Demystifying cleaning and sanitizing of food contact surfaces on the farm

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Today’s Presenters

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What are we going to cover today?

1. Importance of maintaining a rigorous sanitation program for your farm
2. Types of surfaces you need to include in your sanitation farm program
3. Difference between cleaning, sanitizing and disinfecting
4. Resources to support new sanitation practices and strategies
5. Question and answer session
Why do you need a good cleaning and sanitizing program for surfaces?

• Many potential sources of contamination on-farm.
• Reduce possibility of introducing microbial contaminant into fresh produce during production, harvesting, handling, or transportation.
• Ensure produce is safe as possible for customers.
• Have consistent practices understood and carried out by all farm workers (employees and volunteers).
Food contact surfaces

**Food contact surface (FCS):** any surface that comes into direct contact with food

- Hands, harvesting tools, tables, spinners, bins, food bags, carton.

FCSs should:

- Not leach or chemically react with foods to produce substances that are toxic or impart colors, odors, or tastes
- Resist corrosion upon repeated contact with caustic or corrosive chemicals or food ingredients
- Not absorb water that will support microbial growth
- Be finished to a smooth polish so that soils and microorganisms cannot accumulate
- Be resistant to pitting, chipping, scratching, scoring, distortion, and decomposition under normal processing conditions
Thinking in zones helps you prioritize surfaces for treatment in your sanitation program.
Non-food contact surfaces

**Non-food contact surface**: any surface that produce will not touch in normal operations.

- May be near a food contact surface (part of processing or holding equipment) such as sides of flumes, pallets
- Distant from FCSs but near or outside, such as floors, walls, drains, hallways

Surfaces that indirectly contact produce should also be part of a general sanitation program to reduce the risk of cross-contamination from one surface to another.

Zones 2, 3 & 4 are typically non-food contact surfaces
So what’s happening with those plastic door flaps?

Assessing risk involves thinking about the hazard in relation to its probability of occurring.

Source: Adapted from L. Strawn, Eastern Shore AREC, Virginia Tech
A few definitions

- **Cleaning** removes disease-causing microorganisms, dirt, and impurities from surfaces and objects...often includes using cleaner and water to physically remove them.

- **Sanitizing** lowers the number of bacteria on surfaces or objects to a safe level, as judged by public health standards or requirements. Tested on bacterial pathogens only.

- **Disinfecting** kills bacteria and viruses on surfaces or objects. Disinfecting works by using chemicals to kill germs on surfaces or objects. This process does not necessarily clean dirty surfaces or remove germs, but by killing germs on a surface after cleaning, it can further lower the risk of spreading infection. Tested on bacterial pathogens and viruses.
Considerations for your sanitation program

• **Reduce** opportunities for **biofilm** to develop and persist:
  – Biofilms are bacterial microcolonies that adhere to a surface and protect bacteria inside the film.
  – May result from inadequate cleaning and sanitizing. Their removal may be difficult.

• **Create** opportunities for **clean breaks**:
  – Separate production lots by conducting complete cleaning and sanitation of all surfaces before and after produce processing.
  – Reduce amount of product subject to recall or withdrawal from the market in case of contamination event.
  – Record monitoring steps, including who completed tasks, and when, how, and what was cleaned and sanitized.
Cleaning

- Goal is physical removal of soil to prevent microorganism persistence and growth (may be either wet or dry)
- Choose the right product for soil and surface. Consider:
  - Soil type and condition
  - Surface material and condition
- Follow a 3-step process
- **You cannot sanitize or disinfect a dirty surface**
- Note: no cleaners are listed in USDA organic regulations because guidelines require complete removal of any cleaner from food contact surfaces and equipment. If you are properly removing the cleaner, no residue should be in contact with organic foods.
Wet versus dry cleaning

Wet cleaning

- Water and cleaner used to clean the surface
- Used packinghouses or situations where water is present, or product is not affected by water
- Only surfaces cleaned with water and a cleaning product can be sanitized
- Precursor to establishing a clean break

Dry cleaning

- No water used, only surface dirt is removed
- Used in packinghouses or situations where product is handled dry
- Dirt removal can include using a brush, sweeping, air blowing, etc.
- Surfaces that have been dry cleaned cannot be sanitized
### Types of Soil, Solubility Characteristics, and Recommended Cleaning Procedures

