DEPARTMENT OF HOMELAND SECURITY

Office of Inspector General

The Department of Homeland Security's Role in Food Defense and Critical Infrastructure Protection

OIG-07-33

February 2007

Office of Inspector General

U.S. Department of Homeland Security
Washington, DC 20528

February 23, 2007

Preface

The Department of Homeland Security (DHS) Office of Inspector General (OIG) was established by the Homeland Security Act of 2002 (*Public Law 107-296*) by amendment to the Inspector General Act of 1978. This is one of a series of audit, inspection, and special reports prepared as part of our oversight responsibilities to promote economy, effectiveness, and efficiency within the department.

This report assesses actions taken by DHS in support of food defense and critical infrastructure protection. It is based on interviews with employees and officials of relevant agencies and institutions, direct observations, and a review of applicable documents.

The recommendations herein have been developed to the best knowledge available to our office, and have been discussed in draft with those responsible for implementation. It is our hope that this report will result in more effective, efficient, and economical operations. We express our appreciation to all those who contributed to this report.

Richard L. Skinner
Inspector General

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Abbreviations

CBP	Customs and Border Protection, Department of Homeland Security
CDC	Centers for Disease Control and Prevention, Department of Health and Human Services
DHS	Department of Homeland Security
FBI	Federal Bureau of Investigation, Department of Justice
FDA	Food and Drug Administration, Department of Health and Human Services
GAO	Government Accountability Office
HHS	Department of Health and Human Services
ISAC	Information Sharing and Analysis Center
NCFPD	National Center for Food Protection and Defense
NIPP	*National Infrastructure Protection Plan*
S&T	Science and Technology Directorate, Department of Homeland Security
UC Davis	University of California, Davis
U.S.	United States
U.S.C.	United States Code
USDA	United States Department of Agriculture

Executive Summary

The federal government is charged with defending the food supply from intentional attacks and natural hazards. While the Department of Homeland Security (DHS) is not the designated lead for a number of key activities in this area, Congress and the President have assigned DHS many important food defense and critical infrastructure protection responsibilities. This report examines DHS activities relating to post-harvest food, and focuses on prevention, protection, preparedness, and detection efforts.

There are four main limitations in DHS' related efforts. First, DHS must improve internal coordination. DHS food sector activities are distributed across multiple organizational units, and similar program thrusts have emerged. Consolidated management attention is required to reduce the risk of duplication and promote collaboration.

Second, DHS needs to engage its public and private food sector partners more effectively. Food sector partners were frustrated by the quality and extent of DHS external coordination in sector governance and information sharing; mapping; and research, development, education, and training.

Third, DHS could do more to prioritize resources and activities based on risk. DHS units have used different approaches to prioritizing food sector activities in the context of their larger missions, and have not developed a common perspective on food sector risk. There is little consensus on how any of the elements of risk apply to the food sector, and staff in key positions expressed misinformed views about food sector risk.

Finally, DHS must fully discharge its food sector responsibilities. DHS has satisfied basic requirements in most, but not all, areas of responsibility. The department has not submitted an integrated federal food defense budget plan or clearly established assessment standards for use in the food sector.

Our report contains 16 recommendations to enhance DHS' performance and improve the security posture of the food supply. DHS concurred with 12 of these recommendations.

Background

Overview of the Food Sector

The nation's food sector is comprised of an array of distinct businesses and operations that help bring food products to consumers around the world. The host of steps in the food production system is often collectively described as a "farm-to-table" continuum. This continuum is, in fact, a tremendously complex system characterized by numerous interdependencies. An illustration of the farm-to-table continuum can be found in Appendix D.

Pre-harvest elements of the continuum include crops and animals in the field, as well as fertilizers and animal feed. The harvesting or slaughter of agricultural products marks the beginning of the post-harvest food sector, which extends through the balance of the continuum until products are consumed. This review concentrated on post-harvest elements of the food supply so as not to duplicate previous Government Accountability Office work on the pre-harvest side.[1]

The post-harvest food industry accounts for 12% of the nation's economic activity and employs more than 10% of the American workforce.[2] It consists of enormous subsectors, including business lines addressing processing, storage, transportation, retail, and food service. Statistics on just two of these subsectors serve to illustrate the magnitude of the sector.

The National Restaurant Association projects that the industry's 925,000 U.S. locations will reach $511 billion in sales for 2006, serving over 70 billion "meal and snack occasions" for the year.[3] Meanwhile, the nation's $460 billion food retail business consists of more than 34,000 supermarkets, 13,000 smaller food markets, 1,000 wholesale club stores, 13,000 convenience stores, and 28,000 gas station food outlets. Like the other components of the food industry, these subsector business units have a broad geographic distribution and are present in all regions of the country.

[1] For more information on efforts to counter pre-harvest agroterrorism, refer to the Government Accountability Office's March 2005 report, *Homeland Security: Much Is Being Done to Protect Agriculture from a Terrorist Attack, but Important Challenges Remain* (GAO-05-214).
[2] Bureau of Labor Statistics, Occupational Employment Statistics, "Frequently Asked Questions," http://www.bls.gov/oes/oes_ques.htm.
[3] http://www.restaurant.org/pdfs/research/2006factsheet.pdf

Private sector entities are the predominant owners and operators of the food sector. Federal, state, and local governments have noteworthy food production, distribution, retail, and service operations, but these are small when compared to private sector operations.

Regulation of the food industry is divided between federal, state, and local agencies. State, territorial, and local governments conduct oversight of food retail and food service establishments within their jurisdictions. These levels of government oversee restaurants, institutional food service establishments, and hundreds of thousands of food retailers. Within the federal government, primary responsibility for food safety rests with two agencies. The Food Safety and Inspections Service of the U.S. Department of Agriculture (USDA) oversees the processing of red meat, poultry, and processed egg products. The Food and Drug Administration (FDA) of the Department of Health and Human Services (HHS), in turn, regulates the processing of virtually all other food products. In addition to these two, several other federal agencies provide oversight of food processing, distribution, and retail. A comparison of foods regulated by the Food Safety and Inspections Service and FDA can be found in Appendix E.

Hazards to the Food Sector

The food sector could experience several types of significant adverse events. Among these, intentional food contamination is of greatest concern to many in the food security and safety fields. In December 2004, the former Secretary of Health and Human Services, Tommy Thompson remarked that, "I, for the life of me, cannot understand why the terrorists have not attacked our food supply because it is so easy to do."[4]

Protecting the U.S. food supply from intentional adulteration has grown in importance since the attacks of September 11, 2001. Some have suggested that terrorist attacks on the food supply are increasingly likely. In 2003, the President's Council of Advisors on Science and Technology wrote that "terrorist acts of a widely diffuse nature such as attacks on the food supply … could become a preferred means of attack in an environment where terrorist networks have been 'decapitated' and their ability to communicate and raise funds significantly diminished."[5] Food

[4] William Branigin, Mike Allen and John Mintz, "Tommy Thompson Resigns From HHS," *Washington Post*, December 3, 2004.
[5] President's Council of Advisors on Science and Technology, *The Science and Technology of Combating Terrorism*, July 2003, p. 5.

products may be deliberately contaminated with chemical, biological, or radiological agents. Despite the range of possible contaminating agents and the openness of parts of the food supply chain, there have been few recorded cases of deliberate food contamination in the United States. These events have only had a localized effect and have not resulted in serious casualties on a massive scale or catastrophic economic loss. The following are three prominent domestic incidents of food contamination:

- In 1984, members of a religious cult poisoned ten Oregon salad bars with *Salmonella*, resulting in 751 individual cases of illness.
- In 1996, a disgruntled employee of a Texas hospital willfully tainted snacks in a staff break room. This incident caused illness in 12 people.[6]
- In 2003, a Michigan supermarket employee infected 200 pounds of beef with an insecticide, causing illness in 92 people.[7]

Though it is without domestic precedent, the prospect of a mass-scale food contamination event is of particular concern because the nation is subject to major *unintentional* foodborne illness outbreaks. Experts reason that, with some study and limited access, an individual or individuals with malevolent aims could reproduce these outbreaks with more dire consequences. In 2003, the FDA wrote that, "If an unintentional contamination of one food … can affect 300,000 individuals, a concerted, deliberate attack on food could be devastating, especially if a more dangerous chemical, biological, or radionuclear agent were used."[8]

Food safety practitioners devote considerable attention and resources to addressing the hazards associated with *unintentional* food contamination. In the past, this type of food contamination has led to some major outbreaks, which have occurred with much more frequency and on a considerably larger scale than deliberate acts of contamination. In 1985, for example, the unintentional contamination of milk with *Salmonella typhimurium* caused illness in 170,000 individuals in the United States. A decade later, an estimated 224,000 people in 41 states became ill after consuming ice cream with *Salmonella enteriditidis*.[9]

While foodborne disease outbreaks typically result from products contaminated by naturally occurring biological pathogens, foodborne

[6] Ali S. Khan, David L. Swerdlow, and Dennis D. Juranek, "Precautions against Biological and Chemical Terrorism Directed at Food and Water Supplies," *Public Health Reports*, January-February 2001, pp. 3-14.
[7] Association of State and Territorial Health Officials, "Issue Brief: State Activities in Food Security," April 2004.
[8] FDA, "Risk Assessment for Food Terrorism and Other Food Safety Concerns," October 13, 2003.
[9] Food Safety Department, World Health Organization, *Terrorist Threats to Food: Guidance for Establishing and Strengthening Prevention and Response Systems*, 2002, p. 5.

illnesses have also been traced to toxins, heavy metals, pesticides, and other chemicals. In 1981, for instance, a toxic agent in cooking oil sickened about 20,000 and resulted in the deaths of approximately 800 in Spain.[10] Such contamination events can have long-term effects. In Michigan in 1973, a fire retardant containing a potentially carcinogenic hazardous substance was inadvertently mixed with cattle feed and several thousand people ingested products from animals that had eaten the contaminated feed. Studies have shown that people who consumed these products maintained high levels of the toxic substance years later. It persists, for example, in the breast milk of women who consumed affected foods.[11]

Intentional or unintentional damage to food industry facilities could also adversely affect the sector and result in temporary shortages of certain food products. Because there are available substitutes for most foodstuffs, however, the effect of such losses may be firm-, product-, or industry-specific, and not widespread. Damage to facilities at "chokepoints" in the supply chain for a number of food products, however, could have more pronounced economic effects.

The food sector could also suffer adversely from the debilitation of other sectors. Because food is often consumed some distance from its point of production, significant transportation disruptions have the potential to spawn food shortages. The availability of food products is also dependent on the continuing efforts of the food sector workforce. Conditions that undermine the willingness of food industry workers to go to their worksites or to otherwise perform their jobs could also contribute to food shortages. Because major U.S. cities typically have access to about one week's supply of food, however, transportation and labor disruptions of this kind would have to be sustained before they could critically undercut the availability of food.[12] Sustained disruptions could occur, for example, in the case of a widespread outbreak of a communicable disease during which workers may be reluctant to appear at job sites for extended periods. In addition, although it is possible to sustain the flow of some foodstuffs during extended electrical outages, the supply of perishable food products could be significantly reduced in the absence of electricity.

[10] FDA, "Risk Assessment for Food Terrorism and Other Food Safety Concerns," October 13, 2003. (http://www.cfsan.fda.gov/~dms/rabtact.html).
[11] http://www.sciencedaily.com/releases/2000/12/001214082240.htm *and* Brilliant, L.B., et al. "Breast-milk monitoring to measure Michigan's contamination with polybrominated biphenyls," *The Lancet*, Volume 312, Issue 8091, (September 23, 1978), pp. 643-646.
[12] McIntire Peters, Katherine. "Officials fear terrorist attack on U.S. food supply," *Government Executive*, June 10, 2003.

Potential Impacts of Food Sector Hazards

The White House has stated that a successful attack on the nation's agriculture and food system could have "catastrophic health and economic effects."[13] Indeed, regardless of the cause, an adverse food sector event could negatively impact public health, the economy, the public's psychological well-being, and the effectiveness of government. DHS recognizes negative impacts in these four areas as the types of consequences that might result from incidents affecting the nation's critical infrastructures.[14]

Foremost among potential effects are those on public health and safety. Foodborne illness outbreaks currently cause widespread morbidity and mortality. The Centers for Disease Control and Prevention (CDC) estimates that the United States experiences 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths from unintentional food contamination each year.[15] Recent USDA estimates place the annual cost of premature deaths caused by a single common foodborne illness, salmonellosis – an illness resulting from infection with *Salmonella* bacteria – at over $2.1 billion.[16] The current public health burden of unintentional contamination is borne more heavily by vulnerable subpopulations, such as individuals with weakened immune systems. In some cases, sickness from contaminated food results in chronic illness.

Significant public health consequences also are to be anticipated in the event of a well-orchestrated deliberate act of food contamination. A recent article predicted that over 100,000 Americans – many of them school children – could be poisoned if a single milk truck was contaminated with one gram of *botulinum* type A toxin.[17] Though some experts questioned the technical basis for the paper's conclusions and signaled that the dairy industry had taken appropriate countermeasures to reduce this threat,[18] a single intentional food contamination event could sicken thousands.

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[13] *Homeland Security Presidential Directive 9: Defense of United States Agriculture and Food*, January 30, 2004, paragraph 2.
[14] DHS, *National Infrastructure Protection Plan*, June 30, 2006, p. 1.
[15] Mead, Paul S., et al., "Food-Related Illness and Death in the United States," *Emerging Infectious Diseases*, vol. 5, 1999, pp. 607-25.
[16] http://www.ers.usda.gov/Data/FoodBorneIllness/salm_Intro.asp?Pathogen=Salmonella&p=1&s=&y=2005&n=1397187
[17] Wein, Lawrence M. and Yifan Liu, "Analyzing a bioterror attack on the food supply: The case of botulinum toxin in milk," *Proceedings of the National Academy of Sciences*, July 12, 2005, pp. 9984-9989.
[18] Leitenberg, Milton and George Smith, "Got Toxic Milk?: A Rejoinder." June 14, 2005 (http://www.fas.org/sgp/eprint/milk.html), *and* Clay Detlefsen, "Dairy Industry vigilant in addressing food security," *Cheese Market News*, July 1, 2005.

Given the size of the food sector, damage to the sector could undermine the orderly functioning of the economy. The broad distribution and widespread prevalence of the nation's food processing plants, storage facilities, and retail outlets, along with the continuous distribution and transportation of food, suggest that a major contamination event could have a significant disruptive effect on the national economy. The food industry also accounts for $60 billion in exports and a positive net balance of trade. Damage to the nation's food sector could result in the loss of export markets and add to trade deficits.

An incident need not be widespread to cause major harm to U.S. trade. U.S. beef exports plunged when 119 countries instituted bans on American beef after "mad cow" disease was found in a U.S. herd in 2003.[19] Japan, a $1.4 billon annual market for U.S. beef, partially lifted its ban two years later. Even then, nearly half of the countries accepting U.S. beef in 2003 had not permitted the resumption of U.S. beef imports.[20]

Commentators on the subject have observed that an adverse food sector event could also reduce state and local governments' ability to maintain order and deliver essential services. A major food contamination event could engender public panic on a local or mass scale, depending on the affected food product and population, and media coverage of the incident. Widespread public panic could occur if adulteration of foods resulted in a large number of deaths. An appreciable decline in public confidence in the government could result if a contamination event were linked to a government facility.

Finally, an adverse incident affecting the food sector could undermine public morale and confidence in the nation's institutions. Most Americans currently regard their food as safe. A July 2005 Gallup Poll found that large majorities of respondents were "confident" that food in U.S. grocery stores and restaurants was safe.[21] Because there have been few incidents of large-scale food contamination, it is not clear how the public's perceptions about the safety of food might change in response. The Gilmore Commission reported that a major act of terrorism against the food supply is likely to have "a major psychological impact." It further

[19] USDA, "Livestock and Poultry: World Markets and Trade," November 2005.
[20] USDA, "Statement by Agriculture Secretary Mike Johanns Regarding the Opening of the Japanese Market to U.S. Beef," Release No. 0544.05, December 11, 2005.
[21] Gallup Poll News Service, "Is Confidence in U.S. Food Supply Wilting?," September 20, 2005.

indicated that the psychological consequences of such an attack were "not well understood."[22]

A Historical Perspective on Federal Food Defense and Critical Infrastructure Protection Responsibilities

It is the policy of the federal government to protect the food system from "terrorist attacks, major disasters, and other emergencies."[23] The structure of government support for this policy is set out in several different laws and executive directives. To understand the current state of federal efforts surrounding food defense and critical infrastructure protection, one must first understand the history behind those efforts.

A number of federal food-related responsibilities arise from the government's role in critical infrastructure protection. Federal efforts in the critical infrastructure protection arena emerged in July 1996, when President Clinton formed the President's Commission on Critical Infrastructure Protection. This commission, which consisted of representatives of federal agencies, was tasked with assessing the vulnerabilities and threats to the nation's critical infrastructures. For these purposes, "critical infrastructure" was defined to include infrastructures the *incapacitation* or *destruction* of which would debilitate the defense or economic security of the country. At the time, food and agriculture were not regarded as critical infrastructure sectors.[24]

Presidential Decision Directive 63 outlined ways for the Executive Branch to enhance the protection of critical infrastructures. The directive assigned lead responsibilities for infrastructure sectors to particular federal agencies. For example, the Department of the Treasury was designated the lead agency for the banking and finance sector. Responsible agencies were, in turn, to help "swiftly eliminate any significant vulnerability to both physical and cyber attacks on our critical infrastructures."[25]

In addition, the directive envisioned a growing partnership between federal, state, and private sector entities to develop plans to defend against and recover from attacks on infrastructure.[26] Presidential Decision

[22] Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction (Gilmore Commission), *Fourth Annual Report to the President and Congress*, December 15, 2002, p. 68.
[23] *Homeland Security Presidential Directive 9: Defense of United States Agriculture and Food*, January 30, 2004, paragraph 4.
[24] *EO 13010: Critical Infrastructure Protection*, July 15, 1996, paragraph 1.
[25] *Presidential Decision Directive 63: Critical Infrastructure Protection*, May 18, 1998, Section 2.
[26] Ibid., Section 4.

Directive 63 sought to foster this partnership through the formation of Information Sharing and Analysis Centers (ISACs) – which were to serve as information exchange centers.

As food and agriculture were not considered critical infrastructure sectors at the time, they did not receive direct attention under Presidential Decision Directive 63's framework. Notwithstanding their absence from critical infrastructure discussions of the day, food and agriculture did formally register among White House national security considerations. The National Security Council's Weapons of Mass Destruction Preparedness Group included a subgroup related to agriculture and food safety chaired by USDA.[27]

These structures were in place at the time of the terrorist attacks of September 11, 2001. Soon thereafter, President Bush signed Executive Order 13231, modifying White House involvement in critical infrastructure protection activities. This Executive Order stressed the protection of information systems supporting critical infrastructures, forged a presidential critical infrastructure protection board with a number of specialized standing committees, and established a new infrastructure advisory council with membership drawn from the private sector, academia, and state and local government.[28]

Heightened awareness of the hazards facing the food sector grew within the executive and legislative branches of the federal government following the September 2001 attacks. This awareness was reflected, in part, by the June 2002 passage of the *Public Health Security and Bioterrorism Preparedness and Response Act of 2002* (*Bioterrorism Act*). The *Bioterrorism Act* called for increased controls on dangerous biological agents and toxins, and provided the FDA with more authorities to detect and respond to the possible adulteration of food products.[29]

Awareness of these hazards also expanded as a result of the work of the Gilmore Commission. In its fourth annual report to Congress and the President, the Commission discussed its concerns about the readiness of the food and agriculture sectors in the event of a terrorist attack. After examining the readiness of these sectors, the Commission directed 6 of its

[27] *Presidential Decision Directive 62: Protection Against Unconventional Threats to the Homeland and Americans Overseas*, May 22, 1998. Noted in Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction (Gilmore Commission), *Fourth Annual Report to the President and Congress*, December 15, 2002, pp. 69-70.
[28] *EO 13231: Critical Infrastructure Protection*, October 16, 2001, Sections 1, 3, and 10.
[29] 21 U.S.C. §§ 331, 334, 335a, 341, 342, 343, 350, 374, 381, 398, and 399.

56 recommendations at improving terrorism preparedness and response for the food and agriculture sectors.[30]

In July 2002, the White House Office of Homeland Security released a *National Strategy for Homeland Security* that elevated the national security standing of the food sector. Acknowledging possible "insider threats" to the food supply through food product tampering by employees in the processing and distribution system, the *National Strategy for Homeland Security* expanded the list of "critical" infrastructure sectors to include food and agriculture.[31]

The February 2003, *National Strategy for Physical Protection of Critical Infrastructure and Key Resources* highlighted the possible exploitation of critical infrastructure to cause harm and disruption. Whereas past guidance on critical infrastructure protection stressed the risks associated with destroying or disabling critical infrastructures, this new strategy explicitly recognized the potential to *exploit* critical infrastructures to ill effect.[32] This new recognition may have been the product of a painful lesson on September 11, 2001, a day on which commercial airlines were exploited to inflict damage beyond the aviation sector. Whatever its origins, this was an important acknowledgement for the food sector, as many experts regard the exploitation of the sector as of considerably greater concern than the destruction or disabling of its assets.

DHS' engagement in critical infrastructure protection efforts dates to its inception. The department's enabling legislation, the *Homeland Security Act*,[33] transferred the infrastructure protection functions of the Federal Bureau of Investigation's (FBI) National Infrastructure Protection Center and Department of Commerce's Critical Infrastructure Assurance Office to DHS.[34] In addition, the *Homeland Security Act* assigned DHS overarching responsibility for the following critical infrastructure protection activities:

- Carrying out comprehensive assessments of the vulnerabilities of the nation's critical infrastructures;

[30] Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction (Gilmore Commission), *Fourth Annual Report to the President and Congress*, December 15, 2002, p. viii.
[31] Executive Office of the President, Office of Homeland Security, *National Strategy for Homeland Security*, July 2002, pp. 30, 34.
[32] *National Strategy for Physical Protection of Critical Infrastructure and Key Resources*, February 2003, p. viii.
[33] 6 U.S.C. § 101 *et seq.*
[34] 6 U.S.C. § 121(g)(1) transferred most National Infrastructure Protection Center functions to DHS. The Critical Infrastructure Assurance Office's functions are transferred to DHS in § 121(g)(3).

- Integrating relevant information in order to identify priorities for protection and support measures undertaken by the public and private sectors;
- Developing a comprehensive national plan for securing critical infrastructures; and,
- Recommending measures necessary to protect critical infrastructures.[35]

In crafting the *Homeland Security Act*, Congress also recognized the possible danger of foodborne terror. Section 308(b)(2) of the *Homeland Security Act*, 6 U.S.C. §188, required DHS to establish university-based centers of excellence in order to enhance the statutory mission of the new department. Congress set one criteria for the selection of Centers of Excellence as a "demonstrated expertise in food safety."

In December 2003, the White House issued the seventh in a series of Homeland Security Presidential Directives, often referred to as HSPDs, setting homeland security policy for the federal government. This policy directive, Homeland Security Presidential Directive 7, amended the model for interagency coordination on critical infrastructure protection originally set out in Presidential Decision Directive 63. Homeland Security Presidential Directive 7 modified the existing framework by identifying the DHS Secretary "as the principal [f]ederal official to lead, integrate, and coordinate implementation of efforts among [f]ederal departments and agencies, [s]tate and local governments, and the private sector to protect critical infrastructure and key resources."[36] It also designated Sector-Specific Agencies for each critical infrastructure sector responsible for working with DHS to augment security. The food sector is part of one of the 17 federally recognized critical infrastructure sectors. Homeland Security Presidential Directive 7 identified USDA and HHS as co-Sector-Specific Agencies for the food sector, making this the only sector with two Sector-Specific Agencies. A list of critical infrastructure sectors and corresponding Sector-Specific Agencies is presented in Appendix F.

Homeland Security Presidential Directive 7 also stipulates that DHS is to "produce a comprehensive, integrated national plan" to protect critical infrastructures.[37] In June 2006, DHS released a *National Infrastructure Protection Plan* (*NIPP*) consistent with this requirement. The *NIPP* describes missions, goals, and standards for protection of infrastructure

[35] 6 U.S.C. §§ 121(d)(2), (3), (5), and (6).
[36] *Homeland Security Presidential Directive 7: Critical Infrastructure Identification, Prioritization, and Protection*, December 17, 2003, paragraph 12.
[37] *Homeland Security Presidential Directive 7: Critical Infrastructure Identification, Prioritization, and Protection*, December 17, 2003, paragraph 27.

sectors, and expounds on the relationship between DHS and the Sector-Specific Agencies.

Another primary source of executive branch food defense responsibilities is Homeland Security Presidential Directive 9, "Defense of United States Agriculture and Food," which outlines the policy framework for the protection of the food supply. Issued in January 2004, Homeland Security Presidential Directive 9 set out numerous related requirements for DHS, USDA, and FDA, among other federal agencies. Homeland Security Presidential Directive 9 appointed DHS "responsible for coordinating the overall national effort" to protect the food and agriculture sectors, and designated the DHS Secretary as "the principal [f]ederal official to lead, integrate, and coordinate implementation of efforts" among federal, state, local, and private sector elements.[38] Thus, a primary measure of DHS' effectiveness in protecting the food sector is how well the department works with outside entities, especially its federal partners, to facilitate the improved security of the sector.

Other pertinent presidential policy guidance, Homeland Security Presidential Directives 8 and 10, set forth national policy for preparedness and biodefense, respectively. Each accords DHS important related responsibilities.

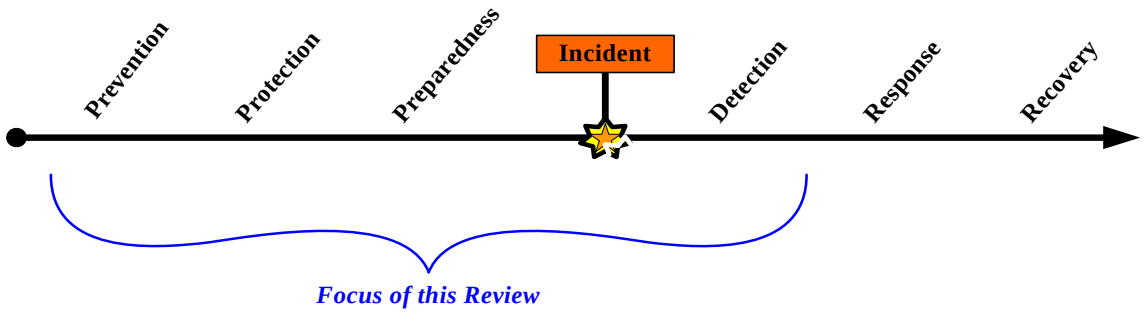
DHS Food Sector Responsibilities

While the two primary sources of DHS' food defense and critical infrastructure protection responsibilities are Homeland Security Presidential Directives 7 and 9, additional responsibilities are outlined in other Presidential Directives,[39] the *Homeland Security Act*, *USA PATRIOT Act*, and strategic documents like the *NIPP*. These responsibilities can be viewed as existing along an incident timeline from prevention to preparedness and detection to recovery.

[38] *Homeland Security Presidential Directive 9: Defense of United States Agriculture and Food*, January 30, 2004, paragraph 6.

[39] *Homeland Security Presidential Directive 8: Preparedness*, *Homeland Security Presidential Directive 9: Defense of United States Agriculture and Food*, and *Homeland Security Presidential Directive 10: Biodefense for the 21st Century* also identify pre-response DHS food-sector responsibilities.

Figure 1. Review Focus Along Incident Timeline



This review focused on DHS' *pre-response* obligations to food sector defense and critical infrastructure protection. Pre-response activities are those that precede awareness that an incident has occurred. Accordingly, they exclude activities in the incident response and recovery process.

DHS pre-response responsibilities in food defense and critical infrastructure protection can be grouped into eight categories:

- critical infrastructure protection management and coordination
- asset identification and sector mapping
- information sharing, threat awareness, and warning
- vulnerability assessment
- consequence assessment and modeling
- protective measures and prioritization
- research and development
- education, outreach, training, and preparedness

Some of these responsibilities specifically identify the food sector as a focus of the department's obligations. In many other cases, however, DHS' responsibilities in the food sector derive from the industry's standing as critical infrastructure. For more detail on these responsibilities and their statutory origins please consult Appendix G.

Congress and the White House have instructed DHS to assume different roles in the execution of its food sector responsibilities. For some responsibilities, DHS is given primary or exclusive responsibility for a task. In other cases, the department is to work collaboratively with other federal departments to fulfill a shared responsibility. Finally, in some other instances, DHS' responsibility is to serve in a supporting capacity.

Challenges Intrinsic to the Fulfillment of DHS' Mandate

DHS faces some noteworthy challenges in the pursuit of its food sector responsibilities. Many of these challenges arise from factors outside of the department's control.

One challenge stems from the sector's absence from early critical infrastructure planning efforts. As discussed earlier, until 2002, executive directives on critical infrastructure protection did not acknowledge the food sector's place among critical infrastructures. The Gilmore Commission attributed its observation that "relatively little action ha[d] been taken to address the threat" to food and agriculture due, in part, to the late acknowledgement of the sector as critical.[40] Prior to 2002, strategies and approaches to critical infrastructure protection were developed without particular emphasis on or consideration of the food sector. This late start represents a hurdle in DHS' efforts to fulfill its food defense and critical infrastructure protection responsibilities.

An additional challenge relates to the fact that so much of the food industry is privately owned and outside of the department's regulatory control. This restricts DHS' familiarity with food industry operations, as well as its understanding of related threats, vulnerabilities, and consequences. DHS also has a limited ability to directly influence appropriate preparedness and mitigation actions. Vibrant cooperation and support between government and the private sector are needed to fully understand vulnerabilities, study possible consequences, prepare for threats, and implement mitigation measures.

Another major challenge DHS faces is a product of the department's pedigree. DHS was assembled from twenty-two pre-existing agencies and organizations. None of these organizations had a primary mission focus on post-harvest food products, though some had contact with the food industry. The closest contact any constituent group within DHS had with food products came through the import inspection process. Agricultural import inspectors, who transferred to DHS from USDA's Animal and Plant Health Inspection Service, regularly inspected imported food products to determine whether they were host to animal or plant pests and pathogens that posed a threat to the nation's pre-harvest agricultural and livestock production. Also, some customs inspectors had received cross-designation as FDA inspectors, and other customs staff were engaged in the implementation of the *Bioterrorism Act* prior to DHS' formation. In

[40] Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction (Gilmore Commission), *Fourth Annual Report to the President and Congress*, December 15, 2002, p. 69.

addition, the National Infrastructure Protection Center, which operated under the Department of Justice prior to the formation of DHS, had some engagement with food sector defense after the sector gained recognition as a critical infrastructure sector. Finally, the Federal Emergency Management Agency dealt with food products as they related to emergency response. Even in combination, these legacy engagements with the food sector were minor. Despite the limited familiarity DHS had with the food sector at the time of its formation, the department was assigned numerous important responsibilities in the area within a year of its establishment.

In part because of DHS' limited legacy expertise in the field, the successful execution of the department's food defense and critical infrastructure protection responsibilities requires substantial coordination with public sector partners. Because numerous public sector entities regulate the food industry, the insights to be gained through partnerships with food industry regulators come with a significant coordination requirement.

Thus, another challenge relates to the fragmentary nature of government food safety regulation and quality assurance activities. Within the federal government, primary responsibility for food safety rests with two agencies with distinct authorities and regulatory regimes, HHS's FDA and the USDA's Food Safety and Inspections Service. In addition to these two primary federal food regulators, at least seven other federal agencies provide some oversight of food processing, distribution, and retail.[41]

Strung together by more than two dozen laws, the complex web of federal food oversight has been draped unevenly over the sector. Consequently, some foods are subject to considerably more intensive oversight than others. As the Government Accountability Office (GAO) has reported, USDA has historically outspent FDA in food safety activities despite the fact that it regulates approximately nine times fewer facilities. This imbalance in spending is also noteworthy considering that the food products USDA regulates account for almost four times less consumer spending, and are tied to about two times fewer foodborne illness outbreaks than those for which FDA is responsible.[42]

[41] USDA's Grain Inspection, Packers and Stockyards Administration; USDA's Agricultural Marketing Service; the Department of Commerce's National Oceanic and Atmospheric Administration; the Environmental Protection Agency; the Federal Trade Commission; the Department of the Treasury's Alcohol and Tobacco Tax and Trade Bureau; and DHS' Customs and Border Protection.

[42] Prepared Statement of Lawrence J. Dyckman, Government Accountability Office, *Federal Food Safety and Security System – Fundamental Restructuring Is Needed to Address Fragmentation and Overlap*, March 20, 2004, pp. 9-10.

Even where oversight is intensive, federal regulators can exercise only limited authority. Neither the Food Safety and Inspections Service nor FDA has the authority to issue mandatory food recalls, except in the case of infant formula. GAO reported that neither agency believes current food safety and inspection laws provide them with authority to fully regulate all aspects of food security.

Added to the patchwork of federal food oversight is the work of state and local agriculture and public health departments, which also regulate the industry. As noted previously, state, territorial, and local governments oversee the safety of food retail and food service establishments within their jurisdictions.

The enormity of the food sector and the complexity of government oversight pose substantial challenges to food defense and critical infrastructure protection. These challenges are compounded by the fact that some of the department's obligations to the food sector are set out in guidance documents that are not clearly compatible. Homeland Security Presidential Directive 7, for example, focuses on terrorism threats, while other applicable presidential directives mandate that DHS protection and preparedness activities address all hazards, regardless of cause. Furthermore, it is sometimes difficult to translate activities across the different frameworks laid out in these directives. It is not easy, for example, to understand how preparedness activities conducted under Homeland Security Presidential Directive 8 support the critical infrastructure protection responsibilities established under Homeland Security Presidential Directive 7. Differences like these have helped set the stage for some of the difficulties in defining priorities and monitoring resource allocation discussed in the following sections. Appendix I provides more information on the interplay of the frameworks for infrastructure protection, national preparedness, and incident management as they apply to post-harvest food.

Facing a complex and unfamiliar infrastructure sector with little legacy expertise, DHS has been invested with a range of responsibilities. Though numerous, these responsibilities represent only a fraction of the department's overall commitments. While DHS must fulfill its food sector responsibilities, the department's level of engagement and resource allocation to related activity should be shaped by a rational assessment of priorities. It is DHS' stated policy to prioritize efforts in accordance with risk. As defined by the department, risk contains three elements:

- Threat – the "intention and capability of an adversary to undertake actions that would be detrimental" to critical infrastructures;[43]
- Vulnerability – a "weakness in the design, implementation, or operation of an asset or system that can be exploited by an adversary, or disrupted by a natural hazard or technological failure,"[44] and
- Consequence - the "result of a terrorist attack or other hazard that reflects the level, duration, and nature of the loss resulting from the incident."[45]

Determining how the three elements apply to the food sector is a challenging task. Mapping this assessment onto judgments about risk in other areas of DHS responsibility and developing risk-driven priorities is a profoundly difficult undertaking.

