

Food Safety on the Farm: Good Agricultural Practices and Good Handling Practices – Packing Operation Sanitation¹

J. A. Lepper, A. Sreedharan, R. M. Goodrich-Schneider, and K. R. Schneider²

As part of the Food Safety on the Farm series, a collection that reviews the generally recognized principles of GAPs as they relate to produce, primarily at the farm level and with a particular focus on fresh Florida crops and practices, this publication focuses on GAPs and GHPs relating specifically to packing operation sanitation. The publications in this series can be found online at the EDIS website at http://edis.ifas.ufl.edu/topic_series_food_safety_on_the_farm.

Introduction

Good agricultural practices (GAPs) and good handling practices (GHPs) encompass the general procedures that growers, packers, and processors of fresh fruits and vegetables should follow to ensure the safety of their product. GAPs usually deal with preharvest practices (i.e., in the field), while GHPs cover postharvest practices, including packing, storage, and shipping. This factsheet covers GAPs relating to packing operation sanitation. There are seven other UF/IFAS Extension factsheets in the 'Food Safety on the Farm' series that focus on specific aspects of the GAPs program and how they relate to Florida crops and practices.

Under the new Food Safety Modernization Act (FSMA), GAPs are a foundation of the Produce Safety Rule (PSR). Other than for round tomatoes in Florida (T-GAPs regulation), GAPs have mainly been a voluntary program.

Additionally, the PSR mandates that all non-exempt operations follow these new FSMA federal guidelines (6), but for all exempt commodities and for those producers exporting to foreign countries, GAPs may still be required. Both the mandatory PSR and GAPs aim to reduce the foodborne illness burden associated with produce.

Microbial Hazards

Poor sanitation in a packing operation environment greatly increases the risk of contaminating fresh produce. Anything that comes in contact with produce can be a source of pathogens (microorganisms causing harm), from equipment surfaces to the water supply. To lower the potential for contamination, it is important to take a proactive role in maintaining high sanitation standards as part of standard operation procedure throughout the packing operation.

Regulatory Background

Similar to the recommended GAPs derived from the Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables, Title 21 of the Code of Federal Regulations (CFR), part 117, section 20 provides required Good Manufacturing Practices (GMPs) for covered operations regarding grounds of food plants (1, 4). Previously, these provisions were located in part 110, but have been

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2. J. A. Lepper, food safety coordinator; A. Sreedharan, former postdoctoral research associate; R. M. Goodrich-Schneider, professor; and K. R. Schneider, professor; Food Science and Human Nutrition Department, UF/IFAS Extension, Gainesville, FL 32611.

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reorganized into part 117 since the enactment of the FSMA. Included are requirements for proper maintenance and storage of equipment, plant construction and design, grounds sanitation, and pest control (1). New considerations also include protection from allergen cross-contact, which may be a concern for a co-op packing tree nuts (e.g., coconuts, almonds, etc.), and/or peanut, along with other produce. Additionally, a farm mixed-type facility that creates a distinct raw agricultural commodity (RAC) processed beyond drying, dehydrating, packaging, and/or labeling, such as dried, diced mangoes, would have to comply with these regulations unless that facility meets the specifications for an exemption or a qualified exemption. Conversely, if a farm or farm mixed-type facility dries or dehydrates a RAC to create a distinct commodity without further processing (e.g., dried, whole blueberries), that entity can meet FSMA requirements for packing, packaging, and holding activities by either complying with the PSR found in 21 CFR part 112 or by complying with GMPs in subpart B of the Preventive Controls for Human Food (PCHF). Any activities of a farm mixed-type facility that fall within the farm definition are exempt from GMPs and may have to comply with the PSR.

Considering the FSMA regulations are science-based, minimum standards for safe food practices, growers must be aware and comply with more stringent regulations. State and local regulatory authorities can adopt mandatory and more specific regulations to improve food safety. Tomato operations in Florida must follow sanitary facility standards among other Tomato Good Agricultural Practices (T-GAPs) during all steps of production (3). These guidelines found in the Tomato Best Practices Manual have been made into rule (Chapter 5G-6) pursuant to Tomato Inspection Law Section 500.70 of the Florida Statutes, which took effect July 1, 2008 (2).

In response to and recognition of nationwide food safety issues, the FSMA was passed by Congress and signed by the President in January 2011 (6). The new law requires companies to implement a food safety program that significantly minimizes potential hazards and risk of foodborne illness. The PSR, one of the seven main components of FSMA, establishes standards to ensure safe growing, harvesting, packing, holding, and (to a limited degree) manufacturing and processing of covered produce on farms. Current GAP programs, with the exclusion of tomatoes in Florida and leafy green producers on the west coast that are part of the Leafy Green Marketing Agreement (LGMA), are intended as guidance, not as a regulation. These standards are usually mandated or enforced by the buyers. However, the PSR is required for all non-exempt operations that fall under

the farm definition (7, 8). For example, an aggregator that packs RACs from several different locations must comply with the PSR as opposed to the PCHF rule unless a farm does not own the sole majority of the product packed. A coverage and exemptions flow chart is available on the FDA website for operations to help determine compliance with the PSR (5, 6).

