An Update on Secure Poultry Supply Plans
Lessons Learned from the HPAI outbreak

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UMN Secure Food System Team
Food system solutions through risked based science
Secure Poultry Supply Plans

SES
SECURE EGG SUPPLY

STS
SECURE TURKEY SUPPLY

SBS
SECURE BROILER SUPPLY
Secure Food Supply Plans

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

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
Goals of the Secure Food Supply Projects

• Avoid interruptions in animal/animal product movement to commercial processing from premises with no evidence of FAD infection
  • Interruptions of movement can have unintended consequences
• Provide a continuous supply of [safe and] wholesome food to consumers; and
• Maintain business continuity for producers, transporters, and food processors through response planning.
Unintended Consequences

- The negative effects on health and welfare (animals, humans, environment, economy) that occur when product movements from monitored premises are stopped during an FAD
  - Affected producers, Food businesses, Rural communities, Nation

**Diagram:**

- No movement
- Continued feed
- No income

- Product dumping
- Resources used up
- Ranging overcrowded birds
- Etc., etc., etc.
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 to protect public health and the environment; 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. All movement is based on science- and risk-based approaches. This helps agriculture and food industries to maintain normal business operations but mitigates the risks of animal and product movements.

Secure Food Supply Projects:
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.
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
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

Develop risk mitigation steps for critical points in the production process

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

How does the process work?

Select next highest priority business process and repeat

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

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

Develop draft compliance agreements, and standard operating procedures (SOP)
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’
Commodity Working Group

• Each commodity (eggs, turkeys, broilers) has a working group that consists of the following
  • UMN → content expert, risk assessor, VPH resident
  • Industry → DVMs, farm managers, corporate representatives
  • USDA → Area epidemiologists, area district directors (ADD), etc
  • State → State animal health officials
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></th>
<th>Animal Infected</th>
<th>Animal Not Infected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease Detected</td>
<td>Infected and Disease Detected</td>
<td>Not Infected and Disease Detected</td>
</tr>
<tr>
<td>Disease Undetected</td>
<td>Infected and Disease Undetected</td>
<td>Not Infected and Disease Undetected</td>
</tr>
</tbody>
</table>
Proactive Risk Assessment Steps

Hazard ID, Characterize the Industry, 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: Release/Entry Assessment
Live Animal / Bird Movement

• Likelihood of the flock becoming infected \textit{before} movement

• Likelihood that infection is \textit{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>
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<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.
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.

Timeline

Days

Scheduled movement date
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.

Timeline

Days

Start of PMIP

Scheduled movement date

Exposure to HPAI several days before movement

Dead

Infectious

Exposure to HPAI close to Movement
Current Activities
Turkey Sector Working Group Current Activities

• Secure Turkey Supply Website
  • Live with posted content

• Turkey Hatching Egg Risk Assessment
  • Risk Assessment in review, CEAH

• Turkey Day Old Poults Risk Assessment
  • Risk Assessment in review, CEAH

• Turkeys to Market Risk Assessment
  • Expert Opinion Survey on biosecurity, aerosol and local area spread
  • Normal mortality modeling complete
  • Updated recommended guidelines
  • A Simulation Based Evaluation of Pre-movement Active Surveillance...

• Turkey Brooders to Grow-out
Summary of the Draft Secure Turkey Supply (STS) Plan

INTRODUCTION

The STS Plan promotes food security and animal health through continuity of market planning prior to a highly pathogenic avian influenza (HPAI) outbreak. This plan makes specific science- and risk-based recommendations that emergency decision makers (such as Incident Commanders) can use to rapidly decide whether to issue or deny permits for the movement of turkey industry products during an HPAI outbreak.

Download the Draft Secure Turkey Supply (STS) Plan

PUBLIC-PRIVATE-ACADEMIC-PARTNERSHIP

The Turkey Sector Working Group—the multidisciplinary team that prepared this STS Plan—includes representatives of the following organizations:

- University of Minnesota Center for Animal Health and Food Safety
- Iowa State University
- Association of Veterinarians in Turkey Production
- The US Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services (USDA APHIS VS)
- State Animal Health Officials

http://www.secureturkeysupply.com/
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David A. Halvorson, Carol Cardona, Marie Culhane*, Jamie Umber

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Food system solutions through risked based science
June 18, 2015
The largest foreign animal disease outbreak in US history
The potential scope of the outbreak was not fully understood.