Results of Review

DHS' Internal Coordination of Food Sector Activities

Several organizational units in the department carry out DHS food-sector-related activities. The supervision of these activities is distributed across several managers in these units. This divided leadership arrangement has produced similar programming across different components and has not provided the level of internal coordination required. The internal coordination that has occurred has been performed on an inconsistent basis. As a result, opportunities to leverage information from one program in support of another have been missed. Coordination across DHS food sector programming can be improved through focused, consolidated leadership attention, with responsibility assigned to a single senior staff official.

Distribution of DHS Food Sector Activities

DHS is not organized to address its food sector responsibilities in a consolidated way. These responsibilities are distributed across multiple DHS units. This is the result of the interplay of DHS' organizational structure and the responsibilities themselves.

[43] DHS, *NIPP*, June 30, 2006, p. 105.
[44] Ibid.
[45] Ibid., p. 103.

As presently structured, DHS has four directorates, seven agencies, fifteen major offices, and a center. These organizational elements are structured to address missions like improving the nation's all-hazards preparedness and securing the border while facilitating the legitimate flow of trade. There is no major organizational entity within DHS that is focused exclusively or even largely on the execution of DHS responsibilities in the food sector.

Drawn from several statutes, the department's food sector responsibilities are broad-based. These responsibilities extend from the monitoring of sector infrastructure protection progress to the development of countermeasures, and from asset identification to consequence modeling. Under DHS' current organization, the functional expertise required to fulfill these responsibilities is distributed across several organizational units.

Efforts to operationalize these responsibilities are also distributed widely across DHS. Many of these efforts are undertaken in units of DHS' Preparedness Directorate. Two divisions in its Office of Infrastructure Protection – the Infrastructure Partnerships Division and Risk Management Division – conduct food sector critical infrastructure protection activities. Another major office within the Preparedness Directorate, the Office of Grants and Training, funds curriculum development, education, outreach, exercises, and planning to prepare for hazards to the food sector. A third unit, the Office of the Chief Medical Officer manages a data system that integrates foodborne illness information, among other related activities. Food defense and critical infrastructure protection activities are also conducted and sponsored by the Science and Technology (S&T) Directorate. S&T supports related research, education, and analysis through its Office of Research and Development, Biological Countermeasures Portfolio, and Homeland Security Advanced Research Projects Agency. Finally, Customs and Border Protection (CBP) has contact with food defense issues through its efforts to enforce federal commercial importation laws and secure the nation's borders.

DHS operates a number of programs and initiatives with food defense and critical infrastructure protection features. Related programs and activities are arrayed across the five different DHS organizational entities discussed above: the Office of Infrastructure Protection, Office of Grants and Training, Office of the Chief Medical Officer, S&T, and CBP. The following table illustrates the placement of DHS food-related programs and initiatives within each of these five DHS units. For more information on DHS food-sector-related programs and initiatives refer to Appendix H.

Table 1. DHS Food Defense and Critical Infrastructure Protection Activities and Initiatives

DHS Activities and Initiatives with Food Defense Applications
Office of Infrastructure Protection
Food & Agriculture Government Coordinating Council
Food & Agriculture Sector Coordinating Council support
Homeland Security Information Network - Food & Agriculture Portal
National Infrastructure Coordination Center
Homeland Infrastructure Threat and Risk Analysis Center
Protected Critical Infrastructure Information program
DHS Educational Reports
Site Assistance Visits
Buffer Zone Plans*
Strategic Partnership Program for Agroterrorism support
National Asset Database
National Infrastructure Simulation and Analysis Center
Office of Grants and Training
Multi-State Partnership for Security in Agriculture support
University of California - Davis (UC Davis) training support
University of Tennessee vulnerability assessment training support
Lousiana State University agroterrorism course development
Exercise support
State Homeland Security Program
Office of the Chief Medical Officer
National Biosurveillance Information System**
Science and Technology Directorate (S&T)
National Center for Food Protection and Defense (NCFPD)
Food Biological Agent Detection Sensor
National Biodefense Analysis and Countermeasures Center research
University of Kentucky tracking system
Critical Infrastructure Protection Decision Support System
Customs and Border Protection (CBP)
Notification and Targeting Support

* Buffer Zone Plans are products of the Buffer Zone Protection Program, a joint effort between the Office of Infrastructure Protection and Office of Grants & Training.

** Management of the National Biosurveillance Integration System transferred from the Office of Infrastructure Protection to the Office of the Chief Medical Officer on September 1, 2006.

DHS programs and initiatives that support food defense and critical infrastructure protection also frequently support other efforts. Some DHS programs that apply to the food sector serve critical infrastructure protection efforts at large, and only engage the food sector to a limited degree. Other DHS programs and initiatives address both pre-harvest and post-harvest elements of the food supply chain. The level of attention and focus these programs and initiatives place on food defense and critical infrastructure protection, in particular, varies considerably. Only 3 of the 25 programs and initiatives listed in the table focus primarily or exclusively on post-harvest food defense and critical infrastructure protection – the National Center for Food Protection and Defense, the Food Biological Agent Detection Sensor, and University of Kentucky tracking system.

Management of DHS Food Sector Activities

The management of DHS' food-sector-related activities is as dispersed as the activities themselves. At the time of our fieldwork, no single senior manager or official in DHS was dedicated to monitoring or overseeing all of the department's food sector activities. Rather, responsibility for executing these activities rested with managers across the five DHS components discussed above.

Nested within separate DHS units, program managers for food-sector-related efforts had limited information about activities in other parts of DHS. As a result, they were not able to easily identify areas in which coordination would have been beneficial. Because these program managers had restricted insight into the related activities of other departmental components, they sometimes executed and supported food-sector-related activities without an appropriate level of internal coordination.

This dynamic was evident in initiatives funded by the Office of Grants and Training and S&T. Grants and Training and S&T did not collaborate with each other in the development of grant guidance and requirements or in the review of grant applications. Just as the Grants and Training did not involve S&T in the development of education, training and outreach programs at the outset, S&T did not involve Grants and Training in the development of its Broad Agency Announcement for its food protection and defense Center of Excellence.

The shortage of advance communication and coordination contributed, in part, to the propagation of similar projects and initiatives. Common

program thrusts emerged in the areas of communication; education, training, and exercises; threat agent studies; and sector modeling and consequence assessment.

Many of these common program thrusts evolved at the S&T-sponsored National Center for Food Protection and Defense (NCFPD), which has pursued a broad base of food-related work. The NCFPD, based at the University of Minnesota, is a university-based Homeland Security Center of Excellence. As of September 2006, the NCFPD had 39 active research projects involving 83 students, including 9 post-doctoral and 56 graduate students.

Initiatives similar to the work conducted by the NCFPD have been sponsored by Grants and Training under the Homeland Security Exercise and Evaluation Program, the Multi-State Partnership for Security in Agriculture, as well as through the University of California at Davis (UC Davis), the University of Tennessee, and Louisiana State University. Programs that S&T has funded that perform work similar to that of the NCFPD include the Food Biological Agent Detection Sensor, and the National Biodefense Analysis and Countermeasures Center. Other parallel efforts are underway at the national laboratories under the auspices of Office of Infrastructure Protection- and S&T-supported programs, the National Infrastructure Simulation and Analysis Center and Critical Infrastructure Protection Decision Support System, respectively.

Communication Initiatives

Several projects funded by Grants and Training and S&T, such as risk communication initiatives and website and database development activities, support initiatives to improve food sector communication and information sharing.

The NCFPD, the Multi-State Partnership, and UC Davis each have food-related risk communication projects that seek to build the capability to educate planners, first responders, and the public about the risks of an attack on the food supply. The NCFPD's risk communication program focuses on the development and delivery of training modules and visual aids to convey messages on food-related incidents. The Multi-State Partnership's risk communication initiatives target key personnel involved in conveying messages to the public during and after a bioterrorism event. Like the NCFPD, it has conducted risk communication training and developed risk communications products for food-related incidents. UC Davis offers a course on risk communication. Its objective is to

prepare first responders to communicate with the public after an intentional attack on the food sector.

S&T and Grants and Training also fund parallel website and database development efforts. The NCFPD, UC Davis, and the National Biodefense Analysis and Countermeasures Center each support websites or databases that currently host or will host information on threats, vulnerabilities, consequences, and protective measures that relate to biological or chemical agents that can be introduced into the food supply. A separate set of similar websites and databases are under development by the Multi-State Partnership and the Homeland Security Exercise and Evaluation Program. The Multi-State Partnership and Homeland Security Exercise and Evaluation Program both sponsor website and database development efforts that will support information on exercises, exercise methodologies, and best practices.

Education, Training, and Exercises

The NCFPD, and Grants and Training-supported programs at the Multi-State Partnership, UC Davis, the University of Tennessee, and Louisiana State University are all involved in the development, delivery, and evaluation of courses and exercises in the realm of food protection and defense.

The NCFPD, the Multi-State Partnership, UC Davis, the University of Tennessee, and Louisiana State University have educational programs on planning for and responding to food-related bioterror attacks, and provide information on assessing vulnerabilities and developing protective measures for the food sector. All of these programs target, at least in part, the first responder community.

Currently, the Homeland Security Exercise and Evaluation Program, the Multi-State Partnership, and UC Davis are all directly engaged in the development and delivery of exercises and the subsequent provision of lessons learned and best practices to the food sector. Grants and Training has directly supported four food contamination exercises since DHS was established. Recently, six states participated in a Multi-State Partnership-facilitated exercise designed to identify the strengths and weaknesses of current information sharing systems. Further, the Multi-State Partnership is involved in assessing training and exercises, and inventorying food emergency response exercises. Although UC Davis does not have as extensive an exercise program, it has integrated tabletop exercises into its educational curriculum.

Threat Agent Studies

The NCFPD, National BioDefense Analysis and Countermeasures Center, and Food Biological Agent Detection Sensor programs have projects that support threat agent identification and detection in food matrices. The detection and identification of agents in foods (food matrices) poses significant challenges. Unlike pure lab samples of threat agents, food matrices contaminated with threat agents contain substances that can help the agent multiply, mask its presence, or generally undermine the effectiveness of detection techniques that are reliable in other settings. Food products contain a range of substances and have varied consistencies, factors that confound efforts to apply any single detection technique widely. Also, threat agents may be unevenly distributed in foods, so identifying appropriate sampling procedures represents another challenge.

The NCFPD's detection and diagnostics projects focus on developing rapid and accurate methods for detecting biological and chemical agents in food products and enabling efficient monitoring and testing in a range of production, processing, and retail settings. The Biological Threat Characterization Center at the National BioDefense Analysis and Countermeasures Center pursues some similar work, and has comparatively tested laboratory test technique and protocols for detecting threat agents in one food matrix. Finally, S&T is sponsoring the development of rapid, portable technology to detect select agents in liquid food matrices under its Food Biological Agent Detection Sensor program.[46]

Both the NCFPD and National BioDefense Analysis and Countermeasures Center support research on agent viability in food matrices. The NCFPD's work relates to the deactivation of threat agents, while the Countermeasures Center effort is centered on the study of agent survivability in different food matrices.

Sector Modeling and Consequence Assessment

DHS has pursued food sector modeling efforts through the NCFPD, the Critical Infrastructure Protection Decision Support System, and the National Infrastructure Simulation and Analysis Center. The NCFPD has developed a food contamination event modeling tool that can be used

[46] Pursuant to Section 201 of the *Bioterrorism Act* (P.L. 107-188), codified at 42 U.S.C. § 262a, CDC has identified 41 "select agents" that pose a threat to human health and safety. CDC lists toxins, bacteria, fungi, and viruses among select agents affecting human health. (http://www.cdc.gov/od/sap/docs/salist.pdf).

track the effect of hypothetical food contamination events. The NCFPD system models the distribution and consumption of the food product, resulting illnesses, public health system contacts, and response. The Critical Infrastructure Protection Decision Support System has assembled a more limited capability in this area by assembling a model for the supply chain for a single food commodity. The National Infrastructure Simulation and Analysis Center is also developing a model for a portion of the food supply chain – the dairy industry.

Table 2. Areas of Shared DHS Food Defense and Critical Infrastructure Protection Program Thrust

Areas of Common Program Thrust										
Program Areas	S&T				G&T					IP
	NCFPD	NBACC	FBADS	CIP-DSS	UC Davis	MSP	U. Tenn.	LSU	HSEEP	NISAC
Communication										
➢ **Risk communication**	✓				✓	✓				
➢ **Websites & Databases**	✓	✓				✓			✓	
Education, Training & Exercises										
➢ **Education**	✓				✓	✓	✓	✓		
➢ **Training & Exercises**					✓	✓			✓	
Threat Agent Studies										
➢ **Agent Detection & ID**	✓	✓	✓							
➢ **Agent Viability**	✓	✓								
Sector Modeling & Consequence Assessment										
➢ **Modeling Activities**	✓			✓						✓

G&T – Office of Grants and Training; IP – Office of Infrastructure Protection; NCFPD – National Center for Food Protection and Defense; NBACC – National Biodefense Analysis and Countermeasures Center; FBADS – Food Biological Agent Detection Sensor; CIP-DSS – Critical Infrastructure Protection Decision Support System; MSP – Multi-State Partnership for Security in Agriculture; LSU – Louisiana State University; HSEEP – Homeland Security Exercise and Evaluation Program; NISAC – National Infrastructure Simulation and Analysis Center

The common program thrusts that have arisen need not result in waste. Indeed, while many of the programs developing under these common thrusts are similar, several are complementary. Provided adequate coordination, programs with common thrusts can fruitfully contribute to one another's work and advance the DHS mission. Shared program thrusts present many opportunities to leverage information and improve final products. However, a management regime is not in place to ensure

that this coordination occurs as needed. As a result, the internal coordination of these efforts has often taken place after programs were already funded or in progress.

Some efforts to coordinate across existing programs have resulted from DHS staff improvisation. Although DHS staff in the different directorates were not initially aware of other DHS food-related activities, they sought to coordinate efforts when they encountered similar programs elsewhere in the department.

After the White House issued Homeland Security Presidential Directive 9, DHS program staff from around the department converged to discuss ways for the department to address its related responsibilities. Affected program staff initially met on a monthly basis. While these Homeland Security Presidential Directive 9 sessions ultimately waned, they did increase awareness that similar programming was occurring in different parts of the department. This awareness prompted Office of Grants and Training staff to establish a forum for collaborating on food-related research projects. Grants and Training staff forged an Agroterrorism Training Working Group in late 2004 and invited S&T and Office of Infrastructure Protection staff to its sessions.

Recently, contacts among the program staff overseeing DHS' food sector activities intensified through exchanges on avian influenza. Several key participants in the Homeland Security Presidential Directive 9 sessions reportedly reconvened to support coordination on pandemic influenza preparedness, and new linkages between the Office of Infrastructure Protection and CBP have developed as well.

Continuing collaboration through the Agroterrorism Training Working Group and on avian influenza, however, have not provided the level of cross-program coordination required. In several instances, coordination across DHS programs occurred as a result of outreach efforts by the institutions performing DHS-sponsored work. Sometimes, this coordination took place without DHS staff involvement. Had these institutions not determined how their efforts would best complement one another, we believe that resources would have been expended in redundant efforts.

The NCFPD's efforts to collaborate across DHS programs provide a good illustration of this dynamic. DHS provided inadequate liaison support to the NCFPD. When we visited the NCFPD in December 2005, staff reported difficulties accessing information and personnel from DHS programs outside of S&T's University Programs group. At the time,

NCFPD was not familiar with important DHS programs involved in food sector protection work, including DHS-funded work being done by other entities.

In September 2006, S&T reported that it was "taking steps to increase the staff devoted to improving coordination" with the NCFPD. But even before the NCFPD had received appropriate DHS liaison support, it had established contacts with the National Labs. NCFPD representatives were able to share information on related modeling efforts under the Critical Infrastructure Protection Decision Support System program and are now in the early stages of planning future collaboration in this area.

The NCFPD also formed relationships with DHS-sponsored food-related initiatives at the Multi-State Partnership and UC Davis and without the department's assistance. As a result, the three institutions have participated in one another's events and have shared information on research findings and best practices. The NCFPD has fostered numerous linkages with these organizations, and in one instance, brought in the Multi-State Partnership to participate in a panel discussion on a post-harvest food contamination scenario.

Coordination at the project level is not the exclusive domain of the NCFPD – other DHS-supported grant recipients have taken steps to accommodate other DHS programs. The Multi-State Partnership, for example, initially had plans to conduct vulnerability assessments and vulnerability assessment training, but elected to forgo its independent efforts and work through the Strategic Partnership Program Agroterrorism initiative. Both programs are now working together to increase its members' knowledge and understanding of vulnerability assessments. In these cases, however, it was the grant recipient, rather than DHS, that sought out and initiated coordination with allied programs.

Despite recent efforts to coordinate at the program and project level, some limited duplication of effort has occurred. Common thrusts in the Food Biological Agent Detection Sensor program and at the NCFPD have converged to the point that they focus on identical research objectives. Without advance coordination, the Food Biological Agent Detection Sensor program and NCFPD both independently embarked on research initiatives to develop rapid testing platforms to detect the same select agents in the same food matrix. In one case related to the detection of one *Clostridium botulinum* in a particular food matrix, Food Biological Agent Detection Sensor program and NCFPD testing platforms target detection at different points in the production cycle, and might complement one another. Food Biological Agent Detection Sensor program and NCFPD

testing platform development efforts related to the detection of *Bacillus anthracis* in the same food matrix, however, appear to be competing approaches to the same problem. It is important to note, however, that while these efforts have duplicative aims, and thereby focus on the same research objective, they are not identical. Both the specific technical approaches underlying these platform development efforts, as well as their timelines for completion, differ.

Need for Consolidated DHS Food Sector Leadership

The department's support for common program thrusts creates a continuing need for thoughtful management attention and oversight of related efforts.

The limited leadership attention to food defense and critical infrastructure protection is so pronounced that several key DHS staff could not identify a senior DHS official responsible for Homeland Security Presidential Directive 9 implementation. One DHS employee advised us that a single DHS contractor was responsible for tracking and monitoring the department's efforts to implement Homeland Security Presidential Directive 9 responsibilities.

Some government officials we spoke with suggested that the DHS Chief Medical Officer was best positioned to assemble a unified effort on food defense and critical infrastructure protection. Indeed, the Chief Medical Officer's primary functions include the coordination of DHS' biodefense activities, and service as the principal DHS liaison with HHS and USDA. Office of the Chief Medical Officer staff we interviewed interpret these functions to include coordination of DHS' implementation of Homeland Security Presidential Directives 9 and 10, and in recent testimony the Under Secretary for Preparedness added that the Chief Medical Officer was responsible for the coordination of "activities to prevent and mitigate biologically-based attacks on … our food supply."[47]

Despite these assertions of Chief Medical Officer responsibilities in this area, the Chief Medical Officer has not been given explicit authority to accomplish coordination and oversight of all DHS food defense and critical infrastructure protection activities. The Chief Medical Officer does not have formal authority to direct the work of other DHS offices and

[47] Statement of George Foresman, DHS Under Secretary for Preparedness, before the U.S. House of Representatives, Committee on Homeland Security, Subcommittee on Emergency Preparedness, Science and Technology, March 8, 2006.

these DHS offices are subject to no specific requirement to support the Chief Medical Officer's efforts. Moreover, at present, the Chief Medical Officer does not have adequate staff support to discharge this responsibility. Within the Office of the Chief Medical Officer, coordination of DHS food-related biodefense activities falls under the purview of the Science, Policy, and Biodefense Division. This division is also tasked with coordinating and integrating DHS' biodefense portfolio, developing policy and procedures for specific threats, and improving international medical coordination. Yet, as of June 2006, it had only two staff.

Effective implementation of DHS' food sector responsibilities requires focused, consolidated leadership attention to preside over internal coordination efforts. This leadership attention can help lend clarity to decisions on prioritizing resources and maintain an overall picture of implementation of DHS food sector responsibilities. If the Chief Medical Officer is to perform this function and do so effectively, he or she will require more clear authorities and additional qualified staff.

To address the internal coordination requirement associated with DHS' food sector activities more effectively, we recommend that the Under Secretary for Preparedness, in conjunction with the Under Secretary for Science and Technology:

Recommendation #1: Identify a single senior DHS official to be accountable for coordinated implementation of all DHS food sector responsibilities, and provide this official with clear authorities and adequate staffing to perform this function.

Public and Private Partners

External coordination is essential for DHS to succeed in executing its responsibilities for food defense and critical infrastructure protection. Relationships with food sector partners are important because of the operational control and regulatory sway that they have with the sector. Related input from public and private sector partners is particularly valuable in light of DHS' limited food sector experience. Partnerships with governmental entities are also vital because DHS shares so many food sector responsibilities.

DHS' interaction with public and private sector partners will shape the level of engagement and support that these groups provide the department in executing its food-related responsibilities.

Sector Governance and Information Sharing

Status of the Food ISAC

Coordination among federal agencies and the private sector on food defense and critical infrastructure protection issues predates DHS. Before DHS became operational, the FBI's National Infrastructure Protection Center became involved in the formation of a private sector Information Sharing and Analysis Center for the food industry. A product of the infrastructure protection framework outlined in Presidential Decision Directive 63, ISACs were to "serve as the mechanism for gathering, analyzing, appropriately sanitizing and disseminating private sector information" to both industry and the government. ISACs were also envisioned as providing a means to disseminate select government information to the private sector.[48]

The Food ISAC was established in February 2002, as a direct outgrowth of an agreement between the National Infrastructure Protection Center and the Food Marketing Institute. At the time, the National Infrastructure Protection Center Director noted that Food Marketing Institute was a natural leader of the ISAC because of its ability to represent the sector and disseminate information to a wide audience.[49]

Declared the "focal point for gathering information on threats" to domestic infrastructures, the National Infrastructure Protection Center integrated a representative of the Food ISAC into its operations – providing the new ISAC a seat at the table alongside members of the intelligence community.[50] According to industry representatives, the Food ISAC distributed some useful threat and vulnerability information to food industry associations and firms in 2002 and early 2003.

By mid 2003, however, DHS' Office of Infrastructure Protection had concluded that, as implemented, the Food ISAC was not well-suited to serve the department's full range of information sharing and analysis objectives. The Office of Infrastructure Protection contended that the Food Marketing Institute's ISAC did not reach a sector-wide audience, and one DHS manager said that the ISAC's connection to the Food Marketing Institute could produce "constant battles" between the Food Marketing Institute and other food sector associations. The Office of Infrastructure Protection also expressed concern that the Food ISAC was

[48] *Presidential Decision Directive 63: Critical Infrastructure Protection*, May 18, 1998. Section IX, Annex A.
[49] http://www.fmi.org/media/mediatext.cfm?id=390
[50] Ibid.

not performing analytical work – a major ISAC responsibility. Rather, the Food Marketing Institute was simply passing news items and government information to its membership. The Office of Infrastructure Protection sought to develop a new structure to serve its vision for information sharing and analysis better.

In August 2003, Office of Infrastructure Protection managers assembled more than 200 food and agriculture sector representatives to discuss the department's vision for information sharing and coordination. According to the Office of Infrastructure Protection, the assembled sector representatives were then given the opportunity to develop a new organizational structure. Two bodies emerged from this DHS-facilitated process – the Food and Agriculture Government Coordinating Council and the Food and Agriculture Sector Coordinating Council.

DHS leaders proclaimed the resulting "self-organization" of the food and agriculture sectors a national model.[51] The Government Coordinating Council, which draws on representatives from government at all levels, including federal departments other than the Sector-Specific Agencies, is responsible for coordinating the food sector's security activities, policy, and communication across layers of government and the private sector. The Sector Coordinating Council consists of private sector representatives from various parts of the food and agriculture sectors. Due to the size of the food and agriculture sectors and the diversity of enterprises active within them, the Sector Coordinating Council is divided into seven subcouncils. While working either independently or with the Government Coordinating Council, the Sector Coordinating Council's mission is to provide DHS and the Sector Specific Agencies a private sector perspective on food and agriculture defense.

DHS sought to apply a new suite of information sharing and analysis initiatives to the new organizational structure. DHS offered these tools to the sector to help address the limitations it perceived in the Food ISAC's operations. One of these new tools, the Homeland Security Information Network Food and Agriculture portal, is specific to the sector. Three other entities, the National Infrastructure Coordinating Center, the Homeland Infrastructure Threat and Risk Analysis Center, and Protected Critical Infrastructure Information Program, address all infrastructure sectors.

Although we encountered little criticism of the composition of Sector Coordinating Council and Government Coordinating Council structures

[51] National Pork Producers Council, *Capital Update*, Vol. 4, Issue 14, April 29, 2005. (http://www.nppc.org/wm/show.php?id=443&c=3)

that emerged from this process, the Food Marketing Institute said that the reorganization effort resulted in lost time and only produced a marginal return. With more than 50 member associations, the Food Marketing Institute asserted that the Food ISAC was able to reach a large proportion of the sector. Instead of building upon this existing information sharing initiative, the Food Marketing Institute maintained that DHS chose "to burn the ISAC and salt the earth." From the Food Marketing Institute's perspective, the department's decision to restructure private sector engagement with the government needlessly set back food sector infrastructure protection efforts.

In July 2004, the National Infrastructure Advisory Council – a joint public and private sector body charged with advising the President and DHS Secretary – recommended that government, "assist the ISACs in delivering basic alerts and advisories to their sectors" and seek to increase the volume and dissemination of alerts and advisories.[52] The evolution of government engagement with the Food ISAC has not developed in line with the National Infrastructure Advisory Council recommendation. Rather than assisting the ISAC in delivering alerts and advisories, DHS has essentially kept the ISAC from such a role. With the transfer of the National Infrastructure Protection Center to DHS, the Food ISAC lost ready access to sanitized government information that it had been able to disseminate to ISAC members in the past. By spring 2006, the Food ISAC's contact with the government had deteriorated to the extent that, according to the ISAC, it did not have a dedicated DHS point of contact. This has contributed to a decline in the volume and scope of information disseminated to industry by the ISAC. Industry representatives reported that the flow of information from the ISAC to the private sector had declined, and that this decline had not been offset by increased information flow from other sources.

Interestingly, the Sector Coordinating Council is not very distinct from the ISAC in terms of industry representation. The Sector Coordinating Council, for the most part, has the same industry participants as the ISAC. Four Sector Coordinating Council subcouncils represent the post-harvest elements of the food supply chain. As of February 2006, nine of the twelve members representing these post-harvest subcouncils on the Sector Coordinating Council were on the Food ISAC's membership list. One of the three not included in this group is a member of an association that is part of the ISAC. The similarity of the Sector Coordinating Council to the Food ISAC is echoed on the pre-harvest side. Five of the nine

[52] National Infrastructure Advisory Council, *Evaluation and Enhancement of Information Sharing and Analysis*, July 13, 2004, p. 12.

organizations on the three pre-harvest Food and Agriculture Sector Coordinating Council subcouncils were also members of the Food ISAC.

Thus, the Sector Coordinating Council only scarcely expanded industry representation beyond the Food ISAC's membership. Though structured distinctly, the Sector Coordinating Council has essentially the same constituent parts as the ISAC, including the Food Marketing Institute.

While the Food ISAC was operating with a representative membership and board in August 2003 when DHS moved to reorganize the sector, the first session of the Sector Coordinating Council did not take place for another ten months, in June 2004. These modest readjustments were accompanied by a hiatus in activity lasting nearly a year.

In contrast to DHS' concern that the ISAC's affiliation with one food industry association may trigger conflicts or disadvantage others, industry representatives we spoke with evinced no apprehension on this front. Rather, some expressed puzzlement over DHS' decision to "orphan" the Food ISAC. Experts outside of the Food Marketing Institute, including other original members of the Sector Coordinating Council, shared this sentiment.

DHS' diminished engagement with the Food ISAC contributed to its decline. An expression of the moribund nature of the Food ISAC is its absence from the ISAC Council, a group of ISACs designed to improve information sharing linkages across sectors. Sustained by the continued involvement of 12 ISACs, the Council seeks to improve national infrastructure protection "by establishing and maintaining a framework for valuable interaction between and among the ISACs and with government."[53] The food sector could be missing valuable partnership opportunities because it does not have a representative on the ISAC Council. DHS notes, for example, that the Sector Coordinating Council Chairs are working with the ISAC Council "to determine and implement information sharing requirements" for each sector. The absence of the Food ISAC from the ISAC Council is likely to diminish the value of this effort for the food sector.

Instead of drawing on the food industry's post-9/11 momentum on critical infrastructure protection efforts, DHS effectively alienated the ISAC's leadership and disengaged from its operations. Meanwhile, as we discuss later, the coordination and information sharing mechanisms DHS

[53] http://www.isaccouncil.org/about/

instituted to address the ISAC's limitations have been slow to develop and are only partially successful.

DHS should leverage more effectively the Food ISAC's information dissemination capabilities in keeping with the National Infrastructure Advisory Council's vision for DHS engagement with ISACs. This can be accomplished without altering the current state of sector governance.

We recommend that the Assistant Secretary for Infrastructure Protection:

Recommendation #2: Restore communication with the Food ISAC by re-establishing a DHS point of contact and creating food-industry-specific products for ISAC distribution.

A New Framework for Coordination

Notable limitations in partnership efforts surfaced after the waning of the ISAC. The current and former Government Coordinating Council and Sector Coordinating Council members we interviewed almost uniformly agreed that these councils originally did not have a coherent focus and a true sense of partnership. Notwithstanding their concerns about the start-up of these bodies, most government and industry representatives we spoke with were optimistic about the future of the Government Coordinating Council and Sector Coordinating Council. And no one we interviewed said that the councils should be abandoned. DHS' official view of the status and operations of the Government Coordinating Council and Sector Coordinating Council is favorable. A December 2005, Office of Infrastructure Protection report card for the food and agriculture sector gives it top ratings for all seven governance metrics.

Participants in the two councils said that they saw the councils as "still evolving" and "in flux." Whether in private or public capacities, council members noted the need to show the employers they represent a "tangible benefit" of their Government Coordinating Council or Sector Coordinating Council participation. Yet early meetings reportedly were poorly organized and inefficient. For several months, basic organizational issues consumed the work of the two councils; meetings had little substantive content and stimulated minimal discussion.

Past and present council members attributed this sluggish start to DHS. They reported that DHS had taken a "top-driven" approach to its critical infrastructure protection leadership role, and that this detracted from the vitality of the councils and sapped the cooperative spirit from the process.

This approach reportedly created a difficult environment for the growth of collaborative efforts and did little to foster productive working relationships with industry leaders and government experts. Several council participants we interviewed said that DHS needed further growth as a business partner.

Early Sector Coordinating Council and Government Coordinating Council meetings did not foster efforts to formulate policy, and when DHS solicited the ideas and recommendations of council members on policy matters, the solicitation process was sometimes regarded as flawed. One limiting factor for policy development during meetings was a shortage of time to comment on draft documents. Some Sector Coordinating Council members reported that their association members generally did not comment on DHS drafts because they were provided insufficient time to do so. This made it hard for food associations to communicate their members' concerns. DHS may have thus lost out on important insights from major components of the nation's food sector.

Participation in the development of key policy documents can serve as an important means of exchange with external partners. DHS engaged the Sector Coordinating Council and Government Coordinating Council to comment on the *NIPP*, the document that articulates national policy for protecting all critical infrastructures. The *NIPP* passed through many iterations. A *NIPP Draft Base Plan* was released on September 15, 2004, followed by an *Interim NIPP*, which was completed in February 2005. A *Draft NIPP* followed in November 2005. The final *NIPP* was published in June 2006.

DHS coordination efforts surrounding the *NIPP* did not proceed smoothly. A common frustration among sector participants we interviewed was that they never learned how or whether their comments were applied to subsequent drafts of the *NIPP*. This led more than one council member to question the value of time spent reviewing DHS policy documents. Other representatives complained that they were provided insufficient time to comment. Some felt that they received little in return for their extensive engagement.

USDA and FDA staff also reported that DHS had not set out a reasonable timeline for developing Sector-Specific Plans. Sector-Specific Plans, which are authored by the Sector-Specific Agencies, discuss how each sector will address infrastructure protection. While DHS reportedly developed the Sector-Specific Plan template over the course of a year, it allowed the Sector-Specific Agencies just two months to complete their draft Sector-Specific Plans. This was an especially challenging task

because the Sector Specific Agencies were asked to consult with their stakeholders as part of the Sector-Specific Plan formulation process. As a result, staff from the Sector-Specific Agencies indicated that Draft Sector-Specific Plans were assembled hurriedly and were not as valuable as they could have been.

Council participants also signaled that, in contrast to DHS' intensive demands upon council members, DHS had demonstrated only limited commitment of its own to the effort. In particular, USDA and FDA expressed concerns about the organizational standing of DHS staff that attend Government Coordinating Council meetings. While a Deputy Under Secretary regularly represents USDA at the Government Coordinating Council, junior staff or contractors have often represented DHS. Staff from one Sector-Specific Agency argued that, as a result, the councils frequently did not have access to anyone in DHS with policy setting authority.

Frustration with the slow pace of council progress and disenchantment with DHS' management style and level of engagement may have led to declining participation in the Government Coordinating Council. Our analysis of Government Coordinating Council meeting minutes shows a difficulty achieving what the Council's charter calls a "decision-making quorum." This quorum is reached when there is at least one representative each from DHS, FDA, USDA, the Association of State and Territorial Health Officials, National Association of State Departments of Agriculture, and National Association of County and City Health Officials. We examined minutes for the 27 Government Coordinating Council meetings that took place between mid-2004 and early 2006. Only 14 of these meetings met the "decision-making quorum" requirement. In the first 15 meetings, only 4 meetings lacked the quorum. By contrast, a quorum was not achieved for 9 of the 12 most recent meetings. This decline in attendance over the more recent meetings may be a product of the frustrations members reported.

One common disappointment Government Coordinating Council and Sector Coordinating Council members shared with us was the unfulfilled expectation that the councils would offer a window into DHS as a whole. Although council members reported that DHS participants in the Government Coordinating Council meetings were generally competent and accessible, many anticipated direct access to more of the department than was provided. While Office of Infrastructure Protection representatives served as the principal DHS points of contact to the councils, members desired more interaction with such DHS components as S&T, Grants and Training, and, because of food import concerns, CBP.

Even after several requests for an audience, some DHS components reportedly did not attend Government Coordinating Council and Sector Coordinating Council sessions. This led some council members to develop unfavorable views of DHS, including one who described the department as "so big and so dysfunctional."

As council members' frustration mounted, Hurricane Katrina brought further dissatisfaction over DHS interaction with the food sector. Although sector experts agreed that the resiliency of food production did not lead to major supply problems, council members maintained that they were not used appropriately to support relief efforts. One Sector Coordinating Council member wondered why members spent so much time on the councils if the councils are essentially ignored during a major event. Perhaps more importantly, we were informed that during the crisis following Hurricane Katrina, the Federal Emergency Management Agency was asked to attend a joint session of the councils, but did not do so. The councils were an untapped resource that could have been more involved in getting food and bottled water to affected citizens. We were told that, due to DHS' perceived unresponsiveness, companies used their own connections to provide food assistance to hurricane victims.