Subpart L of the PSR (Equipment, Tools, Buildings, and Sanitation) requires companies to ensure that equipment, tools, and buildings/operations that come in contact with covered produce during growing, harvesting, packing and holding activities are clean and properly maintained to prevent or reduce produce contamination (7). Subpart E (Agricultural Water) also requires monitoring of agricultural water used in packing and holding of covered produce to prevent contamination by ensuring water is maintained at safe and adequate sanitary quality for the intended use (7). Whether covered or exempt, taking immediate steps to implement packing operation sanitation GAPs will benefit a company's financial viability and overall produce safety. Moreover, even farms exempt from the PSR are subject to the provisions of the Food, Drug and Cosmetic Act (FD&C Act) preventing adulterated food from entering commerce.

How to Control Potential Hazards

For FSMA regulations such as the PSR to be successful, prerequisite programs such as GAPs are necessary to bolster such broad, scalable provisions. Required regulations like the PSR use mandatory verbiage, such as “must”, as opposed to suggested verbiage used in GAPs, such as “should”. Guidance from GAPs may be used to satisfy a mandatory requirement in the PSR and play an imperative role in the reduction of potential hazards. Of the numerous GAPs that can be implemented to minimize contamination of produce, the following have been recommended in the US Food and Drug Administration (FDA) Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables for produce packing, operation maintenance, and pest control (4).

General Packing Considerations

- Remove as much dirt and mud as possible from fresh produce outside of packing operations or packing areas. Removing dirt outside the packing operation minimizes the accumulation of contamination inside the operation.
- As part of the sorting and grading process, remove injured and decayed produce from the rest of the crop to prevent potential spread of contamination to uninfected produce.

- Take steps to prevent airborne contaminants from entering open packing operations. Situate packing operations away from livestock, poultry, and manure storage and treatment operations, since these may be a source of airborne contaminants.
- Repair or discard damaged containers—inspect containers regularly. Storage containers that are so damaged that they cannot be thoroughly cleaned should be discarded.
- Clean and sanitize containers and bins before using them to transport fresh produce.
- Protect unused, cleaned, and new packing containers from contamination when in storage. Sources of contaminants include pests, dirt, and water condensation from overhead equipment and structures.

As part of general packing GAPs, workers involved in handling fresh produce should also practice good hygiene. For more information, see *Food Safety on the Farm: Good Agricultural Practices and Good Handling Practices – Worker Health and Hygiene*, a factsheet in this series by Schneider and others (9).

General Considerations for Facility Maintenance

Produce is highly susceptible to contamination during postharvest handling due to frequent and long contact with processing, wash water, and equipment surfaces. Recirculated water has the chance to cross-transfer pathogens to crops, and thus should be continuously sanitized. Regularly cleaning packing and storage operations can also help prevent contamination. Equipment used in sorting, grading and packing produce should be designed so that it can be adequately cleaned. The following GAPs should be considered in maintaining operation sanitation:

- Ensure and maintain processing and wash-water quality through practices such as periodically sampling and testing water, changing water as necessary, and sanitizing water contact surfaces. For more information, refer to *Food Safety on the Farm: Good Agricultural Practices and Good Handling Practices – Water*, a factsheet in this series by Schneider and others (10).
- Keep equipment or machinery that comes in contact with fresh produce clean. All equipment and protective clothing, such as aprons and gloves, can accumulate and trap soil and pathogens over time. Therefore, they should be cleaned regularly, inspected for defects, and replaced if damaged.
- Clean packing areas at the end of each production day; removing visible mud and debris and sanitizing the washing, grading, sorting and packing lines eliminates environments for microbial survival and growth.
- Inspect the cooling system daily to ensure proper functioning of the equipment and clean regularly.
- Clean produce storage areas regularly; removing visible debris, dirt, and unnecessary items from storage areas on an ongoing basis can help prevent contamination. Take steps to minimize dust and other airborne contaminants.

Pest Control

Animals can be vectors for diseases by carrying and transferring pathogenic microorganisms to the produce they come in contact with. Exclude pests from the packing-house. To minimize the potential for contamination, take precautions against a variety of different pests, including mammals, birds, snails, reptiles, and insects. Consider the following GAPs:

- Establish a pest-control system. A standalone pest control program with licensed operators, as part of a larger food safety system, can help reduce the risk of contamination by requiring frequent monitoring and cleaning of affected areas in all operations. Follow up with the person in charge of pest control to ensure that GAPs are being followed and the process is working.
- Maintain the grounds in good condition. Discourage pests from inhabiting, feeding and breeding around produce fields by keeping grounds free of waste, litter, and other unnecessary items, such as old, unused equipment and product remnants. Keep grasses cut short and maintain adequate surface drainage to prevent standing water and plant stress.
- Monitor and maintain operations regularly. As part of a pest control program, regularly inspect all operations for evidence of pests. Maintain a clean operation by removing dead animals promptly, cleaning soiled surfaces, and minimizing potential nesting and hiding places for pests.
- Block access of pests into enclosed operations. Close off holes in walls, doors, floors, vents, etc. that pests could use to enter the operation. Use screens, wind curtains, and traps when necessary.
- Use a pest control log. Keep a log that records inspection dates and what has been done to fix any pest problems. Monitor affected and treated areas often to see if more effective steps need to be taken.

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