

Department of Homeland Security Science & Technology Directorate - University Programs



Defending our Nation's Food Supply Chain



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National Center for

**Foreign Animal and Zoonotic
Disease Defense**

NATIONAL CENTER FOR
FOOD PROTECTION AND DEFENSE

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Current Key Sector Programs/Initiatives:

Department of Homeland Security:

- National Infrastructure Protection Plan (NIPP)
- National Response Plan (NRP)
- National Bio-Surveillance Integration system (NBIS)
- State Homeland Security Grant Program
- HITRAC
- National Infrastructure Coordination Center (NICC)
- Homeland Security Information System (HSIN) – Food & Ag Portal
- National Critical Asset Database
- Food & Agriculture Coordinating Councils (GCC & F&ASCC)
- Science & Technology development projects:
 - Detection, vaccines & analytics
- Customs & Border Patrol
- DHS Centers of Excellence



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DHS Centers of Excellence:

- Documenting the infrastructure
- Modeling of the infrastructure:
 - Production Systems
 - Processing Systems
 - Distribution Systems
 - Transportation Systems
 - Food Service & Retail systems
- Disease spread modeling
- Food system contamination/adulteration impact models
- Preparedness & Response tools
- Sector Criticality Studies
- Developing new vulnerability Assessment tools
- Risk analytics
- Import Safety Review
- Emerging Issues



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Current Risks & Emerging Issues:

- FMD
- Critical production/process node contamination events
- Changing import risk environment
- Rapid globalization of the food supply chain
- Avian Influenza
- 'Tier' based sector defense
- Sector component mapping, criticality and vulnerability
- Appropriate focus for intelligence and information efforts
- Public confidence in the food supply chain

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- In January 2007, GAO designated the federal oversight of food safety as a high-risk area for the first time.

GAO

For Release on Delivery
Expected at 1:50 p.m. EST
Thursday, February 8, 2007

United States Government Accountability Office

Testimony
Before the Subcommittee on Agriculture,
Rural Development, FDA, and Related
Agencies, Committee on Appropriations,
House of Representatives

