



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).



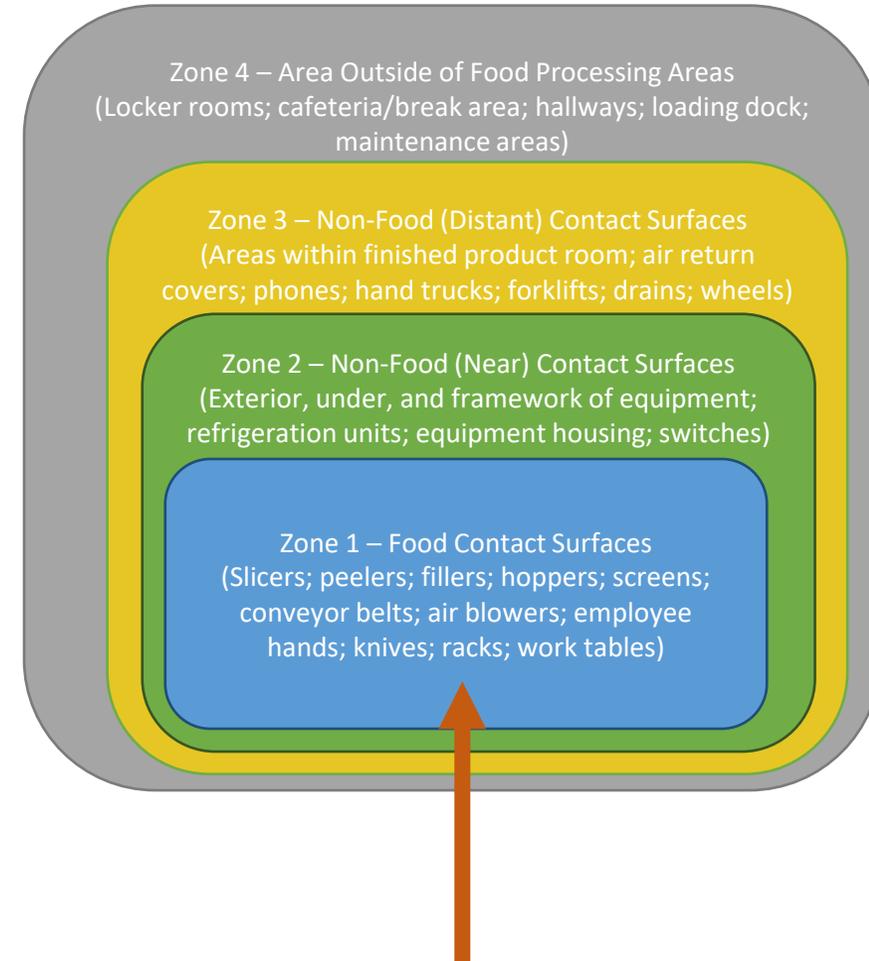
Food contact surfaces

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



Food contact surfaces

Thinking in zones helps you prioritize surfaces for treatment in your sanitation program

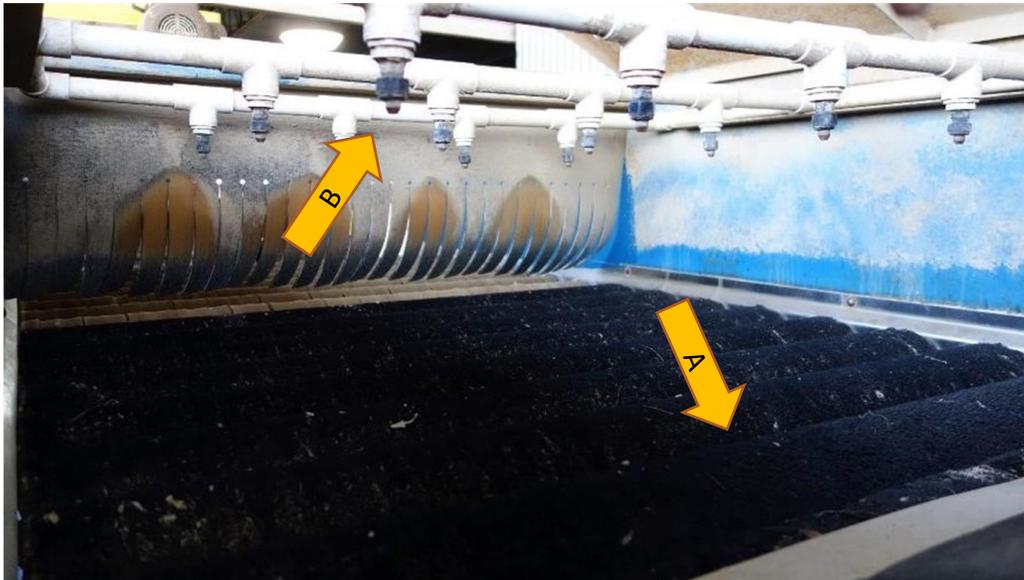
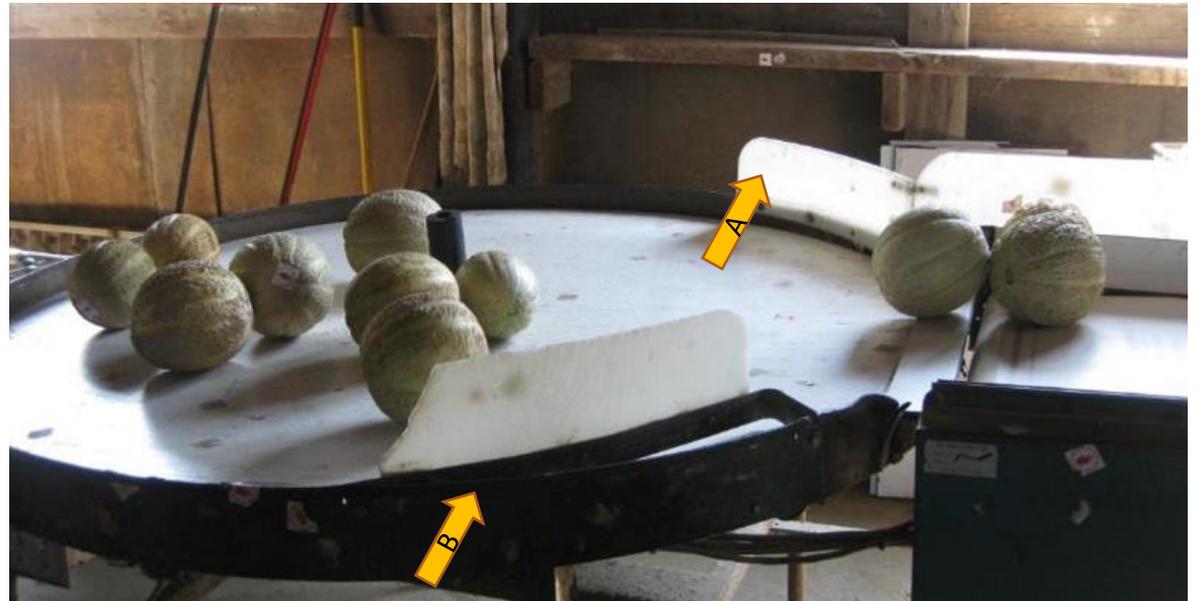


Photo #1

Photo #2



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.

