

## Food Defense: The Vital Role of International Collaboration

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It's a pleasure to be here today to talk about food defense and, in particular, the importance of international cooperation and collaboration to protect the food supply from intentional contamination.

Our food supply and distribution system is global in nature and poses a relatively soft target offering many points at which it could be deliberately contaminated. Many do not realize the extent to which this is true since food appears at the table with little thought about how it got there. The recent melamine in pet food situation, for example, makes us all the more aware of how far and wide food-related items are distributed or the extent to which they are processed.

As a result, it is not necessarily obvious to consumers that the food supply and distribution system are vulnerable to deliberate contamination at numerous points along the production and supply continuum. Furthermore, as we know, characteristics of certain foods may make them more attractive targets because contamination of those foods increases the potential number of people impacted. Fortunately, while the food supply and distribution system are soft targets, there are many steps nations can and have taken individually and collectively to harden these targets and better enhance national and international food defense.

This morning, I'd like to talk about some of the terms we use in our work and then some of the international issues for your consideration as researchers working on food defense.

### Distinguishing between Food Defense, Food Safety, and Food Security

Before I go further with my remarks, it's important at this juncture to clarify the terminology we use. For those of us working on foreign policy, words are our primary tools. As such, the language we choose to describe what we do becomes critically important. And it has been our experience that there are some seemingly similar terms used to refer to protecting the food supply against intentional contamination. But, each of the terms means something fairly different and the use and misuse of the various terms can and does cause confusion.

The term **FOOD DEFENSE** encompasses the steps taken to minimize or mitigate the threat of deliberate contamination of the food supply, and includes identifying points of vulnerability and working to strengthen infrastructure thereby, making the food supply a less attractive and, more importantly, less vulnerable target (i.e., *resiliency*). Controls in support of Food Defense include:

- Physical Security: For example, monitoring the premises for suspicious activity, or locking storage facilities.
- Personnel Security: For example, screening employees, and use of name badges
- And Operational Security: For example, monitoring production to prevent sabotage, and use of tamper-evident packaging.

This concept of Food Defense is, however, distinct from food safety, which focuses on setting standards for industry regarding the safety of food, good manufacturing practices, quality control of agricultural products, and promotion of trade in food products (i.e., *reliability*). Control strategies to enhance food safety can also be distinct from those involved in food defense and include: risk management strategies such as Good Agricultural Practices (GAP); Good Manufacturing Practices (GMP); good hygiene practices (GHP)/Sanitation Standard Operating Procedures (SSOP); and Hazard Analysis Critical Control Points (HACCP) to prevent or reduce microbial, chemical, or physical contamination.

Finally, Food Defense is also distinct from Food Security which is defined by the World Health Organization and others as "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life." In other words, Food Security is a concept that is often discussed in terms of dealing with famine or other national or international food shortages (i.e., *sufficiency*).

Many have used these terms interchangeably and, I would argue, erroneously creating confusion during both national and international policy discussions. My focus today is on Food Defense and, in particular, on the ways in which it is an international issue with global impact.

I should start off by indicating that there is a genuine terrorist threat to the global food supply, both at the production and processing stages. In May 2002, the World Health Assembly recognized this threat when it stated that "the malicious contamination of food for terrorist purposes is a real and current threat, and deliberate contamination of food at one location could have global public health implications." Evidence indicates that terrorist groups have considered the food supply as a target. Before the September 11 terrorist attacks in the United States, many modern bioterrorism attacks were perpetrated using food products with the express purpose of extortion, corporate sabotage, terrorism, political influence, destruction of brand or company image, and/or destruction of an economic sector. Materials discovered at Al Qaeda training camps in Afghanistan show knowledge of specific agents that could be used to contaminate the food supply (their sources, maintenance, growth and toxicity) and the potential of the food supply as a means of distributing those agents for maximum harm.

The food supply is a relatively soft target offering many points at which it could be deliberately contaminated:

- It is mass produced and rapidly distributed worldwide. Contamination could cause morbidity or mortality on a global scale.
- Some foods are more attractive targets because their contamination would reach even larger numbers of people.
- Vulnerable food products include those that are mixed during production to allow uniform distribution of an agent throughout the product; those with a short shelf-life, increasing the chance that the food will be consumed prior to detection of contamination; those that are easily accessible to a terrorist (e.g., open access to food production facilities, or unlocked trucks, etc.); and those that are made in large batches allowing great volumes to be contaminated at one time.
- Furthermore, a number of agents could be used to contaminate food, ranging from microbial agents typically seen in unintentional outbreaks of foodborne illness, pathogenic organisms not normally associated with food consumption, to organisms that have been genetically modified to be more lethal, to biologically derived toxins, to highly toxic chemical agents.