FEDERAL OVERSIGHT OF FOOD SAFETY

High-Risk Designation Can
Bring Needed Attention to
Fragmented System

Statement of David M. Walker
Comptroller General of the United States



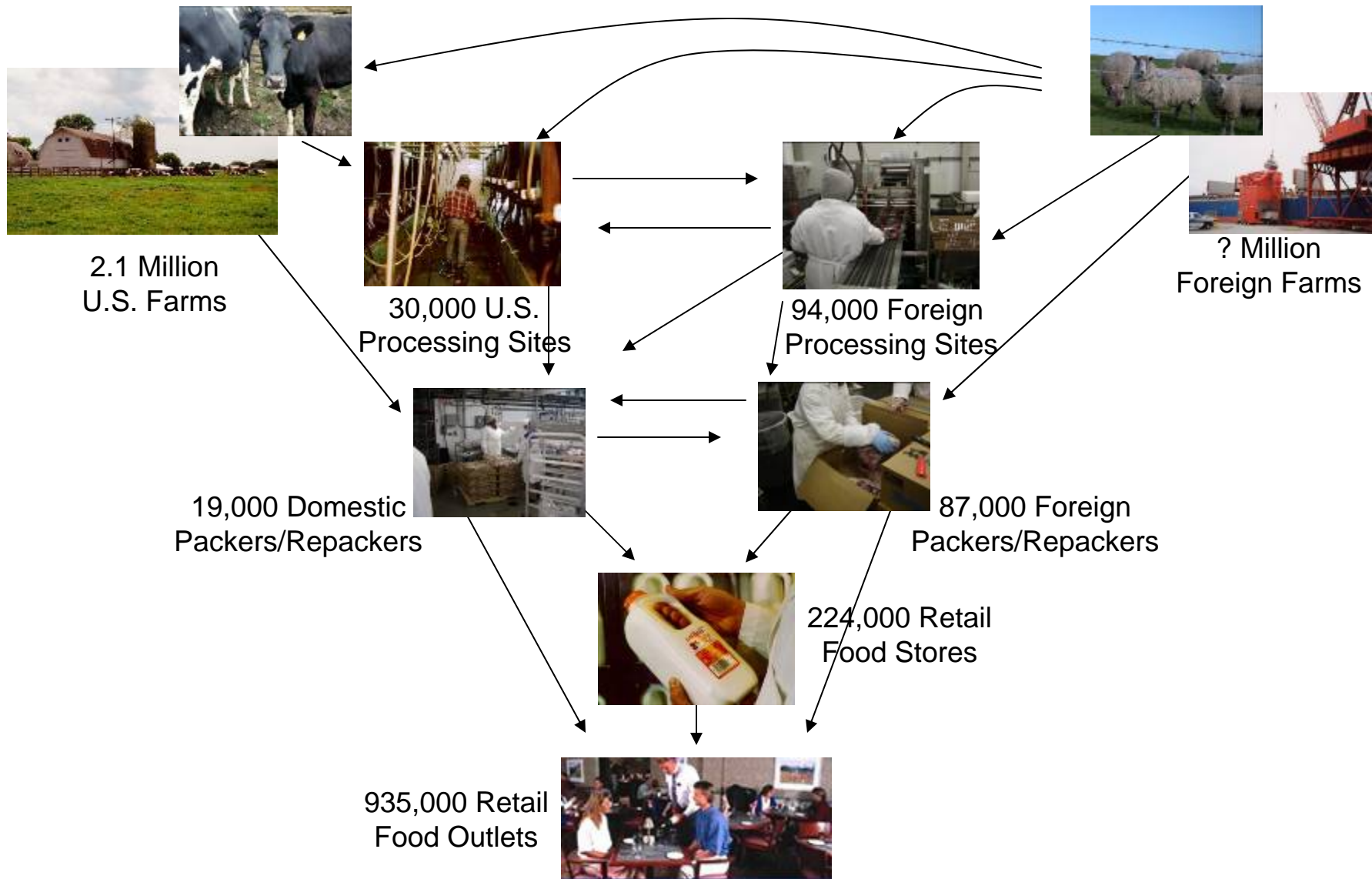
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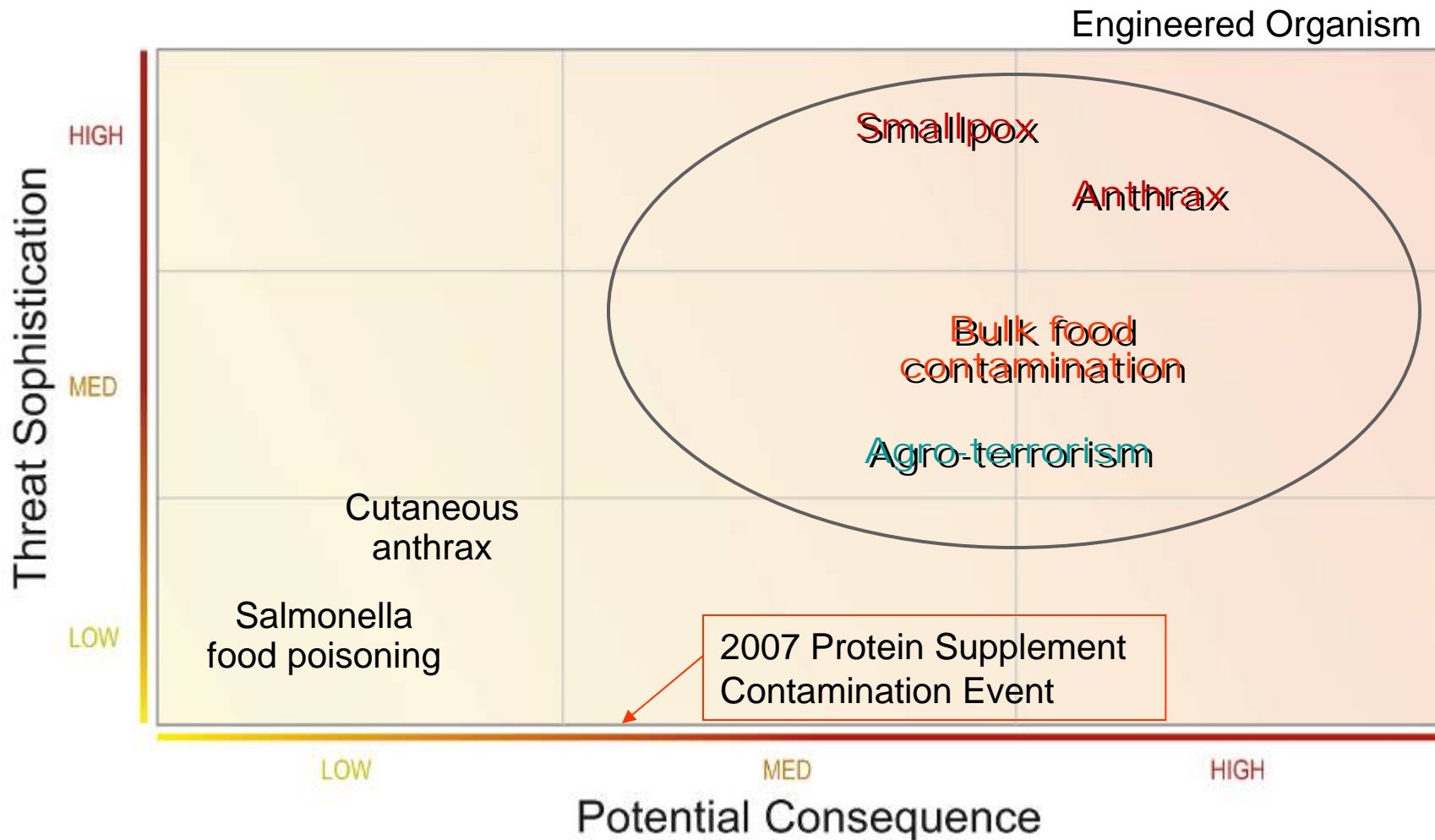
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2007 Protein Supplement Contamination: A case study in Global Food System Risk!

