



Strategic Partnership Program Agroterrorism (SPPA) Initiative

Final Summary Report
September 2005 – September 2008

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I. Executive Summary

To assist in protecting the nation's food supply, the Federal Bureau of Investigation (FBI), Department of Homeland Security (DHS), U.S. Department of Agriculture (USDA), and the Food and Drug Administration (FDA) developed a joint assessment program, the Strategic Partnership Program Agroterrorism (SPPA) Initiative. The purpose of this initiative was to conduct a series of assessments of the food and agricultural sector in collaboration with private industry and State volunteers.

These assessments supported the requirements for a coordinated food and agriculture infrastructure protection program as stated in the National Infrastructure Protection Plan (NIPP), Sector Specific Plans (SSP), National Preparedness Guidelines (released in 2007), and Homeland Security Presidential Directive 9 (HSPD-9), *Defense of US Agriculture and Food*.

SPPA assessments were conducted on a voluntary basis between one or more industry representatives for a particular product or commodity, their trade association(s), and Federal and State Government agricultural, public health and law enforcement officials. Together, they conducted a vulnerability assessment of that industry's production process using the CARVER + Shock tool. The acronym "CARVER" stands for the factors assessed: **C**riticality, **A**ccessibility, **R**ecuperability, **V**ulnerability, **E**ffect, **R**ecognizability, and **S**hock.

As a result of each assessment, participants identified individual nodes, or process points that are of highest concern, protective measures and mitigation steps that may reduce the vulnerability of these nodes, and research gaps/needs. Discussions of mitigation steps and good security practices were general in nature, focusing on physical security improvements for food processing facilities and biosecurity practices and disease surveillance for livestock and plants.

Participants also identified research gaps and needs during each assessment. The research need most often identified during each assessment was enhanced scientific capabilities to provide an early awareness of an event, because these capabilities would also permit a rapid response thereby reducing the impact of an event. Other commonly identified gaps and needs included developing a better understanding of threat-agent characteristics and improved detection methodologies. Most assessments also identified improved communications between government and industry during an emergency as a key gap.

Throughout the SPPA Initiative, the CARVER + Shock tool produced useful distinctions between nodes of higher and lower concern for each food or agriculture production process assessed. The tool has also shown commonalities across food and agricultural industries that make them more

vulnerable to attack, allowing the proposal of generic protective measures or mitigation strategies that could be beneficial to the industries assessed.

II. Background

The Strategic Partnership Program Agroterrorism (SPPA) Initiative was a public-private cooperative effort established by the Federal Bureau of Investigation (FBI), Department of Homeland Security (DHS), U.S. Department of Agriculture (USDA), and the Food and Drug Administration (FDA), in partnership with State and industry volunteers. The intent of the initiative is to collect the necessary data to identify food and agriculture sector-specific vulnerabilities, develop mitigation strategies, identify research gaps and needs, and increase awareness and coordination between the government and industry partners. To accomplish this, the SPPA brought together these Federal, State, local, and industry partners to collaboratively conduct a series of assessments of food and agricultural industries.

These assessments supported the requirements for a coordinated food and agriculture infrastructure protection program as stated in the National Infrastructure Protection Plan (NIPP), Sector Specific Infrastructure Protection Plans (SSP), and Homeland Security Presidential Directive-9 (HSPD-9), *Defense of US Agriculture and Food*.

The NIPP, Food and Agriculture SSPs, and HSPD-9, all call for Federal, State, and industry partners to work together to protect the nation's infrastructure. Specifically, HSPD-9 establishes a national policy to defend the agriculture and food system against terrorist attacks, major disasters, and other emergencies. HSPD-9 directs the government to work with industry to:

- Identify and prioritize sector-critical infrastructure and key resources
- Establish protection requirements
- Develop awareness and early warning capabilities to recognize threats
- Mitigate vulnerabilities at critical production and processing nodes
- Enhance screening procedures for domestic and imported products
- Enhance response and recovery procedures

In March 2004, USDA, FDA and DHS were involved in the creation of two entities, one government and one of private industry, to work together on food and agriculture security initiatives. The first, the government coordinating council (GCC), is comprised of Federal, state, tribal and local governmental agencies responsible for a variety of activities including food and agriculture programs. Second, the Food and Agriculture Sector Coordinating Council (FASCC) is comprised of private companies and associations representing key components of the food system. The GCC and FASCC collaborate on sector-wide security programs aimed towards the protection of the nation's Food and Agriculture Critical Infrastructure. The FASCC has seven sub-councils (each representing a

food and agriculture sub-sector) spanning the farm-to-table continuum. The seven sub-sectors (each represented by a sub-council) of the FASCC were used to designate sub-sectors under the SPPA Initiative. The sub-sectors are:

- Producers/Plant
- Producers/Animal
- Processors/Manufacturers
- Restaurant/Food Service
- Retail
- Warehousing And Logistics
- Agriculture Production Inputs And Services

In addition to supporting the requirement of a coordinated food and agriculture infrastructure protection program (covered by the NIPP, Food and Agriculture SSPs, and HSPD-9), the SPPA Initiative provided information directly applicable to the FASCC sub-sectors. The results of each SPPA assessment have been documented in individual reports particular to the specific product, process, or commodity assessed. In addition, the general results of individual SPPA assessments were used to derive pertinent information for sub-sector summary reports.

