Vulnerability Assessment Tools

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Overview

- Food Defense
- Vulnerability Assessment Tools
  - Operational Risk Management (ORM)
  - CARVER
- Strategic Partnership Program on Agroterrorism (SPPA)
- The Future
What is Food Defense?

Food Defense

Protection of food products from *intentional adulteration* by biological, chemical, physical or radiological agents
What Is Food Defense?

**Food Defense**

Protection of food products from *intentional* adulteration by biological, chemical, physical or radiological agents

**Food Safety**

Protection of food products from *unintentional contamination* by agents
Why The Food Supply?

- Economic, health, societal, psychological, and political significance

- Deliberate contamination could cause:
  - Significant public health consequences
  - Widespread public fear
  - Devastating economic impacts
  - Loss of public confidence in the safety of food and effectiveness of government
Food Defense Goals

- To **prevent** an attack if possible
- To **respond** rapidly and efficiently if needed
- To **recover** rapidly and restore consumer confidence in the food supply
Food Defense Goals

Prevention

- Raise Awareness
  - ALERT
  - Web-based training

- Understand Vulnerabilities
  - Operational Risk Management
  - CARVER+Shock
    - Federal only
    - SPPA
    - Software tool

- Implement Mitigation Steps
Awareness Training

Introduction to Food Security Awareness

- Basic understanding of the risk that intentional contamination presents to food establishments, and what factors affect that risk.
- Encourage food security awareness in the employees and management of food industry establishments.

http://www.fda.gov/ora/training/orau/FoodSecurity/startpage.html
Awareness Training

Food Defense Awareness

- Webcast discussing Federal actions, as well as the role of States and Locals in food defense
- Introduction of ALERT acronym

http://www.ConnectLive.com/events/fooddefense
How do I ALERT the operators of the establishments to make them more aware of Food Defense issues?
A.L.E.R.T

Five Main Principles

1. What do you know about the foods arriving at your establishment?
2. How do you maintain security in your establishment?
3. What do you know about people with access to your establishment?
4. Do you keep track of food security issues in your establishment?
5. What would you do if you were threatened?
In today's world it is important to be **ALERT** to protect your business.

- **A** How do you **ASSURE** that the supplies and ingredients you use are from safe and secure sources?
- **L** How do you **LOOK** after the security of the products and ingredients in your facility?
- **E** What do you know about your **EMPLOYEES** and people coming in and out of your facility?
- **R** Could you provide **REPORTS** about the security of your products while under your control?
- **T** What do you do and whom do you notify if you have a **THREAT** or issue at your facility, including suspicious behavior?

Can you answer these questions?

http://www.cfsan.fda.gov/alert
Vulnerability Assessment Tools

- Operational Risk Management (ORM)
- CARVER
ORM

Food Assessment Process

- Identify Agents
- Identify Foods
- Identify Food/Agent Scenarios
ORM
Identification of Agents

Develop list of priority terrorism agents with potential for dissemination via food

- Started with CDC list
- Modified based on:
  - Stability of agent in food matrix
  - Odor/flavor/color of agent in food matrix
  - Severity of public health outcomes
  - Oral infective/toxic dose
  - Availability of agent
  - Threat intelligence
ORM

Food/Agent Scenarios

Assess risk for specific product-agent-activity combinations covering harvest, production and delivery (farm to table)

- Farm/dairy farm/orchard/apiary/fishing vessel
- Bulk transportation
- Manufacturing (including packing houses)
- Finished product transportation
- Warehousing
- Retail/food service
### ORM Evaluated Foods

- Baby Food
- Breaded food
- Canned Food, Low-Acid
- Cereal
- Deli Salad
- Dietary Supplements
- Entrées, Cooked
- Flour
- Fruit Juice
- Gum Arabic (ingredient)
- High Fructose Corn Syrup (ingredient)
- Honey
- Ice Cream
- Infant Formula
- Milk
- Peanut Butter
- Produce
- Seafood, Cooked
- Soft Drinks
- Spices
- Vitamins
- Water, Bottled
- Yogurt
ORM
Assess Level of Risk

<table>
<thead>
<tr>
<th>SEVERITY</th>
<th>Very High</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>Very</th>
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<td>Low</td>
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**PROBABILITY**

**RISK LEVELS**

- Higher Risk
- Lower Risk
Overarching factor: Intelligence concerning a threat to a particular food may raise its risk level

**Higher**  Foods are classified as high risk when one or more, but not all, combinations are higher

**Lower**  Low risk does not mean no risk - attention should be paid to security of all foods
ORM

Attributes of Target

Common features of higher risk foods

**Large Batches**  –  large number of consumers

**Uniform Mixing**  –  contaminate all servings in batch

**Short Shelf Life**  –  minimal time to identify problem and intervene

**Ease of Access**  –  accessible targets are more attractive
CARVER

- Breaks a food system into its smallest pieces (nodes) in the farm to table continuum
- Identifies “critical nodes” that are the most likely targets for terrorist attack, by applying the analysis to each node
- Leads to the identification of countermeasures to reduce the risk at those nodes
- CARVER software tool developed to facilitate assessments
CARVER + Shock

