

The Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables

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Programs for the prevention of foodborne illness have traditionally focused on the food processing industry and food preparation in restaurants or in the home. This focus has been and is still justified as most foodborne outbreaks are thought to occur as a result of errors made during final cooking and preparation stages - through undercooking, improper cooling or hot holding or cross contamination. Outbreaks associated with food processing establishments are much less frequent than those associated with final food preparation. However, errors made in food processing establishments can have far reaching effects especially when large volumes of food are produced and the product is widely distributed.

Until very recently, on-farm strategies for controlling microbial pathogens in raw agricultural products were not widely considered. However, it is now recognized that significant reduction in the incidence of foodborne illness will be most successful when a farm-to-table approach is taken. This is particularly true for produce that is meant to be consumed raw.

Relatively recent outbreaks of foodborne illness associated with *E. coli* O157:H7 in spring mix and *Cyclospora* in imported raspberries raised concerns regarding pathogens in fresh fruits and vegetables. Unfortunately, the microbiology of agricultural practices related to the production of fresh fruits and vegetables has not been well studied and it became evident that guidance would be useful in this area.

As part of the President's Food Safety Initiative, the Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) published a document entitled "Guidance for Industry: Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables" in October 1998. The document was based in part, on previous documents published by the produce industry in cooperation with government regulators and academic researchers. The document carries no

regulatory, legal, or enforcement weight. However, it is recommended that every producer of fresh fruits and vegetables consider implementing the risk reduction strategies outlined in the guide that are appropriate to their operation. Retail buyers are beginning to request that suppliers of fresh produce follow the steps set out in the guidance document and prove that they are doing so through systematic documentation of practices and third party audits.

The pathogens most often associated with produce-associated outbreaks are those that are found in the intestinal tract of humans and animals such as *E. coli* O157:H7, *Salmonella*, *Shigella* and Hepatitis A. Likewise, the focus of the guidance document is reduction of potential contact between human and animal feces and fresh produce. This contact could be direct or indirect through the application of contaminated water or from poor personal hygiene.

Basic Principles of Good Agricultural Practices (GAPs)

The guide identifies eight principles of food safety within the realm of growing, harvesting and transporting fresh produce. Sometimes termed "Good Agricultural Practices" or GAPs, these principles are considered to be similar to the "Good Manufacturing Practices" or GMPs that are required for the food processing industry. The eight principles outlined by the guidance document are reprinted below:

Principle 1.

Prevention of microbial contamination of fresh produce is favored over reliance on corrective actions once contamination has occurred.

Principle 2.

To minimize microbial food safety hazards in fresh produce, growers, packers, or shippers should use good agricultural and management practices in those areas over which they have some control.

Principle 3.

Fresh produce can become microbiologically contaminated at any point along the farm-to-table

food chain. The major source of microbial contamination with fresh produce is associated with human or animal feces.

Principle 4.

Whenever water comes in contact with produce, its source and quality dictates the potential for contamination. Minimize the potential of microbial contamination from water used with fresh fruits and vegetables.

Principle 5.

Practices using animal manure or municipal biosolid wastes should be managed closely to minimize the potential for microbial contamination of fresh produce.

Principle 6.

Worker hygiene and sanitation practices during production, harvesting, sorting, packing, and transport play a critical role in minimizing the potential for microbial contamination of fresh produce.

Principle 7.

Follow all applicable local, state, and Federal laws and regulations, or corresponding or similar laws, regulations, or standards for operators outside the US for agricultural practices.

Principle 8.

Accountability at all levels of the agricultural environment (farm, packing facility, distribution center, and transport operation) is important to a successful food safety program. There must be qualified personnel and effective monitoring to

ensure that all elements of the program function correctly and to help track produce back through the distribution channels to the producer.

Specific guidance for pathogen reduction based on these principles is provided for five major areas of concern. These include agricultural and processing water quality; handling and application of manure and municipal biosolids; worker health, hygiene and sanitary facilities; and sanitation in the field, packing facility and transportation. Traceback procedures are considered separately as a major area of concern. Improvement in traceback ability will help to enhance investigation of produce-associated outbreaks potentially limiting their economic impact and increasing their use in identifying potential causes of contamination.

The guidance document recognizes that there are different agricultural practices among produce types as well as among growing regions. Producers are encouraged to implement good agricultural and management practices over which they have some control.

Copies of the guidance document are available from:
Food Safety Initiative Staff, HFS-32
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site <http://www.fda.gov>
