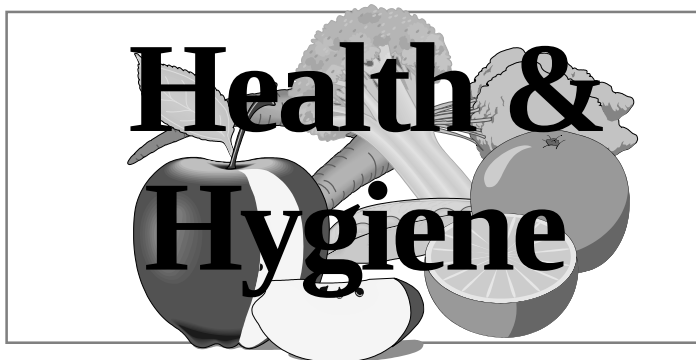




Karen L.B. Gast, Horticulturalist, Postharvest and Marketing; and Kim Holt

State and federal regulations govern standards for worker health and hygiene during the production, harvest and marketing of human food. Operators need to be aware of and implement these regulations in their operations because the health and hygiene of employees who handle fresh produce have an impact on the safety of food, as does the management of on-site sanitary facilities.

Microbial Hazards

Contact of fecal material with produce is a major source of contamination that has been associated with past outbreaks of foodborne illness from fruit and vegetable consumption. Another contamination source is persons with infectious diseases who work with fresh produce. They increase the risk of microbial hazards because they can unintentionally contaminate fresh produce, water supplies and other workers, and transmit foodborne illness if they don't understand and follow basic hygienic principles.

Control of Potential Hazards

Training all employees to follow good hygienic practices can aid in the control of potential food safety hazards.

Personal Health and Hygiene

Operators should consider the following points to help ensure that all personnel comply with established hygienic practices:

- **Establish a training program.** Producers need to develop a sanitation training program that fits their operation and employees. It is important

for all employees, including management, full-time, part-time, and seasonal personnel, to have a working knowledge of basic sanitation and hygienic practices. The type of training will vary depending upon employees' responsibilities. It may include formal presentations, one-on-one instruction or demonstrations, for example, in handwashing. Also, periodic refresher or follow-up training sessions may be needed.

- **Become familiar with typical signs and symptoms of disease.** Supervisors need to become familiar with the symptoms of infectious diseases and have all sick employees report to them before beginning work. Individuals who are sick, especially those with diarrhea, should be excluded from handling produce.
- **Provide protection from skin lesions.** A lesion that contains pus, or an infected wound that is open and draining, increases the risk of contamination if it makes contact with produce. If an



Regular employee training is important to maintain safe hygiene practices.

employee has a lesion that cannot be covered to avoid contact with produce, he or she should not be allowed to work with fresh produce.

■ **Consider alternative hygienic practices.**

Single-service disposable gloves, in combination with handwashing, can be an effective hygienic practice. However, gloves need to be used properly and in no way lessen the importance of handwashing and good hygienic practices.

■ **Have visitors use good hygienic practices.**

Operators need to require that product inspectors, buyers, and other visitors comply with established hygienic practices when inspecting produce.

Training

Employee training should be based on the Occupational Safety and Health Act (OSHA) requirements that are applicable to worker health and training. Other areas of training to consider include the following:

- **The importance of good hygiene.** All employees need to understand the consequences of poor hygiene and how it affects themselves and the safety of the fresh produce-consuming public.

The Best Way to Wash Hands

- Wet hands with warm water.
- Use soap.
- Rub hands briskly together to loosen any dirt and germs. Take 20 seconds or more to do a thorough job.
- Pay special attention to fingernails where germs can hide.
- Rinse hands under clean, warm water.
- Dry hands on a paper towel or with an air dryer.

- **The importance of handwashing.** Thoroughly washing hands before working with produce and after using the toilet can help reduce potential contamination from infectious diseases shed in human feces or transmitted by contaminated hands.

- **The importance of proper handwashing techniques.** Don't assume workers know how to wash their hands properly. Teach proper handwashing techniques, which include warm water, use of liquid soap, thoroughly scrubbing under fingernails and between fingers for at least 20 seconds, and rinsing and drying hands with single-use paper towels.

- **The importance of using toilet facilities.** Instruct all employees on the importance of using toilet facilities, how to use them properly, and if toilet paper should be flushed. Instruct for all facilities, including those connected to a sewage disposal system, on-site sanitary pit privies, and latrines.

U-Pick and Road-Side Produce Stands

Growers who allow the public to pick their own fruits or vegetables, or growers who sell their own produce directly to consumers should consider the good agricultural practices that follow.

