

GOOD AGRICULTURAL PRACTICES FOR THE PRODUCTION AND HANDLING OF PEACHES

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Good Agricultural Practices (GAP) involve a systematic, stepwise, on-farm effort to assure food safety. The potential for food safety crisis exists for all produce items. To date, fresh peaches have not been implicated as the cause of an outbreak of food-borne illness. Fortunately, the same management practices that help ensure product safety often improve fruit quality.

FIELD SANITATION PROGRAM

Land Use History. Peaches are a tree crop, so the fruit are never in contact with the soil, and fecal contamination from past land use is not a serious concern. Furthermore, the non-bearing orchard establishment phase allows time for any microbiological contamination present to have time to become inactivated. The possibility of toxic residues in the soil, such as heavy metals from sewage sludge or excessive pesticide residues, should receive greater scrutiny.

Soils may also become naturally contaminated with animal feces. For example, deer browsing in peach orchards may leave fecal contamination behind. The key management imperative is that manure should never have an opportunity to come in contact with fruit. Drops or windfalls, peaches that fall to the ground, should never be picked up and utilized as fresh-market fruit.

Irrigation Water. Clean water, free of pathogenic microorganisms, is a key component of good, on-farm food safety programs. Surface groundwater, lakes, ponds, canals, and streams, for example, typically supports the growth of microorganisms. Water from these sources should be tested. The presence of *Escherichia coli* is an indicator of fecal contamination. Do not irrigate from a pond or lake if cattle graze in proximity or have access to the water. Well water is less likely to have fecal contamination, although such situations have been documented.

Microbiological Testing of Water. Testing of water for possible microbial contamination or other water quality parameters is a good practice. If you test your water, use a reputable, certified laboratory and retain your records of the test results. The laboratory should be able to provide you with tolerances for allowable populations of microbes in the water. Microbial tolerances are an ongoing topic of discussion by federal regulatory agencies.

Irrigation and Frost Protection. Peaches in practically all growing locations benefit from irrigation. Water may be applied in-furrow, through micro-sprinklers under the tree, by overhead systems, or drip tubes. Clearly, overhead watering for frost protection or irrigation is more likely to spread pathogens into the tree canopy than any other form of irrigation. Water for irrigation must be free of microbial contamination.

Pesticide Application. Pesticides should be mixed and applied according to the label. Potable water should be used for mixing. There is at least one documented case of a food-borne illness from application of pesticides with water containing microbiological contamination.

Worker hygiene is an essential component of food safety. Employees must be trained, and re-trained on a regular basis, so that new employees receive instruction information, and so the message to long-term

employees is fortified. The topics of proper handwashing, toilet habits, health screening, and hygiene in the home all are important. Ideally, training is conducted in the native language of employees and always with sensitivity to the culture of the worker. Documentation of training should be recorded for each worker.

HARVEST

Harvest Containers. Picking bags, buckets, boxes, bins, and other harvest containers should be cleaned and inspected on a regular basis. They should be free of contaminants such as rodent droppings, bird nests, or other organic material. Ideally, they should be washed and sanitized with approved detergents and disinfectants. Physical hazards such as nails, splinters, staples, and so on also should be removed from containers. Plastic bins are easier to clean and disinfect than wooden bins.

Transport Vehicles. The same sanitary guidelines that apply to harvest containers also apply to field vehicles. In addition, tractors and trailers should not be driven through livestock areas and then taken to the orchard without first cleaning and sanitizing properly.

Toilet Facilities in the Field. The number and types of toilets that must be present in the field are regulated by both federal (OSHA) and state agencies. Toilets should be supplied with toilet paper and equipped with a handwashing station that has water, soap, and single-use towels. Toilets also provide an ideal location for the placement of signage that provides information on the importance of good hygiene.

PACKING FACILITY SANITATION

Packing Lines and Other Equipment. General sanitation throughout a packing facility should reflect a documentable, systematic application of common sense to the task of cleaning. At the end of each day, remove fruit from conveyors, from underneath the packing line, and from other areas. Sweep the entire facility. Ideally, pressure washing with an industrial disinfectant is preferred. Wash out drain pans under equipment, floor drains, or other places where water might accumulate.

Storerooms. Storeroom walls, floors, refrigeration coils, condensate drainage pans, floor drains and all other areas in a peach storeroom should be regularly washed as described previously for the packing area.

