Food Safety Modernization Act Produce Safety Rule

Compliance Guide for Produce Growers - Cleaning & Sanitizing (March 2020)

These recommendations are a subset of the full set of requirements. Each farm will have a unique path to fully meeting the requirements of the Produce Safety Rule. These suggestions and resources are an overview and starting point that apply to many, but not all, farms. For more information visit *www.ksre.ksu.edu/producesafety*.

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Equipment, Tools, and Sanitation

FSMA Produce Safety Rule Reference Subpart C § 112.121

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K-STATE Research and Extension

What are the equipment requirements of the Produce Safety Rule?

1) Equipment and tools must have adequate design, construction, and workmanship to enable them to be adequately cleaned
2) Equipment must be installed and maintained to facilitate cleaning of equipment and all adjacent spaces
3) Prevent equipment and tools from attracting and harboring pests
4) Seams on food contact surfaces of equipment must be either smoothly bonded or maintained to prevent accumulation of filth
5) Inspect and maintain equipment to prevent contamination of produce

What are the cleaning requirements of the Produce Safety Rule?

1) Clean and sanitize all food contact surfaces of equipment and tools as frequently as reasonably necessary to protect against contamination of produce
2) Maintain and clean all non-food-contact surfaces of equipment and tools used during harvesting, packing, and holding of produce to prevent contamination of produce
3) Establish and keep documentation of the date and method of cleaning and sanitizing of equipment and tools

What is a food contact surface?

1) Any surface that directly contacts food - for example food contact surfaces of equipment and tools during harvest, packing and holding activities
2) Surfaces from which drainage, or other transfer, onto the food or onto surfaces that contact the food ordinarily occurs during the normal course of operations. If any food contact surface comes into contact with drip or condensation from ceilings or walls, those sources would be considered food contact surfaces.

How do I properly clean equipment and document the process?

1) Review ***PSA factsheet on Cleaning & Sanitizing***
2) Document the process through a ***Cleaning Log***

What are common characteristics of surfaces and cleaning agents?

1) Review ***Appx 6 Cleaning and Sanitizing Supplemental Information***

Produce Safety ALLIANCE

Cleaning vs. Sanitizing

Always use water that has no detectable generic *E. coli* in 100 mL for all sanitation steps. Ensure workers have access to and wear appropriate Personal Protective Equipment (PPE).

What is the difference and why does it matter?

Cleaning: Physical removal of soil (e.g., plant debris) from surfaces which can include the use of water and detergent

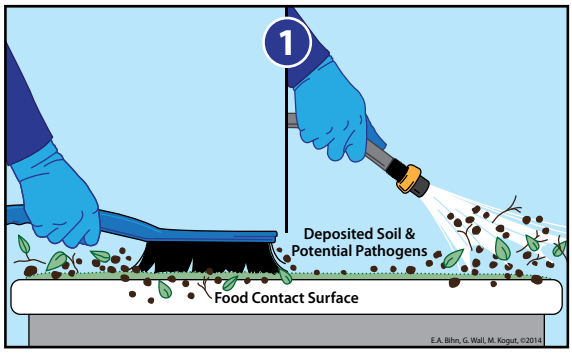
Sanitizing: Treating a cleaned surface to effectively destroy microorganisms of public health significance

Important point: You cannot sanitize a dirty surface. Cleaning always comes first!

- A dirty surface cannot be sanitized! Not all surfaces can be sanitized, but all surfaces can be cleaned! This may include sweeping, wiping off tables, or brushing/rinsing off dirt from harvest totes. Cleaning must be done before sanitizing because sanitizing is generally not effective unless the surface is cleaned first.