- **Promote good hygienic practices.** Have convenient, well-equipped handwashing facilities



It is a good idea to provide customers with safe food-handling information.

available for the public, and encourage customers to wash their hands.

- **Provide clean, properly supplied toilets.** Supply an adequate supply of toilet paper.
- **Promote good handling and processing practices.** Encourage customers to wash all fruits and vegetables that they will eat raw.

Sanitary Facilities

Microbial Hazards and Their Control

The potential for contamination of fresh produce increases if human and other wastes in the field or packing facility are poorly managed. Packing and field facilities need to be operated according to the laws and regulations described in OSHA Act 29 CFR 1928.110, subpart I, and 29 CFR 1910.141, subpart J.

Field sanitation laws in 29 CFR 1928.110, subpart I, describe the appropriate number of toilets to number of workers, proper handwashing facilities, maximum worker-to-restroom distance, and how often such facilities need to be cleaned. Regulations relative to toilet facilities and other sanitation issues are described in 29 CFR 1910.141, subpart J.

Toilet Facilities and Handwashing Stations

- **Toilet facilities need to be accessible.** Workers need to have facilities available at all times, not just on breaks. If facilities are accessible, chances are greater that workers will not relieve themselves elsewhere, such as in fields.
- **Toilet facilities need to be properly located.** Toilet facilities in the field should not be located near water sources used for irrigation, or in a location that promotes runoff and potential contamination concerns for soil, water sources, produce, animals, and workers.
- **Toilet facilities and handwashing stations need to be well supplied.** Be sure to supply an adequate amount of toilet paper. Equip handwashing stations with a basin, water, liquid soap, single-use paper towels, and a waste container.



Portable handwashing and toilet facilities should be available for customers and employees.

- **All facilities need to be kept clean.** Clean all facilities on a regular basis. Containers used to transport or store water for handwashing should be routinely cleaned and sanitized with potable water.

Sewage Disposal

Operators should follow EPA regulations, 40 CFR Part 503, for the use or disposal of human waste and sewage, so that contamination of water, soil, animals, crops, or workers is not of concern.

- **Use caution when servicing portable toilets.** Don't let wastewater from portable toilet facilities drain into fields. Allow sewage transport trucks direct access to toilet facilities to ensure proper collection and disposal of wastes. These safety measures can decrease the potential for contamination of fresh produce in the field.
- **Establish a plan to deal with spills and leaks.** For additional guidance, see 40 CFR Part 503.

Reference

Guide to Minimize Microbial Food Safety for Fresh Fruits and Vegetables, Food and Drug Administration. Available on the World Wide Web at: <http://vm.cfsan.fda.gov/~dms/prodguid.html>

Helpful Information

How to obtain OSHA standards

OSHA General Industry standards, Title 29 CFR 1910, and OSHA Agricultural Industry standards, Title 29 CFR 1928, may be purchased through a U.S. Government Printing Office or by telephone purchase at (202) 512-1800.

29 CFR 1910.141 and 29 CFR 1928.110, that are referenced in this publication, may be viewed and printed from the Web at the following address: http://www.osha-slc.gov/OshStd_toc/OSHA_Std_toc.html.

How to obtain EPA regulations

U.S. EPA. Domestic Septage Regulatory Guidance, A Guide to the EPA 503 Rule. EPA, Office of Water Regulations and Standards, 832-B-92-005, September 1993. Obtain by contacting the U.S. EPA / NCEPI, P.O. Box 42419, Cincinnati, OH 45242-2419. Telephone: 1-800-490-9198, FAX (513) 489-8695. You must give the EPA catalog number for the publication.

Electronic versions of additional EPA documents, such as criteria and supporting documents, are available at: <http://www.epa.gov>.

This material is partially funded through the Cooperative State Research, Education and Extension Service of the U.S. Department of Agriculture, Project Number 99-41563-0675.

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

Publications from Kansas State University are available on the World Wide Web at: <http://www.oznet.ksu.edu>

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Karen L.B. Gast and Kim Holt, *Minimizing Microbial Hazards for Fresh Fruits and Vegetables, Health and Hygiene*, Kansas State University, December 2000.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-2481

December 2000

It is the policy of Kansas State University Agricultural Experiment Station and Cooperative Extension Service that all persons shall have equal opportunity and access to its educational programs, services, activities, and materials without regard to race, color, religion, national origin, sex, age or disability. Kansas State University is an equal opportunity organization. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Marc A. Johnson, Director.