It's clear from the historical evidence that the food supply presents an appealing target to those who would wish to cause harm to human health, economic well being, or sociopolitical stability. The deliberate contamination of the food supply is neither a new nor novel threat. Throughout history, we have seen episodes of intentional contamination sicken many individuals; and we've seen these episodes not necessarily with the intent to kill, but rather, to cause economic loss. For instance, in 1978, deliberate contamination of Israeli citrus with the heavy metal mercury resulted in several people sickened in the Netherlands and West Germany. Terrorists stated they were targeting the Israeli economy.

Other U.S. and international examples in recent history include:

In 1984, the Rajneeshee religious group contaminated salad bars in the U.S. state of Oregon in hopes of affecting the outcome of a local election. This incident caused 751 cases of salmonellosis and resulted in the hospitalization of 45 of the victims.

That same year, Japan also dealt with deliberate contamination when someone contaminated candy in an attempt to extort money from the manufacturer.

More recently, China had to address this issue when, in 2002, 40 people died and 200 individuals were hospitalized in Nanjing after the owner of a fast-food outlet poisoned a competitor's breakfast foods with rat poison.

One year earlier, 120 people in China were sickened when the owners of a noodle factory reportedly laced their food with rat poison.

Furthermore, in May 2003 in Michigan, a supermarket employee pleaded guilty to intentionally contaminating 200 pounds of ground beef with an insecticide containing nicotine. Although the tainted meat was sold in only one store, 111 people, including approximately 40 children, were sickened.

These are only a few examples of deliberate attacks; importantly, it is believed that other attacks with more limited impact may go undetected.

A deliberate attack on food could and would be devastating, especially if a dangerous agent were used. If one looks at accidental or other unintentional incidences of contamination, it is not hard to extrapolate the extent of damage from a

deliberate attack.

By now, we are all familiar with last year's *E. coli* O157:H7 outbreaks from contaminated spinach, leading to a national recall in the U.S. In total, 26 states were affected, more than 200 people were sickened, and 3 people died. And the impact of this incident was international in scope. Like the U.S., Canada, for example, ended up advising consumers not to eat U.S. spinach. By some estimates, this outbreak may have cost up to \$74 million. Even a rumor or hoax can have a significant impact, as we saw in 2001 when rumors surfaced about Foot and Mouth Disease in Kansas. That rumor resulted in an estimated \$50 million loss.

Thus, in addition to the public health impacts of intentional food contamination, the economic consequences could also be staggering. An attack on the food supply would only have to sicken or kill a few individuals to have far reaching and substantial economic consequences, including direct costs for response to an attack, disruption of food distribution, trade restrictions, long-term loss of consumer confidence, and ultimately, loss of market-share to a competing company or nation. Any of these consequences might carry a heavy economic and political toll.

Though the direct and indirect costs associated with the food sabotage are difficult to fully track or anticipate, reports from unintentional contamination incidents are important indicators of the possible economic consequences if a large-scale deliberate event were to occur. USDA, for example, estimates that food-borne illnesses linked to just five pathogens cost the U.S. economy \$6.9 billion annually. The psychological effects on consumer behavior as a result of fear and anxiety over the possibility of a contaminated food product (loss in consumer confidence) can also have a ripple effect on other aspects of the economy.

This problem is not exclusive to the U.S. Given Europe's experience with natural outbreaks of BSE (or "Mad Cow Disease") and incidents such as the Belgium dioxin contamination episode in 1999 European officials are acutely aware of the potential impact of a deliberate contamination in terms of human life, shorter term economic cost, permanent market loss, and potential political fall-out would be significant. While the human death toll from Creutzfeldt-Jakob Disease (CJD) in the UK has been relatively low (161 as of June 4), the linkage between BSE and human health led to international bans of British beef imports, depressed markets for British beef, crippled the UK's cattle industry, and destroyed consumer confidence in the UK's ability to handle a health and agriculture threat. These outcomes ultimately resulted in the creation of a new food regulation authority in the UK. In fact, several years ago during a meeting with counterterrorism officials from a European partner, when we began talking about agroterrorism and food defense issues, they said they were comfortable with the conversation provided that we did not utter the phrases "Foot and Mouth Disease (FMD)" and "Bioterrorism" in the same sentence, such was the concern about the consequences of even hinting at the possibility of using the disease as a deliberate bioterrorism attack on the agricultural system. To begin making the food supply system less attractive to a potential terrorist, the U.S. has begun taking many proactive steps.

