

Food Safety on the Farm: Good Agricultural Practices and Good Handling Practices—Traceback¹

Jaysankar De, Christopher R. Pabst, Alexandra S. Chang, Renée Goodrich-Schneider, and Keith 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 particular focus on fresh Florida crops and practices, this publication focuses on GAPs relating specifically to traceback. 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

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. Because 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.

The aim of both the mandatory PSR and the voluntary GAPs program is to reduce the foodborne illness burden associated with produce (FDA 2018; FDA 2019). The FDA

1. This document is FSHN10-04, one of a series of the Food Science and Human Nutrition Department, UF/IFAS Extension. Original publication date June 2010. Reviewed June 2016. Revised March 2019. Visit the EDIS website at <http://edis.ifas.ufl.edu>.

2. Jaysankar De, postdoctoral research associate; Christopher R. Pabst, graduate student; Alexandra S. Chang, former graduate student; Renée Goodrich-Schneider, professor; and Keith R. Schneider, professor; Food Science and Human Nutrition Department; UF/IFAS Extension, Gainesville FL 32611.

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 2018). An updated report from the CDC estimates that produce accounted for 51.6 percent (21,280 of 41,269) of all foodborne outbreaks in the United States from 1998 to 2016 (CDC 2018).

Traceback is the ability to track food items, including fresh produce, back to their source (i.e., where they were grown and/or packed). Traceback cannot prevent the occurrence of microbiological hazards, which may lead to an initial outbreak of foodborne disease, but it can serve as a complement to the good agricultural and management practices, which are intended to minimize risk to prevent food safety problems, such as physical, chemical, or biological hazards. If an outbreak were to occur, traceback would help identify and remove that produce from commerce (FDA 1998). The Bioterrorism Act of 2002 (FDA 2002), the Florida Tomato Good Agricultural Practices (T-GAPs) Program (CDC 2018), and the FSMA PSR (2019) all specifically address traceback and recordkeeping (as do many other regulations).

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 traceback. 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.

Overview of the Traceback Process

Traceback documents the distribution of food items through the supply chain, which helps in foodborne-illness investigations. When public health officials suspect a foodborne disease outbreak is occurring, they begin epidemiological studies to determine common foods consumed during the probable period of exposure to the pathogen (microorganism that causes harm). If the studies identify a certain food product and rule out other causes such as cross-contamination or ill workers, officials obtain the following information about the food from the establishment where the product was sold or prepared. The information about the suspect food product includes the following (FDA 1998):

- Product types
- Packaging
- Labeling
- Lot numbers
- Date the product was purchased or prepared
- Date received
- Date of stock rotation
- Inventory
- Handling and shipping procedures

Data related to distribution of the implicated product is charted and analyzed. This analysis is accomplished by tracing lot numbers, if they are available. In the absence of these records, officials collect records to create a Shipment Delivery Time Line to identify suspect shipments based on knowledge about the time period when the implicated product was useable and salable during the infection period. Distributor interviews, data collection, and analyses are repeated at each level of distribution until the source of the food product is identified by the health officials (FDA 1998).

Challenges Facing the Produce Industry

It can be difficult to find the source of an outbreak when shipping records are incomplete. In these cases, investigators require more time and resources since they must rely on other records and interviews with people whose memories may be imperfect (FDA 1998). All these add to the challenges of conducting an investigation.

Fresh produce also has a relatively short shelf life and is often gone by the time an outbreak is reported, making it difficult to pinpoint the hazardous item and/or its source. Industry practices, such as recycling shipping crates and comingling produce during distribution or at retail, make direct identification of a source of an implicated product extremely difficult. Even if a facility or field is identified, the source of contamination may no longer be present when investigators arrive on scene. This high degree of uncertainty can cause false associations that negatively affect industries that were implicated, but later exonerated (FDA 1998).

Advantages of an Effective Traceback System

Effective traceback protocols:

- Can lead investigators to identify a specific region, packing facility, or even a field, rather than an entire commodity group as the source of an outbreak, even if only some items carry identification. Narrowing the potential breadth of the outbreak lessens the economic burden on industry operators not responsible for the problem.
- Help limit the population at risk in an outbreak through the speed and accuracy of tracing implicated food products.
- Minimize expenditure of valuable public health resources and reduce consumer anxiety.
- Help public health officials determine potential causes of contamination, thus providing information for growers and shippers for identifying and minimizing future microbial hazards (FDA 1998).

Instituting Effective Traceback Systems

Larger operations, which tend to have more control over the growing/packing/ distribution chain, will be able to implement traceback systems more easily. However, industry associations, growers, and operators are encouraged to implement traceback systems where feasible (FDA 1998).

Operators (e.g., growers, packers, shippers) should develop traceback procedures that document the source of a product, and a mechanism for marking product for effective tracking throughout the growing, packing, and distribution chain. Individual containers from the farm, to the packer, distributor, and retailer should be tracked with as much detail as possible. Documentation should include (FDA 1998):

- Date of harvest
- Farm identification, and
- Information on who handled the produce from grower to receiver.

Growers, packers, and shippers must work with colleagues in transportation, distribution, and retail to create technologies that can trace produce from the grower to the consumer. Bar codes, stamps, stickers, and tags have been suggested to identify the source of produce, as has software to assist retailers in providing more accurate traceback to the grower/packer level (FDA 1998).

References

- Centers for Disease Control and Prevention (CDC). 2018. National Outbreak Reporting System (NORS). <https://wwwn.cdc.gov/norsdashboard/>.
- Florida Department of Agriculture and Consumer Services (FDACS). 2007. Tomato Best Practices Manual. http://fvreports.freshfromflorida.com/5G_TomBPM.pdf.
- Food and Drug Administration (FDA). 1998. Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables. Washington, D.C.: U.S. Department of Health and Human Services, FDA. <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-guide-minimize-microbial-food-safety-hazards-fresh-fruits-and-vegetables>
- Food and Drug Administration (FDA). 2002. Public Health Security and Bioterrorism Preparedness and Response Act of 2002. Washington, DC, 2002. <https://www.govinfo.gov/content/pkg/PLAW-107publ188/pdf/PLAW-107publ188.pdf>.
- Food and Drug Administration (FDA). 2008. Guidance for Industry: Guide to Minimize Microbial Food Safety Hazards of Fresh-cut Fruits and Vegetables. <https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocuments-RegulatoryInformation/ProducePlantProducts/ucm064458.htm>.
- Food and Drug Administration (FDA). 2017. “FDA Food Safety Modernization Act.” <http://www.fda.gov/Food/GuidanceRegulation/FSMA/default.htm>.
- Food and Drug Administration (FDA). 2018. Produce Safety Standards. <https://www.fda.gov/food/guidanceregulation/fsma/ucm304045.htm>
- Food and Drug Administration (FDA). 2019. “FSMA Final Rule on Produce Safety.” <http://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm334114.htm>.
- Schneider, K.R., R. Goodrich-Schneider, D.L. Archer, M.D. Danyluk, G.L. Baker, and C. Thomas. 2018. *The Food Recall Manual (Version 2)*. FSHN0410. Gainesville: University of Florida Institute of Food and Agricultural Sciences. <http://edis.ifas.ufl.edu/fs108>.