

How Can I Really Wash Diseases Off My Produce?

Or How to Disinfect Your Salad

by Janet Raloff, Science News, Senior Editor. September 28, 1996

Between May and August, food containing the especially virulent *E. coli* known as O157:H7 poisoned more than 8,500 individuals in Japan, including 6,000 children. This is the same strain of bacteria that tainted hamburger sold at western outlets of a U.S. fast food chain in 1993 -- causing 700 illnesses and four deaths.

But those were the prominent outbreaks. Since the microbe's discovery in 1982, it has become increasingly common; in the United States alone, it now accounts for some 20,000 cases of food poisoning and 250 deaths annually.

Though usually spread via raw beef or feces, the recent Japanese outbreak may not trace directly to either. Indeed, Japanese health officials reported last month that white radish sprouts, popular in the local diet, might be responsible. Perhaps those radishes had been fertilized with contaminated manure.

It takes more than a tap water rinse to dislodge *E. coli* and many other microbial squatters. Though high temperatures kill them, cooking is hardly a viable answer for lettuce, sprouts, and tomatoes that go into your fresh salad. For these and other foods that are to be eaten raw, consider another solution -- well, actually **two solutions, to be delivered in tandem as disinfecting sprays,** suggests **Susan Sumner, a food scientist at Virginia Polytechnic Institute and State University, in Blacksburg.**

While at the University of Nebraska (which she departed last month), Sumner worked out the recipe for just such a sanitizing combo.

First, **she squirts a vegetable with 3 percent hydrogen peroxide, the same strength available at the drug store for gargling or disinfecting wounds. She follows this up with a mist of mild acetic acid,** also known as **vinegar.** In truth, she says, which solution is sprayed first doesn't matter. Nor were her sprayers very fancy; she used the kind that dampen laundry before ironing.

The solutions represent an adaptation of a chlorine-free disinfection scheme she had been working on for red meat, and which turned out to be effective for decontaminating carcasses. In the course of her more recent studies, Sumner found that vegetables not only tend to come from the garden or farm bearing far more germs than red meat does, but they also hold onto germs more tenaciously.

Overall, most germs that show up on produce come from the soil and are benign. However, worrying that more toxic germs spread by feces could show up in organic foods fertilized with manure, and realizing that there have been reports of Shigella on cantaloupe and Salmonella on raw vegetables, Sumner decided to develop a bactericidal treatment for restaurants and other purveyors of salads.

In her tests, she deliberately contaminated clean fruits and vegetables with *Salmonella*, *Shigella*, or *E. coli* O157:H7 -- all capable of inducing gut-wrenching gastroenteritis. On its own, the hydrogen peroxide was fairly effective against all three germs, she found. But the best results came from pairing the two mists. For instance, she told Science News Online, "If the acetic acid got rid of 100 organisms, the hydrogen peroxide would get rid of 10,000, and the two together would get rid of 100,000."

"What I really liked about this treatment," she adds, "is that every [microbe] that drips off is killed." So you're not just transferring disease-causing contamination from your food to the sink, drain,

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or cutting board. Speaking of which, she notes that the paired sprays work well in sanitizing counters and other food preparation surfaces -- including wood cutting boards.

As for taste, the peroxide didn't leave any lingering flavors and the vinegar, when applied to the skins of tomatoes and peppers, proved hard to detect. While the vinegar's trace could be picked up on lettuce, even that isn't necessarily a major drawback, Sumner notes, especially if it's destined for a salad to be dressed with a vinaigrette.

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