

Bringing in a Safe Harvest

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As gardeners bring fresh produce indoors, questions of food safety may not be on their minds. Here is the hard-earned product of carefully nursed seedlings, plenty of mulching, watering and endless weeding.

Tomatoes, zucchini, spinach and Swiss chard: if you grew these foods, you made be too blinded by pride to think that they could harm you. While dangers are few, especially if general guidelines for handling fresh vegetables are followed, it pays to consider a few matters of concern.

Wash produce in cool running water, advises Laura McDermott, agricultural specialist who works in the Small Fruit and Vegetable Program with Cornell Cooperative Extension in upstate New York.

"Keeping produce in a cooler for an extended period of time is probably not a good idea," she said. "The quality is going to be much better if it goes straight in the refrigerator."

Bruised and pierced fruits and vegetables can harbor bacteria. Common sense applies - send those wilted and yellowed greens to the compost pile, not the salad bowl.

Cooperative extension offices around the country are now in high gear, educating people about gardening and home food preparation. Master gardeners and master food preservers are setting up tables at county fairs and weekend festivals, distributing literature and doing demonstrations. Daily newspapers and rural advertising circulars run articles from extension advising on gardening food safety, and publicizing classes on canning offered at extension offices.

Many fact sheets are available from extension online, offering guidance on all stages of the food process. One topic covered is the application of manure and compost. Some advice follows the details outlined in GAPs (Good Agricultural Practices), measures that farmers are encouraged and sometimes mandated by retailers to adopt.

The cooperative extension arm of Washington State University has [a good web resource](#) summarizing the pathogen risks of manure use and how to avoid contamination. Allowing 120 days between the application of raw manure and harvest on root crops, leafy greens and strawberries is advised, and 90 days for other crops. Aged - meaning year-old - manure should be used at least 60 days prior to harvest. "Never apply fresh manure after the garden is planted," states the site.

"I definitely would encourage home gardeners not to use compost tea," adds Laura McDermott, who now works with commercial growers but helped home gardeners for years. "In many home compost situations the temperature does not get high enough to kill off organisms. When you add water to possibly not heat-treated compost, you have a really good environment for pathogens." Compost tea is tricky because it is applied, at times, to the leaves of plants. If those leaves are edible and commonly eaten raw, like spinach, you've got a recipe for potential illness.

When in doubt about the safety of your compost, leave it out. Pet manure should not be used on food gardens, and neither should pig waste.

These issues are generally covered in composting and vegetable gardening classes, and surface in individual calls to extension during the growing season. Generally, extension offices have a food safety hotline -- it might be just an answering machine, but workers will return calls quickly -- open to field food preservation questions.

Facebook is another tool people are using to get out the word about home food safety. The [Master Food Preservers Alliance of Lane County](#), Oregon has a broad following on Facebook.

This alliance formed when funding for the Master Food Preserver program was cut from the county extension budget.

"Eugene is a very foodie place," said Laura Hinrichs, who is organizing efforts. (Eugene is the largest city in the county.) "We have a lot of people who are interested in food, buying and growing and preserving. We have public functions at least once a month, sometimes more."

Volunteers who were certified Master Food Preservers urged the university to give them an extension staff to oversee their efforts, and their call was answered. Agent Nellie Oehlar came back from retirement to work one day a week with the volunteers, who also do demonstrations on how to use foods available at food banks and pantries.

During canning season, once a month these volunteers are at the county extension offices, selling pectin and checking gauges on pressure canners. Word of mouth is one way news of these dates travels - another way is Facebook.

A particular food safety matter at this time of year, as people harvest garlic crops, is garlic in oil.

Fred Breidt, USDA/ARS Microbiologist at North Carolina, recalls an early television cook advising people to put raw garlic in olive oil and leave it at room temperature.

"It made big news later because basically that's a recipe for botulism," he said. "If you don't refrigerate the stuff you can have problems, and even if you do it's like Russian roulette."

Chopped garlic in oil is a common supermarket product. The difference is the garlic is acidified prior to being put in oil. Manufacturers take the garlic and soak it in phosphoric acid, or citric acid. The goal is to get the pH below 4.6, where the organism that causes botulism -- *Clostridium botulinum* -- can't grow.

"Without doing that first, you have the garlic clove underneath the oil, where there's no air, no oxygen, and the botulism only grows when there's not oxygen," said Breidt. "If there happens to be a spore of this *Clostridium botulinum* present, in or on the garlic clove, it can possibly germinate and grow, and when it germinates and grows it produces a deadly neurotoxin, which can kill you even in very, very tiny amounts."

Botulism poisoning is also of concern in home canning, especially low-acid foods. Green beans, for instance, must be canned in a pressure cooker because the high-pressure steam is needed to kill the spores.

"Anything you're going to put inside of a sealed jar where there's no oxygen, you have to be very careful about," said Breidt. "Canned green beans have caused a lot of problems for people, because they don't kill their spores with processing. They end up storing them at room temperature for long periods of time. Eventually spores germinate, it only takes one, really. If a pH is above 4.6, if there's no air, if there's water, if there's nutrients -- look out."

These spores are everywhere in the world, Breidt notes.

"We eat them all the time," he said. "And it doesn't hurt to eat them. They're not going to grow in our intestinal tract because all the bacteria there keep that from happening."

However, if the botulism toxin develops before you eat a food, gut bacteria offer no protection. For that reason, potatoes baked in foil - homegrown or store bought - can pose problems.

"If you wrap a potato in foil and bake it, and you pull it out of the oven, and stick it on the counter and leave it there for a couple days, you have a potential botulism incubator," said Breidt.

The spore could be on or inside the potato, pushed in by a puncture or a bug bite. Oven temperatures don't push the internal temperature of the potato high enough to kill the spores.

"Put it in the fridge as soon as possible with the foil open," elaborated Fletcher Arritt, who works with Extension at North Carolina State University. "The foil not only is conducive to an anaerobic environment

but it also insulates and slows cooling. Also, cutting the potato open will help to more rapidly cool and help in preventing an anaerobic environment."

The potato doesn't need to cool before it goes into the refrigerator.