III. Program Overview

Thirty-six SPPA assessments were conducted on a variety of food and agricultural products, processes, or commodities (See Appendix A). These assessments covered 31 of the 52 key sites identified under the SPPA initiative. The list of key sites is presented in Appendix B. Each SPPA assessment lasted approximately 3 days and consisted of a team of 20 to 30 participants from Federal, State and local agricultural, food, public health, and law enforcement agencies, food and agricultural companies, and their trade associations. In preparation for the assessment, the USDA or FDA Federal host (Sector Specific Agency or SSA) and a representative of FBI headquarters provided background and educational material. This material ensured that participants were knowledgeable on the CARVER + Shock assessment tool and plans for the assessment. Note: Further information regarding the CARVER + Shock assessment tool can be found at <http://www.fda.gov/Food/FoodDefense/CARVER/default.htm>.

During the assessment, government participants typically toured one or more facilities or production sites related to the industry being assessed. These tours aided participants in understanding the process flow before conducting the tabletop portion of the assessment. Following the tour(s), all participants took part in the CARVER + Shock tabletop assessment. Prior to using the CARVER + Shock assessment tool, a terrorist scenario was agreed upon by the assessment group. This scenario included a terrorist profile with characteristics such as possible skill level, available resources, and whether the terrorist was a company

insider or someone who must breach security to gain access to a point in the process. The scenario also included the selection of a threat agent or the characteristics of a threat agent that would be compatible with the product, commodity, or process being assessed. In addition, the assessments included information briefings and discussions of protective measures or mitigation steps and research needs.

At each assessment, mitigation recommendations and good security practices were proposed and discussed. Mitigation recommendations were typically general in nature due primarily to the fact that multiple companies and facilities/sites were represented at each assessment. Participants also identified research gaps and needs during each assessment. Recurring themes included developing a better understanding of threat-agent characteristics, development or improvement of detection methods for threat-agents of concern, and development or dissemination of models (or their results) related to the impact of a food or agricultural terrorism event. The topic of models related to a terrorism event was commonly discussed while assessing the Criticality, Recuperability, and Shock elements of CARVER + Shock. Evaluating the economic impact of an attack on a single industry or company within the agriculture and food sector was typically difficult to determine. This difficulty was due to the relationships a single food or commodity may have with other facets of the food industry such as related or similar products, subsequent products using this ingredient, distribution modes, and availability of alternate/substitute foods. Additionally, the public sentiment following a terrorist event targeting an industry within the agriculture and food sector was difficult for assessment participants to gauge. In order to better assess the Recuperability element, estimates of the time or method to restore consumer confidence following various event scenarios would assist future threat assessments and was of great interest to participants at many SPPA assessments. Understanding the economic ramifications of an event would also aid in assessing the Criticality and Shock factors because both of these CARVER factors are scored partly on the basis of economic impact.

IV. Assessment Record

Both food and agriculture SSAs, the FDA and USDA, proposed lists of products or commodities within their jurisdiction that could be assessed for the SPPA Initiative (See Appendix B.) Trade associations facilitated interactions among their membership and the government participants. The order and extent of products or commodities assessed were based upon industry and State volunteers, as well as seasonal considerations. The list of all assessments conducted during the SPPA Initiative (September 05 to September 08) is presented in Appendix A.

V. Assessment Results

The intent of assessments conducted under the SPPA Initiative was to determine the presence and extent of vulnerabilities at each node in an industry's production process (i.e., ground beef processing) and propose possible mitigation strategies or research needs to address these vulnerabilities. The CARVER + Shock portion of each assessment was typically based on a generic company or location. This allowed individual company-specific participants to provide perspective into industry-wide practices. When possible, the results from one assessment can provide insight into similar vulnerabilities that may be encountered in like-products or like-processes. The results of each SPPA assessment can be categorized into the following key areas:

- Critical process nodes
- Mitigation recommendations
- Research gaps and needs
- Assessment tool observations

In each of these categories information may exist that was specific to a particular process, product, or commodity.

Commonalities of Critical Process Nodes

The general vulnerabilities identified over the course of many SPPA assessments have been highly dependent upon whether they are a food or agricultural product. To address the differences between various facets of the food and agriculture industry, industry-wide vulnerabilities have been split into representative sub-sectors. A complete list of each SPPA assessment, and the applicable sub-sector(s) for each assessment, see Appendix A. SPPA Assessments and Sub-Sectors.

Producers/Plant

The production of agricultural commodities, such as living crops or harvested products, demonstrates different vulnerabilities than those of processed foods. Assessments of plant production dealt either with highly contagious plant diseases or with toxic substances that may persist in food products. In either case, the threat was usually examined from an economic perspective and less so from a human health perspective. The introduction of a plant disease could potentially cause the destruction of an entire season's worth of a crop. This event could significantly affect other facets of the food industry that use the products of this crop, close our trading partners' borders to the affected product or commodity, and result in tremendous decontamination and disposal costs. For harvested products, such as grain, the introduction of a toxic threat agent could result in the destruction of millions of pounds of adulterated material and result in the recall of large amounts of possibly adulterated products.

