

MODEL CODE
for
PRODUCE SAFETY

Association of Food and Drug Officials Model Code for
Produce Safety
for State and Local Regulatory Agencies

November, 2009

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The Association of Food and Drug Officials (AFDO) developed this Model Code for Produce Safety in response to a growing number of outbreaks associated with consumption of fresh fruits and vegetables. The Code represents the culmination of a two- year effort by a number of dedicated organizations and individuals who were asked to develop a science based regulatory framework to address the production of all fruits and vegetables, while maintaining the flexibility to appropriately address specific commodities of higher concern. It builds upon existing guidance documents and regulations; and, consistent with AFDO's mission to promote uniform food safety laws, rules and regulations, this Model Code for Produce Safety may be viewed as another tool to assist the regulatory community in development of a nationally integrated food safety system.

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ADDITIONAL RESOURCES

Commodity Specific Food Safety Guidelines for the Melon Supply Chain, 1st Edition, November, 2005
Commodity Specific Food Safety Guidelines for the Production and Harvest of Lettuce and Leafy Greens, June, 2008
Commodity Specific Food Safety Guidelines for the Fresh Tomato Supply Chain, 2nd Edition
Food Safety Begins on the Farm – A Grower’s Guide, Rangarajan, Bihn, Gravani, Scott, and Pritts
Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables, 1998
Guidance for Industry: Guide to Minimize Microbial Food Safety Hazards of Leafy Greens; Draft Guidance, July 2009
Guidance for Industry: Guide to Minimize Microbial Food Safety Hazards of Melons; Draft Guidance, July 2009
Guidance for Industry: Guide to Minimize Microbial Food Safety Hazards of Tomatoes; Draft Guidance, July 2009
Protecting Perishable Foods During Transport by Truck, USDA, 1995

AFDO MODEL CODE FOR PRODUCE SAFETY

I. PREAMBLE

The effort by the Association of Food and Drug Officials (AFDO) to formulate a Model Code of Practice for the Production of Fresh Fruits and Vegetables grew out of a request from the east coast tomato industry in late 2006. Industry representatives and regulators agreed that recent outbreaks of foodborne illness attributed to fresh tomatoes were unacceptable. Both parties also recognized that a myriad of regulatory approaches were possible, though not necessarily desirable for a coherent national strategy. In addition, the AFDO Board believed that it was important to address Good Agricultural Practices (GAPs) in the production of all fruits and vegetables. Thus, in keeping with its mission to promote consistency in food safety laws, rules and regulations, AFDO convened a working group to develop a Model Code for food safety at the farm and packing facility. The Code developed herein may be considered as a model for guidance and/or regulation by federal and state regulatory bodies, and for collaboration among such parties working together with the industry. The Code is intended to outline consistent, science-based practices in order to minimize the likelihood of multiple regulatory bodies developing conflicting and/or duplicative standards. This effort is the result of nearly two years of collaboration among federal and state regulatory officials, representatives from the fresh produce industry (including grower associations, individual growers, and marketers), representatives from retail, manufacturing and transportation sectors, academicians, and consumer advocacy groups.

A. Scope

This model code is intended to address food safety practices for produce (fresh fruits and vegetables) at the farm and packing facility. The Code does not address the additional processing steps or handling that may occur at a fresh-cut processing facility. This Model Code focuses on minimizing the potential for contamination of fresh produce with pathogenic microorganisms of public health significance; however, states, localities and other users of this document should consider all potential risks associated with the production of produce.

B. Implementation

In the development of this Code, the AFDO working group adopted an approach similar to that of the Seafood Hazard Analysis and Critical Control Point (HACCP) regulation adopted by the U.S. Food and Drug Administration (FDA). As with the seafood HACCP regulations rule (21 CFR Part 123), regulatory requirements for fresh produce production and packing are presented in broad terms within the Code, with more specific production practices and recommended mitigation options to be presented in a companion “hazards and controls” guidance document. This hazards and control guidance for fresh produce (in development) will assist both the industry and regulators in assessing potential microbial hazards and evaluating and implementing preventive controls or risk mitigation strategies relative to the wide variety of production practices, site-specific conditions, and individual commodities covered by this Code.

C. Responsible Parties

Effective management of food safety requires that responsibility be clearly established between the many parties involved in the production of fresh produce. There may be many different permutations of ownership and business arrangements during the growing, harvesting and packing of fresh produce. For this reason, it is incumbent upon everyone involved to identify which responsibilities rest with which parties, and to ensure that these responsibilities are clearly defined. For example, growers commonly contract with a third party to harvest their crop. The grower must clearly identify which party is responsible for each applicable provision of the Code, such as providing adequate toilet and hand-washing facilities and worker training. Responsibilities may be delegated to individuals within the firm or they may be formally addressed in contractual agreements when third parties are involved. It is important to ensure that each party is aware of its responsibilities so that food safety roles are clearly understood and regulatory response or enforcement action is directed to the responsible party.

