

A collaborative approach required to end periodic vegetable contamination with *E. coli*

We first became aware of the most recent contamination of Romaine lettuce from a pre-Thanksgiving announcement of a grocery chain that had withdrawn the sale of Romaine lettuce because of the *E. coli* contamination in the Salinas area of California.

The problem of the periodic *E. coli* contamination of Western-grown leafy greens goes back at least to 2007, when it was found in spinach. In that outbreak, nearly 200 people became ill; half were hospitalized; 31 developed hemolytic uremic syndrome (HUS), a form of kidney failure; and 3 died. In 2007 an industry coalition developed measures to prevent future outbreaks (<https://tinyurl.com/s2w6yls>).

Despite industry efforts, repeated outbreaks have occurred, the most recent in 2018 and 2019. After last year's outbreak, the presence of *E. coli* was found in "a canal that ran adjacent to a sprawling feedlot for cattle near Yuma, although investigators never definitively proved the chain of contamination" (<https://tinyurl.com/tv4v3mu>).

The withdrawal of product from the marketplace is expensive for growers and grower associations. Grower association rules are currently more stringent than federal regulations that will go into effect during the 2022-2024 period.

According to the US Food and Drug Administration (FDA), "genetic analysis of the *E. coli* O157:H7 strains from patients in this current outbreak are similar to strains of *E. coli* O157:H7 associated with a previous outbreak from the Fall of 2017 and the Fall of 2018 that affected consumers in both Canada and the U.S." (<https://tinyurl.com/tv4v3mu>).

E. coli are naturally occurring enteric bacteria that are found in the intestines of humans and animals. Most serovars (strains) are a beneficial part of the digestive process and do not cause illness. But some Shiga toxin-producing serovars of *E. coli* (STEC) like O157:H7 occur in cattle, deer, goats, and feral pigs where they are benign. The Shiga toxin produced by these bacterial serovars can cause diarrhea and kidney failure in humans, particularly the young, the elderly, and those with compromised immune systems.

STECs on food products can be killed by fully cooking the food. This makes vegetable products like lettuce and spinach that are eaten raw particularly vulnerable to transmitting the live bacteria to humans. Thorough washing can remove STECs, it is easier to accomplish this on vegetables like tomatoes and peas than a head of lettuce or a bunch of spinach.

According to the Centers for Disease Control (CDC), as of November 25, 2019, 67 people infected with the outbreak strain of *E. coli* O157:H7 have been reported from 19 states including 31 who have been hospitalized and 6 who have developed HUS. No deaths have been reported as of November 25th.

Given the continuing but intermittent problem of STEC contamination of vegetal products, particularly leafy greens, state and federal agencies need to more fully engage vegetable growers, livestock producers, surface water management personnel, health care personnel, and researchers to identify the vectors by which the contamination takes place. As various vectors are identified these same parties need to be included in developing policies to mitigate the identified risk. This undoubtedly will involve the development of rules and regulations by the various participants including state and federal government agencies including the CDC, the Food and Drug Administration, and the US Department of Agriculture.

While no one likes more rules and regulations, the use of a collaborative process that includes the various parties involved in the STEC problem should go a long way toward reducing resistance to the needed changes. Given the lethal consequences of STEC infections, the public deserves no less than an all-out effort to eliminate this problem.

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