The areas of highest concern for plant production were those where there was primary (direct human contact) or secondary contact (such as through fertilizers or water) with the product, and where conditions favored transmission or proliferation of a disease or threat agent. Grain elevators and storage vessels allow for high mixing of an intentionally introduced threat agent and possible access to large quantities of material. For a non-proliferating threat agent such as a toxic chemical, the extremely large quantities of material encountered during storage could limit the chances of human health impacts by diluting the threat agent. The possibility of a significant economic impact would still be present if the threat agent is detected or if the terrorist announces the event. To limit vulnerabilities associated with plant material, special attention must be taken in areas of transportation and locations that allow access to large quantities of harvested plant materials.

Producers/Animal

The production of agricultural commodities, such as livestock, demonstrates different vulnerabilities than those of processed foods. Assessments of animal production dealt with readily available, highly transmissible or contagious, animal diseases that were assumed the greatest threat to the particular animal species. Extreme economic impacts were the most commonly hypothesized critical outcome. Direct human health impacts from the consumption of animal products containing a disease, toxin, or other harmful substance are possible, depending on the event scenario, but may not achieve the scale of an event targeting the animals themselves. For SPPA assessments dealing with animal production, the threat was usually examined from an economic perspective. Infecting a single animal could potentially result in the destruction of millions of animals; significantly affecting other facets of the food industry that use animal products, close our trading partners' borders to the affected product or commodity, and result in tremendous decontamination and disposal costs.

The areas of highest concern for animal production were those where there was primary (direct human contact) or secondary contact (such as through animal feed) with the animal being produced, and where conditions favored transmission or proliferation of a disease or threat agent. For example, crowded conditions (such as livestock pens) allow for rapid disease transmission and proliferation. Vulnerabilities were also often associated with transportation nodes and nodes where feed and medicine are administered to animals.

Processed/Manufactured Foods

Assessments of processed/manufactured foods showed a common focus on vulnerabilities that could be attacked as a means to harm public health or cause loss of life (e.g., adulterating a food product). Economic implications of each vulnerable food-processing node were significant, but generally overtaken by the public health implications.

In general, the nodes of highest concern for food products were those in which direct human contact with the largest amount of product (large batch sizes) was both possible and likely. The largest amount of product was typically found in containers that hold either bulk raw ingredients, or large amounts of mixed ingredients. These vulnerabilities were especially true when human access to product or ingredients is a normal operation step such as in the manual addition of secondary ingredients. Additionally, secondary ingredients are a high concern because they are usually dispersed and mixed into large amounts of product during further processing.

For processed/manufactured foods, the amount of product that can be directly contacted and exploited by a terrorist (or disgruntled employee) usually limits vulnerabilities. Thus, processing steps and locations associated with large batch sizes and secondary ingredients that will be mixed into large batch sizes stand out as areas of highest concerns and pose the greatest risks for adverse consequences.

Restaurant/Food Service

Assessments of prepared foods showed a common focus on vulnerabilities that could be attacked as a means to harm public health or cause loss of life (e.g., adulterating a food product). Economic implications of each vulnerable food-preparation node were significant, but generally overtaken by the public health implications and public shock. Shock was a significant factor at both restaurant/food service assessments. The target population considered in an assessment of school kitchens was children. At an assessment of college stadium concessions, the target population was college students and alumni at a quintessential American event, football.

In general, the nodes of highest concern for prepared foods were those in which direct human contact with the food just prior to consumption or delivery to the consumer was possible. Targeting prepared foods just prior to sale or consumption may result in a smaller batch of adulterated product than had the event occurred earlier in the process. However, just prior to sale or consumption there is less chance that the threat agent will be removed, diluted, or destroyed by a normal process step such as washing, mixing, or cooking.

Additionally, differences in nodes of concern were exhibited based on the total amount of people, both company insiders and customers, which could potentially contact the food. For example, the assessment of college football stadium food service exhibited very different accessibility and vulnerability factors for food prepared within a concession stand versus condiments that are available to anyone in the stadium. Condiment stands, which are typically placed outside the concession stand, are accessible to an unlimited number of people. Alternatively, those foods prepared within the concession stand are only

accessible to a limited number of people prior to and during production, which serves as a possible hurdle for the terrorist to overcome.

Retail

SPPA assessments conducted within the retail sub-sector showed a common focus on vulnerabilities that could be attacked as a means to harm public health or cause loss of life (e.g., adulterating a food product to cause direct human harm). Economic implications of each vulnerable food-processing node were assumed significant, but generally overtaken by the public health implications.

In general, the nodes of highest concern were those in which unobserved contact with the product or ingredient was possible for extended periods and when some mixing or simple application of the threat agent could occur. Direct human contact with the product or ingredient as a normal operational step also typically elevated the overall score. Assessments of food products in a retail environment were also highly dependent on who has control of the product at each node. When product was not under company control, even for short periods of time, there was greater uncertainty regarding product vulnerability and the CARVER + Shock Vulnerability factor was typically elevated.