That left MN short on people and resources.
April 20 to 24, 2015
31 cases
Minnesota Poultry Production
The Secure Poultry Supply plans were consulted and quickly adapted to facilitate moving product out of Control Zones \(\rightarrow\) Permitted Movements

**WHY WERE THERE PERMITTED MOVEMENTS FROM MONITORED PREMISES IN 2015?**
The argument for business and Continuity of Business

- $1B were spent on indemnity and disease control.
- Those funds were spent to protect the multi billion annual collective poultry industry.
- The losses to industry would have been greater and the costs of clean up larger without COB planning.
- Products from uninfected farms don’t use resources to be destroyed.
Movement is a necessity

- A million hens will produce 800,000 eggs per day.
- That’s 3,000,000 in³ or 0.5 acres everyday
- The industry is built to move daily and when they can’t, storage capacity is quickly exhausted.
- If not allowed to move, disposal is the only option.
  - Compost (using carbon source and land)
  - Landfill
However, if economics > disease control

there will be unintended consequences.
What are monitored premises?

- Monitored Premises meet a set of defined criteria as determined by IC:
  - No clinical signs (not a suspect)
  - No epidemiological links (not a contact)
  - Biosecurity satisfactory
  - Normal production parameters (mortality and egg production for example)
  - Negative RRT-PCR tests
Identification of Monitored Premises

- Infected Premises
- Contact Premises
- Suspect Premises
- At-Risk Premises
- Monitored Premises
Figure 5-3. Premises Designations in Relation to Permitting and Movement Control

- Infected Premises: YES → Quarantine and Depopulation → YES → No Products Leave Premises
  - Suspect Premises - Birds Show Clinical Signs of HPAI? YES
    - Quarantine YES → Infected Premises
    - PCR Test Positive? Confirmation? YES → Infected Premises
    - PCR Test Negative & Mortality Normal
      - At-Risk Premises* YES → Request Permit to Move Within Control Area
        - Meets Req's for At-Risk Premises
      - Monitored Premises*
        - Meets Req's for Monitored Premises
  - Contact Premises? YES → Quarantine
    - PCR Test Positive? Confirmation? YES → Infected Premises
      - PCR Test Negative & Mortality Normal
        - At-Risk Premises* YES → Request Permit to Move Within Control Area
          - Meets Req's for At-Risk Premises
        - Monitored Premises*
          - Meets Req's for Monitored Premises
    - At-Risk Premises: YES
      - - Epi Invest. Complete
      - - Diagnostic Negative
      - - Biosecurity Measures
        - Requirements for Monitored Premises Met? YES → Monitored Premises
        - NO → Premises Outside of Infected & Buffer Zone? YES → Free Premises
  - NO → Premises Outside of Infected & Buffer Zone? YES → Free Premises

*Continuity of business plans may apply.
MOVING FROM MONITORED PREMISES

Permits
INITIAL PERMIT FOR MOVEMENT OF WASHED AND SANITIZED SHELL EGGS TO PREMISES WITHOUT POULTRY (DIRECTLY TO MARKET)

PERMIT NUMBER: XX.0 DATE OF PERMIT: 
*XX is premises number, initial permits will be numbered zero and subsequent permits 1, 2, 3, and so on.

Shipment is permitted from ____________________________ (premises name & 911 address) to ____________________________ (premises without poultry).

☐ The cargo interior and exterior of the transport vehicle must be cleaned and disinfected. The driver should remain inside the cab of the vehicle. If the driver gets out of the vehicle, the cab interior must be cleaned and disinfected, and the driver must wear protective clothing, such as disposable boots and gloves, and remove them before getting back in the cab. The tires and wheel wells must be cleaned and disinfected when leaving premises within the Control Area.

☐ Transport vehicle must be sealed by premises or company personnel under authorization of Incident Command (IC).

SEAL #: ________________________

☐ This permit is only valid if accompanied by a negative real-time reverse transcriptase polymerase chain reaction (RRT-PCR) test for highly pathogenic avian influenza (HPAI) conducted on a pooled sample of oropharyngeal swabs from 5 dead birds or 11 dead birds out of every 50 dead birds from each house on the premises of origin. (The test must be conducted by a National Animal Health Laboratory Network laboratory.)

☐ Only eggs stored for 2 days from the date of production are eligible to move to market.