D. Food Safety Plan

The workgroup developing this Code agreed that a food safety assessment and a food safety plan, based on the outcome of that assessment, are critical for all firms growing and packing fresh produce. After considerable discussion, it was further agreed that this plan shall be written. It is not the intent that such a written plan place an undue burden on small producers. The workgroup agreed that an acceptable plan shall be commensurate with

the size and complexity of the operation and the inherent risks associated with the commodity and production practices. It is fully expected that for certain operations some plans will be fairly simple while others will be more elaborate.

It is further the intent of the workgroup that the companion hazards and controls guidance document, when available, will include tools to assist the operator with preparation of a written plan and other aspects of the Code.

E. Product Tracing

This document is not intended to prescribe a particular system or specific requirements for product tracing. The workgroup and AFDO recognize the myriad of different tools available to facilitate traceability – and that the federal government and industry have established or are considering product-tracing regulations with more specific requirements. The language in this Code is intentionally broad so as to set baseline requirements for traceability but to avoid creating conflicts with those systems currently in place or under consideration.

II. DEFINITIONS

The following definitions apply for the purposes of this document:

- A. Adequate: Satisfactory for a particular purpose; fully sufficient; suitable or fit.
- B. Agricultural water: Water used in the growing environment (for example, field, vineyard, or orchard) for agronomic reasons. It includes water used for irrigation, transpiration control (cooling), frost protection, or as a carrier for fertilizers and pesticides. Occasionally, a more specific term may be used, such as “irrigation water.” Typical sources of agricultural water include flowing surface waters from rivers, streams, irrigation ditches or open canals; impoundment (such as ponds, reservoirs, and lakes); wells; and municipal supplies.
- C. Clean: Washed, rinsed and/or reasonably free of dust, dirt, food residues, and other debris.
- D. Documentation: A written procedure or record of a task being completed.

E. Food-contact surfaces: Those surfaces that are reasonably likely to contact produce and those surfaces from which drainage onto the produce or onto surfaces that contact the produce may occur during the normal course of operations. “Food-contact surfaces” include, but are not limited to, utensils, containers, and equipment (such as conveyor belts) that contact produce; and that are used in harvesting, post-harvest activities, or packing operations. They do not include tractors, forklifts, hand trucks, pallets, and anything else that is used for the handling or storing of contained or packed produce that does not come into actual contact with the produce.

F. Pathogen: A microorganism of public health significance (i.e. capable of causing human disease or injury).

G. Personal-service area: An area used for activities not directly connected with the production or service function performed by the operation or facility. Such activities include, but are not limited to, first aid, medical services, dressing, showering, toilet use, washing, and eating. A personal-service area may include outdoor areas adjacent to a field in production.

H. Pest: Any animal or insect of public health significance including, but not limited to, birds, rodents, cockroaches, flies, and larvae that may carry pathogens that can contaminate food or food-contact surfaces.

I. Post-harvest activity: Any activity that takes place after the edible portion of the plant has been harvested. This may include washing, cooling, sorting, or packing in the field or at another location.

J. Produce: Fresh fruits and vegetables that are likely to be sold to consumers in an unprocessed (i.e., raw) form. Fresh produce may be intact, (such as strawberries, whole carrots, radishes, and fresh-market tomatoes), or cut during harvesting (such as celery, broccoli, and cauliflower).

K. Sanitize: To treat food-contact surfaces with a process that is effective in destroying or substantially reducing the number of microorganisms of public health concern as well as other undesirable microorganisms, without adversely affecting the quality of the involved product or its safety for the consumer.

L. Shall: Indicates mandatory requirements.

M. Should: Indicates recommended or advisory measures.

N. Water source (Source water): The origin of the water being used at the farm or packing operation or facility. It may be a municipal supply, private well, pond, stream or other body of water.

III. GENERAL REQUIREMENTS

A. Food Safety Plan

1. A written food safety plan shall be developed based on the size, complexity, previous association with foodborne outbreaks, and the outcome of the assessments of an operation as outlined in this model code, including an assessment of the specific risks and controls unique to the operation.

B. Product-Tracing System

1. All entities involved in the produce supply chain, within the scope of this code, shall maintain a system and records to facilitate the identification of the immediate past source of the produce and immediate subsequent recipient of the produce.

2. For every lot shipped or received, records shall be readily available, legible, and the information they contain shall be readily interpretable and include:

- a) identification of the immediate past source of the produce;
- b) commodity identification;
- c) lot identification;
- d) quantity;
- e) date packed,
- f) date shipped or received;
- g) identity of carrier; and
- h) the immediate subsequent recipient of the produce.

3. For every lot shipped, records shall be readily available, legible, and the information they contain shall be readily interpretable and enable tracing to the sources of all components.

4. In the event of commingling or repacking of produce, records shall be maintained for raw product accountability that enable tracing of all incoming products to outgoing products in which they are components.

5. Labels and/or labeling shall be accurate and contain sufficient information to assure product tracing.

a) Labels that are inaccurate shall be removed or defaced prior to packing.

6. The operation shall test its product-tracing system at least annually to ensure it is adequate.

C. Documentation

1. Adequate documentation that demonstrates compliance with the requirements of this code shall be maintained.

2. Documents may be maintained on-site or at an off-site location and shall be available for inspection within a reasonable time frame.

