The Opening Address – Dairy Food Integrity and Risk

Tracking Foodborne Illness: A lawyer's viewpoint

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According to the U.S. Centers for Disease Control and Prevention (CDC), each year about 76 million cases of foodborne illness occur in the United States (Mead, *et al*. 1999). That means that annually, one in four Americans contracts an illness by eating food that has been contaminated with such pathogens as *E. coli*, *Salmonella*, hepatitis A, *Campylobacter*, *Shigella*, Norovirus and *Listeria*. Most of those illnesses are relatively minor. But about 325,000 individuals will be hospitalized, and 5,000 will die. Billions of dollars will be spent on medical treatment and billions more lost in decreased food sales and, for the families of sick people, wages will be lost (FDA/CFSAN 2004). When careless business practices poison customers, and when regulatory agencies do not have the manpower or ability to help business perform, people die and market share is lost, nationally and internationally.

Foodborne Illness: A changing landscape

The issue of food safety is not new. A century ago, Upton Sinclair exposed corruption within the U.S. meat-processing industry that caused federal meat inspectors to turn a blind eye to contamination in his muckraking book, "The Jungle". But some important changes have occurred since Sinclair's book was published.

First, meat and meat processing are no longer the most common source of foodborne illness in the U.S. In 2005, the CDC reported that the incidence of *E. coli* and *Salmonella* contamination in ground beef products had been reduced significantly due to cooperation between United States Department of Agriculture (USDA) regulators and meat processors (CDC, 2006). Today, an increase in production and consumption of seemingly innocuous and healthful vegetables, including lettuce, sprouts, parsley, spinach, tomatoes and green onions—even almonds—has resulted in a significant jump in foodborne illness associated with these products in the U.S.

Since 1995, the U.S. Food and Drug Administration (FDA) has reported 24 outbreaks related to fresh leafy products. Twenty of those outbreaks were associated with *E. coli* O157:H7 (Calvin, 2007). Just last year, the CDC confirmed 205 illnesses and three deaths directly related to the consumption of *E. coli*-contaminated spinach (FDA, 2007). Late last year and throughout this year, the CDC reported that more than 425 people in 44 states became infected with *Salmonella* found in peanut butter, all traced to one processing plant in Georgia. More than 70 were hospitalized (CDC, 2007). From experience, we know cases of *Salmonella* are under-reported. Consequently, we estimate that the number of people sickened may well have been more than 15,000.

The second new development in food safety in the U.S. is the result of the shrinking world and the global marketplace. New variables include the threat of terrorist attacks via the food network—a potential disaster that was probably not seriously contemplated before the horror of September 11—and a significant increase in food imports. The U.S. has experienced first-hand a hepatitis A outbreak traced to green onions from Mexico (Wheeler, *et al.* 2005) and the illnesses and deaths of thousands of American pets traced to contaminated wheat gluten from China (FDA, 2007).

And finally, there's the scientifically questionable but increasingly popular demand for "natural," or unprocessed foods, such as raw milk or unpasteurized juice, or "environmentally friendly" practices such as using recycled water or planting native grasses. Experience seems to be telling us that the benefits of such practices are often offset by the risks – particularly to children and others with compromised immune systems. Specifically, our law practice has seen an increase in the incidence of foodborne illness cases related to consumption of unpasteurized dairy products. In one recent case, 18 people became ill with *E. coli* O157:H7 infections after consuming raw milk from a small family-owned dairy in Washington State; of those, five of them were children under the age of 13 (WSDA, 2006).

Given these changes, we shouldn't be surprised that food safety has become, more than ever, a legal and political issue, as well as a question of personal and corporate ethics.

The Legal Process: Tools used in evaluating claims of foodborne illness

It is predictable that some people are inclined to issue claims of dubious legitimacy, or claims that are simply fraudulent. In our work as litigators, we see no shortage of bogus claims. There are claims that food looked or "smelled funny," claims of finding foreign objects in one's food, and other non injury-causing events that we are presented with and dismiss virtually every day.

