

# Food Safety on the Farm: Good Agricultural Practices and Good Handling Practices—Transportation<sup>1</sup>

Christopher R. Pabst, Jaysankar De, Alina Balaguero, Jessica Lepper, Renée M. Goodrich-Schneider, and Keith R. Schneider<sup>2</sup>

*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 particular focus on fresh Florida crops and practices, this publication focuses on GAPs and GHPs relating specifically to post-harvest transportation of produce. 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](http://edis.ifas.ufl.edu/topic_series_food_safety_on_the_farm).*

## Introduction

The principles of Good Agricultural Practices (GAPs) were introduced by the US Food and Drug Administration (FDA) in the 1998 Guidance for Industry *Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables* (FDA 1998). This guidance document for the fresh fruit and vegetable industry provided general guidelines for reducing the risk of contamination of fresh produce by microbial organisms. In response to this guidance, the United States Department of Agriculture (USDA) formally implemented the Good Agricultural Practices & Good Handling Practices (GAPs and GHPs) audit verification program.

The USDA incorporated the Produce GAPs Harmonized Food Safety Standard into its GAP & GHP audit program in 2011. The USDA further combined these two into

a harmonized GAPs (H-GAPs) program in May 2018. To make the oversight of food safety stronger and more efficient, the FDA and the USDA announced the alignment of the USDA H-GAP with the requirements of the FSMA's Produce Safety Rule (PSR) in June 2018. Since H-GAP is not equivalent to the Global Food Safety Initiative (GFSI), the USDA augmented the H-GAP audit to meet GFSI equivalence standards. The new USDA Harmonized GAP Plus+ audit is the only USDA GAP audit recognized as being GFSI technically equivalent. Regardless, all these programs adhere to the same basic principles of GAPs.

Under the new Food Safety Modernization Act (FSMA), GAPs are the foundation of the PSR. Up until the PSR, GAPs programs have been voluntary, imposed by the industry or buyers. Exceptions are the Florida Tomato Good Agricultural Practices (T-GAP) and Tomato Best Management Practices (T-BMP) regulations, which are state laws regulating the safe production of tomatoes. The current PSR mandates all non-exempt operations to follow the new FSMA federal guidelines (FDA 2017), except for exempt commodities (as outlined in the regulation) and for those producers exporting to foreign countries. In those circumstances, voluntary GAPs programs may still be required by buyers or trade organizations. Additionally, for commodities covered under FSMA, the Sanitary Transportation of Human and Animal Food, an additional rule

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2. Christopher R. Pabst, graduate student; Jaysankar De, postdoctoral research associate; Alina Balaguero, former graduate student; Jessica Lepper, training specialist; Renée M. Goodrich-Schneider, professor; and Keith R. Schneider, professor; Food Science and Human Nutrition Department; UF/IFAS Extension, Gainesville, FL 32611.

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within the overarching regulation (FDA 2018b) will govern those activities.

The aim of both the mandatory PSR and the voluntary GAPs program is to reduce the foodborne illness burden associated with produce (FDA 2018a, 2019). The FDA has compiled information from the Centers for Disease Control and Prevention (CDC) data regarding produce-associated outbreaks that occurred between 1996 and 2010 where contamination was likely to have happened early in the production chain, during growing, harvesting, manufacturing, processing, packing, holding, or transportation (CDC 2018; FDA 2018a). An updated report from the CDC estimates that produce accounted for 51.6% (21,280 of 41,269) of all foodborne outbreaks in the United States from 1998 to 2016 (CDC 2018)

This fact sheet will focus on those activities and facilities that will be operational under GAPs as outlined in the *Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables* (FDA 1998; FDA 2008). This fact sheet will specifically address those GAPs that pertain to crop transportation under section VIII:E. Transportation and Storage. Additional UF/IFAS Extension fact sheets in this series focus on other specific aspects of the GAPs program and how they relate to Florida crops and practices.

## Microbial Hazards

Microbial cross-contamination can occur between produce and other food and non-food sources that come into contact with it during loading, unloading, storage, and transportation (FDA 1998). The proper transport of fresh produce from farm to market will help reduce the potential for microbial contamination.

## How to Control Potential Hazards

All producers and packers should use sanitary practices to ensure the safe transport of their food once it leaves their field or facility. Whether GAPs or PSR, the requirements of these programs do not directly apply to produce that is transported by ship or air (due to limitations in the law); thus this fact sheet will focus on produce that is shipped via motor or rail transport. Operators involved in the transport of fresh produce should evaluate potential sources of contamination at each step of the transportation process, including transport to and from the field, storage, packing facilities, distribution centers, and retail centers. Successful management of transportation involves active dialogue with transport personnel to ensure sanitation conditions are evaluated and GAPs are being followed. Additionally,

information on the T-GAP and T-BMP programs for the Florida tomato industry is available in the *Tomato Best Practices Manual* (FDACS 2007).

## General Considerations

- Workers involved in the loading and unloading of fresh produce during transport should use good hygiene and sanitation practices. Refer to the *Food Safety on the Farm: Good Agricultural Practices and Good Handling Practices – Worker Health and Hygiene* fact sheet in this series, available at <http://edis.ifas.ufl.edu/fs158> (Lepper et al. 2017).
- Product inspectors, buyers, and other visitors should comply with established hygienic practices, such as thoroughly washing their hands before inspecting produce (FDA 1998).

## General Transport Considerations

All workers involved in transporting fresh produce, including growers, packers, shippers, brokers, exporters, importers, retailers, and wholesalers should help ensure good sanitation practices are used throughout the transportation chain. The following GAPs should be considered in transport sanitation (FDA 1998).

- Wherever produce is transported and handled, the sanitation conditions should also be evaluated.
- Use trucks that can be cleaned, block infestation of pests, and allow effective inspection. Prioritize cleaning surfaces such as a truck roll-up door that can directly impact exposed produce (e.g., produce packaging with ventilation holes).
- Inspect trucks or transport carriers for damage, cleanliness, odors (foul or pleasant), and obvious dirt or debris before beginning the loading process. Keep a log to make sure inspections are being conducted.
- Use dedicated transport vehicles to reduce the risk of cross-contamination from previous loads. Do not transport fresh produce in trucks that previously carried live animals, animal products that were improperly packaged or contained, or other harmful substances. To clean the interior surfaces of trucks, remove surface debris and wash with appropriate approved sanitizers.
- Operators should be aware of prior loads carried in a transport vehicle and use this information when deciding what vehicles to use for produce transport.
- Maintain proper temperatures from the loading dock to the receiving dock to help ensure both the quality and safety of fresh produce. Trucks should be pre-cooled

so they are at the proper temperature before loading. Be aware of temperature requirements for produce to prevent transporting mixed loads with incompatible refrigeration requirements. Before loading and about every four hours during transport, inspect the cooling unit to make sure it is in proper working condition, and inspect for condensation.

- Load produce in trucks or transport carriers in a manner that will minimize damage. Take care to prevent contamination of produce during loading, and arrange produce in a way that allows proper refrigerated air circulation.
- Utilize transportation logs to be completed by responsible personnel in conjunction with the truck's driver. Consider implementing performance standards into participating transportation contracts. Utilize checklist and reporting systems to ensure that product is shipped under proper conditions.

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