Within the U.S., we are taking a multi-pronged approach. At the national policy level, Homeland Security Presidential Directive/HSPD 9 gives key federal agencies responsibility for identifying and prioritizing sector-critical infrastructure and key resources for establishing protection requirements; developing awareness and early warning capabilities to recognize threats; mitigating vulnerabilities at critical production and processing nodes; enhancing screening procedures for domestic and imported products; and enhancing response and recovery procedures.

The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (usually referred to as The Bioterrorism Act) established national provisions to inspect food offered for import at ports of entry into the U.S, with the greatest priority given to inspections to detect the intentional contamination of food. Regulations to enhance Food Defense under the Bioterrorism Act provide for the registration of food facilities, prior notification of imported food shipments, establishment and maintenance of records, and administrative detention of any food for up to 30 days when there is credible evidence that the food poses a serious threat to humans or animals.

Vulnerability assessments the U.S. Departments of Agriculture, Homeland Security, the Department of Health and Human Services' Food and Drug Administration, and the Federal Bureau of Investigation are working closely together with State Departments of Agriculture and Health as well as the private sector to identify the most critical nodes or vulnerabilities along the food supply and production system, using the vulnerability assessment tool, CARVER + Shock. EPA has also used this tool to analyze the drinking water infrastructure in the U.S. CARVER is an acronym which stands for Criticality, Accessibility, Recuperability, Vulnerability, Effect, and Recognizability all attributes used to evaluate the effectiveness of a target for terrorist attack. In addition to CARVER, the tool evaluates a seventh attribute, the combined health, economic, and psychological impacts or the "Shock" attributes of an attack.

Surveillance the U.S. has established individual diagnostic laboratory networks to monitor human, animal, and plant health, as well as the food and water supplies. These individual networks are now working together under the Integrated Consortium of Laboratory Networks, or ICLN and play a significant role in monitoring the food supply as it moves from "farm to fork." This increasing ability to quickly identify outbreaks of foodborne illness could ensure that outbreaks or unusual patterns of illness are investigated quickly. As part of this surveillance, the U.S. is increasing national participation

in the first Internet-based food safety system eLEXNET (Electronic Laboratory Exchange Network). This shared electronic data system consolidates and shares microbial food contamination findings among federal, state and local laboratories increasing speed, awareness, and coordination to prevent or respond to deliberate threats to the food supply.

Working with private industry to reduce threats and contain outbreaks of foodborne illness. In this process, U.S. agencies have issued new industry guidance on security measures, and have encouraged specific additional industry security measures in response to the increased threat level. These help food producers, warehouses, importers, stores, restaurants, and other food establishments to minimize the risk that their food will be subject to intentional contamination or tampering.

Information sharing The Strategic Partnership Program Agroterrorism (SPPA) initiative is designed to gather information to provide stakeholders with comprehensive reports including warnings and indicators, key vulnerabilities, and potential mitigation strategies.

In addition to this work within the U.S., we have also begun raising the issue of Food Defense internationally. In my international travels, I often hear skepticism about U.S. perceptions of the threat of bioterrorism or of the needed actions. The degree to which bioterrorism is seen to be a significant security threat affects our individual and collective willingness to invest resources in biodefense. And the nature of respective national threat assessments will influence the kinds of international programs put in place to defend against bioterrorism.

Fortunately, we have found that Food Defense is often the exception to this international skepticism. When raising food defense and agroterrorism issues, officials overseas seem to "get it" and often indicate that they share the same concerns, probably because of the potential widespread consequences to an economy and the supporting infrastructure. Many countries have also had problems with unintentional contamination of food supplies, so they understand some of the implications already.

For example, in 2004, the U.S. introduced bioterrorism onto the agenda for the G8 leaders, leading to the G8 leaders' statement that year covering the issue of "Defending Against Bioterrorism." One component of that work articulated by G8 leaders was to increase protection of the global food supply. In 2005, G8 nations built on this policy foundation and put together some of the first-ever international technical and policy events looking at initial steps in food defense.