Another area in which DHS can improve its work with the councils is by helping to establish a direct link to the National Infrastructure Advisory Council. Originally, the National Infrastructure Advisory Council did not have a member from the food sector, but a former Chief Executive Officer of a major food company has since been appointed. FDA staff expressed concerns that this individual does not have a formal relationship with the Government Coordinating Council and Sector Coordinating Council. An original member of the Sector Coordinating Council confirmed that the food industry does not have a "formal link" to the National Infrastructure Advisory Council. Without an appropriate linkage to the Government Coordinating Council and Sector Coordinating Council, the National Infrastructure Advisory Council may arrive at judgments incompatible with Government Coordinating Council and Sector Coordinating Council positions.

Leveraging the expertise and capabilities of the food sector may be easier due to recent improvements council participants reported in the operation of these bodies. As a result of DHS' growing experience with food infrastructure, some interviewees said DHS has developed a better understanding of private sector needs. Also, council participants believe that DHS' leadership is seeking to be more responsive to the councils than in the past. They praised the Assistant Secretary for Infrastructure Protection for his commitment to improved coordination between DHS

and the private sector. Through enhanced coordination, ultimately DHS was able to secure the support of the Secretaries of Agriculture and Health and Human Services for the frameworks and processes outlined in the *NIPP*.[54] Overall, Government Coordinating Council and Sector Coordinating Council representatives were optimistic that DHS would continue to develop its relationship with the coordinating councils. DHS' ability to foster and maintain a positive relationship with the coordinating councils will do much to determine the department's overall effectiveness in providing leadership, coordination, and support of food defense efforts.

We recommend that the Assistant Secretary for Infrastructure Protection:

Recommendation #3: Seek out improvement in DHS' relationship with food sector partners through:

- Better attention to the demands and information flow related to coordinating council comments on DHS initiatives;
- Higher level DHS official attendance at council meetings; and
- Increased responsiveness to council requests for information, briefings, and presentations by other DHS components.

DHS Support for Food Sector Information Sharing

DHS support of food sector information sharing currently hinges on: the National Infrastructure Coordinating Center; the Homeland Security Information Network Food and Agriculture portal; Homeland Infrastructure Threat and Risk Analysis Center; and the Protected Critical Infrastructure Information program. Each of these programs and initiatives had shortcomings with respect to food sector information sharing at the time of our fieldwork. The persistence of shortcomings in these areas is disturbing when considered alongside the decline of the Food ISAC.

The public and private sector representatives we interviewed generally did not have a good sense of the work DHS performs in these four areas. As an illustration of the limited extent to which food sector experts were familiar with DHS' information sharing efforts, few could differentiate between the National Infrastructure Coordinating Center and the Homeland Infrastructure Threat and Risk Analysis Center.

The National Infrastructure Coordinating Center

[54] DHS, *NIPP*, June 30, 2006, p. 3.

Industry and government representatives we met with rarely had any knowledge of the National Infrastructure Coordinating Center or its operations. Two federal food sector intelligence experts outside of DHS said that they were not aware that the National Infrastructure Coordinating Center existed. "If we've never heard of it," one noted, "what does that tell you about the[ir] marketing plan?" In fact, a National Infrastructure Coordinating Center manager acknowledged that the Center had not pursued any food- or agriculture-specific outreach.

Given the limited familiarity food industry and government partners had with the National Infrastructure Coordinating Center, it should not be surprising that the Center received little or no information on post-harvest food-related threats, incidents, or crises. A 24/7 watch operation center overseen by the Office of Infrastructure Protection, the National Infrastructure Coordinating Center is to serve as a point of "two-way communication" between the private sector and DHS for reporting threats, events, or crises that might affect critical infrastructure. The Center forwards select information it receives from the public and private industry to other units in DHS using several different types of reports. From August 2005 through late March 2006, the National Infrastructure Coordinating Center produced 855 written reports, of which 93 (about 11%) referenced food or agriculture. According to the Office of Infrastructure Protection, however, the National Infrastructure Coordinating Center "did not produce any reports that relate to post-harvest food matters" during that period – which included Hurricane Katrina response and recovery efforts.

The absence of any informational products related to post-harvest food during that period might also result from the National Infrastructure Coordinating Center's location and composition. This make-up might lead the Center to focus more effort on outreach and product development in infrastructure sectors in which staff have especially good access or expertise. For example, the National Infrastructure Coordinating Center can directly access transportation sector information and expertise through its co-location with DHS' Transportation Security Operations Center and the presence of the Highway ISAC in the same facility. When we visited the Center in February 2006, a few National Infrastructure Coordinating Center staff had sector-specific experience, although none had experience in food or agriculture. It is reasonable to expect that the sector-specific experience center staff had, in turn, formed the basis for more effective infrastructure information monitoring and reporting in those sectors.

The National Infrastructure Coordinating Center is designed to facilitate information sharing "among Sector Coordinating Councils, Government

Coordinating Councils, ISACs, and other security partners."[55] In order to fulfill its mission in this area, the Center must build more substantial relationships with food sector entities.

We recommend that the Assistant Secretary for Infrastructure Protection:

Recommendation #4: Expand National Infrastructure Coordinating Center outreach efforts to include outreach targeted to the food sector, and actively seek to increase information flow related to the food sector.

Homeland Security Information Network's Food and Agriculture Portal

The effectiveness of other DHS information sharing initiatives also has been limited with respect to the food sector. The Homeland Security Information Network is comprised of a number subsystems structured around different user communities. It includes subsystems supporting law enforcement, international interests, and emergency management, among others.[56] Among these subsystems is the "Critical Sectors" subsystem, which supports the Food and Agriculture portal. The Homeland Security Information Network Food and Agriculture portal is a web-based tool for sharing threat and analytical information with sector representatives. DHS engaged food sector representatives in the design and online layout of the portal starting in October 2004. More than a year-and-a-half later, these discussions were still ongoing.

The general view of food sector experts we spoke with was that the network's Food and Agriculture portal has potential value, but limited utility for the sector's information sharing purposes in its current form. Concerns expressed centered on the following areas:

- The absence of staff support for the portal by food experts undermines its ability to offer germane, timely information.
- The portal has few members and an even smaller group of regular users, limiting the reach of information on the site. In December 2005, the Office of Infrastructure Protection reported that only 166 individuals had access to the Homeland Security Information Network's Food and Agriculture portal.

[55] DHS, *NIPP*, June 30, 2006, p. 64.
[56] For more information on the Homeland Security Information Network please consult our recent report on the subject. (DHS OIG, *Homeland Security Information Network Could Support Information Sharing More Effectively*, OIG-06-38, June 2006.)

- The portal is a passive system and does not notify members about new content.
- Content is generally not very relevant, current, or useful from the vantage point of food sector representatives.
- The portal may not be well-suited to duplicate the threat reporting function envisioned for the ISAC.

While food sector representatives were aggrieved by the portal's early stage of development, we are concerned that the network's Food and Agriculture portal may essentially duplicate an FBI effort. A limited access web community with information on threats, vulnerabilities, and protective efforts related to the food and agriculture sectors, the FBI's AgInfraGard became operational in March 2006. As described by the FBI and food sector representatives with access to the web community, much of AgInfraGard's content is similar to that of the Homeland Security Information Network's portal. The FBI believes its system is developing more quickly than the Homeland Security Information Network's and has greater capability for information exchange. Meanwhile, according to one FBI analyst, the DHS system "takes information but it doesn't give a lot."

Notwithstanding these areas of concern, there are some positive signs regarding Food and Agriculture portal development. Perhaps the most significant is the expressed interest of the Office of Infrastructure Protection in detailing a state government and private sector representative to help develop portal content. Identifying funding for this effort and ensuring that detailees have adequate expertise will be keys to success on this point. Without such an investment, a Sector Coordinating Council representative candidly warned, "Homeland Security Information Network is going to die." If the Office of Infrastructure Protection is able to advance plans in this area, it might be able to fulfill the potential of the system, and cultivate a vital information sharing network.

We recommend that the Assistant Secretary for Infrastructure Protection:

Recommendation #5: Evaluate the feasibility of providing financial support for and otherwise facilitate the detailing of state or local government and private sector representatives to support Office of Infrastructure Protection food sector efforts with an emphasis on the Homeland Security Information Network's Food and Agriculture Portal.

Homeland Infrastructure Threat and Risk Analysis Center

Another major DHS information sharing initiative, the Homeland Infrastructure Threat and Risk Analysis Center, is also in an early stage of development. The center, which began operating in January 2005, conducts threat, vulnerability, and consequence analysis related to the nation's infrastructure. As of June 2006, the center had prepared 38 written products. Of these, four related to post-harvest food. Two of the four address the same material; one in classified form, the other in unclassified form.

The Homeland Infrastructure Threat and Risk Analysis Center regards private sector infrastructure owners as a primary customer base. Yet, few food sector representatives we spoke with were familiar with the center or any of its products. Private sector representatives who had received specialized briefings by the center's staff, and others who reviewed the center's products, however, reflected positively on the program and its work. A member of the Sector Coordinating Council praised one May 2006, briefing the center proactively organized, and reported that the Homeland Infrastructure Threat and Risk Analysis Center has been receptive to industry input on its products.

Conversely, FDA and National Counterterrorism Center staff were critical of food-related intelligence products developed by the Homeland Infrastructure Threat and Risk Analysis Center. They said that these products had not drawn on subject matter expertise as much as conjecture, and said that some included irresponsible speculation. They said that they often considered the center's products to be at odds with the experts in other government organizations, and asserted that the center's products had not been vetted to the extent necessary.

The Homeland Infrastructure Threat and Risk Analysis Center was, however, able to supply some evidence that its food and agriculture sector products were vetted by government and private sector experts, and stressed the importance of independent assessments of intelligence information. The center also supplied evidence that its products had been received well by a Department of Justice official and state homeland security representatives from North Dakota and New York.

Since its formation, Homeland Infrastructure Threat and Risk Analysis Center staff have participated in exercises and food sector intelligence meetings with other federal food sector experts. Unfortunately, difficulties in the relationship between staff in other departments and one Homeland Infrastructure Threat and Risk Analysis Center representative strained the center's exchanges with FDA and the National Counterterrorism Center. An official from the Homeland Infrastructure

Threat and Risk Analysis Center reported that this individual has been reassigned, and USDA, FDA, and National Counterterrorism Center staff remained committed to working with DHS. Recent indications are that the Homeland Infrastructure Threat and Risk Analysis Center's relationship with outside food intelligence experts has improved in recent months.

The FDA staff we spoke with recommended that the Homeland Infrastructure Threat and Risk Analysis Center develop more internal expertise on particular infrastructure sectors by adding staff. When we spoke with center representatives, they, too, acknowledged a need in this area and indicated that the center was working to increase its staff. In the meantime, it is imperative that DHS exploit USDA and FDA expertise to a greater extent in interpreting food sector threat and vulnerability information. Additional contact with USDA and FDA could also help the center develop products that support the informational needs of industry better.

Protected Critical Infrastructure Information Program

The *Homeland Security Act* armed DHS with a new tool for gathering private sector information on the nation's critical infrastructure – the ability to designate information as Protected Critical Infrastructure Information. Approved infrastructure information submitted to the government under DHS' Protected Critical Infrastructure Information program is protected from disclosure under the Freedom of Information Act and should not be subject to production under a subpoena in civil litigation. Infrastructure information related to any infrastructure sector can be submitted through the program.

The food sector has been the most engaged infrastructure sector in Protected Critical Infrastructure Information activities. Protected Critical Infrastructure Information program staff described FDA's Center for Food Safety and Nutrition as the program's "biggest customer." Indeed, the agency was one of the first government units outside of DHS to become Protected Critical Infrastructure Information accredited, and Protected Critical Infrastructure Information program staff reported that other HHS agencies and USDA were next on their list of federal entities targeted for accreditation. Perhaps more notably, most of the Protected Critical Infrastructure Information program's information submissions came from the food industry as of February 2006. In fact, at the time, 257 of 330 total submissions, or about 78%, were food sector submissions.

Despite these successes, FDA representatives we met with had unenthusiastic impressions of the Protected Critical Infrastructure

Information program. While they planned to use the program to protect needed private sector infrastructure information in the future, they decried early difficulties in meeting the Protected Critical Infrastructure Information program's extensive training and security requirements to become accredited. FDA staff said that the "intense" accreditation process took four months. One FDA representative remarked that if he had known how difficult it would be to achieve accreditation, he would have opted to use another means to gather the food infrastructure information FDA needed.

Government Coordinating Council and Sector Coordinating Council members who discussed the Protected Critical Infrastructure Information program with us reported that the program's staff has been very helpful in working with the private sector. Yet Government Coordinating Council participants in one federal department advised that they were concerned that Protected Critical Infrastructure Information program staff's limited familiarity with the particulars of the food industry might lead them to make improper judgments in granting Protected Critical Infrastructure Information protections for related information.

Even with publication of the Protected Critical Infrastructure Information Final Rule on September 1, 2006, industry skepticism about the program may persist. One food security expert at a large firm said the law and regulation had established a "cumbersome operational mechanism" that weighed against participation. Other industry representatives we spoke with were not convinced that the program would be very useful for food companies. Meanwhile, a government representative expressed the view that the industry was likely to regard the program warily until its information protections had been challenged in a legal setting and upheld in court. A recent GAO report, *Information Sharing: DHS Should Take Steps to Encourage More Widespread Use of Its Program to Protect and Share Critical Infrastructure Information*, made similar observations.[57]

Protected Critical Infrastructure Information program staff said that the key to increasing Protected Critical Infrastructure Information utilization lies with potential end-users in government. Ultimately, government agencies' need for information is the primary impetus driving Protected Critical Infrastructure Information submissions. Government end-users of Protected Critical Infrastructure Information are also well-positioned to lead private sector outreach efforts, as they can more effectively establish the government's need for private sector critical infrastructure information on a case-by-case basis. Both USDA and FDA staff expressed the same

[57] GAO-06-383, May 2006, pp. 19-23.

perspective and recognized that they are the key to more food industry participation.

Charting and Protecting the Food Sector

Asset Identification and System Mapping

DHS is responsible for collecting information on critical infrastructure assets and systems. The National Asset Database is currently the department's primary repository for maintaining information on critical infrastructure assets. It is not clear, however, how the National Asset Database in its present form satisfies DHS' responsibilities regarding the food sector. The volume of recorded assets in the National Asset Database varies substantially by state, and the National Asset Database does not include all government information on food industry assets. Finally, the database draws together information on infrastructure assets, but not the systems that are vital to understanding the food sector.

As of January 2006, the National Asset Database had information on 77,069 infrastructure assets around the nation.[58] Of those, 6,486 assets, or eight percent, were listed as relating to the post-harvest food sector.[59] The National Asset Database contains other assets that support the food sector, but are not reflected in this figure because they are listed under other infrastructure sectors and segments. A number of port facilities that are involved in shipping of food, for example, are listed as transportation assets and, as a result, are not included in the 6,486 asset figure.

Like National Asset Database assets at large, food sector assets in the database reflect variation in the intensity of state responses to 2003 and 2004 data calls. Indiana and Wisconsin, for example, account for more than 53% of the total number of food sector assets in the database. Accordingly, Wisconsin's 2,032 food sector assets in the database are about 20 times the number listed for Florida (102), and more than 145 times more than the number listed for California (14). Meanwhile, the District of Colombia, Nevada, New Hampshire, Puerto Rico, Rhode Island, Vermont, and Wyoming have no food sector assets in the National Asset Database.

[58] DHS OIG, *Progress in Developing the National Asset Database*, June 2006, p. 1.
[59] For the purposes of this analysis, food and agriculture sector assets without agricultural attributes, and restaurants and food vendors were considered post-harvest food assets.

The limitations of food sector entries in the National Asset Database are also evident upon examination of the assets listed for the 20 most populous U.S. counties. Despite the broad geographic distribution of food industry assets and the prevalence of major food processing, transit, retail, and service facilities in all major U.S. cities, all but 2 of these 20 counties had fewer than ten food assets listed in the National Asset Database. In fact, the National Asset Database listed no food assets for five of these counties: Clark County (Las Vegas), Nevada; Los Angeles County (Los Angeles), California; Miami-Dade County (Miami), Florida; New York County (Manhattan), New York; and Santa Clara County (San Jose), California. Six other top counties had only one food asset listed in the National Asset Database.[60]

One reason data limitations such as these persist is that the Office of Infrastructure Protection has been unable to exploit existing federal information about food industry assets. Office of Infrastructure Protection staff reported that, in one case, this was the result of the FDA's unwillingness to share information. Office of Infrastructure Protection staff advised us that they had sought the registered food facility list that FDA is required by law to maintain, but said that FDA had resisted sharing this information.[61] Nevertheless, other available federal food industry information is not included in the National Asset Database. The Food Safety and Inspections Service, for example, maintains a list of food processing facilities it inspects. We compared a sample of 100 facilities from this list to the National Asset Database and found that none were recorded in the database.

The Office of Infrastructure Protection has an opportunity to resolve some of these basic issues in the near term, as it intends to convene expert panels to review and refine National Asset Database asset information for each sector. Although a panel has not yet been assembled for the food and agriculture sector, a panel of sector experts was scheduled to have reviewed all the sector's assets by October 2006.

While an expert panel may be able to resolve some issues with the National Asset Database data, other more foundational issues also require attention. The *USA PATRIOT Act* defines critical infrastructure to include *systems* and assets,[62] yet the National Asset Database emphasizes assets. To date, the most advanced step by DHS to define parts of the food *system*

[60] Broward County, Florida; Maricopa County, Arizona; Orange County, California; Riverside County, California; San Bernardino County, California; and San Diego County, California.
[61] FDA maintains a listing of registered food facilities in the United States pursuant to Section 305(a) of the *Bioterrorism Act*, P.L. 107-188, codified at 21 U.S.C. § 415a.
[62] *USA PATRIOT Act*, P.L. 107-56 § 1016(e), codified as 42 U.S.C. § 5195c(e).

has been the development of a sector taxonomy to support the classification of National Asset Database assets. This taxonomy was designed to categorize infrastructure elements and facilitate communication about them by forging common terms of reference.[63]

The Office of Infrastructure Protection staff we spoke with touted this taxonomy development effort as a noteworthy success and indicated that its development had been a point of coordination with USDA and FDA. Industry and federal partners we spoke with, however, did not regard consultation on the development of the sector taxonomy to be a major point of success in defining food industry systems. Instead, they held that DHS had focused too intently on assets, and devoted too little thought and energy to understanding the food sector as a system. Additionally, they considered DHS' perceived asset-orientation to place the food sector at an unfair disadvantage in relation to other sectors.

The view that DHS had taken an asset-driven approach to infrastructure protection was advanced by the *Draft NIPP's* emphasis on assets and the National Asset Database in its proposals for prioritizing critical infrastructure protection. The *Draft NIPP* stressed that "identifying and prioritizing nationally critical assets" were at the core of DHS' infrastructure protection budgeting process.[64] It also indicated that the National Asset Database was to "support the implementation of *NIPP* risk management framework activities," while serving as "the foundation for the *NIPP* risk assessment process."[65]

Food sector representatives said that DHS' asset-orientation would result in an understatement of food sector risk for three reasons. First, they perceived that the DHS' focus on assets led the department to emphasize the effects of asset destruction over asset exploitation. As discussed earlier, the greatest concern to many in the food sector relates to the exploitation of the sector to distribute intentionally adulterated foods. Thus, an emphasis on the effect of asset destruction would miss the most consequential possible effects of an attack on the food sector. Furthermore, the consequences of losing a single food industry asset are considered relatively small because the food industry has few monolithic components and because it has many infrastructural redundancies. This redundancy contributes to the likely resiliency of the food sector such that, if, for example, a single food processing plant were destroyed, agricultural products could be shipped to other food processing plants.

[63] DHS, *Infrastructure Taxonomy* (Draft), May 20, 2005, p. 1.
[64] DHS, *Draft NIPP*, November 2, 2005, p. 92.
[65] Ibid., p. 82.

Second, food sector representatives pointed out that important links in the food supply chain are not easily captured in an asset-based model. The food industry is, for example, heavily dependent on transportation, yet mobile transportation links cannot be mapped in an asset database the same way as fixed physical assets. Unlike buildings, refrigerated trucks do not have set geographic coordinates. Moreover, the transit routes they frequent are subject to change. Because of these traits, food industry transportation assets of this kind are not reflected in the National Asset Database.

Finally, food sector representatives expressed concern that DHS' asset-orientation would lead it away from an understanding of the second- and third-order effects of a food contamination incident. In focusing on a particular food industry asset, they believed DHS would lose perspective on upstream and downstream consequences of an incident affecting that asset. For example, contamination at a processing facility might not just affect that facility. Upstream producers of the contaminated commodity might suffer if consumer demand for the resulting products declines. In addition, downstream distributors, retailers, and food service establishments serving the contaminated product might also experience a downturn in their business as a result of such an incident. In addition, other parts of the economy, like the public health system, might be stressed as a result of a contamination incident. Accordingly, to grasp the second- and third-order effects of an adverse food event at a single facility, DHS must first understand that facility's place within the food supply chain and larger economic system.

Food and agriculture sector representatives said that their frustration with DHS' apparent asset-orientation peaked in 2005. During the summer of that year, DHS asked the sector to prepare a list of the "Top 100 Assets" in food and agriculture. With only a short time to assemble a list, the sector responded with an apparently unprioritized, alphabetical list of 47 food commodities and systems. Public and private sector representatives complained that DHS had set up a "box-checking exercise" that simply did not work from a food supply standpoint. They argued that the creation of a top 100 list of physical assets in the sector was not possible at the time, and that DHS' imperative that one be developed showed that the department did not understand the sector.

The same redundancies that contribute to the resiliency of the sector in the event that one infrastructure unit is destroyed, also make it extremely difficult to define a limited set of highly critical assets. The food sector is replete with accessible "critical nodes" at which food products could be

contaminated intentionally. The consequence of contaminating food products at many different "critical nodes" in the supply chain of several different food products may be similar. And, in many cases, particular "critical nodes" exist in the thousands, even for a single food product.

This calculus combined with the sheer size of the food sector have led USDA and FDA to focus their vulnerability and consequence assessments on particular industry subsystems and food products, rather than on particular assets. Despite this, DHS maintained an interest in the identification of priority assets. The *Draft NIPP* set out a requirement for Sector Specific Agencies to submit priority assets to DHS by May 1, 2006.[66] According to USDA representatives, however, the Sector Specific Agencies did not accommodate this request.

In response to food and agriculture sector concerns that DHS' approach to critical infrastructure protection had not properly addressed the underlying systems, the federally funded research center known as the Homeland Security Institute is studying ways to integrate a systems-based approach into infrastructure protection in a way that is applicable to all sectors.[67] As part of its related research effort, the Homeland Security Institute is tasked with defining criticality criteria that can be used to frame sector risk analysis and risk management activities. Food sector representatives expressed optimism that this analysis would yield major dividends in their dealings with DHS.

A more effective dialogue between DHS and its partners is needed to address concerns about asset exploitation, assets that do not have fixed coordinates, and system-wide impacts that the malevolent exploitation of food sector assets might have. Recent revisions to the *NIPP* may help foster this dialogue. Whereas the November 2005 edition of the *NIPP* stressed the need to identify assets in its approach to risk management, the final *NIPP* expands the risk management framework to include the identification of systems, networks, and functions.[68] Indeed, according to the department, "DHS has evolved to the realization that an asset-based focus is not representative of all sectors."

Targeting and Prior Notice Support

Other DHS efforts to work with the Sector Specific Agencies to protect the food sector offer a better example of external coordination. The

[66] DHS, *Draft NIPP*, November 2, 2005, p. 88.
[67] See Section 312 of the *Homeland Security Act*, 6 U.S.C. § 192.
[68] DHS, *NIPP*, June 30, 2006, p. 4, *and* DHS, *Draft NIPP*, November 2, 2005, p. 26.

ongoing operations of CBP's National Targeting Center and the FDA's Prior Notice Center are designed to augment the nation's oversight of imported goods, including food products. The *Bioterrorism Act* invested FDA with several new authorities to protect the food supply. Section 307 of the Act requires all food importers to notify the FDA if any of the agency's regulated products are scheduled for import into the United States. This prior notice requirement is designed to allow the government to target high-risk food imports for additional scrutiny.[69]

Collaboration between CBP and FDA on import protection began shortly after the passage of the *Bioterrorism Act*. Initial coordination between the two agencies concentrated on the development of prior notice rules, but quickly expanded to include technical exchanges on how to operationalize these rules. To ease importers' reporting burden, CBP designed and built a food prior notice interface with the Automated Commercial System, the import tracking and control system used by CBP. The National Targeting Center also worked with FDA staff to create targeting criteria for high-risk foods. FDA's Prior Notice Center, which is the entity administering the prior notice requirement, is now co-located with the National Targeting Center. Both CBP and FDA representatives commended the interagency cooperation exhibited by the National Targeting Center and Prior Notice Center. CBP and FDA staff we interviewed viewed the immediate personal contact and exchange that has grown out of this co-location as vital.

Overall, representatives of both CBP and FDA described the two agencies' working relationship favorably. It has formed the basis for other noteworthy collaborations. They have, for example, worked to develop joint contingency plans for their information systems. CBP has also trained many of its inspectors on FDA regulations and requirements, such that now about 10,000 inspectors are cross-designated.

CBP's relationship with the Food Safety and Inspections Service is not as well-developed, but has evolved quickly. CBP officials meet with Food Safety and Inspections Service staff weekly to discuss food shipment tracebacks and means of improving customs data linkages to Food Safety and Inspections Service's food re-inspection facilities outside ports of entry. CBP is also working with Food Safety and Inspections Service staff to develop import targeting criteria for Food Safety and Inspections Service -regulated commodities. CBP planned to test these targeting criteria at select ports during the Summer of 2006. Finally, the two agencies are pursuing the signature of a Memorandum of Understanding

[69] 21 U.S.C. § 381.

that would, among other things, formally grant Food Safety and Inspections Service access to CBP's targeting system.

Coordination of Research and Development, and Education and Training Initiatives

Critical Infrastructure Protection Research and Development Planning

DHS is responsible for planning critical infrastructure protection research and development activities across the federal government. Homeland Security Presidential Directive 7 charges DHS to prepare annual federal research and development plans to enhance the protection of critical infrastructures in collaboration with the White House's Office of Science and Technology Policy.[70]

To fulfill these responsibilities, DHS has developed a *National Plan for Research and Development In Support of Critical Infrastructure* in consultation with other departments. This plan serves as the research and development roadmap for critical infrastructure protection. It outlines priorities, goals, and objectives for research and development projects across various departments and agencies. The first plan, for 2004, was released in April 2005. A 2005 plan was never released, and has reportedly been consolidated with the 2006 plan. As of early December 2006, this plan had not yet been published.

In the development of the 2004 plan, DHS solicited suggestions and recommendations from all federal departments charged with protecting critical infrastructures, including the Sector Specific Agencies for the food sector. According to S&T, USDA and HHS participated in sessions on the content of the 2004 plan, and provided information on the food and agriculture sector. The two departments have also been active participants and reviewers for the draft 2005 effort.

Perhaps because the 2004 plan emphasized overarching critical infrastructure protection research themes, it did not highlight any work with a clear, direct connection to the food sector. Rather than selecting priority research and development efforts from among the needs identified for the protection of particular infrastructure sectors, the 2004 plan focused on nine research themes to support the protection of all critical

[70] *Homeland Security Presidential Directive 7: Critical Infrastructure Identification, Prioritization, and Protection*, December 17, 2003, paragraph 30.

infrastructure sectors. In particular, the plan identifies the following research and development themes as critical infrastructure protection priorities: detection and sensor systems; prevention and protection systems; entry and access portals; insider threats; analysis and decision support systems; response, recovery, and reconstitution tools; new and emerging threats and vulnerabilities; advanced infrastructure architectures and systems design; and human and social issues.[71] Although the plan asserts that progress in each of these areas will benefit all infrastructure sectors, in several cases related research initiatives did not appear to have been developed in consideration of the food sector. For example, the plan's discussion on detection and sensor systems mainly addresses cyber security and the protection of critical infrastructure facilities against attacks with small arms and explosives, rather than product contamination. The plan's discussion of research area with possibly the greatest bearing on the protection of the food supply – protection and prevention – also focuses on assaults and intrusions targeted at physical and cyber critical infrastructure.[72] Moreover, while the plan repeatedly singles out other infrastructure sectors, it never mentions food. By contrast, the plan discusses the protection of the nation's water supply seven times.[73]

More meaningful integration of food sector research and development initiatives into the plan could be achieved though greater harmonization with the research and development requirements identified in Food and Agriculture Sector-Specific Plans. In their September 2004 draft Sector-Specific Plans, USDA and FDA identified post-harvest food sector research and development needs that do not clearly correspond with the research themes highlighted in the plan. It is not evident, for example, where threat agent characterization, studies of the human health impact of oral doses of threat agents, and medical diagnostics and countermeasures – areas FDA and USDA singled out as in need of research and development support – fall within plan's nine research themes, if at all.[74]

Closer coordination of critical infrastructure protection research and development plans may develop under a rubric recently outlined in the *National Infrastructure Protection Plan*. The *NIPP* requires, for example, that future Sector-Specific Plans represent sector-specific research and development needs within the context of the nine research and development "themes" presented in the plan. In addition, the *NIPP*

[71] *NPRD,* April 2005, pp. vii-viii.
[72] Ibid., p. 29.
[73] Ibid., pp. 20, 30, 32, 35, 36, 52, and 61.
[74] USDA, *Agriculture and Food (meat, poultry, and egg products) Draft Sector-Specific Plan*, September 3, 2004, pp. 174-75. FDA, *Food Sector Draft Sector-Specific Plan*, September 3, 2004, pp. 96-100.

creates an annual reporting process for Sector Specific Agencies to submit sector-specific research and development requirements to DHS.[75]

Coordination of Education, Training, and Research and Development Efforts

In the past, DHS has not fully engaged its federal food sector and industry partners in the initial stages of grant development or in the proposal selection process for the Office of Grants and Training and S&T education, training, and research and development projects. As a result, federal partners said they were sometimes caught off guard when grant solicitations for food defense training, and research and development projects were issued. Because FDA, USDA, and other federal partners support similar food-related programs, it is important for DHS to improve coordination in this area.

S&T External Coordination

S&T's success in bringing public and private sector partners together in selecting and managing food-related programs has been mixed.

This mixed performance is evident in the case of S&T's grant to the University of Kentucky to develop a wireless electronic monitoring system to secure milk. S&T did not involve USDA, FDA, or industry participants in the selection of the proposal for this program. In fact, because the University of Kentucky submitted the proposal in response to a broad solicitation for critical infrastructure protection projects of all kinds, the S&T proposal review team did not have any food-specific expertise. Notwithstanding the early absence of public and private sector partners from the proposal selection process for this program, University of Kentucky project staff reportedly have collaborated with other academic institutions and representatives of the milk industry following the grant award.

A similar dynamic appears to have prevailed with S&T's food defense center of excellence. We were unable to reconstruct fully the solicitation, selection, and award process for the National Center for Food Protection and Defense because S&T did not maintain complete records on these steps.

[75] DHS, *NIPP*, June 30, 2006, pp. 84-85, and 147.

USDA officials reported that they were not included in the initial planning and development of program requirements or content for the NCFPD, while FDA representatives indicated that they participated in these efforts. USDA staff members became involved later in the grant process.

S&T provided documentation for the first round of the proposal review and selection process, during which external reviewers, including representatives from USDA and FDA, evaluated proposals. S&T also provided memoranda that summarize the conclusions of the second and third phases of the Center of Excellence review and selection process, and state an affirmative case for the selection of the University of Minnesota-based consortium. S&T could not, however, produce detailed information on the deliberations involved in these two phases of the review and selection process. Nor did it provide a summary appraisal of the thirteen other proposals it received or the three other site visits it conducted for the second and third phases of the process.

Despite these limitations in the documentation of the Center of Excellence review and selection process, no one we spoke with held that the University of Minnesota-based consortium was a poor choice for a DHS Center of Excellence. Indeed, in their narrative assessments of the University of Minnesota proposal, reviewers from the first round of the proposal review process noted the consortium's potential for adding much benefit to the food sector. One reviewer applauded the proposal for including processes to ensure "research findings get translated into use," and others commended the consortium's flexibility, partnerships with industry and academic institutions, and management plan.

Now that the Center is operational, both the Food Safety and Inspections Service and FDA communicate with it regularly. To support a close working relationship, the National Center for Food Protection and Defense holds bi-weekly teleconferences and periodic meetings with representatives from the two agencies.

The NCFPD continues to engage and consult federal, state, and local government, as well as private-sector stakeholders, in pursuing its research agenda. NCFPD programs are reviewed, for example, by a seven-person External Board of Advisors consisting of academic, private industry, and federal government representatives. This group is to provide strategic oversight of NCFPD's overall research program, and evaluate risks and opportunities in the area of food protection and defense.[76]

[76] NCFPD, *National Center for Food Protection and Defense 2005 Annual Report*, January 25, 2006. p. 12.

The NCFPD enlists the support and counsel of key food industry representatives by other means, as well. The NCFPD regularly communicates with Sector Coordinating Council leadership, and has created an Industry Working Group. The NCFPD consults the Industry Working Group on ongoing research and has made responsive adjustments to its research plans as appropriate. In one instance, the NCFPD used the Industry Working Group as a "sounding board" for its supply chain questionnaire intended for an industry audience. The Industry Working Group reviewed the questionnaire, provided feedback to Center researchers on the survey's strengths and weaknesses, and helped researchers develop more probing questions to identify security gaps previously omitted from the survey.

Industry Working Group members regard the working group as one of the Center's strengths, and said that it links research proposals to real-world food defense challenges and consequences. One Industry Working Group member commended the Center for creating a neutral forum for private sector competitors and government regulators to collaborate on food defense issues. Generally, Industry Working Group members expressed their satisfaction with the NCFPD and said that their association with the NCFPD had resulted in valuable industry contacts, a sounding board for food defense requirements, and a partner for spreading awareness in the food sector on terrorism and intentional contamination. Further, they noted that the Center's research projects will assist them in better securing industry processes and supply chains as well as fostering a collaborative environment with their competitors in the defense of the nation's food supply.

Industry consultation has also been a hallmark of another S&T program, the Food Biological Agent Detection Sensor. In developing program requirements, S&T staff responsible for the Food Biological Agent Detection Sensor program collaborated with federal partners and industry representatives. Program staff worked directly with FDA in the development of the Food Biological Agent Detection Sensor program. They collaborated in the development of detection thresholds, definition of agent and matrix characteristics, cycle times, and other detection platform requirements. In addition, S&T staff consulted with food industry officials and visited several facilities to ensure that the program requirements they established were compatible with food industry needs in areas like cost and performance.

Despite these two favorable engagements with S&T, an FDA representative communicated his concern that S&T may be funding duplicative programs in other areas. In 2004, FDA requested an all-

inclusive list of S&T food and agricultural-related research projects in order to coordinate and prevent duplicative research, but S&T never provided such a listing. FDA staff maintain that their request is crucial in preventing the emergence of duplicative research and development projects. In particular, FDA staff were concerned that the National BioDefense Analysis and Countermeasures Center was proceeding with research in this vein. Indeed, the Countermeasures Center has apparently not consulted with FDA in structuring its food-related research initiatives. To its credit, though, it is working closely with the Food Safety and Inspections Service, and is currently funding two Food Safety and Inspections Service vulnerability assessments.