<table>
<thead>
<tr>
<th>Food or Soil</th>
<th>Solubility Characteristics</th>
<th>Recommended Cleaning Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugars, salt</td>
<td>Water soluble</td>
<td>Rinse with hot water followed by mildly alkaline detergent if necessary</td>
</tr>
<tr>
<td>High protein foods (Meat, poultry, fish)</td>
<td>Water soluble</td>
<td>Alkaline detergents, chlorinated alkaline cleaners</td>
</tr>
<tr>
<td></td>
<td>Alkaline soluble</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slightly acid soluble</td>
<td></td>
</tr>
<tr>
<td>Fats and oils (fat, meat, butter, margarine, oils)</td>
<td>Water soluble</td>
<td>Mildly alkaline detergent. Strong alkali if necessary</td>
</tr>
<tr>
<td></td>
<td>Alkaline soluble</td>
<td></td>
</tr>
<tr>
<td>Stone-forming foods, mineral scale (Milk products, beer, spinach)</td>
<td>Water insoluble</td>
<td>Chlorinated cleaner or mildly alkaline cleaner; alternate with acid cleaner once per week.</td>
</tr>
<tr>
<td></td>
<td>Alkali insoluble</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acid soluble</td>
<td></td>
</tr>
<tr>
<td>Permanent water hardness scale</td>
<td>Water insoluble</td>
<td>Strong acid cleaner for heavy buildup, regular mild acid to prevent accumulation</td>
</tr>
<tr>
<td></td>
<td>Alkali insoluble</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acid soluble</td>
<td></td>
</tr>
<tr>
<td>Starchy foods, fruits, vegetables</td>
<td>Partly water soluble</td>
<td>Mildly alkaline detergent</td>
</tr>
<tr>
<td></td>
<td>Alkali soluble</td>
<td></td>
</tr>
</tbody>
</table>


• The University of Florida Extension also has a fact sheet that reviews soils and cleaners in detail: [https://edis.ifas.ufl.edu/pdffiles/FS/FS07700.pdf](https://edis.ifas.ufl.edu/pdffiles/FS/FS07700.pdf)
How to clean in 3 steps