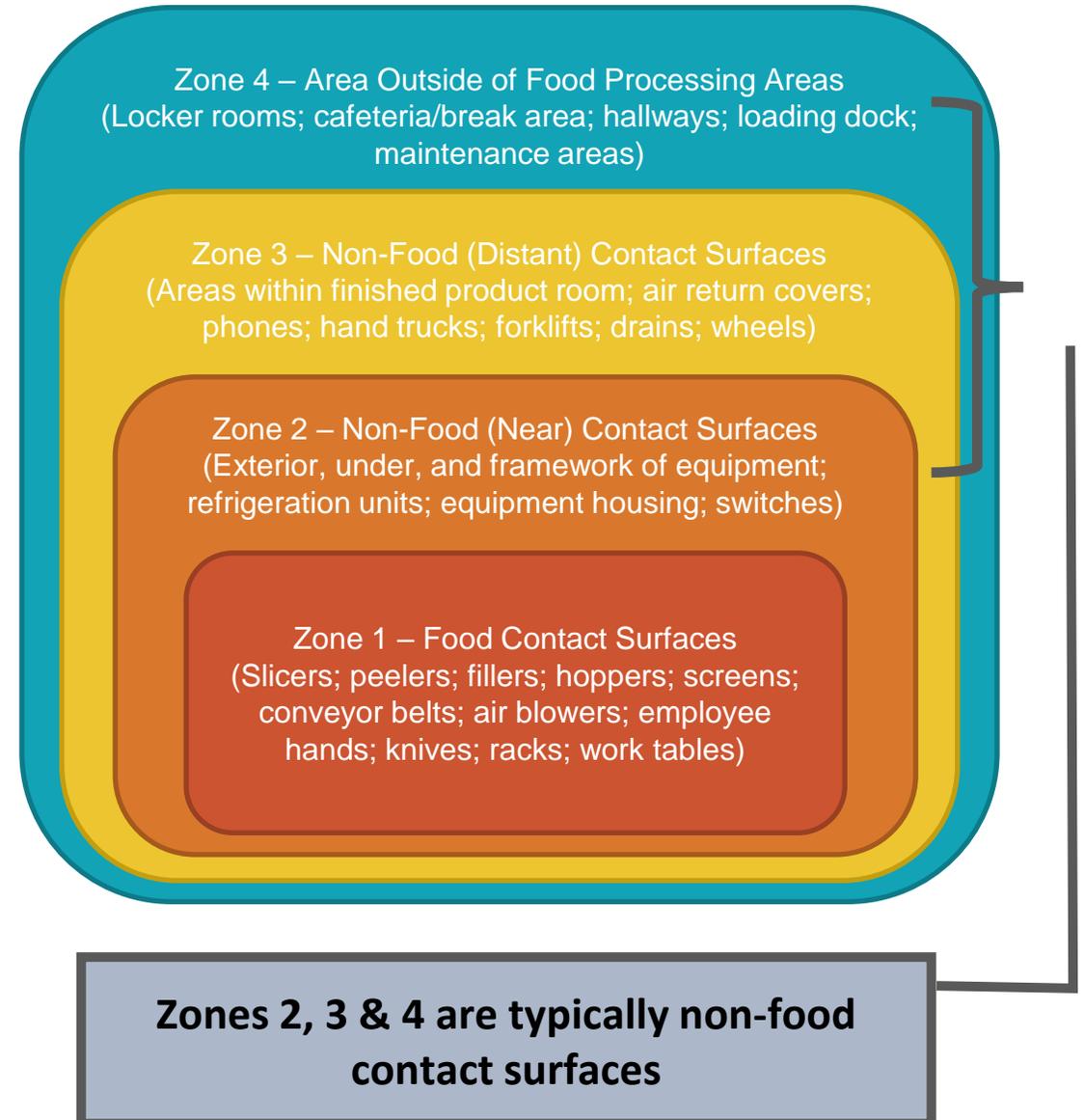




Photo #1

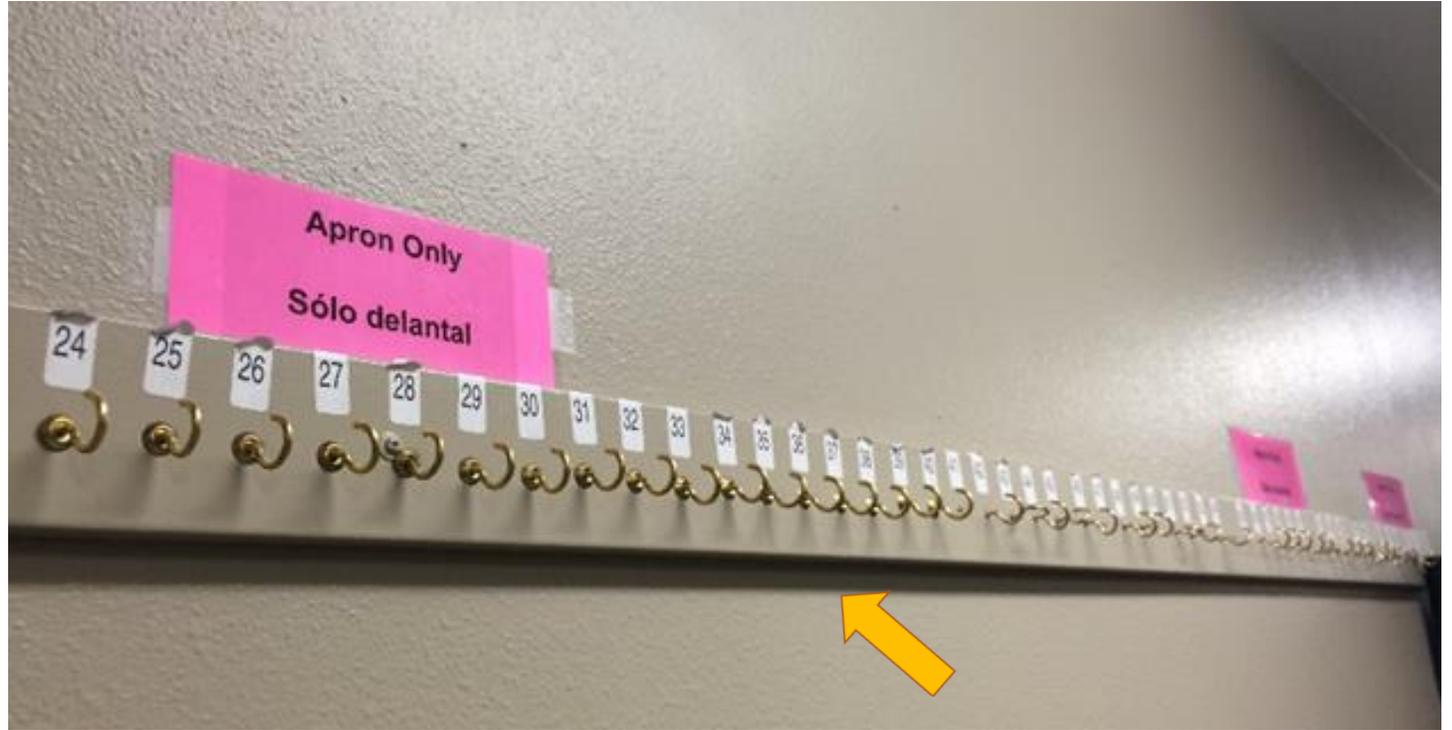
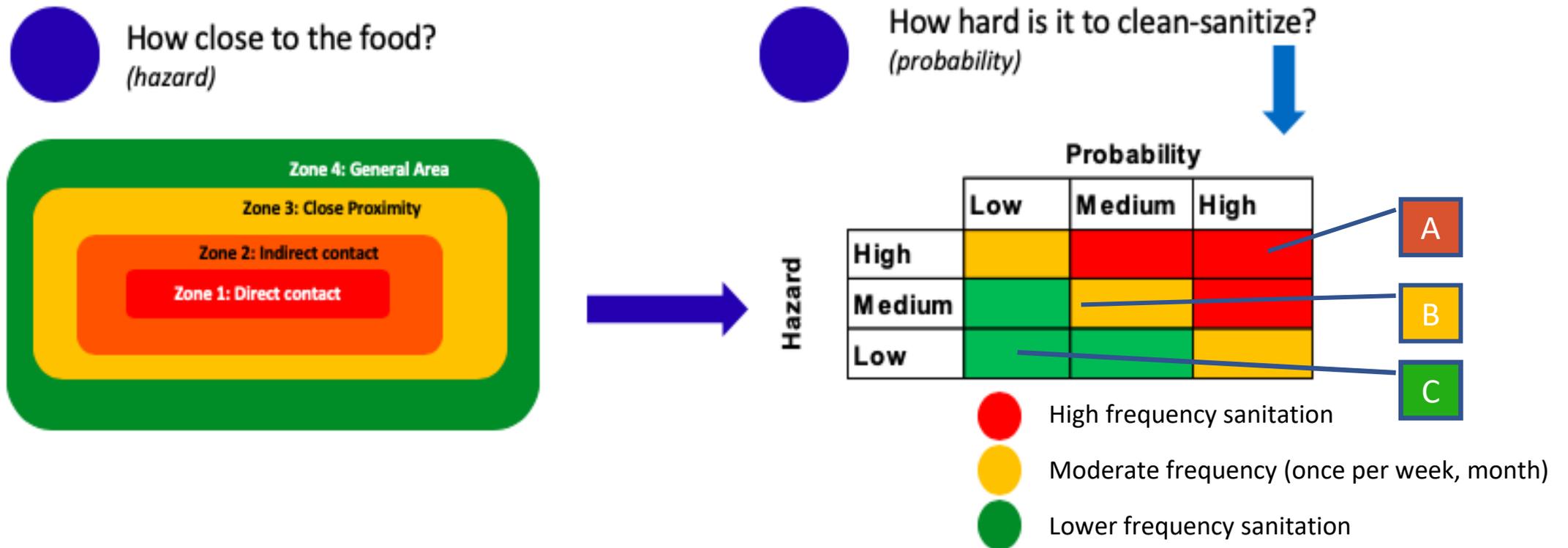


Photo #2

So what's happening with those plastic door flaps?

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



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.



Necessary step before sanitizing or disinfecting

- **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.