In our experience, food industry corporations over-emphasize, and thus overreact, to such claims, essentially responding in the same manner to legitimate and illegitimate complaints. But denying legitimate claims increases the likelihood of failure to enact important measures to improve food safety. Not improving food safety increases the risk of poisoning consumers and resulting litigation. Litigation carries not only its own expenses, but the threat of public relations headaches as well. Food industry companies should understand some of the reliable methods for recognizing suspect food poisoning claims.

<u>Incubation Period</u>

Take, for example, incubation period – the time between ingestion of a foodborne pathogen and the onset of symptoms. These well-established periods are stated as ranges, not precise periods of time, but they still can be used to identify an improper claim. The claimant who insists that her *E. coli* O157:H7 illness was sparked by the hamburger she ate an hour before she got sick does not have a winnable case regardless of the damages because the incubation period of *E. coli* O157:H7 is one to ten days, typically two to five days. (See Table I)

In most situations, foodborne pathogens will be undetectable by the consumer—an intrinsic risk to consumers in the first place. Therefore, customers who believe they were sickened by food that "tasted odd" are usually wrong; however, many consumers with legitimate complaints tend to retroactively assign a negative connotation to a meal once the health department has identified it as a source of an outbreak. This common response doesn't necessarily eliminate a claim.

<u>Health agency investigation</u>

Although statutes and regulations vary from state to state, there are a number of bacterial and viral illnesses associated with food consumption that are monitored by health departments, including *E. coli* O157:H7, *Campylobacter*, *Salmonella*, *Shigella*, *Listeria*, Norovirus, and hepatitis A. For most of these pathogens, a positive lab result from a human sample (blood or stool), triggers a mandatory report to the local health authority and some type of follow-up investigation. The length, breadth, and paperwork involved in any investigation varies depending on the pathogen involved, the type of food implicated, the number of persons who may be sick, the local jurisdiction, and other factors.

We have learned through litigating thousands of food poisoning claims arising out of dozens of outbreaks in the U.S. that food producers frequently take issue with some or all of the health agency's conclusions regarding a given outbreak. In our experience, none of these defendants has successfully avoided liability where the health agency has linked a specific product to a specific outbreak. One likely reason for this is that most health agencies do good and careful work. Despite the occasional disagreement of the pinpointed member of the food service industry, most would agree that health agencies are rather cautious and conservative. In our experience, health agencies do not lightly or prematurely label an entity as the source of an outbreak.

U.S. health agencies insist on virtual certainty before declaring an outbreak, or pinpointing a restaurant as the "confirmed" source. Without 95 percent confidence in a particular conclusion, health agencies are likely to define individuals or outbreaks as "possible." This is the case even where the confidence in a particular conclusion is well above the legal standard.

When litigating foodborne illness cases, it has also been our experience that the jury is simply more likely to accept the "neutral" determinations of a government health agency over paid experts. One excellent example arose out of an *E. coli* outbreak in Washington State in 1998. State and local health officials who investigated the case concluded that the source of the outbreak was a ground beef meal prepared and served at an elementary school. Eleven children were identified as either "confirmed" or "probable" victims of the outbreak. All except one of them attended the school. Four of the children developed hemolytic uremic syndrome (HUS),[1] which resulted in their suffering varying degrees of permanent kidney damage.

Interestingly, the child with the most severe injuries was the one who did not attend the school and did not eat the implicated meal. The child's older sister, however, did attend the school and had eaten the meal. It was our position that this non-student had been infected via exposure to her sister or another student, a phenomenon known as "secondary infection."[2] The school district took issue with nearly every aspect of the case and, in doing so, attacked Washington Department of Health investigators' conclusions. The defendant even contended that the tacos were not the source of the outbreak, that the non-student had not been infected with *E. coli* O157:H7. The jury, however, believed the health department's conclusions, and issued a multi-million dollar award to the injured children.

This works both ways; if health authorities investigate and find a claimant's illness did *not* come from a particular source, the plaintiff faces an uphill battle in proving his illness was, in fact, caused by that source.

