Rapporteur Briefings

General Session

September 25, 2014
Briefings from Day 1

TJ Myers and Beth Lautner

SECD Experiences / Perspectives

Presentations of September 24, 2014
Refresher on Agenda for Wednesday September 24, 2014

• Welcome by Sponsoring Organizations
• Keynote Speaker (Steven McOrist)
• SECD Experience / Perspectives
  • Asia panel
  • North America panel
  • South America panel
  • Europe and Oceania panel
Themes from the Discussions

Country presentations – two categories

1. Countries that have experienced SECD

A. Europe and the classical virus
   - Virus still circulating; low levels of clinical disease
   - Not a significant economic impact
   - Little vaccine use
   - No delta coronavirus detected at this point
   - Some retrospective testing being conducted
1. Countries that have experienced SECD (cont.)

B. Asia, the Americas, and the recent virus strains

- Significant economic impact
- Greater virulence and transmissibility
- Epidemiology studies to evaluate source and spread
- Response actions
  - Reporting
  - Biosecurity is critical (*an investment, not an expense*); must include all production types
  - Diagnostics, surveillance, and molecular epi
  - Vaccination (effectiveness?)
  - Movement precautions
2. Countries that have not experienced SECD

A. Preventive Actions
   • Risk assessments
   • Import policies

B. Preparedness Measures
   • Diagnostic capabilities
   • Surveillance (including syndromic) and reporting
   • Build from on-going preparedness and response efforts
   • Contingency planning
   • Biosecurity education and disease awareness
All Countries Emphasized

• Government-industry collaboration
• Free and open sharing of information
  • In-country and between countries
• Flexibility as new information becomes available
• Non-regulatory role for governments in emerging diseases
• View PED as a “wake up call”
Knowledge and Other Gaps

• Pathways for cross-border introduction and spread
  • Role of feed ingredients?
  • Risk of transmission through semen?

• Vaccine and diagnostics research needed
  • New vaccine candidates
  • Cross protection of classical PEDV for recent strains?
  • Serology

• Resources to support control efforts
Briefings from Day 2

Concurrent Sessions and Breakout Discussions

Of September 25, 2014
Concurrent Sessions and Breakout Discussions

• Session A – Risks, Pathways, Prevention
  – Risk/Pathways - Breakout Discussion A1
  – Prevention - Breakout Discussion A2

• Session B – Impacts, Response, Control
  – Strain Variation/Impacts - Breakout Discussion B1
  – Response/Control - Breakout Discussion B2
Discussion highlights from morning session

PEDv reemergence in EU (EFSA)

- Risk assessment, scientific opinion and communication
- An independent organization (declaration of interests) dealing with animal health, plant health, food and feed
- Mandate: 1) current epidemiology situation in EU, North American and Asia in last 10 years, 2) characterization new Delta coronavirus 3) differences between PED strains in EU and Americas 4) impact of alpha and delta, 5) risk assessment of entry routes ranked by level of risk (no probability scoring)
- Literature search, internet, meetings, consultations
- Estimated completion date: October 2014
Discussion highlights from morning session

Intro risk to France (ANSES)

- Animal and plant health
- April 2014 requested to assess risk of introduction, spread and methods to reduce risk
- Expert Assessment Group
- Introduction ranking (live pigs 6/7, blood products 6, semen 5, embryos 5, equipment/vehicles 5)
- Blood 71°C for 10 min, all others need re-validation
- Spread estimates – rapid, if no intervention
  - Early identification, movement restriction, depopulation of infected herds, high biosecurity
    - Estimated seroprevalence of sows 3.6%
Discussion highlights from morning sessions

Pathway Assessment of Exotic Viral Pathogens of Swine to US

- Only pathway for entry at this time (later exposure...) in clearance process for report release
- Quantity imported, biological factors, import mitigations
- Used representative viruses (CSF, FMD, pseudorabies)
- Air, fomites, live animal vectors, feed
### Discussion highlights from morning session

**Pathway Assessment of Exotic Viral Pathogens of Swine to US**

<table>
<thead>
<tr>
<th>Negligible risk</th>
<th>Non negligible risk</th>
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<tr>
<td>Manure, blood, bones, hides, trophies, pharmaceuticals, commercial and passenger conveyances, farm and military equip, regulated garbage, rendered feed, feed from milk, animal manure, processed plant derived, microbial culture mining or chemical synthesis</td>
<td>Cell culture/microbial organisms, swine /ruminant diagnostic samples, dietary supplements, vaccines, non-regulated garbage, unprocessed grains, non-rendered pet food chews and treats, commercial swine meat/products/by-products, bushmeat, live animals and germplasm (regs geared towards big diseases so countries that don’t have them have less mitigations and therefore could be a risk for unknown diseases), humans, ,other such as pet trade</td>
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Discussion highlights from morning session