For food and non-food contact surfaces

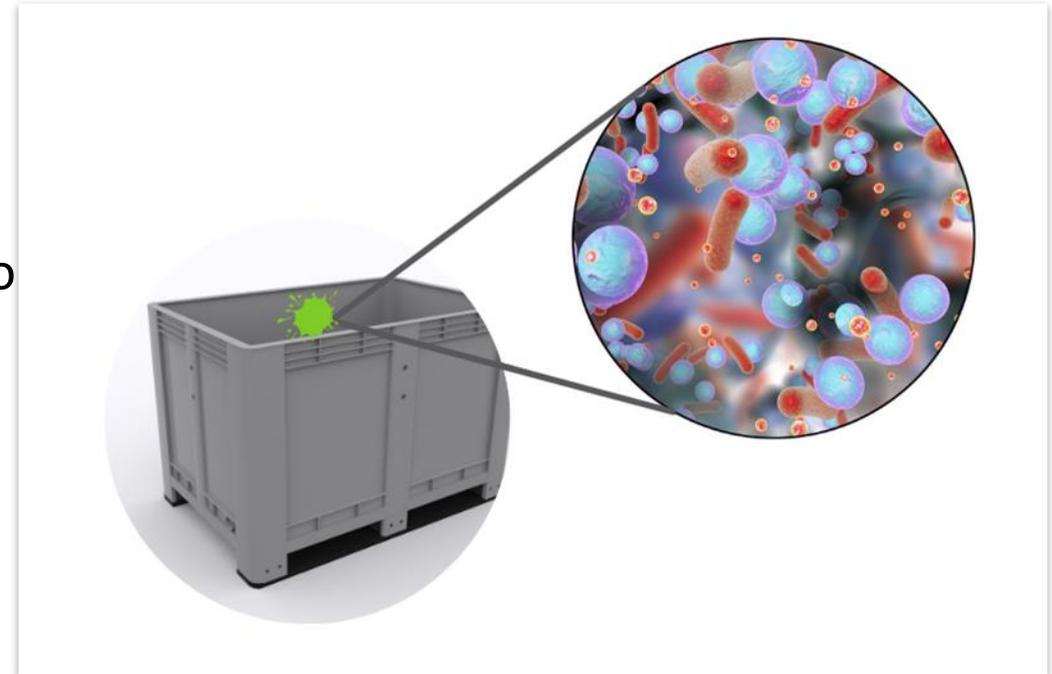
- **Disinfecting** kills bacteria and viruses on surfaces or objects. Disinfecting works by using chemicals to kill germs on surfaces or objects. This process does not necessarily clean dirty surfaces or remove germs, but by killing germs on a surface after cleaning, it can further lower the risk of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