In the context of greater overall sharing of information on research initiatives among USDA, FDA, and DHS, we recommend that the Under Secretary for Science and Technology:

Recommendation #6: Develop and maintain, in collaboration with the Offices of Grants and Training and Infrastructure Protection, a comprehensive report on DHS food sector research and education initiatives to be shared with FDA and USDA on a regular basis.

Office of Grants and Training External Coordination

Until late 2004, Office of Grants and Training did not seek Food Safety and Inspections Service, FDA, or food industry participation in the development or selection of Grants and Training education and training programs. These groups were not involved in the development of program requirements or in the Grants and Training grant solicitation or selection process.

Government Coordinating Council members conveyed their concerns that Grants and Training did not solicit input for the development of grant requirements, solicitation, and the grant selection process for the UC Davis Agroterrorism Preparedness Training Curriculum. While an educational technology expert from USDA's Animal and Plant Health Inspection Service participated in the selection of the UC Davis effort, neither Food Safety and Inspections Service nor FDA did. Perhaps as a result, Government Coordinating Council members said that they were caught off guard when the grant was awarded. Indeed, USDA had awarded funds to another university for similar work just days earlier. Seven days prior to the DHS announcement of its $4.7 million award to UC Davis to provide training and education on the protection of the food supply, USDA announced a $750,000 award to St. Joseph's University to

develop online courses aimed at protecting the nation's food supply from contamination.

Following the UC Davis selection and resulting complaints from the Government Coordinating Council, Grants and Training sought to integrate other sector partners. Although Grants and Training successfully reached out to USDA and received participation from the Animal and Plant Health Inspection Service, it did not immediately involve the Food Safety and Inspections Service. Nor did it reach out to the FDA for some time. Without Food Safety and Inspections Service and FDA engagement, Grants and Training lost out on potentially valuable assessments of the impact of its programming on the post-harvest portion of the farm-to-table continuum.

After awarding several training, education, and preparedness grants, Grants and Training developed a method for gathering the perspectives of food sector experts on its work. Grants and Training engaged federal and state partners through its Agro-Terrorism Training Initiative Working Group. The group has gathered statistics on agro-security programs, monitored their progress, exchanged related information, and assisted with course development efforts. At the outset, the only federal participants in the working group outside of DHS were from the Animal and Plant Health Inspection Service. Later, as the working group continued to facilitate information exchange and integrate subject matter expertise, Grants and Training enlisted and received the participation of the FBI, CDC, and state and academic partners.

Initially, Grants and Training did not appreciate the need for FDA and Food Safety and Inspections Service participation in this forum. Grants and Training did not recognize that the federal agencies involved in the regulation of post-harvest food were absent from the working group until March 2005. That month, Grants and Training organized a summit to "develop a seamless emergency response to agro-terrorism training plan that reflected the coordination efforts between DHS and USDA." Working group participants at the summit noted that the FDA and Food Safety and Inspections Service were not represented and expressed the view that they should be included in future sessions. After soliciting participants for contact information, Grants and Training extended invitations to FDA and Food Safety and Inspections Service, and both attended 2005 and 2006 working group sessions.

While they did not participate in initial grantee selection processes, federal partners and private sector representatives have been involved in the course review process for Grants and Training's food-related training and

education initiatives. To ensure that Grants and Training-sponsored courses provide accurate information and effectively reach target audiences, Grants and Training now requires that the FDA, Food Safety and Inspections Service, and the Animal and Plant Health Inspection Service formally endorse its food-related courses, and also involves private sector subject matter experts in its course review process. Grants and Training reports that all six of UC Davis' food-related courses have been vetted and approved by USDA and FDA.

Moreover, several of Grants and Training's grant recipients have sought out key entities involved in post-harvest preparedness. UC Davis worked with more than 15 collaborators in developing its agroterrorism preparedness curriculum, including representatives of the State of California's food and public health agencies, food and health associations, academic institutions, and private industry. Similarly, the University of Tennessee has collaborated with FDA, the Animal and Plant Health Inspection Service, the Food Safety and Inspections Service, other academic institutions (including two with DHS agroterrorism programs), and State of Tennessee agencies in developing its plans for a vulnerability assessment training course. The Multi-State Partnership for Security in Agriculture also drew on input from various state departments of food and agriculture, public safety, and state homeland security advisors in designing its proposal.

Expanded regional collaboration is one of the national priorities identified in the National Preparedness Goal. This priority stems from recognition of the importance of establishing partnerships across jurisdictions and in cooperatively building capabilities. Regional collaboration is also valued because it allows for related costs and risks to be spread out over multiple jurisdictions.

The vision for the State Homeland Security Program calls for regional collaboration of this nature, but it does not have a funding vehicle to support non-urban, multi-state efforts. Unlike the Urban Areas Security Initiative, which provides a means for suburban and urban areas to jointly apply for DHS grants to address risks across jurisdictions, the State Homeland Security Program has no provision for states to submit joint applications. This arrangement has reportedly worked to the detriment of an important multi-state food-sector program.

The Multi-State Partnership for Security in Agriculture currently receives funding through an Urban Areas Security Initiative discretionary grant award channeled through the State of Iowa. Unless it is able to effectively petition for urban area funds once again, the only way the Multi-State

Partnership can access DHS financial support is through the State Homeland Security Program. As currently configured, though, the application process does not enable the Multi-State Partnership to effectively compete for funds.

The Multi-State Partnership can apply for State Homeland Security Program support in two ways, neither of which is satisfactory. One way the Multi-State Partnership can apply for such funds is by having one state apply for funding to support the whole multi-state partnership. At present, however, State Homeland Security Program awards are given to states in undifferentiated blocks, so there would be no straightforward way to determine how much DHS intended to apportion to the multi-state effort as opposed to other state-specific projects. Moreover, states are reportedly anxious about applying for State Homeland Security Program funding for the multi-state effort because they fear that the budget for the multi-state effort will be withdrawn from other funds they would have received without including the Multi-State Partnership.

In the alternative, the Multi-State Partnership could request that each of the participating states apply for funding under the initiative individually. However, this option is cumbersome and guarantees that the same issues with differentiating multi-state initiative funds from state-specific funds will be repeated across eleven states. Moreover, if it were to receive funding from eleven different states, the Multi-State Partnership may have to significantly alter its administrative and financial structure to account for activities and expenditures in a more disaggregated, unduly complex fashion.

While the current grant application process presents significant barriers to non-urban, multi-state initiatives, Grants and Training's ability to address these barriers is subject to some noteworthy constraints. For one, the Office of Grants and Training interprets its appropriation language to mean that it can only consider applications for State Homeland Security Program formula-based grant funds that are submitted by *states*.[77] As a result, non-profit consortia and regional organizations are precluded from directly applying for funds under the program.

What is more, the Office of Grants and Training cannot easily fashion an alternative grant program to support such multi-state enterprises. The Office has no independent appropriations stream to support a new grant program of this nature, and believes it is not independently authorized to pursue one absent a congressional mandate.

[77] Public Law 109-295 (2006).

Notwithstanding these constraints, Grants and Training can take steps to remove grant application barriers to multi-state initiatives. It can do so by fashioning a State Homeland Security Program grant application process that is more receptive to multi-state initiatives. This could be accomplished in a number of ways. One way would be for Grants and Training to permit groups of states to submit applications for State Homeland Security Program funds in support of multi-state initiatives. These applications would be submitted separately from states' individual applications for funds, and could designate one state as the lead.

We recommend that the Assistant Secretary for the Office of Grants and Training:

Recommendation #7: Develop a grant process to support non-urban, multi-jurisdictional preparedness programs on a regional level.

Prioritization Challenges

Congress and the President have conferred enormous responsibilities upon DHS, requiring the department to embrace an ambitious mission. For DHS to effectively address its vast overall mission and significant responsibilities in food defense and critical infrastructure protection, it must allocate its resources and efforts in line with clear and rational priorities.

Secretary Chertoff has frequently stressed the use of risk management techniques to prioritize the department's activities. In his prepared remarks for a March 2005 speech, the Secretary endorsed a "risk-based approach" to guide DHS operations and target resources. He directed the department to prioritize its undertakings on the basis of three variables – threat, vulnerability, and consequence.[78]

Notwithstanding this guidance, the department's approach to food-sector-related work has not always been guided by risk in a clear, consistent way. Rather, multiple approaches to prioritizing efforts have been employed across different units within DHS. Further, we encountered little consensus on how the different elements of risk rate with respect to post-harvest food. Disparate views in these areas are likely to persist if the

[78] DHS Secretary Michael Chertoff, Prepared remarks delivered at George Washington University's Homeland Security Policy Institute on March 16, 2005. (http://www.dhs.gov/dhspublic/display?theme=42&content=4392)

department continues to apply inconsistent approaches in evaluating the elements of food sector risk.

Of the DHS components working with the food sector, Grants and Training has perhaps the most anomalous and complex approach to risk. Grants and Training's approach to prioritization can be seen as consisting of two parts. First, Grants and Training prioritizes support for activities based on how and whether they advance preparedness goals. Second, Grants and Training allocates funds to different applicants based on assessments of their applications and the level of perceived risk associated with their jurisdiction or geographical area. Neither of these approaches to prioritization portray the level of risk to the food sector in a clear and transparent way. Further, the second approach does not fully account for food sector risk.

To determine which preparedness activities to support, Grants and Training began by considering the nation's response requirements. The Office of Grants and Training's mandate under Homeland Security Presidential Directive 8 is to prepare the nation for hazards of all kinds – natural and manmade, intentional and inadvertent. To determine how to prioritize its preparedness efforts, Grants and Training developed a series of *scenarios* intended to represent a broad range of catastrophic events that could occur. Grants and Training used these fifteen scenarios – one of which dealt with food contamination – to determine which *tasks* the nation needed to be prepared to perform to address these threats.[79] Grants and Training, in turn, took these tasks and grouped them into three dozen *capability requirements*. Finally, Grants and Training, in consultation with homeland security stakeholders and in consideration of national, state, and urban area homeland security strategies, identified a subset of *priority capabilities*. Although "food and agriculture safety and defense" is listed as a capability requirement, it was not selected as a priority capability.[80] Grants and Training thus notes the need for the development of food defense capabilities, but does not place a high priority on that effort.

In addition to priority capabilities, the *National Preparedness Goal* identifies "overarching priorities," that are not capability-specific. One of these overarching priorities – implementation of the *National Infrastructure Protection Plan* – addresses food critical infrastructure protection in part.

[79] DHS, *National Preparedness Guidance, Homeland Security Presidential Directive 8: National Preparedness*, April 27, 2005, pp. iii, and 3.
[80] DHS, *Interim National Preparedness Goal*, March 31, 2005, pp. 7, 10.

DHS' judgments about priority capabilities and overarching priorities, however, are not the only factor in determining what activities preparedness funds support. States also have an important role in determining how Grants and Training funds are ultimately spent. Much of Grants and Training's support of preparedness efforts is channeled through state governments. Grants and Training requires states to develop state-based homeland security strategies and set priorities within the scope of those strategies. Some states place particular emphasis on post-harvest food security in their homeland security strategies, and, in turn, support related priorities with funding distributed through Grants and Training's State Homeland Security Program. Conversely, because DHS does not require states to address all target capabilities in their strategies, or food and agriculture safety and defense in particular, a number of states might not use any State Homeland Security Program funding to sponsor efforts in this area.

Grants and Training's past analysis of Fiscal Year 2004 state homeland security plans revealed that states planned initiatives in 14 different areas to address agroterrorism threats. Such initiatives ranged from vulnerability and risk assessments to exercises, and from information sharing and surveillance to public outreach. While several states and territories planned a broad complement of related activities, 13 states did not present any initiatives to address agroterrorism in their Fiscal Year 2004 Homeland Security Strategies, according to Grants and Training.

We could not ascertain which states were or were not *currently* performing Grants and Training-supported state food safety and defense activities because Grants and Training does not regularly track states' activities in each of the target capability areas. Nor does Grants and Training track state and urban area support for food sector infrastructure protection activities. Grants and Training does, however, monitor state capability development priorities outlined in their homeland security strategies. For their 2005 State Homeland Security Strategy submissions, Grants and Training asked states to identify three to five additional capabilities that are priorities for them beyond DHS' priority capabilities. In response, nearly one-third of states identified food and agriculture safety and defense as a state priority.

Funds for Grants and Training's largest grant programs are allocated in line with appraisals of the quality of the grant applications, and the level of perceived risk associated with a particular jurisdiction or geographical area. Grants and Training derives these assessments of risk from Infrastructure Protection's Risk Management Division. In determining the

level of risk associated with a particular state or urban area, Risk Management Division considers the infrastructure assets in the area, population factors, other area attributes, and related threat information. The complex analysis underpinning these risk determinations specifically accounts for the presence of and risks to assets in 14 of the 17 recognized infrastructure sectors. It does not, however, include any specific reference to or coverage of post-harvest food assets.

The risk analysis undergirding Grants and Training's geographic allocation of funds partially accounts for threat of food contamination in other ways. It accounts for the possibility that the assets included in the analysis might be subject to a food contamination incident as part of the process of assessing their level of risk. So while the overall risk analysis does not account for the risk of food contamination at a food processing facility that could in turn affect people around the country, it does address the possibility of food contamination at schools, stadiums, and other assets. The risk analysis also considers some other factors, like a city's population, that could impact a food contamination incident's effect. Still other factors weighed in the analysis might, in part, reflect food-related threats or incidents. Another factor applied to the risk formula for states – state total agriculture sales – could serve as a proxy for the volume of foods produced in a state, though it does not account for the volume of foods processed, transported, stored, sold, or prepared. Even so, no comparable factors are considered in the risk analysis for urban areas.

Although Grants and Training's support of food defense and critical infrastructure protection activities cannot be easily understood in terms of risks to the food sector in particular, the prioritization efforts of other DHS units can. The prioritization conclusions staff in these units reached were not, however, consistent with one another. DHS staff, contractors, and grantees we interviewed had sharply discrepant views on the level of risk associated with an attack on the food sector. Some DHS perspectives on food sector risk, including those of senior managers, did not appear to be fully informed by information available to other parts of the department.

In 2003, after conducting a risk assessment on the subject, FDA reported to Congress that there was a "high likelihood, over the course of a year, that a significant number of people will be affected by an act of food terrorism or by an incident of unintentional food contamination that results in serious foodborne illness."[81] While some DHS representatives have embraced this perspective on food sector risk, it is a view that was not supported by a number of key DHS managers.

[81] FDA, *Risk Assessment for Food Terrorism and Other Food Safety Concerns*, October 13, 2003.

Differences in DHS perceptions about food sector risk extended to all of the elements of risk. DHS staff perspectives on food sector threats, vulnerabilities, and consequences ranged from low to high. The distribution of views on food sector vulnerabilities provides a useful illustration.

Most experts we spoke with regarded the food sector as highly vulnerable to attack. They considered food sector security to be less intensive than the security for other critical infrastructures. In addition, they noted the openness and international dimensions of the food supply chain as other factors contributing to its vulnerability. By contrast, one senior Office of Infrastructure Protection manager maintained that the food sector's vulnerability was not very high because "food contamination is naturally tested for in food safety systems." While this statement is not wholly inaccurate, it reveals an important misconception. Existing food safety operations to a very large extent have been structured to address naturally occurring food contaminants and contaminants that may be inadvertently introduced into food products. Until recently, these operations have not focused on detecting the kinds of agents that experts expect someone might use in the intentional contamination of food. As a result, their capacity to mitigate such threats is still limited.

In another noteworthy case, a CBP manager expressed the view that the loss of life associated with a food contamination event was likely to be restricted to a hundred or so persons. This perspective is at odds with a food contamination event model at the NCFPD, which projects losses of life in the tens of thousands for a particular type of contamination incident.

Misconceptions like this should not persist in a unit that has experts who are aware that food safety operations are not structured in a way to effectively address a number of food contamination scenarios. Yet we encountered other similarly misinformed perspectives among DHS managers on other occasions when better information was available elsewhere in the department.

In some cases, DHS thinking about the vulnerabilities of food sector assets and the consequences of an attack on them did not account for the most serious threats to these assets. DHS has funded the production of several Buffer Zone Plans on food industry assets that do not discuss the possibility of contaminating food at these facilities. Whereas the intentional contamination of food would perhaps most likely result from an insider threat, Buffer Zone Plans concentrate on threats "outside the fence," and seek to create a buffer zone around facilities. Accordingly,

Buffer Zone Plans that do not account for the threat of food contamination are not necessarily deficient. Rather, they may simply add less value to the protective environment of food facilities than more comprehensive analyses.

DHS has also funded the development of an automated tool to evaluate the consequences of terrorist attacks on different assets, but did not include food contamination among the possible modes of attack. The Gross Consequence of Attack tool provides high-level assessments of the consequences of 20 different modes of attack, many of which may be regarded as more technically challenging or less consequential than food contamination. The tool examines, for example, the consequence of aerial releases of chemical and biological agents at particular facilities, though the aerisolization and delivery of many chemical and biological agents presents major technical hurdles that contaminating food with the same agents does not. Despite this omission, the department planned to run the tool on all assets in the National Asset Database to help determine which were more consequential. Because the tool does not account for the most serious mode of attack on food assets, the maximum potential consequence of an incident affecting these assets will be greatly underrepresented in any resulting analysis.

DHS is not likely to achieve internal consensus on food sector vulnerability until there is agreement on what tool or tools to use to measure it. Disagreement among DHS and its federal partners on the tool to use for food sector vulnerability assessments might have contributed to uneven vulnerability assessment practices across DHS units.

DHS' Office of Infrastructure Protection and S&T have funded CARVER and CARVER+Shock assessments of food systems and assets. CARVER+Shock is a prioritization tool originally developed by the Department of Defense that has been adapted to assess food sector vulnerabilities. CARVER+Shock examines the criticality, accessibility, recuperability, vulnerability, effect, recognizability, and shock from the disruption or loss of a particular asset or system to help develop protective measures.

In the past, the Office of Infrastructure Protection funded such assessments through its support of Site Assistance Visits and Buffer Zone Plans in the food sector. The Office of Infrastructure Protection's Risk Management Division's support of the CARVER tool in the food sector has, however, ceased. S&T's National BioDefense Analysis and Countermeasures Center is funding the conduct of two CARVER+Shock assessments by the Food Safety and Inspections Service. Meanwhile, the

Office of Infrastructure Protection's Infrastructure Partnerships Division is providing support for the FBI-led Strategic Partnership Program Agroterrorism Initiative, which employs CARVER+Shock. This support continues despite DHS' past endorsement of the competing Risk Analysis and Management for Critical Asset Protection methodology for all critical infrastructure protection efforts.[82]

As S&T and the Office of Infrastructure Protection's Infrastructure Partnerships Division support large scale plans to move forward with CARVER+Shock assessments of food sector subsystems, another DHS component is supporting an effort to employ a different assessment methodology. As noted earlier, the Office of Grants and Training has provided a $2 million grant to the University of Tennessee to develop an agroterrorism assessment training program. Under current plans, the program will encourage program participants to focus on an Operational Risk Management approach to assessment, as well as CARVER+Shock.

For DHS to resolve differences in the appraisal of food sector risk, the department must take several steps. In particular, DHS must embrace a common approach to food sector vulnerability assessment, develop more internal expertise on food defense matters, improve coordination among affected staff in the department, and strengthen communication with experts outside DHS. In addition, DHS must ensure that formal assessment tools used in the food sector are similar to or compatible with those applied in other infrastructure sectors.

Without departmental consensus on the level of overall food sector risk or any of its elements, DHS cannot be expected to rationally apportion its resources and efforts across the full range of infrastructure sectors. As the basis for their decisions on how to allocate resources and efforts across infrastructure sectors, DHS managers could point to no document that rated risk across all sectors and ranked them accordingly. What is more, DHS managers cannot, at present, refer to a standardized consequence and vulnerability assessment instrument to measure these elements of risk across sectors.

DHS managers have had to make difficult choices about apportioning resources and efforts across different infrastructure sectors without the benefit of a clear consensus on cross-sector priorities. In more than one case, DHS managers reportedly assigned risk and priority across infrastructure sectors using rather informal approaches. Protected Critical Infrastructure Information program staff advised us that they determined

[82] DHS, *Draft NIPP*, November 2, 2005, p. 125.

which sectors to target for outreach activities by discussing among themselves what sectors, "as a public citizen, they would be most concerned about." For Protected Critical Infrastructure Information program staff, food was chosen as one of the sectors of highest concern. Homeland Security Information Network staff reportedly applied a similar approach and arrived at a similar conclusion – the food sector was among their priorities, as well.

Despite these informal conclusions that the food sector should be a high priority, the department devotes fewer resources to it than at least one other sector. The transportation sector receives dedicated funding for mass transit, port, and aviation security, each of which exceeds DHS' funding for food and agriculture security. Other sectors, like the chemical and nuclear sectors, are also the focus of intensive programs and funding. In considering the level of support received by the food sector relative to other infrastructure sectors, some food and agriculture security experts questioned whether the department has directed sufficient resources to improve the sector's protective posture. Until a thoughtful consensus on cross-sector risk emerges, however, it is difficult to assess the merits of this critique.

While a fully comprehensive and well-founded solution to cross-sector prioritization may be some time off, less ambitious efforts to prioritize efforts are in order at this time. There is an immediate need for prioritization across the food and agriculture sectors.

DHS' current patchwork of programs, initiatives, and staff supporting food sector defense and critical infrastructure protection more often than not also support agricultural defense. This bundling of pre- and post-harvest food responsibilities is evident, for example, in the Government Coordinating Council and Sector Coordinating Council, as well as a number of Grants and Training-funded initiatives. The institutional habit of addressing these threats with shared resources is, to a large extent, an outgrowth of the fact that the two share a common "farm-to-table" continuum. Allocating common resources across food and agriculture is often sensible, as adverse events affecting one part of the continuum tend to have negative consequences elsewhere along the supply chain.

It may not be necessary or wise to completely separate activities supporting food defense from agricultural defense, but it is important to monitor the balance of efforts devoted to one or the other and determine which of the two should receive greater attention. At present, little attention has been spent on tracking the balance of DHS effort devoted to the post-harvest food sector as compared to agricultural defense. Due to

the intense bundling of the food- and agriculture-related efforts, it is difficult to discern the effective level of prioritization attached to post-harvest food defense.

Though we were unable to separate expenditures between the two subsectors, it appeared to us that pre-harvest agricultural defense was receiving more support than post-harvest food defense. This seemed to be the case both from an overall program perspective and within bundled programs and activities.

Pre-harvest activities receive considerable direct attention in the department's efforts, while post-harvest food rarely received comparable attention. On the pre-harvest side, for example, S&T manages the Plum Island Animal Disease Center ($60.0 M) in addition to a Center of Excellence on Foreign Animal and Zoonotic Disease ($6 M). Meanwhile, Grants and Training supports what appear to be exclusively pre-harvest course development and training initiatives at Kirkwood Community College ($3.2 M) and the Center for Domestic Preparedness ($0.8 M). By contrast, DHS only sponsors two programs with a primarily post-harvest orientation, the National Center for Food Protection and Defense ($5 M) and Food Biological Agent Detection Sensor ($3.6 M). Overall, DHS spends eight times more on pre-harvest programs than programs with a post-harvest focus.

Within bundled DHS programs and activities, more often than not pre-harvest efforts appeared to be ascendant. A pre-harvest orientation is, for example, evident with respect to some of Grants and Training's related programming. Louisiana State University's agroterrorism preparedness and response course, for example, is focused primarily on the pre-harvest parts of the supply chain; only about one twentieth engages post-harvest food defense.

DHS personnel working on food and agricultural issues also tend to have a pre-harvest orientation. Almost all of these staff have backgrounds in animal health, while only a few have direct experience related to post-harvest food. This is an important distinction because, as one government representative noted, there is a "huge difference between being a vet and being a food safety expert."

The agriculture sector's comparative ascendance with respect to post-harvest efforts occurs despite the absence of an apparent management decision to prioritize agriculture over food. While we found no evidence of a clear, consistent management decision to prioritize pre-harvest activities over post-harvest activities, the recent attention to avian

influenza has driven many of the department's bundled internal resources to focus more intensively on the agricultural sector.

DHS and its federal partners need flexibility in apportioning resources to support pre- and post-harvest defense, as related levels of risk are subject to change over time. Nevertheless, it is important to develop shared perspectives on the relative risk of threats in the pre- and post-harvest portions of the farm-to-table continuum. Further, it is important for DHS to monitor the relative allocation of resources across food and agriculture to ensure that these are balanced in line with risk determinations.

DHS Fulfillment of its Responsibilities

In most areas of DHS food sector responsibility, the department has taken action to meet its obligations. It has done so despite the fact that a number of its related responsibilities were set out recently. Many of DHS' food-related responsibilities originated with the issuance of Homeland Security Presidential Directive 9 less than three years ago.

Despite this challenge, DHS has satisfied basic requirements in most areas of food defense and critical infrastructure protection responsibility. Nonetheless, to date, DHS has not fully met all of its food-related responsibilities. In two areas, we were unable to identify fully responsive DHS activities. First, DHS has not collaborated with USDA and FDA to prepare and submit an integrated food defense budget plan to the White House. Second, DHS has yet to develop adequate standards or processes for integrating food sector vulnerability assessments through the development of common consequence and vulnerability standards and guidance.

Table 3. DHS Execution of Food-Related Responsibilities

DHS Execution of Food Related Responsibilities	
Critical Infrastructure Protection Management and Coordination	
Asset Identification and Mapping	✓
Information Sharing, Threat Awareness, and Warning	✓
Vulnerability Assessment	
Consequence Assessment and Modeling	✓
Protective Measures and Prioritization	✓
Research & Development	✓
Education, Outreach, Training, and Preparedness	✓

Budget Coordination

Homeland Security Presidential Directive 9 established that, "for all future budgets, the Secretaries of Agriculture, Health and Human Services, and Homeland Security shall submit … an integrated budget plan for defense of the United States food system."[83] According to the department, the Homeland Security Council initially directed DHS to delay implementation of this requirement.

As DHS food defense spending has increased and its related programs have grown, so have the benefits of coordinating food defense budgets with USDA and HHS. Yet almost three years after Homeland Security Presidential Directive 9 issued, we did not see any evidence that DHS was complying with this requirement.

When we queried about DHS' plans to satisfy its budget coordination obligations under Homeland Security Presidential Directive 9, one Office of Infrastructure Protection manager advised that the resource prioritization process in the *NIPP* would fulfill the department's budget coordination requirement. There is, however, an important difference between the Homeland Security Presidential Directive 9 requirement and the resource prioritization process in the *NIPP*.

The process outlined in the *NIPP* relates to overall national protective prioritization, not the formulation of integrated budget plans for each sector. The requirement in Homeland Security Presidential Directive 9

[83] *Homeland Security Presidential Directive 9: Defense of United States Agriculture and Food*, January 30, 2004, paragraph 26.

focuses on maximizing efficiency among the federal departments responsible for food defense, whereas the process outlined in the *NIPP* is not specific to any infrastructure sector.

To meet its responsibilities under Homeland Security Presidential Directive 9, we recommend that the Under Secretary for Preparedness, in conjunction with the Under Secretary for Science and Technology:

Recommendation #8: Work with HHS and USDA to prepare an integrated food defense budget plan for Fiscal Year 2009 using a process that satisfies Homeland Security Presidential Directive 9 requirements.

Vulnerability Assessment Standards

Homeland Security Presidential Directive 7 mandates that DHS "establish uniform policies, approaches, guidelines, and methodologies for integrating [f]ederal infrastructure protection and risk management activities within and across sectors."[84] To satisfy this mandate, DHS must establish uniform approaches to the assessment of vulnerability – a key ingredient of risk.

To date, DHS actions have contradicted its responsibility in this regard. Rather than pursuing a uniform approach to food sector vulnerability assessment, DHS is supporting a number of approaches and has not set clear standards to ensure compatible assessment results.

After September 11, 2001, FDA and Food Safety and Inspections Service conducted initial vulnerability assessments of the food industries they regulate. While each of these assessments rated the vulnerability and criticality of particular steps in the production, processing, distribution, and retail of the products they regulated, the two efforts employed different methodologies. A White House-based subcommittee later directed the two agencies to apply a common approach to vulnerability assessment. FDA and Food Safety and Inspections Service thus came to use the CARVER+Shock assessment methodology.

FDA and Food Safety and Inspections Service have subsequently used CARVER+Shock to conduct numerous vulnerability assessments. Staff from these organizations reported that experts from the two agencies have scored steps in the supply chain of similar food products similarly using

[84] *Homeland Security Presidential Directive 7: Critical Infrastructure Identification, Prioritization, and Protection*, December 17, 2003, paragraph 14.

CARVER+Shock. Although use of CARVER+Shock may lead to parallel conclusions for the same or similar products, the difference in the agencies' regulatory cultures and areas of statutory emphasis could contribute to important differences of opinion in certain areas.

Perhaps for these reasons, some Office of Infrastructure Protection staff regard CARVER+Shock as unscientific and inexact. One senior Office of Infrastructure Protection manager expressed the view that CARVER is "totally subjective," leading to vulnerability determinations that are the "best guess" of those completing the assessment. Our review of CARVER assessments in Buffer Zone Protection Program and Site Assistance Visit reports tended to support this assessment. CARVER assessments for the same facility type conducted during the same month, for example, produced very different scores from one report to the next. A CARVER assessment of one dairy plant rated the vulnerability and criticality of a particular production node to be three times greater than another assessment on the same node of a different plant. Because the accompanying narratives do not provide comparable information on facility production or security features it is not possible to determine whether these scoring discrepancies can be justified.

Office of Infrastructure Protection staff in the Risk Management Division regard the Risk Analysis and Management for Critical Asset Protection as a more objective, precise process that can be tailored to the food sector. This view was reinforced by the *Draft NIPP*, which stated that, "ideally, all asset owners and operators will use the Risk Analysis and Management for Critical Asset Protection methodology to assess their assets once the methodology is finalized."[85]

The tension between advocates for one assessment methodology or the other was palpable during our interviews. Food industry and government representatives in other departments have not embraced DHS' support of the Risk Analysis and Management for Critical Asset Protection assessment methodology over CARVER+Shock. A Food Safety and Inspections Service representative underscored the fact that the White House had instructed the food sector to use CARVER+Shock as its standard vulnerability assessment tool, and expressed dismay that DHS sought to shift to another tool. FDA and USDA had collaborated to apply CARVER+Shock to the food and agriculture sectors. They were not keen on shifting to another tool. Some industry representatives are also reluctant to embrace a new vulnerability assessment tool, as they considered the familiar CARVER+Shock to suit their needs.

[85] DHS, *Draft NIPP*, November 2, 2005, p. 125.

Despite DHS' early stand in favor of Risk Analysis and Management for Critical Asset Protection, the food sector's support for CARVER+Shock remains unabated. Perhaps the best expression of this is the tool's use in the largest current food sector vulnerability assessment initiative. Announced in July 2005, the Strategic Partnership Program for Agroterrorism Initiative is an FBI-funded effort to develop a comprehensive perspective on food and agricultural vulnerabilities by performing new assessments and validating old ones. FDA or USDA representatives serve as Strategic Partnership Program Agroterrorism assessment facilitators, while DHS, FBI, and state and local departments of health and agriculture, as well as volunteer private sector representatives, participate in these assessments.[86] Participants plan to complete 52 vulnerability assessments for food and agriculture subsectors by 2007.

Further confounding matters is the fact that different DHS components support different assessment methodologies. In practice, DHS is supporting three different approaches. As noted earlier, the National BioDefense Analysis and Countermeasures Center and the Infrastructure Partnerships Division currently support CARVER+Shock assessment initiatives, while Grants and Training sponsors a course development effort at the University of Tennessee based, in part, on Operational Risk Management. Meanwhile, Risk Management Division staff maintain that the only suitable approach is Risk Analysis and Management for Critical Asset Protection.

Although DHS has officially advocated the universal adoption of the Risk Analysis and Management for Critical Asset Protection assessment, the department has yet to develop final guidance and tools to support its use in the food sector. The Office of Infrastructure Protection reports that technical specifications for Risk Analysis and Management for Critical Asset Protection modules have been written for five infrastructure sectors, and that modules are in use in the nuclear power and chemical manufacturing industries. Despite progress in other sectors, DHS has not completed overarching guidance and sector-specific modules for the food and agriculture sector. Furthermore, an Office of Infrastructure Protection manager advised us that DHS has no short or medium term plans to proceed with the costly process of developing a Risk Analysis and Management for Critical Asset Protection module for the food sector.

[86] Center for Food Safety and Applied Nutrition, "Strategic Partnership Program Agroterrorism (SPPA) Initiative: A Joint Effort of the FBI, DHS, USDA, and FDA to Help Secure the Nation's Food Supply," August 2005; and Center for Food Safety and Applied Nutrition, "SPPA Initiative Questions and Answers," September 23, 2005.

Discord on the choice for an assessment tool is a point of major concern. If DHS ultimately determines that past USDA, FDA, and private sector CARVER+Shock assessments are not compatible with its baseline criteria for use in comparative risk analysis, then this large body of work will be rendered moot in cross-sector considerations. This concern becomes more pressing as the volume of CARVER+Shock assessments grows.

S&T reports that it has plans to engage its Centers of Excellence and the national labs to research "all available [assessment] tools and methodologies and then to develop, test, and field" a new sector specific tool to replace CARVER+Shock, in consultation with the sector. The need for action in this area is urgent. Those conducting food sector assessments should be able to proceed with the confidence that their efforts will be considered in DHS' comparative risk analysis. DHS must do as it has committed in the *NIPP*, and make a determination about the suitability of existing food assessment methodologies for inclusion in comparative risk analysis.[87] Further, DHS must establish how these assessments will be applied in a broader sector-specific risk methodology in collaboration with USDA and FDA. These reviews should proceed without delay. Accordingly, we recommend that the Assistant Secretary for Infrastructure Protection:

Recommendation #9: Expedite the review of existing food sector assessments to determine their suitability for use in comparative risk analysis, and collaboratively identify the role of these assessments in the sector-specific risk methodology.

Additional Staff Support Needed

Although DHS has addressed the remainder of its basic food sector responsibilities, public and private sector partners did not characterize the department's activities in many of these areas as particularly effective.

DHS would be better equipped to acquit its responsibilities if it devoted more staff resources to the post-harvest food sector. As noted earlier, the public and private sector viewed DHS staff currently working on post-harvest issues as professional and dedicated. DHS simply needs additional expertise to address its responsibilities in the sector. In all of DHS, we encountered only nine staff who attend to post-harvest food defense issues as a significant portion of their duties. Two left the

[87] DHS, *NIPP*, June 30, 2006, p. 146.

department during the course of our review. The remaining seven have more expertise in pre-harvest than post-harvest food issues, and almost all of them devote the bulk of their time to pre-harvest matters.

Without an internal audience that is receptive to post-harvest food issues and is knowledgeable in the field, much of the related work being done on the department's behalf will not be developed or leveraged to its full potential. In our view, the paucity of qualified and engaged DHS staff has contributed to the internal and external coordination and prioritization challenges discussed in this report.

