

What Vegetable Farmers Do to Keep Your Food Safe

The Ethos in Farming: The food farmers grow for you, they feed to their own families. As a result, modern farming integrates the virtues of agriculture's top management practices and standards combined with the best of modern technological and environmental methods. And for vegetable farmers that understand their leafy-green crops quickly get to your family's plate (including their own), they set a high standard for protecting you against potential environmental contaminants. Hang out with a produce farmer for a day, you'll observe him knowing, watching for, and working to prevent these contaminants.

Major Contaminants: *Physical, Chemical and Biological*

Unless grown in a controlled greenhouse environment, farmers must protect crops from several contaminants.

Physical: Clips and screws, broken glass, pens and pencils, money, cigarettes, candy wrappers and more; useful tools and materials that become a contaminant when in the wrong place or setting.

Chemical: Machine oils, cleaners, sanitizers, and pesticides are typically harmless when used properly and in the right amount. But they create a potential hazard and can quickly become a contaminant in the event of an unintended spill or improper use.

Biological: Discussed as the "good, the bad and the ugly." microorganisms have some very interesting qualities. Some of the good microorganisms include probiotics and beneficial bacteria that can be found in our human digestive system. They are found in yogurt, for example. The ugly are those things that rot or decay or cause things to decompose (and often are very visible or noticeable through the odor they give off). The bad are those microorganisms that can make us sick, for example *E. coli* 0157. Plus, the bad are not visible to the human eye and are difficult to detect until symptoms appear or regular testing of water and other environmental tests are done to try and pinpoint risks.

Types of Pathogens include viruses, bacteria and parasites.

The Main Culprit: *A Negative Change in the Environment*

- Environmental pollution is any change that harms living organisms, including humans and animals.
- Foreign substances, known as pollutants, can contaminate water and crops and are sometimes harmful to people and the environment. Pollutants can come from a variety of areas and include substances that are broader than just micro-organisms.

What Farmers Do to Protect You:

1. Over the years, farmers in the produce industry have tapped into the vast resources available to create industry-led food safety standards, also known as safety protocols. These resources, listed below, helped formulate and guide the high-quality food safety system we know today.
 - a. Shift from not just quality-based specifications to food safety centric requirements

Our Farmers

“Our farmers consistently go above and beyond to protect consumers. Arizona (and California) farmers lead the nation in food safety with worker health and hygiene training, water testing, animal deterrents, use of certified biological soil amendments, pre-harvest pathogen testing, auditing, and documentation. Every one of us chooses to take risks every day. We leave our home, get into a vehicle, buckle up, and drive away. We know we could get into an accident, we know we could die. But we get in the car anyway, and we do everything we can to keep ourselves safe. There are so many aspects of our lives in which we accept a certain level of risk, but for some reason, people do not accept the same risk and implement the same precautions when it comes to their food. It is unreasonable to think that there is zero risk in eating fresh foods that are grown outdoors, that require specific temperatures to remain fresh, that are handled by numerous people, and that are potentially transported long distances. If you are putting something in your body that you are preparing in your own kitchen, regardless of where it originally came from or what it is (meat, vegetables, legumes, etc.), I believe you need to take responsibility to know that it is safe to eat. If you run a restaurant, the last thing you want is for your customers to become sick, so the final responsibility lies on you and your staff. If you are the last person to handle food before it goes in someone’s mouth, including your own mouth, then you have final responsibility in making sure it’s safe.

“Plus, farmers have done and continue to do an amazing job at maintaining the highest food safety standards, and that’s what they should continue to focus on. If farmers are expected to fight for consumer safety, then shippers, processors, harvesters, restaurants, and everyone else involved in the farm-to-fork continuum should have to do that too. I find it baffling why so much falls on the shoulders of the farmers when it comes to food safety. That’s where it starts, but that is certainly not where it should end. Feeding our country is a group effort, and the best way to protect consumers is for each player to maintain the highest standards regarding their own responsibilities.”