What have we learned So Far?

- A global supply chain vulnerability was exposed within the food and agriculture infrastructure where there was little effective surveillance and detection system available.
- Investigations of food and agriculture contamination/adulteration events within the global supply infrastructure present unique challenges and foreign governments may or may not be cooperative.
- The sampling and testing demands, even for modest scale events, placed upon FDA and CBP during global supply chain events will quickly exceed the capacity now in place!
- CBP will have to carry out the inspection, surveillance, sampling and testing of critical imports from the global supply chain recommended by FDA in the face of even modest events – Yet they are not yet adequately equipped, staffed or trained to do so!
- Public confidence in the food supply chain, particularly as it relates for the global components of that supply chain, is fragile and requires careful, accurate and pro-active risk communications.
- There are food and agriculture infrastructure vulnerabilities that we do not yet fully understand because they are unique to the global aspects of our national food supply chain and they have not been adequately documented and studied .

DHS initial emphasis on high consequence threats



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2007 Protein Supplement Contamination: A case study in Global Food System Risk!

What have we learned So Far?

- **This was a very unsophisticated act, yet the consequences have been substantial and not yet fully understood!**
- **Event such as this provide potential 'roadmaps' to those with even more dire intent, so we must address such newly identified vulnerabilities rapidly.**
- **This event clearly suggests that we are not prepared to effectively manage and rapidly mitigate the effects of a major bio-event within the food supply infrastructure!**

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Chinese Imports Profile

- China is currently the number one country importing into the US for the first six months of FY 2007
- Legitimate imports of Chinese food products have increased from \$2.4 Billion to \$4.0 Billion in the last four years
- Food and agricultural imports from China account for only 1.5% of all Chinese imports
- China provides only 5% of total U.S. food imports
- There were over 4,500 importers of food and agriculture products from China in FY 2006
- During 2006, the FDA rejected more than twice as many food shipments from China as from all other countries combined
- CBP is developing rapid response procedures to food contamination events and mechanisms to address the recognized risk from Chinese food products

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How should we approach Risk Assessment?

