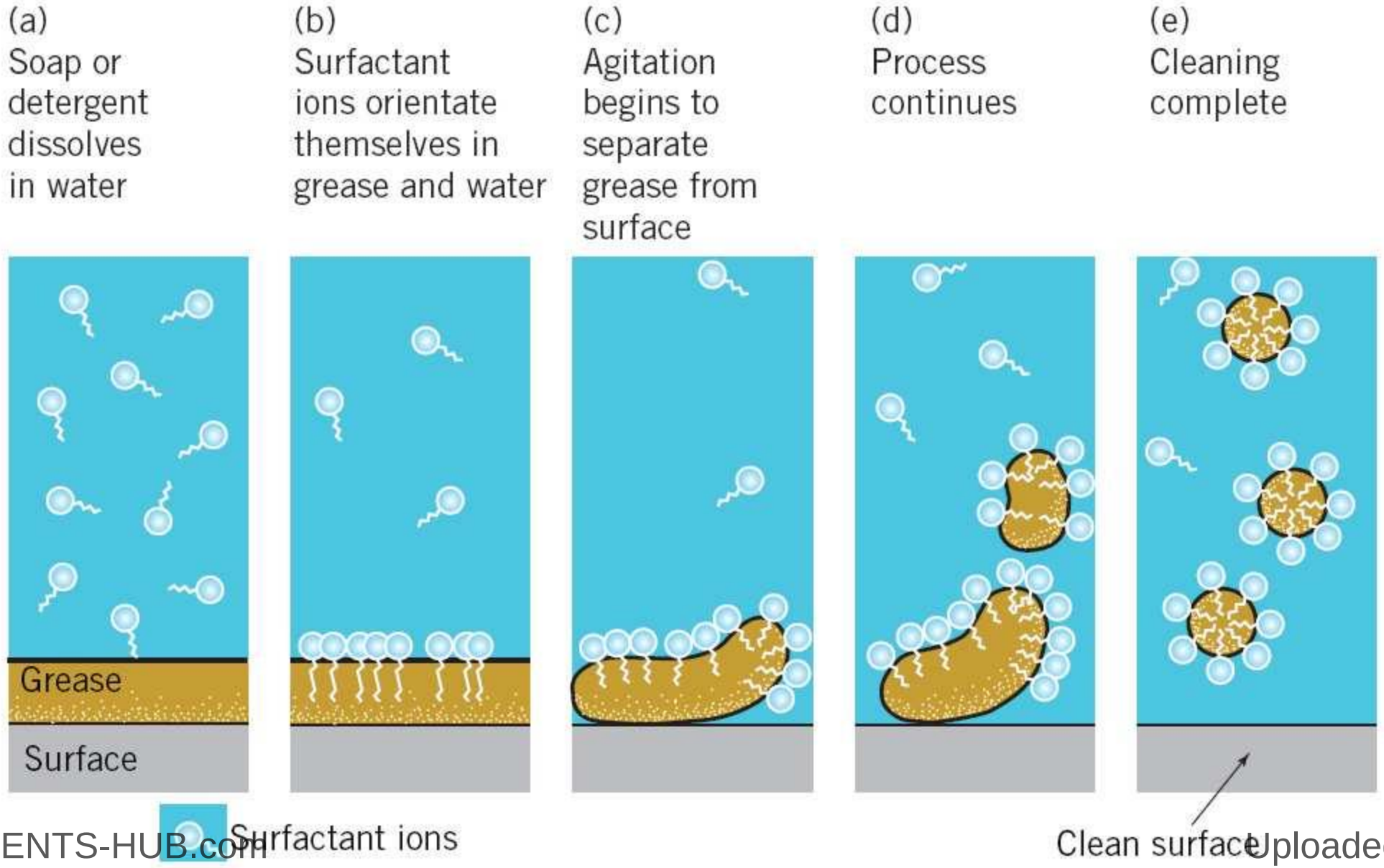
Factors affecting cleaning efficiency

- 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
  - UPPER LIMIT

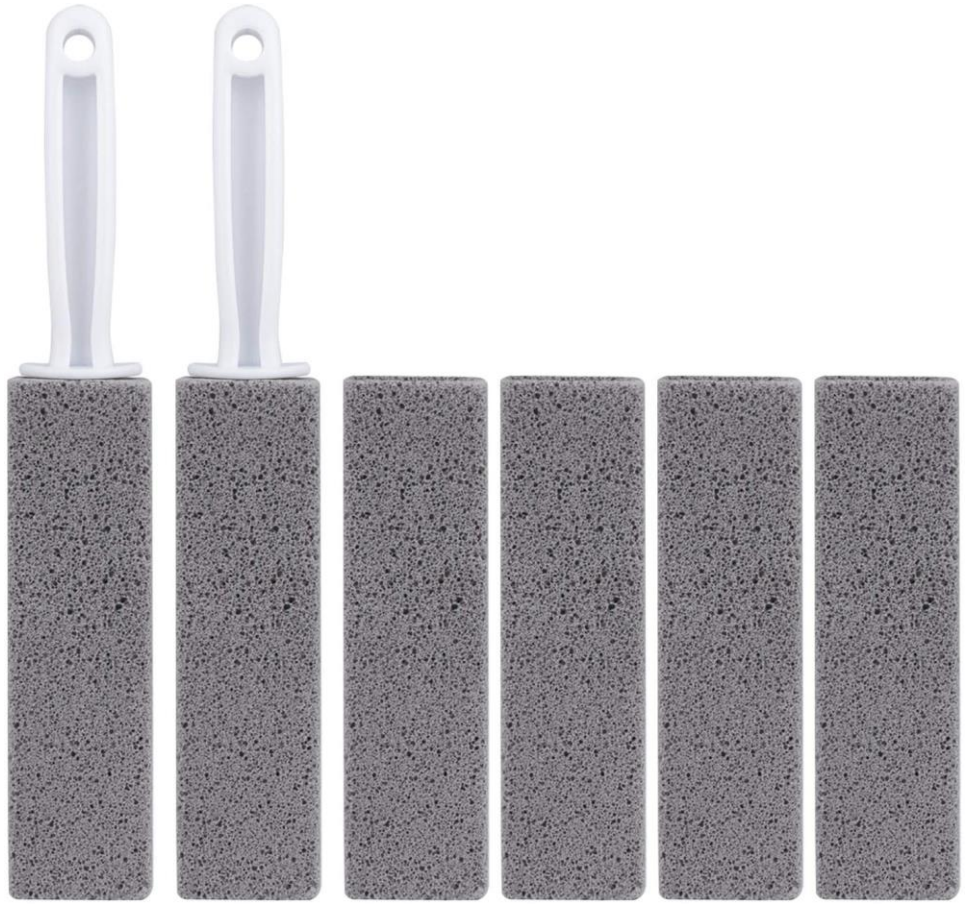
Type of detergents

- Soaps
  - Warm water . Hand washing , soft water
- 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

Degreaser



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:

Room temperature and cleaning frequency

Room Temperature	Cleaning Frequency
41°F (5.0°C) or less	at least once every 24 hours
4rF-45°F (0°C-7.2°C)	at least once every 20 hours
