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Exclusively for Management

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The American Food Supply: Efficient and Exposed

Modern husbandry practices and heightened imports imperil the U.S. population, economy

Last month's candid remark about the U.S. food supply by outgoing Secretary of Health and Human Services Tommy G. Thompson brought the national spotlight to a glaring vulnerability in homeland security. Indeed, many of the practices that have made the American food chain the most efficient in the world contribute to its susceptibility to a catastrophic attack. A simulation funded by the U.S. Department of Agriculture (USDA), for instance, reveals that foot-and-mouth disease could spread to as many as 28 states by the time officials confirmed the first case—an event that would require destruction of most of the country's $90-billion livestock industry.

This study demonstrates the economic devastation that could follow an act of agroterrorism, a terrorist assault on crops or livestock, or an accidental outbreak. Even though the farming sector accounts for less than three percent of the U.S. workforce, food production employs an estimated one out of every eight American workers. The industries supporting the U.S. food supply make up nearly 10 percent of the nation's Gross Domestic Product and generate almost one trillion dollars in annual cash receipts. At approximately $140 billion a year, agricultural exports represent a critical component in the U.S. balance of trade as they equal double the combined total of other industries.

Increased globalization presents another potential danger to the American food supply. As of 2004, food and food products represented nearly 20 percent of the nation's imports. Many of the regulations governing the U.S. food supply were designed to protect a domestic food production and distribution chain, and the nation has had to strengthen food-safety initiatives to manage the risks associated with increasing food imports. Post-September 11 fears have provided the impetus required to spur government action in this arena, prompting implementation of several initiatives that will also help protect the food supply from intentional contamination.

Tool for terror?

The practice of agroterrorism dates back to ancient times, when the Romans salted Carthaginian fields to render them barren. In 19th century America, General William Tecumseh Sherman employed a similar strategy as he ordered the burning of crops in his "March to the Sea." Although several nations have conducted extensive research on using biological weapons against agricultural targets, few have employed such tactics in warfare.

Examples of food sabotage in the United States have been small in scale, involving groups or individuals, rather than state-sponsored agents. One of the few terrorist attacks involving food contamination took place in Oregon in 1984, when members of a religious cult introduced *Salmonella typhimurium* to salad bars in an attempt to disrupt a local election. The incident resulted in 751 cases of salmonellosis, with 45 victims needing hospitalization. In 1996, another case involved a disgruntled laboratory worker who poisoned his co-workers by infecting food with *Shigella dysenteria* type 2. Twelve people fell ill, with four being hospitalized and five receiving emergency-room treatment.

These instances demonstrate some of the drawbacks of contaminating food supplies as a means of terrorist attack. Although many people may get sick, few actually die. Consider last month's poisoning of Ukrainian President-elect Viktor Yushchenko: Even though his blood contained 100,000 units of pure TCDD, the most harmful dioxin chemical, Yushchenko survived the attack, which left him disfigured. Terrorists of the al Qaeda mindset seek to maximize the number of casualties and will likely use more efficient methods of accomplishing this goal.

Even so, the nation cannot afford to sit back in complacency. The U.S. military has found extensive research on American agriculture on al Qaeda computers seized in Afghanistan, and a significant portion of the al Qaeda training handbook addresses agricultural warfare. While this type of attack may not offer the same drama as a suicide bombing, it can yield far greater economic impact with significantly less risk. Launching a successful assault against a nation's livestock requires less expertise than a biological attack against humans. Often readily available, these agents require little training to prepare and administer and generally

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pose no threat to humans. Furthermore, agricultural attacks are almost impossible to trace unless the perpetrator admits to the deed.

In 1997, for instance, Taiwan experienced a mysterious foot-and-mouth outbreak among its swine population. The disease spread throughout the island within six weeks, forcing the government to stop pork exports and slaughter eight million pigs. The incident, which was allegedly traced back to a single pig from Hong Kong, cost the nation more than $19 billion. Diagnosing and wiping out the disease cost $4 billion, while resulting trade embargoes produced indirect losses of $15 billion. Even though China was suspected of biological terrorism, the Taiwanese government could not prove these allegations.