Generally for non-food contact surfaces

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 in 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

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

Choose a cleaner that will be effective on soil you need to remove

•Source: Penn State Extension. Food Safety and Sanitation for Food Manufacturers online course at <https://extension.psu.edu/food-safety-and-sanitation-for-food-manufacturers>

•The University of Florida Extension also has a fact sheet that reviews soils and cleaners in detail: <https://edis.ifas.ufl.edu/pdf/files/FS/FS07700.pdf>

How to clean in 3 steps

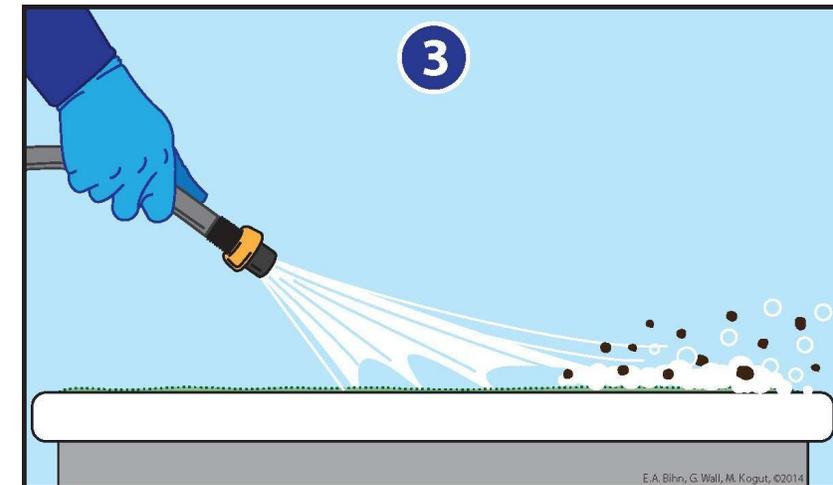
Step 1: Remove any obvious dirt and debris from the food contact surface.



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.



Download fact sheet:

<https://producesafetyalliance.cornell.edu/sites/producesafetyalliance.cornell.edu/files/shared/documents/Cleaning-vs-Sanitizing.pdf>

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.



Last revised: 11/9/2020

This work product was supported under Cooperative Agreements 12-25-A-5357, 15-SCIDX-NY-0001, and 18-SCIDX-NY-0001A01, between the US FDA, USDA, and Cornell University. The information and viewpoints in this product do not necessarily reflect the viewpoints and policies of the supporting organization, cooperating organizations, or Cornell University.

To suggest edits, updates, or additional products, please contact Donna Clements (dmp274@cornell.edu, 509-552-4355).



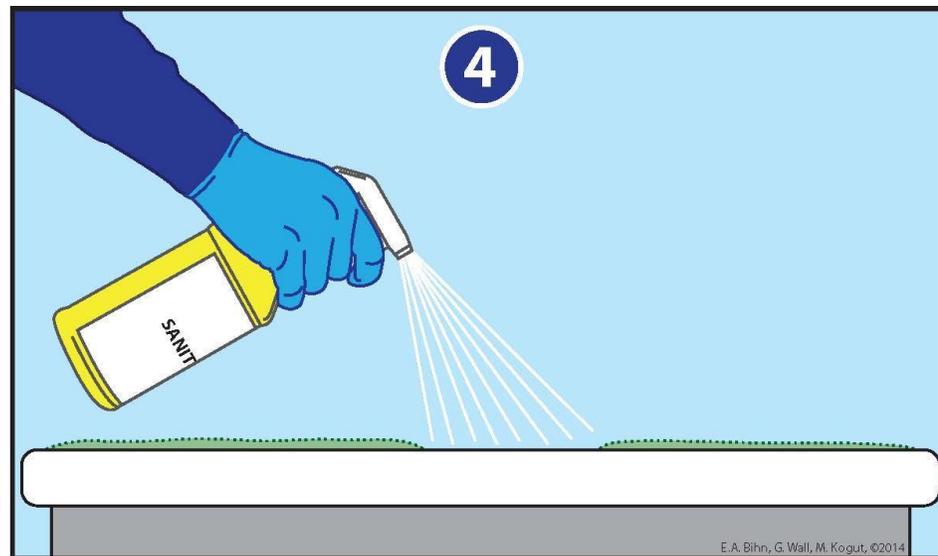
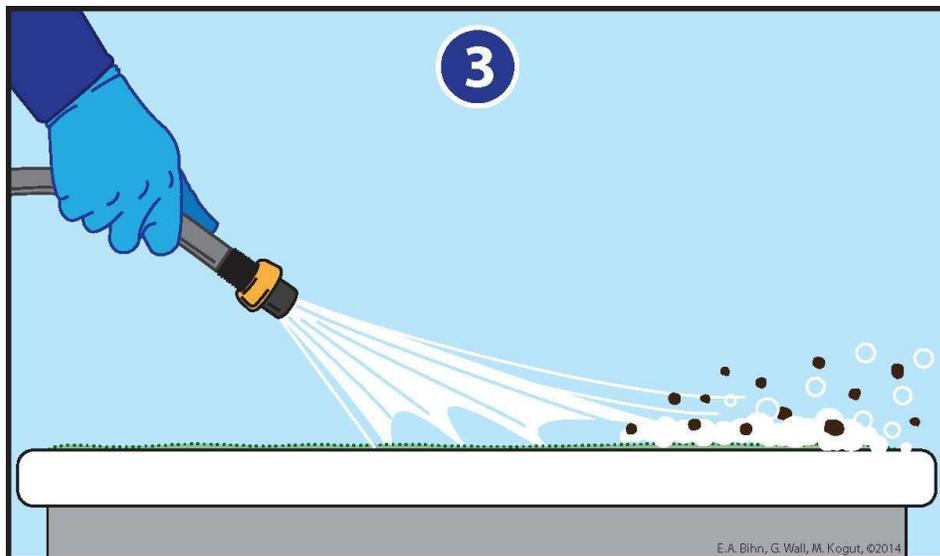
LABEL INFORMATION