**Step 1:** Remove any obvious dirt and debris from the food contact surface.

**Step 2:** Apply a cleaner and scrub the surface.

**Step 3:** Rinse the surface with clean water, making sure to remove all of the cleaner and soil.

Sanitizing

- Reduces the number of microorganisms of public health significance to a safe level within 1 minute but does not completely sterilize the surface
  - 99.999% reduction for food contact surfaces
  - 99.9% reduction for non-food contact surfaces
- Many products available:
  - For food contact surfaces and non-food contact surfaces in your produce operation, consult:
    https://producesafetyalliance.cornell.edu/sites/producesafetyalliance.cornell.edu/files/shared/documents/PSA-Labeled-Sanitizers-for-Produce.xlsx
  - Spreadsheet helps you locate important information quickly. Read the label carefully for allowed uses.
<table>
<thead>
<tr>
<th>Product Name</th>
<th>Alternate Brand Names</th>
<th>EPA Sublabel</th>
<th>Active Ingredients</th>
<th>EPA Registration Number</th>
<th>Link to EPA Label</th>
<th>Labeled for Use</th>
<th>Labeled for Use in Non-Porous Food Contact Surfaces?</th>
<th>Labeled for Use in Fruit and Vegetable Wash Water?</th>
<th>Labeled for Use in Irrigation Water?</th>
<th>Controls Efficacy Against Public Health Organisms?</th>
<th>OMRI Listing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agchlor 310</td>
<td>Agchlor 310F</td>
<td>N/A</td>
<td></td>
<td>2792-62</td>
<td>Label PDF</td>
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<td>No</td>
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</tr>
<tr>
<td>Alpet D2</td>
<td>Alpet D2 Surface Sanitizer</td>
<td>N/A</td>
<td></td>
<td>73332-1</td>
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<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Not listed</td>
</tr>
<tr>
<td>Anthineum Dioxide</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>9150-2</td>
<td>Label PDF</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Not listed</td>
</tr>
<tr>
<td>Market Guard 700</td>
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<td>N/A</td>
<td></td>
<td>1677-234</td>
<td>Label PDF</td>
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<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Not listed</td>
</tr>
<tr>
<td>Simply Save Antimicrobial Produce Wash</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bionate HS 15% (Sublabel A)</td>
<td>Pentagren 15%</td>
<td>N/A</td>
<td>Sublabel A: General Directions for Use (Bionate HS 15%)</td>
<td>63588-2</td>
<td>Label PDF</td>
<td>Yes</td>
<td>See Page 5</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Not listed</td>
</tr>
<tr>
<td>Bionate HS 15% (Sublabel B)</td>
<td>Pentagren 15%</td>
<td>N/A</td>
<td>Sublabel B: Agricultural Uses (Pentagren 15%)</td>
<td>63588-2</td>
<td>Label PDF</td>
<td>Yes</td>
<td>See Page 5</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Not listed</td>
</tr>
<tr>
<td>Bromide 4000</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>85451-17</td>
<td>Label PDF</td>
<td>Yes</td>
<td>See Page 4</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Not listed</td>
</tr>
<tr>
<td>Bromide Plus</td>
<td>AZURE® Deluxe Algae Controller</td>
<td>N/A</td>
<td></td>
<td>8612-49</td>
<td>Label PDF</td>
<td>Yes</td>
<td>See Page 5</td>
<td>No</td>
<td>No</td>
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<td>Not listed</td>
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<tr>
<td>Busan 6040</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>1448-345</td>
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<td>Yes</td>
<td>See Page 5</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Not listed</td>
</tr>
</tbody>
</table>
How to clean and sanitize in 4 steps

Step 1: Remove any obvious dirt and debris from the food contact surface.

Step 2: Apply a cleaner and scrub the surface.

Step 3: Rinse the surface with clean water, making sure to remove all of the cleaner and soil.

Step 4: Apply a sanitizer approved for use on food contact surfaces, rinse as necessary, and let the surface air dry.

Note: not all materials can be sanitized but all surfaces can be cleaned.
Disinfecting

• Destroys or inactivates all infectious organisms (bacteria and viruses) on **hard, non-food contact surfaces** within 10 minutes

• EPA List N – products approved for use against viruses and other emerging pathogens: [https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2](https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2)
  

• Some sanitizers are also labeled as disinfectants:
  
  – Requires a higher concentration of and longer contact time with active ingredients
  
  – Refer to label on your existing sanitizer for directions about whether and how to use it for disinfection
  
  – Not all disinfectants are safe for food contact surfaces, follow manufacturer’s instructions
## Sanitizers vs. disinfectants

<table>
<thead>
<tr>
<th></th>
<th>Sanitizers</th>
<th>Disinfectants</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA-registered</td>
<td>EPA-registered</td>
<td>EPA-registered</td>
</tr>
<tr>
<td>Food contact surfaces (and non-food contact surfaces)</td>
<td>Non-food contact surfaces</td>
<td></td>
</tr>
<tr>
<td>Reduce bacterial load <strong>99.999%</strong> on food contact surfaces, <strong>99.9%</strong> on non-food contact surfaces</td>
<td>Destroy/inactivate <strong>100%</strong> of certain infectious microorganisms (such as bacteria and viruses) and fungi; exception includes bacterial spores</td>
<td></td>
</tr>
<tr>
<td>Lower concentration and shorter contact time (within 1 minute)</td>
<td>Higher concentration and longer contact time (within 10 minutes)</td>
<td></td>
</tr>
<tr>
<td>Cannot have artificial scents or perfumes for use on food contact surfaces</td>
<td>May include artificial scents and perfumes</td>
<td></td>
</tr>
<tr>
<td>Tested against bacterial pathogens only (<em>E. coli, Salmonella Typhimurium, Staphylococcus aureus</em>)</td>
<td>Must be effective against bacteria, viruses, and fungi; must be tested against every organism the label claims to kill</td>
<td></td>
</tr>
<tr>
<td>Used throughout the food industry</td>
<td>Typically used in hospitals, nursing homes, hotels</td>
<td></td>
</tr>
</tbody>
</table>