Health agency inspections and documentation

One extraordinarily effective tool in establishing whether a product that no longer exists was defective is uncovering documentation of the food service establishment's track record from previous health agency inspections. This may include information regarding prior incidents or accusations of food contamination and illness, and prior facility inspections and food production and service procedure evaluations. In the U.S. Court system, supportive documents can be acquired through the discovery process or through the applicable Freedom of Information Act. Such documents will help the plaintiff make his case in a variety of ways. Sometimes, there may be documentation of improper food handling procedures that can circumstantially support one's case. In other situations, a list of improper techniques and code violations can serve as a tool for limiting a defendant's trial options, or it can position a case for early and favorable settlement. Finally, particularly egregious or repetitive examples of improper food handling techniques can help build a case for punitive damages[3] in jurisdictions where such damages are available.

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[1] Hemolytic uremic syndrome is an illness that even in the best American medical facilities has a mortality rate of about 5%. About 50% of patients require dialysis due to kidney failure, 25% experience seizures, and 5% suffer from diabetes mellitus. The majority of HUS patients requires transfusion of blood products and develops complications common to the critically ill. Among survivors of HUS, about five percent will eventually develop end stage kidney disease, with the resultant need for dialysis or transplantation, and another five to ten percent experience neurological or pancreatic problems which significantly impair quality of life. More information available at: http://www.about-hus.com.

[2] An individual who becomes ill with an infectious disease as a consequence of a contact with a primary case.

[3] Damages awarded to a plaintiff in excess of compensatory damages in order to punish the defendant for a reckless or willful act.

Health agency documentation of improper or inadequate cooking procedures can help make a case for a victim alleging food poisoning. In 2001, a young girl suffered a particularly severe *E. coli* O157:H7 infection that left her with permanent kidney damage. She had eaten a hamburger purchased from a California fast-food chain. By the time health department officials investigated, however, the case of meat from which the girl's hamburger had been chosen was long gone. The health department did not find any food on site that tested positive for *E. coli* O157:H7. But a thorough review of the restaurant's current and prior inspections revealed a serious flaw in the firm's cooking method that provided an explanation for the client's exposure. According to the inspection report:

> Hamburger buns are toasted on the grill immediately adjacent to the cooking patties, and it is conceivable that, early in the cooking process, prior to pasteurization, meat juices and blood containing active pathogens might possibly splash onto a nearby bun.

In fact, the restaurant had been advised at least six times of the dangers of cross contamination of the buns by hamburger juices. The matter settled shortly after the presentation of this information.

In a 2002 case, a Chinese restaurant in Ohio was the suspected source of an *E. coli* O157:H7 outbreak. Again, no contaminated leftover food was found. In addition, the restaurant was buffet-style, which complicated the identification of a single contaminated food item. A disproportionate number of ill patrons were children, and it began to appear that the culprit food might in fact be Jell-O. Obtaining the health department investigation report provided the answer to the obvious question: How would Jell-O become the source of an *E. coli* outbreak? A previous inspection report identified a host of food handling errors, including "raw meat stored above the Jell-O in the refrigerator." Officials concluded that "the likely source of *E. coli* O157:H7 in the Jell-O was from raw meat juices dripping on the Jell-O while it was solidifying in the refrigerator." Once that report was obtained, the restaurant never seriously contested liability.

Another example: In 2003, a group of people who had attended a banquet hosted by a restaurant in Washington State fell ill several days later. Many of them tested positive for *Salmonella,* but leftover food had either been discarded or had tested negative. Nonetheless, the health department's subsequent investigation provided the information necessary to establish liability. The restaurant had violated state regulations by "pooling" dozens, if not hundreds, of raw eggs in a single bucket for storage overnight. This process allowed bacterial contamination from a single egg to taint exponentially larger amounts of food, thereby placing many more consumers at risk. The establishment used the raw, pooled, eggs as a "wash" on a specialty dessert. Then, once again in violation of food code, food workers failed to cook the eggs thoroughly.