45°F-50°F (7.2°C- 10.0°C)	at least once every 16 hours
50°F-55°F (I0.0°C-I2.8°C)	at least once every 10 hours

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 (82 C) > manual in temperatures (77 C)
- Temperature on the equipment surface

Steam cleaning system
low amount of water, without chemicals

chemical sanitization

- Immerse equipment in sanitizing solution
- Or 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

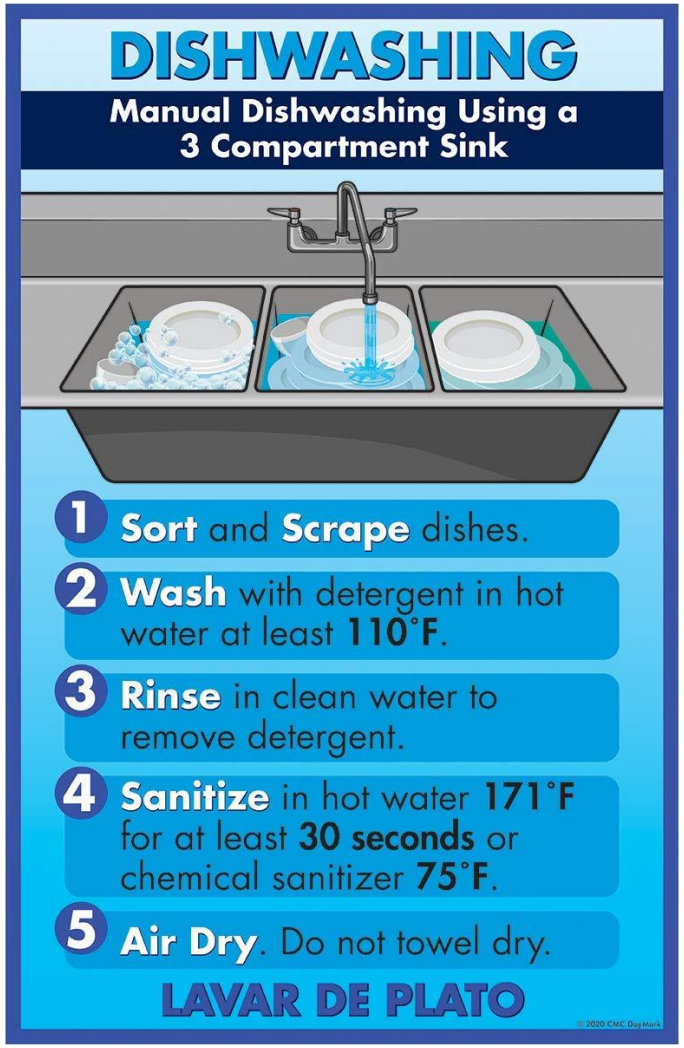
- Summary of advantages and disadvantages page265