Single Product Sheet

[Back to MAIN PAGE](#)

EPA-Labeled Product Name	Alternate Brand Names	EPA Sublabel	Active Ingredients	EPA Registration Details								
				EPA Registration Number	Link to EPA Label	Labeled Use Info Based on Version Date:	Labeled For Use on Non-Porous Food Contact Surfaces?	Labeled For Use in Fruit and Vegetable Wash Water?	Labeled For Use in Irrigation Water?	Contains Efficacy Statement to Control Public Health Organisms?	Organic Materials Review Institute (OMRI) Listing	
Agchlor 310	•Agchlor 310F	N/A		2792-62	Label PDF	5/23/2012	Yes See Page 7	Yes See Page 7	No	No	Not listed	None
Alpet D2	•Alpet D2 Surface Sanitizer •Alpet Surface Sanitizer D2	N/A		73232-1	Label PDF	4/21/2020	Yes See Page 6	No	No	For Food Contact Surfaces	Not listed	None
Anthium Dioxide	•Anthium TM Dioxide •stabilized chlorine dioxide	N/A		9150-2	Label PDF	4/6/2020	Yes See Page 23	Yes See Page 9	Yes See Page 22	No	Not listed	None
Antimicrobial Fruit and Vegetable Treatment	•Market Guard 700 •Simply Save Antimicrobial Produce Wash	N/A		1677-234	Label PDF	10/31/2017	No	Yes See Page 4	No	For Washing Fruits and Vegetables	Not listed	None
BioSide HS 15% (Sublabel A)	•Pentagreen 15% •Peragreen WW	Sublabel A: General Directions for Use (BioSide HS 15%)		63838-2	Label PDF	2/21/2020	Yes See Page 5	Yes See Page 9	No	For Food Contact Surfaces	See Notes for restrictions	OMRI Review Allowed
BioSide HS 15% (Sublabel B)	•Pentagreen 15% •Peragreen WW	Sublabel B: Agricultural Uses (Peragreen 15%)		63838-2	Label PDF	2/21/2020	No	Yes See Page 14	Yes See Page 15	No	See Notes for restrictions	OMRI Review Allowed
Bromicide 4000	•Liquibrom 4000	N/A		83451-17	Label PDF	12/31/2015	No	Yes See Page 4	No	No	Not listed	None
Bromide Plus	•AZURE® Deluxe Algae Controller •Crystal® Blue	N/A		8622-49	Label PDF	8/7/2013	No	Yes See Page 5	No	No	Not listed	None
Busan 6040	N/A	N/A		1448-345	Label PDF	12/5/2012	No	Yes See Page 5	No	No	Not listed	None

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>
 - EPA List N FAQs:
<https://www.epa.gov/coronavirus/frequent-questions-related-coronavirus-covid-19>
- 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

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

Source: North Carolina State University, <https://ncfreshproducesafety.ces.ncsu.edu/wp-content/uploads/2020/03/Novel-Coronavirus-Considerations-for-Small-Farms-040320.pdf?fwd=no>.

Product	Active Ingredients as Received	Labeled Concentration for Sanitizing Hard Surfaces	Labeled Concentration for Disinfecting Hard Surfaces
Ultra Clorox Brand Regular Bleach	6.0% sodium hypochlorite	200 ppm 1 tbsp per 1 gallon of water. 2 minutes contact time.	2700 ppm ¼ cup per gallon of water. 5 minutes contact time.
Sanidate 5.0	5.3% peroxyacetic acid (PAA) and 23.0% hydrogen peroxide	147-500 ppm PAA 1.6-5.4 fl. oz. per 5 gallons water. 2 minutes contact time.	230-1000 ppm PAA 0.5-2.2 fl. oz. per gallon of water. 10 minutes contact time.
Tsunami 100	15.2% peroxyacetic acid (PAA) and 11.2% hydrogen peroxide	150-270 ppm PAA 1.0-1.8 ounces (product) per 8 gallons of water 1 minute contact time.	Not Labeled
Vigoro SP-15	15.0% peroxyacetic acid (PAA) and 10.0% hydrogen peroxide	85 ppm PAA and 57 ppm hydrogen peroxide 3.1 fluid ounces per 50 gallons of water. 1 minute contact time.	800 ppm PAA and 530 ppm hydrogen peroxide. 3.0 fluid ounces of the product per 5 gallons of potable water.

Overview of products, with adjustments for sanitizing and disinfecting levels

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

Name	Active ingredient(s)	Sublabel
Induclor	Calcium hypochlorite	
PPG Calcium Hypochlorite Tablets	Calcium hypochlorite	
Oxine	Chlorine Dioxide	
ZeroTol 2.0	Hydrogen peroxide	B
BioSide 15%	PAA with hydrogen peroxide	A
Maguard 5626	PAA with hydrogen peroxide	
Oxonia Active	PAA with hydrogen peroxide	
Peraclean 15	PAA with hydrogen peroxide	
Peraclean 5	PAA with hydrogen peroxide	
Perasan A	PAA with hydrogen peroxide	A
PerOx Extreme	PAA with hydrogen peroxide	
Proxitane 15:23	PAA with hydrogen peroxide	
Proxitane EQ Liquid Sanitizer	PAA with hydrogen peroxide	
Sanidate 15.0	PAA with hydrogen peroxide	
Sanidate 5.0	PAA with hydrogen peroxide	A
Sanidate Disinfectant	PAA with hydrogen peroxide	
Tsunami 100	PAA with hydrogen peroxide	
VigorOx SP-15	PAA with hydrogen peroxide	
Selectrocide 2L500	Sodium chlorite	
Selectrocide 5G	Sodium chlorite	



Water quality and your sanitation program

- 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



Free chlorine test strips



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

- Water temperature
- pH of solution
- **Appropriate concentration**

Sodium hypochlorite (bleach) 6%

Note: **Bold, italicized text is information for the reader and is not part of the label.**
[Bracketed information is optional text.] Underline text is new. Strike-through (text) means removed.
R0126-30.1

EPA Reg. No. 5813-50 Ultra Chlorox Brand Regular Bleach Page 1 of 40

for front or back

CONCENTRATED

ULTRA

BRAND

- 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. Rinse skin immediately with plenty of water for 15-20 minutes. **IN EITHER CASE, CALL A POISON CONTROL CENTER OR DOCTOR IMMEDIATELY FOR TREATMENT ADVICE.**
See back panel for additional precautionary labeling.

