

**Leafy Green Sewage**  
(New York Times)  
By NINA PLANCK

FARMERS and food safety officials still have much to figure out about the recent spate of E. coli infections linked to raw spinach. So far, no particular stomachache has been traced to any particular farm irrigated by any particular river.

There is also no evidence so far that Natural Selection Foods, the huge shipper implicated in the outbreak that packages salad greens under more than two dozen brands, including

Earthbound Farm, O Organic and the Farmer's Market, failed to use proper handling methods.

Indeed, this epidemic, which has infected more than 100 people and resulted in at least one death, probably has little to do with the folks who grow and package your greens. The detective trail ultimately leads back to a seemingly unrelated food industry — beef and dairy cattle.

First, some basic facts about this usually harmless bacterium: E. coli is abundant in the digestive systems of healthy cattle and humans, and if your potato salad happened to be carrying the average E. coli, the acid in your gut is usually enough to kill it.

But the villain in this outbreak, E. coli O157:H7, is far scarier, at least for humans. Your stomach juices are not strong enough to kill this acid-loving bacterium, which is why it's more likely than other members of the E. coli family to produce abdominal cramps, diarrhea, fever and, in rare cases, fatal kidney failure.

Where does this particularly virulent strain come from? It's not found in the intestinal tracts of cattle raised on their natural diet of grass, hay and other fibrous forage. No, O157 thrives in a new — that is, recent in the history of animal diets — biological niche: the unnaturally acidic stomachs of beef and dairy cattle fed on grain, the typical ration on most industrial farms. It's the infected manure from these grain-fed cattle that contaminates the groundwater and spreads the bacteria to produce, like spinach, growing on neighboring farms.

In 2003, The Journal of Dairy Science noted that up to 80 percent of dairy cattle carry O157. (Fortunately, food safety measures prevent contaminated fecal matter from getting into most of our food most of the time.) Happily, the journal also provided a remedy based on a simple experiment. When cows were switched from a grain diet to hay for only five days, O157 declined 1,000-fold.

This is good news. In a week, we could choke O157 from its favorite home — even if beef cattle were switched to a forage diet just seven days before slaughter, it would greatly reduce cross-contamination by manure of, say, hamburger in meat-packing plants. Such a measure might have prevented the E. coli outbreak that plagued the Jack in the Box fast food chain in 1993.

Unfortunately, it would take more than a week to reduce the contamination of ground water, flood water and rivers — all irrigation sources on spinach farms — by the E-coli-infected manure from cattle farms.

The United States Department of Agriculture does recognize the threat from these huge lagoons of waste, and so pays 75 percent of the cost for a confinement cattle farmer to make manure pits watertight, either by lining them with concrete or building them above ground. But taxpayers are financing a policy that only treats the symptom, not the disease, and at great expense. There remains only one long-term remedy, and it's still the simplest one: stop feeding grain to cattle.

California's spinach industry is now the financial victim of an outbreak it probably did not cause, and meanwhile, thousands of acres of other produce are still downstream from these lakes of E. coli-ridden cattle manure. So give the spinach growers a break, and direct your attention to the people in our agricultural community who just might be able to solve this deadly problem: the beef and dairy farmers.

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