Improper sanitation is a frequent problem. In 2000, a producer and distributor of high-end fresh food items were identified as the source of a large *Shigella* outbreak on the U.S. West Coast. The relatively new firm marketed itself as a high-end food business, but health inspections revealed serious problems, including the lack of fully operational bathrooms for employees, insects near food production sites, and evidence of rodents in the facility. During litigation, we also learned that a major commercial purchaser of the firm's product had conducted its own inspection, and had refused to purchase any more products until a number of significant upgrades were made to the facility.

In a 2002 case, a Seattle-area restaurant was suspected as the source of a medium-sized outbreak of food poisoning. Even though one of the patrons experienced an unusually severe illness, authorities were unable to pinpoint the particular pathogen. The defendant and its insurer were initially unwilling to concede liability, but previous inspection reports revealed a consistent pattern of poor food handling practices. The repeat occurrences of numerous health code violations led the health department to close the restaurant and temporarily revoke its license. In the end, the restaurant decided not to contest liability.

Documented histories can go a long way toward supporting a claim for punitive damages. In 1996, a well-known California producer of fresh juices was identified as the source of a major outbreak of *E. coli* O157:H7 infections on the U.S. West Coast. Through the discovery process,[4] we sought documentation of inspections by governmental agencies, the juice producer itself, and private parties. After many legal delays, we uncovered previously undisclosed inspection reports, including a report from the United States Department of the Army, revealing that the U.S. Army had inspected the juice producer's production methods prior to the outbreak and determined not to buy its products. In a letter to the company, Army officials stated:

> We reviewed deficiencies noted in the report, which our inspector discussed with you at the time of the inspection. As a result, we determined that your plant sanitation program does not adequately assure product wholesomeness for military consumers. This lack of assurance prevents approval of your establishment as a source of supply for the Armed Forces at this time.

Through further discovery, we obtained internal company emails reacting to the Army's inspection. One employee had suggested a microbiological testing program to address some of the problems uncovered in the inspection. The following is a portion of an email responding to the suggestion:

[4] The "discovery process" is the formal means, created and controlled by court rules, that parties to a lawsuit use to obtain information from each other, and third parties. Examples include written questions called interrogatories, and requests for the production of documents.

> …why are we doing it, why now, what do we WANT TO PROVE…IF THE DATA is bad, what do we do about it. Once you create a body of data, it is subpoenable.

At the time of the *E. coli* outbreak, the company had not adopted the suggested testing regimen. We filed a motion to apply California law regarding punitive damages due to the company's prior knowledge that its product was unsafe. With the punitive damages motion pending, we obtained a multi-million dollar settlement for the families of children who sustained permanent kidney damage after developing HUS.

<u>Health care provider treatment and diagnosis</u>

Medical records are also an important part of making a food-poisoning case. Using testing methods, medical laboratory workers can use stool, and less commonly blood, samples to culture pathogenic bacteria or viruses and determine the pathogen causing a claimant's illness.

As previously discussed, each foodborne pathogen carries with it an expected incubation period—the typical amount of time that passes between exposure to the pathogen and the onset of symptoms. Medical records can help identify the cause and timing of exposure to the pathogen.

Symptoms are also important. Most common bacterial and viral pathogens found in food cause similar symptoms -- nausea, vomiting, diarrhea, fever, aches, chills, and the like. Various pathogens can have more A-typical courses. While these cannot be used alone to determine the pathogen affecting a claimant, it can be part of the puzzle. For example, yellow skin and eyes, or jaundice often characterizes hepatitis A infections. *E. coli* O157:H7 infections are most often characterized by excessively painful stomach cramps and bloody diarrhea.

<u>Laboratory testing, PFGE, and epidemiologic investigations</u>

Health care providers may in some instances order testing of an ill person's blood or stool to help determine the cause of illness. In many circumstances, a positive result in such a test must be reported to the health authorities pursuant to statute or regulation. Many states require reporting of positive tests for a number of pathogens, including *E. coli* O157:H7, *Salmonella, Shigella, Listeria*, hepatitis A, *Campylobacter*, and others. It is the report of such positive results that often triggers health agency investigations of outbreaks.

