

Hello, and welcome to Essentials of Food Safety for Farmworkers, a training series brought to you by the CCE Cornell Vegetable Program. Every produce farm should implement food safety practices to ensure that produce is safe for consumers. This is Caitlin Tucker, Program Assistant for the Cornell Vegetable Program. Throughout this series, I will walk you through to create a worker training program, foodborne pathogens of concern, routes of contamination, principles of health and hygiene, risk assessment, and so much more.

This training aims to cover many of the required worker training topics set forth by FSMA (the Food Safety Modernization Act), or other 3rd party auditing programs. This training series primarily focuses on training farmworkers in the produce industry. Because Food Safety is a company-wide responsibility, we invite all farm employees to participate in this training.

Here are some highlights from Part 1: How to Create a Worker Training Program.

- Every farm should have a food safety manager
- All workers involved in growing, harvesting, washing, packing produce should be trained.
- Farmworkers should be trained on health and hygiene practices, sources and routes of contamination, how to spot food safety risks, how to mitigate risks they see, etc.
- Worker trainings should be documented
- Trainings should be held annually, throughout the season, or as needed if a problem occurs

Let's begin Part 2: Food Safety and Why it Matters

Objectives for part 2 include:

- Describe the reasons all farm employees should care about food safety
- Identify the 3 types of pathogens that cause foodborne illnesses
- Identify the 5 routes of contamination on the farm
- Describe potential food safety risks on the farm

Why should we care about food safety?

Reason Number 1:

We don't want people to get sick. Produce that has been contaminated with germs can cause severe illness, and even death. Did you know The CDC estimates that each year 48 million people get sick from a foodborne illness, 128,000 are hospitalized, and 3,000 die?

Some people are more at-risk, including: Older adults, Younger children, People with weakened immune systems, And Pregnant people

Reason Number 2: Food Illness Outbreaks Hurt Business

When produce is found to be contaminated, those products may be pulled off of the grocery store shelves across the nation. Even after the source of the outbreak has been traced, customers may still feel uneasy about buying those products. Sales may not rebound for months which means farms lose money. Outbreaks can decrease consumer confidence and loyalty. If a foodborne illness is traced back to your farm, your customers may lose confidence in your ability to grow safe produce. They may decide to buy their produce from another farm. If your farm is linked to a food illness outbreak, you may be required to stop production until the source of the outbreak is identified and resolved. And finally, if a food illness outbreak is serious enough, the farmer, or farmers could be sued for damages.

Reason Number 3: Some Buyers may be required to follow food safety practices.

There may be a push from customers to have food safety practices and policies. Or, larger buyers, like grocery stores, farm to school programs, hospitals, restaurants, food hubs, etc. may require you to have food safety policies before they will buy produce from you. They may ask that you complete a 3rd party audit program like GAPs, Harmonized GAPs, Primus, etc.

Reason number 4: Federal Law says we must follow food safety on the farm.

In 2011, under President Obama, the Food Safety Modernization Act (known as FSMA) was passed. This Act focuses on preventing food safety issues through worker training, risk assessment, having food safety policies, and so on.

The rule that applies to produce is called the Produce Safety Rule. Some farms are required by LAW to comply. Ask your local extension educator if your farm falls under this rule.

Reason number 5: There are other benefits!

Time is Money, but there is only so much time in a day. Food safety practices can help increase efficiency on the farm through recordkeeping, reduce spread of plant diseases through regular cleaning and sanitization of tools, harvest bins, and equipment. You can improve wildlife management through monitoring for signs of feces, animal tracks, or trampling. And finally, routine tasks on the farm can be streamlined through the use of Standard Operating Procedures (SOPs).

How can people get sick from eating produce?

Most foodborne illness are caused by three types of germs that can be spread by feces, saliva, or mucous. The three germs are called: bacteria, viruses, and parasites. They cannot be seen with the naked eye.

Let's review each contaminant:

- 1) **Bacteria** – most foodborne illnesses are caused by bacteria! They can cause vomiting, diarrhea, cramps, fever, nausea, etc. They are often spread by poor hygiene like lack of handwashing, or coughing and sneezing. Some bacteria that cause people to get sick include Shigella, E. coli O157:H7, Salmonella, and Listeria. Listeria can be especially harmful to pregnant people. The disease called Listeriosis can cause pregnant people to miscarry, deliver their babies early, or have low birth weight.
- 2) **Viruses** – Viruses can cause projectile vomiting, diarrhea, cramps, muscle aches and so on. Foodborne viruses cannot live on plants or food. They can only live within a host – like a human or animal. Good health and hygiene practices can help prevent the spread of viruses. Norovirus and Hepatitis A are some of the most common viruses that cause foodborne illness. Symptoms for Hepatitis A start 2-4 weeks after exposure.
- 3) **Parasites** – parasites like *Toxoplasma gondii* or *Giardia lamblia* can cause diarrhea, cramping, muscle pain, weight loss, malnutrition. Parasites can be spread by contaminated water, soil, or person to person contact. Additionally, contaminated animal or human feces can spread parasites. Poor health and hygiene can also cause food to become contaminated with parasites.