Date of current negative RRT-PCR test for HPAI: ____________________________ (This permit allows movement of eggs from the premises of origin until the next day’s RRT-PCR test results are available.)

This permit is valid ONLY if a copy of the current negative RRT-PCR test results for this flock is attached.

I certify that the flock of origin of the washed and sanitized shell eggs has met the permit criteria as stated in the Secure Egg Supply Plan.
Wait, perhaps....

- There could be HPAI on the inside of the egg.
  - The eggs are held for 2 days before they leave the processing plant.

- There could be HPAI on the outside of the egg
  - Nope, they are washed and sanitized.
What else?

• Could the packing materials be carrying the virus?
  • No, only new material is used.

• Could the truck or the driver carry virus from the control zone out?
  • Yes, potentially.
  • The permit addresses truck and driver biosecurity.
The science says move

- The risk of spread as a result of moving product can be reduced to negligible for a variety of products → product moved.
Permitted movements in MN

- 5,236 mi$^2$ of control zone in Minnesota
  - Included in the control zones were:
    - 1,599 backyard flocks
    - 264 commercial premises
    - 49 other premises (processing plants, etc.)

- In MN, 2731 permits were issued to 49 states
  - 931 poultry and eggs
  - 553 feed
  - 1,399 birds to slaughter
SPS LESSONS
MN experience

• Biosecurity that had worked in the past was not enough – particularly for wild bird introductions

• Permitted movements did not seem to contribute to the spread of HPAI

• The SPS was adapted quickly:
  • To be more streamlined
  • To move materials not part of SPS
Risk assessments are not a la carte

- Testing 2 consecutive days
- Pre-movement isolation period
- Truck driver biosecurity

Low risk
Risk assessments are not a la carte

- Testing 2 consecutive days
- Pre-movement isolation period
- Truck driver biosecurity

Significant risk
Risk assessments are specific

**Washed and sanitized eggs to market**
- How could infected but undetected chickens spread infection via egg traffic to market?
  - Truck and driver biosecurity are needed to mitigate risk.

**Pullets to lay**
- How could pullets moving to a lay farm result in spread?
  - Infected but undetected pullets, driver, crew, equipment, vehicle, etc. All need to be mitigated.
SPS plans apply to **monitored premises**

- Risk assessments are based on the infected but undetected premises (monitored premises)

<table>
<thead>
<tr>
<th>Monitored</th>
<th>Infected</th>
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<tbody>
<tr>
<td>1. Few infected birds</td>
<td>1. Many infected birds</td>
</tr>
<tr>
<td>2. Minimal virus</td>
<td>2. Lots of virus</td>
</tr>
</tbody>
</table>
Its about revenue stream

• The Secure Poultry Supply plans are about products
• That means the materials of daily farm operations are not part of the SPS
• But, the RA approach to managing risk could be applied to many of these products
  • Manure (in the works)
  • Routine mortality
  • Garbage
RAs take a long time

• Many of the RAs took a decade to complete

• Easiest commodities first: washed and sanitized eggs to market

• The lack of an RA was perceived (incorrectly) as an indication of low or negligible risk associated with the product

• The lack of a FINAL stamp was perceived (incorrectly) as only incomplete data available
It was a lot of work

• The BAH hired 10 temporary, clerical staff to handle the demands of permitting
  • In the period between Mar 29 and July 28, 5,048 staff hours were spent on permitting.
• Companies dedicated their own personnel to permitting

• The alternative approach of stopping movement is also labor intensive.
What now?

• We are still working on new product risk assessments. (Live to Live)
• We are gathering information to understand why things like streamlining happened. What can we do to make sure the tools are used correctly?
• We are thinking about writing a manual to guide the use of permits. How many people do you need to hire and what types of skills do they need?
• We are looking at the products/materials of daily operation and applying the science of RA to them as well.
Conclusions

• This is not over.

• COB is important but chaos/demand/immediacy can alter the process.

• The risk is not the same if the components are not the same.

• Keep your eye on overall risk levels.
Acknowledgments

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

- Jamie Umber, DVM, MPH, DACVPM: umber@umn.edu
- Marie Culhane, DVM, PhD: grame003@umn.edu

- Secure Poultry Supply Websites
  http://secureeggsupply.com/
  http://www.securebroilersupply.com/
  http://www.secureturkeysupply.com/

- USDA FAD PReP Materials and References

Thank You