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A Presentation for

2009 DHS University Network Summit

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FAZD CENTER

National Center for Foreign Animal and Zoonotic Disease Defense

A Joint Project of

National Center for Foreign Animal and Zoonotic Diseases Defense (FAZD Center)
And
National Center for Food Protection and Defense (NCFPD Center)

National Center for Food Protection and Defense

A Homeland Security Center of Excellence

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Key Drivers behind the Project:

1. The movement of Food and Agriculture Sector (FAS) commodities is market driven, involves a highly complex infrastructure and is not well documented.
2. Key decision-makers and other stakeholders are only partially informed on how commodities move at any given time
3. This gap in movement information hinders modeling of how infectious disease, such as foot and mouth disease (FMD), might spread within our susceptible populations and how contaminated or adulterated food products move through the nation's distribution systems
4. The NASS data does not provide sufficient granularity for livestock movements
5. Events such as the recent *E.*coli in spinach, *Salmonella* saintpaul in imported peppers and *Salmonella* in peanut paste have demonstrated the need for rapid access to accurate movement information across all commodities
6. The ability to acquire and model movement data with higher fidelity is necessary to investigations and early interventions

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Initial Research focused on five key areas:

1) Developing representative business rules for livestock movements
2) Development of a stakeholder accessible FASTRANS database
3) Development of a commodity routing model to output GIS based sector representative commodity movement information
4) Collection of data on location, transaction modalities and quantities of livestock passing through sales yards and data on representative characteristics of livestock way points, such as truck stops where in-transit livestock commingle, and
5) Early pilot studies to look at the value in accurate disease modeling of more realistic sales yard representation and way stops in the spread of exotic animal disease viruses such as FMD.

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DHS Strategic Goals Addressed

To secure the Food and Agriculture critical infrastructure and key resources (CR/KR) effort via multiple component efforts ranging from direct sector engagements with the states and the private sector to identify critical sector components, such as with the Food and Agriculture Sector Criticality Assessment Tools (FASCAT) to risk and vulnerability analysis to event modeling.

Document the sector and enable the states to respond to Critical Infrastructure component Data Calls

To prepare to protect the sector, mitigate sector disruptions, investigate sector events, respond to and recover from sector disaster events and enhance disease spread and food system event modeling capabilities to support decision makers at the local, state and federal government levels

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FASTRANS Customers:

1) Livestock Disease modeling community
2) Food system event consequence modeling community
3) Food or agriculture system event investigators
4) Infrastructure Protection community for sector asset data calls and system component criticality and vulnerability assessment priorities - federal and state levels
5) Sector mitigation and response planners

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Current Capabilities

Data management:

- Livestock movement records can be entered manually or via file importation.
- Collected livestock movement records can be viewed via a table or graphically on a map and can be exported for use by other applications
- graphical user interface

Analytical Tools:

- Routing and way point analytical tools:
  - Generate most likely transportation routes between premises
  - Generate list of most likely way points between premises
    - Way points include: truck stops, weigh stations, rest stops, and other locations where livestock may congregate for any period of time thus creating a “temporary premises” for potential cross infection

Data Records:

Cattle movement data for CA and TX
Swine movement data for IA, MN, and NC
Premises information and livestock processing facilities
Transportation grid – including way point data

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Project Outcomes To Date

Based on the results from the pilot studies and on the commodity movement and marketing data collected, this project has clearly demonstrated the value to DHS and the states of an effective livestock movement tracking and tracing capability.

A GIS-based structure was developed and serves as the core for the FASTRANS database that provides for the capture and access of an array of transportation, population and infrastructure information.

The project also:

1. Identified representative sources and collected initial information on cattle (beef and dairy) and swine movement information,
2. Developed an infrastructure to hold this information and facilitate future data collection,
3. Developed a model and commodity routing module, and
4. Undertook a pilot study to explore the impact accurate sales yard representation and way points have on exotic disease spread modeling.