Now that we know what causes people to get sick from eating produce, let's talk about the 5 ways in which produce can become contaminated. We'll cover each route of contamination separately. The 5 routes of contamination are:

- 1) People
- 2) Animals
- 3) Water
- 4) Soil Amendments
- 5) Equipment, tools, surfaces, buildings

How can people contaminate produce?

- If you do not properly wash your hands after eating, drinking, smoking, using the restroom, or after working with animals or soil amendments
- If you have been injured and blood or other bodily fluids gets onto the produce
- if you work while you are sick.
- If you wear dirty clothes or boots to the farm, or if your boots or clothes get contaminated with manure while working on the farm.
- If you do not properly use the restroom by throwing away toilet paper into the toilet or if you do not wash your hands with soap and water.
- If you harvest produce with contaminated tools.

How can animals contaminate produce?

Domesticated animals like cats, dogs, chickens, or other pets can contaminate produce if they are allowed in the area where crops are grown, harvested, washed, packed, or stored.

Wild animals can also contaminate produce – and they are much harder to control! It is important to remember that ALL animals are capable of spreading pathogens in their feces, mucous, or saliva.

If animals poop in fields, eat crops, root, or trample on crops they can spread contamination.

Animals, both domesticated and wild, can contaminate the water sources that may be used to irrigate crops.

If manure is not properly stored, it can run-off into the field during rain events or flooding. OR animals can get into the manure and spread it across the farm.

How can water contaminate produce?

Water can easily carry and spread food borne pathogens.

Water can become contaminated from animals – if they get into creeks, ponds, streams, rivers, etc. that are used for irrigation OR if there is frequent flooding from those water sources. Small animals can contaminate irrigation hoses if they are able to get into them during the off-season when they are stored.

If there are heavy rains or flooding, contamination can be spread easily to a large area.

Water that is used for washing vegetables can also spread or introduce contamination. How does that work? If you harvest cucumbers and just ONE cucumber is contaminated with feces, when they all go into the wash water, the feces will spread in the water and can contaminate ALL of the cucumbers. This is why it's important to use a food safe sanitizer to kill germs in the water.

Another thing that can happen is called “infiltration”. If the crop you are washing is very warm and the water you are washing it in is very cold, a vacuum like effect called infiltration can happen. The crop will suck water up into the crop, including any germs that are in the water. This is very bad – it can reduce the quality and shelf life of the crop AND once germs are inside they cannot be removed. Crops like tomatoes, peppers, cantaloupes, wilted greens, apples, and summer squash are more at risk. There is also more risk if you completely submerge the vegetables or keep them in water for a longer period of time. Wounded or bruised fruit is also at greater risk because there are open wounds that foodborne germs can enter through.

How can soil amendments contaminate produce?

- All manures can carry foodborne germs.
- If you apply manure too close to harvest, crops can be contaminated.
- If the manure is not completely treated – there is a chance it might have foodborne germs in it.
- If manure is improperly stored, animals can get into it, or it can spread from water run-off then it could also cause contamination of crops.
- If manure is spread on a windy day, there is a chance particles can blow onto areas of the field or garden that you did not intend.
- Cross contamination can happen if you use tools or equipment to handle manure or soil amendments and they are not cleaned and sanitized before using for produce.

How can equipment, tools, surfaces, or buildings contaminate produce?

If equipment, tools, surfaces, and buildings are not regularly cleaned and sanitized and they are used for crop production, they can harbor foodborne germs.

Anything can be a food contact surface if it comes into contact with food. This includes vehicles that are used for transporting produce, harvest tools, washing and packing equipment, and any and all harvest bins. Food contact surfaces should be cleaned and sanitized.

Tall grass outside of buildings can attract small animals like rodents.

Birds and rodents can also enter into packing areas.

Puddles of water in buildings and packing areas can harbor foodborne germs as well.

And lastly, trash and/or cull bins that are not routinely emptied can attract rodents, insects, and other animals.

Summary

- Every farmworker should be trained on food safety measures
- Some farms may be required, by law, to implement food safety
- Bacteria, viruses, and parasites can cause foodborne illnesses
- Foodborne pathogens can harm people, hurt businesses, decrease consumer confidence, or result in legal action
- Workers, animals, water, soil amendments, tools, surface, and equipment can all serve as sources of contamination

Thank you for watching Part 2: Food Safety and Why it Matters. If you have any questions or would like clarification or help identifying resources, do not hesitate to reach out. You can reach

Extension Specialist Robert Hadad via email at rgh26@cornell.edu or by phone at 585-739-4065. You can reach CVP Technician, Caitlin Tucker, at cv275@cornell.edu or by phone at 573-544-4783. If you would like to learn more about the Cornell Vegetable Program visit cvp.cce.cornell.edu.

Next Up: Part 3: Everyday Practices to Prevent Food Safety Risks