Warehousing and Logistics

Commonalities within the warehousing and logistics sub-sector showed a high dependence on the food or commodity being assessed. Processed foods and harvested agricultural products (including meats) demonstrated a common focus on vulnerabilities that could be attacked as a means to harm public health or cause loss of life (e.g., adulterating a food product). The focus of vulnerabilities and critical nodes for live agricultural products (animals in particular) demonstrated a greater emphasis on the economic impacts of a terrorist event.

Processed foods and harvested agricultural products:

In general, the nodes of highest concern for processed food products and harvested agricultural products were those in which direct human contact with the largest amount of product (large batch sizes) was both possible and likely. Due to the nature of food warehousing and logistics, which may involve long storage periods and could require direct handling of packaged food supplies, many nodes were deemed accessible.

Although accessibility was determined to be relatively high at many nodes, vulnerability varied greatly depending on the ability of a terrorist to disperse a threat agent throughout bulk products or into multiple packaged products. For processed food products and harvested agricultural products, the amount of product that can be directly contacted and exploited by a terrorist (or disgruntled employee) usually limits vulnerabilities. Thus, steps and locations

associated with large batch sizes or extended storage time, affording a greater probability of successful adulteration, stand out as areas of highest concerns posing the greatest risks for adverse consequences.

Live agricultural products:

Live plants and the storage and distribution of livestock, demonstrate different vulnerabilities than those of processed food products or harvested agricultural products (such as grain). Assessment scenarios that involved live plants or animals typically dealt with readily available, highly transmissible or contagious, diseases. Extreme economic impacts were the most commonly hypothesized critical outcome. Direct human health impacts from the consumption of plant or animal products containing a disease, toxin, or other harmful substance are possible depending on the event scenario, but may not achieve the scale of an event targeting the animals themselves. For SPPA assessments dealing with live animals, the threat was usually examined from an economic perspective. Infecting a single animal could potentially result in the destruction of millions of animals, significantly affecting other facets of the food industry that use animal products, close our trading partners' borders to the affected product or commodity, and result in tremendous decontamination and disposal costs.

The areas of highest concern for the storage and distribution of live agricultural commodities were those where there was primary (direct human contact) or secondary contact (such as through fertilizers or animal feed) with the plant or animal, and where conditions favored transmission or proliferation of a disease or threat agent. For example, crowded conditions (such as a livestock trailer) would allow for rapid disease transmission and proliferation.

Commonalities of Mitigation Strategies and Good Security Practices

Over the course of the SPPA assessments, participants discussed but did not always come to consensus on numerous mitigation strategies, and good security practices. Mitigation recommendations may not, and are not, expected to apply universally to all sites, industries, or processes. The application of mitigation recommendations, even very general recommendations, must be based on a comprehensive determination of risk for a specific site. Where feasible, this report generalized the suggested mitigation strategies in order to show potentially broader applicability across industries.

The following mitigation strategies or good security practices were the most common suggestions brought up throughout the three-year SPPA Initiative:

Biosecurity and Good Security Practices for Livestock and Plants

Biosecurity and good security practices for livestock and plants have encompassed two realms: protecting and isolating livestock and plants from pathogens, and mitigating the economic fallout after exposure. Discussion of good security practices when dealing with protection and isolation were a cornerstone of past SPPA assessments that dealt with agricultural products or commodities. Recurring themes included, but were not limited to,:

- Assessing the water supply (to both livestock and plants),
- Assessing livestock feed suppliers,
- Assessing plant nutrient suppliers,
- Assessing transportation providers (when possible)
- Isolating new livestock acquisitions,
- Screening visitors, to include review of point of origin or recent travel locales,
- Decontaminating clothing and material prior to entering and departing premises, and
- Decontaminating materials used in the rearing process.

Good security practices in a post-exposure state received considerable attention during several SPPA assessments. Highlighted good security practices included a robust foreign animal disease (FAD) screening and detection regimen, immediate isolation of suspected FAD-infected animals, and effective depopulation and disposal practices. In addition to physical practices, industry participant recognized the need for a public relations campaign designed to educate consumers and ease foreign market concerns following an event.

Physical Security and Access Control Measures Based On Site-Specific Vulnerability Assessments

Within food processing industries, where possible, deterrents should be imposed or bolstered at highly accessible or vulnerable nodes. This may vary by site and depends on the production process point, but may include cameras, mirrors, door alarms, door logs, additional supervision, restricted access areas, color-coded uniforms or bump caps to designate work area, and limiting personal items on the production floor. At agriculture production sites, the emphasis of physical security and access control measures should be on limiting potential contact between outsiders and the plants or animals being produced. This typically would include increasing the visibility of commodities during production and training the industry to be aware of suspicious activity.