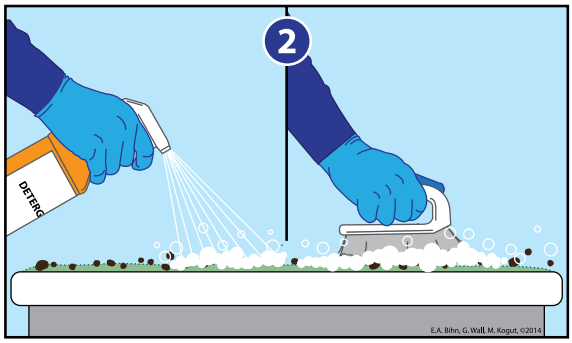
Four steps to cleaning and sanitizing

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



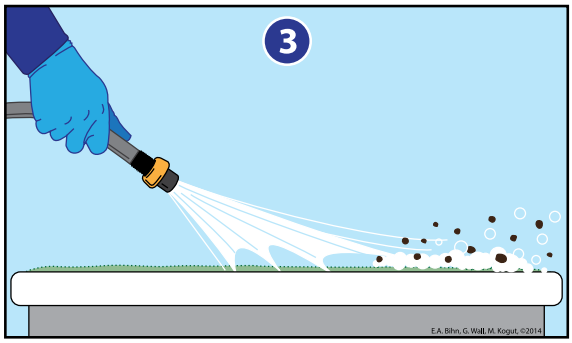
- First, remove any obvious dirt and debris from the food contact surface. This can be done using a brush to sweep, air to blow off, or water to rinse off debris. The right pressure is important.
- Avoid cleaning with high pressure washers or air compressors, as this could spread pathogens and other debris over a large area.
- Overly low pressure water or air may not effectively remove soil and debris from surfaces.
- Use just enough pressure to remove the debris.
- Tools should have a designated area for use. This can be achieved through color coding. For instance, black handles can designate use on floors only and blue handles could designate use on food contact surfaces such as conveyor belts.

Step 2: *Apply a detergent and scrub the surface*



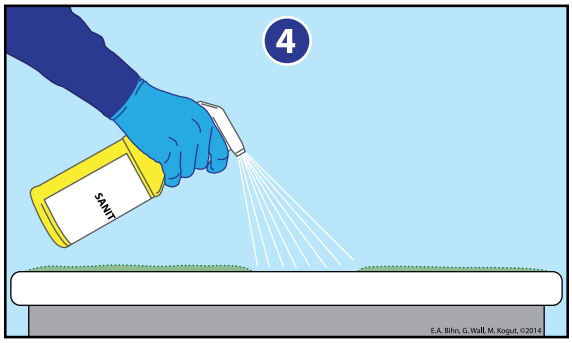
- Be sure to use a detergent effective on the type of soil that needs to be removed. Some detergents are designed to remove fats (e.g., from animal slaughter) while others may be more effective at removing carbohydrates (e.g., sugars from fruit), or proteins, so select the detergent that removes the type of soil that is present.
- Detergents should be appropriate for use on food contact surfaces.
- Apply the detergent at the level recommended on the label and physically scrub the surface to remove any soil.
- Removing the soil and other organic build-up can help minimize the formation of biofilms.

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



- Rinse the surface with clean water that has no detectable generic *E. coli* in a 100 mL sample.
- Make sure all of the detergent and soil is removed.
- Avoid rinsing with high pressure washers as this could spread pathogens over a large area, recontaminating areas that may have already been cleaned.
- Minimize splashing or aerosolizing to prevent the spread of contamination from one surface (e.g., floors, floor drains) to another by using high volume, low spray water.

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.*



- Sanitizer: A substance that reduces the amount of microorganisms to acceptable levels. Sanitizers are generally considered to be part of a broader group of substances called antimicrobial pesticides. The label will describe approved uses, such as for water or for food contact surfaces, as well as approved concentrations.
- Apply a registered sanitizer approved for use on food contact surfaces. Ensure that the product is the proper concentration per the label instructions.
- Apply and use sanitizers according to label instructions. There may be a 5th step if the sanitizer requires a final rinse, so be sure to read and follow the label. See Selecting an EPA-Labeled Sanitizer.
- Allow the surface to air dry.
- Document this as a clean break if the farm separates 'lots' using this process.
- In organic operations, the application of a sanitizer may need to be followed by a potable water rinse. Follow the certifier's requirements for application and residue management on food contact surfaces.