Nation at risk

In December 2003, the United States received a stark wake-up call to the economic impact of a livestock outbreak within its own borders. A single Holstein in Washington came down with bovine spongiform encephalopathy (BSE), or "mad cow" disease. News of the infected cow immediately prompted 30 nations to ban U.S. beef exports, sealing their markets to an industry that typically produces annual export revenue of $3.2 billion.

The incident underscores one of the greatest weaknesses in the American food chain: livestock. Farm animals are particularly prone to disease because of modern husbandry practices and biotechnology innovations designed to enhance quality and quantity of meat, which raise stress levels and lower immunity.

Another factor undermining the safety and security of the U.S. food supply is its invisible nature. In fact, the system works so well that people cannot conceive of its failure. Americans take for granted that they will have ready access to safe food. The efficiency of the U.S. food chain allows Americans to spend a fraction of their disposable income on food, compared to other nations: approximately 11 percent versus 20 to 30 percent elsewhere. This same efficiency has contributed to the invisibility of food production in the eyes of the government. As agricultural production requires fewer resources—2.2 million farms in 1998 compared with 6.3 million in 1929, employing only 2.6 percent of the nation's workforce—its need for emergency-response funding has commanded inadequate attention.

The September 11 attacks alerted the United States to the need to fortify its homeland against terrorists, and food safety received a significant boost. Prior to September 11, 2001, the U.S. Food and Drug Administration (FDA) employed approximately 150 inspectors. Additional counterterrorism funding enabled the agency to hire more than 655 new field inspectors and enhance its laboratory analysis capacity. As a result, the FDA has increased border inspections of food imports more than sixfold, from 12,000 in fiscal year 2001 to more than 78,000 in fiscal year 2003. While these figures represent dramatic improvement, it still accounts for less than one percent of the nearly 3.7 million shipments containing roughly 30 billion tons of food that arrive at the nation's 132 ports each year.

Imported tastes

The sheer volume of food entering the nation daily presents a daunting challenge to food inspectors, and the amount of imported food continues to grow, fueled by consumer demands for exotic produce, meats and seafood year-round. Inadequate oversight of this portion of the food chain concerns experts such as Laurie Garrett, Pulitzer Prize-winning journalist and Senior Fellow for Global Health at the Council on Foreign Relations.

Until recently, imported foods did not constitute a significant part of the daily diet. "Imported foods were for exotic and special occasions," says Garrett. "You had your special European cheeses and your olives from the Middle East that you might serve for a dinner party, but day to day, you ate stuff that came from your country." Increased globalization has greatly altered

the diets of wealthy nations as citizens have grown accustomed to cheap, easy access to foods formerly considered luxuries. "We've changed our palate and what we want to eat. The day-to-day palate of the wealthy world involves a globalized food supply, but we don't have global institutions for monitoring things."

In fact, most food-safety monitoring takes place at the state, not national, level, and the current system of regulations varies widely, with some states such as New York and California having strict standards that exceed national requirements and others enforcing minimal safety standards. In 1993, a national fast-food restaurant in Washington State was linked to the deaths of three children from *E. coli* 0157:H7. Although the Washington case was initially regarded as the first appearance of this strain of the organism, the microbe had surfaced earlier in Nevada. Unfortunately, that state's public-health infrastructure failed to detect the organism; children had died, but their cause of death had gone uninvestigated. With such disparate standards within U.S. borders, the country's prospects for regulating imported foods appear bleak indeed.

Advances in food safety

Recent legislation—most notably the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, also known as the Bioterrorism Act—has attempted to address vulnerabilities in the food supply at the national level.

Just last month, the FDA published final regulations for establishing and maintaining records that identify the previous source of all food received, as well as the immediate recipient of all food released. According to a statement released by Dr. Lester M. Crawford, Acting FDA Commissioner, "The ability to trace back will enable us to get to the source of contamination. The records also enable [the] FDA to trace forward to remove adulterated food that poses a significant health threat to the food supply." All businesses covered by the rule must comply within 12 months from its publication in the Federal Register, although small businesses have an additional six to 12 months, depending on the number of full-time employees.