Several individuals we interviewed saw the large contractor contingent within DHS' food sector staff as a detriment. They expressed frustration that contractors who were not able to speak on DHS' behalf were their principal points of contact for the department. Because DHS contractors did not have the authority to command the department's resources, they were perceived to have little to offer in interagency forums. Some representatives of other departments added that they had concerns about the potential for high turnover among DHS' contractor base. Finally, one government representative outside DHS said that he thought some of DHS' contractors were overstating threats to food and agriculture in order to ensure the renewal of their contracts. These perceptions have damaged DHS' relationship with its food sector partners.

We recommend that the Assistant Secretary for Infrastructure Protection, Under Secretary for Science and Technology, and Chief Medical Officer:

Recommendation #10: Pursue the recruitment, hiring, and retention of several additional staff with expertise in matters of post-harvest food defense.

Opportunities for Additional Work

While DHS must position itself better to address its full range of food defense responsibilities, it also could take steps to support food defense in areas in which the department has established core competencies and skill sets. If DHS takes action in these areas it could contribute usefully where other federal partners may have less developed programs. These areas include food imports, food in transit, consequence modeling and simulation, exercise support, situational awareness, and protective measure initiatives.

Food Imports

USDA trade data suggest that the United States imported $76.7 billion in food for human consumption 2005. That year, more than 4.5 million shipments of food entered the United States from abroad. These imported foods account for approximately 11% of food consumed in the United States according to USDA Economic Research Service estimates.[88]

Imported foods have been linked to a number of significant foodborne illness outbreaks in the United States. In 2003, hundreds of restaurant patrons in four states became ill with hepatitis A after consuming contaminated green onions from Mexico.[89] In 1996 and 1997, Guatemalan raspberries were linked to more than 2,500 *Cyclospora* infections throughout the United States and Canada. *Salmonella* from Mexican cantaloupes afflicted about 25,000 Americans in 1989.[90]

Beyond their public health effects, foodborne illness outbreaks have economic repercussions. And the adverse economic effects of foodborne illness outbreaks from imported foods are frequently distributed across all producers of the food product and its agricultural inputs, both domestic and foreign. A USDA examination of three cases of foodborne illness from imported foods found that: "In each case, damage was not limited to the producers of the contaminated product. Anyone producing a product for the U.S. market, including U.S. growers, may be caught in the consumer backlash against a product ..."[91]

The risk of contamination of imported foods is increased by the potential for product tampering and adulteration. Terrorists could adulterate foods for U.S. consumption without entering the country. Indeed, many food imports originate or transship through countries with well-articulated terrorist organizations. CBP reports that there were 203,403 commercial entries[92] of food products from "special interest countries" – countries that present a potential terrorist threat to national security – into the United

[88] Jerardo, Andy. *Import Share Of U.S. Food Consumption Stable At 11 Percent*, FAU-79-01, July 2003, p. 1.
[89] CDC, "Hepatitis A Outbreak Associated with Green Onions at a Restaurant --- Monaca, Pennsylvania, 2003," *MMWR Weekly* 52(47), November 28, 2003. pp. 1155-1157.
[90] FDA, "Risk Assessment for Food Terrorism and Other Food Safety Concerns," October 13, 2003. (http://www.cfsan.fda.gov/~dms/rabtact.html).
[91] USDA, Economic Research Service. *International Trade and Food Safety: Economic Theory and Case Studies*. November 2003. p. 93.
[92] In this context, a "commercial entry" refers to an "entry line," or single shipment of merchandise that importers submit to CBP for release into U.S. commerce. These entries may take the form, for example, of a cargo container off a ship or lesser quantities of goods filling a portion of a container or a mailed parcel.

States in 2005.[93] According to CBP statistics, the volume of food products imported from these nations has increased 77% since 2000.

While threat of contaminated food products entering the United States from abroad is worth noting, it can be overstated. Limitations on the survivability of some possible threat agents, security measures to prevent product theft abroad, and careful quality controls for many imported goods, combine to reduce vulnerabilities. In addition, imported food items are often subject to extensive processing before they reach American consumers.

CBP addresses the risks posed by imported foods through activities in at least four areas. First, as discussed earlier, CBP has taken an active role in supporting FDA and USDA in targeting imported foods for additional scrutiny and inspection. CBP assisted in the creation of targeting rules for FDA's prior notice requirement, and for USDA's Animal and Plant Health Inspection Service. In addition, CBP is moving forward with the development of another rule set for the Food Safety and Inspections Service, which was to have been piloted recently.

CBP has also supported federal food partners with trade data and systems access. CBP worked closely with FDA to establish its Prior Notice Center, which is co-located with CBP's National Targeting Center. CBP also has been active in an interdepartmental Food Safety Working Group to develop an integrated food import process and information systems to address related hazards, including those presented by intentional contamination.

Additional food defense activities may develop under CBP's Director of Agricultural Bioterrorism Countermeasures within its Office of Field Operations. Preliminary plans reportedly call for CBP's Agricultural Bioterrorism Countermeasures program to speed the development of additional food targeting criteria, and help train inspectors to enhance their ability to recognize and interdict bioterrorism threats.

Other CBP opportunities to improve food defense rest with a major private sector trade partnership initiative. Through the Customs-Trade

[93] This figure reflects the number of commercial entries of food products for human consumption. Food products for human consumption were identified using Harmonized Tariff Schedule codes associated with imported merchandise. The OIG, in consultation with a CBP agriculture trade specialist, developed a list of Harmonized Tariff Schedule codes representing products for human consumption by adjusting an FDA listing of import codes subject to prior notification requirements. The OIG modified this listing to ensure the inclusion of all products for human consumption, including those regulated by USDA, and the exclusion of products that principally serve as animal feed. A listing of the tariff codes used in this analysis is available from the OIG upon request.

Partnership Against Terrorism, CBP is attempting to improve supply chain security and reduce the chance that dangerous cargo enters the United States. In exchange for expedited processing and more limited inspection, private sector participants provide CBP with supply chain security profiles and commit to implement agreed to security measures. Launched in November 2001, the Customs-Trade Partnership Against Terrorism now has more than 5,700 certified members, including importers, customs brokers, terminal operators, carriers and foreign manufacturers.[94]

Customs-Trade Partnership Against Terrorism members account for a significant share of total food imports. In 2005, members were associated with 18% of imported foods. That year, Customs-Trade Partnership Against Terrorism members also accounted for 23% of food imports from special interest countries.

While the Customs-Trade Partnership Against Terrorism provides generic guidance and specifications for supply chain security, the program could do more to help secure the food industry's supply chain. At present, Customs-Trade Partnership Against Terrorism security guidelines are less detailed and targeted than optimal from a food defense perspective. Available FDA and Food Safety and Inspections Service guidelines are more detailed than the Customs-Trade Partnership Against Terrorism guidance on the actions importers can take to improve security of the food supply. FDA, for example, lists 11 different management actions that can be taken to prepare for possible tampering events. These include various strategies for dealing with a food contamination event, such as internal and external communication plans and maintenance of floor and food flow plans in a secure location.[95] The Customs-Trade Partnership Against Terrorism could use these or other similar guidelines as the basis for a separate program guideline for food importers. To ensure consistency with the Customs-Trade Partnership Against Terrorism mission of countering terrorist threats, rather than improving food safety, such guidance should focus on preventing and addressing food adulteration or the intentional introduction of animal or zoonotic disease.

Short of the elaboration of separate security guidelines for food importers, the Customs-Trade Partnership Against Terrorism program could include references to existing food security guidelines in its security profile guidance. Program materials currently recommend training programs on

[94] CBP, **"**Remarks of Acting Commissioner Deborah J. Spero," Customs-Trade Partnership Against Terrorism Conference, March 1, 2006. (http://www.cbp.gov/xp/cgov/newsroom/commissioner/speeches_statements/03012006_ctpat_conf.xml)

[95] FDA, "Guidance for Industry - Importers and Filers: Food Security Preventive Measures Guidance," March 21, 2003. (http://www.cfsan.fda.gov/~dms/secguid7.html)

security, but do not list USDA and FDA food importer guidelines as a training resource. At minimum, Customs-Trade Partnership Against Terrorism should expand awareness of these products.

We recommend that the Commissioner of Customs and Border Protection:

Recommendation #11: Consider the elaboration of food-specific criteria and guidelines for Customs-Trade Partnership Against Terrorism food industry firms in collaboration with FDA and USDA.

Food in Transit

Homeland security officials appreciated early that the transportation of food products represented a point of particular vulnerability in the food supply chain. In February 2003, the White House Office of Homeland Security noted that the food sector depends on "transportation system owners and operators … to meet the safety and security standards necessary to protect food products in transit."[96] A security failure in this area could have significant consequences, as food products in transit are sometimes distributed to a number of locations.

Findings from a recent report by the American Transportation Research Institute highlight the need for additional work in this area. In January 2005, the Research Institute released a USDA-funded report on food transit security and the perspectives of food carriers, including a survey of motor carrier firms. The American Transportation Research Institute reported that a leading concern among survey respondents was security at rest stops and parking areas. Some carriers, especially those using a higher percentage of contracted drivers, also labeled personnel issues as a major concern. Indeed, the Research Institute noted that some trucking companies have 100% annual staff turnover.[97] Weaknesses in rest stop and personnel security provide openings for the deliberate contamination of food products. Further, contamination at these points in the supply chain could be difficult to trace or attribute.

DHS seeks to improve personnel security in the transportation arena through its Transportation Worker Identification Card program. The Transportation Worker Identification Card program aims to create a secure credential for transportation workers to use in accessing key transportation

[96] The White House, Office of Homeland Security. *The National Strategy for the Physical Protection of Critical Infrastructure and Key Assets*, February 2003, p. 39.
[97] American Transportation Research Institute, *Identifying Vulnerabilities and Security Management Practices in Agricultural and Food Commodity Transportation*, January 2005, pp. 4, 6, 8, and 9.

facilities, including seaports, airports, trucking, and rail facilities. In exchange for the Transportation Worker Identification Card credential, transportation workers who enroll in the program provide documentation to verify their identity and submit to a security threat assessment. By providing a more secure credential and performing threat assessments on transportation workers through the Transportation Worker Identification Card program, DHS expects to reduce unapproved individuals' access to key facilities. The Transportation Worker Identification Card program is currently in its initial roll out phase targeting workers who access maritime facilities.

DHS has another program with the potential to improve rest stop and parking area security for food transporters. A current DHS program targeting motor carrier operators and other highway professionals, Highway Watch, provides a possible means for increasing awareness and reporting in this area. Highway Watch is a national transit security program funded though a cooperative agreement with TSA. Outreach and training about security risks are key features of the program. Another central feature of the program is its National Call Center, which handles calls from highway professionals who report suspicious activity or safety concerns.

Although Highway Watch currently devotes no specific attention to threats to food in transit, it has potential to improve the protective status of food in transit. By using current training and outreach activities to raise awareness of the potential for food adulteration, for example, Highway Watch could improve transporter reporting of suspicious activities in the vicinity of tankers and freighters carrying food items. If increased sensitivity in this area were coupled with commodity-specific call center statistics, DHS could develop valuable leads about efforts to infiltrate food shipments and potentially prevent the theft or adulteration of food products in transit.

DHS also can do more to study and disseminate information on the application of tracking and seals technologies to the transportation of food. DHS is currently sponsoring a related effort at the University of Kentucky. Funded by S&T, this project explores means of tracking milk product through the early stages of the supply chain for the purpose of increasing security. Additional research into the ways that other technologies can be applied to the security of food in transit may help increase the adoption of these technologies by food industry transporters and reduce vulnerability to food adulteration at a number of points in the supply chain.

We recommend that the Under Secretary for Preparedness:

Recommendation #12: Study ways to integrate food defense awareness into existing transportation security programs fully and consider additional research to improve the security of food in transit.

Exercise Support

Food contamination exercises provide key learning opportunities for food sector representatives, and generate valuable lessons about how the response to a food-related incident is likely to proceed. Sector Coordinating Council and Government Coordinating Council representatives said that they found food contamination exercises to be very instructive. Meanwhile, experts in infrastructure modeling reported that exercises provide them with important information about how different groups are likely to respond in an event, and that this information critically informs their modeling and simulation efforts.

DHS has extensive experience in the conduct, facilitation, and support of homeland security exercises. As of June 2006, Grants and Training had provided direct support for 1,149 exercises through its Exercise and Training Division, and provided financial support for an additional 299 exercises through its Urban Areas Security Initiative and State Homeland Security Program grants. In addition, Grants and Training sponsors and coordinates a major biennial top officials (TOPOFF) exercise drawing in representatives from a broad sweep of federal, state, and local agencies and the private sector. In total, Grants and Training has expended more than $317 million on Urban Areas Security Initiative, State Homeland Security Program, and TOPOFF exercises since DHS' formation. It also provides technical support and sets standards for exercises through its Homeland Security Exercise and Evaluation Program.

In the context of its extensive overall exercise support program, DHS has provided little direct support for or attention to exercises relating to food contamination. Since 2003, DHS has provided direct support for only four post-harvest food-related exercises through Grants and Training's Exercise and Training Division. DHS has sponsored six additional post-harvest food contamination table-top exercises through the Multi-State Partnership for Security in Agriculture. And while the June 1, 2006 National Exercise Schedule listed a total of 226 exercises over the following year, it did not register a single post-harvest food-related exercise.

By devoting more attention to post-harvest food exercises, DHS can capitalize on valuable opportunities to gather information and improve preparedness. Participants in the exercises DHS has sponsored reported that their participation paid dividends in a number of areas. Exercise participants develop a richer understanding of the consequences of an event and their related decisions, identify preparedness needs, and learn about alternative responses.

In pursuing additional food contamination exercises, DHS should present scenarios that test the quality and extent of coordination that occurs when contamination events cross jurisdictional lines. Contaminated foods are frequently distributed across a broad geographic range before they are consumed. Food contamination incidents like this trigger mobilization and response from widely scattered local and state authorities in agencies with public health, food inspection, and agricultural missions. Research on foodborne illness outbreaks has demonstrated that outbreak investigations involving multiple jurisdictions result in slower responses than those conducted by a single jurisdiction. Food contamination exercises that involve a range of local, state, and federal authorities can help isolate factors that slow multi-jurisdictional response and identify solutions.

We recommend that the Under Secretary for Preparedness:

Recommendation #13: Expand efforts to sponsor food contamination event exercises with an emphasis on exercises spanning multiple state and local jurisdictions.

Consequence Modeling and Simulation

Effective modeling and simulation of homeland security incidents can improve our understanding of their consequences, and provide key information support to decision-makers during a related event. Modeling and simulation of food contamination incidents, however, has not developed to the extent desirable. In a 2002 report that advocated additional modeling and simulation of bioterrorism events, the Institute of Medicine reported that major uncertainties in our understanding of the impacts of a biological attack on food remained.[98]

[98] Institute of Medicine, National Research Council of the National Academies. *Countering Bioterrorism: The Role of Science and Technology*. Washington, DC: The National Academies Press, 2002. p. 29.

DHS has access to modeling tools and expertise that can be applied to understand food sector consequences better. DHS currently funds modeling and simulation efforts of the Critical Infrastructure Protection Decision Support System, the National Infrastructure Simulation and Analysis Center, and the National Center for Food Protection and Defense. These programs have developed promising models in several areas of the food supply chain. One of the National Labs, for example, has developed advanced models for the beef and corn production, processing, and distribution chains, including a wide array of corn-based products. Meanwhile, the NCFPD has developed food contamination models that predicted clinical illness within six hours of actual clinical data from a recent *E. coli* outbreak.

Collectively, related modeling initiatives have charted a fraction of the food industry. At the time of our fieldwork, these DHS-sponsored programs had developed detailed models or contamination scenarios for only the beef, dairy, corn, and fresh vegetable supply chains. Further, experts in all three of the programs acknowledged that their models for these supply chains needed further refinement, and could not account for the second- and third-order impacts of a major food contamination incident.

Because DHS models of food supply chains and simulations of food contamination events are not fully developed, the department cannot fully appreciate the consequences of an incident of this type. Indeed, even preliminary simulations of food contamination events affecting most food products have not been developed. As a result, the department's ability to assist decision-makers in many types of food contamination events is limited.

To understand sector dynamics more fully and provide better decision support tools for government officials and private sector leaders, existing food sector models should be expanded to additional product lines and different logistical pathways, to include the import and export processes. According to food system modelers we interviewed, existing modeling efforts could also benefit by a more in-depth understanding of the likely public health response to a large-scale food contamination event, as well as variations in this response across jurisdictions.

Consequence modelers should tap into ongoing food-related efforts in other areas to advance their food sector models and simulations. Modelers should participate, for instance, in the continuing Strategic Partnership Program Agroterrorism vulnerability assessments and exercises, in addition to working closely with biosurveillance programs.

Modeling efforts undertaken by the Critical Infrastructure Protection Decision Support System, the National Infrastructure Simulation and Analysis Center, and the NCFPD should complement one another. To this end, modelers at the NCFPD and the National Labs should collaborate formally, share information on modeling and simulation techniques, and exchange data on food product distribution, product consumption, and possible public health effects and responses.

We recommend that the Under Secretary for Science and Technology, and the Assistant Secretary for Infrastructure Protection:

Recommendation #14: Expand food sector modeling to other portions of the food supply chain for the purpose of improving food contamination event consequence assessment and decision support.

Situational Awareness

A recent end-to-end biodefense assessment conducted by the Homeland Security Council identified early warning and surveillance system development as a top priority for the nation.[99] Early warning could significantly reduce morbidity and mortality from a food contamination incident if the public is immediately notified about contaminated food products and less contaminated product is consumed.

DHS has the potential to increase situational awareness and early warning capabilities in this area through the National BioSurveillance Information System. A core component of the President's National Biosurveillance Initiative, the National Biosurveillance Integration System is designed to improve national biosurveillance capabilities by drawing in information from various existing federal information systems. In particular, the National Biosurveillance Integration System is "to combine and analyze information collected from human, animal and plant health, food and environmental monitoring systems."[100] Plans for the National Biosurveillance Integration System call for this information, in turn, to be interpreted by subject matter experts from several agencies, and ultimately melded with intelligence data.

[99] Elsa A. Murano, Under Secretary for Food Safety, USDA, Testimony before the Agriculture, Rural Development, and Related Agencies Subcommittee on the FY05 Appropriations for Programs Under its Jurisdiction, April 1, 2004. *and* DHS, *Budget in Brief, Fiscal Year 2005*, p. 51. (http://www.dhs.gov/interweb/assetlibrary/FY_2005_BIB_4.pdf)

[100] Office of Management and Budget, *The Budget of the United States Government, Fiscal Year 2006*, February 7, 2005, p. 37.

If properly implemented, the National Biosurveillance Integration System could help speed the characterization of foodborne illness outbreaks, reduce the detection time following an incident, and aid with agent identification. CDC officials report that, at present, "unusual but naturally occurring" food contamination events may not be seen by public health experts as intentional attacks for some time. When foodborne illness reports are coupled with intelligence information available to the National Biosurveillance Integration System, deliberate food contamination events may be recognized sooner.

The National Biosurveillance Integration System also has singular potential to identify contamination events affecting both animal and human health – a capability that could be especially valuable under certain contamination scenarios. In the case of contamination of foods that are used in both animal feed and fare for human consumption, for example, the National Biosurveillance Integration System may be able to accelerate the process of linking resulting animal and human illnesses and identifying the point of contamination.

While the National Biosurveillance Integration System has the potential to improve federal efforts to reduce the effect of adverse food-related events, at the time of our fieldwork it was not well-positioned to realize this promise due to its early stage of development. To fulfill its potential in this area, the National Biosurveillance Integration System must secure the active participation of experts from other federal agencies in monitoring incoming information. As of June 2006, however, the National Biosurveillance Integration System had secured the participation of only one detailee from a federal agency outside of DHS. Effective surveillance of food-related information will be aided by the engagement of FDA, CDC, and Food Safety and Inspections Service staff, none of which have committed representatives. DHS staff knowledgeable about the program reported that related negotiations with USDA were nearing completion, but that discussions with CDC and FDA about sharing information and providing staff support were still in their early stages.

In addition to securing qualified staff support from other agencies, the National Biosurveillance Integration System must integrate information from the full range of federal systems that monitor foodborne illness. Early plans for the National Biosurveillance Integration System only reflected the inclusion of information from two food-related health monitoring systems – a Food Safety and Inspections Service consumer complaint monitoring system and a system with data from food laboratories. Without information from other federal foodborne illness

monitoring systems, the National Biosurveillance Integration System may miss opportunities to identify and link related illness patterns. Other federal foodborne illness monitoring systems like the CDC's FoodNet, PulseNet, the Electronic Foodborne Outbreak Reporting System, and the USDA's Food and Agriculture Biosurveillance Integration System may be appropriate for inclusion in the National Biosurveillance Integration System. These systems support the reporting and surveillance of foodborne illnesses, tracking of and information sharing on illness-causing organisms, and health department advisories.[101]

We recommend that the Chief Medical Officer:

Recommendation #15: Evaluate the advisability and feasibility of integrating additional federal foodborne illness reporting, surveillance, and detection systems into the National Biosurveillance Integration System.

Protective Measure Initiatives

Food industry and government representatives reported that there is a need for additional guidance on specific food-related protective measures. One representative of a major food company said that she sought more detailed, specific information on possible protective measures. Other industry representatives said that they wanted guidance on what protective measures to put in place to address their greatest vulnerabilities and sought protective measures guidance they could provide smaller producers and suppliers.

DHS has issued food industry protective measure guidance at both the asset and subsystem levels. This guidance could be modified to satisfy the informational needs of food industry representatives more completely.

DHS has issued two types of asset-level protective measure guidance products – Buffer Zone Plans and Site Assistance Visits. Buffer Zone Plans are products of the Buffer Zone Protection Program, a joint effort between Grants and Training and the Office of Infrastructure Protection. Public and private infrastructure owners and state and local authorities develop Buffer Zone Plans with the assistance of Office of Infrastructure Protection field staff. The resulting plans identify vulnerabilities associated with facility buffer zones, and analyze and categorize the level of risk linked to these vulnerabilities. Seven Buffer Zone Plans have been

[101] For more information on these systems, see: http://www.cdc.gov/foodnet/, http://www.cdc.gov/pulsenet/, and http://www.cdc.gov/foodsafety/fsactivities.htm

completed on food sector assets. Perhaps because they focus on threats "outside the fence," in the areas surrounding facilities, Buffer Zone Protection Program reports on food sector assets do not always account for the threat of contaminating food within the facilities. As a result, the program's potential for mitigating threats to the food supply is greatly constrained. In any case, food sector assets represent less than one percent of the Buffer Zone Protection Program sites DHS had funded as of January 2006.

Site Assistance Visits combine vulnerability assessment and protective measure guidance. Between October 2003 and May 2005, DHS conducted six Site Assistance Visits of food sector assets. These reports describe general vulnerabilities and mitigation strategies for covered facilities. Possible biological contamination of food products is discussed in more detail than in reports produced under the Buffer Zone Protection Program. As a result, Site Assistance Visit reports are likely to be more valuable to food industry firms from a protective measures standpoint. Because they are facility-specific and usually classified, though, they offer little to the food industry at large.

DHS has also prepared and distributed two types of subsystem-specific reports relating to food sector protective measures. *Potential Indicators of Terrorist Activity* reports offer information about detecting possible terrorist activity, while *Protective Measure* reports identify suggested actions and best practices to diminish potential threats. These reports are distributed by DHS to state and territorial Homeland Security Offices, and are to be shared, in turn, with asset owners and law enforcement personnel.

Protective Measure and *Potential Indicators of Terrorist Attack* reports we reviewed were not fully developed in the area in which they had the potential to offer most to industry – in the recommendation of customized protective measures. The protective measures guidance we reviewed often proposed generic security measures and provided little or no information about specific steps that could be taken by firms with facilities in a particular subsector. In cases in which more specific guidance was provided, it was largely derivative. A *Protective Measures* report on the transportation of food and agricultural commodities, for example, repeatedly referred to published FDA and USDA guidance for transporters and added little new information. While these documents might provide useful information to law enforcement on the basic elements of food industry subsystems, information of this kind is not valuable to industry representatives who already have an intimate understanding of their operations. Perhaps as a result, even though these documents were

distributed with instructions to share them widely, private sector experts we spoke with reported very limited familiarity with them.

DHS should use its relationships with the Sector Specific Agencies, other government agencies, and industry to develop vibrant informational and analytical products that meet food industry interests and needs. To this end, DHS could identify food industry protective measure models and best practices and disseminate these more widely to improve the protective environment across the food industry. These products could also highlight useful technologies and methods to be applied to improve security at the operational level.

DHS could develop written products that fit this mold by building on asset-specific knowledge and tapping into ongoing assessment efforts. Although a senior Office of Infrastructure Protection manager said that no additional Site Assistance Visits are planned for the food sector in the foreseeable future, improved protective measures guidance could also glean from Site Assistance Visit reports covering new parts of the sector. Additional supporting analysis could be derived from work under the Strategic Partnership Program Agroterrorism program, the Homeland Infrastructure Threat and Risk Analysis Center, the National Center for Food Protection and Defense, and further engagement with the USDA, FDA, and the private sector.

We recommend that the Assistant Secretary for Infrastructure Protection:

Recommendation #16: Continue to develop and disseminate information about food subsystem-specific operational protective measures and operational best practices in collaboration with FDA and USDA.

Conclusion

While there is no consolidated DHS leadership attention to food defense and critical infrastructure protection, one unit in the department monitors and rates the food sector's progress in achieving some related objectives. The Office of Infrastructure Protection monitors the progress of critical infrastructure protection efforts in each of the federally recognized critical infrastructure sectors. The Office of Infrastructure Protection's evaluation of sector progress is captured in part in a sector report card, that tracks basic progress in laying the foundation for future critical infrastructure protection success in the sector. In its December 2005 report card, the Office awarded the food and agriculture sectors the highest performance rating in all three of its major sector status categories, and a "green light" for 19 of 22 sector metrics. Office of Infrastructure Protection officials have added to this warm assessment with statements that the food and agriculture sectors have "created the blueprint" in the critical infrastructure protection arena. This positive assessment does not coincide with the difficulties we encountered.

To improve overall U.S. food defense and critical infrastructure protection, DHS must execute its related responsibilities more effectively. Disjointed DHS work on defense of the food supply caused by the absence of a clear leader brought confusion in cases in which DHS made good faith efforts to work with partners. Confusion also prevailed when partners or potential partners made efforts to reach out to DHS on information sharing, consultation, and other coordination efforts. The recommendations in this report are designed to improve the department's internal and external food sector activities. By taking the steps recommended, DHS will be able to more fully address the vulnerabilities of the nation's food sector.

Management Comments and OIG Analysis

In August 2006, we shared a draft of this report with the Offices of Infrastructure Protection, Grants and Training, Chief Medical Officer, S&T, and CBP, and subsequently met with staff in each of these units to gather their feedback. Each office provided general and technical comments on the draft report, and responses to the draft's recommendations. The Preparedness Directorate consolidated these comments and responses and provided them to us in the last days of November. We considered each of these comments and responses, and additional documentation provided, and made responsive edits and additions to some sections of the report.

Since we issued our draft report for the department's review and comment, we have removed one recommendation (formerly recommendation #6). In it, we had recommended that the department publish a final rule on its Protected Critical Infrastructure Information program. Shortly after we issued our draft report, the department published its final rule.

In its appraisal of our remaining recommendations to enhance DHS' performance and improve the security of the food supply, the department generally concurred. Of this report's 16 recommendations, the department concurred with 12. Of the remaining 4 recommendations, one has been amended in line with the department's comments, and we anticipate that DHS will concur with it in its final form. The department did not concur with the remaining 3 recommendations and we have not amended them.

We will continue to monitor the department's progress in implementing these recommendations, and will close them when the department has established that it has taken appropriate corrective actions.

We have summarized the department's responses to this report's recommendations below, along with our analysis.

Recommendation #1: Identify a single senior DHS official to be accountable for coordinated implementation of all DHS food sector responsibilities, and provide this official with clear authorities and adequate staffing to perform this function.

DHS Response: The department expressed general agreement with this recommendation, and indicated that this senior manager would be "most appropriately located" within the Preparedness Directorate. In the department's view, this senior manager should be at the Deputy Assistant Secretary level or higher so that he or she is at a level commensurate with

similar leaders at USDA and FDA. Further, the department acknowledged the need for this official to have the authority to oversee the coordination of efforts within several DHS components.

OIG Evaluation: We believe that the effective implementation of this recommendation will help enhance DHS performance in the areas of food defense and critical infrastructure protection. We look forward to the designation of a senior DHS official to be accountable for coordinated implementation of all DHS food sector responsibilities. Upon his or her designation, we will assess the appropriateness of the authorities and staff support he or she has been provided. This recommendation is *resolved – open*.

Recommendation #2: Restore communication with the Food ISAC by re-establishing a DHS point of contact and creating food-industry-specific products for ISAC distribution.

DHS Response: The department did not agree to restore communication with the ISAC. DHS responded that the ISAC had been subsumed into the Sector Coordinating Council, and that the Sector Coordinating Council is "responsible for the appropriate means or entity for information sharing." The department also wrote that the ISAC Council and Partnership for Critical Infrastructure Security, which includes Food and Agriculture Sector Coordinating Council representation, were currently working to "determine the most appropriate information sharing framework for the sector."

While the department took issue with restoring communication with the Food ISAC, it noted that it has created food and agriculture related products in the past and said it will continue to do so. In particular, the department highlighted three Homeland Infrastructure Threat and Risk Analysis Center product types it will use in the future to address private infrastructure stakeholders, including those in the food and agriculture sectors.

OIG Evaluation: The organization that manages the Food ISAC participates in the Sector Coordinating Council, but that should not preclude it from having a productive role outside of participation on the Council. Nor should its engagement with the Sector Coordinating Council constitute a reason not to maintain a point of contact with it. That the department has resisted a step as basic as maintaining a point of contact with the Food ISAC is troubling.

Communication with the ISAC continues to be important because the other information sharing mechanisms DHS has established are still in early stages of development. Whereas the reach of other DHS information sharing methods remains limited, the ISAC can potentially access a significantly larger audience. At minimum, if DHS were to leverage this greater informational reach, it could improve communication with the sector in a crisis. This recommendation is *unresolved.*

Recommendation #3: Seek out improvement in DHS' relationship with food sector partners through:

- Better attention to the demands and information flow related to coordinating council comments on DHS initiatives;
- Higher level DHS official attendance at council meetings; and
- Increased responsiveness to council requests for information, briefings, and presentations by other DHS components.

DHS Response: DHS concurred with this recommendation and provided two examples of its work in this area: discussions with the Sector Coordinating Council about the content of the Homeland Security Information Network, and the Assistant Secretary's attendance at sector council meetings.

OIG Evaluation: In reviewing the department's progress in this area, we will seek specific information about measures in each of the three areas for improvement identified in the recommendation. This recommendation is *resolved – open*.

Recommendation #4: Expand National Infrastructure Coordinating Center outreach efforts to include outreach targeted to the food sector, and actively seek to increase information flow related to the food sector.

DHS Response: The department concurred with this recommendation, and highlighted recent National Infrastructure Coordinating Center outreach and information sharing activities that touch on the food and agriculture sector. According to the department, the National Infrastructure Coordinating Center will work through the Homeland Security Information Network Food and Agriculture portal to facilitate information sharing in areas of interest to the Sector Coordinating Council. According to the department, FDA and USDA are encouraged to send representatives to the National Infrastructure Coordinating Center during major incidents and events.

OIG Evaluation: The *NIPP* describes the National Infrastructure Coordinating Center as "a centralized mechanism and process for information sharing and coordination between the government, [Sector Coordinating Councils], [Government Coordinating Councils], and other industry partners."[102] In order for the Center to effectively serve in this capacity, its interaction with the sector must be more proactive. In reviewing the department's corrective action plan, we look forward to learning about National Infrastructure Coordinating Center outreach activities that *specifically* target the food sector. In addition, we hope to learn the details of new efforts to increase information flow to the food sector. This recommendation is *resolved-open*.

Recommendation #5: Evaluate the feasibility of providing financial support for and otherwise facilitate detailing state or local government and private sector representatives to support Office of Infrastructure Protection food sector efforts with an emphasis on Homeland Security Information System's Food and Agriculture Portal.

DHS Response: The department concurred with this recommendation, and noted the Government Coordinating Council's call for state assistance and the Assistant Secretary for Infrastructure Protection's support for this action.

OIG Evaluation: The department concurs with this recommendation and some responsive efforts have been undertaken. In evaluating the department's corrective action plan we will consider the Office of Infrastructure Protection's progress in enlisting the support of a state representative in this area. We will also assess whether the Office of Infrastructure Protection has studied the feasibility of detailing local government and private sector representatives with ties to the food sector.

Recommendation #6: Develop and maintain, in collaboration with the Office of Grants and Training and Office of Infrastructure Protection, a comprehensive report on DHS food sector research and education initiatives to be shared with FDA and USDA on a regular basis.

DHS Response: The department agreed with this recommendation. In its response, the department wrote that S&T and the Offices of Grants and Training and Infrastructure Protection will develop comprehensive annual reports on food and agriculture sector research and education initiatives,

[102] DHS, *NIPP*, June 30, 2006, p. 64.

and that these reports will be shared with FDA and USDA. These reports will build off an existing report on food and agriculture sector education initiatives developed by Grants and Training's Agriculture Working Group.

OIG Evaluation: The department's plan to develop a comprehensive annual report on food and agriculture research and education initiatives fits squarely with our vision in this area. We will close this recommendation when we receive this report and can establish that it has been provided to FDA and USDA. Until then, this recommendation is *resolved – open.*

Recommendation #7: Develop a grant process to support non-urban, multi-jurisdictional preparedness programs on a regional level.

DHS Response: DHS did not concur with this recommendation. The department wrote that it could not comply with this recommendation because it did not have congressional authorization to alter the current Urban Areas Security Initiative program to support non-urban, multi-jurisdictional preparedness programs on a regional basis.

OIG Evaluation: The department's response appears to reflect a misreading of our recommendation. We did not recommend any changes to the Urban Areas Security Initiative, or the development of a new grant program. Instead, we recommended that Grants and Training develop a process for non-urban, regional preparedness programs to compete for funds. We believe that improvements in this regard are consistent with the stated priorities of the National Preparedness Goal, and congressional interest in encouraging support for regional initiatives.[103] In a future response, Grants and Training can provide evidence that it has created a grant process more accessible to regional, non-urban programs by making adjustments in the State Homeland Security Program grant application process.

Recommendation #8: Work with HHS and USDA to prepare an integrated food defense budget plan for Fiscal Year 2009 using a process that satisfies Homeland Security Presidential Directive 9 requirements.

[103] H.R. Conf. Rep. No. 109-241, at 69 (2005) for FY 2006; H.R. Conf. Rep. No. 109-699, at 153 (2006) for FY 2007.