Overview of products, with adjustments for sanitizing and disinfecting levels

<table>
<thead>
<tr>
<th>Product</th>
<th>Active Ingredients as Received</th>
<th>Labeled Concentration for Sanitizing Hard Surfaces</th>
<th>Labeled Concentration for Disinfecting Hard Surfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultra Clorox Brand Regular Bleach</td>
<td>6.0% sodium hypochlorite</td>
<td>200 ppm 1 tbsp per 1 gallon of water. 2 minutes contact time.</td>
<td>2700 ppm ¾ cup per gallon of water. 5 minutes contact time.</td>
</tr>
<tr>
<td>Sanidate 5.0</td>
<td>5.3% peroxyacetic acid (PAA) and 23.0% hydrogen peroxide</td>
<td>147-500 ppm PAA 1.6-5.4 fl. oz. per 5 gallons water. 2 minutes contact time.</td>
<td>230-1000 ppm PAA 0.5-2.2 fl. oz. per gallon of water. 10 minutes contact time.</td>
</tr>
<tr>
<td>Tsunami 100</td>
<td>15.2% peroxyacetic acid (PAA) and 11.2% hydrogen peroxide</td>
<td>150-270 ppm PAA 1.0-1.8 ounces (product) per 8 gallons of water 1 minute contact time.</td>
<td>Not Labeled</td>
</tr>
<tr>
<td>Vigorox SP-15</td>
<td>15.0% peroxyacetic acid (PAA) and 10.0% hydrogen peroxide</td>
<td>85 ppm PAA and 57 ppm hydrogen peroxide 3.1 fluid ounces per 50 gallons of water. 1 minute contact time.</td>
<td>800 ppm PAA and 530 ppm hydrogen peroxide. 3.0 fluid ounces of the product per 5 gallons of potable water.</td>
</tr>
</tbody>
</table>

Extracted from – Summary of chemicals commonly used on many farms showing the differences in concentrations and contact time for sanitizing vs disinfecting. Source: University of Vermont, http://blog.uvm.edu/cwcallah/2020/03/30/clean-sanitize-disinfect/.
How do I choose a sanitizer?

• What surface material are you going to be working with?
• How frequently will you be applying a chemical product to it?
• Are you an organically certified or practicing operation? (OMRI certification at https://www.omri.org/)
• The product must be registered with the EPA and registration in Colorado is also required
• National Pesticide Information Retrieval System can help answer registration questions, and is searchable by state: http://npirspublic.ceris.purdue.edu/ppis/
• What PPE and application equipment (foamer, sprayer) do you need to apply it?
• Talk to chemical supplier about what will work best for your operation
Sanitizers approved for use on food contact surfaces in organic systems by NOP

**Nearly all have a restriction on use, so check with your certifier to make sure you mix, use and dispose of the solution appropriately**

<table>
<thead>
<tr>
<th>Name</th>
<th>Active ingredient(s)</th>
<th>Sublabel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induclor</td>
<td>Calcium hypochlorite</td>
<td></td>
</tr>
<tr>
<td>PPG Calcium Hypochlorite Tablets</td>
<td>Calcium hypochlorite</td>
<td></td>
</tr>
<tr>
<td>Oxine</td>
<td>Chlorine Dioxide</td>
<td></td>
</tr>
<tr>
<td>ZeroTol 2.0</td>
<td>Hydrogen peroxide</td>
<td>B</td>
</tr>
<tr>
<td>BioSide 15%</td>
<td>PAA with hydrogen peroxide</td>
<td>A</td>
</tr>
<tr>
<td>Maguard 5626</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>Oxonia Active</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>Peraclean 15</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>Peraclean 5</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>Perasan A</td>
<td>PAA with hydrogen peroxide</td>
<td>A</td>
</tr>
<tr>
<td>PerOx Extreme</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>Proxitane 15:23</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>Proxitane EQ Liquid Sanitizer</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>Sanidate 15.0</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>Sanidate 5.0</td>
<td>PAA with hydrogen peroxide</td>
<td>A</td>
</tr>
<tr>
<td>Sanidate Disinfectant</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>Tsunami 100</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>VigorOx SP-15</td>
<td>PAA with hydrogen peroxide</td>
<td></td>
</tr>
<tr>
<td>Selectrocide 2L500</td>
<td>Sodium chlorite</td>
<td></td>
</tr>
<tr>
<td>Selectrocide 5G</td>
<td>Sodium chlorite</td>
<td></td>
</tr>
</tbody>
</table>
• Don’t use an untreated water source for cleaners and sanitizers. Best to use municipal water, but you can use tested source verified to contain no generic E. coli (like well water).
• Never use untreated surface water.
• Understand the water quality you will use with the sanitizer
  • pH, temperature, water hardness, high mineral content
Monitor the product throughout its use to maintain the correct concentration

