

Cleaning and Sanitizing

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Focus on Cleaning and Sanitizing

- **Cleaning** means free of any visible soil
 - involves use of soap/detergent and water
 - adequate rinsing so no residue
 - water of potable quality
- **Sanitizing** is next step – reduction in pathogens to non-harmful levels
- **Sterilization** is ultimate

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What gets cleaned and sanitized?

- Food products
- Food Contact Surfaces

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Clean and Sanitize Product

- Is Rinsing Enough?
 - Customer specifications
 - Allows only partial removal of microorganisms
 - Can spread microbial contamination without water renewal
 - Use of potable water – test annual and change as needed
- Sanitizers – many options

Effectiveness of
each varies with
the food tested

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Screen for Punctured or Bruised Produce – these provide entry for:

- **Plant Pathogens**
- **Foodborne Illness Pathogens**

So proper harvesting/culling is important to both safety and quality.

Cleaning/Packing Last Chance

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The importance of water

Singular critical point capable of amplifying an error in sanitation or hygiene management during production, harvest, or postharvest



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Wash Water Quality



- Use potable water for all produce washing, cooling, dipping, icing, and processing.
- Avoid water temperatures in dump tanks that are more than 10°F cooler than produce.



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Chlorination of Water

- Maintain constant chlorine by monitoring. In general 100-150 ppm. Up to 150 PPM (1 ½ Tablespoons per gallon)
- Most effective if used after soil is removed as organic material (soil) breaks down effectiveness - Change solution as needed
- Monitor pH of water. Optimum range 6.0-7.0
- Be conscience of the temperature of the water. High temp. results in quicker pathogen kill, but also results in rapid loss of chlorine due to gas formation.

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Postharvest Water Disinfection Strategies

- Some Options: Chlorine gas, Sodium hypochlorite, Calcium hypochlorite, Chlorine dioxide, Acidified sodium chlorite, Surfactants, Ozone, Ionizing radicals, Hydrogen peroxide, Peroxyacetic acid, Ultraviolet Illumination.
- Monitor effectiveness – use of test strips.
- Additional Resource: *Introduction to ORP as a Standard of Postharvest Water Disinfection Monitoring*, Trevor Suslow, UC Davis.

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Agents Fresh Produce

1. Sodium hypochlorite – *aka Bleach* (6%, 100 - 200 ppm; pH 6.4; H₂O temp.)
2. Tsunami™ (80 ppm)
3. H₂O₂ (5%)
4. PRO-SAN (1%)
5. H₂O₂ (1.5%) + Lactic acid 1.5%)
6. Acidified sodium chlorite (Sanova™)

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Cleaning and Sanitizing of Food Contact Surfaces

- Harvest and tote containers
- Packing surfaces
- Worker hands
- Worker attire
- Cleaning tools should be clean!



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Step 1: Cleaning = Washing & Rinsing

- **Are adequate supplies available?**
- Hand soap and cleaning detergent
- Disposable towels
- Clean water
- **Are supplies used properly?**
- Hands washed after using the bathroom
- After harvesting or work in field
- After eating or drinking or smoking
- Containers washed and rinsed after hauling products
- Surfaces cleaned beginning of each day and after contact with contaminated surfaces

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Regardless of size of operation, develop a system to maintaining carton and tote hygiene



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Growers Are Innovating Their Own On-Farm Sanitation Routines



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Iowa Food Safety Task Force
Kansas Health Foundation

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DECA, October 2007



Step 2: Sanitizing Agents

- Usually used with chemicals
- Typical sanitizers include chlorine, iodine, or ammonia based agents
- Be sure approved for food contact
- **Use correct concentrations for food contact for that product!**
- Test correct concentrations reached – test strips
- Discard and change solution as needed
- Avoid *re-contamination* of sanitized items – with hands or contact

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OTC Sanitizers

- **Chlorine Bleach**
- 1. Can be used for sanitizing Product and Food Contact Surfaces
- 2. Important to **measure accurately to avoid toxicity**
- 3. Use **test strips** to ensure proper concentration for use – example – document that used with log
- 4. Note: Don't use scented/oxidized chlorine bleach

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Chlorine Bleach Use

- **Product (before)**
 - 1. Up to 150 PPM (1 ½ Tablespoons per gallon)
Most effective if used after soil is removed as organic material (soil) breaks down effectiveness
 - 2. Change solution as needed
 - **Food Contact Surfaces**
 - 50 – 100 PPM (1 Tablespoon/gal.)
 - Packing table
 - Package materials
 - Gloves/Aprons
- Source: KSU, ISU, UC Davis

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Training is Important!

- **Farm workers are sometimes the last/only people to handle the produce before the consumer.**
- **Workers need to know about about food safety and chemical safety issues.**
- **Effective training results in better employees and safer produce.**



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