DHS Response: DHS did not concur with this recommendation in its original form, and asserted that it called for activities beyond the department's authority. The department observed that implementation of this Homeland Security Presidential Directive 9 provision called for the agreement and cooperation of government agencies outside of DHS – USDA and FDA, and noted that Homeland Security Council initially directed DHS to delay implementation of this requirement. Notwithstanding these concerns, DHS reported that it will submit an integrated budget plan for defense of the U.S. food system for FY 2009.

OIG Evaluation: We have amended this recommendation to properly reflect our aim that the department satisfy its obligations under Homeland Security Presidential Directive 9. We now recommend that the department *work with* HHS and USDA to prepare an integrated food defense *plan*. In addition, we have changed the fiscal year we recommend the department to take this action from FY 2008 to FY 2009. Because the FY 2008 budgeting process is now drawing to a close, in our judgment it is no longer reasonable to expect DHS to comply with this requirement for that fiscal year.

We expect to learn from DHS' corrective action plan whether it concurs with the new wording of this recommendation, and look forward to reviewing evidence of the department's collaborative work to prepare an integrated food defense budget plan. In the meantime, we consider this recommendation *unresolved*.

Recommendation #9: Expedite the review of existing food sector assessments to determine their suitability for use in comparative risk analysis, and collaboratively identify the role of these assessments in the sector-specific risk methodology.

DHS Response: DHS management concurred with this recommendation. The department acknowledged present consensus among five federal agencies that CARVER+Shock is currently the base available tool for use in the food and agriculture sector. It also noted that S&T is funding the development of a new assessment tool for the sector.

OIG Evaluation: The department's acknowledgement of interdepartmental consensus that CARVER+Shock is presently the "best available" assessment tool for use in the sector is an important step. We expect that the department will make consistent use of CARVER+Shock in its future sector assessment efforts until a new tool is developed. S&T's support for the development of a new sector-specific assessment tool is

also a welcome development. We look forward to reviewing progress in this area in the coming year. This recommendation is *resolved - open*.

Recommendation #10: Pursue the recruitment, hiring, and retention of several additional staff with expertise in matters of post-harvest food defense.

DHS Response: DHS agreed with this recommendation, but took issue with its exclusive focus on the cultivation of expertise in the post-harvest food arena. The department recognized a need for additional staff with experience in the food and agriculture sector, and stressed that these additional staff will have to engage both pre- and post-harvest aspects of the sector. It also wrote that efforts were underway to expand DHS expertise in the sector by "leveraging" Food and Agriculture Government and Sector Coordinating Council expertise, and through a Homeland Infrastructure Threat and Risk Analysis Center initiative to designate private sector specialists to work with the program.

OIG Evaluation: We appreciate the rich interconnectedness of pre- and post-harvest aspects of the food and agriculture sectors and note in this report that together they represent a complex system characterized by numerous interdependencies. Despite the vital linkages between these parts of the sector, they are also distinct in important ways and can be considered separately to positive effect. The pre- and post-harvest parts of the sector are occupied by different industry groups, and have many distinct stakeholders. This is evident in the structure of the Sector Coordinating Council, which has separate subcouncils for pre-harvest animal and plant production and agricultural inputs. Perhaps more importantly from a human resources standpoint, however, is that they often rely on different skill sets and expertise. Thus, veterinary expertise does not clearly translate into a working knowledge of the food sciences and related biochemistry.

This recommendation was not intended to suggest that DHS' pre- and post-harvest balance of expertise is askew. Indeed, we could not arrive at such a judgment without first evaluating the department's pre-harvest staff expertise; something beyond the scope of this review. Rather, this recommendation relates our clear sense that DHS has insufficient staff expertise in the post-harvest arena.

In reviewing the department's 90-day action plan, we expect to learn about specific steps the department has taken to recruit, hire, and retain staff with post-harvest food sector expertise. Until we can confirm that the

department has taken action in these areas, this recommendation will be *resolved – open*.

Recommendation #11: Consider the elaboration of food-specific criteria and guidelines for Customs-Trade Partnership Against Terrorism food industry firms in collaboration with FDA and USDA.

DHS Response: DHS did not concur with this recommendation. In disagreeing with it, the department held that implementation of this recommendation would shift the Customs-Trade Partnership Against Terrorism away from its current "macro" focus and move toward a program dealing with the safety of products in individual shipping containers. According to the department, the program is intended to improve supply chain security, but not attest to the safety of individual products shipped through the supply chain. The department also writes that the program's security specialists do not have the knowledge or skills to identify and prevent food adulteration or the introduction of animal or zoonotic diseases in the food manufacturing process.

OIG Evaluation: According to the Customs-Trade Partnership Against Terrorism strategic plan, the program supports CBP's priority mission of preventing terrorists and terrorist weapons from entering the country. As this report discusses, intentionally contaminated foods can be used as a weapon by terrorists. Because food products could be contaminated at different points in the supply chain before they arrive in the United States, and because the Customs-Trade Partnership Against Terrorism is designed to ensure that partnering firms improve their supply chain security practices, the program should consider measures to reduce the risk of a terrorist attack on imported foods.

Current Customs-Trade Partnership Against Terrorism security criteria can be refined to address this risk more effectively. CBP can use existing USDA and FDA non-mandatory security guidance for food importers to help refine the program's security criteria or develop separate guidance for program participants who handle food shipments. USDA and FDA standards in this area provide more detailed physical security, personnel oversight, and operational management guidance than existing Customs-Trade Partnership Against Terrorism criteria. We anticipate that if CBP were to implement changes in these areas, current CBP security specialists would be able to monitor these new criteria without any additional knowledge or technical expertise.

CBP can satisfy this recommendation by demonstrating that it has weighed adjustments to its Customs-Trade Partnership Against Terrorism criteria in light of the risk of the deliberate contamination of imported foods. To do so, CBP would have to study possible refinements to its current Customs-Trade Partnership Against Terrorism criteria in light of USDA and FDA work in the area. CBP could then conduct cost-benefit analyses and risk assessments to determine whether it is appropriate to adopt any related refinements. CBP could then determine whether to apply these new criteria uniformly to all program participants or simply those handling food products. Because the department has indicated that it is unwilling to consider elaborating guidance and criteria to respond to this risk, however, this recommendation is currently *unresolved*.

Recommendation #12: Study ways to integrate food defense awareness into existing transportation security programs fully and consider additional research to improve the security of food in transit.

DHS Response: The department concurred with this recommendation, but recommended that it be redirected to the Transportation Security Administration.

OIG Evaluation: We have directed this recommendation to the Under Secretary for Preparedness because of the Preparedness Directorate's role in funding and managing training and transportation security grant programs, including Highway Watch.

In reviewing the department's corrective action plan for this recommendation, we will look for evidence that the department has examined ways to expand awareness of food security in the context of transportation security programs. We will also look for indications that the department has considered research initiatives related to food in transit. This recommendation is *resolved – open***.**

Recommendation #13: Expand efforts to sponsor food contamination event exercises with an emphasis on exercises spanning multiple state and local jurisdictions.

DHS Response: DHS concurred with this recommendation and noted the need for exercises of this type to be coordinated with USDA and FDA.

OIG Evaluation: The department has embraced this recommendation. We hope to review evidence of DHS support for exercises of this kind,

including exercise after-action reports, when we receive the department's corrective action plan. This recommendation is *resolved – open***.**

Recommendation #14: Expand food sector modeling to other portions of the food supply chain for the purpose of improving food contamination event consequence assessment and decision support.

DHS Response: DHS concurred with this recommendation, and highlighted additional work the department has sponsored in this area.

OIG Evaluation: We look forward to learning more about the department's modeling of additional portions of the food supply chain, when available. This recommendation is *resolved – open***.**

Recommendation #15: Evaluate the advisability and feasibility of integrating additional federal foodborne illness reporting, surveillance, and detection systems into the National Biosurveillance Integration System.

DHS Response: DHS concurred with this recommendation.

OIG Evaluation: The department's receptiveness to this recommendation is a positive sign. We will monitor progress in this area during the course of our ongoing review of the National Biosurveillance Integration System. Before closing this recommendation, we will look for evidence that National Biosurveillance Integration System program managers have fully considered integrating the food-related information systems we reference in this report. For now, this recommendation is *resolved – open*.

Recommendation #16: Continue to develop and disseminate information about food subsystem-specific operational protective measures and operational best practices in collaboration with FDA and USDA.

DHS Response: DHS concurred with this recommendation and indicated that efforts in this area are currently being pursued through a collaborative effort between the Government and Sector Coordinating Councils.

OIG Evaluation: We welcome the active engagement of public and private sector stakeholders in the process, and look forward to reviewing DHS contributions to this effort. This recommendation is currently *resolved - open*.

Purpose, Scope, and Methodology

We conducted this review to determine whether DHS has effectively executed its responsibilities in the areas of food defense and critical infrastructure protection. We framed our review around three objectives: identifying DHS' related responsibilities, determining how the department had operationalized those responsibilities, and assessing the quality of related programs and initiatives. To supplement our assessments in this area, we solicited expert opinions from representatives of other federal and state agencies, the private sector, and academia.

Our fieldwork was conducted from November 2005 to April 2006. During this period, we conducted more than 80 interviews. Among those interviewed were a number of staff and contractors working for S&T, the Office of Infrastructure Protection, Office of Grants and Training, CBP, and Office of the Chief Medical Officer. We also met with representatives of departments of public health and agriculture from six states and localities, and personnel from other federal agencies including the USDA, FDA, CDC, FBI, and Office of the Director of National Intelligence. Finally, we interviewed academics and researchers in the food security and defense arena, quality assurance and security experts from food industry firms, and officials from industry associations representing food processors, distributors, retailers, and food service concerns. To ensure that we received the perspectives of representatives of a range of private and public sector views, we spoke with representatives of all four Sector Coordinating Council subcouncils pertaining to post-harvest food, as well as representatives of seven of the organizations on the Food and Agriculture Government Coordinating Council.

We supplemented these interviews with extensive document review and analysis efforts. We studied DHS concept papers, grants, statements of work, project schedules, review panel analyses, and performance information. We also reviewed government threat assessments, vulnerability assessments, consequence assessments, protective plans for facilities, and security guidelines. Lastly, we examined reports from GAO, the Congressional Research Service, the Homeland Security Institute, and academic and research institutions, and reviewed relevant speeches, testimony, and news articles.

This review was conducted under the authority of the Inspector General Act of 1978, as amended, and according to the *Quality Standards for Inspections* issued by the President's Council on Integrity and Efficiency.

Recommendations

Recommendation #1: Identify a single senior DHS official to be accountable for coordinated implementation of all DHS food sector responsibilities, and provide this official with clear authorities and adequate staffing to perform this function.

Recommendation #2: Restore communication with the Food ISAC by re-establishing a DHS point of contact and creating food-industry-specific products for ISAC distribution.

Recommendation #3: Seek out improvement in DHS' relationship with food sector partners through:

- Better attention to the demands and information flow related to coordinating council comments on DHS initiatives;
- Higher level DHS official attendance at council meetings; and
- Increased responsiveness to council requests for information, briefings, and presentations by other DHS components.

Recommendation #4: Expand National Infrastructure Coordinating Center outreach efforts to include outreach targeted to the food sector, and actively seek to increase information flow related to the food sector.

Recommendation #5: Evaluate the feasibility of providing financial support for and otherwise facilitate the detailing of state or local government and private sector representatives to support Office of Infrastructure Protection food sector efforts with an emphasis on the Homeland Security Information Network's Food and Agriculture Portal.

Recommendation #6: Develop and maintain, in collaboration with Office of Grants and Training and Office of Infrastructure Protection, a comprehensive report on DHS food sector research and education initiatives to be shared with FDA and USDA on a regular basis.

Recommendation #7: Develop a grant process to support non-urban, multi-jurisdictional preparedness programs on a regional level.

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Management Comments on the Draft Report

Preparedness Directorate
U.S. Department of Homeland Security
Washington, DC 20528

Homeland Security

MEMORANDUM FOR: Carlton Mann
Acting, Assistant Inspector General for Inspections
And Special Reviews

FROM: George W. Foresman
Under Secretary

SUBJECT: *Response to Draft Inspector General Report on the Department of Homeland Security's Role in Food Defense and Critical Infrastructure Protection*

This responds to the August 16, 2006, memorandum requesting the Directorate for Preparedness' comments on the draft Office of the Inspector General report, *The Department of Homeland Security's Role in Food Defense and Critical Infrastructure Protection*. The attached document provides comments on the 17 recommendations directed to the Preparedness, Customs and Border Patrol, and Science and Technology Directorates.

Please accept our thanks for the opportunity to respond to the draft report and to work with the Office of the Inspector General during this engagement. As Preparedness and the other Department of Homeland Security components work toward refining their programs, the Office of the Inspector General's independent analysis of program performance greatly benefits our ability to continuously improve our activities. We look forward to continuing this partnership in the future.

Questions concerning specific comments should be addressed to Brad Shefka at 202-282-8532.

cc: W. Ralph Basham
Jay M. Cohen
Corey D. Gruber
Robert Stephan
Steven Pecinovsky

Attachments:
1) Response to Recommendations
2) General/Technical Comments

In addition to the general and technical comments sent previously, a review of the report's recommendations follows:

Recommendation #1. **Identify a single senior DHS official to be accountable for coordinated implementation of all DHS food sector responsibilities, and provide this official with clear authorities and adequate staffing to perform this function.**

Concur. In general we concur with the need for a single Department of Homeland Security (DHS) senior official to be accountable for all DHS food sector responsibilities and believe that this official is most appropriately located in the Preparedness Directorate.

This proposed senior official needs to be at the level of a Deputy Assistant Secretary or higher. This is necessary so that he/she will be on an equal footing with the Department co-partners in the Government Coordinating Council (GCC), the United States Department of Agriculture (USDA) and the Food and Drug Administration (FDA), and to facilitate the integration of all the various parts of DHS together into an effective joint approach. This official will need the authority to oversee the coordination of many the future, ongoing and evolving efforts underway within various DHS components.

Recommendation #2. **Restore communication with the Food ISAC by re-establishing a DHS point of contact and creating food-industry-specific products for ISAC distribution.**

Non-concur. The Food Information Sharing and Analysis Center (ISAC) has been subsumed into the Sector Coordinating Council (SCC) and the SCC is responsible for the appropriate means or entity for information sharing. The Partnership for Critical Infrastructure Security (PCIS) and the ISAC Council are currently working together to determine the most appropriate information sharing framework for the sector. This is the approach that has been adopted under the National Infrastructure Protection Plan (NIPP). Homeland Infrastructure Threat and Risk Analysis Center (HITRAC) have issued food and agriculture related products, which were developed with sector input, and will continue to do so. Three product types have been developed to further HITRAC's unique mission requirements and to respond to the needs of public and private infrastructure stakeholders:

Strategic Sector Assessment -- The Strategic Sector Assessments are a series of reports that provide an overall assessment of the potential terrorist threats to Critical Infrastructure/Key Resources (CI/KR). The purpose of this product is to raise general awareness of DHS' security partners and to support detailed sector level security planning. The reports are completed at classified and unclassified levels and are coordinated throughout their production with private and public infrastructure owners and operators, largely through the SCCs. The Strategic Sector Assessment for the Food/Agriculture sector is currently in vetting.

Suspicious Activity Assessment -- The Suspicious Activity Assessment is a quarterly report that reviews suspicious incident reports received by DHS. The report is an analysis of individual reports as well as the full stream of intelligence community reporting to identify any signs or patterns of activity which potentially indicate threats to individual sector components or threats to the sector as a whole at the national level.

Private Sector Note -- The Private Sector Note is a timely report that provides the private sector with DHS' perspective on events, activities or information to our security partners in order to support their specific sector level security planning.

Strategic Homeland Infrastructure Risk Assessment -- HITRAC produces a national level risk assessment for senior policymakers that integrate assessments of threat, vulnerability, and consequence into a single measurement of risk. The assessment provides a strategic view of current levels of risk to CI/KR sectors from international terrorists and their affiliates.

Recommendation #3. **Seek out improvement in DHS's relationship with food sector partners through:**

a. Better attention to the demands and information flow related to coordinating council comments on DHS initiatives;
b. Higher level DHS official attendance at council meetings; and
c. Increased responsiveness to council requests for information, briefings, and presentations by other DHS components.

Concur. As both the Council and the Department gain operational experience working in this partnership model each of these areas will be enhanced. For example, DHS is working closely with the Food and Agriculture SCC to identify specific categories of information to be shared using the sector portal on Homeland Security Information Network—Critical Sector (HSIN-CS). We do note that the Assistant Secretary of Infrastructure Protection (ASIP) has personally attended council meetings.

Recommendation #4. **Expand NICC outreach efforts to include outreach targeted to the food sector, and actively seek to increase information flow related to the food sector.**

Concur. The NICC has increased its outreach to all sectors and provides daily information updates on activities and incidents in all sectors to its wide customer base. DHS is working closely with the Food and Agriculture SCC to identify specific categories of information to be shared using the sector portal on HSIN-CS. The NICC will be at the hub of this information sharing activity. The NICC regularly posts infrastructure related products to all HSIN-CS portals to support the situational awareness and planning needs of CI/KR partners. The information provided by the NICC to CI/KR partners, including the food and agriculture sector, is comprised of analytical, threat/warning, and all-hazards products developed by various elements within DHS and other Federal departments and agencies. Additionally, during incidents of national significance, the NICC conducts daily interactive situational awareness teleconferences with CI/KR partners including the food and agriculture sector.

As SSAs, the USDA and the Food and Drug Administration (FDA) provide sector-status information to the NICC during hurricane reporting. The NICC compiles input from each Sector-Specific Agency (SSA) and posts the consolidated CI/KR input on the interagency Common Operating Picture, which is accessible via various federal portals within HSIN. USDA and the FDA are also encouraged to send representatives to the NICC during major incidents/events to enhance awareness and collaboration.

Recommendation #5. **Evaluate the feasibility of providing financial support for and otherwise facilitate the detailing of State or local government and private sector**

representatives to support IP food sector efforts with and emphasis on HSIN's Food and Agriculture Portal.

Concur. The GCC has recently released a call to the states to fill this role using an Intergovernmental Personnel Assignment to fund the program. The ASIP has supported this initiative.

Recommendation #6. **Finalize a Final Rule for the PCII program and publish this rule in the Federal Register.**

The Protected Critical Infrastructure Information (PCII) Final Rule was signed by the Secretary on August 15, 2006, and published in the Federal Register on September 1, 2006. DHS suggests that this recommendation be closed.

Recommendation #7. **Develop and maintain, in collaboration with G&T and IP, a comprehensive report on DHS food sector research and education initiatives to be shared with FDA and USDA on a regular basis.**

Concur. Science and Technology Directorate (S&T), G&T, and IP will collaborate in the development of comprehensive reports on an annual basis to support the reporting requirements of the Sector Specific Agencies for the NIPP Annual Report. These reports will be shared with FDA and USDA. In fact, the Agriculture Working Group has already produced a report of all education initiatives which could be used as a starting point for the comprehensive report.

Recommendation #8. **Develop a grant process to support non-urban, multi-jurisdictional preparedness programs on a regional level.**

Non-concur. The report recommends that the Assistant Secretary for Grants and Training develop a grant process similar to the Urban Area Security Initiative (UASI) process that supports non-urban multi-jurisdictional preparedness programs. However, the UASI program was not created by DHS. It is a Congressionally-created program designed to specifically target high-density urban areas where the greatest risk exists. In lieu of authorizing legislation, G&T has consistently stressed the importance of regionalization and encouraged individual States to join together to apply for funds for such purposes.

Recommendation #9. **Submit, in coordination with HHS and USDA, an integrated food defense budget for Fiscal Year 2008 using a process that satisfies HSPD-9 requirements.**

Non-concur. This recommendation is presently beyond the scope of DHS' authority. While this is a provision within HSPD-9, in 2005 the Homeland Security Council directed that DHS, USDA, and FDA delay implementation of any effort to coordinate the food and agriculture defense budget. Further, this provision requires the agreement and cooperation of FDA and USDA. Beginning with the FY2009 submissions, each Department will still submit separate budget submissions, but concurrently, will also submit an integrated USDA-Department of Health and Human Services (HHS)-DHS integrated budget plan for defense of the U.S. food system.

Recommendation #10. **Expedite the review of existing food sector assessments to determine their suitability for use in comparative risk analysis, and collaboratively identify the role of the assessments in the sector-specific risk methodology.**

Concur. The current use of CARVER+Shock is the result of an interagency (FBI, USDA, FDA, EPA, and DHS) consensus that this is the best available tool, partially because industry is familiar and comfortable with it. It should have been noted that DHS/S&T currently has a project underway to engage the Food and Agriculture Centers of Excellence and the National Laboratories to research all available tools and methodologies; and then to develop, test, and field a more appropriate sector specific tool. The Sector-Specific Plan requirements will further identify the appropriate risk assessment approach to be used within the sector.

Recommendation #11. **Pursue the recruitment, hiring, and retention of several additional staff with expertise in matters of post-harvest food.**

Concur. In general we concur that there is a need for more Food and Agriculture experienced and dedicated staff across every DHS Directorate that has direct engagement on matters related to this sector. However, these specialists will have to engage in all aspects of the food and agriculture system from pre-harvest to post harvest. Current efforts underway include leveraging sector expertise through the GCC/SCC process, as well as an initiative to bring private sector expertise into HITRAC through the HITRAC Private Sector Specialist Program. This program will allow sectors to designate specialists to come and work in HITRAC in order to gain their unique insights into key vulnerability and security issues, to provide a mechanism for continuing dialogue with these experts, and to develop a standing body of private sector personnel who could be called upon to regularly provide CI/KR expertise to DHS. This program will not only improve the private sector's understanding of DHS' CI/KR protection policies, but it will also allow contribution of private sector insights into HITRAC's operations and analysis.

The report makes emphasizes the distinction between pre- and post-harvest segments of the Food and Agriculture sector. Yet only a very few in the sector take the same position. Most in the sector view the nation's food supply chain as a system with many diverse, redundant and dispersed components. This system view is more consistent with the 'continuum' that characterizes this sector. Acts committed against nearly any segment of this system have direct consequences across the system from pre-harvest to post-harvest. Indeed, this system is actually a cycle where inputs, products, by-products and even food waste products continuously move through the entire cycle. The text of the draft report suggests a lack of full appreciation of this reality.

In the case of S&T, within the Biological Program Office, we are currently establishing a dedicated Office of Agricultural Defense which has responsibility for both our pre-harvest and post-harvest food activities. Also, the University Program is attempting to recruit individuals who have extensive industry knowledge and government contacts in order to engage both private and public sector interests across the food system from primary production to consumption.

Recommendation #12. **Consider the elaboration of food-specific criteria and guidelines for C-TPAT food industry firms in collaboration with FDA and USDA.**

Non-concur. The Customs-Trade Partnership Against Terrorism (C-TPAT) program is designed to strengthen supply chain security from the point of stuffing the container, through the final delivery in the United States, and reduce the likelihood that a weapon of mass destruction (WMD) or weapon of mass effect (WME) could be introduced into the shipping container. The voluntary, incentives based program is not intended to attest to the safety of the individual products being shipped in the containers themselves. C-TPAT Supply Chain Security Specialists are primarily physical security experts, and are not trained to identify and prevent food adulteration or the intentional introduction of animal or zoonotic diseases in the food manufacturing process itself. These skill sets reside in FDA and USDA.

Customs and Border Protection strongly opposes altering the C-TPAT program from its intended objective to strengthen the supply chain to reduce the possibility that a WMD or a WME could be introduced into a legitimate shipping container while in transit to the United States. The C-TPAT program should remain more macro in application, and not begin to focus on commodity specific issues in which CBP does not have subject matter expertise.

Recommendation #13. **Study ways to more fully integrate food defense awareness into existing transportation security programs and consider additional research to improve the security of food in transit.**

Concur. We recommend this recommendation be directed to the Transportation Security Administration, as the SSA for the Transportation Systems Sector. Both USDA and FDA currently have sector specific transportation security programs, both publish security guidelines, and both have directly engaged sector related transportation firms. DHS needs to support these programs via an integration of effort with the existing highway and transportation sector efforts via the GCC process.

Recommendation #14. **Expand efforts to sponsor food contamination event exercises with and emphasis on exercises spanning multiple state and local jurisdiction.**

Concur. These exercises need to be fully coordinated with both USDA and FDA.

Recommendation #15. **Expand food sector modeling to other portions of the food supply chain for the purpose of improving food containment event consequence assessment and decision support.**

Concur. The significant DHS supported modeling to both pre-harvest and post-harvest sector components should be better catalogued in the report. The National Laboratories and the Centers of Excellence have developed advanced models for disease events, food contamination, and Critical Infrastructure Protection Decision Support System (CIP-DSS) focused models. For example, Sandia National Laboratories, developed advanced models for the entire beef production, processing, and distribution chain. They have also developed an advanced model of the corn system from production, through processing and across the beverage, feed, food additive, and corn-based food products systems. The Minnesota-based Center of Excellence (the National Center of Food Protection and Defense) has developed an advanced food contamination model specifically to support planning, protective measure and mitigation tool development, exercises and response.

USDA, FDA, and DHS all have important responsibilities in this area. USDA and FDA have analytic tools and responsibility for managing food and plant pathogens and food safety issues. DHS, in its overall coordinating role, has responsibility for very large consequence events and assessing and understanding cascading consequences. Therefore, DHS S&T has focused on modeling large consequence events, e.g. the contamination of a central food processing plant, and looking not only at the primary impacts of such an event but at cascading second and third order effects. In such cases, it is not necessary to model all attacks but only representative families of attack that differ significantly in key features. As resources allow, , DHS/S&T will take the lead for coordinating the modeling of newly identified families of attack involving very large consequence events and their cascading effects.

In support of this, NCFPD research efforts in food sector modeling are currently being expanded to include additional food products, covering both USDA and FDA regulated foods. NCFPD researchers have requested and/or received letters of support from HHS, FDA, and DHS in order to facilitate the obtainment of food product data from industries such as bottled water and the dairy industry of California. Although NCFPD food sector models are still in development, they were recently tested for validity. When compared retrospectively to data from a 2004 outbreak of *E. coli* O157:H7 in Minnesota, the NCFPD food sector model was able to predict clinical illnesses within +/- 6 hours of actual clinical data. The NCFPD food sector modeling efforts should prove to be a useful tool in managing a major food system contamination event.

Recommendation #16. **Evaluate the advisability and feasibility of integrating additional federal food borne illness reporting, surveillance, and detection systems into NBIS.**

Concur. The National Biosurveillance Information System (NBIS) team is presently addressing this need. Additionally, it should be noted that the NBIS transferred from IP to the Preparedness Chief Medical Officer as of September 1, 2006. The report should be updated to reflect this transfer of program control.

Recommendation #17. **Continue to develop and disseminate information about food subsystem-specific operational protective measures and operational best practices in collaboration with FDA and USDA.**

Concur. This is currently a primary focus of a GCC/SCC collaborative effort.

DHS General Comments

In our desire to further strengthen the Food Defense program at the DHS, we are supportive of and receptive to many of these recommendations. However, we also have a number of general comments and concerns about the report as written:

1. It focuses almost exclusively on remaining issues devoting very little space to the many accomplishments of the program. Yet by its own acknowledgement "In most areas of DHS food sector responsibility, the Department has taken action to meet its obligations. It has done so despite the fact that a number of its related responsibilities were set out recently. Many of DHS's food-related responsibilities originated with issuance of HSPD-9 less than two-and-a half years ago." In spite of the fact that the Department has "taken action to meet its obligations," it seems that less than five percent of the one hundred or so pages of the document describe the positive steps taken by DHS. This results in a document that can be perceived as saying the "system is broken," rather than saying "reasonable efforts have been made in the short time available, but there is still much to do".

2. For those issues identified, the report often goes beyond the high level descriptions for which there may be broad supporting evidence and input, seeking to emphasize anecdotal points with phrases like "in one case …" or "one individual said …". These singular statements tend to strongly color the statement without providing any sense of the statistical validity or generality of the statement. For example, on page18 it says "As a result, opportunities to leverage information from one program in support of another have been squandered. In one instance, wasteful duplication apparently has occurred." The term 'squandered' has strong negative colorations. Using the term "missed or lost" would have conveyed the essence without emotional overtones. Furthermore, there is no indication of how pervasive the issue may or may not be. This is one program among the twenty-five program food responsibility areas in which DHS is working. In digging further into this one example, on page 27, we find out that this area of apparent duplication is in the development of food sensors where $3.6 million is being spent on a system called Food Biological Agent Detection Sensors (FBADS) and $1.1 million is being spent on a related approach in the National Center for Food Protection and Defense. Yet later on, on page 54, FBADS is cited as an example of strong collaboration with FDA and industry, i.e. "Industry consultation has also been a hallmark of … the Food Biological Agent Detection System." More importantly, if one drills down to the next level, FBADS and the NCFPD are not duplicative but complementary. FBADS using one type of technology for developing a detection system that can be fielded in two years, while NCFPD is researching the next generation detection system using a different technology in accordance with the goals and mandate of a university center of excellence.

3. The above example is illustrative of another concern. As the report itself notes on page 25, "The common program thrusts that have arisen need not result in waste. Provided adequate coordination, programs with common thrusts can fruitfully contribute to one another's work and advance the DHS mission." Unfortunately, but understandably, the authors did not have the time to delve into the next level on some of the seemingly overlapping activities to understand their substantial differences and their complementary nature. In the case of the S&T work, this is true not only for the detection programs discussed above, but also for the threat and vulnerability programs conducted by NBACC, CIPS, NISAC and the NCFPD, which for the most part each address different complementary aspects of the issue under consideration. Having been unable

to drill down to this added level of detail, the evaluation should not leave the impression that these are necessarily duplicative.

4. A clear example of this is the emphasis in the report of the Food Information Sharing and Analysis Center (ISAC), under the somewhat inflammatory heading "The Rise and Fall of the Food ISAC," beginning on page 30. As with the other critical infrastructure and key resource (CI/KR) sectors, the Food ISAC has been subsumed into the Sector Coordinating Council (SCC), and the SCC is responsible for the appropriate means and entity for information sharing. We are concerned that the draft report lacks balance in exploring the issue of the Food ISAC and reporting on the stand up phase and current state of the SCC and Government Coordinating Council (GCC) under the framework established by the National Infrastructure Protection Plan (NIPP). Focusing on the viewpoint of a single industry representative with close association with the Food ISAC does not seem to be the most balanced approach. It appears that in-depth information gathering, utilizing those directly involved in the start up phase of the SCC, and GCC, as well as current information sharing efforts, was not conducted. Therefore, we do not concur with recommendation 2 of the report.

At present, DHS enjoys a vastly improved relationship with the ISACs and the Partnership for Critical Infrastructure Protection, which is comprised of the Chairs of the SCCs. Further, DHS continues to work with the ISAC Council to determine and implement information sharing requirements within each of the sectors.

5. Additionally, we take exception to the comments in the draft report related to the Homeland Infrastructure Threat and Risk Analysis Center (HITRAC), on pages 42 and 43. This section of the report does not accurately depict HITRAC support to the Food and Agriculture Sector, and provides a completely inaccurate and biased description of the intelligence analyst assigned to this area. That an inspection report would speculate about an individual employee's execution of his or her duties again presents a balance issue.

We are attaching documentation of interactions with FDA and USDA. The statement that "at the time of our interview, this isolation was so pronounced that DHS' food sector HITRAC representative was not permitted on USDA and FDA premises and was effectively barred from the monthly intelligence roundtable on food and agricultural issues" is simply not true and should be stricken from the report.

Contrary to the assertions in the report regarding HITRAC interface, we can provide details of HITRAC interaction with the Chair of the SCC, as well as professional commendations from the private sector for intelligence threat support provided. There has been excellent interest in HITRAC products for which valuable feedback has also been received. Publication of the classified information bulletin, "(U) Potential Terrorist Threat to the U.S. Agriculture Sector" has been particularly well received. The author was commended by the DHS Chief Intelligence Officer, a Department of Justice official, and State homeland security representatives from North Dakota and New York. The report is silent on this accomplishment.

We also note that in the course of coordinating the above mentioned bulletin with the National Counterterrorism Center (NCTC), there was considerable difficulty in getting the assigned NCTC representative (who is a USDA employee on rotation to NCTC), to respond to requests for review and comment. At no time did this individual offer alternative wording to any

potential problem areas. Rather, this individual chose to forward an email to the Office of Intelligence and Analysis (OI&A) staff in order to block publication all together. We have provided email traffic that documents the extra effort expended by HITRAC to address each and every concern raised by NCTC and USDA. It is inappropriate for one person to simultaneously represent the interests of the Intelligence Community and the Sector Specific Agency (SSA) as happened here.

HITRAC support has been "forward leaning" and comprehensive with respect to food and agriculture constituents. The report does not acknowledge this key support and feedback, as exemplified by the co-hosting of a red cell analytic session attended by many senior USDA, FDA and food/agriculture private sector representatives in September 2005.

6. The draft report is also critical of DHS in the area of utilizing established assessment standards for use in the food sector on pages 1, 63 and 64. The current use of CARVER+Shock is the result of an interagency (FBI, USDA, FDA, EPA and DHS) consensus that this is the best available tool, and it is a tool with which the private food industry is familiar and comfortable. It should have been noted that the DHS Science and Technology Directorate (S&T) currently has a project underway to engage the Food and Agriculture Centers of Excellence and the National Laboratories to research all available tools and methodologies for the purpose of developing, testing and fielding a more appropriate sector specific tool with sector consensus. One of the NIPP Sector Specific Plan (SPP) requirements is to identify the appropriate risk assessment approaches and supporting methodologies for the sector.

7. The report also contains an inaccurate statement regarding the NIPP on page 36. SSPs are not due until December 31, 2006. The report incorrectly states that SSAs were allowed only two months to complete draft SSPs. These efforts have been underway since early Spring 2006.

8. Regarding the report's statements on the quantity of food/agriculture assets in the data base beginning on page 46, the food/agriculture infrastructure information included in the National Asset Database (NADB) is derived primarily from submissions provided by the States' and territories' Homeland Security Advisors (HSA). We are currently working with the States to review sector criticality requirements and reassess the sector NADB inventory from a more systemic perspective.

As the report correctly describes, we also continue to work with USDA and FDA to improve the quality of their respective NADB submissions. We are currently sponsoring a study through the Homeland Security Institute (HSI) to define criticality criteria that can be used to frame sector risk analysis and risk management activities. Work in this area is being used in the evolving SSP development.

9. Regarding the discussion of taxonomy on page 48, the taxonomy is developed to categorize assets, systems, or functions representative of each sector. The categories for each sector do not outline the areas of administrative responsibility for each SSA, rather they define systemic components of each sector or industry. As an example, pipelines are outlined in the Energy sector as components of the petroleum, oil and natural gas infrastructure or system. However, TSA is responsible for the protection and administrative oversight of the pipeline systems as the Transportation Sector lead. We are working with USDA and FDA to refine and

update the Taxonomy document as required to accurately represent the sector.

10. To add to the discussion of the NIPP beginning on page 50, the published version of the NIPP replaces the term "assets" with "assets, systems, and functions" to indicate the expanded view of the nation's infrastructure and the inclusion of systems or networks of infrastructure. DHS has evolved to the realization that an asset-based focus is not representative of all sectors. We remain flexible to allow for the appropriate tailoring of our framework for asset identification and protection to reflect sector characteristics, business operations and risk landscape.