3. Documentation shall be maintained for a minimum period of two years, absent state or federal regulations to the contrary.

IV. CROP- PRODUCTION REQUIREMENTS

A. Field Assessment

1. General Requirements

a) The responsible party shall ensure that fields, as well as the structures and equipment within or adjacent to them, are managed to minimize harborage of pests and wildlife that may be a source of contamination of fresh produce with pathogens while it is being grown.

b) Any storage sheds, buildings, or other structures, equipment and containers used in the fields to contain produce, or food-contact surfaces shall be cleaned and, where appropriate, sanitized to prevent contamination with pathogens.

2. Land Use Considerations

- a) The responsible party shall evaluate previous land use history and adjacent land use.
- b) When previous land use history or adjacent land use indicates a possibility of pathogen contamination, growers shall perform corrections as needed to minimize the potential for an adverse public health impact.
- c) The evaluation may lead to the conclusion that the land should not be used to grow produce until the risks presented by prior or adjacent land use can be minimized.
- d) The responsible party shall evaluate the farm sewage-treatment or septic system at least annually to verify it is maintained in a manner to prevent contamination of fields or produce, and in compliance with local laws and regulations.
- e) An evaluation should also be conducted following any significant flood event. Fresh produce that has been in contact with flood waters is considered to be adulterated due to potential exposure to sewage, animal waste, and pathogens, and shall be excluded from the human food supply.

B. Agricultural Water for Field Use

1. General Requirement

Water quality shall be adequate for its intended use and shall meet all applicable federal and state laws and regulations.

2. Assessment of Water Source

- a) The responsible party shall identify, assess the adequacy for its intended use, and document all water sources.
- b) When microbial testing is deemed necessary to verify adequacy of source water quality:
 - (1) Testing shall be performed and documented using standard indicators of fecal pollution, such as generic *E. coli* tests. The frequency of testing and point of water sampling shall be determined based on the water source, its particular history, and the outcome of the risk assessment.

(2) The results of a microbial analysis of a water source available from a public source, such as the local water authority, may serve as acceptable documentation in lieu of testing by the grower.

3. Assessment of Water Distribution System

a) The responsible party shall prepare a description of the water system in use. This description should be sufficient to facilitate an assessment of the risk. This description may use maps, photographs, drawings (hand drawings are acceptable) or other means to communicate the location of water source(s), permanent fixtures and the flow of the water system (including holding systems, reservoirs or any water captured for re-use).

b) The responsible party shall perform an initial assessment, followed by a review (or new assessment) any time there is a change made to the system or a situation occurs that could introduce an opportunity to contaminate the system. A water-system assessment shall include an inspection of the water system under the control of the responsible party for the purpose of identifying conditions that may result in contamination with pathogens of concern.

c) Water systems intended to convey untreated human or animal waste shall be separated from conveyances utilized to deliver agricultural water.

d) In the event that the assessment identifies conditions that may result in contamination with pathogens of concern, action shall be taken to correct these conditions.

4. Assessment of Water Use in Crop Production

a) Growers shall assess the use and quality of water, water application methods and application schedules with respect to crop characteristics and the degree of contact with the edible portion of the crop for the purpose of identifying conditions that may result in contamination with pathogens.

b) Based on this assessment, growers shall take appropriate action to eliminate or minimize the potential for contamination.

5. Microbial Testing of Agricultural Water

a) The responsible party shall review the assessments of water source, water distribution system, and water use in regard to the crop characteristics, pathogens of concern, proximity to harvest,

and other relevant factors and determine the need for microbiological testing of water.

b) When microbial testing is deemed necessary, it shall be performed at a frequency and sampled at a location based on the assessments, and it shall be documented. When microbial testing is deemed necessary to verify adequacy of source water quality, testing shall be performed as described in Section IV B 2 b)(1) of this code.

C. Soil Amendments

1. Biosolids

a) A responsible party who uses biosolids (treated sewage sludge) as fertilizer or as a soil amendment in the production of produce shall meet the requirements of 40 CFR Part 503, and comply with any additional state requirements. Where biosolids are used, the risk of contamination shall be assessed and appropriate controls shall be implemented.

2. Manure

a) If a responsible party uses a product containing manure, including leachates and teas, it shall be treated or otherwise handled so as not to serve as a source of contamination of produce. Any product containing manure shall be treated and applied in accordance with all federal, state and local requirements.

(1) If the responsible party uses a product containing treated manure, there shall be documentation of the composition, treatment, and time and method of application.

(2) If the responsible party uses product containing raw or incompletely treated manure, it shall be used in a manner so as not to serve as a source of contamination of produce. If such a product is used, there shall be documentation of the composition, and time and method of application.

(3) For purposes of this code, the use of a product containing any combination of raw and treated manure shall be subject to the same requirements as a product containing raw or incompletely treated manure.

b) The responsible party shall store manure-containing products in a manner or location such that it does not become a potential source of contamination with pathogens.

c) The responsible party shall take steps to ensure that equipment that comes into contact with raw or incompletely treated manure does not become a potential source of contamination with pathogens.

