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Growing and Direct Marketing Produce: Potential Hazards

Joan Hegerfeld-Baker, SDSU food safety Extension specialist

Providing a safe food to the consumer requires a process that incorporates food safety from planting to harvesting. Fruit and vegetables growers that market locally are confronted with the same food safety concerns as produce operations that distribute statewide, nationally, or even globally. Growers must first identify the potential food safety hazards related to their operation. Once the hazards are identified, a plan that addresses safe food handling must be implemented.

THREE RISK/HAZARD CATEGORIES

Three categories of risks or hazards must be addressed: biological, chemical, and physical.

Biological hazards associated with fruit and vegetable production are pathogens (disease-causing microorganisms such as viruses, parasites, molds, and bacteria) that can cause a **foodborne illness**. Fruits and vegetables have been known to be contaminated with pathogens, particularly if Good Growing Practices (GGP) are not followed. The pathogens of concern for fresh produce are often in the intestinal tract of humans and animals (including birds). An increase in the proportion of reported foodborne illness outbreaks has been linked to fresh produce. The following are the pathogens most often implicated:

- *E. coli* O157:H7 is a bacterium that produces a powerful toxin that can cause severe illness. Outbreaks of *E. coli* O157:H7 infections occur regularly and have been both large and small, ranging from localized areas to spanning several states. Transmission of *E. coli* was first associated with contaminated ground beef; but it has also been spread through unpasteurized fruit juices, lettuce, and contaminated drinking water; as well as through contact with infected animals (such as in petting zoos) and person-to-person, especially among children in day-care centers.

- *Salmonella* is actually a group of bacteria that can

cause diarrheal illness in humans. The FDA conducted trace-back investigations of three outbreaks caused by eating tomatoes contaminated with several strains of *Salmonella*. The investigators traced the tomatoes from restaurants back to distributors, packers, or growers in the United States. *Salmonella* can come from pets, wild animals, birds, contaminated water, and those handling the food at stages from growth to consumption.

- *Cyclospora* is a parasite linked to various types of fresh produce. *Cyclospora* is spread by ingestion (e.g., consuming water or food that was contaminated with infected stool). *Cyclospora* needs time (days or weeks) after being passed in a bowel movement to become infectious. Therefore, it is unlikely that *Cyclospora* is passed directly from one person to another. It is not known whether animals can be infected with *Cyclospora* and then pass the infection directly to people.

- *Shigella* infections may be acquired from eating food that became contaminated by infected food handlers who did not wash their hands effectively after using the bathroom. Vegetables can become contaminated if they are harvested from a field with sewage in it (flies that breed in infected feces contaminate the food), or from contaminated workers handling fresh produce.

- Hepatitis A virus (HAV) is found in every part of the United States and throughout the world. When water sources such as private wells are contaminated with feces from infected humans, the water may spread the Hepatitis A virus. The virus can enter the water in various ways, including irrigations with contaminated water, sewage overflows, or a broken sewage system. In addition, there are many opportunities for contamination to occur for produce with a complex plant surface that is subjected to hand picking, rinsing, processing, cooling, icing, storage, transport, and so on, such as green onions and strawberries.

Five commodity groups make up over 75% of produce-related foodborne-illness outbreaks:

- 30% Lettuce (iceberg, romaine, mesclun, spinach) – *Salmonella*, *E. coli* O157:H7, *Cyclospora*
- 17% Tomatoes – *Salmonella*
- 13% Cantaloupes – *Salmonella*
- 11% Herbs (basil, parsley) – *E. coli* O157:H7, *Cyclospora*, *Shigella*
- 5% Green onions – *HAV*

Other outbreaks involve raspberries, strawberries, and almonds.

Chemical hazards identified in fruit and vegetable production are often related to incorrect application by the producer. However, chemical contamination from pesticides can occur via run-off during floods or from contaminated soil or water. Other routes of chemical contamination are misuse of chemical cleaners and sanitizers. People (both consumers and growers) often have a greater concern over chemical contamination. However, contamination of fruits and vegetables from pathogens is a much greater threat.

Physical hazards consist of foreign materials that can lead to injury or serve as a carrier of a microorganism. The more-common physical hazards are metal, glass, wood, rocks, insects and worms, hair, and in some situations dirt.

Use a critical approach to track your produce from growing to market to reduce the possibility of a hazard. Identifying potential problems at the growing stage reduces the possibility of problems later on.

Each grower's land, facilities, equipment, and growing practices are unique. Therefore, each potential hazard is unique. Know your operation and what you need to do each step of the way to provide a safe food.

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