Check the factors that are important to maintaining your sanitizer’s efficacy:

- Water temperature
- pH of solution
- Appropriate concentration

Free chlorine test strips
Sodium hypochlorite (bleach) 6%

Look for:
- **EPA registration number**
- **Percent of Sodium Hypochlorite**

**DANGER: CORROSIVE.**

**FIRST AID:**
IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. IF ON SKIN OR CLOTHING: Take off contaminated clothing. Wash skin with plenty of water for 15-20 minutes. In serious case, call a Poison Control Center or Doctor immediately for further advice.

**Active ingredient:** Sodium Hypochlorite 6%

**NET CONTENTS:** 0.94 fl oz (27.0 ml)

(Yield: 7.9% available chlorine) Contains no phosphates

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**Sanitizing Food Contact Surfaces:** Refrigerators, freezers, plastic cutting boards, stainless cutlery, dishes, glassware, countertops, sinks, pot and pans, stainless utensils - Use approximately 1 tablespoon of this product per gallon of water to prepare a 200 ppm available chlorine solution; use chlorine test strips to determine exact available chlorine concentration. Wash, wipe, or rinse items with detergent and water, then apply sanitizing bleach solution. Let stand 2 minutes. Air dry.

**Sanitizing Hands:**
Petty House: Empty room. Fill with 3/4 of this product per gallon of water. Let stand 5 minutes. Rinse with water. For use in: Hospital, nursing home, correctional facilities, schools, kindergartens, day-care centers, physical therapy, healthcare, medical/vocational schools, day care centers, child care centers, washing floors, sinks, gurneys, carts, transport equipment, treatment areas, laundry rooms, laboratories, kitchens, buildings, offices, housing food preparation areas, animal care facilities, toilets, showers, storage areas, laboratories, patient rooms, hospital, operating rooms, dental offices, laboratories, toilet facilities.

**Sanitizing Air:**
Use this product to disinfect air to reduce the spread of airborne pathogens into the human body, either into the oronasal airways of the upper respiratory tract or onto the skin. It is not intended for use in any other area or environment. Air dry.
Look for:
- EPA registration number
- Sanitizing food contact surfaces instructions

**Sanitizer/Disinfector**
A versatile cleaner, sanitizer, and broad-spectrum disinfectant for hard, non-porous surfaces.

FOR COMMERCIAL USE

**ACTIVE INGREDIENTS:**
- Hypochlorite
- Peroxyacetic Acid
- Sodium Hypochlorite

**Peroxide Enzyme Solution**
- 3.9% (by weight)
- 11.7% (by volume)

**TOTAL:**
- 71.7%

**FOR FOGGING ALCOHOL SOLUTIONS:**
- 70.0%

**SAFE USE:**

1. **Always follow the instructions provided by the manufacturer.**
2. **Use in accordance with the label instructions.**

**Sanitization of Food Contact Surfaces**

**SaniDate 5.0** is an effective sanitizer against *Escherichia coli*, *Staphylococcus aureus* and *Escherichia coli* O157:H7. Its effectiveness against foodborne pathogens is supported by food safety authorities. **SaniDate 5.0** is used in food contact surfaces and equipment. It is a sanitizer on hard, non-porous surfaces as tanks, vats, piping systems, dispensing equipment, evaporators, filters, pumps, evaporators, dishwashing machines, and other food processing equipment.