D. Animals

1. The responsible party shall assess the impact of domestic and wild animal activity on the potential for pathogenic contamination of produce, considering the crop characteristics, type and number of animals, pathogens of concern, nearness to the growing field, proximity to harvest, and other relevant factors.
2. Based on the assessment, the responsible party shall put into place measures to exclude domestic animals from growing fields.
3. Where domestic animals are used in farming operations, the responsible party shall put in place measures to prevent or minimize the potential for contamination of produce with pathogens from animal urine and feces.
4. The responsible party shall monitor growing fields and adjacent land for evidence of animal activity and shall take appropriate action to prevent or minimize the potential for contamination of produce with pathogens from animal feces.
5. When the assessment or monitoring indicates a possibility of contamination with pathogens, growers shall perform corrections as needed to minimize the potential for an adverse public health impact.
6. The responsible party shall follow all local, state and federal regulations concerning animal control.

E. Worker Health and Hygiene

1. Personal Health and Hygiene

a) Workers shall be required to wash their hands thoroughly before starting work, after using the toilet, after each break, and at any other time when their hands may have become a source of contamination. Hand sanitizers shall not be used as a substitute for hand washing.

- b) Eating, drinking, spitting, chewing gum and using tobacco shall be prohibited except in clearly designated areas separate from production fields.
- c) Personal-service areas for workers shall be maintained so as not to be a source of contamination and located away from produce-handling areas.
- d) Workers, visitors, and field personnel who show signs of illness (e.g., vomiting, jaundice, diarrhea) shall be restricted from direct contact with produce or food-contact surfaces.
- e) Any worker, visitor, and field personnel with an open sore or lesion that cannot be effectively covered (e.g., to prevent contact with produce or related equipment) shall be restricted from direct contact with produce or food-contact surfaces.
- f) If gloves are used, the responsible party shall have a policy in place to ensure that gloves are used properly.
- g) The responsible party shall designate competent supervisory personnel to ensure compliance by all workers, visitors, and field personnel with the requirements in this section.

2. Training

- a) Growers shall provide training for all workers (including supervisors, full-time, part-time and seasonal personnel), on proper sanitation and hygiene practices. Training shall be documented.
- b) All workers shall be trained on job responsibilities that impact food safety.
- c) Training in personal hygiene and sanitary practices shall include:
 - (1) proper hand-washing techniques;
 - (2) proper use of toilet facilities;
 - (3) proper glove use, if gloves are used, including the need to wash hands before gloves are donned, and to wash hands in between changing gloves, and that the use of gloves in no way lessens the need or importance of hand washing and proper hygienic practices;
 - (4) seeking prompt treatment for cuts, abrasions and other injuries; and

(5) reporting signs of illness (e.g., vomiting, jaundice, diarrhea) to their supervisor before beginning work.

d) Periodic refresher or follow-up training shall be conducted.

3. Visitors

Growers shall ensure that visitors, including buyers, product inspectors, and auditors, comply with all established personal hygiene practices.

F. Sanitary Facilities

1. Toilet Facilities and Hand-Washing Stations

a) All toilet facilities and hand-washing stations shall be

(1) kept clean, well supplied with toilet paper, water, soap and paper towels, and shall be accessible and properly located;

(2) directly accessible for servicing;

(3) serviced and cleaned on a schedule sufficient to ensure suitability for use; and

(4) located as to minimize the potential risk for field and produce contamination.

b) Water used for hand washing shall meet the microbial standards for drinking water prescribed in 40 CFR Part 141.63.

2. Sewage Disposal

a) Sewage and septic systems shall be maintained in a manner to prevent contamination of growing fields or produce with pathogens, and in compliance with local laws and regulations.

b) Portable toilet facilities shall be serviced in a location and manner that does not pose a risk of contamination of growing fields or produce with pathogens.

c) The responsible party shall have a plan for immediate control and treatment of any effluent in the event of leakage or a spill. Leakages or spills shall be managed and disposed of in accordance with applicable federal, state and local laws and regulations, and in a manner that prevents or minimizes contamination of growing fields or produce with pathogens.

V. HARVEST AND IN-FIELD HANDLING REQUIREMENTS

A. General Harvest Considerations

1. Preharvest

a) Immediately prior to harvest, the responsible party should evaluate the production environment for changes in conditions that may be reasonably likely to result in contamination of the produce with pathogens. The scope and nature of the evaluation will vary depending on the commodity and complexity of the operation.

b) Harvest crews shall be trained to recognize and avoid harvesting produce that is reasonably likely to be contaminated with pathogens.

