Most people are well aware of basic food safety practices in the kitchen, such as washing hands before preparing food or keeping raw meat separate from other foods. But did you know that food safety practices also apply to your garden?

It's true! Think of the garden as an extension of your kitchen. Just because it's outside doesn't mean we shouldn't incorporate basic food safety practices.

Garden food safety -why?

Much of the produce we harvest from our gardens is eaten raw: lettuce, carrots, peppers, and tomatoes, to name a few. When produce is eaten raw, any nasty germs (pathogens) that may be on it can be transferred to anybody who eats the produce, making them sick.

Food safety is particularly important when we are growing and sharing our garden's bounty with other people, such as donating to a food shelf or church dinner, selling at the local Farmers' Market, or giving to the neighbors. Some people eating our produce, such as children, older folks, or anyone who is pregnant or has a compromised immune system, are at much greater risk of getting very sick from bacteria like *Salmonella*, viruses such as Hepatitis A, or parasites such as Toxoplasma gondii.
Where do these pathogens come from?

These pathogens can come from several places, such as:
- Wild and domestic animals (birds, deer, cows, or pets, for example);
- Using non-potable or dirty water on produce, hands, or equipment;
- Soil amendments like manure or manure-based compost;
- Dirty harvest tools or containers, such as knives or harvest buckets;
- From the hands of those who are picking or otherwise touching the produce.

And once germs are on the produce, they can be very difficult - if not impossible - to remove (read more about this here).

Prevention is key: Five tips for a healthy harvest.

Extension's On-Farm Food Safety team teaches commercial produce growers and home gardeners alike how they can reduce the risks of foodborne illness from fresh produce. These research-based practices are known as GAPs, or Good Agricultural Practices. Several GAPs related to harvest are outlined below.

1) Clean hands and healthy harvesters

Be sure to have clean hands when harvesting produce.

Photo: Anne Sawyer

Anyone who is touching produce should always wash their hands first, using clean, potable water and soap. You don't need fancy soap - any soap will do. If you don't have easy access to handwashing in your garden, consider bringing your own! Note that hand sanitizers are not an adequate substitute for handwashing in the garden, because dirt on your hands will absorb the sanitizer and make it useless against germs.

Remember to rewash anytime your hands may be contaminated, such as after using the restroom, after coughing into your hands, or after accidentally picking something with feces on it. If you use gloves, remember to wash before putting on gloves, and change your gloves if they become torn or contaminated.

Finally, be sure that anyone who is touching produce is feeling well and hasn't been sick for at least 24 hours or more.

2) Watch for signs of animals

Be on the lookout for signs of animal activity in your garden before and during harvest. Some
Signs of animal activity may include bite marks or missing produce, bird droppings, dog or other animal feces, or trampled plants. Never pick anything that has visible contamination such as bird droppings - remember, once it's there, it can be impossible to wash off. Read more about animal activity in the garden here.

The same also goes for pets - keeping pets out of the garden is important when you are growing food for other people to eat. Pets can carry germs that make people very sick.

For example, dogs can carry *Salmonella* in their guts and shed it in their feces without showing signs of illness. Cats - particularly young outdoor cats - can carry *Toxoplasma gondii* (a parasite) and shed the parasite eggs (oocysts) in their feces. These oocysts can survive in soil for well over a year. *Toxoplasma gondii* can be particularly devastating to pregnant or immunocompromised people, among others.

3) Use clean equipment

It's a good idea to clean and, ideally, sanitize your harvest equipment before use. You don't need to do this every day, but be sure to do so at the beginning of the season, and repeat as often as necessary to keep things clean.

Cleaning means to scrub with a brush or clean cloth using soapy water - using a regular dish soap is just fine. Sanitizing means to spray with a sanitizer, such as a simple bleach solution made from 2 teaspoons of bleach per gallon of water.

In order for a sanitizer to be effective, the surface must be clean, so be sure you scrub before you sanitize.

4) Use clean water

If you are washing produce at the garden, be sure to use clean, potable (drinkable) water. Really dirty produce, such as carrots or potatoes, can be washed outside before being brought into the kitchen and washed again. If it's not too dirty, you can wash it in the kitchen instead.

No matter where you wash, washing under running water is ideal, but dunking in buckets or sinks full of clean water can also be effective. If you are using buckets of water to dunk produce, it's a good idea to change the water when it gets too dirty.
Lots of produce, like peppers, tomatoes, or eggplants, will be clean enough that they won’t need to be washed until right before they’re eaten. If you are doing a garden-based tasting event, such as at a school, follow these guidelines for washing produce.

5) Off the ground, into the fridge!

When you harvest, try not to set fresh produce back on the ground. You never know what may have been on that ground before you - mice, birds, or the neighbor's cat.

Also, avoid picking up produce that you accidentally drop. Bruises and cuts can be places for pathogens to reside and multiply.

Pick produce into clean containers and then move your fresh produce to a cool location as soon as possible. Even keeping produce in the shade until you can get it into a cool building or refrigerator will help keep it fresh longer.

If possible, try to harvest in the morning, before produce has a chance to warm in the sun. Not only will your fresh produce last longer if it’s cooled and stored properly, but most pathogens that can make us sick prefer warm conditions, so cooling can help prevent the multiplication and spread of germs among freshly picked produce.

Above all, remember my favorite food safety motto: "Do unto others' food as you would have them do unto yours." While implementing good food safety practices can take some effort in the beginning, in the end, you’ll feel better knowing that you’re doing all you can to provide safe, healthy, quality produce to those in your community.

Happy harvesting!

Got questions about garden food safety? Check out the Extension GAPs (Good Agricultural Practices) Education Program page or reach out to Anne Sawyer at sawye177@umn.edu

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