**WARNING:**

- Use a Sanitizing solutions only if the area is thoroughly cleaned with a non-foaming detergent product. Use solution for no more than 5 minutes. Do not rinse. Sanitize by applying the solution to the food contact surfaces so that they remain visibly wet for 1 minute. Rinse thoroughly with clean, potable water before resuming operation.

**SANITIZING CONVEYORS FOR MEAT, POULTRY, SEAFOOD, FRUITS, AND VEGETABLES**

1. **Apply sanitizer to the return portion of the conveyor or the equipment using a coarse spray or other means to wet the surfaces.**
2. **Allow items and/or surfaces to drain thoroughly before resuming operation.**

This product is not to be used for sanitization of surfaces made of wood. This product can be used in Federally Inspected Meat and Poultry facilities as a sanitizer. Clean equipment immediately after use:

1. Remove all products from equipment unless treating only the return portion of a conveyor.
2. Remove visible food particulate matter and soil by a warm water flush, or pre-flush, or a pre-scrape and, when necessary, pre-soak treatment.
3. Thoroughly wash surfaces or equipment with a good detergent or compatible cleaning solution. Rinse with potable water.
4. Add 1.6 to 5.4 fl. oz. of SaniDate 5.0 to 5 gallons of potable water (147–500 ppm of peroxyacetic acid), and apply by wiping, mopping, or coarse spray, or by adding to closed system.
5. If applicable, fill closed systems with diluted sanitizer solution at a temperature of 5°C (41°F) to 40°C (104°F).
6. Treated surfaces must remain visibly wet for one (1) minute.
7. Allow items and/or surfaces to drain thoroughly before resuming operation. Do not rinse.
Steramine Tablets

Alternate Brand Names:
- Steramine 1-Qt Tablets or Sani-Spray Tablets or Sani-Spray Multi-Purpose Sanitizing Tablets

[The Multi-Purpose Sanitizer]

For Sanitizing Food Contact Surfaces

[USE ONE (1.5g) TO TWO TABLETS PER 1 GALLON OF WATER]

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Prepare sanitizing solutions with warm water. Allow several minutes for tablets to thoroughly dissolve before using.

FOR SANITIZING DISHES, GLASSES, AND UTENSILS IN RESTAURANTS, TAVERNS, AND OTHER PUBLIC EATING PLACES.
1. Scrape and prewash utensils and glasses whenever possible.
2. Wash with a good detergent or compatible cleaner in first sink compartment.
3. Rinse with clean water in second sink compartment.
4. Sanitize in a solution of 1 (1.5g) to 2 TABLETS per 1 GALLON OF WATER (200 to 400 ppm) in third sink compartment. Immerse all utensils for at least one minute or for contact time specified by governing sanitary code.
5. Place sanitized utensils on a rack or drainboard to air dry.
6. A fresh sanitizing solution must be prepared at least daily or more often if the solution becomes diluted or soiled.

DIRECTIONS FOR SPRAYING

FOR SANITIZING FOOD PROCESSING EQUIPMENT, DAIRY EQUIPMENT, SINKS, COUNTERTOPS, TABLES, REFRIGERATED STORAGE AND DISPLAY EQUIPMENT AND OTHER HARD NONPOROUS FOOD CONTACT ARTICLES AND SURFACES.
1. Wash and rinse all articles and surfaces thoroughly.
2. Apply a solution of 200 to 400 ppm concentration by combining 1 (1.5g) or 2 tablets per gallon of warm water, allowing several minutes for tablets to dissolve completely before using. Spray with hand trigger sprayer or wipe on and allow surface to remain wet for at least one minute followed by adequate draining and air drying. Do not rinse or wipe.

For use as a solution (200-400 ppm)
- For use as a spray (300 ppm)
Surface materials

- Think equipment, tools, packaging, floors, walls, ceilings, etc.
- To properly clean and sanitize a surface, it should be “hard” and non-porous
  - Hard metal: stainless steel
  - Soft metals: aluminum, aluminum alloys, brass, bronze, copper, tin, or mild steel
  - Nonmetallic surfaces: plastics or rubber
  - Glass
  - Sealed concrete, ceramics, paint and enamel surfaces
- Understand any vulnerabilities of the surface material- could it be damaged by the cleaning process or the products used?
  - Example – using a scour pad with an abrasive cleaner on a stainless steel surface – this can scratch the surface and potentially cause rust or corrosion
- Any surfaces that are pitted, corroded, or absorb water cannot be adequately cleaned.
Surfaces that are difficult to clean