Agricultural Security and Food Defense Plans

A common recommendation was to develop or continue to employ dedicated agricultural security or food defense plans, or incorporate these plans into other security procedures or safety plans. Several trade organizations that participated in the SPPA Initiative have developed plan templates for their constituents. Industry can tailor these templates for their own specific processes/facilities or

integrate the template with existing security and safety plans. For example, the FDA and USDA have developed model food defense plans and/or guidance: <http://www.fda.gov/Food/FoodDefense/FoodSecurity/default.htm> and http://www.fsis.usda.gov/Food_Defense_&_Emergency_Response/Guidance_Materials/index.asp . The USDA has also developed voluntary agricultural security guidance: www.usda.gov/documents/PreHarvestSecurity_final.pdf

Site-Specific Vulnerability Assessments

Conduct site-specific assessments to learn of vulnerabilities unique to that site. This activity can build upon the SPPA assessments, which were general in nature (focused on product or commodity instead of a specific site). All vulnerability assessments should be periodically revisited and modified as necessary. As new tools become available, industry should experiment to find the most useful tool for their specific product, commodity, or process. During the summer of 2007, the FDA released a free software version of the CARVER + Shock assessment tool to facilitate site-specific assessments: <http://www.fda.gov/Food/FoodDefense/CARVER/default.htm> .

Process Design Changes

Process design changes, such as altering the time/temperature of a food-processing step, may be useful to eliminate certain threat-agents. This would require valid, reliable, and scientifically supported information regarding the stability characteristics of all possible threat-agents and any changes must provide sufficient benefit to outweigh any adverse affects on final product quality. Process design changes could also include the physical layout of a production facility (i.e., place critical nodes where employee traffic can be controlled or monitored.)

Penetration Audits

Penetration audits may be a useful tool to assess or validate security procedures. They may also be useful to validate the results of risk assessments. Penetration audits may include having an outsider attempt to access the facility or may be conducted by having a current employee attempt to access another location within the facility to see if they are challenged or their activity is noticed and communicated to superiors.

Agricultural Security and Food Defense Incorporated into Procurement Selection Process

Agricultural security and food defense-related parameters and Standard Operating Procedures (SOPs) could be applied to procurement selection processes and vendor assurance programs. The goal is to assure the security and defense of raw ingredients and other inputs. This action may also cause a

trickle-down effect, where security or defense measures are implemented throughout the agriculture and food industries. For instance, food processors may inquire if their suppliers have a food defense plan and conduct food defense training. If possible, the processors may also periodically review or audit their suppliers' food defense plans. Likewise, the food retailers may inquire if the food processors have a food defense plan and conduct food defense training.

Raw Materials Inspection

Raw materials inspection procedures should be enhanced to include an emphasis on the detection of tampering or adulteration. This could include SOPs for rejecting opened, damaged, or altered goods, and quarantine and investigation procedures. The use of tamper resistant labels on packaging, and containers should also be encouraged.

Employee Peer Monitoring Programs

Companies should create or further develop employee peer monitoring programs to include an emphasis on agricultural security and food defense activities. Employees are a valuable asset and can be utilized to increase security for little or no additional cost to a company. Examples would include "badge challenges" - questioning anyone without a visible and valid company identification badge, and "location challenges" - questioning peers that are found in areas not associated with their job function. Another option is to team individuals together (buddy system) at nodes of higher concern. The addition of another individual that verifies and oversees the production process provides dual control during a critical step.

Awareness Training

Awareness training should be implemented to educate employees about the importance of agricultural security and food defense. These activities would need to be tailored to the appropriate audience at each level within an organization. Awareness training could include information regarding the implications of a terrorist attack on the U.S. food supply (including production agriculture). To further this goal, FDA and USDA offer a free web-based course: <http://www.fda.gov/Training/ForStateLocalTribalRegulators/default.htm> . The FDA has also introduced the ALERT program intended to raise the awareness of state and local government agency and industry representatives regarding food defense issues and preparedness: <http://www.fda.gov/Food/FoodDefense/Training/ALERT/default.htm> . In addition, Employees FIRST is an FDA initiative that food industry managers can include in their employee food defense training programs. Employees FIRST educates front-line food industry workers from farm to table about the risk of intentional food contamination and the actions they can take to identify and reduce these risks: <http://www.fda.gov/Food/FoodDefense/Training/ucm135038.htm>

Trade Industry Group Good Security Practices:

Trade industry groups can encourage their members to incorporate industry-specific food defense and agriculture security practices while developing site/facility-specific defense or security plans. Trade industry groups can provide this information through guidance documents and good security practices developed in conjunction with their industry members. Many industry groups and trade associations currently have existing components of agricultural security or food defense plans, e.g., emergency contact lists, biosecurity procedures, physical security programs, and recall procedures. Companies should evaluate existing programs to see if they compliment or strengthen security or defense plans. The evaluation findings may justify the financial commitments necessary to make changes within a system or process design. Industry, in general, would prefer for trade organizations to promote the adoption of good security practices.

Commonalities of Identified Research Gaps and Needs

Throughout the SPPA assessments and subsequent discussions, participants identified numerous research gaps and needs. For this report, research gaps and needs that were highly specific for a single product or commodity have been omitted or generalized so that they are more broadly applicable.