Clean Breaks

- Establishing a 'clean break' can help limit the amount of product subject to a recall or withdrawal from the market. Many produce packers establish a traceability program, including 'lot' designation, to follow their products through the food system and to limit risk to their business from a recall. A sanitation 'clean break' is needed before and after the production of a 'lot' to consider it separate from other production 'lots'. In a recent produce-associated recall, the lack of a defined clean break resulted in an entire season's worth of production being withdrawn instead being limited to specific 'lot' or 'lots' (Chapman and Danyluk, 2013).
- Documentation is key to establishing a clean break. Be sure to keep records of when, how, and what was cleaned and sanitized in the packinghouse as well as any monitoring steps and who completed each task. These records will help establish distinct lots and document clean breaks.

Reference:

- Chapman, B., & Danyluk, M. (2013). Establishing Lot Size through Sanitation Clean Breaks in Produce Packing Facilities. University of Florida/IFAS Extension.

Cleaning and Sanitizing Record

Farm:

Date	Time	Tools/Equipment	Cleaned and/or Sanitized?	Method used	Cleaned By

Reviewed by: **Title:** **Date:**

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

Appendix 6. Cleaning and Sanitizing Supplemental Information

A6.1 GENERAL CHARACTERISTICS OF SOME FOOD CONTACT SURFACES

Surface Material	Concerns	Recommendations
Aluminum	Readily attacked by acidic and highly alkaline cleaners.	Use only soft metal-safe, moderately alkaline cleaners
Black iron or cast iron	Acid or chlorinated detergents can cause rust. Lacks strength	Not recommended in food processing. If present in drains, use moderately alkaline cleaners.
Brass, copper, mild steel	All less corrosion resistant than stainless steel.	Acidic cleaners encourage steel rusting; use moderately alkaline cleaners with corrosion inhibitors.
Concrete	Often etched by acidic products and cleaning compounds. Can crack	Concrete should be dense and acid resistant. Materials should not loosen from surface. Use alkaline cleaners.
Galvanized metals	Tend to rust leaving a white powder by-product due to zinc corrosion that could cause product adulteration.	Avoid use as food contact surface. Should not be used with acidic foods
Glass	Strong caustic cleaning compounds can etch.	Clean with moderately alkaline or neutral detergents.
Lead	Solder and flux containing more than 0.2% lead may not be used as a food contact surface	Try to eliminate use in food processing plant.
Nylon	Sensitive to acidic cleaners	Do not use acidic cleaners
Paint and sealants	Chemical leaching, flaking and peeling.	Generally, not recommended for direct contact surfaces, especially those subject to abrasion. Use only approved substances. Use moderately alkaline cleaners.
Plastics	Some stain easily. Some cannot be used at very low or high processing temperatures. May crack or cloud from prolonged exposure to strong acidic or alkaline cleaners; easily scratched.	More corrosion resistant than stainless steel; resistant to chlorine. Useful to color coordinate items for intended use (e.g., treated seeds vs. untreated seeds) and select plastics that will not deform or crack when exposed to processing conditions.
Rubber	Damaged by certain solvents. Deteriorates with constant chlorine use. Trimming boards can warp and their surface can dull knife blades.	Avoid porous or spongy types that hold water or food debris. Use alkaline cleaners
Stainless steel	Expensive, certain grades are pitted by chlorine or other oxidizers.	Best metal surfaces for food processing. Consider 300 level series. Use non-abrasive acidic and alkaline cleaners; do not use hydrochloric acid or chlorides.
Wood	Pervious to moisture and oils/fats. Softened by alkali and other caustics. Often difficult to clean.	Should not be used in food applications. Where used, clean with detergents containing surfactants. Treated woods must meet criteria for wood preservatives in 21 CFR 178.380. Limit use as food contact surface.
Adapted from National Seafood HACCP Alliance, 2000. *Sanitation Control Procedures for Processing Fish and Fishery Products*, pp. 2-8, and Ontario Ministry of Agriculture, Food and Rural Affairs, 2006.		