— ***Paula Rivadeneira, Ph.D., Assistant Professor and Food Safety and Wildlife Extension Specialist, University of Arizona Cooperative Extension.***

- b. Identification of Shipper and Company behind the label or brand (the primary source, the entity that holds the brand or label)
 - c. Local, state and national agencies like USDA, GAP, FDA and more
 - d. Independent, third-party audit companies
 - e. End-consumer requirements
 - f. Auditing standard setters
 - g. Leafy Greens Marketing Agreement
 - h. Science and research-based standards
 - i. Ongoing research
2. In the early days of food safety, the United States Department of Agriculture (USDA), through their Good Agricultural Practices audit program, had one of the first audits that covered food Safety. Additionally, the Food and Drug Administration had a guidance document called the Guide to Minimize Microbial Contamination. These first programs started popping up in the late 1990s.
 3. Independent third-party audit companies also help guide our food safety programs and our “in customer” requirements, customers like McDonald’s, Wendy’s and other food companies that request special food safety practices. Often, “In customer” requirements are more strict and strident than any governmental agency.
 4. Audit standard setters, entities like the Global Food Safety Initiative, that tell everyone else what the third-party auditor questions are going to be when surveying a farm or shipper regarding their food safety practices. Scientists contribute counsel to these groups to formulate the most up-to-date, proactive food safety questions in the food safety environment.
 5. The Leafy Greens Marketing Agreement (LGMA), in California and Arizona, established a science-based set of standards providing information and research that the industry relies on to maintain high food safety standards and improve on them when new science comes out.
 6. Finally, all these food safety standards and systems are created to prevent and reduce the three common contaminants that can cause harm to humans: physical, chemical and biological.

What's *E. coli*?

“*E. coli* is a bacterium, and as such, all warm-blooded animals have the potential to carry it in their guts, particularly ruminants, like cows and sheep. In fact, humans carry *E. coli* as well! But the *E. coli* in our guts generally does not make us sick – it’s an important part of our gastrointestinal flora that prevents harmful bacteria from taking over. There are hundreds of kinds of *E. coli*, and only some are pathogenic (harmful). There is a group of *E. coli* called shiga toxin-producing *E. coli* (STEC), and they release shiga toxin, which is considered a bioterrorist agent. It kills red blood cells, which then clog the kidneys while the kidneys attempt to filter them out, and this eventually causes hemolytic uremic syndrome (HUS), often making the infection deadly.”

—**Paula Rivadeneira, Ph.D., Assistant Professor and Food Safety and Wildlife Extension Specialist, University of Arizona Cooperative Extension.**

“When we have contamination in food and water, it’s coming largely from three main sources: water (storm water, illegal discharge or untreated wastewater); human recreation; and wild or domestic animals. There’s often a variety of micro-organisms, and of course one of them is *E. coli*. One important distinction is that a pathogen is a micro-organism that causes a disease. However, not all bacteria and not all microbes can cause diseases, only specific subsets of them. Generic *E. coli* is commonly used as an indicator of fecal pollution of water. Other diverse types of *E. coli* are mainly harmless, but some may cause illness; for example, an outbreak caused by *E. coli* 0157:H7 at a hamburger restaurant chain.

—**Channah M. Rock, Ph.D., water quality specialist and Associate Professor, University of Arizona Cooperative Extension.**

In a voluntary effort to better protect consumers, producer farmers initiated the Arizona and California Leafy Greens Marketing Agreement (LGMA). Farmers are now also required to follow the Produce Safety Rule (PSR), which is a part of the federal Food Safety Modernization Act (FSMA) – although, in comparison, the PSR is relatively basic compared to the more robust standards of LGMA. Ultimately, the LGMA and FSMA focus is on the prevention of biological contamination or the reduction of biological risks. Obviously, this is a proactive way to deal with the bad microorganisms.