Threat-Agent and Agent/Matrix Research:

Industry participants expressed a need for more specific threat-agent information. Participants identified the following agent or agent/matrix research needs as priorities:

- Could a list of biological and chemical agents be prioritized for their potential risk to specific products or commodities and can this list be provided to industry?
- Is information regarding threat-agent inactivation temperatures, effects of environmental conditions, agent persistence, etc. known and readily available to the food industry? Although it is not feasible to research the stability of all potential threat-agents against all scenarios, general threat-agent stability information in a representative variety of conditions and matrices would be useful.
- What oral dose is toxic or infectious for each threat-agent (biological and chemical)? The minimum toxic or infective dose may be useful during threat assessments.
- What are possible or feasible ranges of terrorist capabilities for threat-agent production or acquisition?

Incident Detection:

Industry participants noted a need for information concerning the detection methods currently available for threat-agents (biological and chemical) applicable to each industry. They also asked which detection methods have been validated against products or commodities within their industry. The following specific questions were asked:

- What detection methods are currently available?
- Are the methods rapid?
- What methods have been validated against particular products, commodities, or processes?
- To whom are the methods/materials available (industry, emergency responders, etc.)?

Incident Magnitude and Response:

Industry participants expressed interest in the development or availability of economic models or studies on the consequences of terrorist attacks on certain food products or agricultural commodities. The interdependencies and supply chain complexities of the food and agriculture industry make the impact of an attack on a single item or commodity difficult to determine. Additionally, the participants sought information regarding the time or method to restore consumer confidence following an attack.

To assist the industry, and State and local government officials responding to a terrorist attack against foods where threat agents are used, the USDA has published the “Guidelines for the Disposal of Intentionally Adulterated Food Products and the Decontamination of Food Processing Facilities”:

http://www.fsis.usda.gov/PDF/Disposal_Decontamination_Guidelines.pdf .

Similarly, the U.S. Environmental Protection Agency (EPA) has published the “Federal Food and Agriculture Decontamination and Disposal Roles and Responsibilities”: <http://www.epa.gov/OHS/pdfs/conops11222005.pdf> .

Improved Communication Channels:

There is an abundance of food defense and agriculture security information available from government websites, trade organizations, State and local health or agriculture departments, etc. The participants at several SPPA assessments suggested creating a single resource by consolidating these materials. One possibility is the FBI sponsored “InfraGard” website which includes a Food and Agriculture Special Interest Group. InfraGard is an information sharing and analysis effort serving the interests and combining the knowledge base of a wide range of members within both the FBI and the private sector. InfraGard is an association of businesses, academic institutions, state and local law enforcement agencies, and other participants dedicated to sharing information and intelligence to prevent hostile acts against the United States. For more information, please visit: www.infragard.net

Another possible solution is the use of the Food and Agriculture section of the Homeland Security Information Network (HSIN), a web portal for information sharing. The SSAs have been working with DHS to update this portal so that it can be a “one-stop shop” for the food and agriculture sector to find and share security or defense information. For more information about this portal, please visit:

http://www.dhs.gov/files/programs/gc_1156888108137.shtm

An additional communication issue was the need for simplified and uniform point-of-contact lists and procedures for suspicious incidents. Many industry and State participants requested clear protocols for whom to contact (besides local law enforcement) following a suspected contamination or terrorist event. One such resource is FoodSHIELD, a communication tool hosted by the National Center for Food Protection and Defense (NCFPD) – A DHS Center of Excellence: www.foodshield.org. The “one-stop” website provides the emergency contact information sought by the participants. The USDA is a supporter and partner in FoodSHIELD.

Commonalities of Identified Threat Indicators

Threat indicators, early warnings of a possible suspicious event or planning for an attack, have been discussed at all assessments. Participants have focused upon very general threat indicators dealing with employee vigilance and awareness. These indicators include:

- Observing employees, visitors, vendors, and contractors in areas where they have no legitimate reason to be.
- Someone expressing an unusual interest in the production process.
- Employee health patterns such as unusual absence or attendance patterns and illnesses related to particular job functions or work areas.
- Delays in deliveries, deviations from delivery schedules or evidence of product tampering.

VI. Overall Assessment Observations

Assessment Preparation and Conduct

Each SPPA assessment began with a series of preparatory email communications four to six weeks prior to the site visit. Training materials and background information were provided during this period leading up to a group conference call several weeks prior to the visit. During the conference call, participants were provided training on the CARVER + Shock tool in addition to an overview of the agenda, logistics, and generic commodity process flow diagram illustrating the nodes that would be evaluated during the assessment process.

Additionally, a read-ahead workbook was provided to each participant containing copies of the training material, background information related to the particular food or agriculture process, threat agent information necessary for use with the CARVER + Shock tool, and other information related to the assessment process. At the assessment, government participants typically toured one or more sites related to the food or agriculture process under review. These tours were conducted to ensure that participants had a thorough understanding of the generic process flow prior to conducting the tabletop portion of the assessment. Following the tour(s), all participants meet for several days to conduct the CARVER + Shock assessment, receive informational briefings, and discuss mitigation steps and research needs related to the commodity process or food defense in general.

This schedule and format worked well throughout the SPPA Initiative. The pre-assessment training materials and conference call adequately prepared participants for the assessment process and this training saved valuable time during the on-site assessments. Although the CARVER + Shock training and the tool itself worked well with assessments of the food and agriculture sectors, there were many lessons learned regarding usage of the tool.