Perhaps the most important scientific advance in tracing food poisoning is in pulsed field gel electrophoresis (PFGE), or DNA "fingerprinting." When a sample of bacteria such as *E. coli* or *Salmonella* is taken from a stool sample or a meat product, it can be cultured to obtain and identify the bacterial isolate. Bacterial isolates can be further broken down into their various component parts, creating a DNA "fingerprint." PFGE operates by causing alternating electric fields to run the DNA through a flat gel matrix of agarose, a polysaccharide obtained from agar. The pattern of bands of the DNA fragments – or "fingerprints"- in the gel after the exposure to the electrical current is unique for each strain and sub-type of bacteria. By performing this procedure, scientists can identify the strain of pathogenic bacterium. The PFGE pattern generated from bacteria isolated from contaminated food can be compared and matched to the PFGE pattern isolated from human samples.

When PFGE patterns match, they, along with solid epidemiological work, provide reliable evidence that the contaminated product was the likely source of the person's illness. This is particularly true where the PFGE pattern has not been reported elsewhere. For example, suppose two unrelated persons both test positive for a genetically identical, unique strain of *E. coli* O157:H7 in a given town within a matter of days. If the subsequent inquiry into these two illnesses reveals no other common exposures between the two people other than a hamburger from the same restaurant on the same day, it is nearly impossible to find a credible, alternate explanation for their illnesses.

In 1993, a large *E. coli* outbreak occurred in the Western U.S. Scientists at the CDC performed DNA "fingerprinting" by PFGE and determined that the strain of *E. coli* O157:H7 found in patients had the same pattern as the strain isolated from hamburger patties served at a large chain of regional fast food restaurants. Had this source been identified sooner, hundreds of illnesses may have been prevented. As a result, the CDC developed standardized PFGE methods and, in collaboration with the Association of Public Health Laboratories, created PulseNet so that scientists at public health laboratories throughout the country can rapidly compare the PFGE patterns of bacteria isolated from ill persons and determine whether they are similar, thus indicating an outbreak linked to exposure to a common source. At present, PulseNet tracks seven foodborne disease-causing bacteria: *Campylobacter jejuni, E. coli* O157:H7, *Listeria monocytogenes,* nontyphoidal *Salmonella, Shigella, Vibrio cholerae,* and *Yersinia pestis*.

With an isolated illness, the lack of a positive stool sample or separate, indistinguishable, PFGE pattern may be problematic for a claimant. In the context of most outbreaks, however, circumstantial evidence may compensate. One such example is where one member of a dining party does not get tested, and others do. If three of four persons who ate together fall ill with the same documented pathogen, and the fourth demonstrates the same symptoms in the same time frame, liability can easily be established *without* the positive stool sample, but *with* solid epidemiological evidence of exposure to a foodborne pathogen. In addition, if leftover or under-cooked food tests positive for the given bacterium or virus, we have powerful evidence that the food is the likely cause of the illness.

Case Study: Ammonia poisoning

The majority of foodborne illnesses arise from avoidable errors—often an accumulation of many errors. In a 2002 case, school children and teachers at an Illinois public school consumed chicken contaminated with ammonia and became ill with food poisoning—poisoning that resulted from the acts and omissions of three separate entities.

In 2001, the State of Illinois contracted with a major food company for processed chicken for school lunches. The chicken was processed at a plant in Pennsylvania, then transferred to a refrigeration company. But the food company's delivery greatly exceeded the refrigeration company's shipping and storage capacity, so the refrigeration company contracted with a storage facility to house the overflow chicken products at its facility in Missouri. The chicken was stored along with large amounts of other food intended for consumption at Illinois schools.

