



Food Safety Hazards of Concern on the Farm

Good Agricultural Practices

Getting to know the potential food safety hazards on a fruit and vegetable farm

- The Micro-world and how it relates to production of safe produce on the farm
- Chemical and physical food safety hazards

During the past few years, there has been more news about food-borne illness and fresh produce; and the trend keeps rising. We know that there is the potential of foodborne illness from fresh produce. Fresh produce does not undergo a "kill" step such as cooking.

As a grower or produce handler you need to know about foodborne illnesses and what causes them. This information can help you to focus your food safety efforts on the hazards most likely to affect your product.

The Invisible Micro-world

Microorganisms are the most common cause of foodborne illness. They include bacteria, viruses, parasites, and molds. Because these micropests cannot be seen, it is important to learn to control your environment to reduce the chances that they will contaminate the fruits and vegetables you wholesale or sell at your retail store.

Bacteria

Bacteria are responsible for most foodborne illness. Some examples are the *salmonella* bacteria, *staphylococcus* bacteria, and *listeria*. Bacteria may be brought into your operation on people, shoes, on trucks, equipment or boxes used to transport food. Your best defense is to assume that bacteria are always there. Learn to control your environment to minimize the presence of microorganisms and to prevent their growth.

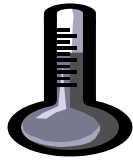
Potentially Hazardous Foods

Foods are defined as "potentially hazardous" if they are able to provide bacteria with what they need to grow—that is, they will have many nutrients (especially protein and starch), be high in moisture, and will be low in acid. Some examples include eggs, chicken, cottage cheese, and ground beef. While most fresh fruits and vegetables have not been traditionally labeled as "potentially hazardous," (the exception is melon, a low-acid fruit that supports the growth of microorganisms) experience has taught us that they can be a source of microorganisms picked up in the fields or in the packing house. The problem is that fresh fruits and vegetables are often considered *ready-to-eat*. They may not be cooked or heated, but are often served fresh, out of hand, cut, or used as part of a salad or other food that is not heated. This means that any pathogenic (illness causing) microorganisms that might be present at harvest or after handling in the packing room can remain on the produce all the way to the consumer's kitchen.

Time Temperature Relationships

Temperature is one of the most important factors in bacterial growth. If you have a product that should be temperature controlled, use the FDA Food Code guidelines. Bacteria will grow and multiply if they are at a temperature that supports growth. Temperature control is an important way to maintain the quality of produce and minimize the growth of pathogens. Monitoring produce and water temperatures is critical when

cooling produce, washing and packing, during cold storage, and when produce is displayed at the point of sale.



135°F



41° F

The Temperature Danger Zone

Viruses:

Viruses are another type of organism that can cause foodborne illness. Viruses use food merely as a way to transport themselves from one place to another. Once in a human, they reproduce rapidly and cause illness.

Viruses are often passed onto food by contaminated water or an infected food handler or farm worker. An example is Hepatitis A. Good personal hygiene habits, especially good handwashing techniques, can help to prevent the spread of viruses.

Parasites:

Parasites are microorganisms that survive by living on or inside a host. Parasites may be found in contaminated water or are passed along by an infected worker who practices poor personal hygiene. Though parasites are most likely found in raw animal or seafood products, a parasitic type of organism associated with produce is *Cyclospora cayetanensis*. While cooking fresh produce would thoroughly will kill parasites, much of the time, produce is served raw.

Molds:

There was a time when we thought that molds were harmless. Simply cut out the moldy part and eat the rest of the food. Right? Wrong!

New research has found that molds often develop toxins that may make a person ill, or may be potentially cancer causing. Patulin is a mycotoxin (mold toxin) that is produced by certain species of *Penicillium*, *Aspergillus*, and *Byssochyllum* molds that may grow on a variety of foods including fruit, grains and cheese. Patulin has been found to occur in a number of foods including apple juice, apples and pears with brown rot.

Additional Food Safety Hazards

- **Chemical hazards**

Chemical contamination can occur when pesticides or cleaning chemicals come into contact with foods or food preparation surfaces. In order to prevent chemical contamination be sure to:

- Keep all insecticides, pesticides, cleaning solutions, and other chemicals away from food preparation areas.
- Check water supplies to be sure they do not contain hazardous chemicals, including lead.

- **Physical hazards**

Although most incidents of contamination of a food product with physical hazards are more unsightly or unappetizing than dangerous, sometimes when physical contamination of a food product occurs can result in injury to the consumer.

- Check equipment to be sure it is in working order.
- Check for splinters or burrs from wood or plastic from pallets or harvest containers.
- Avoid the use of glass in a food operation; shield light bulbs to prevent contamination if breakage occurs.
- Be sure slicing or cutting equipment is working and that there are metal pieces from can openers or other equipment getting into food.

Additional sources of physical contamination are jewelry, nail polish, hairpins, etc.