A6.2 TYPES OF SANITIZERS

Sanitizer	Forms/ Description	Advantages	Disadvantages
Chlorine	Hypochlorite Chlorine gas Organic chlorine, e.g., chloramines	- Kills most types of microorganisms - Less affected by hard water than some - Does not form films - Effective at low temperatures - Relatively inexpensive - Concentration determined by test strips	- May corrode metals and weaken rubber - Irritating to skin, eyes and throat - Unstable, dissipates quickly - Liquid chlorine loses strength in storage - pH sensitive
Iodophors	Iodine dissolved in surfactant and acid	- Kills most types of microorganisms - Less affected by organic matter than some - Less pH sensitive than chlorine - Concentration determined by test strips - Solution color indicates active sanitizer	- May stain plastics and porous materials - Inactivated above 120°F (48.9°C) - Reduced effectiveness at alkaline pH - More expensive than hypochlorites - May be unsuitable for CIP due to foaming
Quaternary Ammonium Compounds	Benzalkonium chloride and related compounds, sometimes called quats or QACs	- Non-corrosive - Less affected by organic matter than some - Residual antimicrobial activity if not rinsed - Can be applied as foam for visual control - Effective against *Listeria monocytogenes* - Effective for odor control - Concentration determined by test strips	- Inactivated by most detergents - May be ineffective against certain organisms - May be inactivated by hard water - Effectiveness varies with formulation - Not as effective at low temperature as some - May be unsuitable for CIP due to foaming
Acid-Anionic	Combination of certain surfactants and acids	- Sanitize and acid rinse in one step - Very stable - Less affected by organic matter than some - Can be applied at high temperature - Not affected by hard water	- Effectiveness varies with microorganism - More expensive than some - pH sensitive (use below pH 3.0) - Corrodes some metals - May be unsuitable for CIP due to foaming
Peroxy Compounds	Acetic acid and hydrogen peroxide combine to form peroxyacetic acid	- Best against bacteria in biofilm - Kills most types of microorganisms - Relatively stable in use - Effective at low temperatures - Meets most discharge requirements - Low foaming; suitable for CIP	- More expensive than some - Inactivated by some metals/ organics - May corrode some metals - Not as effective as some against yeast and molds
continued			

Sanitizer	Forms/ Description	Advantages	Disadvantages
Carboxylic Acid	Fatty acids combined with other acids; sometimes called fatty acid sanitizers	- Kills most types of bacteria - Sanitize and acid rinse in one step - Low foaming, suitable for CIP - Stable in presence of organic matter - Less affected by hard water than some	- Inactivated by some detergents - pH sensitive (use below pH 3.5) - Less effective than chlorine at low temperatures - May damage non-stainless steel materials - Less effective against yeasts and molds than some
Chlorine Dioxide	A gas formed on-site and dissolved in solution or by acidification of chlorite and chlorate salts	- Kills most types of microorganisms - Stronger oxidizer (sanitizer) than chlorine - Less affected by organic matter than some - Less corrosive than chlorine - Less pH sensitive than some	- Unstable and cannot be stored - Potentially explosive and toxic - Relatively high initial equipment cost
Ozone	A gas formed on-site and dissolved in solution	- Kills most types of microorganisms - Stronger oxidizer (sanitizer) than chlorine and chlorine dioxide	- Unstable and cannot be stored - May corrode metals and weaken rubber - Potentially toxic - Inactivated by organic matter (similar to chlorine) pH sensitive - More expensive than most
Hot Water/ Heated Solutions	Water at 170 – 190°F (76.7 –87.8°C)	- Kills most types of microorganisms - Penetrates irregular surfaces - Suitable for CIP - Relatively inexpensive	- May form films or scale on equipment - Burn hazard - Contact time sensitive; inappropriate for general sanitation
From National Seafood HACCP Alliance, 2000. *Sanitation Control Procedures for Processing Fish and Fishery Products*, pp. 2-22 and 2-23.			