In November, 2001, there was a large ammonia leak at the Missouri storage facility, and massive amounts of food destined for the school lunch program, including the chicken, were exposed to ammonia. Neither the sub-contracted storage facility nor the refrigeration company notified health authorities or the Illinois State Board of Education. Even more remarkably, the two companies continued shipping food from the facility, shipping some 800,000 pounds of product after the leak without any notice to customers. Originally, it was a shipment of potato wedges to Illinois schools that first alerted authorities. Schools began complaining of potatoes that smelled of ammonia, prompting an inquiry, and the companies admitted that a leak had occurred. The state instructed the refrigeration company to place all food connected with the school lunches on hold, pending further evaluation.

The FDA at this time "determined to place all product stored at [the storage facility] at time of ammonia leak on hold until procedures are established for clean up and treatment of products to dissipate ammonia odor." But the companies decided that, rather than destroy the food and take the loss, they would re-box, re-label, and "re-condition" the boxes, and then send them on to the schools. Apparently the chicken was reconditioned to remove the smell, but nothing was done to actually remove any ammonia. Eventually, the chicken was served to students at the Illinois elementary school. Within minutes, 157 students—roughly half the school population—fell ill. The scene verged on total chaos. Students and teachers were running into the halls vomiting, with their throats and noses burning. Students panicked. School administrators called in ambulances, and children were taken to five local hospitals.

Who was at fault? Virtually every entity involved.

Case Study: *Salmonella* poisoning

In 2003, an Illinois health department received multiple reports that people had become ill after eating at a Vernon Hills, Illinois restaurant. Investigators visited the restaurant, and soon learned that its dishwashing machine was broken and corroded; the tube that fed chlorine into the machine was plugged, preventing proper sanitization of dishes. They also found that food was not stored at proper temperatures, and three employees and a manager had called in sick that day. With evidence growing increasingly clear that the restaurant was the source of a foodborne illness outbreak, investigators instructed employees on hand-washing procedures, and collected stool samples from the employees. They discovered 13 employees who had been allowed to work despite suffering from diarrhea and other symptoms. Under pressure, Chili's closed the restaurant.

But the problem was only beginning to emerge. People who had eaten at the restaurant recently were instructed to seek medical help if ill, and to report their illnesses to the health department. The health department was flooded with telephone complaints. One customer reported there had been no running water while she had been there for lunch – information that management had not thought necessary to share with investigators.

Eventually, investigators identified over 300 individuals who had been sickened as a result of the outbreak. Of those, 141 customers and 28 employees tested positive for *Salmonella*, while 105 others were deemed probable cases. The health department concluded that infected employees had contaminated food with *Salmonella* as a result of poor sanitary practices and improper food handling.

Clearly, this entire outbreak could have been avoided by the most simple and obvious of sanitary practices. The company's shortcuts turned out to be extremely costly.

Learning From the Past

How can we ensure that gains in food safety already made are preserved and new problems addressed? Based on my many years of experience with the issues, here are some recommendations:

It took a nationwide crisis, and the horrible deaths of several young children, for the U.S. to begin addressing the issue of *E. coli* contamination in meat. That crisis occurred in the early 1990s, when undercooked hamburgers containing the deadly strain of bacteria *E. coli* O157:H7 sold by a U.S. fast-food restaurant chain sickened 650 people and four children died. After this tragedy, the head of the USDA's Food Safety and Inspection Service, Michael Taylor, took a regulatory and systems approach to food safety. Taylor declared that *E. coli*-contaminated raw ground beef would be classified and treated as "adulterated" within the meaning of the Federal Meat Inspection Act. Taylor also introduced a mandatory Risk Management System that required meat processors to adopt comprehensive precautions that included carcass washes, citric acid sprays, steam pasteurization, and air-exchange systems.

This appears to have worked. Incidents of *E. coli* poisoning involving ground beef have declined. And there is a lesson here for the broader food industry.

Looking to the Future

Following Taylor's example, notice must be served to producers and other food processors world-wide that *E. coli*, *Salmonella*, and other foodborne pathogens will be classified and treated as adulterants. In addition, the same kind of comprehensive Risk Management System should be established and implemented, along with criminal and civil penalties for violations.

