Sanitation
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ROP Workshop

Overview of ROP
- Introduction
- Definition
- Benefits
- Misconceptions and Risks

Types of Processes
- Vacuum packaging
- Cook chill
- Sous vide
- Modified Atmosphere Packaging (MAP)

Safety Concerns
- Microbiology
- Micro Applied to ROP
- Sanitation
“Adequately treat food-contact surfaces by a process that is effective in destroying vegetative cells of microorganisms of public health significance, [...] reducing numbers of other undesirable microorganisms, but without adversely affecting the product or its safety to the consumer.”

• Activities that prevent product adulteration
• Activities designed to minimize economic loss
Why worry about Sanitation?

- Cooking processes are not designed to destroy an infinite number of microorganisms.

- Steps must be included to minimize the number of microorganisms before thermal treatment is applied.
Sources of Microbial Contamination

- Raw product or ingredients
- Food handling equipment/surfaces
- Employee contact
- Water used in preparation, washing or conveying food
Control of Contamination

- Clean and wash all raw agricultural products
- Frequently clean all food handling equipment
- Use ingredients that are supplier guaranteed to be free of microorganisms
- Water must be good quality
Visible or invisible, unwanted material on food-contact surfaces

Soils are grouped by what they are soluble in:
- Water – sugars, some starch, most salts
- Acid - Minerals
- Alkali – Protein, fat emulsions
- Surfactants – oil, fat, food residue, inert soil
Sanitizing starts with Cleaning

• Cleaning – complete removal of food soil
• Sanitizing – reduce the microbial load to a level considered safe for public health
• Proper Cleaning and Sanitizing Steps:
  1. Rinse
  2. Clean
  3. Rinse
  4. Sanitize
Cleaning and Sanitizing

1. Rinse
   • Removes food particles on surfaces
   • Use warm water, NOT hot water

2. Clean
   • Remove carbohydrates, proteins, fats and mineral soils
   • Penetrates soils to lift them from surface and wash away with water

Cleaning Considerations:
Type of soil present
Type of Surface
Method available for Cleaning
3. Rinse again
   • Use clean, hot water
   • Remove all detergent residue

4. Sanitize
   • Destroy disease causing microorganisms
   • Reduce microbial load to a level appropriate for public health
Types of Sanitizers

- Chlorine
- Iodophors (Iodine compounds)
- Quaternary Ammonium Compounds
- Others:
  - Peroxyacetic Acid
  - Ozone
  - Ultraviolet Radiation
Organic and Inorganic Impurities

Chlorine Demand
Not effective for disinfection.
Chlorination Basics

“Free Chlorine”
Available for disinfection.
Factors affecting Chlorination Efficacy

- Concentration
- pH of the water
- Organic and Inorganic impurities in the water
- Temperature
Effect of Chlorine Concentration

- **20 ppm** (Free Chlorine)
- **50 ppm** (Free Chlorine)
Effect of pH

The lower the pH, the faster the kill rate!

Reason: In acidic environment chlorine is in the form of hypochlorous acid (germicidal).
Effect of pH X [Chlorine]

The more chlorine we add...

...the higher the pH of the water becomes!

So...the pH of water after chlorine addition determines kill rates!!!
Effect of Organic and Inorganic matter

Even when the levels of free chlorine are the same...

...suspended matter physically blocks the action of chlorine, protecting the bacteria!
Effect of Temperature

The higher the temperature, the less active the chlorine is!!!
Chlorine Measurements

• (Total) Residual chlorine: measured by titrimetric methods or test kits

• (Free) Residual by the DPD reagent method

Neither the University of Nebraska – Lincoln, or the instructors of this training, endorse these specific brands of chlorine test strips. These are only included here as examples of this type of product.
Choosing a Sanitizer

- Kills microorganisms
- Safe and non-irritating to workers
- Must be rinseable
- No adverse effect on food
- Compatible with other chemicals and equipment
- Readily soluble in water
Beyond Sanitation

• Preventing contamination and cross-contamination

Employee Health

Employee Hygiene

Color Coding Cleaning Supplies

Color Coding/ Separating Utensils

Organizing Food Storage Areas (Top to Bottom)
Beyond Sanitation

• Preventing contamination and cross-contamination

BE AWARE AND SHARE!!!