In the face of asymmetric risks:

- Threats are abundant!
- Vulnerabilities abound!
- Consequences are less apparent



Soybean Rust Infection



We cannot protect everything, all of the time, against everyone and everything!

Our strategy must shield us against high risk and mitigate or moderate lower risks

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How should we approach Risk Assessment?

- ✓ What we need are better tools to help us understand exactly what our asymmetric vulnerabilities are and what the potential consequences of those vulnerabilities, if attack, might actually be.
- ✓ With such tools, the public and private sectors can begin to prioritize our protective measures – **Shields** - as well as our planned response and **mitigation** actions in order to protect our nation from the truly serious consequences of an attack.
- ✓ Such tools will enable us to 'reform' the DHS risk formula for our sector to insure more appropriate and sector specific use of our limited system protection resources at all levels of government and for the owners of the infrastructure.

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How should we approach Risk Assessment?

Shields prevent and deter attack and minimize impact.

Examples:

- System Node Surveillance
- Random Process and Product testing
- Employee controls
- Raw Materials Surveillance



Mitigation Strategies limit impact and facilitate response and recovery.

Examples:

- Coop Plans
- Response Plans
- Product Recall Protocols
- Insurance products



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Sector Criticality Study



Objective

The long-term goal of the program is to develop a suite of scalable, risk-based tools to assess system criticality for the food and agriculture sector. It will provide States and the private sector with preliminary guidance to allow them to identify food and agriculture sector (FAS) assets requiring protection.

Documenting Food & Agriculture System Critical Components

Microsoft Excel - SystemSummaryWorksheet

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I8 Potential Consequence:

1	DRAFT FAS SYSTEM SUMMARY WORKSHEET DRAFT										
2	Food & Agriculture Sector 12-Jul-07										
3	John T. Hoffman			NCFP&D & FAZD							
4	All data is notional and provided for example only!										
5											
6	To Properly Use this Matrix a full assessment of threat, vulnerability and consequence is required for each sub-sector system/commodity!										
7											
8	Sub Sector/ Commodity:	Threats:			Vulnerability:		Potential Consequence:		Tier:		
9											
10	Commodity / Product Chain	Critical component(s):				Shield:		Mitigation Strategy			
11											
12	Inputs/ Services	Fertilizer					RANK				
13			Product Contamination	Processing & Storage	Economic loss, reduced agriculture output			Security Program	Traceability, Reserve Storage		
14			Theft of Chemicals	Storage & Transport	Mass Casualty or infrastructure explosive/destruction event		1	Security Program	Traceability, passive security, physical protection		
15			Fertilizers					Security Program	Redundant sources		
16			Disruption of Supply	Production & Storage Facilities	Economic loss, reduced agriculture output						
17			Transportation Shutdown	Hwy system, Rail network, Fuel Supply	Economic loss, reduced agriculture output		2	?	Reserve Storage		
18											
19	Producers: Plant	Corn									
20			Crop disease	Fields	Economic loss, product shortages			Surveillance & Detection	Traceability, laboratory capacity		
21			Contamination of Field Crops	Fields & harvest aggregation sites	Economic loss, product shortages			Surveillance & Detection	Redundant sources		
22			Contamination of produce	Harvest Aggregation sites	Human or animal casualties, economic loss, loss of confidence in food supply & government		1	Surveillance & Detection	Redundant sources		
23			Destruction of facilities	Farm facilities	Economic loss, product shortages			Physical Security Program	Redundant sources		
24			Transportation Shutdown	Hwy system, Rail network, Fuel Supply	Economic loss, product shortages		2	?	Reserve Storage		

