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Exclusively for Management

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Food Safety, Part II: Another September 11 Scenario

Protecting the domestic food system against foodborne illnesses

Before September 11, the idea of terrorists spraying a field of grain with deadly chemicals may have seemed more like a movie script than an immediate threat. The thought of food in a corporate lunch room being laced with disease-causing bacteria might also have seemed far-fetched. Unfortunately, those scenarios, though still unlikely, are not as comfortably remote as they once were.

Intentional contamination of our nation's food supply is now being taken very seriously as a national security threat. The food safety and public health systems expected to deal with those threats have come under close scrutiny, and their inadequacies have suddenly become more evident to a wider array of people than ever before.

By the best estimates of the Centers for Disease Control and Prevention (CDC), 76 million Americans contract foodborne illnesses each year, of which 325,000 are hospitalized and at least 5,000 die. Foodborne illnesses have traditionally occurred naturally or resulted from accidents or negligence in food production or distribution. With the increased threat of terrorism, however, deliberate contamination of this country's food supply has come to the forefront as a potential problem.

Last month, The Lipman Report *looked at both accidental and deliberate contamination of imported food. This issue examines the domestic food production and distribution system in the United States to determine what government and industry are doing—and can do—to protect against contamination.*

Foodborne Diseases—Accidental Contamination of the U.S. Food System

Contamination of food by accident or negligence can occur in many ways. Meat and poultry can become contaminated by coming in contact with just a small amount of bacteria from intestinal fluids during slaughter. Fruits and vegetables can be contaminated by the water used to wash or irrigate them. During food processing, contamination can occur when humans infected with a disease handle food or when the food is touched by already-contaminated utensils. Fully cooked food can be re-contaminated when it comes into contact with contaminated drippings from raw foods.

Raw meat and poultry, raw eggs, unpasteurized milk and raw shellfish are most likely to become contaminated. Raw fruits and vegetables are an emerging concern as well, especially because their consumption has increased in the U.S. during the past few decades. Cooking food eliminates many bacteria, as does washing fruits and vegetables, but those preventative actions are not foolproof.

The most commonly recognized foodborne infections in America are caused by the bacteria *Campylobacter, Salmonella* and *E. coli*, and by a group of viruses called calicivirus, but the prevalent types of foodborne diseases change constantly. A century ago, the most common were typhoid fever, tuberculosis and cholera. Improvements in food safety, such as pasteurization of milk, safe canning and disinfection of water supplies, have eliminated those diseases in food. Yet new foodborne diseases are being discovered, like a parasite called *Cyclospora* that was found in Guatemalan raspberries in 1996 and caused diarrhea in Americans who ate them. In 1998, a new bacteria strain called *Vibrio parahaemolyticus* caused an epidemic of diarrhea among people who ate raw Texas Gulf oysters.

Not only do these foodborne diseases disrupt, and sometimes even end, lives, but their cost to the U.S. economy is also high. The CDC estimates that medical expenses and lost wages resulting from foodborne *Salmonella* in America—just one of the more than 250 known foodborne diseases—total more than $1 billion per year.

Agroterrorism—Deliberate Contamination of the U.S. Food System

Intentional contamination or disruption of the food supply by terrorists is a form of bioterrorism called agroterrorism, and its effects are hard to predict. Depending on the goals of the perpetrators, agroterrorism could have greater health and economic effects than natural or accidental outbreaks of foodborne illnesses because terrorists will likely plan strategically for the maximum impact.

A few possible methods of agroterrorism would be: to contaminate food after production with

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either chemical or biological agents that can kill or cause illness among consumers; to damage the agricultural economy by introducing crop pathogens or animal diseases such as foot and mouth disease; to disrupt food distribution systems; or to create hoaxes, spreading fear and thereby severely disrupting areas of the food system.