CARVER + Shock

There was an expectation from the beginning of the SPPA Initiative that the assessment tool would be evaluated for improvements throughout the process to make it more applicable to the food and agriculture industries and more user-friendly for government and industry partners. Key considerations include the clarity of definitions and scoring criteria, the impact scales, and weighting factors. It is expected that this tool will continue to improve over time as a result of continuing evaluation and modifications. Currently, the Food and Agriculture Sector is working with the Homeland Security National Center for Food Protection and Defense at the University of Minnesota to determine criticality criteria for agricultural and food assets, systems, and networks.

VII. Participant Perspective

Although much information was exchanged during the course of these assessments, the greatest benefit may have been in the enhanced communication channels that were formed. Numerous initiatives such as this, to collaborate on security efforts at the Federal and State levels, are the result of a shift towards working in partnership to address security issues. Programs and assessments such as the SPPA and others have further bolstered the trust between industry and their government partners, while also allowing government agencies to tap into the valuable knowledge base found in private industry.

The comments received from industry participants and trade organizations regarding the SPPA assessments were very positive. The structure of these assessments allowed open discussions and questions. This informal atmosphere has further improved the interactions and open communications among the industry and government participants. The fact that multiple Federal agencies were represented has also been a great advantage for industry participants. Often a single question posed by industry was addressed by the multiple perspectives of the Federal and State food and agriculture leads, and law enforcement agents in attendance. Having all of these voices in the same room at the same time strengthened the perception that all facets of the Government are working in unison to improve the safety and security of the food and agriculture sector.

VIII. Conclusion

It is virtually impossible to guard against all threats to the food and agriculture supply. Food and agriculture industries, like all facets of U.S. commerce, must anticipate the possibility of a terrorist attack on their products and evaluate their preparedness and mitigation strategies to either thwart an attack or, at the very least, mitigate the damage, and recover from the economic and psychological impact of an attack. The SPPA initiative was a significant step towards hardening food and agriculture industries. This was accomplished by providing training and hands-on experience with a terrorism-focused assessment tool to industry members. Additionally, the SPPA Initiative provided Federal, State, and local government an in-depth look at the vulnerabilities that may be associated with facets of the food and agriculture industries. Finally, the SPPA Initiative increased communication between industry, government, and law enforcement stakeholders concerned with the safety, security, and economic breadth of the U.S. food supply.

Appendix A

SPPA Assessments, Trade Associations, and Sub-Sectors

| Industry | Food/Commodity Assessed | Date | States | Trade Associations | SSA | Sub-Sector(s) |
|-------------------------------|---------------------------|--------|--------|---|----------|--|
| Yogurt | Yogurt | Nov-05 | TN, MN | International Dairy Foods Assn., National Yogurt Assn. | FDA | Processors/Manufacturers |
| Grain Export Elevator | Corn | Dec-05 | LA | National Grain and Feed Assn. | FDA/USDA | Producers/Plants |
| Bottled Water | Bottled water | Jan-06 | NJ | International Bottled Water Assn. | FDA | Processors/Manufacturers |
| Baby Food | Baby food (jarred) | Feb-06 | MI | Food Products Assn. | FDA | Processors/Manufacturers |
| School Kitchens | Spaghetti sauce with meat | Feb-06 | NC | None | USDA | Restaurant/Food Service |
| Frozen Food | Frozen pizza varieties | Mar-06 | WI, FL | American Frozen Food Institute | FDA/USDA | Processors/Manufacturers |
| Swine Production | Swine | Mar-06 | IA | Multiple host farms | USDA | Producers/ Animals |
| Apple Juice | Apple juice | Apr-06 | NH | Food Products Assn. | FDA | Processors/Manufacturers |
| Fresh Produce | Lettuce (bagged) | May-06 | CA | United Fresh Fruit and Vegetable Assn., Produce Marketing Assn., International Fresh-cut Produce Assn., Western Growers Assn. | FDA | Processors/Manufacturers, Producers/Plants |
| Infant Formula | Infant formula (powdered) | Jun-06 | AZ | International Formula Council | FDA | Processors/Manufacturers |
| Ready-to-Eat Chicken Products | Chicken strips | Jun-06 | AR | American Meat Institute | USDA | Processors/Manufacturers |
| Beef Cattle Feedlot | Cattle | Jul-06 | NE | National Cattlemen's Beef Assn. | USDA | Producers/Animals |
| Dairy Processing | Milk | Jul-06 | NY | International Dairy Foods Assn. | FDA | Processors/Manufacturers |
| Ground Beef | Ground beef | Aug-06 | KS | American Meat Institute | USDA | Processors/Manufacturers |