The Leafy Greens Marketing Agreement: *The Details*

1. The Leafy Greens Marketing Agreement (LGMA) is a shipper-based program established in response to the 2006 spinach outbreak. Shippers and farmers came together to establish a program that could be more proactive in preventing outbreaks.
2. LGMA established commodity-specific guidelines (metrics) for the growing, handling and processing of leafy greens.
3. Within the LGMA, the shipper oversees a grower component
4. LGMA also has a harvesting component where expectations within the shipper’s oversight are established.
5. Audits to check for compliance are conducted by USDA-qualified third-party auditors.

Food Safety Plan and Professional Responsibility

All farms, historical and current, are expected to create, implement and maintain a food safety plan that is supported and endorsed by the highest level of the company.

An organization’s food safety plan includes basic standard operating procedures and policies that guide the food safety activities of the farm, its employees, and companies or people that do business with the farm.

The list of Food Safety Plan considerations for a farm and other organizations includes the following:

1. Land history (affidavit)

2. Farm and adjacent land use (Pre-season Assessment)
3. Water distribution system to and on the farm (Sanitary Survey)
4. Food safety criteria for farm inputs such as seeds, soil amendments, fertilizers (Letters of Guarantee)
5. Requirements for service providers such as Pest Control Advisors and pesticide applicators
6. Field sanitation unit types, placement, numbers, cleaning, spill control, disposal of waste
7. Animal intrusion prevention, buffering, harvest exclusions, and control of rodents
8. Foreign object control, trash removal
9. Prevention of cross-contamination from equipment movement
10. Worker health and hygiene practices that extend to contractors that perform work on the farm
11. Visitor policy
12. Training
13. Administrative policies regarding documentation and record storage
14. Traceback

Food safety professionals will inspect the farm throughout the crop production season to monitor for food safety hazards and correct or exclude potentially contaminated produce. Additionally, they will collect samples as required, participate in audits, train and retrain employees and others as needed, make corrections if warranted and keep accurate records and provide them when requested. Food safety professionals are required to participate in all audits conducted on the farms.

A Culture of Food Safety

The food farmers grow feeds their families, friends, neighbors and people everywhere. Employees on the farm understand why farmers have a food safety program, the role they personally play in growing safe-to-eat crops, and their responsibility to report situations that may affect food safety. The community-at-large is encouraged to help reduce any risk that may put food safety at risk.

Ultimately, farmers put themselves in a continuous improvement mode to constantly operate in a proactive food safety environment.

Arizona and California LGMA members are very focused on and serious about food safety.



Food Safety Experts Identify Two Main

Pollution Points

1. ***Point Source***: Things you can easily identify. You can point to it. For example, you can see the discharge from a pipe.
2. ***Non-point Source***: These are not easily identified.

Our Farmers: Ever Vigilant

A farmer's food safety role transitions to the shipper when the crop is mature. Why? Once the crop is ready to harvest, harvesting typically becomes the responsibility of the shipper (and why both farmers and shippers are part of Arizona and California's LGMA program). The shipper will determine when harvest will begin, selects the harvesting company, transports the product from the field, and decides where the product will be cooled, processed and distributed.

Despite this harvest-phase transition, farmers are ever vigilant. As farmers move into the next crop, the next season and future plans, they continue to place their food safety program front and center. Today's modern farm-to-fork food safety continuum means that tracking capabilities of a leafy green product can allow us to know what farm fields the product comes from almost within hours.

However, these traceback capabilities may not ultimately help federal agencies find the exact point of contamination if an outbreak occurs. Some estimate dozens of links in the food supply chain exist creating ever-increasing opportunities for contamination to occur if food safety practices are not in place and even then, they can still occur. The food supply chain includes links in production, processing, distribution, Preparation. Mishandling at multiple points increases risks.

If an outbreak has a "non-point source" as in the case of the recent *E. coli* outbreak (see box) the ability to pinpoint the problem becomes more difficult. But traceability allows us to begin the process of finding out what happened and working to prevent the next outbreak.

That's why in the production-phase of farming, your vegetable farmers continue their ever knowing, watching for, and working to prevent contamination while your healthy food is growing under their watchful care.

Sources:

Information provided by the University of Arizona Extension, food safety experts, leaders in the Food Safety arena and our Arizona Farmers.

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