

## **Laboratory 3**

### **HACCP-Hazard Analysis/ Critical Control Points**

#### Good Manufacturing Practices (GMP's)

- Broad and general in nature.
- defines the goals and objectives of the cleaning and sanitizing processes.

#### Sanitation Standard Operating Procedures (SSop's)

- Became mandatory on January 27, 1997
- they detail a specific sequence of events to perform a task. In this case it is the cleaning and sanitizing of equipment and surfaces.
- Monitoring records are kept.

#### HACCP became mandatory for:

- Large establishments (>500 employees) on January 26, 1998
- Small establishments (between 500 and 10 employees) on January 25 1999
- Very Small Establishments (less than 10 employees) on January 25, 2000

#### Origins of HACCP:

- Developed by microbiologists
- US Space Program needed it
- Not limited to food safety

#### Preventative system

- Safety designed into the formulation and production process

#### Can be used to control many factors that affect the safety of a food product

- Physical
- Chemical
- Biological

## Advantages

- Focuses on preventing hazards from entering food
- Based on science
- Requires detailed record keeping
- More efficient government oversight
- Places responsibility on producer and/or distributor to identify and check food safety areas throughout the entire process

## 7 Principles of HACCP

- Conduct hazard analysis and risk assessment
- Determine Critical Control Points (CCP)
  - Steps where loss of control would result in unacceptable health risk to the consumer
  - Steps in which food safety hazard can be prevented, eliminated or reduced to acceptable levels.
- Establish Specifications for each CCP
  - Means of testing
  - Tolerance levels
- Monitor each CCP
- Establish Corrective action to be taken if deviations occur at a CCP ("What if" Step)
  - detailed protocol
  - Steps to bring it into control
  - disposal of products manufactured when CCP was out of control
- Establish a record keeping system
  - Very important. Shows that you have been following the rules.
- Establish verification procedures

## Sanitizing Agents

### **-Hypochlorites/ Chlorine Based Sanitizers:** (Clorox™ 5.25% NaOCl)

- Usually used in levels of 100-200 ppm.
- Must be rinsed off if concentration is > 200 ppm.
- Best if used after thorough cleaning due to it's reactions with excess organic matter.
- Can be used with non-ionic detergent
- Concentration decreases with time if exposed to the air.
- Very corrosive
- discolors product
- can give bad flavor or odor
- can oxidize lipids
- Has broad spectrum of activity (can kill just about anything)
- inexpensive
- easy to use.

### **-Iodophores:**

- Products like "Betadine" are iodophors used in the health industry.
- Iodine based cleaners.
- Iodine in same chemical group as chlorine but larger in size and less reactive.
- Used most often in the Meat industry as hand sanitizers.
- Usually used in 25 ppm.

#### Advantages:

- It kills vegetative cells without irritating (like chlorines) and without leaving a film like Quats
- Kills just about everything (except spores)
- Can be used with acid-anionics and are stable at low and high pH.
- Doesn't lose activity as quickly as chlorine based sanitizers.
- Very easy to use
- Noncorrosive

#### Disadvantages:

- Some lose of potency when used around proteins
- Can turn starch purple.
- May leave a flavor/odor
- Moderately expensive.

### **-Quaternary ammonium compounds: (Quats)**

- Like  $\text{NH}_4^+$ , but has a compound heavier than Hydrogen on in place of hydrogen.
- Products like Lysol™ are Quats
- anything with the word ammonium in it (usually some kind of ammonium chloride).
- The  $\text{Cl}^-$  is there to even out the charge. It is not responsible for the reactivity.

#### Disadvantages:

- Can support resistant microorganisms
- Only effective against certain microorganisms (not G-).
- Film former.

#### Advantages:

- Non- corrosive
- Non- irritating
- No flavors or odors
- can be used when organic matter still remains (use in sanitizing wash)

### **-Acid-anionics:**

- Mixture of an acid and a anionic detergent.
- Combination has a synergistic effect, not just additive.

#### Advantages:

- Broad spectrum of activity against vegetative cells
- Low toxicity to animals
- Cheaper than quats and Iodophores

#### Disadvantages:

- Effective at low pH's
- Corrosive (due to low pH)
- Doesn't kill spores.
- reacts with concrete.