2. Harvesting Containers and Equipment

a) Harvesting containers, packing containers, and equipment should be stored in a manner so as not to serve as a source of contamination with pathogens to the extent practicable and appropriate.

b) The types and construction of harvest containers and equipment should be appropriate to the commodity being harvested and their condition maintained so as not to serve as a source of contamination with pathogens.

c) Food-contact totes, bins, other harvest containers and harvest equipment shall be clean prior to use. When in use, containers and harvest equipment shall be sufficiently maintained so as not to become a source of contamination with pathogens.

d) Food-contact totes, bins and other harvest containers and equipment that are no longer cleanable shall not be used for harvest but can be used for other non-food uses if clearly marked or labeled.

e) Food-contact totes, bins and other harvest containers and equipment designated for harvesting shall not be used for other purposes unless clearly marked or labeled for that purpose.

f) Pallets shall be kept clean and in good condition as appropriate for their intended use.

g) Properly trained personnel shall inspect all food-contact totes, bins and other harvest containers and equipment prior to harvest and as needed to ensure that they are suited for their intended purpose and functioning properly.

B. Harvest and In-Field, Post-Harvest Activities

- 1.** Steps should be taken to identify and not harvest produce that is reasonably likely to be contaminated with pathogens.
- 2.** Harvesting and packing equipment, utensils and machinery shall be designed, maintained, calibrated, and used as intended, and handled in a manner so as not to become a source of contamination of produce with pathogens.
- 3.** Properly trained personnel shall inspect all equipment to ensure that it is functioning properly, and that all food-contact surfaces are clean and sanitary prior to use, and maintained during use in a manner so as not to become a source of contamination of produce with pathogens.
- 4.** Washing, grading, sorting, and packing lines shall be cleaned and sanitized, at least daily when in use, so as not to become a source of contamination with pathogens.
- 5.** Cooling equipment shall be inspected at an appropriate frequency, all debris removed, and cleaned and sanitized as necessary when in use.

C. Harvested Crops

- 1.** The responsible party should remove as much dirt, mud and debris as practicable from the produce before it leaves the field.
- 2.** The responsible party shall ensure that harvested produce is handled in a manner such that it is not reasonably likely to become contaminated with pathogens.
- 3.** If temperature control is important for food safety, steps should be taken to minimize temperature increases and the time between harvest and destination.

D. Water Use in Harvest and In-field Post-Harvest Operations

1. General Considerations

a) If water directly contacts the harvested crop or is used on food-contact surfaces, the responsible party shall ensure that water when applied meets the microbial standards prescribed for drinking water in 40 CFR Part 141.63. Where necessary, water shall be treated to achieve those standards and monitored appropriately.

(1) Special considerations or variances may be appropriate for some crops, such as cranberries and watercress, where deliberate flooding of the field is part of production and harvest practices.

(2) The responsible party for harvest/post-harvest activities in the field that include the use of water that comes into contact with harvested produce or food-contact surfaces shall perform and document periodic assessment of water use and water system including water source and quality, delivery systems and equipment.

b) If applicable to intended use, the water-delivery system shall be of adequate size and design and installed and maintained so as not to serve as a source of contamination of produce, water supplies or equipment with pathogens, or to create an unsanitary condition. The water system shall prevent backflow from, or cross-connection between, piping systems that discharge wastewater or sewage and piping systems that carry water for post-harvest activities.

c) When produce is washed, the responsible party shall use wash methods appropriate to the commodity. The responsible party should consider wash-water temperature for certain produce to prevent internalization of microorganisms from the water into the produce.

d) Any antimicrobial chemicals used in water and that contact food or food-contact surfaces shall be used in accordance with FDA and EPA regulations, label instructions for concentration and contact time, and other requirements.

e) If used, ice shall be made from water that meets microbial standards for drinking water prescribed in 40 CFR Part 141.63. Ice shall be manufactured, transported, and stored under sanitary conditions.

2. Monitoring

- a) Equipment designed to assist in maintaining water quality, such as chlorine injectors, filtration systems, and backflow devices, shall be routinely inspected and maintained to ensure effective operation.
- b) Food-contact surfaces of equipment such as dump tanks, flumes, wash tanks, and hydrocoolers, shall be monitored at an appropriate frequency, have all debris removed, and be cleaned and sanitized as necessary when in use.
- c) Water in dump tanks, flumes, wash tanks, and hydrocoolers shall be monitored and managed as necessary to maintain sanitary conditions. Standard Operating Procedures (SOPs), including water-change schedules, shall be developed for all post-harvest uses of water.
- d) Where necessary for food safety, temperature of post-harvest water used in the field in equipment such as dump tanks and flumes shall be monitored and kept at temperatures appropriate for the commodity.
- e) If antimicrobial chemicals are used in water, their concentrations and other pertinent conditions (e.g., pH) shall be monitored at appropriate intervals to maintain efficacy.

E. Worker Health and Hygiene

1. Personal Health and Hygiene

- a) Workers shall be required to wash their hands properly before starting work, after using the toilet, after each break, and at any other time when their hands may have become a source of contamination with pathogens. Hand sanitizers shall not be used as a substitute for hand washing.
- b) Eating, drinking, spitting, chewing gum and using tobacco shall be prohibited except in clearly designated areas separate from production fields.
- c) Personal-service areas for workers shall be maintained so as not to be a source of contamination with pathogens and located away from produce-handling areas.
- d) The responsible party shall have a written policy regarding the use of hair coverings (e.g., hair nets, beard nets, caps), and the wearing of artificial fingernails and jewelry.

e) Workers, visitors, and field personnel who show signs of illness (e.g. vomiting, jaundice, and diarrhea) shall be restricted from direct contact with produce or food-contact surfaces.

f) Any worker, visitor, and field personnel with an open sore or lesion that cannot be effectively covered (i.e. to prevent contact with produce or food-contact surfaces) shall be restricted from direct contact with produce or food-contact surfaces.

g) If gloves are used, the responsible party shall have a policy in place to ensure that gloves are used properly.

h) The responsible party shall designate competent supervisory personnel to ensure compliance by all workers, visitors, and field personnel with the requirements in this section.

