Proactive Risk Assessment to Support Managed Movement of Livestock and Poultry

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Current Food Production System

• Today's food system is based on fewer larger farms and global supply chain
  – Consolidated vertically integrated system to efficiently produce safe, abundant, affordable food
• “Just-in-Time” food systems
Quarantine and Movement Control

• “Control Areas”
  – geographic area for affected premises and nearby unaffected premises considered at-risk
Unintended Consequences

• Animal Health and Welfare
• Public Health and Welfare
• Environmental Health and Welfare
• Economic Health and Welfare of:
  – Affected producers
  – Food businesses
  – Rural communities
  – Nation
Preparedness and Response Goals

1. Detect, control, and contain the FAD in animals as quickly as possible
2. Eradicate the FAD using strategies that seek to stabilize animal agriculture, the food supply, the economy, and protect public health; and
3. Provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products.
Continuity of Business
(Managed Movement)

COB is the managed movement of non-infected animals and non-contaminated animal products from non-infected premises in an FAD outbreak. This helps to facilitate agriculture and food industries in maintaining normal business operations, while simultaneously mitigating the risk of disease spread from this movement.

FAD PReP; NAHEMS GUIDELINES: CONTINUITY OF BUSINESS; Draft July 2012
Key Elements for Managed Movement during an Outbreak

- Proactive risk assessment
- Surveillance requirements
- Biosecurity guidelines
- C&D procedures
- Epi - trace forward/backward
- Permitting guidance for movement
- Information management
Secure Food Supply Projects

Continuity of Business

• Development of protocols and tools to eliminate or minimize unintended negative consequences of the disease and disease response on agriculture and consumers while at the same time achieving the goals of disease control and response.
Secure Food Supply Plans

High Path Avian Influenza (HPAI)
- Secure Egg Supply
  - Eggs and egg products
- Secure Turkey Supply
  - Movement of birds
- Secure Broiler Supply
  - Movement of birds, hatching chicks and eggs

Foot and Mouth Disease (FMD)
- Secure Milk Supply
  - Movement of milk

FMD, Classical Swine Fever, African Swine Fever, and Swine Vesicular Disease
- Secure Pork Supply
  - Movement of animals
Proactive Risk Assessment

• Promote business continuity
  – movement of non-infected animal and non-contaminated animal products from uninfected farms

• Facilitate emergency response planning

• Develop/evaluate mitigation measures

• Informs movement permitting decisions
  – Must be supported by a risk assessment (or a scientifically based logical argument) to demonstrate the risk of disease spread associated with the movement of the product is acceptable
Work with industry to identify products of concern and establish priority

Work with industry to describe normal business processes

For selected product, develop detailed outline of daily production work flow

Develop risk assessments to evaluate likelihood/consequences of product movement

Complete proactive risk assessment (RA) including risk mitigation steps for selected product and production process

Develop risk mitigation steps for critical points in the production process

Develop draft compliance agreements, and standard operating procedures (SOP)

Communicate results of proactive RA and all draft agreements and procedures to broader stakeholder group

Recommend inclusion in federal, state and dairy business contingency plans. Make policy recommendations.

Select next highest priority dairy business process and repeat

How does the process work?
Public Private Partnership Approach
Government – Industry – Academic

- Focus on shared interests and identify mutual benefits
- Understand perspectives, priorities and responsibilities
- Adapt to changing realities and needs
- Increase knowledge of risk and science-based approaches
- Prevention & management as well as control
- Recognize ‘acceptable risk’
Proactive Risk Assessment Steps

Scope and Assumptions

- Specific commodity, disease, and situation
- Infected but undetected farm scenario
  - (conservative plausible assumption not “worst case”)
- Outbreak has already occurred

<table>
<thead>
<tr>
<th>Disease Detected</th>
<th>Animal Infected</th>
<th>Animal Not Infected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Infected and Disease Detected</td>
<td>Not Infected and Disease Detected</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disease Undetected</th>
<th>Animal Infected</th>
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Proactive Risk Assessment Steps

Hazard ID
- Characterize the virus behavior
- Historical outbreak information
- Literature Review

Characterize the Industry
- Current industry structure, GMPs, SOPs, regulations, etc
Proactive Risk Assessment Steps

Pathway Analysis

– Identify pathways that allow movement of virus
– Modeling – disease spread, viral load in commodities and environment

Disease Transmission Model

- Step 1: Premises in Control Area becomes infected
- Step 2: HPAI infection is not detected before movement
- Possible movement of HPAI infected birds
Proactive Risk Assessment Steps

Evaluate Risk; Entry / Exposure Assessment

- Qualitative and Quantitative approaches
- Expert opinion, literature review, and modeling approaches
- Each pathway and overall risk of movement

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Likelihood of Exposure as a Function of Distance
Based on Spatial Transmission Models

Expert opinion on risk factor for introducing Disease of Concern
(by experts with field experience)
Release/Entry Assessment
Live Animal / Bird Movement

• Likelihood of the flock becoming infected before movement

• Likelihood that infection is not detected by the time of movement

• For product assessments, the premises was conservatively assumed to be infected, undetected
## Risk Categories

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>More than an even chance that the event will occur</td>
</tr>
<tr>
<td>Moderate</td>
<td>The event is unlikely but does occur</td>
</tr>
<tr>
<td>Low</td>
<td>It is very unlikely that the event will occur</td>
</tr>
<tr>
<td>Very Low</td>
<td>It is highly unlikely, but is not negligible</td>
</tr>
<tr>
<td>Negligible</td>
<td>Likelihood that event will occur is insignificant</td>
</tr>
</tbody>
</table>

No Zero Risk
Develop / apply mitigation measures = Final Risk Level

• Each pathway and overall risk of movement

Likelihood of exposure close to the time of movement is reduced by Pre-Movement Isolation Period (PMIP) Biosecurity

If the house is infected several days before movement, it would likely be detected via active surveillance.

