

Preharvest Food Safety: Vegetable Products

For annually planted crops (fruit or vegetable), considerations are:

Soils—review previous uses of the field, as well as adjoining fields.

1. Do animals have access to the field?
2. What was the last crop grown?
3. What was grown in the adjoining fields?
4. Was the field ever used as a feedlot, land fill, or toxic waste site?
5. If the previous use of the field is unknown, testing the soil (and pre-planting corrective action as appropriate) is “encouraged.”

Fertilizers—manure and compost should be monitored for possible microbial pathogens.

1. Consider a minimum application to harvest interval (manure or compost).
2. Consider possible drift of manure or compost from open fields into adjacent fields of maturing crops.
3. As research results become available, be prepared to adjust practices accordingly.

Water—all uses present opportunities for microbial contamination of the crop.

1. Irrigation water: consider
Source—well, open canal, reservoir, reused irrigation water, a municipality, or other
Testing for contaminants—suggested testing for *E. coli* and total coliforms
Method of water delivery—drip station, sprinkler pump, pressure system, or other
2. Water for employees should be potable, changed daily.
3. Pesticide and foliar feed mix water could be a source of microbial contamination.
4. Produce wash water—“Clean and sanitary water is recommended for use in washing produce in the field. The water may be tested periodically for contaminants.”

Farm employees—personal hygiene is important in preventing microbial contamination.

1. Growers/harvesters must carefully review:

The number, condition, and positioning of toilets must meet all local, state, and federal guidelines.

Portable toilets should not be cleaned in the field.

Septic trucks servicing the portable toilets should have direct access to the toilets and perform their service so as to minimize the likelihood of contamination of product—preferably at a remote site.

Hand washing facilities should be easily accessible and supplied with potable water, soap, and single-use paper towels. Drain water should be collected for remote disposal, rather than being allowed to drain into the field.

2. Personal hygiene/training:

Provide personal hygiene training to all farm/harvesting personnel.

Emphasize the importance of washing hands after breaks, after using the toilet, before starting work, and before going home. Advocate use of sanitation facilities.

Have a system in place that records sickness, cuts, and other ailments that could contaminate product.

Rubber gloves, leak proof bandaids, or other corrective measures are encouraged for minor cuts.

Equipment

1. Harvest—clean and sanitize or disinfect tables, baskets, and mechanical harvesters daily; any equipment that comes in contact with raw product should be cleaned and sanitized frequently.
2. Harvesting materials—clean and sanitize packaging materials, brushes, buckets, and other harvesting materials to minimize contamination. Don't use harvesting containers for purposes other than carrying harvested product (e.g., lunches, tools, fuels, etc.).

Organic growers: don't apply raw manure to field within 60 days of harvest. Compost must reach a temperature of 131-149°F (55-60°C) for several days and then finish decomposing for 6 weeks. Use of compost is apparently unrestricted.

Everything after this is “post-harvest,” but may take place at or near the field.

- Leave as much dirt (soil) as possible in the field.
- Potable water for washing, cooling, and making ice
- People who touch product (including inspectors or buyers) should wash hands often and possibly wear gloves.
- Control dust, dirt, and pests.

Organic processing: “**organic critical control points**” are points at which organic foods may be contaminated or commingled with conventional foods.

Other notes:

Extensive guidelines for growing beans and seeds and sprouting them for sale were prepared in 1996 and 1997 by the International Sprout Growers Association. FDA (with a lot of input from CDHS) now has guidelines. <<http://vm.cfsan.fda.gov/~dms/sprougd1.html>;
<http://vm.cfsan.fda.gov/~dms/sprougd2.html>>

FDA has been conducting a “Survey of Fresh Produce Processing Facilities,” which is essentially like any other inspection of food processing facilities, except that the produce industry seems to have been specially targeted lately. A survey of sprouters by CDHS was done as an MPVM project.

FDA has proposed to issue specific guidance for produce growing, which would take precedence over voluntary guidelines, possibly on a commodity by commodity basis. The industry says FDA has no credentials to issue such guidance.

Since the fall of 1997, FDA has sent inspectors to countries that export food to the U.S., to examine conditions of production and harvest. Similar inspections have been imposed on domestic growers and harvesters, for equity’s sake. Survey results are accessible via FDA's web site <<http://www.foodsafety.gov/~dms/fs-toc.html#prod>>.

FDA has also mandated a HACCP program for fruit juices. This is a true HACCP program (essentially directed to post-harvest processing) that mandates a CCP that will achieve 5-log destruction of pathogens known to have been transmitted by juice. Thermal pasteurization is the default treatment, but other methods that achieve demonstrably equivalent results are allowed (see refs.).

References:

Voluntary food safety guidelines for fresh produce. International Fresh-cut Produce Association and Western Growers Association, 1997.

Certification handbook. California Certified Organic Farmers, 1996.

Food and Drug Administration (& U.S. Department of Agriculture, Centers for Disease Control and Prevention), October 26, 1998. Guide to minimize microbial food safety hazards for fresh fruits and vegetables. <<http://www.foodsafety.gov/~dms/prodguid.html>>

U. S. Food and Drug Administration, Center for Food Safety and Applied Nutrition, Office of Plant and Dairy Foods and Beverages, October 7, 2002. Exemptions from the warning label requirement for juice - recommendations for effectively achieving a 5-log pathogen reduction. <<http://www.cfsan.fda.gov/~dms/juicgui6.html>>

Department of Health and Human Services, Food and Drug Administration. 21 CFR Part 120. Hazard Analysis and Critical Control Point (HACCP); Procedures for the Safe and sanitary processing and importing of juice; Final Rule. Federal Register: January 19, 2001 (Volume 66, Number 13). <<http://www.cfsan.fda.gov/~lrd/fr01119a.html>>

U. S. Food and Drug Administration, Center for Food Safety and Applied Nutrition. FDA HACCP (Seafood, juice, dairy, etc.). <<http://www.cfsan.fda.gov/~lrd/haccp.html>>