

Foodborne Illnesses and Practical Protections

BY KENNETH M. ODZA



A perfect storm may be brewing. Dangerous pathogens are evolving quickly. *Listeria*, for example, already a very virulent bug—hospitalizing approximately 2500 in 2006 and killing a full 20 percent (500) of those hospitalized—has learned to survive modern food handling procedures and seems only to be growing deadlier. Organic and natural food producers are not immune.

Improvements in microbiological detection techniques and a prevailing regime of strict liability create serious risk for co-op grocers. Public health officials can detect outbreaks that were previously undetectable. No matter whether your co-op follows safe food handling practices and does nothing to cause an outbreak, it can become liable and its name marked with the 21st century equivalent of the scarlet letter.

This article tracks the trends in foodborne illnesses, explains why outbreaks have been in the news more frequently, and suggests some practical steps a co-op can take to protect itself.

1. Detection of foodborne pathogens is on the rise

Centers for Disease Control and Prevention (CDC) reports that every foodborne disease (save one) within its active surveillance network has been on the rise over the last few years. As illustrated in the CDC graph below, through 2006 incidents of *Vibrio*, *Salmonella*, *Listeria*, and *E. coli* O157:H7 are all on the rise. (*Campylobacter* is the only pathogen not trending upwards, but *Campylobacter* is also not associated with outbreaks, and therefore, is unlikely to be major source of liability.)

Vibrio vulnificus, according to the CDC, normally lives in warm seawater. *Vibrio* can cause disease in those who eat contaminated seafood or have an open wound that is exposed to seawater. Among healthy people, ingestion of *V. vulnificus* can cause vomiting, diarrhea, and abdominal pain. In persons with compromised immune systems, particularly those with chronic liver disease, *Vibrio* can infect the bloodstream, causing a

severe and life-threatening illness. CDC estimates that *Vibrio* bloodstream infections are underreported and fatal about 50 percent of the time.

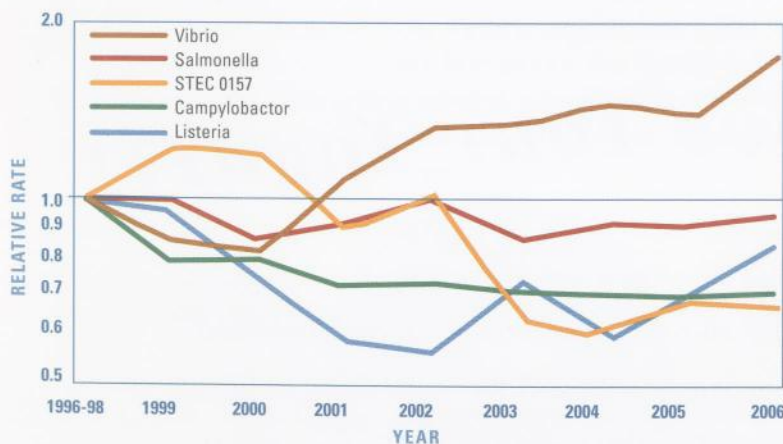
E. coli O157:H7 is one of hundreds of strains of the bacterium *Escherichia coli*. Although most strains are harmless, this strain produces a powerful toxin that can cause severe illness. *E. coli* O157:H7 infection often causes severe bloody diarrhea and abdominal cramps. Usually the illness resolves in 5 to 10 days. In some persons, particularly children under five years of age and the elderly, the infection can also cause a complication called hemolytic uremic syndrome (HUS), in which the red blood cells are destroyed and the kidneys fail. HUS is the principal cause of acute kidney failure in children, and most cases of HUS are caused by *E. coli* O157:H7.

Salmonella bacteria live in the intestines of many food animals, such as cows and chickens. Most people infected with *Salmonella* develop diarrhea, fever, and abdominal cramps 12 to 72 hours after infection. Infection is usually diagnosed by culture of a stool sample. The illness usually lasts four to seven days, and most people recover without treatment. Infants, elderly persons, and people with impaired immune systems are more likely than others to develop severe illness, where *Salmonella* spreads from the intestines to the bloodstream and then to other body sites, and death can occur if not treated promptly with antibiotics.