2. Training

a) The responsible party shall ensure training is provided for all workers, including supervisors, full-time, part-time and seasonal personnel, on proper sanitation and hygiene practices. Training shall be documented.

b) All workers shall be trained on job responsibilities that impact food safety.

c) Training in personal hygiene and sanitary practices shall include:

(1) proper hand-washing techniques;

(2) proper use of toilet facilities;

(3) proper glove use, if gloves are used, including the need to wash hands before gloves are donned, and to wash hands in between changing gloves, and that the use of gloves in no way lessens the need or importance of hand washing and proper hygiene practices;

(4) seeking prompt treatment for cuts, abrasions and other injuries; and

(5) reporting signs of illness (e.g. vomiting, jaundice, diarrhea) to their supervisor before beginning work.

d) Periodic refresher or follow-up training shall be conducted.

3. Visitors

The responsible party shall ensure that visitors, including buyers, product inspectors, and auditors, comply with all established personal hygiene practices detailed in subsection 1.

F. Sanitary Facilities

1. Toilet Facilities and Hand-Washing Stations

- a) All toilet facilities and hand-washing stations shall be
 - (1) kept clean, well supplied with toilet paper, water, soap and paper towels, and shall be accessible and properly located;
 - (2) directly accessible for servicing;
 - (3) serviced and cleaned on a schedule sufficient to ensure suitability for use; and
 - (4) located so as to minimize the potential risk for field and produce of contamination with pathogens.
- b) Water used for hand washing shall meet the microbial standards prescribed for drinking water in 40 CFR Part 141.63.

2. Sewage Disposal

- a) Sewage and septic systems shall be maintained in a manner so as to prevent contamination of growing fields or produce with pathogens, and in compliance with local laws and regulations.
- b) Portable toilet facilities shall be serviced in a location and manner so as to prevent contamination of growing fields or produce with pathogens.
- c) The responsible party shall have a plan for immediate control and treatment of any effluent in the event of leakage or a spill. Leakages or spills shall be managed and disposed of in accordance with applicable federal, state and local laws and regulations, and in a manner that prevents or minimizes contamination of growing fields or produce with pathogens.

G. Transportation from the Field

1. Personnel

a) Personnel involved in the loading and unloading of produce during transport shall practice good hygiene and sanitary practices consistent with Part E.1. of this section.

b) Drivers and transportation-handling personnel shall be made aware of food safety requirements for proper handling and transport of produce.

2. Transportation Vehicles

a) The carrier shall ensure that the cargo areas of vehicles used to transport produce from the field are as clean as practicable. The carrier shall maintain the cargo area of the vehicle so as to minimize the potential for contamination of produce with pathogens.

b) Cargo areas and containers that have been used to transport trash, animals, raw animal products or other items that may be a source of contamination with pathogens shall not be used to transport produce, unless the cargo area or container is first cleaned and sanitized by a procedure sufficient to ensure that contamination of produce does not occur.

3. Loading Vehicles

a) The personnel responsible for loading of produce shall inspect the cargo areas of vehicles used to transport produce from the field to ensure they are as clean as practicable so as to minimize the potential for contamination of produce with pathogens.

b) Personnel responsible for the loading and unloading of produce shall take steps to minimize the potential of physical damage to produce, which can introduce and/or promote the growth of pathogens.

VI. PACKING FACILITY REQUIREMENTS

A. Unloading of Transport Vehicles at the Packing Facility

1. Personnel who come in direct contact with the produce while unloading shall practice good hygiene and sanitary practices consistent with Part C.1. of this section.

2. Personnel responsible for unloading shall inspect the cargo areas of transport vehicles, produce containers and, as appropriate to

the operation, the produce, to ensure there are not conditions that may have resulted in contamination of produce with pathogens.

3. Personnel responsible for unloading should take steps to minimize the potential of physical damage to produce, which can introduce and/or promote the growth of pathogens.