Active Ingredient: Sodium Hypochlorite 6.0%
Other Ingredients: 94.0%
Total: 100.0%

(Yields 5.7% available chlorine)
Contains no phosphorus

NET CONTENTS: _____

ACCEPTED
with COMMENTS
EPA Letter Dated:
MAR - 3 2011

Under the Federal Insecticide,
Fungicide, and Rodenticide Act as
amended, for the pesticide,
registered under EPA Reg. No. 5813-50

Note: **Bold, italicized text is information for the reader and is not part of the label.**
[Bracketed information is optional text.] Underline text is new. Strike-through (text) means removed.
R0126-30.1

EPA Reg. No. 5813-50 Ultra Chlorox Brand Regular Bleach Page 11 of 40

GENERAL USE Continued:

Kitchen: Refrigerators, work surfaces, garbage disposals, freezers, sinks, appliances, plastic laminate, stoves, stovetops, countertops, (ceramic) tile (floors or countertops), vinyl, linoleum, solid surface countertops, sealed granite, sealed marble, glass, garbage cans, trash cans, trash compactors, dish cloths, brushes, synthetic sponges¹⁴, mops, latex enamel painted woodwork, walls, faucets, food storage containers, dishwashers, tea pots, coffee makers, plastic coasters, plastic water bottles, reusable water bottles.
¹⁴Not approved for use in the state of California.

Bathroom: Bathtubs, urinals, faucets, showers, shower curtains, shower walls, shower doors, potty seats, sinks, bathroom jets, countertops, sealed granite, sealed marble, porcelain, floors, vinyl, tile, cat litter boxes, combs and brushes, and mold and mildew removal.

Baby's Nursery -and/or- Items: Hard, nonporous -or- washable toys, changing tables, painted cribs, high chairs, plastic mattress covers, bumpers, and diaper pails.

Outdoors: Coolers, lawn chairs, pool baths, shovels, plastic watering cans, handles. Kills/Removes mold, moss siding, tile, brick, stucco, and patio surfaces, fences, arbors, trellises, benches, and Also use on flower pots and planters before disinfecting.

Around the Home: Colorfast laundry, mouse, dust pans, baby gates, baby

Sports Equipment: Frisbees, ping pong rods, golf clubs, goggles, yoga mats

Pet Items: Dog crates, kennels, pet toys

For use in: Hospitals, nursing home care centers, physicians' offices, hotels, motels/condominiums, timeshares, restrooms, bathrooms, kitchens, schools, buildings, offices, homes, food processing, animal care facilities, universities, closets, churches, storage areas, utility installations, patient rooms, dorms, clinics, play areas, school buses, toilet room facilities.

DISINFECTING:

Use 3/4 cup of this product per gallon of water. Wash, wipe, or rinse items with water, then apply disinfecting -or- bleach solution. Let stand 5 minutes. Rinse thoroughly and air dry.

Toilet Bowls and/or Bidets: Flush toilet/bidet. Pour 1 cup of this product into bowl. Brush entire bowl including rim with a scrub brush or mop; let stand 10 minutes before flushing again.

Potty Seats: Empty seat. Fill with 3/4 water. Let stand 5 minutes. Rinse with water. Let stand 5 minutes. Rinse thoroughly and air dry.

Litter Boxes: Remove litter. Wash box of this product per gallon of water. Rinse thoroughly and air dry. (Let dry.)

Mildew: Use 1 cup of this product per gallon of water. Wash, wipe, or rinse items with water, then apply disinfecting -or- bleach solution. Let stand 5 minutes. Rinse thoroughly and air dry.

SANITIZING:

Food Contact Surfaces: Refrigerators, freezers, plastic cutting boards, stainless cutlery, dishes, glassware, countertops, pots 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 -or- bleach solution. Let stand 2 minutes. Air dry.

Wooden cutting boards: Use approximately three tablespoons of this product per gallon of water to prepare a 600 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 -or- bleach solution. Let stand 2 minutes. Rinse all surfaces with a solution of 1 tablespoon of this product per gallon of water. Do not rinse or soak equipment overnight.

DO NOT USE ON STEEL, ALUMINUM,

or other metal surfaces. Do not use as a disinfectant on any surface or instrument that may come into contact with the human body, either into or on the skin, or on normally sterile areas of the body, or on membranes but which does not ordinarily come into contact with the body, or otherwise enter normally sterile areas. Do not use on medical devices prior to sterilization.

Sanitizing Food Contact Surfaces: Refrigerators, freezers, plastic cutting boards, stainless cutlery, dishes, glassware, countertops, pots 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 -or- bleach solution. Let stand 2 minutes. Air dry.

A complete summary of footnotes can be found on Page 40.

Peroxyacetic acid at 5%



**KEEP OUT OF REACH OF CHILDREN
DANGER – PELIGRO
STRONG OXIDIZING AGENT**

*Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand this label, find someone to explain it to you in detail.)*

FIRST AID	
If in eyes	<ul style="list-style-type: none"> 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. Call a poison control center or doctor for treatment advice.
If on skin or clothing	<ul style="list-style-type: none"> Take off contaminated clothing. Rinse skin immediately with plenty of water for 15–20 minutes. Call a poison control center or doctor for treatment advice.
If swallowed	<ul style="list-style-type: none"> Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.
If inhaled	<ul style="list-style-type: none"> Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for treatment advice.
<p>Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For general information on this product, contact the National Pesticides Information Center (NPIIC) at 1-800-858-7378 (NPIIC web site: www.npiic.org). For medical emergencies, call the poison control center at 1-800-222-1222.</p>	
<p>NOTE TO PHYSICIAN Probable mucosal damage may contraindicate the use of gastric lavage.</p>	

See inside booklet for additional precautionary statements and directions for use.

Net Contents:
 ■ 2.5 ■ 5 ■ 30 ■ 55 ■ 275 ■ 330 gallons

1752-0

Sanitizer/Disinfectant

A versatile cleaner, sanitizer, and broad-spectrum disinfectant for hard, non-porous surfaces

FOR COMMERCIAL USE

ACTIVE INGREDIENTS:

Hydrogen Peroxide..... 23.0%
 Peroxyacetic Acid..... 5.3%
INERT INGREDIENTS:..... 71.7%
TOTAL:..... 100.0%



Manufactured by: Biosafe Systems, Inc.
 22 Meadow Street East Hartford, CT 06108
 1-888-273-3088
 EPA Registration No. 70299-19
 EPA Establishment No.
 ■ 067441-IL-001 ■ 70299-NV-1
 ■ 92957-MI-001 ■ 70299-NV-2
 ■ 082521-GA-001
V19 N1
 011020



and vegetables. For post harvest applications, fruits and vegetables can be sprayed or submerged in the resulting solution for a minimum contact time of 45 seconds, followed by adequate draining.