If these best practices were adopted, firms would have to certify that they are in compliance in every aspect of their supply chain. Branding can and should reflect this certification of both the firms and their suppliers. The result would be a "seal of approval," which should, in the case of produce firms, address such issues as the location of produce fields near livestock, irrigation and harvesting methods, and packaging.

Second, government needs a food-safety champion like Michael Taylor, an articulate and highly visible spokesperson for food safety. At the same time, we should consolidate responsibility for food safety into one federal-level agency, which would become the authority on best practices, and the point of contact for state and local regulators and health departments.

Third, the food industry itself needs to take more responsibility for quickly and efficiently warning consumers as soon as it is discovered that contaminated food has entered the marketplace. The recent peanut butter scandal in the U.S. is a classic example of the costs of failing to do this. Federal and state governments should assert their authority in this area—especially at the state or regional level, since most outbreaks are regional, not national.

Fourth, we need to educate the public about the benefits of irradiation of all mass-produced food, including fresh produce. Resistance to this practice seems to be rooted in perception, not science.

Fifth, attention must be paid to the vulnerability of food-supply systems to acts of terrorism. Denial and lack of common sense seem to dominate thinking at all levels—business and federal and state governments.

Sixth, government must use its economic and political leverage to monitor food imports and enforce the same standards enforced on domestic producers. This is a central trade issue that has been neglected.

And finally, there is an urgent need to improve the resources available to victims of foodborne illness. In the U.S., where the system relies on private medical insurance, out-of-pocket medical costs are rarely reimbursed by insurance—even if victims have coverage. By the time compensation arrives, victims can be mired in debt. And food processors and retailers whose products sicken their customers should minimally provide, as a gesture of goodwill, reimbursement for lost wages. This is not just an ethical response. It's also a good business practice.

Taken together, all of these recommendations will go a long way toward improving the safety and security of our food supply. In the U.S., one of the major food-safety success stories came as a result of the 1993 West Coast *E. coli* outbreak. According to the CDC, *E. coli* outbreaks declined by 42 percent between 1996 and 2004 (CDC, 2004).

Now consumer confidence in fresh produce has been shaken. Because three-quarters of America's lettuce and spinach comes from California, the problem has hurt an industry, undermining consumer confidence not just in one supplier, but also in an entire sector, most of which continues to produce a healthy and safe product. More companies, ranging from food processors to retailers, are asking for help to regain their "reputational capital" after foodborne disease problems. It remains to be seen whether the brand names of the fast-food chains involved in the recent *E. coli* or *Salmonella* outbreaks will fully recover.

Obviously, the goal of the food-service industry should be to produce high quality products that sell well without injuring customers. With this goal in mind, everyone's interests are better served by the fair and efficient assessments of claims, by health and food-industry officials alike, rather than by the extreme reaction so often seen.

To that end, any business that produces food should be prepared to respond quickly and wisely to any claim of illness caused by its product. There is a natural tendency to react out of anger, but combative responses almost invariably backfire on the industry. Certainly, if a claim of harm is truly bogus, the industry can and should fight it. But when a claim has merit, it is better to treat a customer fairly and learn from mistakes. A calm and reasoned perspective will help the food industry keep its eye on the bottom line.

Table I. Incubation Periods of Common Foodborne Pathogens[5]

PATHOGEN	INCUBATION PERIOD
Staphylococcus *aureus*	1 to 8 hours, typically 2 to 4 hours.
Campylobacter	2 to 7 days, typically 3 to 5 days.

[5] Procedures to investigate foodborne illness. 5th Edition. Prepared by the Committee on Communicable Diseases Affecting Man, International Association of Food Protection. Ames, Iowa. 1999.

E. coli O157:H7	1 to 10 days, typically 2 to 5 days.
Salmonella	6 to 72 hours, typically 18-36 hours.
Shigella	12 hours to 7 days, typically 1-3 days.
Hepatitis A	15 to 50 days, typically 25-30 days.
Listeria	3 to 70 days, typically 21 days
Norovirus	24 to 72 hours, typically 36 hours.

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