- Surfaces that are porous absorb water and potential pathogens and can also provide a breeding ground for pathogens
  - Carpeting, padding, open cell foam (cannot clean adequately)
  - Cardboard (cannot clean adequately, brush off)
  - Wood
  - Fabric if unable to be laundered and machine dried
- Other surfaces that are difficult to clean:
  - Wire mesh or grating (many angles and nooks to try to clean sanitize well)
  - Unsealed or damaged concrete (may become pitted, where surface is smooth and/or coated can be cleaned and sanitized)
Coming Soon: CSU Selecting Cleaners and Sanitizers Online website and app

Selecting Appropriate Cleaners and Sanitizers for Farm Surfaces

This interactive tool will help produce growers understand the benefits and precautions of using cleaners and sanitizers on food contact surfaces and help them select the correct products for the types of surface materials on their farms. Choosing appropriate cleaners and sanitizers simultaneously prolongs surface and equipment lifespan and decreases risks of bacterial growth and produce contamination.

Choose Your Surface Material
Click on a material below to identify cleaning and sanitizing products that can be applied to surfaces you use for handling, packing, or storing produce on your farm.
What supplies do you need for cleaning and sanitizing?

- Brushes or scrub pads
  - Use brushes that have molded bristles instead of drilled and stapled
- Buckets or tubs
- Spray bottles, foamer, hoses
  - Understand what you need for the application of the product
  - Store hoses up off the ground and so they drain
- Measuring tools - measuring cups or spoons
  - Choose a vessel that is the exact size or draw a line to delineate the measurement
- Monitoring devices – test strips, titration kit
Best practices for cleaning and sanitizing tools

- Color code or label tools
- Keep the supplies needed in close proximity to where the process will occur
- Clean and sanitize your tools if possible or replace frequently
- Store cleaning and sanitizing tools in a clean, dry location free from pests or other contaminants
- Monitor your inventory to make sure you do not run out and have a backup plan if you do run out of supplies

Photo credit: https://phsinverter.com/cross-contamination-prevention/
Power washing best practices

• Concern with pressure washing - Aerosolization of dirt, debris and potential pathogens will get onto produce or food contact surfaces

• Location – choose the location where you will pressure wash carefully.
  - Do not pressure wash – directly in the dirt/ground; over drains; near produce storage; or any place where the spray from the pressure washing can contaminate produce or food contact surfaces
  - Ideal location for pressure washing is outdoors in an area away from produce fields, produce storage and food contact surfaces/equipment that has good drainage and is away from vehicle/foot traffic

• Limit pressure to 160psi and ensure what you are pressure washing is durable and will not be damaged by the pressure

• Do not add sanitizer to a hot water pressure washer (hotsy)
Power washing indoors

• For indoor equipment
  - If possible, move the piece of equipment outdoors to pressure wash (clean out of place)
  - If that is not possible (clean in place):
    • Clean the equipment at a time when there is no fresh produce present – at the end of the day, on a non-processing day
    • Clean from the top down to wash all dirt, debris and potential pathogens to the floor
    • Avoid spraying the floor with the high-pressure nozzle, switch to a low pressure/low splash nozzle and wash dirt, debris, and cleaner residue to the drain
    • Sanitize as normal
• Never pressure wash drains!
Create a Sanitation SOP

What is going to be cleaned, sanitized, disinfected?

Who will complete the process?

What do you need to complete the process?

How and when will the process be performed?

Sample SOP: Cleaning and Sanitizing Surfaces, Tools, and Equipment
Revision: 1.0
Date: 07/22/2014

1—Purpose
Describes how food contact surfaces, tools, and equipment are to be cleaned and sanitized.

2—Scope
Applicable to farm and packinghouse personnel including farm owners and workers.

3—Responsibility
Workers are responsible for following the SOPs to properly clean and sanitize food contact surfaces. Farm owners and food safety managers are responsible for training the workers on proper technique, providing necessary resources such as tools, detergents and sanitizers, and making sure the cleaning and sanitizing steps are followed correctly.