Processing Water. Although hand packing of peaches without the use of water is feasible, most commercial packing houses use water either in hydrocoolers, in dump tanks, for rinsing, for formulation of waxes and fungicide solutions, or in some cases for all of these operations. Water quality management for good sanitation is imperative. The addition of a disinfectant to water does not in turn disinfect the peaches. Rather, water is sanitized to help prevent the spread of microorganisms by the water itself.

Hydrocoolers and Dump Tanks. Fruit can absorb small amounts of water and any microorganisms that are present in the water. Minimize the time that fruit spend in dump tanks by emptying them in advance of work breaks. Water used for these operations typically is chlorinated to a concentration of approximately 100 PPM and the pH adjusted to near neutral to maximize the efficacy of the chlorine. Other disinfectants are approved, but none are as inexpensive as chlorine. Chlorine gas, liquid sodium hypochlorite, or granular calcium hypochlorite may be used. Any form of chlorine causes changes in the water pH, so adjustment of pH must be a frequent, on-going component of the water quality management program. Excessive chlorine causes objectionable odors, can irritate workers' skin, is corrosive to equipment, and increases cost.

Rinse Water. Peaches typically are rinsed under spray nozzles as they pass across the de-fuzzing brushes. This rinse water should be of at least potable quality. If chlorine or other approved disinfectants are desired, a suitable injection system can be utilized to adjust the water quality to the desired conditions. A concentration of 100 PPM chlorine is adequate for rinsing and hydrocoolers, as the soil and other contaminants have already been removed from the fruit by earlier operations.

Wax and Fungicide Formulations. Water used to formulate waxes and/or fungicides must be of drinking quality.

Pest control is pertinent to all aspects of production. The openness of orchards and packing facilities make it almost impossible to exclude birds, rodents, domestic animals, or other pests from these areas. Storage areas generally are enclosed and effective pest control can more realistically be accomplished. Daily cleaning, monitoring for signs of pests, elimination of potential nesting locations, and constant vigilance in attending to these tasks will help reduce risks. There are companies that specialize in pest exclusion.

Transportation. Refrigerated trucks are a critical link in the cold chain. The role of trucks in temperature management makes them important for food safety, as well as for maintenance of peach quality. Prior to loading, trucks should be inspected for cleanliness. If there are traces of odors or visible signs of foreign matter, they should be pressure washed with an appropriate disinfectant. Some companies require specific trailer sanitation protocols. In addition to cleanliness, the truck should be inspected for potential refrigeration problems. This would include condition of door seals, walls and insulation, air delivery chutes, bulkheads, and so on. Peaches should be adequately cooled and trailers should be precooled prior to loading. Refrigeration systems are designed to maintain temperature, not to remove field heat.

Traceback and recall programs allow tracing of fruit from its point of consumption back to its point of origin. All handlers who had possession of the fruit at any time are identified. Traceback can be very important if someone becomes ill from eating your peaches. If a food safety crisis occurs, it is especially important to validate the cause of the illness and the source of the fruit. A recall program is similar to a traceback program in the sense that anyone with possession of the fruit must be contacted quickly so that the product can be removed from the marketing chain and not be consumed. Peach handlers will find it useful to read the traceback literature developed by the California Tree Fruit Agreement (see references).

Record keeping protects you as a producer. In food safety, “. . . you didn’t write it down, you didn’t do it . . .” is a truism that should be heeded. Careful record keeping is essential. Records may be vital if your operation is ever involved in food safety controversy. Record keeping should be a part of your employee training program, and managers should set the proper example by giving adequate attention to record keeping themselves.

Third Party Audits. Independent food safety audits are not mandated by law, but many receivers and supermarket chains have begun to require that produce handling facilities be audited by an independent third party. If your company contracts for such an audit, be sure that you keep any records that the auditor provides and make a good-faith effort to comply with any suggestions for correcting deficiencies that may exist in your operation.

Crisis Management. How will you react if you get the word that an outbreak of illness is associated with consumption of your peaches? What is the first step you would take to address the situation? Do you have a professional spokesperson in your company who is responsible for meeting the media? Do you have a plan for developing a statement for the media each day? There are literally dozens of such questions that a manager should be prepared to answer in a time of crisis. The worst thing that business managers can do is nothing. Do not wait until there is panic before trying to develop a plan of action. There are numerous firms today that can help you develop a crisis management plan.

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