Other regulations previously implemented under the Bioterrorism Act include the following:

- *Registration of food facilities.* Effective in December 2003, owners and operators of foreign or domestic food facilities that manufacture, process, pack or store food for either human or animal consumption in the United States must submit information to the FDA about the facility and its emergency contacts.
- *Advance notice of imported food shipments.* Another regulation, which also went into effect in December 2003, requires the FDA to receive prior notice of imported food shipments before the food arrives at an American port.
- *Administrative detention.* The legislation also gives the FDA new authority to detain food for up to 30 days if it receives credible evidence that the food presents a serious health threat to humans or animals.

Protecting the breadbasket

Even though the stealthy nature of agroterrorism holds less appeal to terrorists like the al Qaeda organization that favor high drama, the potential for economic devastation makes the U.S. food supply an attractive target. The same measures that can help thwart a bioterrorist attack can also protect the agricultural industry from the more common, ever-present danger of natural outbreaks.

The federal government has increased security resources for the FDA and USDA in recent years, but more must be done. To begin, the nation must perform a comprehensive needs analysis to determine the investments required to bolster the federal emergency management infrastructure. The analysis should give special attention to areas such as continuing foreign animal disease (FAD) research and preparedness and response exercises using

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both tabletop and field simulations. Development of near real-time diagnostic and communication systems should receive top priority to enable the country to mitigate the effects of either a terrorist-induced or naturally occurring outbreak.

Additionally, the nation must increase the number of veterinary professionals who have the skills required to identify and treat exotic animal diseases. Recent years have seen fewer students of large-scale husbandry in the veterinary science field, a trend that reflects lack of educational support and career incentives for livestock epidemiology and treatment. Many veterinary schools focus on diseases endemic to the United States and therefore produce professionals ill qualified to identify and treat FADs that threaten American livestock. By developing incentives and altering curricula to fill this void in expertise, the nation will expand its capability to test for exotic contaminants and to reassure the public once a publicized incident occurs.

Of course, protecting the nation's food supply demands the commitment of all the industries involved in the vast food-production sector. The federal government largely entrusts food-safety regulation to the FDA and USDA, but these agencies do not have specific authorization to impose security requirements—nor would industry welcome such interference. The country thus relies on farms and food-processing companies to protect themselves. As seen elsewhere in corporate America, however, convincing organizations to invest in security poses a challenge as each entity in the supply chain jockeys to maintain a share of typically razor-thin margins.

Security is not a luxury, but a necessity—an investment to protect business continuity and to preserve financial viability. The business of feeding the nation demands a womb-to-tomb approach that begins with securing the production of livestock feed and crop fertilizers and continues until the final, untainted product reaches the consumer. The private sector has the ultimate responsibility for security implementation, but the federal and state governments need to lead and support the effort by developing and funding programs to protect the nation's food supply—including heightened monitoring of domestic facilities and imported food shipments.

A concerted security effort will require cultivating partnerships within industries, as well as with federal, state and local public-health agencies. One promising organization unites agricultural producers, processors and restaurant chains to share best practices that promote food safety. This type of cooperation can provide a potential role model for greater interagency collaboration at all levels as the United States strives to create and implement a unified food-safety strategy.

The myriad challenges facing the U.S. food supply require far-reaching policy initiatives. So many weaknesses permeate the current regulatory system—due in part to inconsistencies in state governance—that no panacea exists. The nation, however, cannot afford to ignore the vulnerabilities that subject its food supply to potential contamination through either natural or intentional means. Other countries' experiences demonstrate the economic folly of inaction.

Modern husbandry practices will continue to expose livestock to new diseases, just as the rising demand for food imports will carry greater risk for the introduction of new microbes. By recognizing and acknowledging the gravity of this threat, the U.S. government and the private food-production sector can act toward remediation. The fate of the country literally depends on it.

The Lipman Report Editors

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