4—Materials
- Detergent name, brand, and concentration (labeled for use on food contact surfaces) [Provide name here]
- Sanitizer name, brand, and concentration [Provide name here]
- Container(s) as needed for mixing and using detergent(s) and sanitizer(s) or for washing tools
- Brushes, sponges, or towels for scrubbing tools and equipment
- Clean water (microbial equivalent to drinking water)

5—Procedure
1. The surface should be brushed or rinsed to remove visible dirt and debris.
2. Prepare the detergent [Add detergent mixing or preparation instructions here].
3. Apply the prepared detergent solution and scrub the surfaces moving in the direction top to bottom for large pieces of equipment. Detergent should be mixed according to the product instructions.
4. Rinse the surface with clean water until all soap suds are rinsed away moving in the direction top to bottom for large pieces of equipment.

Create a schedule for your sanitation practices

<table>
<thead>
<tr>
<th>Equipment/Area</th>
<th>Cleaning Frequency</th>
<th>Person Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table in packing area</td>
<td>Daily</td>
<td>Emily Jones</td>
</tr>
<tr>
<td>Hydrocooler</td>
<td>Daily</td>
<td>John James</td>
</tr>
<tr>
<td>Packaging area walls</td>
<td>Weekly</td>
<td>Emily Jones</td>
</tr>
<tr>
<td>Inside delivery trucks</td>
<td>Monthly</td>
<td>Eli Packer</td>
</tr>
</tbody>
</table>
Recordkeeping

- Maintain records of cleaning and sanitizing activities
  - Required under the Produce Safety Rule and third-party audits
- Include date, time, item cleaned/sanitized, process used, and who did it
- Produce Safety Alliance has templates: https://producesafetyalliance.cornell.edu/sites/producesafetyalliance.cornell.edu/files/shared/documents/Templates.docx
Key take-aways

• Know the difference between cleaning, sanitizing and disinfecting and the correct steps for each process

• **Cannot sanitize a dirty surface**

• Choose products that work for your operation and are EPA approved for use. Take into consideration:
  – Surface material compatibility
  – Mixing, application, and monitoring requirements
  – PPE requirements

• Keep supplies needed for cleaning and sanitizing stocked and in close proximity to the location where those activities will occur

• Create SOPs and schedules for cleaning and sanitizing processes at your farm
  – Train employees on how to clean and sanitize the surfaces and on product use

• Maintain records of cleaning and sanitizing activities
Additional resources

- CSU Extension produce safety resources and tools: http://www.coproducesafety.org
- University of Vermont Sanitizer Dose Calculator: http://blog.uvm.edu/cwcallah/files/2016/06/Sanitizer-Dose-Calculation.xlsx
- University of Florida Basic elements of cleaning and sanitizing: https://edis.ifas.ufl.edu/pdffiles/FS/FS07700.pdf
- University of Massachusetts How to clean and sanitize video: https://www.youtube.com/watch?v=DckC_kHyD1I
Upcoming Produce Safety Alliance Grower Training March 25-26, 2021

- Virtual course in 2 half-days covering:
  - Requirements in the FSMA Produce Safety Rule and how to meet them;
  - Microorganisms relevant to produce safety and where they may be found on the farm;
  - How to identify microbial risks, practices that reduce risks, and how to begin implementing produce safety practices on the farm; and
  - Parts of a farm food safety plan and how to begin writing one.

- $35/person. Register by March 15, 2021 at: https://cfvga.memberclicks.net/cpsatrainingmarch25-262021#/
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http://www.coproducesafety.org
Please answer the polling questions to provide feedback on what was presented today.

Questions?
Links from slides

- Produce Safety Alliance Sanitizers Excel tool: https://producesafetyalliance.cornell.edu/sites/producesafetyalliance.cornell.edu/files/shared/documents/PSA-Labeled-Sanitizers-for-Produce.xlsx
- Produce Safety Alliance has templates: https://producesafetyalliance.cornell.edu/sites/producesafetyalliance.cornell.edu/files/shared/documents/Templates.docx
- EPA List N – products approved for use against viruses and other emerging pathogens: https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2