DHS understands that some of the nation's infrastructures are more systems-based than others. In cooperation with the Sector leads, DHS desires to mature our understanding of the sectors so that we can better represent, understand, and prioritize intra-sector and cross-sector assets, systems, and networks. From a systemic perspective, all systems and networks represent an interconnected network of various individual components. These single components may not be significant individually due to built-in redundancies, but the synergy of the individual components may transform them into a system of significance. Before DHS can be expected to understand the systems, functionalities and interdependencies, information regarding the individual components and their interconnectivity must be understood. An overarching network analysis must be supported by appropriate component element information. This overarching network approach is the case in many sectors, including Energy, Transportation, and Water.

An example of the discussion above is provided by analysis of the food/agriculture supply chain. Per the report, "to grasp the second and third order effects of an adverse food event at a single facility, DHS must first understand that a facility's place within the food supply chain and larger economic system." The first step in accomplishing this task is to identify the individual facilities or assets and determine how they tie together into the larger supply chain. Once the components are identified, nodal and interdependency analysis can be conducted to determine the vulnerabilities of a given system. From a supply chain perspective, numerous systems may be intertwined to form the supply chain process. It is nearly impossible to track every conveyance or map every route a vehicle may take to transport goods. However, we can identify key shipping and receiving facilities in order to maintain awareness of the system flow of the supply chain.

11. Regarding the Top 100 submission, which is discussed on page 49 and following, USDA/FDA provided DHS with a list of asset types or systems of interest within the sector. These forty-seven categories were arranged in alphabetical order and seemingly represented all systems in the food/agriculture sector, not simply those of significance. Some categories were of obvious importance while others may be considered seemingly insignificant (i.e. Alcoholic Beverages, Candy/Gum, Soft Drinks, and Spices). This information has helped us identify key aspects of the sector from a taxonomy perspective, but has been less relevant in terms of identifying specific assets, systems and networks of more pronounced concern.

12. DHS disputes the claim on page 71 of the report that "DHS has not, for example, completed overarching guidance and sector-specific RAMCAP modules." The technical specifications for RAMCAP modules have been written for five sectors. The Commercial Nuclear Power Module is in general use in the sector. The Chemical Manufacturing Module is currently in limited use, and the modules for Nuclear Spent Fuel, Liquid Natural Gas Storage and

Petroleum Refineries are in piloting/beta testing. Two other modules for Dams, Locks and Levees and Water Distribution and Treatment are in the planning phase. This work will help inform and streamline RAMCAP development in the Food/Agriculture sector. As this work progresses, future RAMCAP development will also be enhanced by continued improvement of the CARVER+Shock vulnerability assessment tool and the HSI study.

13. When discussing the Buffer Zone Protection Program (BZPP) starting on page 84, the report is critical that BZPP reports do not always account for the threat of contamination of food within the facilities. This is not the mission of the BZPP, so correlating it to mitigation of threat from a food facility is simply misplaced and inappropriate. The BZPP is a grant program based on risk analysis designed to provide resources to State, local, and tribal law enforcement and other security professionals to enhance security of priority CI/KR facilities, thereby making it more difficult for terrorists to conduct surveillance or successfully launch an attack from the immediate vicinity of a potential target.

14. Finally, in its conclusion, the draft report correlates internal scoring related to sector organization, establishment of coordination mechanisms, and other administrative sector activities under the NIPP to actual protection of the sector. As noted during the exit conference, the food/agriculture sector was the first to suggest use of the SCC framework that is in place today, which serves as the principal entity for sector coordination with the government on the wide range of CI/KR protection activities and issues. The report states that this sector status scoring "does not coincide with the significant difficulties and *noteworthy disharmony"* the OIG found (emphasis added). The correlation is inaccurate, and this language should be revisited. Further, to state that this assertion calls critical infrastructure protection efforts in all other sectors into question is unbalanced and unfair.

The above general comments are not meant to say that major improvements in addressing the DHS Food Defense responsibilities are not needed. In fact, the sector would, benefit significantly from more internal and external coordination, and we endorse many of the recommendations. The intent of the above comments is to seek and to encourage a more balanced tone in the report and to express our concern about its open publication in the current form because of this lack of balance.

The main limitations of the report are its factual errors and reliance on single interviews to characterize "progress" in key areas, and its narrow focus on many of the shortcomings of the efforts of the Department without discussing the larger relevant strategic issues that impact performance. For example, criticizing DHS for not submitting an integrated Federal food defense budget plan when DHS is not empowered to do so. These approaches may undermine the otherwise useful recommendations contained in the report

We recommend the OIG revisit these areas specifically, and widen the limited scope of other Federal and private sector feedback that the report presently contains. This will help balance the report and improve its accuracy across the board

DHS Technical Comments

OIG Comment:
p. 20, Table: *G&T Grant Program: DHS Activities and Initiatives with Food Defense Applications*

G&T Response:
Program shown in the table should read Homeland Security Grant Program (HSGP), not State Homeland Security Grant Program (SHSGP).

OIG Comment:

p. 22, 1st paragraph: *Initiatives similar to the work conducted by the NCFPD have been sponsored by G&T under the Homeland Security Exercise and Evaluation Program, as well as through the University of California at Davis, the University of Tennessee, Louisiana State University and the Multi-State Partnership for Security in Agriculture. Programs that S&T has funded that perform work similar to that of the NCFPD include FBADS, and the National Biodefense Analysis and Countermeasures Center. Other parallel efforts are underway at the national laboratories under the auspices of IP and S&T-supported programs, the National Infrastructure Simulation and Analysis Center and Critical Infrastructure Protection Decision Support System, respectively.*

S&T Response:
While the efforts are similar, they are complementary, with NCFPD's efforts usually predating the others. As the IG report notes, NCFPD has coordinated its research with DHS Office of Infrastructure Protection and is collaborating with NBACC on evaluating/populating food event models. NCFPD is actively working with the OGT funded Centers such as the University of California at Davis and University of Tennessee, collaborates with the MSP, and also has participated in the FASCC and GCC.

OIG Comment:
p. 26, 3rd paragraph: *The NCFPD's efforts to collaborate across DHS programs provide a good illustration of this dynamic. DHS provided inadequate liaison support to the NCFPD. When we visited the NCFPD in December 2005, staff reported difficulties accessing information and personnel from DHS programs outside of DHS S&T University Programs group. At that time, NCFPD was not familiar with some important DHS programs involved in sector protection work, including DHS-funded work being done by other entities.*

S&T Response:
S&T is taking steps to increase the staff devoted to improving coordination.

OIG Comment:
p. 27, paragraph 2: *In at least one case, work supporting overlapping program thrusts produced what appears to be a clear case of duplication. At a combined cost of approximately $4.7 million, the NCFPD and FBADS are both independently developing rapid testing platforms to identify the same select agents in precisely the same food matrix.*

S&T Response:

This statement is somewhat inaccurate, because the NCFPD and FBADS programs represent different strategic thrusts in the DHS research portfolio, not duplication. First, there are major differences between the NCFPD and the FBADS efforts. The current sensors under development by the FBADS program all rely on the same biochemical mechanism of detection (i.e. antibody-toxin binding). NCFPD's botulism sensor uses fundamentally different technology; a bio-reactive membrane coupled to an electrochemical readout to be able to detect and distinguish between biologically active and inactive toxin. While the FBADS sensors will most likely be ready for operational deployment within the next 2 years, the NCFPD basic research is into advanced concept designs of alternative technologies to detect pathogens and toxins. In order to maintain long-term technological sophistication and superiority, a continued and sustained investment in basic research and development is essential. Through NCFPD's research programs, DHS is developing the basic technological capabilities to deploy the next generation of advanced food pathogen sensors. Second, the cost estimate of $1,122,134 for NCFPD does not consider the joint product benefits of the research cited. NCFPD's research on sensors for the detection of botulinum toxin is one of several related projects developing sensors for a number of different pathogenic agents in a variety of food matrices. There are multiple benefits from this work, only one of which is nominally related to the FBADS efforts.

OIG Comment:
p. 29, 2nd paragraph: *External coordination is essential for DHS to succeed in executing its responsibilities for food defense and critical infrastructure protection. Relationships with food sector partners are important because of the operational control and regulatory sway they have with that sector.*

S&T Response:
NCFPD's Industry Working Group (IWG) consists of high level representatives from 22 different major food producing corporations and its External Board of Advisors (EBA) adds senior industry executives and regulatory leaders. The IWG and EBA already provide DHS with an excellent resource for external coordination and collaboration with the food sector industry. NCFPD's active engagement with the Food and Agriculture Sector Coordinating Council and its leadership is another important means of engaging with the food sector stakeholders.

OIG Comment:
p. 50, last paragraph: *Early efforts to engage federal partners in contributing to the NPRD did not achieve desired results. In the development of the 2004 plan, DHS solicited suggestions and recommendations from all federal departments charged with protecting critical infrastructures, including the SSAs for the food sector. However, S&T staff reported that not all of these departments were responsive. DHS's requests for information on HHS's critical infrastructure protection R&D plans went unfilled. Consequently, DHS staff was forced to bypass HHS and obtain information on its related R&D activities from the Office of Management and Budget (OMB). After DHS staff integrated this information into the plan, we were told that HHS was given credit for participation in the development of the NPRD, even though it had not responded to requests for information or reviewed the draft plan.*

S&T Response:
S&T recommends deleting the text, "DHS's requests for information on HHS's critical infrastructure protection R&D plans went unfilled. Consequently, DHS staff was forced to bypass HHS and obtain information on its related R&D activities from the Office of

Management and Budget (OMB). After DHS staff integrated this information into the plan, we were told that HHS was given credit for participation in the development of the *NPRD*, even though it had not responded to requests for information or reviewed the draft plan". S&T has since learned the quoted statements are incorrect for the 2004 activities and are not representative for the 2005 activities. HHS did prove to be the source of R&D input for the 2004 plan and they took part in several meetings that focused on the content of the plan and its strategic direction. HHS and USDA were active participants and reviewers for the 2005 effort.

S&T recommends replacing the deleted text with, "The USDA and HHS provided primary coordination and information on the Food and Agriculture Sector for the development of the 2004 and 2005 plans". The intent of the "NPRD" plan is to not emphasize individual sectors, but find overarching themes as instructed by OSTP. Also, HHS and USDA have been increasingly helpful in providing information. The closer coordination across all R&D sector plans and the "NPRD" will indeed improve as sector R&D plans mature, as well as through the NIPP process.

OIG Comment:
p. 56, 1st paragraph: *G&T did not appreciate the need for FDA and FSIS participation in this forum for several months after it was formed. G&T did not recognize that the federal agencies involved in the regulation of post-harvest food were absent from the working group until March 2005. Working group participants at a summit held that month noted that FDA and FSIS were not represented and expressed the view that they should be included in future sessions. After soliciting participants for contact information, G&T extended invitations to FDA and FSIS, and both attended 2005 and 2006 working group sessions.*

G&T Response:
This language does not accurately capture events as they occurred. G&T proposes the use of alternative language as follows:

In March 2005, G&T sponsored an Agroterrorism Training Initiative Working Group summit, which included G&T's grant recipients, the USDA and other Federal, State and local stakeholders. During this time, G&T's grant recipients were in their early development stages and one primary objective of the summit was to develop a seamless training plan for an emergency response to agro-terrorism that reflected the coordination efforts between DHS and USDA. As a result of the working group's efforts and the focus of the UC-Davis grant, it was determined that there needed to be outreach to the FDA and FSIS. The FDA and FSIS are now both active participants in all of the Agroterrorism Training Initiative Working Group's activities and have been involved in vetting the training curriculum of the UC-Davis grant.

OIG Comment:
p. 57, 3rd paragraph: *The Multi-State Partnership for Security in Agriculture currently receives funding through a UASI discretionary grant award.*

G&T Response: The Multi-State Partnership, as an entity, does not receive funding through this cooperative agreement. Iowa receives the grant award on behalf of the partnership.

OIG Comment:

p. 59, 1st paragraph: *"Of the DHS components working with the food sector, G&T has perhaps the most anomalous approach to risk. G&T's prioritization stance does not easily fit within the risk management approach embraced by the other organizational units with food sector activities. Rather than considering risk across infrastructure sectors, G&T identifies priorities by considering deficits in the nation's preparedness posture."*

G&T Response:
This section should be clarified. The language appears to state that G&T established priorities independent of the rest of the Department. However, the National Priorities reflected in the National Preparedness Goal were developed through a collaborative, interagency process that also included State, local, and non-government input. These National Priorities fall into two categories: overarching priorities that contribute to the development of multiple capabilities, and capability-specific priorities that build selected capabilities from the Target Capabilities List (TCL) for which the Nation has the greatest need. Included in the overarching National Priorities is implementation of the NIPP, which is the cornerstone of an integrated, national approach to protecting critical infrastructure across all sectors. The capability-specific priorities map to 8 capabilities from the TCL. Those capabilities are frequently referred to as priority capabilities because of their direct link to the National Priorities, as outlined in the National Preparedness Goal.

Furthermore, all of the data for the risk assessment, prioritization, and allocation processes was leveraged and coordinated with Infrastructure Protection (IP) and is synchronized with the Department's broader risk management approach, as outlined in the NIPP.

OIG Comment
p. 59, 3rd paragraph: *G&T requires states to develop state-based homeland security plans and set priorities within the scope of those plans. Some states place particular emphasis on post-harvest food security in their homeland security plans, and, in turn, support related priorities with funding distributed through G&T's Homeland Security Grant Program. Conversely, because DHS does not require states to address all target capabilities in their plans, or food and agriculture safety and defense in particular, a number of states might not use any HSGP funding to sponsor efforts in this area. We could not ascertain which states were or were not currently performing G&T-supported state food safety and defense activities, however, because G&T does not regularly track states' activities in this area.*[1]

G&T Response: In 2005, States and territories updated their Homeland Security Strategies to reflect the national priorities as identified in the National Preparedness Goal. Through this process, G&T asked States to identify 3-5 additional capabilities that are priorities for them, beyond those outlined in the National Priorities in the National Preparedness Goal. Nearly one-third of the States and territories indicated that the Food and Agriculture Safety and Defense capability is a priority for them, and this was reflected in their strategy updates.

[1] G&T has studied states' agroterrorism-related plans in the past, however. G&T's analysis of Fiscal Year 2004 state homeland security plans revealed that states planned initiatives in 14 different areas to address agroterrorism threats. Such initiatives ranged from vulnerability and risk assessments to exercises and from information sharing and surveillance to public outreach. While several states and territories planned a broad complement of related activities, 13 states (including California) did not present any initiatives to address agroterrorism in their Fiscal Year 2004 homeland security strategies according to G&T. [Recommend deleting the quoted footnote. You could incorporate the info in your response if you feel it is significant.]

OIG Comment
p. 60, 1st paragraph: *Although G&T's support of food defense and critical infrastructure protection activities does not easily translate into the Secretary's risk management framework, the prioritization efforts of other DHS units do.*

G&T Response: All data for the assessment, prioritization, and allocation processes was leveraged and coordinated with IP and is synchronized with the Department's risk management approach.

OIG Comment
p. 62, 3rd paragraph: *As S&T and IP IPD support large scale plans to move forward with CARVER+Shock assessments of food sector subsystems, another DHS component is supporting an effort to employ a different assessment methodology. As noted earlier, G&T has provided a $2 million grant to the University of Tennessee to develop an agroterrorism assessment training program. Under current plans, the program will encourage program participants to focus on an Operational Risk Management (ORM) approach to assessment, rather than CARVER+Shock. This support for ORM assessment is not consistent with the Homeland Security Council's 2003 instruction to abandon this assessment approach in favor of CARVER+Shock for the food and agriculture sectors.*

G&T Response: G&T's grantee, the University of Tennessee, and its Agriculture and Food Vulnerability Assessment Training Program will introduce various assessment methodologies that can be used to evaluate vulnerabilities in agriculture and food systems, as well as individual facility analysis. Assessment methodologies that will be presented include ORM, System Analysis, and Carver+Shock. The use of Carver+Shock as a practical tool for assessment and identification of critical nodes will be emphasized, which is clearly stated in the University of Tennessee's Program of Instruction.

OIG Comment
Vulnerability Assessment Standards

p. 69, 1st paragraph: *Further confounding matters is the fact that different DHS components support different assessment methodologies. In practice, DHS is supporting three different approaches. As noted earlier, S&T's NBACC and IP IPD currently support CARVER+Shock assessment initiatives, while G&T sponsors an ORM-based course development effort at the University of Tennessee. Meanwhile, IP RMD staff maintains that the only suitable approach is RAMCAP.*

G&T Response: This statement that "G&T sponsors an ORM-based course development effort at the University of Tennessee" is a misrepresentation. While the University of Tennessee will include ORM as one of its tools, it will also introduce various assessment methodologies that can be used to evaluate vulnerabilities in agriculture and food systems, as well as individual facility analysis. Assessment methodologies that will be presented include Analysis and Carver+Shock. The use of Carver+Shock as a practical tool for assessment and identification of critical nodes will be emphasized, which is clearly stated in the University of Tennessee's Program of Instruction.

OIG Comment
Preparedness Framework – the NIPP and the National Preparedness Goal
p. 106, 1st paragraph: *This goal sets preparedness priorities and establishes a system for assessing the state of overall national preparedness.*

G&T Response: The States were asked to align their activities with the Goal and the National Priorities, including implementation of the NIPP. They were also required to identify 3-5 additional capabilities that are priorities for them. This allowed them the opportunity to address relevant agricultural issues,, regardless of the scope of the Goal.

OIG Comment
p. 106, 2nd paragraph: "*... none of the eight priority capabilities focuses primarily on food.*"

G&T Response: Many critical sectors are not specifically targeted by the eight priorities, including the nuclear, chemical, or transportation sectors. This fact illustrates the clear benefit of having NIPP implementation as a National Priority. NIPP encompasses all CI/KR protection activities across all sectors.

OIG Comment
p. 108, 2nd paragraph: *Implementing the NIPP, may also bear positively on food critical infrastructure protection, as the NIPP recognizes the food sector as a critical infrastructure sector.*

G&T Response: Implementing the NIPP is one of the 7 national priorities, and is the umbrella for all CIP activities including the agriculture sector.

OIG Comment
p. 107, 2nd paragraph: *The Target Capabilities List (TCL) identifies 36 capabilities that DHS has determined are essential for different levels of government to effectively prepare for terrorist attacks and other major disasters.[2] These target capabilities were distilled from critical tasks identified in the UTL and are similarly grouped into their support for the different preparedness mission areas – prevention, protection, response, and recovery. One such target capability relates directly to food. Among the nine targeted "protection" capabilities is the "capability to identify and defend against pathogens, chemical and biological contaminants, and other hazards that affect the safety of food and agriculture products."[3] Other target capabilities only relate to food defense as part of a larger set of activity, like those concerning risk assessment and critical infrastructure protection.*

G&T Response: The report should note that several of the 37 TCLs directly relate to or support the agriculture sector, per TCL Version 2.0. They include the following:

1) Critical Infrastructure Protection in which agriculture is one of the sectors;
2) Epidemiological Surveillance & Investigation, which is the capacity to rapidly conduct epidemiological investigations. It includes exposure and disease detection of both deliberate

[2] DHS, *National Preparedness Guidance, Homeland Security Presidential Directive 8: National Preparedness*, April 27, 2005, p. iii.
[3] DHS, *Target Capability List: Version 1.1*, May 23, 2005, p. 54. [Recommend deleting footnotes. They don't add anything to the response.]

release and naturally occurring events; rapid implementation of active surveillance, maintenance of ongoing surveillance activities; epidemiological investigation, analysis, and communicating with the public and providers about case definitions, disease risk and mitigation; and recommendations for the implementation of control measures

3) Public Health Laboratory Testing capability, which is the ongoing surveillance, rapid detection, confirmatory testing, data reporting, investigative support, and laboratory networking to address potential exposure or exposure to all-hazards; which include chemical, radiological, and biological agents in all matrices, including clinical specimens, food, and environmental samples taken from water, air, or soil. Such all-hazard threats include those deliberately released with criminal intent, as well as those that may be present as a result of unintentional or natural occurrences

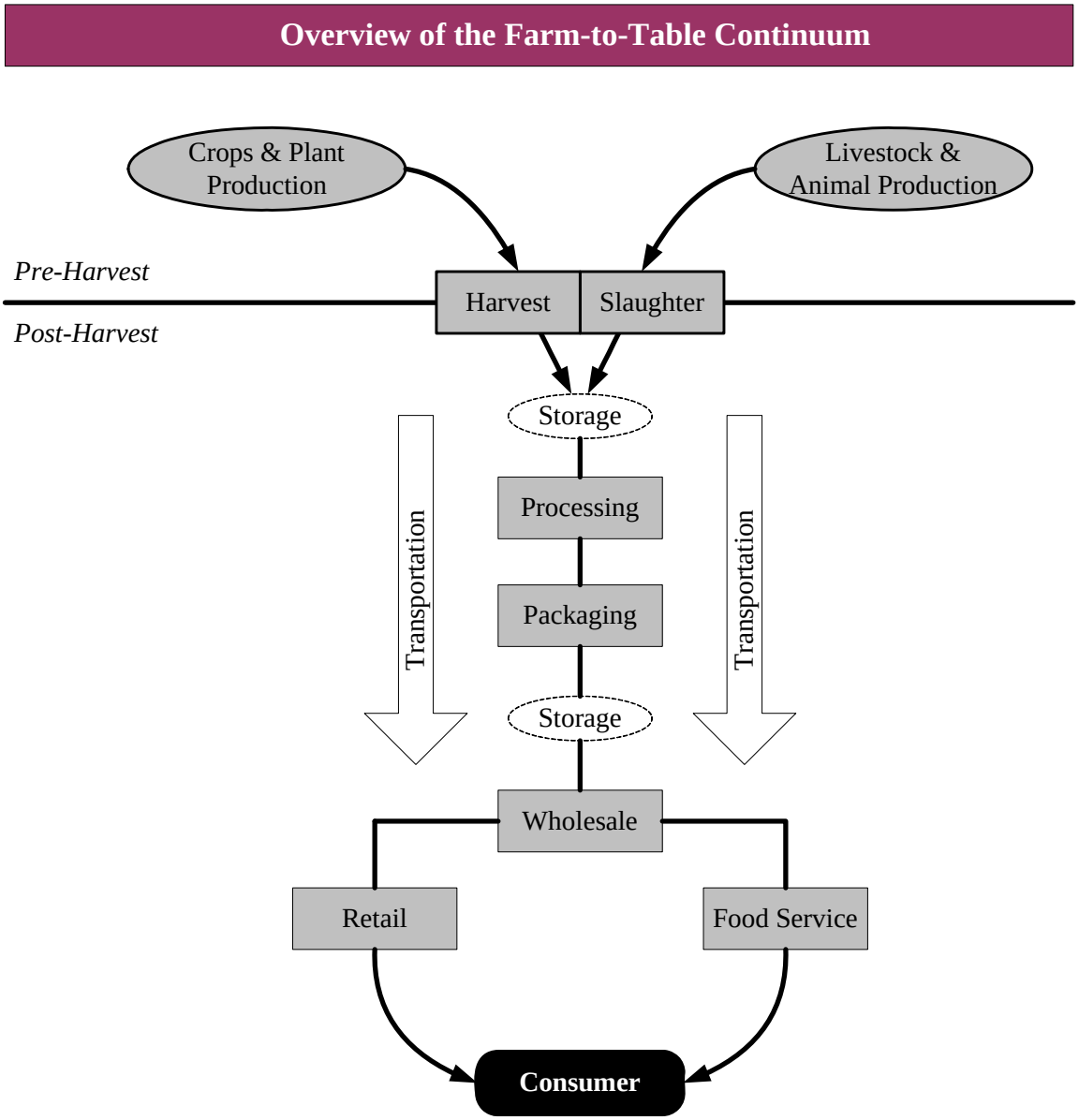
4) Food and Agriculture Safety and Defense

5) Animal Health Emergency Support, which is the capability to protect, prevent, detect, respond to, and recover from threats and incidents that would result in the disruption of industries related to U.S. livestock, other domestic animals (including companion animals), wildlife, and/or endanger the food supply, public health, and domestic and international trade. It includes the ability to respond to large-scale national and regional emergencies, as well as to smaller scale incidents through rapid determination of the nature of the event, initiation of the appropriate response, containment of the disrupting effects, and facilitation of recovery.

Farm-to-Table Continuum

This graphic provides a general overview of food processing across the production and supply chain. It is not intended to represent all stages or specific processing steps for all foods, rather the important links between the food and transportation sectors are noted at each phase of the continuum.

Figure 2. Farm-to Table Continuum



Federal Food Sector Regulatory Oversight

Nine federal agencies have a regulatory role in the food sector. FDA and USDA's Food Safety and Inspections Service are the two primary entities with an oversight role. Summaries of the roles played by each of these nine agencies are provided below, as are examples of foods regulated by FDA and Food Safety and Inspections Service.

Federal Food Regulatory Agencies

Agriculture Marketing Service, USDA
The Agricultural Marketing Service includes six commodity programs--Cotton, Dairy, Fruit and Vegetable, Livestock and Seed, Poultry, and Tobacco. The programs employ specialists who provide standardization, grading and market news services for those commodities. The agency enforces such federal laws as the Perishable Agricultural Commodities Act and the Federal Seed Act.

Alcohol and Tobacco Tax and Trade Bureau, Department of the Treasury
Established as part of the *Homeland Security Act*, this new bureau assumed some functions historically done by the Bureau of Alcohol, Tobacco, and Firearms. The agency also collects alcohol, tobacco, firearms and ammunition excise taxes, to ensure that these products are labeled, advertised and marketed in a legal manner.

Customs and Border Protection, DHS
In the discharge of its import protection role, CBP has a variety of contact with the food and agriculture sector. As discussed in this report, CBP works with FDA and USDA on import targeting. CBP also conducts inspections of agriculture imports, a function that was performed by the Animal and Plant Health Inspection Service prior to the creation of DHS.

Environmental Protection Agency
Although the Food and Drug Administration regulates most aspects of food production and consumption in the United States, the EPA is responsible for regulating the use of pesticides on food. In cooperation with the states, the agency carefully regulates pesticides to ensure that their use does not compromise food safety. In particular, the federal pesticide program is designed to ensure that pesticides can be used without posing harm children and infants. The agency also provides information

to the public about possible food contamination dangers, such as mercury in fish.

Federal Trade Commission
The agency's enforcement of truth-in-labeling laws examines the claimed benefits of food and other commodities. Additionally, review of anti-competitive practices focuses on key aspects of the economy, like the food sector.

Food and Drug Administration, HHS
FDA regulates most of the food consumed in the United States. FDA's inspection activities are not continuous, unlike the Food Safety and Inspections Service. Another major FDA mission is to protect the safety and wholesomeness of food. The agency's scientists test samples to see if any substances, such as pesticide residues, are present in unacceptable amounts. If contaminants are identified, FDA takes corrective action. FDA also sets labeling standards to help consumers know what is in the foods they buy. FDA also ensures that medicated feeds and other drugs given to animals raised for food do not threaten consumer health.

Food Safety and Inspection Service, USDA
The Food Safety and Inspections Service performs continuous onsite inspection of U.S. meat, poultry, and processed egg facilities. The agency sets requirements for meat and poultry labels and for certain slaughter and processing activities, such as plant sanitation and thermal processing. The Food Safety and Inspections Service tests for microbiological, chemical, and other types of contamination and conducts epidemiological investigations in cooperation with CDC. In addition, the Food Safety and Inspections Service conducts enforcement activities to address situations where unsafe, unwholesome, or inaccurately labeled products have been produced or marketed. Another important Food Safety and Inspections Service activity is the re-inspection of imported products.

Grain Inspection, Packers and Stockyards Administration, USDA
This agency facilitates the marketing of livestock, poultry, meat, cereals, oilseeds, and related agricultural products, and promotes fair and competitive trading practices for the overall benefit of consumers and American agriculture.

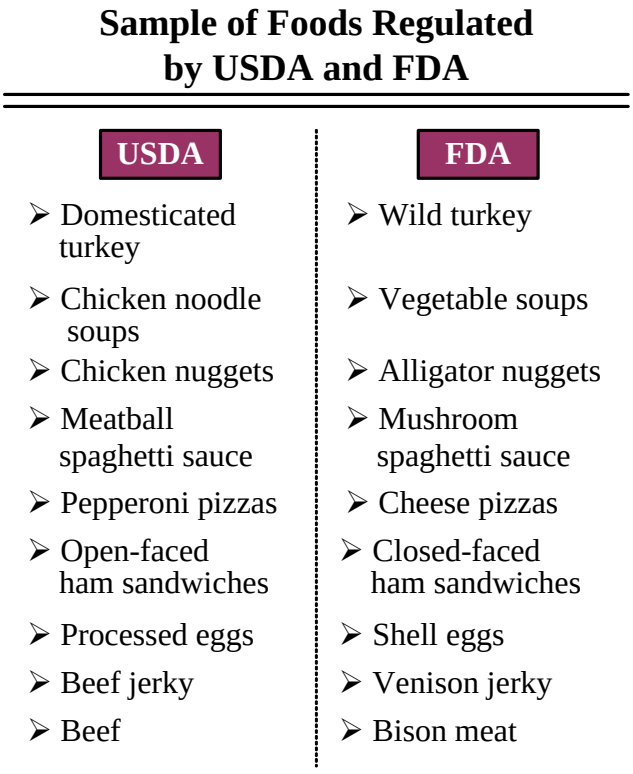
National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Department of Commerce
Under this agency, a voluntary seafood inspection program is conducted. The program provides vessel and plant sanitation, product inspection,

grading, certification, and other services. Participants may use official marks on compliant products, indicating the items were federally inspected. Additional work includes reviewing compliance with fisheries regulations and reduction of wasteful fishing practices.

Complex Web of Federal Food Oversight

One challenge in coordinating food defense is the division of regulatory responsibility between FDA and the Food Safety and Inspections Service on food safety inspections. The absence of a single food safety agency has helped foster the development of overlapping and close connections in regulating the post-harvest food sector. The different intensity of effort in FDA and Food Safety and Inspections Service inspection regimens can also result in differences in the vulnerability of food products.

Figure 3. Regulatory Oversight of Sample Food Products



Critical Infrastructure Sectors and Designated Sector-Specific Agencies

Table 4. Critical Infrastructure Sectors and Sector-Specific Agencies

Critical Infrastructure Sectors	
Critical Infrastructure Sector	**Sector-Specific Agency**
Agriculture and Food*	USDA and HHS/FDA
Banking and Finance	Department of the Treasury
Chemical	DHS
Commercial Facilities**	DHS
Dams**	DHS
Defense Industrial Base	Department of Defense
Emergency Services	DHS
Energy	Department of Energy
Government Facilities**	DHS
Information Technology	DHS
National Monuments and Icons**	Department of the Interior
Nuclear Reactors, Materials, and Waste**	DHS
Postal and Shipping	DHS
Public Health and Healthcare	HHS
Telecommunications	DHS
Transportation	DHS
Water	Environmental Protection Agency

* Agriculture and Food were initially treated as separate infrastructure sectors.[104] In February 2003, however, *The National Strategy for the Physical Protection of Critical Infrastructures and Key Assets* redefined the two as a single infrastructure sector.[105]

** These sectors are considered key assets or key resources rather than critical infrastructure sectors.

[104] Executive Office of the President, Office of Homeland Security, *National Strategy for Homeland Security*, July 2002, p. 30.
[105] Executive Office of the President, Office of Homeland Security, *National Strategy for the Physical Protection of Critical Infrastructures and Key Assets*, February 2003, p. xii.

DHS Food Sector Responsibilities

Table 5. DHS Food Sector Responsibilities and Their Origins

DHS Responsibilities in Food Defense and Critical Infrastructure Protection		
Role	**Responsibility**	**Statutory Basis**
Critical Infrastructure Protection Management and Coordination		
Lead	➢ Lead, integrate, and coordinate critical infrastructure protection efforts by federal, state and local governments, and the private sector	Homeland Security Presidential Directive 7 (12)
	➢ Establish uniform policies, approaches, guidelines, and methodologies for infrastructure protection and risk management	Homeland Security Presidential Directive 7 (14)
	➢ Outline critical infrastructure protection goals, objectives, milestones, and key initiatives	Homeland Security Presidential Directive 7 (27)
	➢ Establish metrics and criteria for related programs	Homeland Security Presidential Directive 7 (14)
Collaborative	➢ Submit integrated budget plan for U.S. **food** system defense	Homeland Security Presidential Directive 9 (26)
Support	➢ Provide specific expertise and assistance in addressing critical infrastructure protection	*NIPP* , p. 18-19
Asset Identification & Mapping		
Lead	➢ Identify critical infrastructure and maintain a national inventory of critical infrastructure assets	Homeland Security Presidential Directive 7 (13); *NIPP* , p. 31
	➢ Develop a program to geospatially map, image, analyze, and sort critical infrastructure	Homeland Security Presidential Directive 7 (31)
Information Sharing, Threat Awareness, & Warning		
Lead	➢ Establish systems, mechanisms, and procedures to share critical infrastructure threat information with federal, state and local governments, and the private sector	Homeland Security Presidential Directive 7 (28)
	➢ Establish an effective information sharing and analysis mechanism for **food** and agriculture	Homeland Security Presidential Directive 9 (19)
	➢ Develop a national indications and warnings architecture for infrastructure protection	Homeland Security Presidential Directive 7 (33)
	➢ Identify and assess the nature and scope of threats, provide threat scenarios and assessments,	*NIPP* , p. 19
	➢ Develop biological threat awareness capacity for detection of attacks on **food**	Homeland Security Presidential Directive 9 (10)
	➢ Conduct assessments of the evolving biological weapons threat	Homeland Security Presidential Directive 10
Collaborative	➢ Develop and enhance intelligence operations and analysis capabilities for the **food** sector	Homeland Security Presidential Directive 9 (9)
	➢ Facilitate information sharing on physical and cyber threats and incidents	Homeland Security Presidential Directive 7 (25)

* Homeland Security Presidential Directive 10 paragraph citations refer to paragraphs in the published version of the document. (http://www.whitehouse.gov/homeland/20040430.html)

DHS Responsibilities in Food Defense and Critical Infrastructure Protection**		
Role	**Responsibility**	**Statutory Basis**
	Vulnerability Assessment	
Lead	➢ Conduct vulnerability assessments and analyses, and test vulnerabilities	Homeland Security Act, §201(d)(2) and §201(d)(2)(6)
	➢ Establish uniform approaches to vulnerability assessment	Homeland Security Presidential Directive 7 (14)
Collaborative	➢ Expand and conduct vulnerability assessments for the **food** sector	Homeland Security Presidential Directive 9 (11)
	➢ Facilitate sharing of information about vulnerabilities	Homeland Security Presidential Directive 7 (25)
	➢ Develop analyses to understand weaknesses that may be exploited by adversaries	Homeland Security Presidential Directive 10
	Consequence Assessment & Modeling	
Lead	➢ Model the implications of exploitation of infrastructure vulnerabilities	Homeland Security Presidential Directive 7 (32)
	➢ Create and maintain models of critical infrastructure systems	USA PATRIOT Act, §1016 (d)(2)(B)
	Protective Measures & Prioritization	
Lead	➢ Prioritize and coordinate the protection of critical infrastructure	Homeland Security Presidential Directive 7 (13)
	➢ Identify priorities for protective and support measures	Homeland Security Act, §201(d)(3)
	➢ Recommend measures to protect critical infrastructure	Homeland Security Act, §201(d)(6)
Collaborative	➢ Develop and implement mitigation strategies to protect vulnerable critical **food** and agriculture production nodes	Homeland Security Presidential Directive 9 (12)
	➢ Expand development of common screening procedures for **food** items entering the United States	Homeland Security Presidential Directive 9 (13)
	➢ Facilitate sharing of information about potential protective measures and best practices	Homeland Security Presidential Directive 7 (25)

* Homeland Security Presidential Directive 10 paragraph citations refer to paragraphs in the published version of the document. (http://www.whitehouse.gov/homeland/20040430.html)

DHS Responsibilities in Food Defense and Critical Infrastructure Protection**		
Role	**Responsibility**	**Statutory Basis**
	Research & Development	
Lead	➢ Establish a university-based center of excellence in **food** security	Homeland Security Presidential Directive 9 (25); Homeland Security Act, §308(b)(2)(B)(vi)
	➢ Coordinate research and development of methods for detection, prevention technologies, agent characterization, and dose response relationships for high-consequence agents in the **food** supply	Homeland Security Presidential Directive 9 (23)
Collaborative	➢ Coordinate interagency research and development to enhance the protection of critical infrastructure	Homeland Security Presidential Directive 7 (22)(e)
	➢ Prepare an annual critical infrastructure protection research and development plan	Homeland Security Presidential Directive 7 (30)
	Education, Outreach, Training & Preparedness	
Lead	➢ Establish a university-based center of excellence in **food** security	Homeland Security Presidential Directive 9 (25); Homeland Security Act, §308(b)(2)(B)(vi)
	➢ Ensure adequate response capabilities for terrorist attack, disease outbreak, or other disaster impacting **food** infrastructure	Homeland Security Presidential Directive 9 (14)
Collaborative	➢ Establish opportunities for professional development and specialized training in **food** protection	Homeland Security Presidential Directive 9 (22)
Support	➢ Support the development of inter-disciplinary higher education programs to prepare **food** defense professionals	Homeland Security Presidential Directive 9 (21)

** Excluding response and recovery responsibilities.

DHS Food-Sector-Related Programs

DHS operates a number of programs and initiatives with food defense and critical infrastructure protection features. Some of these programs serve critical infrastructure protection efforts at large, and only engage the food sector as part of one of these infrastructures, to a limited degree. Related DHS programs and activities are arrayed across five different DHS organizational entities: the Offices of Infrastructure Protection, Grants and Training, and the Chief Medical Officer, S&T, and CBP. The following section provides brief descriptions of the related programs and initiatives within each of these four DHS components.