History offers rare examples of attacks against agricultural targets. During World War I, Germany waged a large-scale, biological sabotage program in which they attempted to infect livestock in Norway, Romania, Spain and the United States. In 1952, as part of the Mau Mau uprising in Kenya, there was a case that involved the use of African bush milk to infect steer. More recently, allegations have attributed the 1998 outbreak of foot-and-mouth disease in Taiwan to mainland China, although no substantive evidence has been found.

Very few attempts at agroterrorism have occurred in the United States, and most have been thwarted. In 1996, a police chief in Berlin, Wisconsin, received an anonymous letter claiming that feed at a local animal food processing plant was tainted with a deadly pesticide. Tests confirmed the contamination, and shipments of 300 tons of feed bound for farms throughout the Midwest were stopped. In 1999, the owner of a rival facility was indicted for twice contaminating the competitor's products.

Prevention of Foodborne Diseases and Agroterrorism

Even with some important and effective safeguards already in place, the possible scenarios for potential agroterrorism are essentially limitless, making prevention particularly difficult. The good news is that many of the solutions to preventing agroterrorism will correct some long-running problems that have resulted in the unintentional spread of foodborne diseases as well.

One of the most commonly cited problems in the food safety system is what the General Accounting Office in October 2001 called, "a patchwork structure that cannot address existing and emerging food safety risks." The nation's main oversight of food production and distribution is divided between the U.S. Department of Agriculture (USDA) and the U.S. Food and Drug Administration (FDA). Responsibilities for administering laws in the food safety system are spread among at least 12 different government agencies, usually because the original assigning of responsibilities was done piece by piece with little or no regard to overall efficiency.

Therefore, some absurd divisions occur. For example, the USDA is responsible for inspecting wholesale manufacturers of open-faced meat or poultry sandwiches, those with one slice of bread. By law, the USDA is required to conduct such inspections every day. The FDA is responsible for inspecting wholesale manufacturers of closed-faced meat or poultry sandwiches, those with two slices of bread. Yet the FDA is required by law to inspect such facilities only once every five years. Although there are no differences in the risks that these sandwiches pose, their regulation and oversight are widely inconsistent. Such inspection discrepancies exist for many similar products: beef broth versus chicken broth, hot dogs in pastry dough versus hot dogs in a roll, pizza with meat topping versus meatless pizza.

That is why many in government are arguing for consolidation of food safety oversight under one agency. Soon after the September 11 attacks, a consolidation bill was introduced by Senator Richard Durbin (D-Ill.) but defeated in Congress. Food industry representatives fought it, saying consolidation would raise their costs without necessarily increasing food security. In March 2002, Homeland Security Director Tom Ridge revived the idea, saying the Bush administration was looking at it seriously again.

Another prevention issue was raised in January of this year, when the FDA came out with new security recommendations for food producers, distributors and retailers that included specific advice on

increasing oversight and background checks of employees all along the food chain. The recommendations included farm workers, food processors, food transporters, and restaurant and grocery workers—all who have access to vital links in the food chain—because a terrorist among them could potentially create much damage. High turnover rates in the food industry, however, make such monitoring of personnel especially difficult.

Detection of Foodborne Diseases and Agroterrorism

One of the many problems in detecting foodborne diseases is that they often do not reveal themselves until after they have infected people. Rapid diagnostic methods for identifying contamination in food are not consistently available. Tracing the contamination source is often guesswork, as is determining whether the contamination was intentional or accidental. Doctors, local and state governments, and public health facilities are usually the first to receive information that could signal possible contamination. Yet different states have different levels and methods of monitoring, depending on funding and interest in the issue. For example, California, New York and Texas have strong programs governing food safety, while some states—including Arkansas, Idaho and Maine—are governed by federal requirements in cases where their individual programs did not meet minimum federal standards or the state simply elected to discontinue its program. Those states that do have credible networks are often not readily connected to similar networks across the country. As a result, detection before damage is widespread can be difficult.