Taking this work even further, at U.S. initiative, the Asia Pacific Economic Cooperation (APEC) forum has enthusiastically embraced the Food Defense issue. Last year, for the first time ever, all 21 APEC economies signed onto a U.S.-Australia-Chile co-sponsored Food Defense Initiative to "Mitigate the Terrorist Threat to the APEC Food Supply." And just two weeks ago, officials from 15 APEC economies, as well as representatives from the private sector, met in Hanoi for the second step in the APEC process to strengthen food defense methodologies. We are now working with other APEC economies to further share strategies and develop and articulate APEC Food Defense Principles perhaps the first time a multilateral entity has attempted to tackle this critical counterterrorism issue.

We face several key challenges when discussing food defense internationally looking at increased awareness, and at international collaboration in response to an event (whether real or hoax).

Overall, I find international colleagues, for the most part, to be receptive and enthusiastic to collaborate on food defense. At the same time, even among close allies, I have been surprised by some of the questions and concerns that international colleagues have raised. For example, proposing food defense collaboration can lead to the question "What do you know that I don't?" The U.S. must often explain that, even in the absence of a specific threat to a particular food or area, we believe that putting the time, energy, and resources into food defense represents a prudent and precautionary contribution to all of our efforts to combat bioterrorism.

Additionally, sometimes international partners voice concerns (or, more often, hint at concerns) that collaborative work on Food Defense will affect cross-border trade somehow inadvertently creating unexpected trade restrictions or barriers.

In the event of a terrorist attack (or even a hoax), the international challenges could be substantial. As we all know, internal coordination for any government may often be particularly difficult in the midst of a crisis, especially if multiple ministries or sectors are involved as would be the case in the event of an attack on the food supply. We should imagine having to coordinate activities within not one, but multiple countries in response or mitigation. Bans on food imports, and the potentially permanent loss of markets, could be immediate impacts of such a situation. Furthermore, not being able to effectively coordinate a food defense response among multiple nations has the potential to create, in the short term, tension among trade partners, and over the longer term, lasting diplomatic tensions.

One final challenge to stimulating and continuing this international dialogue is that of competing priorities. Food Defense,

prudent as it may be, is simply not high on the agenda for some nations. For some countries, food *safety* issues are perceived as a more significant concern enough that it makes it difficult to get some countries to look beyond food safety concerns to protecting the food supply from *deliberate* contamination. Identifying the synergies between food defense and food safety will be critical to identify ways in which the needs may not be competing but may instead be interdependent strengthening mechanisms for both national protection and international cooperation.

There are a number of ways that nations and the international community can work together to address the challenges of food defense and international cooperation: Strengthen public-private partnerships to address food defense; Multi-sectoral engagement is essential; "Translate" this multi-sectoral engagement into cross-border cooperation; and Communication is key.

### **Information Sharing is Vital**

Fortunately, if I may use an agricultural metaphor, we are starting to see international food defense cooperation efforts bear fruit. Thanks to food defense initiatives like those within the G8 and APEC, nations are talking to each other proactively about protecting the food supply from deliberate contamination, and are identifying ways to collaborate. As governments, we are also starting to see the private sector at least the very largest multi-national firms begin to incorporate food defense practices around the globe.

Finally, you may be wondering how this applies to you as researchers. As such, I'd like to leave you with three sets of questions and issues for your consideration during this workshop and in your research:

First, what are ways that research can motivate and develop international collaboration on food defense issues? What can research tell us about the global distribution of the food supply in ways that will encourage and compel other nations to take action? Where are the natural synergies between researchers or institutions from different nations? What are the obstacles to cross-border research cooperation, and what should researchers and government be doing to address those obstacles?

Second, what are the potential roles for the private sector in the discussion about food defense and what can research do to stimulate private sector engagement? Some relevant research questions include whether there are there effective strategies to "incentivize" voluntary adoption of food defense practices, and what are some of the lessons we may learn from similar endeavors in the past, from other security practices, or from collaboration with other industries?

And, finally, effective research can help us understand the implications of food defense strategies for international trade. It's clear that there are linkages and potential impacts. What kind of research efforts will ensure that enhanced food defense does not interfere with continued and growing global commerce? What are the ways to make these efforts complementary and not conflicting?

These are just some of the ways we look to you as the core of the research community investigating food defense to inform and influence the policy work we do, both domestically and internationally. The results of your efforts provide us with the words and the tools to make a difference in our relations globally. Thank you again for this opportunity to talk about a vision for international cooperation on food defense.

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