Exposure to HPAI several days before movement

Scheduled movement date

Timeline  Days
Develop / apply mitigation measures = Final Risk Level

• Each pathway and overall risk of movement

Likelihood of exposure close to the time of movement is reduced by **Pre-Movement Isolation Period (PMIP) Biosecurity**

If the house is infected several days before movement, it would likely be detected via active surveillance.

The disease prevalence and the likelihood of detecting before movement would be lower in this case.

Scheduled movement date
Likelihood of exposure close to the time of movement is reduced by **Pre-Movement Isolation Period (PMIP) Biosecurity**

- If the house is infected several days before movement, it would likely be detected via *active surveillance*.
- The disease prevalence and the likelihood of detecting before movement would be lower in this case.

Develop / apply mitigation measures = Final Risk Level

- Each pathway and overall risk of movement
## Permitting Guidance Requirements

<table>
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<tr>
<th>Product</th>
<th>The proactive risk assessment for movement is:</th>
<th>And traceability information (premises ID, GPS coordinates, or other) is available:</th>
<th>And production parameters are normal:</th>
<th>And the following biosecurity measures are in place (please see the product-specific section for the list of sections involved in each of these measures):</th>
<th>And the premises biosecurity is acceptable?</th>
<th>And the epidemiological assessment is acceptable?</th>
<th>And the RRT-PCR result is negative?</th>
<th>Permitting guidance to move product:</th>
<th>Action:</th>
<th>And the second RRT-PCR result is negative?</th>
<th>Action:</th>
<th>Permitting guidance to move product:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasteurized liquid egg</td>
<td>Negligible</td>
<td>YES</td>
<td>YES</td>
<td>1. Truck and driver biosecurity</td>
<td></td>
<td></td>
<td></td>
<td>Issue PERMIT to move product:</td>
<td>Issue PERMIT to move to market</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-pasteurized liquid egg</td>
<td>Negligible</td>
<td>YES</td>
<td>YES</td>
<td>1. Truck and driver biosecurity</td>
<td>NA</td>
<td>NA</td>
<td>YES</td>
<td>Issue PERMIT to move to pasteurization</td>
<td>Non-pasteurized liquid egg becomes pasteurized liquid egg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Washed and sanitized shell eggs (to premises without poultry) | Negligible                                    | YES                                           | YES                                   | 1. Truck and driver biosecurity  
2. Product-specific biosecurity                                                | YES                                       | YES                                     | YES                             | Issue PERMIT to move to market for eggs collected 2 days earlier |                                    |
| Washed and sanitized shell eggs (to premises with poultry) | Low                                           | YES                                           | YES                                   | 1. Truck and driver biosecurity  
2. Product-specific biosecurity                                                | YES                                       | YES                                     | YES                             | Issue PERMIT to move to market for eggs collected 2 days earlier |                                    |
| Nest run shell eggs                          | Low                                           | YES                                           | YES                                   | 1. Truck and driver biosecurity  
2. Product-specific biosecurity                                                | YES                                       | YES                                     | YES                             | Issue PERMIT to move to market for eggs collected 2 days earlier |                                    |
| Layer hatching eggs                          | Low                                           | YES                                           | YES                                   | 1. Truck and driver biosecurity  
2. Product-specific biosecurity                                                | YES                                       | YES                                     | YES                             | Issue PERMIT to move to market for eggs collected 2 days earlier |                                    |
| Layer day-old chicks                         | Low                                           | YES for both the breeder farm and the hatchery | YES                                   | 1. Truck and driver biosecurity  
2. Product-specific biosecurity                                                | YES                                       | YES                                     | YES                             | Issue PERMIT to move layer day-old chicks to pullet farm; 21-day quarantine at pullet premises |                                    |
| Layer day-old chicks                         | Low                                           | YES for both the hatchery and the pullet farm  | NA                                    | 1. Truck and driver biosecurity  
2. Product-specific biosecurity  
3. No eggs from RRT-PCR positive breeder flocks in hatchery egg room | YES                                       | YES                                     | NA                              | NA                                 | NA | NA                                    | NA | NA                                 |
Lessons Learned / Challenges

• Industry participation and input is necessary
• This is a new approach
• This is an ongoing process
• Communication
• Risk Management approach is not the single answer – part of the solution
• **NOT GOLDEN TICKET:** Political Pressure and Public Perception still have great influence
Acknowledgments

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– USDA - AHPIS – VS - STAS - CEAH
– University of MN CAHFS; VPHPM Residents, Staff, and Faculty
– CFSPH Iowa State University
– UC Davis
– State Animal Health Officials
– Industry Stakeholders
Questions / More Information

- Timothy J. Goldsmith DVM, MPH, DACVPM  
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- Secure Food Supply Websites
  http://secureeggsupply.com/
  http://www.securebroilersupply.com/
  http://www.secureturkeysupply.com/
  http://www.securepork.org/
  http://securemilksupply.org/

- USDA FAD PReP Materials and References

Thank You