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

Type of Sanitizer	Advantages	Disadvantages
Chlorine	Kills most microorganisms Effective at low temperature Test strips determine concentration Relatively inexpensive Does not form films	May corrode metal & weaken rubber Irritating to skin, eyes & throat Unstable, dissipates quickly Loses strength with organic material May be unstable at high temperature
Iodine	Kills most microorganisms Less affected by organic material Solution color indicates activity Dissipates slowly & leaves residue	May stain plastic & porous materials Inactivated above 120ºF (49ºC) May be unsuitable for CIP
Quaternary Ammonium Compounds (Quats or QAC)	Non corrosive Residual activity if not rinsed Less affected by organic material Test strips determine concentration Can be applied as foam	Inactivated by most detergents Ineffective for certain microorganisms Effectiveness varies with formulation May be inactivated by hard water May be unsuitable for CIP

Manual vs mechanical dishwashing



DISHWASHING

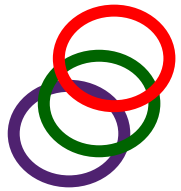
Manual Dishwashing Using a 3 Compartment Sink

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

Mechanical Dishwashing

- Mechanical dishwashing is used to clean and sanitize multi-use equipment and utensils
- Designed to clean and sanitize large quantities of equipment and utensils
- More reliable than manual washing for removing soil and bacteria



Mechanical Dishwashing: Process

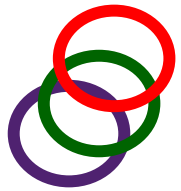
- Consist of eight separate steps:

1- Pre-scrape and pre-flush soiled equipment and utensils

2- Rack equipment and utensils

3- Wash equipment and utensils in a detergent solution

4- Rinse equipment and utensils in a clean water



Mechanical Dishwashing: Process

5- Rinse equipment and utensils in a fresh hot sanitizing water

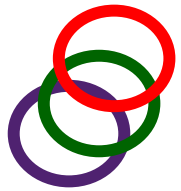
6- Air dry equipment and utensils

7- Store clean and sanitary items

8- Clean and maintain the machine

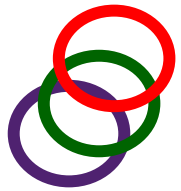
Mechanical Dishwashing: Process

- Type of utensils and quantity of equipment and utensils to be processed during peak periods will determine the selection of dishwashing machine
- Sufficient counter or table space for soiled equipment and utensils and for the clean and sanitary equipment and utensils
- Freshly deposited soil
- Dried deposited soil



Mechanical Dishwashing: Process

- Equipment and utensils should be exposed to the wash water for at least 40 second
- Effective sanitizing wash water , power rinse water, final rinse water temperature
- Clean and sanitized equipment and utensils must be air dried before storage
- It is prohibited the cloth drying of clean and sanitized equipment and utensils



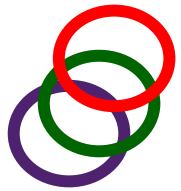
Manual Dishwashing

- Performed in sink that has 3 compartment

- Each sink must be large enough to accommodate immersion of the largest equipment and utensils

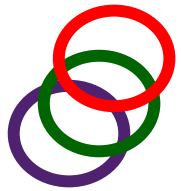
Manual Dishwashing:

- Sink must be equipped with sloped drain boards or dish tables for soiled and cleaned items
- Each compartment must be supplied with hot and cold potable water
- Sink must be cleaned and sanitized prior to use
- A cloth, nylon brush or other approved cleaning device should be used to loosen and remove soil



Manual Dishwashing:

- When hot water is used as a sanitizer temperature must be maintained above 77^{o}C
- Chemical sanitizers are preferred over heat to save energy
- Soil and other deposits can shield bacteria from chemical sanitizers
- Clean and sanitized items should be air dried before put into storage

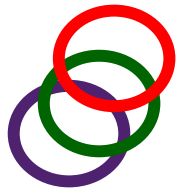


Manual Dishwashing:

- Avoid wiping cleaned and sanitized items with clothes or towels
- Storage should protect clean and sanitized items form being re-contaminated
- Cabinets and carts may not be located in locker room and toilet room and under sewer line that are not shielded
- When the cleaning agent disappears in the first compartment , the wash solution should be drained and replaced

Manual Dishwashing:

- When detergent build up in the second compartment water should be drained and replaced
- When the sanitizer in the third compartment is depleted, it should be drained and a new solution made
- Concentration of the chemical sanitizer should be tested periodically



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 (TIME TEMPERTURE CONTROL 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 jewellery 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

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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