Note: May cause bleaching of treated surfaces, test commodity

TREATMENT OF FRUIT AND VEGETABLE PROCESSING WATERS

Use SaniDate 5.0 for the treatment of waters used in the processing of fruits and vegetables. Mix SaniDate 5.0 with water either batch-wise or continuously. Add 59.1-209.5 fl. oz. of SaniDate 5.0 solution to 1,000 gallons of water. This will provide 151-512-1,817 ppm of SaniDate 5.0, or 27-96 ppm peroxyacetic acid in the use solution. Fruits and vegetables can be sprayed or submerged in the resulting solution for a contact time of 45 seconds, followed by adequate draining. At this use dilution, SaniDate 5.0 will control the growth of spoilage and decay causing non-public health organisms in process waters and on the surface of post harvest fruits and vegetables. This is not intended for control of any public health organisms on fruit and vegetable surfaces.

TREATMENT FOR NON-POTABLE WATER SYSTEMS (wash tanks, drench tanks, evaporators, humidification systems and/or storage tanks)

Treat water containing plant pathogens with 0.6-2.1 fl. oz. of SaniDate 5.0 per 100 gallons of water or use a dilution rate of 1:620-1:2,200. This will provide 4-14 ppm of SaniDate 5.0, or 24-85 ppm peroxyacetic acid in the use solution.

POST HARVEST SPRAY TREATMENTS ON PROCESS AND PACKING

Inject SaniDate 5.0 directly into spray, misting, humidification, fogging or other system make up system water on process and packing lines to prevent bacterial diseases on post-harvest fruits and vegetables. Inject the product concentrate into the water at a dilution ratio of 1:588-1:2,451. This will provide 24-100 ppm of peroxyacetic acid in the use solution. For best results, where dump tanks are used, make a spray treatment as produce is leaving dump tanks. Applicable for use on all harvest commodities.

FOR FOG TUNNEL AND FOGGING APPLICATIONS OF PRODUCE

Inject SaniDate 5.0 directly into the system at a rate of 22 fl. oz. per 100 gallons of water. This will provide 100 ppm of peroxyacetic acid in the use solution. Allow a contact time of 20-30 seconds with the fog. For best results, distribute produce in a single conveyor and ensure uniform distribution of fog across produce surface by the produce as it passes on the conveyor or by even distribution of the fog in the treated area. Do not rinse. Applicable for use on all types of post-harvest commodities. See specific directions for treatment of post-harvest potatoes.

FOGGING OF FRUITS AND VEGETABLES IN STORAGE

For fruits and vegetables in storage, apply SaniDate 5.0 by fogging to produce to control non-public health organisms that cause spoilage and/or decay, using any type of fogging equipment such as thermo-foggers and cold foggers.

- Prior to fogging, cover any metal equipment or controls inside the storage area that are sensitive to hydrogen peroxide and/or peroxyacetic acid.
- Vacate all personnel from the room prior to fogging.
- Mix the product concentrate with water at 1:588-1:730 ratio (0.17-0.66 fl. oz. per gallon of water) and apply it as a fog directly into the storage. Fog uniform distribution is achieved across all sections of the stored produce. If necessary, fog distribution, a carrier solution compatible with SaniDate 5.0 and use on produce may be added as recommended by fogging equipment manufacturer.
- After fogging, do not allow personnel to enter into treated area until fog has dissipated and there are no strong odors, characteristic of active fogging.
- Make first fog application immediately after produce gets into storage (within 24 hours of storage) using highest rate and repeat application if necessary once a week for up to a month using lowest rate depending on how long the produce will be in storage.

SANITIZATION OF FOOD CONTACT SURFACES

SaniDate 5.0 is an effective sanitizer against *Escherichia coli*, *Staphylococcus aureus* and *Escherichia coli* O157:H7. Also effective against beverage spoilage organisms *Pediococcus damnosus*, *Lactobacillus malefermentans*, and *Saccharomyces cerevisiae*. SaniDate 5.0 is for use in circulation cleaning and institutional/industrial sanitizing of pre-cleaned, hard, non-porous food contact surfaces and equipment.

Use as a sanitizer on hard, non-porous surfaces as tanks, vats, piping systems, pipelines, beverage dispensing equipment, evaporators, filters, pumps, evaporators, clean-in-

place systems, pasteurizers and aseptic equipment used in dairies, breweries, wineries, beverage and food processing plants, conveyors, boxing or packing equipment, peelers, corers, de-boners, scrapers, collators, slicers, dicers, knives, saws, non-wooden cutting

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:

- Remove all products from equipment unless treating only the return portion of a conveyor.
- 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.
- Thoroughly wash surfaces or equipment with a good detergent or compatible cleaning solution. Rinse with potable water.
- 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.
- If applicable, fill closed systems with diluted sanitizer solution at a temperature of 5°C (41°F) to 40°C (104°F).
- Treated surfaces must remain visibly wet for one (1) minute.
- Allow items and/or surfaces to drain thoroughly before resuming operation. Do not rinse.

- for a minimum of 1 minute.
- Place all bottles/cans on a rack or drain board to air dry. Do not rinse.

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

- Remove all products from equipment.
- Prepare solution by adding 1.6-5.4 fl. oz. of SaniDate 5.0 to 5 gallons of potable water (147-500 ppm of peroxyacetic acid).
- Apply sanitizer solution to the return portion of the conveyor or to the equipment using a coarse spray or other means to wet the surfaces.

Look for:
 - EPA registration number
 - Sanitizing food contact surfaces instructions

NOTE: Bracketed information is optional wording/text for product specific labels

STERAMINE™ 1-G Tablets

www.sanitize.com

[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.]

Quaternary ammonium

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

[Directions for Use For Steramine™ 1-QT Tablets or SANI-SPRAY Tablets or SANI-SPRAY MULTI-PURPOSE SANITIZING TABLETS. Below]**Directions for Use**

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

[Steramine 1-QT] [SANI-SPRAY] Tablets is a no-rinse food contact surface sanitizer.