B. Water Use

1. General Considerations

a) The responsible party shall prepare a description of the water system in use. This description should be sufficient to facilitate an assessment of the risk. This description may use maps, photographs, drawings (hand drawings are acceptable) or other means to communicate the water source(s) and locations thereof, permanent fixtures and the flow of the water system (including holding systems, reservoirs or any water captured for re-use).

b) The responsible party shall perform an initial assessment, followed by a review (or new assessment) any time there is change made to the system or a situation occurs that could introduce an opportunity for contamination. A water-system assessment shall include an inspection of the water system under the control of the packing facility for the purpose of identifying conditions that may result in contamination with pathogens.

c) Plumbing shall be of adequate size and design and adequately installed and maintained to:

(1) carry sufficient quantity of water to required locations throughout the facility;

(2) avoid constituting a source of contamination to produce, water supplies, equipment or utensils, or creating an unsanitary condition; and

(3) provide that there is not backflow from, or cross-connection between, piping systems that discharge wastewater or sewage and piping systems that carry water for post-harvest operations.

d) If water directly contacts the harvested crop or is used on food-contact surfaces, it shall meet the microbial standards for drinking water prescribed in 40 CFR Part 141.63. Where necessary, water shall be treated to achieve those standards and monitored appropriately.

e) Any antimicrobial chemicals used in water and that contact food or food-contact surfaces shall be used in accordance with FDA and EPA regulations and label instructions for concentration and contact time or other requirements.

2. Monitoring

a) Equipment designed to assist in maintaining water quality, such as chlorine injectors, filtration systems, and backflow devices, shall be routinely inspected, calibrated on an appropriate frequency, and maintained to ensure effective operation.

b) Food-contact surfaces of equipment such as dump tanks, flumes, wash tanks, and hydrocoolers, shall be monitored at an appropriate frequency, debris removed to the extent practicable, and cleaned and sanitized as necessary during periods of use (seasons of operation).

c) Water in dump tanks, flumes, wash tanks, and hydrocoolers shall be monitored and managed as necessary to maintain sanitary conditions. Standard Operating Procedures (SOPs), including water-change schedules, shall be developed for all uses of product-contact water in packing operations.

d) Where necessary for food safety, temperature of water used in equipment such as dump tanks and flumes shall be monitored and kept at temperatures appropriate for the commodity.

e) If antimicrobial chemicals are used in water, their concentrations and other pertinent conditions (e.g., pH), shall be monitored at appropriate intervals to maintain efficacy.

3. Wash Water

a) The packing facility shall use wash methods appropriate to the commodity. The facility should consider the wash-water temperature for certain produce to prevent internalization of microorganisms from the water into produce tissue.

4. Cooling Operations

a) Cooling shall be conducted in a manner to minimize the potential for contamination with pathogens.

b) Interiors of hydrocoolers and other cooling equipment shall be routinely cleaned and sanitized according to written sanitation SOPs or as frequently as needed. Air cooling equipment and cooling areas shall be clean and sanitary and inspected on a

periodic basis. Air intakes shall not be located near potential sources of contamination.

c) Ice shall be made from water that meets the microbial standards for drinking water prescribed in 40 CFR Part 141.63. Ice shall be manufactured, transported, and stored under sanitary conditions.

d) Containers holding finished product during chilling operations shall be clean and sanitary.

C. Worker Health and Hygiene

1. Personal Health and Hygiene

a) Workers shall be required to wash their hands properly before starting work, after using the toilet, after each break, and at any other time when their hands may have become a source of contamination with pathogens. Hand sanitizers shall not be used as a substitute for hand washing.

b) Eating, drinking, spitting, chewing gum and using tobacco shall be prohibited in the packing facility except in clearly designated areas.

c) Personal-service areas for workers shall be maintained so as not to be a source of contamination and shall be located away from produce-handling areas.

d) Packing facilities shall have a written policy regarding the use of hair coverings (e.g., hair nets, beard nets, caps), and the wearing of artificial fingernails and jewelry.

e) Workers, visitors, and field personnel who show signs of illness (e.g. vomiting, jaundice, diarrhea) shall be restricted from direct contact with produce or food-contact surfaces.

f) Any worker, visitor, or other personnel with an open sore or lesion that cannot be effectively covered (i.e. to prevent contact with produce or food-contact surfaces) shall be restricted from direct contact with produce or food-contact surfaces.

g) If gloves are used, the responsible party shall have a written policy in place to ensure that gloves are used properly.

h) The responsible party shall designate competent supervisory personnel to ensure compliance by all workers, visitors, and other personnel with the requirements in this section.

2. Training

- a) The responsible party shall ensure training is provided for all workers, including supervisors, full-time, part-time and seasonal personnel, on proper sanitation and hygiene practices. Training shall be documented.
- b) All workers shall be trained on job responsibilities that impact food safety.
- c) Training in personal hygiene and sanitary practices shall include:
 - (1) proper hand-washing techniques;
 - (2) proper use of toilet facilities;
 - (3) proper glove use, if gloves are used, including the need to wash hands before gloves are donned, and to wash hands in between changing gloves, and that the use of gloves in no way lessens the need or importance of hand washing and proper hygienic practices;
 - (4) seeking prompt treatment for cuts, abrasions and other injuries; and
 - (5) reporting signs of illness (e.g. vomiting, jaundice, diarrhea) to their supervisor before beginning work.
- d) Periodic refresher or follow-up training shall be conducted.

3. Visitors

The responsible party shall ensure that visitors, including buyers, product inspectors, and auditors, comply with all established personal hygiene practices.