Listeriosis is a serious infection caused by eating food contaminated with the bacterium *Listeria monocytogenes*. The disease affects primarily pregnant women, newborns, and adults with weakened immune systems. *Listeria* is killed by pasteurization and cooking; however, in certain ready-to-eat foods such as hot dogs and deli meats, contamination may occur after cooking but before packaging. As described above, according to the CDC, *Listeria* kills a full 20 percent of those hospitalized as a result of the disease and more than any other food-borne pathogen.

The CDC's published active surveillance does not list what can be called emerging pathogens. For example, it does not describe the impact of what are called non-O157:H7 strains of shiga-toxin producing *E. coli*. We know that in Europe, and increasingly in the United States, non-O157:H7 strains are beginning to overtake O157:H7 as a major health concern. These strains include serogroups known as O26, O45, O103, O121, O111, or O145. It is believed that these other strains account for a large number of foodborne illnesses, but little research has been accomplished. Public health officials assume that the non-O157:H7 strains will behave and cause health effects like O157:H7, but no one is sure. Anecdotal evidence suggests that these other strains may affect a broader range of the population and, in general, behave in significantly different ways.

The CDC also does not tell us the prevalence of variant Creutzfeldt-Jakob Disease (vCJD), better known as the human version of mad cow disease. This is believed to be a serious condition characterized by an abnormal prion protein that clumps together and accumulates in brain tissue. The result is progressive brain damage and death. vCJD is believed to be caused by ingesting BSE-infected spinal or brain tissue from cattle. The first documented incident in the United States of a cow testing positive for bovine spongiform encephalopathy (BSE



Relative rates compared with 1996–1998 baseline period of laboratory-diagnosed cases of infection with *Campylobacter*, STEC* 0157, *Listeria*, *Salmonella*, and *Vibrio*, by year—Foodborne Diseases Active Surveillance Network, United States, 1996–2006.

* Shiga toxin-producing *Escherichia coli*.

or mad cow disease) whose meat entered the human food chain occurred in 2003. No such incidents have been documented since. Prion-related diseases are not yet well understood.

2. Darwinian evolution: bugs are adapting

Bugs are adapting to sanitary practices and becoming more virulent. Foodborne pathogens resemble an ever-adapting insurgency. As regulations improve food handling to protect the public against these dangerous bugs, they adapt and, seemingly, stay a step ahead. As these pathogens evolve, many people also believe, they step up their virulence, becoming ever more dangerous.

Few scientists will disagree that food-borne pathogens are evolving quickly. Some pathogens like *Listeria* and *E. coli* O157:H7, which have been around for a number of years, are altering themselves genetically on a rapid basis. *E. coli* O157:H7 evolves so quickly that its genetic makeup often changes significantly between the time it's ingested by someone and the time that person sheds the bug in a stool.

Many scientists also believe that food sanitation techniques and food preservation practices enrich conditions for populations of pathogens that can easily spread. It is an example of Darwinian survival of the fittest; bugs that survive human attempts at sanitation are more able to resist human attempts at sanitation.

Pathogens that survive are also thought to be physiologically more fit. Microbiologists examining the genomes of these pathogens have discovered that often the same circuitry that allows the bugs to survive human sanitation efforts controls the bug's virulence (how dangerous the bug can become). For example, those mapping the genome of *Listeria* have discovered that the same gene that seems to be helping it to adapt to refrigeration and other modern food sanitization and preservation techniques also controls the bug's virulence.

As scary as this kind of evolution appears, there are no systematic studies of practices in food production environment and the evolution of foodborne pathogens. While new food sanitation techniques are being developed rapidly, science is not able to predict the long-term effects. Organic farming practices are not a solution and do not lessen the risk.

3. Better detection means more documented outbreaks

As discussed above, foodborne illness is on the rise, new pathogens are arising, and old bugs are evolving rapidly. In addition, technologies for detecting pathogens and linking illness to food are also improving rapidly.