Considers seven factors affecting the desirability of a target

1. **Criticality**  
   Public health and economic impacts to achieve the attacker’s intent

2. **Accessibility**  
   Physical access to the target

3. **Recuperability**  
   Ability of the system to recover from the attack

4. **Vulnerability**  
   Ease of accomplishing the attack

5. **Effect**  
   Amount of direct loss from an attack

6. **Recognizability**  
   Ease of identifying a target

7. **Shock**  
   Combined physical, public health, psychological, and economic effects of an attack
CARVER + Shock

- Federal assessments
  - Classified
  - Very limited exposure

- Limited assessments with specific industries
  - Bottled Water

- Strategic Partnership Program on Agroterrorism (SPPA)
Strategic Partnership Program on Agroterrorism (SPPA)

What it is

- A joint initiative of FBI, DHS, FDA and USDA
- Announced July 26, 2005
- Collaborate with private industry and states
- Overall goal is to undertake or validate vulnerability assessments
- Use CARVER + Shock assessment tool
Voluntary industry and state partners join the Federal partners to conduct local assessments.

Government works with commodity group trade associations to increase the number of firms conducting the assessment and to generate information based on more than one company.

A site visit is conducted at food and agriculture sites that represent the industry/commodity group.

The actual assessment takes place in a facility conference room or hotel conference room.
SPPA

Objectives

- Identify vulnerabilities in the food and agriculture sector
- Identify early indicators and warnings that could signify planning for an attack
- Develop mitigation strategies to reduce the threat/prevent an attack
- Identify research and development (R&D) needs
- Gather information to enhance existing tools that both Government and industry employ
- Develop guidance for Federal, state, local and industry stakeholders
### SPPA Criteria List

<table>
<thead>
<tr>
<th>Aquaculture production</th>
<th>Hot dog processing</th>
<th>High fructose corn syrup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle stockyard/sale barn</td>
<td>Import facilities</td>
<td>Honey</td>
</tr>
<tr>
<td>Beef cattle feedlot</td>
<td>Processed poultry</td>
<td>Ice cream</td>
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<tr>
<td>Citrus Production</td>
<td>Liquid eggs processing</td>
<td>Infant formula</td>
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<td>Corn farm</td>
<td>School kitchens</td>
<td>Milk</td>
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<tr>
<td>Dairy farm</td>
<td>Retailers – processing meat</td>
<td>Peanut butter</td>
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<tr>
<td>Poultry farm</td>
<td>Warehouses/Distribution Center</td>
<td>Produce</td>
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<tr>
<td>Rice mill</td>
<td>Animal foods/feeds</td>
<td>Seafood</td>
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<tr>
<td>Seed production</td>
<td>Baby food</td>
<td>Soft drinks</td>
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<tr>
<td>Soybean farm</td>
<td>Deli salads</td>
<td>Spices</td>
</tr>
<tr>
<td>Swine production</td>
<td>Dietary supplements</td>
<td>Vitamins</td>
</tr>
<tr>
<td>Veterinary biologics</td>
<td>Flour</td>
<td>Bottled water</td>
</tr>
<tr>
<td>Deli meat processing</td>
<td>Frozen entrees</td>
<td>Yogurt</td>
</tr>
<tr>
<td>Grain elevator/Grain export handling facility</td>
<td>Fruit juice</td>
<td>Stadium Food Service</td>
</tr>
<tr>
<td>Ground beef processing</td>
<td>Gum arabic</td>
<td>Breakfast cereals</td>
</tr>
</tbody>
</table>

**Conducted**

**Received or Scheduled**
Food Processing

- 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.

- Secondary ingredients are a high concern because they are usually dispersed and mixed into large amounts of product during further processing.
Agricultural Production

- Readily available, highly transmissible or contagious plant and animal diseases are the greatest threat from an economic perspective.

- A zoonotic disease transmissible between animals and humans, as a threat-agent, raises the possibility for a dual impact to public health and the economy.
SPPA

Lessons Learned

- Excellent opportunity for the private sector to educate officials about their operations and to interact with government
- Excellent opportunity for industry to learn from each other
- The downside
  - Significant time commitment
  - Impossible to engage the entire sector
  - Time only permits the exploration of a few agents
CARVER Software Tool

- Assessment process using a software-based system
  - Uses a set of questions
  - Simple menus of options
  - Identifies and ranks vulnerabilities for a country (food supply, food production process or facility)
  - Results based on input of information
  - Customized results available only to the user

- Free and available by download
- Limited availability of CDs
- See [www.cfsan.fda.gov/fooddefense](http://www.cfsan.fda.gov/fooddefense)
Summary

- Continue to focus on risk
  - Direct resources to areas of maximum risk
- Continue to raise awareness
- Identify mitigation strategies
- Ensure the ability to respond is robust
- Develop plans for recovery
- Integrate Food Defense with Food Safety
Food Protection

Food Safety

Food Defense

Prevention – Intervention - Response

- Awareness
- Risk-based decision making
- Mitigation strategies
- Communication
- Scientific infrastructure
- IT infrastructure
QUESTIONS ?