Good Agricultural Practices (GAPs) and Good Handling Practices (GHPs): A Framework for Minimizing On-Farm Food Safety Hazards

Seth Urbanowtiz, Extension Educator

Introduction

Approximately 48 million people in the United States get sick, 128,000 are hospitalized and 3,000 die from foodborne diseases each year (CDC, 2011). Produce has continued to be implicated in major foodborne illness outbreaks in recent years. Risks arise from an increasingly global food system and an aging population, and because fresh produce is often consumed raw. Because food can be contaminated at many points along the marketing chain and the costs incurred can be so great, it is important for producers, packers and shippers to reduce the incidence of foodborne illness through good agricultural practices (GAPs).

Despite significant concerns, the vast majority of fresh produce in the United States is wholesome and safe to eat. Nevertheless, illnesses caused by viruses, parasites, fungi and bacteria are significant and can be reduced through proactive steps. The best approach to maintaining quality and safety on-farm is through awareness of potential risks and identification and establishment of management practices that minimize the chance of contamination from growing and selling fresh produce. Fortunately, many management practices that help ensure food safety also improve or maintain product quality.

Good Agricultural Practices (GAPs)

Good Agricultural Practices are non-regulatory-based practices that were developed by the United States Department of Agriculture (USDA) and Food and Drug Administration (FDA) to reduce the risk associated with and prevalence of foodborne illness in fresh fruit and vegetable production. GAPs usually cover pre-harvest practices (field practices), while GHPs cover post-harvest practices, including packing and shipping. These science-based recommendations help minimize microbial food safety hazards during the growing, harvesting, packing and transporting of produce by focusing on the following primary components: water,
Practices implemented to minimize microbial contamination will be most effective when adapted to specific operations due to the range of commodities, growing conditions and production practices that can influence the production system. Being aware of the risks and implementing management practices that address the risks will be an effective response to ensuring a safe product.

Beyond the aforementioned primary GAP components, there are eight basic principles outlined that minimize microbial food-safety risks.

**Principle 1.** Prevention of microbial contamination is the key principle for maintaining food safety in fresh produce. Once something is contaminated, removing or killing the microbial pathogen is difficult and often futile.

**Principle 2.** Implementation of GAPs and GHPs should be implemented in those areas that are under the control of the operation.

**Principle 3.** Microbial contamination is possible from farm-to-fork. The major source of contamination is from enteric microorganisms, or those microorganisms that are associated with human or animal feces.

**Principle 4.** The water source and its quality determine the potential for contamination. The potential for contamination of fresh produce is significant and should be minimized.

**Principle 5.** Operations that use manure or biosolids should manage the material in a way that reduces the potential for contamination.

**Principle 6.** Workers are essentially food handlers. As a result, worker hygiene and sanitation practices are critical in minimizing microbial contamination of fresh produce.

**Principle 7.** Adhere to all applicable local, state and federal laws and regulations and similar laws, regulations and standards for operators outside the United States for agricultural practices.

**Principle 8.** Accountability along the marketing channel is essential to a successful food-safety program. Monitoring and traceback from seller through distribution to producer must be in place for an effective food-safety program (FDA, 1998).

**GAP Food-Safety Plan**

Implementing GAPs and documenting practices in a food-safety plan aids in organizing the steps necessary to maintain food safety and reduce risks from farm-to-fork. Ellis et al. (2004) outline five steps to creating a food-safety plan: list the actions taken, identify points where there is a risk of contamination, monitor the potential areas of risk, modify the procedures if necessary and document any changes or modifications. Many Extension offices offer food-safety plan templates that can guide those interested through the process of plan development. Regardless of method or organization, the plan should be practical to the person or company using it.

**GAPs Reduce Risk**

Economic risks associated with food safety include litigation, reduced sales, farm reputation and loss of farm business, among others. When green onions were implicated in a hepatitis A outbreak, those farms that had implemented GAPs maintained a fairly constants volume of
sales and demand for their other products produced were not impacted; while those farms that did not implement GAPs saw their volume of green onion sales decrease by 50 percent and demand for other products decrease by 30 percent. In addition to lost sales, the seller of the green onions paid more than $50 million in compensation (Calvin et al., 2004).

GAPs can also improve market access, particularly to those markets that require safety assurance. These might include hospitals, local schools, senior centers, and marketing cooperatives, among others.

Conclusion

Food-safety programs benefit the producer and the consumer. Risks can be minimized and a food-safety program does not have to be complex or expensive. University of Nevada Cooperative Extension and the Nevada Department of Agriculture can assist you in preparing to implement GAPs in your production system or in GAP certification, respectively.

Resources

Quality resources exist at a variety of institutions and government agencies. The following list provides further resources that can help build awareness and minimize the risk of microbial contamination of produce. The list is not comprehensive and is included based on the author’s perceived ease of use, understanding and application to Nevada.

- The national GAPs program is housed at Cornell University: [http://www.gaps.cornell.edu/](http://www.gaps.cornell.edu/)
- Nevada Department of Agriculture provides resources and offers GAP certification. [http://agri.nv.gov/GAP/](http://agri.nv.gov/GAP/)
- North Carolina State University has many resources available to consumers, producers, industry and trainers. [http://ncreh.fass.ncsu.edu/gaps](http://ncreh.fass.ncsu.edu/gaps)
- University of California is a leader in food safety. They are experts in post-harvest water use. [http://www.ucfoodsafety.ucdavis.edu](http://www.ucfoodsafety.ucdavis.edu)
- University of Minnesota has a food safety plan that is comprehensive and easy to use. [http://food.safety.cfans.umn.edu/fsp4u/](http://food.safety.cfans.umn.edu/fsp4u/)

References


Food and Drug Administration. Guide to Minimize Microbial Food Safety Hazards for
Fresh Fruits and Vegetables. 1998. Retrieved from: