African Swine Fever (ASF)
Soybean Meal Supply Chain Workshop

Hosted by University of Minnesota and the Swine Health Information Center

July 10, 2019
Welcome!

Polly L. Sullivan, Facilitator, Ready Inc.
Agenda

• 9:00-10:30
  – Session Kickoff
  – ASF Background and Threat Status: Dr. Paul Sundberg
• Break
• 10:45-Noon
  – Canada’s Approach to ASF Control: Melissa Dumont, Animal Nutrition Association of Canada
  – U.S. Soy Supply Chain Overview: United Soybean Board/USSEC Representatives
• Lunch Served
• 12:30-2:45
  – Breakout Group Discussion/Short Break/Group Reports
• 2:45-4:00
  – Key Messages, Consensus, Next Steps
• Adjourn
Session Kickoff

Dr. Jerry Shurson, Swine Nutrition, University of Minnesota
Why Are We Here?

• ASF is endemic in China, continues to spread to other countries, and is a significant threat to U.S. agriculture
• ASF has caused major changes in global trade and supply and demand for soybean meal and pork
• Feed ingredients, including soybean meal, have been identified as potential risk factors for ASF transmission
• Many questions, perceptions, and misinformation exist about the risk of ASF introduction from various feed ingredients
• If ASF enters the U.S., it will have devastating effects on:
  – Economy
  – Soybean meal use, markets, and exports
  – Domestic pork supply and prices
  – Inability to export pork
What you told us about …

Your Motivation to Participate

• Learn
  – Risk of ASF and FAD introduction through various feed ingredient supply chains
  – Risk of ASF in imported organic soy from China

• Strategies to prevent ASF introduction in North America are needed
  – Must have alignment between U.S. and Canada
  – Develop strategic partnerships and procedures for U.S. soy response to ASF
  – Critical for maintaining U.S. soybean meal demand
  – Identify science-based, practical, and effective risk mitigation and biosecurity procedures that won’t be detrimental to commerce
What you told us about …

Expected Outcomes and Action Items

• Identify potential risk factors for ASF introduction from the soy supply chain
• Develop action plans for prevention, mitigation, and reducing ASF spread if introduced into North America
  – Identify critical control points in feed production, distribution, and storage to minimize risk of transmission
• Develop a clear, concise, practical biosecurity plan for imported soy products
  – Develop an action plan for prevention and mitigation
• Identify knowledge gaps
  – Develop industry research collaborations to obtain needed information
• Identify action items needed for developing diagnostic assays capable of detecting virus in large volumes of feed ingredients
• Develop educational materials and communicate a consistent message to the pork industry and veterinarians
What you told us about …

Your Reservations and Concerns

- Most had none
- Open and transparent communication and don’t violate anti-trust
- Is this issue too big to address?
- If new government regulatory requirements are desired, unintended and negative consequences must be considered
What Do We Want to Accomplish Today?

• Begin a conversation and gather information
  – All aspects of the soy supply chain, with special interest on imported soy products

• Identify education and research needs focused on:
  – Prevention
  – Mitigation
  – Product differentiation
  – Diagnostic assays for feed ingredients

• Develop an action plan, funding sources, and collaborative efforts
  – Address education and research needs
Facilitation Briefing and Introductions

Polly L. Sullivan
Objectives

• Identify and discuss the various segments and potential risk factors of the soy supply chain in North America
• Identify and discuss potential prevention, mitigation, and product differentiation (country of origin) strategies for soy products used in the U.S. pork industry
• Identify research and education needs related to foreign animal viruses and soy products
Tools for Productive Conversations

- **Listen & Note**
- **Parking Lot**
- **Pause to Summarize**
- **“PAC”**
What is PAC?

• Playback
  • “What I hear you saying is …”
  • “Let me restate to make sure I understand …”

• Acknowledge
  • “I agree that …”
  • “You’re right, it’s important to …”

• Challenge
  • “What about …?”
  • “Have you considered …”
  • “How would we address …”

Introductions

• Your name, title and organization/company
• Your organization or company’s role in the soybean, feed or pork supply chain
ASF Background and Threat Status

Dr. Paul Sundberg, Swine Health Information Center
African Swine Fever (ASF)  
Soybean Meal Supply Chain Workshop

Paul Sundberg, DVM, PhD, DACVPM  
Swine Health Information Center  
psundberg@swinehealth.org

global disease monitoring, targeted research investments and analysis of swine health data
- Wild boar: Poland, Ukraine, Romania
- Domestic: Ukraine, Romania
- Rise of incidence in domestic pigs
Keeping an eye on it . . .

Official Reports

- As of Feb. 27th, there are 116 officially reported ASF cases in China.
- As of Jan. 27th, MARA has lifted bans in 92 ASF epidemic areas.
- 900,000 pigs culled
- Five ‘zones’ for control, cleanup and marketing
Keeping an eye on it . . .

February 2019
China Swine Association
Zhengzhou City of He Nan Province

Message from the conference:
• There is an estimation of loss 30%-35% of pigs in this country, means 200M-300M units of pigs
• It is estimated up to 60% losses in some provinces like Shandong, Henan

July 2019
30% - 85% loss in breeding herds per province
First year of outbreak in the United States revenue loss by commodity would be

- $8 billion for pork
  - pork sector = $20B to US economy (USDA 2017)
- $3 billion for beef
- $4 billion for corn
- $1.5 billion for soybeans

• Monitoring of disease threats and ongoing review of swine disease control efforts to determine their effectiveness.
• Ongoing dialogue with Canadian and Mexican government, swine and health organizations to collaborate and implement practices that would protect the North America Swine Herd from entry of a Foreign Animal Disease.
• Restrict imports of soy-based animal feed products from countries of high risk to transmit FAD
• Adopt a responsible feed ingredient sourcing strategy for all imported products to prevent the introduction of FADs into the US.
• Evaluate swine FAD virus viability in pig feed or feedstuffs and develop feed holding time information as it relates to transport and storage to assist in disease prevention.
• Develop a science based plan to safely introduce essential feed and feed ingredients, as well as other products, from countries of high risk
• Focus communication, education, funding and research activities by all NPB staff, committees of the NPB, governmental agencies, other industry organizations, all vendors to the USA swine industry and all producers to keep the US national swine herd free of all FADs including and especially targeting ASF.
What about feed?
Soybean meal imports?

23 Ports of Entry since 2016
• 82% from 4 ports
  • San Francisco
  • Baltimore
  • Seattle
  • New Orleans

Source: NPPC
Feed or feed components??

Batch 1 (d 1 PI)
Batch 2 (d 8 PI)
Batch 3 (d 25 PI)
Batch 4 (d 37 PI)
Mean daily temperature & % RH data utilized during the Trans-Pacific model


China  Pacific  USA
ASFV: Relationship of Trans-Atlantic route and sampling points

Batch 1 (d 1 PI)
Batch 2 (d 9 PI)
Batch 3 (d 19 PI)
Batch 4 (d 30 PI)
## Results: Summary of virus survival across both models (37 DPI or 30 DPI)

<table>
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<tr>
<th>Ingredient</th>
<th>SVA (FMDV)</th>
<th>ASFV</th>
<th>PSV (SVDV)</th>
<th>PEDV</th>
<th>FCV (VESV)</th>
<th>PCV2</th>
<th>BHV-1 (PRV)</th>
<th>PRRSV 174</th>
<th>BVDV (CSFV)</th>
<th>VSV</th>
<th>CDV (NiV)</th>
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<td>Complete feed (+ control)</td>
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ASF in feed and water – one exposure

Niederwerder et al., 2019. *Emerging Infectious Diseases.*
ASF in feed and water – ten exposures

Niederwerder et al., 2019. Emerging Infectious Diseases.
ASF in feed and water – twenty exposures

Infection Probability

Dose (TCID\textsubscript{50})

Niederwerder et al., 2019. Emerging Infectious Diseases.
global disease monitoring, targeted research investments and analysis of swine health data
Task Force Objective:
There is agreement that there is risk of introduction of pathogens into and within the U.S. via imported feed products. The Task Force will evaluate the risk and help decide what actions need to be taken to protect the U.S. pork industry from that risk. Actions should be achievable, based on science and minimize trade disruptions.

- Pork producers, associations, feed-related researchers
- 14 people from USG: FDA and APHIS VS, PPQ, PPD; ARS FADDL
- AFIA, NGFA, US poultry, NMPF, NCBA
The identification of gaps in knowledge and subsequent research needs included:

- development of diagnostic testing capability for feed/ingredients,
- development of a response plan that will support feed/ingredient monitoring for FAD contamination
- performing a risk assessment for potential spread of a disease once identified within the US,
- development of a plan to assess and mitigate contamination within the feed system once the virus is identified within the US
- evaluation of the regulatory needs and feasibility of potential regulatory actions for feed importation, and
- development and evaluation of efficacy of mitigations for feed contamination.
global disease monitoring, targeted research investments and analysis of swine health data
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BREAK
Pathogen Detection & Surveillance

Dr Declan Schroeder, Molecular Virology, Department of Veterinary Medicine

June 24th 2019
Baltimore Classification

- I: dsDNA
- II: ssDNA
- III: dsRNA
- IV: (+)ssRNA
- V: (-)ssRNA
- VI: ssRNA-R
- VII: dsDNA-R
Families and Genera of Viruses Infecting Vertebrates

DNA

- dsDNA
  - Asfarviridae
  - Poxviridae
    - Chordopoxvirinae
  - Iridoviridae
    - Ranavirus
    - Lymphocystivirus
    - Megalocytivirus
- dsDNA (RT)
  - Hepadnaviridae
  - Herpesviridae
  - Papillomaviridae
  - Adenoviridae

ssDNA

- Circoviridae
- Anellovirus
- Paroviridae
  - Parovirinae
Figure 2. Phylogeny showing EhV (arrow head) and ASFV (arrow) embedded within a megavirus clade, outside the families *Poxviridae* & *Iridoviridae*. Adapted from Sharma et al (2014). Inserts: Electron micrograph images of a) EhV, bar=170nm and b) ASFV, bar=50nm. Mackinder et al (2009) and Andres et al (1998), respectively.
Eukaryotes

Worden et al. Science 2015
Figure 2. Phylogenetic tree of the RNA polymerase II beta subunit.

https://doi.org/10.1371/journal.pone.0015530
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0015530
Figure 5. Experimental flow chart illustrating the four-step process required for the development of the RISNA assay
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WELCOME BACK – Let’s Recap
Canada’s Approach to ASF Control in the Feed Ingredient Supply Chain

Melissa Dumont, Animal Nutrition Association of Canada
Current U.S. Soybean Meal Imports

Philip Lobo  Minneapolis, MN  July 10, 2019
Objectives

- Background
- U.S. Soybean Meal and Cake Imports
- What We Have Learned
USB Background

• 73 USB Directors
• About 570,000 Soybean Farmers
• Averaged $81.7 Million in National Checkoff Collections over Past Five Years*
• Used for education, outreach and promotion

*USB Diligent Board Books 7/18, 7/17, 7/16, 7/15, 7/14
U.S. SOYBEAN FLOW (Marketing Year 2017/2018)

Imports
- 0.5% • 594 MT • 22 MBU

Beginning Stocks
- 6.4% • 8,208 MT • 302 MBU

Exports
- 45.0% • 2,129 MT • 79,945 MBU

Exports
- 9.5% • 1,110 MT

Ending Stocks
- 7.7% • 903 MT

Soy Oil Production
- 92.1% • 10,958 MT

Solvent Extractors (est.)*
- 98.9% • 55,287 MT • 2,031 MBU

Extruders (est.)*
- 1.1% • 639 MT • 23 MBU

Soy Meal Production
- 98.2% • 44,648 MT

Meal Production
- 28.1% • 12,792 MT

Human
- 47.8% • 5,590 MT

Human
- 64.0% • 3,539 MT • 120 MBU

Industrial
- 35.0% • 4,100 MT

Industrial
- 0.3% • 120 MT

Animal
- 68.8% • 31,281 MT

Animal
- 22.6% • 10,953 MT • 109 MBU

Whole Soybeans
- 11.6% • 4,966 MT • 511 MBU

Endings Stocks
- 79.5% • 11,923 MT • 438 MBU

Imports
- 1.0% • 449 MT

Beginning Stocks
- 0.8% • 363 MT

Ending Stocks
- 1.1% • 502 MT

Source: Data is from USDA Market View Database unless noted. Values are as of April 2019 update. Reference: https://marketviewweb.ears.usda.gov/ for the complete most recent dataset.
2017 Domestic SBM Feed Utilization
(million metric tons, excluding hulls)

- Poultry: 18.1 million metric tons (64%)
- Swine: 6.9 million metric tons (24%)
- Dairy: 2.6 million metric tons (9%)
- Beef: 0.24 million metric tons (1%)
- Other: 0.5 million metric tons (2.1%)

Total of 28.3 million metric tons

High volume but relatively lower risk due to heat and solvent treatment

Source: Soybean Meal Demand Analysis, Decision Innovation Solutions, Sept. 2018
2017 Domestic Hull Feed Utilization (million metric tons)

- Total of 2.3 million metric tons
- Dairy: 1.3 million metric tons (57%)
- Beef: 0.9 million metric tons (41%)
- Swine: 0.1 million metric tons (3%)

Low volume but higher risk due to minimal heat and no solvent exposure

Source: Soybean Meal Demand Analysis, Decision Innovation Solutions, Sept. 2018
Soy Checkoff Actions

- Supported Scott Dee’s work on mitigants for FADs
- Protocol for USSEC-funded travel outside the U.S.
- Protocol for travel to USSEC organized events inside and outside the United States
- Moratorium on all swine related activities in which teams would be organized from an ASF positive country
U.S. Soy Value Chain

Risk Factors
- Hulls
- Transportation
- Manure
Overview of Commercial Soy Extraction

• Cleaning

• Dehulling
  – Reduces meal fiber, increases protein

• Conditioning—150 degrees F for 15-30 minutes

• Flaking—Additional pressure and heat

• Extracting—Soak in solvent at 145-150 degrees F for 30-40 minutes

• Desolventizer/Toaster/Dryer/Cooler (DTDC)
  – 150-165 degrees F for 10-15 minutes
  – 220 degrees F for 45-60 minutes
Overview of Commercial Soy Extrusion

• **Cleaning**
  – Removing foreign material and stones

• **Dehulling (Optional)**
  – Reduces meal fiber, increases protein

• **Grinding**
  – Coarse/Fine, depending upon the type of extruder used

• **Extrusion**—130 degrees C to 150 degrees C
  – Depending upon the extruder (Dry/Wet)

• **Drying/Cooling**
  – Depending upon the types of extruder used to process soybeans

Source: Mian Riaz, Ph.D.  
Texas A&M University
U.S. Soybean Meal Imports
U.S. Soybean Meal and Cake Imports by month January 2017-April 2019

World Total

India

Canada

Turkey

China

Norway(*)

(*) denotes a country that is a summarization of its component countries
U.S. Soybean Meal and Cake Imports from China by month January 2017-April 2019

ASF Outbreak Reported 8/18
2019 SBM Imports from China by Port of Entry

Harmonized Codes
- 120810 - Flours and meals of soybeans
- 120100 - Organic soybeans whether or not unbroken
- 210690 - Meal organic soybean
- 150790 - Soybean oil, refined and fractions, not modified
What We Have Learned
What We Have Learned

• Volume imported from China is decreasing
• The vast majority is coming in through one port
  – Need to determine:
    • How to reach these companies/ Make them aware
    • Help ensure the biosecurity of future shipments
    • How to help organic pork producers
• Ramifications of an outbreak are enormous
  – Can ruin a huge portion of the domestic pork and feed industries
While the U.S. Soybean Export Council (USSEC) does not guarantee the forecasts or statements of USSEC Staff or Contractors, we have taken care in selecting them to represent our organization. We believe they are knowledgeable and their presentations and opinions will provide listeners with detailed information and valuable insights into the U.S. Soy and U.S. Ag Industry. We welcome further questions and always encourage listeners to seek a wide array of opinions before making any financial decisions based on the information presented. Accordingly, USSEC will not accept any liability stemming from the information contained in this presentation.

Thank You
Discussion

What are the greatest risk factors for ASF introduction into the soy supply chain?
Lunch is Served
Please Return at 12:30 PM
ASF-Soybean Meal Supply Chain Workshop

WELCOME BACK – Let’s Recap
## Breakout Assignments

<table>
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<tr>
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Group Reports and Feedback
Discussion

What do pork producers and soybean growers need to know?
Summary and Consensus

• Objectives and Outcomes
  – Potential risk factors
  – Prevention, mitigation, product differentiation strategies
  – Communication and research needs

• Key Messages

• Parking Lot

• Next Steps
Closing Discussion

• What’s your primary takeaway from today’s session?
• What next steps will you take within your organization?
• What actions do you expect researchers and industry associations to take?