[DIRECTIONS FOR SANITIZING WITH HAND TRIGGER SPRAY BOTTLE]

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 300 ppm concentration by dissolving one tablet (0.56g) in a clean one-quart size (32 oz.) hand trigger spray bottle filled with warm water, allowing several minutes for tablet to dissolve thoroughly before using. Spray surfaces to be sanitized with hand trigger spray bottle and allow surfaces to remain wet for at least one minute followed by adequate draining and air drying. Do not rinse or wipe.]



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.

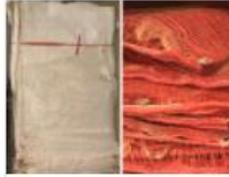
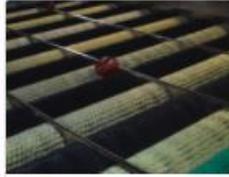
Choosing appropriate cleaners and sanitizers simultaneously prolongs surface and equipment lifespan and decreases risks of bacterial growth and produce contamination.



Get Started →

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.

 Aluminum	 Burlap	 Cardboard	 Cleaning brushes	 Concrete
 Copper and alloys	 Fabric	 Fiberglass	 Foam	 Galvanized metal
 Painted surfaces	 Plastic (hard)	 Plastic (other)	 Roller brushes	 Rubber
 Stainless steel	 Steel and iron	 Wood		

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

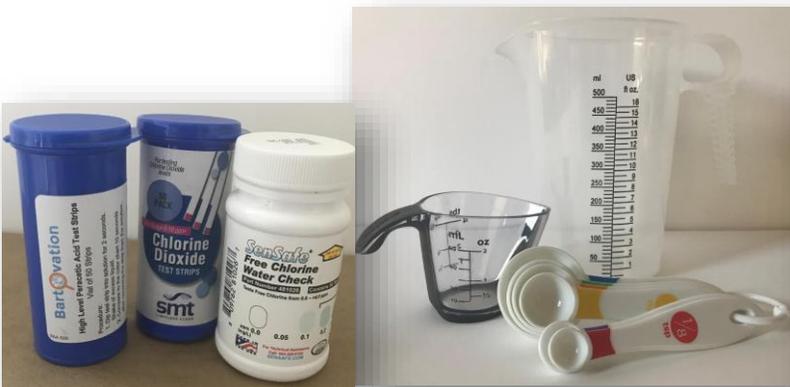


Photo credit:
homedepot.com





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

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!



Photo credit: <https://www.hotsy.com/en/resources/what-is-your-job/food-processing.html>

Create a Sanitation SOP

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

Applies 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.

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?

<https://gaps.cornell.edu/sites/gaps.cornell.edu/files/shared/documents/logsheets/Postharvest%20Sanitation-SOP-Cleaning.docx>

Create a
schedule for
your
sanitation
practices

Sample Sanitation Schedule		
Equipment/Area	Cleaning Frequency	Person Responsible
Table in packing area	Daily	Emily Jones
Hydrocooler	Daily	John James
Packaging area walls	Weekly	Emily Jones
Inside delivery trucks	Monthly	Eli Packer

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>

Cleaning and Sanitizing Record *Template*

Name and address of farm: _____

List the date, time, tool or equipment name, and method for each cleaning or sanitizing activity.

Date	Time	List tools/equipment	Cleaned and/or Sanitized?	Method used	Cleaned By (initials)
10/11/16	10:07 AM	Harvest tools	cleaned	See Cleaning SOP (Removed dirt with brush, washed with detergent, rinsed, air dried)	EAB
10/11/16	10:30 AM	Dump Tank	cleaned and sanitized	See Dump Tank Cleaning and Sanitizing SOP (drained tank, washed with detergent, rinsed, sanitized with 150 ppm NaOCl)	EAB

Reviewed by: _____ Title: _____ Date: _____

FSMA PSR reference § 112.140(b)(2) Confidential Record

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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.coproductsafety.org>
- University of Vermont Sanitizer Dose Calculator: <http://blog.uvm.edu/cwcallah/files/2016/06/Sanitizer-Dose-Calculation.xlsx>
- CSU Cleaning food contact surfaces on farms: <http://freshproduce.colostate.edu/wp-content/uploads/2020/09/Cleaning-Food-Contact-Surfaces-on-Farms-Sept-2020.pdf>
- University of Florida Basic elements of cleaning and sanitizing: <https://edis.ifas.ufl.edu/pdf/files/FS/FS07700.pdf>
- Produce Safety Alliance Cleaning versus sanitizing fact sheet: <https://producesafetyalliance.cornell.edu/sites/producesafetyalliance.cornell.edu/files/shared/documents/Cleaning-vs-Sanitizing.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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For more information or support with FSMA, call 970-491-2942 or [email us](mailto:us@coproducesafety.org).

- [Home](#)
- [COVID-19](#)
- [FSMA](#)
- [Produce Safety Rule](#)
- [Calendar](#)
- [Fellowship](#)
- [News](#)
- [About Us](#)



[Resources to help comply with the FSMA Produce Safety Rule.](#)

[Learn if you are covered under the Produce Safety Rule.](#)

[Learn about the Collaborative's new produce safety mentorship program!](#)

[Research & science applicable to growers & industry partners.](#)

[Support for Colorado's fruit & vegetable producers.](#)

Welcome to Colorado's Produce Safety Information Hub!

This web site provides Colorado's fresh produce industry with food safety information under the Food Safety Modernization Act (FSMA), signed into law in 2011. CSU Extension, the Colorado Department of Agriculture and other organizations are partnering to help produce growers comply with FSMA and enhance the safety of produce grown on their farms.

<http://www.coproducesafety.org>

THANK
YOU

Please answer the polling questions to provide feedback on what was presented today.

Questions?

Links from slides

- The University of Florida Extension soils and cleaners fact sheet: <https://edis.ifas.ufl.edu/pdf/files/FS/FS07700.pdf>.
- Produce Safety Alliance Sanitizers Excel tool: <https://producesafetyalliance.cornell.edu/sites/producesafetyalliance.cornell.edu/files/shared/documents/PSA-Labeled-Sanitizers-for-Produce.xlsx>
- Sanitation SOP: <https://gaps.cornell.edu/sites/gaps.cornell.edu/files/shared/documents/logsheets/Postharvest%20Sanitation-SOP-Cleaning.docx>
- 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>
 - EPA List N FAQs: <https://www.epa.gov/coronavirus/frequent-questions-related-coronavirus-covid-19>
- National Pesticide Information Retrieval System: <http://npirspublic.ceris.purdue.edu/ppis/>