Coupled with that is the fact that the food system encompasses many different industries: agricultural and food production facilities, restaurants and grocery stores—located all over the country. Once an infected food gets into the food chain, it can potentially spread disease far and wide, and it can do so rapidly. Some possible solutions to these challenges are being developed, such as inexpensive sensors in food packaging that can signal a food's freshness or the presence of some forms of contamination, but the application of such technology is at least a few years away.

The CDC has a number of surveillance systems to track foodborne diseases, in an attempt to detect outbreaks, pinpoint their causes, recognize trends and develop effective responses. Many of these systems, however, are passive, meaning they rely on reporting by state health departments and clinical laboratories. That means only a fraction of the actual occurrences of these diseases are recorded through these systems, since incidents of foodborne disease often go unreported to doctors or public health departments.

The CDC, along with the FDA and the USDA, does run an active surveillance system called FoodNet, which conducts epidemiological studies to track foodborne diseases. Two other CDC active surveillance systems that could play a role in tracking and responding to agroterrorism are PulseNet and the Epidemic Information Exchange. PulseNet uses DNA technology to determine if cases of foodborne illness occurring at the same time in different locations are caused by the same strain of bacteria and stem from a common food item, thereby making quick response possible. The Epidemic Information Exchange is "a secure, web-based communications network for public health officials." It connects them with state and local health departments, the CDC and the U.S. military, to share both routine and emergency health information.

These computer and web-based information gathering and exchange systems are only a start in early detection of food contamination or tampering. Existing tracking systems do not encompass the entire food system, from farmers to processors to retailers to consumers. Tracking should also include public health, medical and emergency personnel, who are on the front lines and can recognize patterns among developing diseases.

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What the Private Sector Can Do

Just as all terrorist threats have been taken more seriously in recent months, security managers have had to re-evaluate vulnerabilities like mail rooms and food-entry points. Those familiar with food safety issues note that the most likely source for contamination is a disgruntled employee, yet extra vigilance is also called for in examining food service employees and food sources.

Some steps to take against contamination of company food supplies are:

- Invite security advisors, including local law enforcement and health department representatives, to tour the facility to identify potential security vulnerabilities. This not only helps protect an organization, but also opens lines of communication and builds relationships with those who would be called in an emergency.
- Clarify with food suppliers, including delivery companies, what security measures they have in place to ensure no tampering occurs with their products. Require a stipulated minimum pre-employment background investigation of their employees who have access to food. Also, be vigilant in checking out the background of all company employees, even those with seemingly benign responsibilities and part-time status, and especially those with food service access or responsibility. In addition, control access to food stored on-site.
- Have in place a clear and accessible system, such as a toll-free hotline, for employees to report any suspicious activities regarding the company food supply. Make sure everyone knows who to contact, and how to do it, even if it is anonymous. A quick response plan should be in place as well. If an employee sees someone putting a strange substance in a company coffee pot, they should be able to report that immediately and get an immediate response, even if it means a lot of false alarms.
- Make sure a well-thought-out procedure exists for testing any suspicious substances, such as discolored food, or products that appear to have been tampered with. Know who to call for help and, again, make sure employees know who to contact within the company about any of their suspicions. The company's response in the first hour or two to emergency situations will go a long way toward preventing disease as well as controlling unwanted media attention.
- Lobby for stronger legislation governing food safety at the state and federal levels. Because of the potential for foodborne diseases to spread rapidly, the existing patchwork of state regulations creates dangerous vulnerabilities that jeopardize the nation's entire food supply. Businesses must therefore encourage policymakers to pass uniform standards regarding food safety, similar to the current focus on producing a national standard for obtaining state drivers' licenses.

The idea of coordinating and linking all the points in the food production, processing and distribution chain—as well as all parts of the human and animal health systems and the medical and emergency response systems—may seem a daunting task. There is no one solution or entity that will make it happen. However, the nation's awareness of terrorist threats has increased since September 11, and a better food safety and public health system may result. It will take a combination of local, state, national and international initiatives. It will also require commitment from government, industry and the private sector. But the result will be safer food and less disease for everyone, whether terrorists strike again or not.

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