For example, non-O157:H7 strains of *E. coli* that would have gone undetected just a few years ago are now being detected by some public health departments. It is only in the last year or two that some public health depart-

ment labs have become capable of screening for strains of non-O157:H7 strains of shiga-toxin producing *E. coli*. The result is that outbreaks of non-O157:H7, such as those involving serogroups O26, O45, O103, O121, O111 or O145, that previously would have gone either unnoticed or without resolution as to their source, are being discovered, identified and linked to the source. The upshot for the food industry is that even without an increase in the incident of foodborne pathogens, liability exposure will continue to increase.

Confirmed vCJD incidence, which is now virtually non-existent in the United States, may

also increase with the development of an ability to detect it in a living human being. Today, the only way to confirm vCJD in a human is following death, by autopsy of the brain. According to the CDC and the National Institute of Allergy and Infectious Diseases, considerable research is ongoing to understand what are called "prion" diseases such as vCJD in humans and BSE in cattle. It is only matter of time before enough is understood about these diseases to develop more effective detection techniques. Once that happens, claims of exposure to BSE and vCJD, now almost impossible to prosecute, could become common. ■>

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◀ 4. Strict liability

Most states impose strict liability on those preparing food, including restaurants, institutions, manufacturers, growers, supermarkets (to the extent they further package or process), and others. (See *Agricultural Law*, 2005, Matthew Bender & Company, Inc., a member of the LexisNexis Group, Part 2 CIVIL LIABILITIES Chapter 7 Products Liability 2-7 Agricultural Law § 7.syn.) No matter how much care these entities take to handle food safely, liability is imposed without regard to fault.

For example, certain strains of *E. coli* cannot be washed out of leafy greens. An institution that serves the leafy greens, even when it is undisputed that the greens were well washed and handled as safely as possible, will be liable. As illustrated above, the odds of this kind of liability are only increasing, even for the most cautious of food sellers.

5. How your co-op can minimize risk

Constantly monitor and upgrade food handling practices. This is the most obvious thing any seller should do to minimize risk. For example, to the extent your co-op prepares food or repackages food, you should employ a food safety professional prescribing proper food handling standards of care and steps to assure compliance.

Consider getting involved with your suppliers, particularly your produce and protein suppliers (chicken, beef, pork, fish, etc.) to assure compliance with industry food safety standards. Even suppliers who are following organic growing standards and regulations may not necessarily be following the strictest safety standards. Visit the fields. Determine whether there is a livestock operation or animal manure near the farm. Understand the sources of irrigation. Make sure pickers are gloved and masked. Consult your food safety professional to audit the farm and proscribe best practices.

Shift risk by contract where possible. A co-op should use whatever bargaining power it has with its vendors and suppliers to negotiate promises of indemnification and additional insurance. Careful drafting of these clauses and selecting the appropriate controlling law is critical. Wrong choice of words can cause an indemnity clause to become virtually meaningless. Monitor compliance to assure that your vendors and suppliers have the appropriate amounts and kinds of insurance and additional insurance in place.

Have a crisis management team in place before a crisis happens. The moment an outbreak occurs, your co-op should have a team that includes expertise in food safety, epidemiology, public relations and legal protection,

people who are ready to go to work with the public health department, to respond and help plot a strategy to minimize exposure.

Review your insurance coverage. Comprehensive general liability and products liability insurance should be evaluated for your co-op. You should review your policies closely, because some insurance carriers are including foodborne pathogen exclusions in their policies. Obviously, financial and legal exposure could be very significant for your co-op. ■

Attorney Ken Odza's practice focuses on food law, food litigation, and emerging issues in food liability. He has extensive experience with experts and key federal and state regulators in responding to claims of foodborne illnesses. He also successfully litigated what are believed to be the first claims filed in the United States arising out of alleged exposure to bovine spongiform encephalopathy (BSE, or mad cow disease). Ken is a principal at Stoel Rives LLP in Seattle and can be reached at kmodza@stoel.com or 206/386-7595.

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