| Industry | Food/Commodity Assessed | Date | States | Trade Associations | SSA | Sub-Sector(s) |
|---|---------------------------------|-------------|---------------|--|------------|---|
| Livestock Auction Markets (Cattle Sale Barn) | Cattle | Aug-06 | MO | Livestock Marketing Assn., Missouri Cattlemen's Assn., National Cattlemen's Beef Assn. | USDA | Producers/Animals |
| Dairy Cattle Farm | Dairy Cattle | Sep-06 | ID | Idaho Dairymen's Assn., Idaho Department of Agriculture | USDA | Producers/Animals |
| Soybean Farm | Soybean | Oct-06 | IL | Illinois Crop Improvement Assn., National Corn Growers Assn. | USDA | Producers/Plants |
| Corn/Grain | Corn | Nov-06 | IL | National Corn Growers Assn. | USDA | Producers/Plants |
| Retail-Fluid Milk | Milk (one-gallon containers) | Jan-07 | TX | International Dairy Foods Assn. | FDA | Processors/ Manufacturers, Retail |
| Link Sausage Processing | Sausage | Mar-07 | WI | American Meat Institute | USDA | Processors/ Manufacturers |
| Stadium Retail Food Service | Hot dogs, ketchup | Mar-07 | KS | Kansas State University | FDA | Restaurant/Food Service |
| Correctional Institution Food Processing | Ground beef patties | Apr-07 | OH | Ohio Department of Rehabilitation and Correction | USDA | Processors/ Manufacturers |
| Egg Products | Eggs (liquid) | Apr-07 | PA | United Egg Assn. | USDA | Processors/ Manufacturers |
| Commercial Feed Mill | Animal feed | Jun-07 | IA | National Grain and Feed Assn. | FDA | Processors/ Manufacturers |
| Hot Dogs | Hot dogs | Jun-07 | PA | American Meat Institute | USDA | Processors/ Manufacturers |
| Breakfast Cereal | Frosted flakes | Jul-07 | MN | Grocery Manufacturers/Food Products Assn. | FDA | Processors/ Manufacturers |
| Domestic Grain Cooperative | Grain (all) | Jul-07 | NE, IA | National Grain and Feed Assn. | USDA | Producers/Plants |
| Grocery Stores | Rotisserie chicken | Aug-07 | PA | Food Marketing Institute | FDA | Retail |
| High Fructose Corn Syrup | High fructose corn syrup | Sep-07 | AL | Corn Refiners Assn. | FDA | Processors/ Manufacturers |
| USDA Commodity Warehouse | Beef trimmings | Sep-07 | MO | None | USDA | Warehousing and Logistics |

| Industry | Food/Commodity Assessed | Date | States | Trade Associations | SSA | Sub-Sector(s) |
|------------------------------------|--------------------------------|-------------|---------------|--|--------------|---|
| Distribution Centers | Lettuce | Nov-07 | VA | International Foodservice Distributors Assn. | FDA/ USDA | Warehousing and Logistics |
| Import Re-Inspection Facility | Beef trimmings | Nov-07 | MD | International Assn. of Refrigerated Warehouses, Global Cold Chain Alliance | USDA | Warehousing and Logistics |
| Poultry Broilers | Poultry | Nov-07 | GA | Georgia Poultry Federation | USDA | Producers/Animals |
| Flour | Flour | Feb-08 | OK | North American Millers' Assn. | FDA | Processors/ Manufacturers |
| Beet Sugar | Beet sugar | Mar-08 | MN | US Beet Sugar Assn. | USDA | Processors/ Manufacturers |
| Transportation (Livestock Hauling) | Cattle | May-08 | CO | Agricultural and Food Transporters Conference - American Trucking Assn. | USDA | Producers/Animals, Warehousing and Logistics |

Appendix B
Strategic Partnership Program Agroterrorism Initiative
Criteria List

(V = Validate, I = Initiate)

A.) USDA's Criteria for Site Visits

Production Agriculture

- Aquaculture Production Facility - I
- Beef Cattle Feedlot - V
- Cattle Stockyard/Auction Barn - I
- Citrus Production Facility - I
- Corn Farm - I
- Dairy Farm - I
- Grain elevator and storage facility - I
- Grain export handling facility - I
- Poultry Farm - I
- Rice Mill - I
- Seed Production Facility - I
- Soybean Farm - I
- Swine Production Facility - V
- Veterinary Biologics Firm - I

Food Processing and Distribution

- Deli meats processing - V
- Ground beef processing facility - V
- Hot dog processing - V
- Import Re-inspection facilities - V
- Liquid eggs processing - V
- Poultry processing - V
- Retailers (further processing on-site) - I
- School food service central kitchens - I
- Transportation companies - I
- Warehouses - I

B.) FDA's Criteria for Site Visits

- Animal by-products - I
- Animal foods/feeds - I
- Baby food - I
- Breaded food, frozen, raw - I
- Canned food, low acid - I
- Cereal, whole-grain, not heat treated - I
- Deli salads - I
- Dietary supplement, botanical, tablets - I
- Entrees, fully cooked - I
- Flour - I
- Frozen packaged entrees - I
- Fruit juice - V
- Gum Arabic (ingredient) - I
- High fructose corn syrup (ingredient) - I
- Honey - I
- Ice cream - I
- Infant formula - V
- Milk, fluid - V
- Peanut butter - I
- Produce - I
 - Fresh - V
 - Cut, modified atmosphere packaged - V
- Retail setting - I
- Seafood, cooked, refrigerated, ready-to-eat - I
- Soft drink, carbonated - I
- Spices - I
- Vitamin/Micro-ingredient premixes/flavors - I
- Vitamins, capsules - I
- Water, bottled - V
- Yogurt - I