D. Worker Health and Hygiene

1. Toilet Facilities and Hand-Washing Stations

- a) All toilet facilities and hand-washing stations shall be:
 - (1) kept clean, well supplied with toilet paper, soap and paper towels, and shall be accessible and properly located;
 - (2) directly accessible for servicing;
 - (3) serviced and cleaned on a schedule sufficient to ensure suitability for use; and

(4) located so as to minimize the potential risk for field and produce contamination.

b) Water used for hand-washing shall meet the microbial standards for drinking water prescribed in 40 CFR Part 141.63.

2. Sewage Disposal

a) Sewage and septic systems shall be maintained in a manner to prevent contamination of the packing facility or produce with pathogens, and in compliance with local laws and regulations.

b) Portable toilet facilities shall be serviced in a location and manner that does not pose a risk of contamination of the packing facility or produce with pathogens.

c) The responsible party shall have a plan for immediate control and treatment of any effluent in the event of leakage or a spill. Leakages or spills shall be managed and disposed of in accordance with applicable federal, state and local laws and regulations, and in a manner that prevents or minimizes contamination of the packing facility or produce with pathogens.

E. Packing-Facility Sanitation

1. General Considerations

a) The responsible party should remove as much dirt, mud and debris as practicable from produce before it enters the packing facility.

b) The responsible party shall adopt measures that minimize contamination of produce with pathogens from animals. Facilities shall have a policy restricting domestic animals from the packing facility.

c) Prior to use, the lines used for washing, grading, sorting, or packing shall be cleaned and sanitized. When in use, the lines shall be maintained so as not to be a source of contamination with pathogens.

2. Facility Maintenance

a) Facilities used to store produce shall be cleaned and, as necessary, sanitized prior to use.

b) Packing-facility premises shall be maintained to minimize harborage of pests and wildlife.

c) Equipment and machinery shall be maintained and handled so as not to be a source of contamination with pathogens.

3. Pest Control

a) The responsible party shall exclude pests to the extent possible and appropriate to the facility.

b) The responsible party shall minimize the availability of food items and water to animals and pests.

c) The responsible party shall establish a pest-control program, which shall include regular and frequent monitoring to assess and ensure the program's effectiveness.

d) The responsible party shall maintain a pest-control log that includes dates of inspection, inspection reports and steps taken to eliminate any problems. Applications of pesticides (e.g., insecticides, rodenticides) shall be performed in compliance with local, state, and federal pesticide regulations.

4. Packing Containers and Equipment

a) Packing containers and equipment should be stored in a manner so as not to become a source of contamination with pathogens.

b) The types and construction of packing containers and equipment should be appropriate to the commodity being packed and their condition maintained so as not to serve as a source of contamination with pathogens.

c) Food-contact totes, bins, other packing containers and packing equipment shall be clean and sanitary prior to use. When in use, containers and packing equipment shall be maintained so as not to become a source of contamination with pathogens.

d) Food-contact totes, bins and other packing containers and equipment that are no longer cleanable shall not be used for packing but can be used for other non-food uses if clearly marked/labeled.

e) Food-contact totes, bins and other packing containers and equipment designated for use for packing shall not be used for other purposes.

f) Pallets shall be kept clean and in good condition as appropriate for their intended use.

g) Properly trained personnel shall inspect all food-contact totes, bins and other packing containers and equipment prior to packing and as needed to ensure that they are suited for their intended purpose and functioning properly.

F. Transportation from the Packing Facility

1. Personnel

a) Personnel involved in the loading of produce during transport shall practice good hygiene and sanitary practices consistent with Part C.1 of this section.

b) Drivers and transportation-handling personnel shall be made aware of food safety requirements for proper handling and transport of produce.

2. Temperature Control

a) Prior to loading, if refrigeration is required for safety, the vehicle cargo area shall be pre-cooled. The proper temperature for pre-cooling should be appropriate to the type of produce, or as specified by agreement between the shipper and carrier.

b) During transport, if refrigeration is required for safety, the carrier shall ensure that the vehicle cargo area is maintained at temperatures appropriate for the particular type of produce, or as specified by agreement between the shipper and carrier.

c) If refrigeration is required for safety, refrigerated transport vehicles shall have properly maintained and fully functional refrigeration equipment that is in operation for the entire transport time. This equipment shall be controlled by a thermostatic device as necessary to maintain temperatures in the cargo area for the particular type of produce being transported, or as specified by agreement between the shipper and carrier.

3. Transportation Vehicles

a) The carrier shall ensure that the cargo areas of vehicles used to transport produce from the field are as clean as practicable. The carrier shall maintain the cargo area of the vehicle so as to minimize the potential for contamination of produce with pathogens.

b) Cargo areas and containers that have been used to transport trash, animals, raw animal products or other items that may be a

source of contamination with pathogens shall not be used to transport produce, unless the cargo area or container is first cleaned and sanitized by a procedure sufficient to ensure that contamination of produce does not occur.

4. Loading Vehicles

a) The personnel responsible for loading of produce shall inspect the cargo areas of vehicles used to transport produce from the packing facility to ensure they are as clean as practicable so as to minimize the potential for contamination of produce with pathogens.

b) Personnel responsible for the loading of produce shall take steps to minimize the potential of physical damage to produce, which can increase risk of contamination with, or growth of, pathogens.