More Berries

Most of the diseases transmitted via fresh produce occur as part of the “fecal-oral pathway.” This is the movement of human pathogens from an infected individual’s waste to material ingested by a healthy person. Most commonly, this occurs when the infected individual handles food without properly washing his/her hands.

Employee hygiene, including hand washing and proper facility use, is an important step in breaking the infection cycle.

Open wounds also may contain pathogens. Use of a sealed covering (rubber or latex gloves, just a bandage is not sufficient) is the only way to contain them. The best method of reducing contamination from open sores or wounds is by removing affected employee(s) from situations where they may come in contact with produce, directly or indirectly.

Restrooms in packing houses must have appropriate hand-washing facilities:
- A place to remove aprons, smocks, and gloves and hang them outside the restroom.
- Hand-washing stations located outside restrooms. This can aid supervisors in ensuring employee hygiene.
- A fresh-water source (not re-circulated water).
- Soap.
- A non-reusable hand-drying system (disposable towels, air dryer, etc.).
- Possibly a sanitizing solution for use in conjunction with, but not to replace, proper hand washing.

Employees can maintain good hygiene only if the proper facilities are available to them.

Storage and Transport

Cooling

Human pathogens tend to grow slowly or not at all below about 45°F. This is, therefore, the normal target for cooling systems. However, depending on the cultivar, growing region, maturity, treatments (such as temperature conditioning), etc., storage below 45°F may not be possible because of the potential for chilling injury. In such cases, fruits should be stored at the lowest safe temperature.

Cooler system coil maintenance and sanitation are also important (any pathogens growing in the air handlers of a forced-air cooer can potentially be blown into the stored commodity, possibly infecting the entire store of products).

Storage room and vehicle cleanliness

Be sure storage rooms and truck trailers are clean. If a trailer previously hauled raw meat, there is great potential for contamination. Trailers should be cleaned if there are traces of odors or visible signs of foreign matter.

Reefer maintenance

Proper reefer (a refrigerated vehicle) maintenance should be done and details recorded to avoid possible mishaps due to inappropriate shipping temperatures. Occasional use of a data logger to track temperature and cooler functionality/accuracy during transit is also desirable.

“The Cold Chain”

To maintain “the cold chain” (the total refrigerated atmosphere), fruit should never leave refrigeration, including loading/unloading docks. Once fruit has been cooled to storage temperature, it must remain at that temperature to maintain an environment in which bacterial growth will be minimized. If, at any point in shipping or storage, fruits are removed from a cold environment and warmed to a level where microbial growth may begin, pathogenic cells may begin to multiply and will not be eliminated by a return to a cold environment.

Use the same good agricultural practices and sanitary guidelines in packinghouse operations as were used in field operations in terms of employee handling, loading, and unloading for product safety. This is particularly important if handlers directly contact fruit (cutting, re-packing, etc.).

Unpacking and Display

Product quality

Even at the consumer level, the cold chain must be maintained. Removal of bruised and decaying fruit while setting up and rotating displays reduces chances for human pathogen proliferation as well. Use sanitation procedures in the back room and display area as outlined previously to avoid cross-contamination between different foods or contamination by workers.

Limit consumer handling

Consumer packs may be preferable to bulk displays because they avoid possible contamination of vegetables by consumers while selecting produce.

Record-Keeping

Keeping records is important. It will help document adherence to good agricultural practices and identify potential problem areas.
- Keeping records helps allocate legal responsibilities in a trace-back situation.
- Keep track of microbial test results, reefer and storage room temperature levels, any and all cleaning and maintenance activities, etc.
- History has shown that, in a trace-back situation following an outbreak, responsibility is often pinned on those with the least- (or worst-) kept records.
- Self-check lots are available from several commercial auditing companies to aid in record-keeping.

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More Berries

Give preference to groundwater sources: they have come in contact with the edible portion of fruit.

Pumps and irrigation stations must also be kept within ¼ mile of them at all times. If a worker touches this fruit, the contaminated material can get on his/her hands and be spread to any other fruit he/she touches.

Human hygiene

If pickers are in the field for more than 3 hours, GSHA requires that there be 1 portable toilet per 20 employees.

These must be moved with the crews and be kept within ¼ mile of the field. They must never be emptied in the field or near surface water sources.

Appropriate hand-washing facilities must be provided with portable toilets.

Soil contaminants

Animal manure applied as fertilizer must be composted unless it is incorporated into the soil not fewer than 90 days before harvest or stored containers can easily become contaminated by rodents, insects, and other animal life. Investors who display symptoms of illness should be sent home. This is not feasible, be disallowed from coming in contact with fruit or any equipment that will contact the crop.

Containers used in the field, in packing houses, and for shipment should all be kept clean until used. If any of the containers are reusable, they should be cleaned regularly with more frequent washings if any of the containers are reusable, they should be cleaned regularly with more frequent washings if they become overly soiled. Any disposable contain-

Fruit that falls to the ground and is subject to animal contamination.

Workers who display symptoms of illness should be sent home. This is not feasible, be disallowed from coming in contact with fruit or any equipment that will contact the crop.

Workers who have recently had enteric (intestinal) disease should, if allowed to work at all, be utilized in a non-vegetable handling capacity. Sending sick employees home is, unfortunately, usually the best method of dealing with this.

Disease transmission and cross contamination

 Probably the #1 source of foodborne illness is unsanitary worker conditions.

Cleaning and sanitation of packingline equipment is critical. Just one source of pathogen introduction at any point can potentially inoculate all vegetables passing through the line.

Cleaning with detergent and physical labor (such as scrubbing or pressure-washing, etc.).

Send sick employees home is, unfortunately, usually the best method of dealing with this.

Stains should never be harvested for fresh market.

Harvest and Packing

Pesticides

Pesticide labels are prepared for the safety of product, workers, and environment. It is critical that they be followed.

Apply only those treatments specifically labeled for the crop.

Do NOT harvest until the label-designated time.

Animals can easily transmit pathogens. Minimizing animal contact in fields and packing facilities reduces the risk of contamination.

Keep domesticated animals out of the field at harvest.

Animal exclusion

Animals can bring contaminants into contact with fruit at any stage, from farm to fork.

Animals should be kept at least 150 feet from field edges where water is held and away from any point where water is used for irrigation. Water sanitation is not as critical. Mulch are not likely to transmit pathogens to fruit, so should ideally be tested for the presence of soil contaminants, particularly at harvest time. Animals can easily transmit pathogens.

Animal carcasses, or animal waste materials should not be handled by farmworkers. Ideally, harvest workers should not handle culls in the field. This can spread infection from contami-

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