Office of Infrastructure Protection Programs and Initiatives

Food and Agriculture Government Coordinating Council
Officially organized in 2004, the Food and Agriculture Government Coordinating Council is the government's primary resource for the coordination of inter-departmental work on food security. DHS, USDA, and FDA rotate as the Government Coordinating Council chair on an annual basis. Three state and local associations and several other federal entities, including the Departments of Defense and Commerce, as well as the EPA, are part of the Government Coordinating Council. In addition to its active participation in the Government Coordinating Council, DHS provides funding for the Government Coordinating Council's administrative support requirements. DHS support for the Government Coordinating Council Secretariat totals approximately $155,000 a year.

Food and Agriculture Sector Coordinating Council
The Food and Agriculture Sector Coordinating Council is the private sector's counterpart to the Government Coordinating Council. Also organized in 2004, the Sector Coordinating Council includes a variety of members across the food and agriculture sectors. Although dozens of companies and organizations participate, seven subcouncils of three members each lead the Sector Coordinating Council. Joint meetings facilitate communication between the Sector Coordinating Council and the Government Coordinating Council. DHS provides funding for the Sector Coordinating Council's administrative support requirements. DHS support for the Sector Coordinating Council Secretariat totals approximately $180,000 a year.

Homeland Security Information Network Food and Agriculture Portal
The Homeland Security Information Network Food and Agriculture Portal is an internet-based tool for sharing threat and analytical information for sector participants. Initial discussions on portal design began in October 2004. Representatives from the Government Coordinating Council and Sector Coordinating Council helped establish the online layout of the system, which is currently in the pilot stage. The portal is designed for sharing information, facilitating response to events, and expanding dialogue in the food and agriculture sectors. DHS support for Homeland Security Information Network Food and Agriculture portal development and related sector outreach and requirements development efforts has totaled approximately $430,000.

National Infrastructure Coordinating Center
A 24/7 watch operations center, the National Infrastructure Coordinating Center reports to DHS' Office of Infrastructure Protection, but is considered an "operational extension" of the DHS National Operations Center. The primary missions of the National Infrastructure Coordinating Center are to "maintain operational and situational awareness" of critical infrastructure issues and to provide "a centralized mechanism and process for information sharing and coordination."[106] The National Operations Center is the source of most requests for information handled by the National Infrastructure Coordinating Center. The National Infrastructure Coordinating Center issues four types of finished products: suspicious activity reports, spot reports, current situation reports, and a daily sector pulse. As the food sector is a critical infrastructure sector, these products may address related issues.

Homeland Infrastructure Threat and Risk Analysis Center
The Homeland Infrastructure Threat and Risk Analysis Center, which originated in January 2005, provides industry and government a better understanding of threats to critical infrastructure. The center is located within and jointly staffed by the Office of Intelligence and Analysis and the Office of Infrastructure Protection. It considers threat, risk, and consequence in the creation of various notices and warnings. The center, which has developed some food sector products, regards the private sector as its primary customer.

Protected Critical Infrastructure Information Program
Established in Section 214 of the *Homeland Security Act*, the Protected Critical Infrastructure Information program is designed to increase the

[106] DHS, *NIPP*, June 30, 2006, p. 64.

amount of critical infrastructure information by providing private industry with an alternative means to share voluntarily their sensitive and proprietary business information with the federal government. Private sector infrastructure information submitted under the program has greater protections from disclosure than other government information, and it may not be released, for example, in response to Freedom of Information Act requests. DHS, which is charged with guarding this information, is to use information deemed Protected Critical Infrastructure Information to improve the protective environment of all infrastructure sectors. The food industry has provided information under the Protected Critical Infrastructure Information program.

DHS Educational Reports

DHS has created three types of reports on critical infrastructures. These reports are distributed to state and territorial Homeland Security Offices, and are designed for sharing with asset owners and law enforcement personnel.

Characteristics and Common Vulnerabilities Reports

These reports meld information on characteristics, vulnerabilities and consequences, along with possible warning signs of an attack, to facilitate protective measures, detection and prevention for each infrastructure sector. DHS had completed five Characteristics and Common Vulnerability Reports on the food and agriculture sectors as of December 2005.

Potential Indicators of Terrorist Activity Reports

These reports offer suggestions on how to detect possible terrorist activity in areas adjoining critical infrastructure. They have content similar to the characteristics and common vulnerabilities reports discussed above. DHS had completed five Potential Indicators of Terrorist Activity reports on the food sector by December 2005.

Protective Measure Reports

Protective Measure reports are designed to inform states and infrastructure owners about best practices and other possible means to defend particular sectors against terrorist acts. The reports suggest ways to remedy vulnerabilities discussed in Common Characteristics and Potential Indicators reports. DHS had completed six of these reports on the food sector as of December 2005.

Site Assistance Visits
Site Assistance Visits are designed to aid in filling gaps in private sector vulnerability assessments. A Site Assistance Visit is a one- or two-day "inside the fence" review of an asset's vulnerabilities. Written reports are created as a product of this review. These reports discuss baseline threats, vulnerabilities, and protective measures. DHS has concentrated Site Assistance Visit efforts on sector components of "particular concern." As of December 2005, DHS had conducted eight Site Assistance Visits of food sector assets.

Buffer Zone Plans
Buffer Zone Plans are products of the Buffer Zone Protection Program, a joint effort between the Office of Infrastructure Protection and Office of Grants and Training. State and local authorities in conjunction with public and private infrastructure owners develop Buffer Zone Plans under the guidance of Office of Infrastructure Protection staff. Among other things, the plans identify vulnerabilities associated with facility buffer zones – extensions of protection beyond the gates of critical facilities – and analyze and categorize the level of risk associated with these vulnerabilities. A limited number of Buffer Zone Plans have been completed on food sector assets.

Strategic Partnership Program for Agroterrorism Initiative
Announced in July 2005, this initiative is an FBI-funded effort to develop a comprehensive perspective on food and agricultural vulnerabilities. Strategic Partnership Program Agroterrorism is designed to gather vulnerability information on food and agricultural product types, commodities, and activities, rather than particular firms or facilities. FDA or USDA representatives serve as facilitators, while DHS, FBI, and state and local departments of health and agriculture typically participate alongside private sector representatives.[107]

National Asset Database
The National Asset Database is to serve as a "comprehensive catalog of the assets, systems, and networks that comprise" the country's critical infrastructures.[108] Overseen by the Office of Infrastructure Protection, the National Asset Database is housed and maintained at Oak Ridge National Laboratory. Food sector assets are represented in the National Asset Database.

[107] Center for Food Safety and Applied Nutrition, "Strategic Partnership Program Agroterrorism (SPPA) Initiative: A Joint Effort of the FBI, DHS, USDA, and FDA to Help Secure the Nation's Food Supply," August 2005; and Center for Food Safety and Applied Nutrition, "SPPA Initiative Questions and Answers," September 23, 2005.
[108] DHS, *NIPP*, June 30, 2006, p. 159.

National Infrastructure Simulation and Analysis Center
Originally part of the Department of Energy's Office of Energy Assistance, the National Infrastructure Simulation and Analysis Center is now overseen by the Office of Infrastructure Protection. The National Infrastructure Simulation and Analysis Center is a partnership of Sandia National Laboratories and Los Alamos National Laboratory. It provides advanced modeling and simulation capabilities for the analysis of critical infrastructures, including the food sector, and their interdependencies, vulnerabilities, and complexities.

Office of Grants and Training Programs

Multi-State Partnership for Security in Agriculture
Iowa, the lead sponsor in the Multi-State Partnership for Security in Agriculture, received $2.0 million in 2002 for its Agriculture Counterterrorism Project. Under the project, the Multi-State Partnership, which includes 10 states in the Central United States, facilitates interstate agro-security planning and the development of asset protection programs for the food supply chain. The project also assists the food industry's development of vulnerability assessments and effective security strategies.

University of California - Davis Training Support
The Western Institute for Food Safety and Security at UC Davis received a $4.7 million training grant. The Institute's focus is on developing a training process to enhance preparedness against weapons of mass destruction targeted at food and agriculture. The program has seven training courses in its agroterrorism-preparedness curriculum. These courses address issues of awareness, team building, preparedness, risk communication, detection and investigation, response, and recovery. The program plans to train 1 million first responders through courses and performance-testing exercises.

University of Tennessee Training Support
In October 2005, the University of Tennessee College of Veterinary Medicine received a grant of $2 million to develop and deliver a national 16-hour agricultural vulnerability assessment training program for state and local officials and agricultural managers. The program aims to strengthen the ability of state and local communities to improve the intelligence and operational capabilities for prevention and deterrence of terrorist acts against the sector by providing courses to 300,000 first responders.

Louisiana State University Course Development
The National Center for Biomedical Research and Training at Louisiana State University received $1.4 million for food and agriculture course development. Training targets those involved in food and agriculture with supervisory responsibilities and provides information on the prevention and deterrence of a terrorist attack on food and agriculture. Participants engage in several scenarios involving planning and case studies and conduct a table-top exercise based on a vulnerability in their region.

Exercise Support
Grants and Training's Exercise and Training Division provides food defense exercise support in at least two ways. First, it has provided direct support for three food sector-related exercises. Second, it helps state and local jurisdictions create, conduct, and evaluate exercise programs through its Homeland Security Exercise and Evaluation Program. The goal of this program is to standardize exercises, and related policies, definitions, and requirements across government.

State Homeland Security Program
Grants and Training supports food defense activities at the state level through the State Homeland Security Program. This program began in Fiscal Year 2003 with $566 million in funding for grants. For Fiscal Year 2006, the program awarded grants totaling $544.5 million. This program was designed to assist states and localities build capabilities to address state homeland security strategies and develop all-hazard target capabilities. The State Homeland Security Program provides support for state and local planning, training, exercising, and equipment. These activities enhance state and local capabilities to prevent, protect, respond to and recover from a range of catastrophes and adverse events, including food-related incidents.

Office of the Chief Medical Officer Program

National Biosurveillance Integration System
The National Biosurveillance Integration System, which was launched in December 2005, is part of a national biosurveillance initiative. The system is designed to augment national biosurveillance capabilities through coordination of various systems in existence at federal agencies. By accessing information from human and animal health, food and environmental monitoring systems, the National Biosurveillance Integration System seeks to reduce detection time following an event,

speed determinations about the cause of biological events, and advance recovery efforts.

S&T Programs

National Center for Food Protection and Defense
The NCFPD is a university-based Homeland Security Center of Excellence established in 2004. Based at the University of Minnesota, the NCFPD will receive $15 million over its first three years of operation. The Center's mission is to reduce the likelihood of deliberate contamination of the food chain, develop rapid detection methodologies, enhance strategies for effective and efficient response to and mitigation of intentional attacks, and expand the pool of experts in food security. In conducting food defense activities, the Center collaborates with many industry, academic, federal, state, and local entities.

Food Biological Agent Detection Sensor
The Food Biological Agent Detection Sensor program was established in 2005. This program focuses on developing a rapid, portable detection technology for *Clostridium botulinum* toxin in a beverage matrix. Once the technology is developed and tested, the focus will move to other liquid food matrices, as well as other select agents. Awards for the first phase of the program, which will culminate in the testing of pre-production model sensors, totaled $3.6 million.

National BioDefense Analysis and Countermeasures Center
The National BioDefense Analysis and Countermeasures Center is a resource established by S&T in 2003 to serve as a research and information hub for the federal government at large. Construction is underway at Fort Detrick, Maryland for a permanent laboratory facility. The Center studies current and future biological threats, assesses vulnerabilities, determines potential consequences, and provides a forensic analysis capability. It is comprised of three entities: a Biological Threat Characterization Center, the Biological Defense Knowledge Center, and a Biological Forensic Analysis Center, which is the lead federal entity for performing forensic analysis on biological samples. During Fiscal Years 2003 and 2004, the facility allocated $5.5 million in support of threat assessments, detection, and viability studies for biological, chemical, and toxic agents that could threaten food.

University of Kentucky Tracking System
The University of Kentucky, in collaboration with the University of Louisville and Western Kentucky University, has received approximately $1.5 million in funding to develop a wireless milk tracking system using satellite technology. The system is expected to take two to three years to develop.

Critical Infrastructure Protection Decision Support System
The Critical Infrastructure Protection Decision Support System is an equal collaboration between Argonne, Los Alamos, and Sandia National Laboratories. The program's budget for Fiscal Year 2005, which is equally divided among the three labs, was $7.5 million. The system develops interdependent infrastructure models to assess the consequences of disruptions in any of the infrastructure sectors. Critical Infrastructure Protection Decision Support System models attempt to simulate disruption scenarios, evaluate consequences, and assess the effectiveness of mitigation actions. The program uses information from the models to support a "risk-informed" decision-support tool to identify activities to best reduce overall risk.[109]

CBP Initiative

Notification and Targeting Support
CBP has collaborated with FDA in developing prior notification requirements for imported foods and currently shares a watch center facility with FDA's Prior Notice Center. Also, CBP has supported the development of targeting criteria to aid FDA and USDA in targeting high-risk food imports. Finally, CBP has provided FDA and USDA with key access to information systems, and designed and developed a prior notice submission interface with the primary customs trade information system, the Automated Commercial System.

[109] S&T, Parney Albright, "Critical Infrastructure Protection Decision Support System," August 4, 2004.

The Food Sector in Frameworks for Infrastructure Protection, National Preparedness, and Incident Management

Much of DHS' mission and many of its related responsibilities can be traced to three key policy frameworks, those for: infrastructure protection, national preparedness, and incident management. To a large extent, these policy frameworks mark their beginnings with different Homeland Security Presidential Directives. Federal infrastructure protection and preparedness activities, the focus of much of this review, were outlined in Homeland Security Presidential Directives 7 and 8. Homeland Security Presidential Directive 5, in turn, discusses federal policy and responsibilities relating to incident management.

According to the *NIPP*, these frameworks collectively amount to a "common, holistic approach to achieving the homeland security mission."[110] Each of these frameworks contain elements relating to the food sector, but it is unclear how they correspond with one another to form a holistic approach.

In this section, we outline each of these frameworks – infrastructure protection, national preparedness, and incident management – and their applicability to the food sector. In addition, we examine how effectively the food sector elements of these frameworks link together.

Infrastructure Protection Framework

In February 2003, the White House published *The National Strategy for the Physical Protection of Critical Infrastructure and Key Assets*. The *National Strategy* discussed the government's plan to secure critical infrastructures, and counted the food industry as part of a critical infrastructure sector – the food and agriculture sector.

Homeland Security Presidential Directive 7 clarified roles and responsibilities set forth in the *National Strategy* with the aim of enhancing the protection of critical infrastructures from terrorist threats. It identified DHS as the overall lead and coordinator of federal infrastructure protection activities, and designated Sector-Specific Agencies for each critical infrastructure sector. According to Homeland Security Presidential Directive 7, Sector Specific Agencies are responsible for working with DHS to augment security for their respective sectors.

[110] DHS, *NIPP*, June 30, 2006, p. 74.

Homeland Security Presidential Directive 7 designated USDA and HHS's FDA as the dual Sector Specific Agencies for the food and agriculture sector.

In addition to assigning sector-specific roles, Homeland Security Presidential Directive 7 mandated that DHS lead the development of a plan for infrastructure protection. This plan, the *National Infrastructure Protection Plan* was released in June 2006. It describes missions, goals, and standards for protection of the infrastructure sectors. The *NIPP* outlines actions to be taken by DHS and the Sector Specific Agencies to increase the protection of critical infrastructures.

The *NIPP* sets the stage for common risk-reduction activities across infrastructure sectors, and lays the foundation for activities to be undertaken by individual infrastructure sectors. According to the plan, the following risk management activities are to be conducted for each critical infrastructure sector: setting security goals; identifying assets, systems, networks, and functions; assessing risks; prioritizing; implementing protective programs; and measuring effectiveness.[111] The *NIPP* signals that these activities are to be conducted independently for each sector and to be performed in all-hazards context. This all-hazards orientation is significant in that it extends the reach of critical infrastructure protection activities beyond the scope initially envisioned in Homeland Security Presidential Directive 7, which exclusively focused on protecting critical infrastructures from terrorism.

The *NIPP* also calls for the elaboration of Sector Specific Plans for each infrastructure sector. These Sector-Specific Plans are to "detail the application of the *NIPP* framework specific to each … sector."[112] The Sector-Specific Agencies are charged with completing their respective Sector-Specific Plans in 2006, and reviewing them on an annual basis.[113] As discussed in the main body of the report, coordinating councils are the key voice for government and industry for each sector. The Government Coordinating Councils and Sector Coordinating Councils are the bridge between DHS' national framework and sector experts within DHS.

In addition to the *NIPP*, DHS is charged with preparing a *National Plan for Research and Development in Support of Critical Infrastructure Protection*. This plan sets forth research and development priorities, goals, and objectives relating to critical infrastructure protection. As noted

[111] DHS, *NIPP*, June 30, 2006, p. 4.
[112] Ibid., p. 105.
[113] Ibid., pp. 76, 147.

earlier in the report, however, the most recent iteration of the *National Plan for Research and Development in Support of Critical Infrastructure Protection* does not include any explicit reference to research and development support for the food sector in particular.

Preparedness Framework

Homeland Security Presidential Directive 8 designates the DHS Secretary as "the principal Federal official for coordinating the implementation of all-hazards preparedness in the United States," and directs the development of a domestic all-hazards national preparedness goal.[114] DHS issued an Interim National Preparedness Goal on March 31, 2005. This goal sets national preparedness priorities and establishes a system for assessing the state of overall national preparedness.

The preparedness framework laid out in the National Preparedness Goal is centered around preparedness capability development and assurance. This framework uses representative planning scenarios to develop an all-hazards preparedness task list. The task list is, in turn, used to construct a list of targeted capabilities. Among these targeted capabilities, the Interim National Preparedness Goal identified four as national priorities. The National Preparedness Goal also set out three additional overarching priorities: implementation of the *National Incident Management System* and *National Response Plan*, expanded regional collaboration, and implementation of the *NIPP*. Following Hurricane Katrina, DHS adopted an additional national priority capability. While improvements in these priority areas may indirectly benefit the preparedness posture with respect to an attack on the food supply, none of the eight priorities focuses primarily on food.[115] One, however – Chemical, Biological, Radiological, Nuclear, and Explosive Detection – includes a "capability measure" that applies to the ability to monitor food for these threats.[116] The push to build on another overarching priority, Implementing the *NIPP*, may also bear positively on food critical infrastructure protection, as the *NIPP* recognizes the food sector as a part of a critical infrastructure sector.

While food defense and critical infrastructure protection activities are not a direct priority under the National Preparedness Goal at this time, they register throughout DHS' national preparedness framework. The National

[114] *Homeland Security Presidential Directive 8: National Preparedness*, December 17, 2003, paragraphs 4 and 5.
[115] Grants and Training notes that the *National Preparedness Goal* priorities do not specify targeted action in several critical infrastructure sectors, including the nuclear, chemical, or transportation sectors.
[116] DHS, *Target Capabilities List: Volume 1.1*, May 23, 2005, p. 41.

Planning Scenarios, for example, which were designed to represent the "scope, magnitude, and complexity" of catastrophic events that may occur for the purpose of identifying "core prevention and response requirements" to aid in preparedness planning,[117] include an intentional food contamination scenario involving the contamination of ground beef with liquid anthrax.[118]

The December 2005 iteration of the Universal Task List includes an array of tasks that are food-related. Teams of experts identified the tasks in the Universal Task List as the steps necessary to prepare to address the national planning scenarios. These tasks are intended to form the basis of a "common language and reference system" to drive training, exercises, operational planning undertakings, and preparedness assessments.[119] Some of the Universal Task List's food-related tasks support prevention, like collecting information on threats to the food supply, while others address protection and focus, for example, on developing standardized training courses for food-related incidents.[120] Still others concern response and recovery tasks related to food. In total, the Universal Task List contains 53 tasks that explicitly relate to food. In addition to food sector specific tasks, the Universal Task List has other broad-based tasks with an effect on the food sector.

The Target Capabilities List identifies 37 capabilities that DHS has determined are essential for different levels of government to effectively prepare for terrorist attacks and other major disasters.[121] These target capabilities were distilled from critical tasks identified in the Universal Task List and are similarly grouped into their support for the different preparedness mission areas – prevention, protection, response, and recovery. One such target capability relates directly to food. Among the nine targeted "protection" capabilities is the "capability to identify and defend against pathogens, chemical and biological contaminants, and other hazards that affect the safety of food and agriculture products."[122] Other target capabilities only relate to food defense as part of a larger set of activity, like those concerning risk assessment, critical infrastructure

[117] DHS, *National Preparedness Guidance, Homeland Security Presidential Directive 8: National Preparedness*, April 27, 2005, pp. iii, 3.
[118] DHS, *National Planning Scenarios, Version 20.2 Draft*, April 2005, p. 13-1.
[119] DHS, *Target Capabilities List: Volume 1.1*, May 23, 2005, p. 3.
[120] These are listed as tasks "Pre.A.2.5" and "Pro.C.1.7.15" in DHS' *Universal Task List: Version 2.1*, May 23, 2005, pp. 23, 57.
[121] DHS, *National Preparedness Guidance, Homeland Security Presidential Directive 8: National Preparedness*, April 27, 2005, p. iii.
[122] DHS, *Target Capability List: Version 1.1*, May 23, 2005, p. 54.

protection, epidemiological surveillance and investigation, and public health laboratory testing.

Incident Management Framework

Issued in February 2003, Homeland Security Presidential Directive 5 required DHS to develop two major guidance documents, the *National Incident Management System*, and *National Response Plan*.[123]

The *National Incident Management System* sets out the principles for managing incidents at all levels – federal, state, and local – but does not present any information tailored to specific incident types. In establishing the doctrine for overall incident management, the *National Incident Management System* does not make any reference to food contamination incidents in particular.

The *National Response Plan* identifies the structure and mechanisms for *national* domestic incident management efforts. Emergency Support Functions are a key ingredient in the *National Response Plan* incident management framework. Emergency Support Functions are the "primary means through which the federal government provides assistance" to other governmental elements in emergency situations.[124] An Emergency Support Function outlines services needed to support recovery efforts, and represents part of a scalable response system that can be invoked as appropriate.

Two Emergency Support Functions relate to food, Emergency Support Functions 6 and 11. Emergency Support Function 6 discusses the provision of supplies during incidents, including the provision of food. The Federal Emergency Management Agency is the lead for Emergency Support Function 6, but in this capacity it works with other entities, like USDA's Food and Nutrition Service, to meet the nutritional needs of an affected population. The Food and Nutrition Service, and other supporting entities, are required to report to FEMA, the coordinator for Emergency Support Function 6, to ensure proper information sharing about ongoing specific recovery actions.

Emergency Support Function 11 relates to agriculture and natural resources. USDA is the coordinator for Emergency Support Function 11,

[123] *Homeland Security Presidential Directive 5: Management of Domestic Incidents*, February 28, 2003, paragraphs 15 and 16.
[124] DHS, *Quick Reference Guide to the National Response Plan, Version 4.0*, May 22, 2006, p. 14.

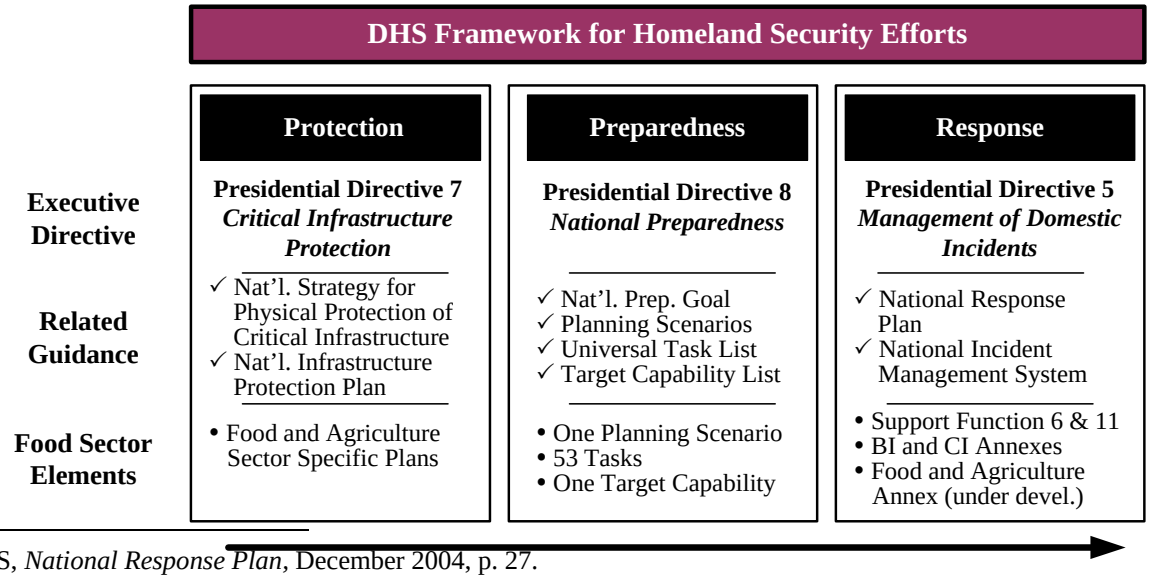
which includes four primary functions. Two of these functions relate to post-harvest food – the provision of nutrition assistance, and the assurance of the safety and security of the commercial food supply. The Food and Nutrition Service is the lead for the former, while the Food Safety and Inspections Service is the lead agency for the latter.

The *National Response Plan* also includes several incident annexes. These incident annexes are designed to guide federal activities during specific types of evolving incidents, in which the localized impact of the incident may grow in scope and severity over time.[125] One such incident annex is to relate to food and agriculture incidents. This incident annex is still under development, however. In the meantime, food contamination incidents may be addressed in line with the Biological Incident Annex. The Biological Incident Annex, which lists HHS as the coordinating agency and FDA as a participant, presents general policies for federal management of biological incidents.

Linkages Between Food Sector Elements of Infrastructure Protection, National Preparedness, and Incident Management Frameworks

DHS considers these infrastructure protection, national preparedness, and incident management frameworks to be complementary, but their compatibility is difficult to decipher at the sector level. Although these frameworks theoretically interconnect, the linkages between these processes for the food sector need more development.

Figure 4. Food Sector Elements of Homeland Security Frameworks



[125] DHS, *National Response Plan*, December 2004, p. 27.

DHS has asserted that the *National Response Plan* and *NIPP* are "complementary plans."[126] DHS' considers the *NIPP* to provide "steady state" infrastructure protection efforts that can be folded into the *National Response Plan* effort as Homeland Security Advisory System[127] levels dictate.[128] Indeed, parallels between the two frameworks should facilitate such a transition from *NIPP*-driven food sector critical infrastructure protection activities and food sector incident management. The *National Response Plan*, like the *NIPP*, bundles food and agriculture activities, and is ultimately to have a food and agriculture incident annex to parallel the food and agriculture Sector-Specific Plan developed under the *NIPP*. Until the food and agriculture incident annex is developed, however, it is not possible to determine how effectively food sector incident management will leverage critical infrastructure protection activities. Questions regarding the role of FDA, which is not mentioned in Emergency Support Functions 6 and 11, for example, need to be resolved if food sector critical infrastructure protection efforts are to be fully exploited during an incident.

While the *NIPP* has and *National Response Plan* will have a clear place for food sector activities, the role of the food sector is not as clear within the national preparedness framework. The national preparedness framework clearly accounted for the food sector in its examination of national capability requirements, but the end product of that process does not prominently single out food sector activities. Although a number of targeted capabilities may indirectly support food preparedness, only 1 of 37 does so in a direct way, and this target capability has not been identified as a priority capability. Without a major food sector preparedness capability focus, it is difficult to determine how preparedness activities align with food sector infrastructure protection and incident management efforts.

Tracking food sector activities across the range of incident preparedness and response frameworks is difficult, as these are not fully developed or clearly aligned. Further clarification may be helpful to show, for example, how preparedness activities conducted under Homeland Security Presidential Directive 8 support the food sector infrastructure protection responsibilities established under Homeland Security Presidential Directive 7. Differences like these can create difficulties in defining

[126] DHS, *NIPP*, June 30, 2006, p. 74.
[127] The Homeland Security Advisory System is a color-coded system that communicates a threat-based view of the likelihood of an attack so measures can be taken to lessen the chance or impact of an incident.
[128] DHS, *NIPP*, June 30, 2006, p. 74.

priorities and monitoring resource allocation. Improved integration of infrastructure protection, national preparedness, and incident management frameworks has the potential to reinforce the prevention, protection, response, and recovery posture of the food sector.

Chronology of Significant Events

1996

July 15, 1996	*Executive Order 13010: Critical Infrastructure Protection* issued

1998

May 22, 1998	*Presidential Decision Directive 63: Critical Infrastructure Protection* issued

2001

September 11, 2001	Terrorist attacks on World Trade Center and Pentagon
October 8, 2001	*Executive Order 13228: Establishing the Office of Homeland Security and the Homeland Security Council* issued
October 16, 2001	*Executive Order 13231: Critical Infrastructure Protection* issued
October 24, 2001	*USA PATRIOT Act* signed

2002

June 12, 2002	*Bioterrorism Act* signed
July 2002	*National Strategy for Homeland Security* published
November 25, 2002	*Homeland Security Act* signed
December 15, 2002	Fourth Gilmore Commission Report released

2003

January 1, 2003	Provisions of *Homeland Security Act* go into effect
February 2003	*National Strategy for the Physical Protection of Critical Infrastructure and Key Resources* published
February 28, 2003	*Homeland Security Presidential Directive 5: Management of Domestic Incidents* issued
March 1, 2003	All components transition into DHS; DHS stood up
December 17, 2003	*Homeland Security Presidential Directive 7: Critical Infrastructure Identification, Prioritization, and Protection* issued
December 17, 2003	*Homeland Security Presidential Directive 8: National Preparedness* issued

2004

January 30, 2004	*Homeland Security Presidential Directive 9: Defense of United States Agriculture and Food* issued
April 28, 2004	*Homeland Security Presidential Directive 10: Biodefense for the 21st Century* issued
April 28, 2004	Grants and Training awards $2 million to the Multi-State Partnership for Security in Agriculture
May 25, 2004	Grants and Training-funded exercise involving intentional food contamination at a G-8 Summit takes place in Georgia
March 1, 2004	*National Incident Management System* Document
June 16, 2004	First meeting of the Food and Agriculture Government Coordinating Council
June 16, 2004	S&T awards National Center for Food Protection and Defense $15 million over three years
June 29, 2004	Grants and Training-funded table-top exercise on intentional contamination of food with anthrax takes place in Minnesota
July 6, 2004	National Center for Food Protection and Defense launched
August 23, 2004	Grants and Training awards UC Davis $4.7 million to develop an agroterrorism preparedness training curriculum
August 25, 2004	Second Grants and Training-funded exercise on intentional contamination of food with anthrax takes place in Minnesota
September 15, 2004	*National Infrastructure Protection Plan, Draft Base Plan* issued
October 15, 2004	First meeting of the Agro-Terrorism Training Working Group
December 2004	*National Response Plan* published

2005

February 2005	*Interim National Infrastructure Protection Plan* released
April 8, 2005	*National Plan for Research & Development in Support of Critical Infrastructure Protection* (2004 edition) published
March 31, 2005	*Interim National Preparedness Goal* released
April 2005	*Draft National Planning Scenarios, Version 20.2* released
May 23, 2005	*Universal Task List, Version 2.1* released

May 23, 2005	*Target Capabilities List, Version 1.1* released
July 22, 2005	S&T awards Food Biological Agent Detection Sensor cooperative agreements
July 26, 2005	Strategic Partnership Program Agroterrorism Initiative announced
August 8, 2005	Grants and Training awards the University of Kentucky (in collaboration with the University of Louisville and Western Kentucky University) $1.5M to develop a wireless milk tracking system
September 30, 2005	Grants and Training provides Louisiana State University with $1.4 million to develop a course on preparedness and response to terrorist incidents relating to the food supply
September 30, 2005	Grants and Training awards the University of Tennessee $2.0 million to develop a vulnerability assessment training course
November 2, 2005	*Draft National Infrastructure Protection Plan, Base Plan* released
December 1, 2005	DHS launches National Biosurveillance Integration System pilot system

2006

June 1, 2006	Grants and Training provides exercise support for a bottled water contamination exercise in North Carolina

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