Sheet1 / Sheet2 / Sheet3

DRAFT SYSTEM COMPONENT CRITICALITY WORKSHEET

General Layout

Microsoft Excel - Criticality Worksheet_Blank Draft July 12 2007

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DRAFT SYSTEM COMPONENT CRITICALITY WORKSHEET										
Version 2 Food & Agriculture Sector Template Concept Document										
Name of Organization:										
Point of Contact:										
Telephone Number:										
Date Completed:										
To Properly Use this Matrix a full assessment of threat, vulnerability and consequence is required for each sub-sector system/commodity!										
Sub Sector or Organization Component:	Commodity / Product Chain	Potential Threat	Sub-system / Component at Risk	Scale/Size of component at risk:	Ease of Attack or Probability of Disaster	Potential Direct Consequence:	Critical Component?	2nd - 3rd order Impacts	Recovery / Return to Normalcy	Tier:
Help Help Help Help Help Help Help Help Help Help Help										
Dairy Farm	Dairy	FAD	Animal	Mid-Size	Low	Loss of Herd/Flock Loss of Key Output Long Term System Shut Down	Catastrophic Yes	Loss of Market Access > 12 Months Damage to Customers Damage to Tax Base Gov Cost to Respond		Tier 2

Once completed for a specific commodity, system or system component, the data can be uploaded to the FAS SYSTEM SUMMARY WORKSHEET

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DRAFT SYSTEM COMPONENT CRITICALITY WORKSHEET

Once the Worksheet is Complete for a Component
The Data is uploaded to the Summary Worksheet

Sub Sector/ Commodity:	Threats:	Vulnerability:	Potential Consequence:	Tier:
Input Services	Fertilizer	Product Contamination Theft of Chemicals Fertilizers Disruption of Supply Transportation Shutdown	Processing & Storage Storage & Transport Economic loss, reduced agriculture output Mass Casualty or infrastructure explosion/destruction event Economic loss, reduced agriculture output Economic loss, reduced agriculture output	1 1 2
Producers: Plant	Corn	Crop disease Contamination of Field Crops Contamination of produce Destruction of facilities Transportation Shutdown	Fields Fields & harvest aggregation sites Harvest Aggregation sites Human or animal casualties, economic loss, loss of confidence in food supply & government Farm facilities Hug system, Rail network, Fuel supply Economic loss, product shortages Economic loss, product shortages Economic loss, product shortages	1 1 2

Sub Sector or Organization Component:	Commodity / Product Chain:	Potential Threat:	Sub-system Component at Risk:	Scale/Size of component at risk:	Ease of Attack or Probability of Director:	Potential Direct Consequences:	Effect of Attack or Director:	Critical Component?	2nd - 3rd order Impacts:	Recovery / Return to Normalcy:	Tier:
Dairy Farm	Dairy	FAD	Animals	Mid-Size	Low	Loss of Herd/Flock Loss of Key Output Long Term system Shut Down	Contaminated	Yes	Loss of Market Access > 12 Months Damage to Customers Damage to Tax Base Gov Cost to Respond		Tier 2

The Summary Worksheet assists in ranking critical system components and facilitating prioritizing protective efforts.

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Vulnerability Assessment Tools Development

Once define what, within the sector's systems, is truly critical how do we assess its vulnerability and potential consequences, if attacked?

Until now we have relied upon **CARVER+Shock**. This is a point based, physical facility tool adapted from a US military targeting tool. It has provided some useful information but is limited in its utility for this sector.

Criticality
Accessibility
Recuperability
Vulnerability
Effect
Recognizability
Shock



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Vulnerability Assessment Tools Development

This project will aid in the development of a new suite of sector specific tools that will be designed to aid both the states and the private sector in a more realistic and effective assessment of the sector's component systems.

Tools Design Criteria:

- Accommodate system analytics
- Sub-sector specific components
- Cross infrastructure components
- Assess critical nodes within systems
- Assess sector specific consequences
- Provide relative risk ranking
- Guide realistic protective measures/shields & mitigation
- A component of system COOP planning
- Enable the Private Sector, the States & DHS to more appropriately evaluate and prioritize risk.

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Recent Important New Developments

- The new DHS Office of Health Affairs has been given primary responsibility within DHS for the implementation of HSPD-9.
- The recent Presidential Executive Order on the Safety of Imports has initiated a broad inter-agency review of import safety issues and potential steps to lower risks from dangerous imports.

Farmland Defense Mascot



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