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FASTRANS data collection going forward:

1. Extend FASTRANS to include remaining states in CONUS and international borders (Canada and Mexico) and expand data content to additional commodities
2. Capture state level representative commodity movement data
   Automate (where possible) extraction of movement data from various sources (such as CPB data for imports; state level livestock data, etc.)
3. Capture Commodity Movement Business Rules – fully integrate the rules into the model
4. Expand database content to includes:
   Sales yards
   Auction sites (include Internet auctions)
   County and state fair operations data
   Key Commodity Distribution Nodes
5. Leverage the FAS-CAT deployment with the states to collect commodity movement information, key facilities and business rules
   This linkage can provide continuous improvement of the national FASTRANS data sets via the annual DHS data calls for the food and agriculture sector

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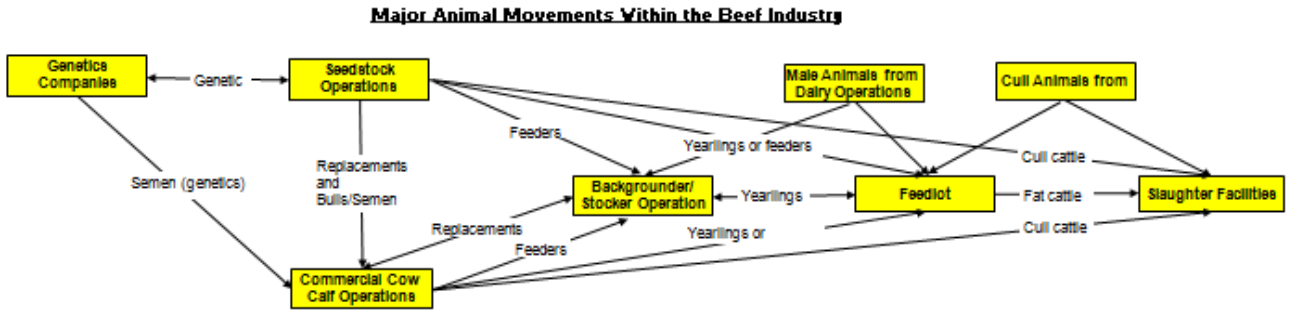
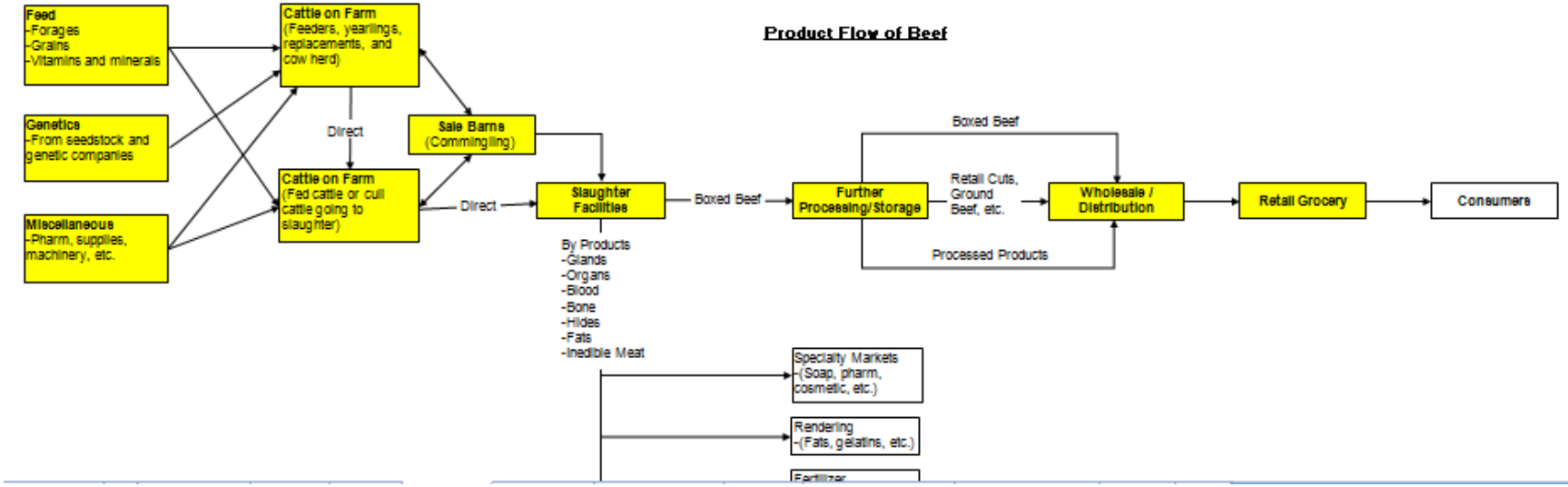
Example of FASCAT commodity Flow diagram used to examine critical system components:





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Questions?

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