Porcine-origin feed and PEDv
  • Observations: PCR+ SDPP could cause disease but feed with PCR+ SSPP did not cause disease
  • Field-based, retrospective, case-control study
  • Overall results:
    o ingredients negligible to very low association
    o minor differences among lot numbers for some products
    o no compelling evidence in this study for recall
    o work with reputable supplier
    o work to improve traceability from ingredients to pigs
    o educate clients and production staff, communicate, report
Discussion highlights from morning session

SDPP and PEDv in Canada

- *Feed investigation*
- *Taking all 9 criteria together*
  - Many questions still remain
  - Epidemiological evidence supports that a specific lot of SDPP was associated with Canadian outbreak
- CFIA concluded that there was no evidence to confirm the source of the contamination of the SDPP
Group Session A1 - Risk/Pathways

Moderator: Lisa Ferguson
Reporter: Theresa Boyle

General discussion:

• Producers want the information available to be able to decide what mitigations to take to meet the level of risk they are comfortable with.
  o Comparison of different risk assessments

• Inspection at country of origin rather than wait till it gets to the POE. Resources often the limiting factor.
Group Session A1 - Risk/Pathways

General discussion (cont.):

• There must be some common link that is not obvious as it is in so many countries in a short time.

• We should all decide on feed ingredients and how we are going to manage them. Risk is very low, can never be zero. SDPP conceivable causes sporadic disease, now have dense populations with virus that spreads easily.
General discussion (cont.):

• Took BSE to stop ruminant to ruminant. Maybe should consider stopping species to species feeding?
  – Epi work demonstrated feed related.
  – Feed is customer driven.

• U.S. hasn’t done a detailed epi investigation of affected and non-affected herds (didn’t have data in the beginning, now a case-control study may or may not reveal answers)
Most likely route of introduction....

• Very virulent, easily spread so once it is here, it is here.
  – How do we prevent the next one? What do we need to do differently?
• Two strains came into U.S. within a couple of months of each other, there must be a link.
  – Unknown.
• U.S. does not definitively know when the actual first cases were. Symptoms are similar to other diseases so may have gone undiagnosed in the beginning.
Sharing of research related to pathways of introduction...

• Guelph will be doing a case-control study for the Ontario cases. They are gathering the possible questions to ask.
  – Difficult to determine intro into country. Can only look at within herd spread.
Sharing of research…

Pork industry research

• Inter-herd transmission risk factors
• Feed industry has been very cooperative
• Case-specific: develop better bioassay or tests for feed, risk evaluation research (risk assessment of feed and feed system), feed mills with positive PCR, possible role of starlings, interventions - products added to feed to decrease or eliminate the risk.
• Truck disinfection – time and temp, baking
Research needed to define risk/pathways...

- Mitigation methods (ex: irradiation)
- Can we learn from infected countries – common imports, not just feed, plastic. Could that help narrow the list?
- Need some type of working group set-up to follow-up with this meeting and try to answer some of the questions.
- We can do a lot more together!
- OIE ad-hoc working group met in June 2014. Should it be a notifiable disease? Report available in Nov 2014. If notifiable then additional meetings to review available data. If not notifiable, then no follow-up. Countries would then need to request additional work. OIE most likely willing.
Research needed to define risk/pathways...

• Sharing of isolates (U.S. willing)
• Better tools and vaccines to prevent diseases.
Group Session A2 - Prevention

Moderator: Troy Bigelow
Reporter: Denise Spencer

1. With the introduction of new vaccines in the market, will they be incorporated into sow or piglet herd management protocols for the prevention of disease spread?
   a. Will vaccines increase or provide protective herd immunity?
   b. Will vaccines be a cost effective tool for industry?
   c. Or, will vaccines promote non-clinical cases and disease shedding?
Incorporation of new vaccines....

- Good vaccines should not promote non-clinical cases and disease shedding
- More basic research on coronavirus (TGE and PED)
- Major challenge is getting mucosal immunity (consider route of administration) and mutations rates
- Currently used PED vaccines are not very effective (results may be due concurrent infection with other viruses)
Incorporation of new vaccines ....

• Cost benefit analysis should be considered (route of administration may impact cost...i.e. via water)
• Attenuated vaccine strain (bench level) not commercial
2. As disease becomes endemic, will cleaning and disinfection of livestock hauling vehicles remain a primary biosecurity component for the prevention of new disease outbreaks?

a. Do you predict vehicle cleaning biosecurity practices will continue to be prioritized or will current industry cleaning practices wane as herd immunity increases and time passes?
Cleaning and disinfection of livestock hauling equipment....

- As disease wanes the practice will stop (cost of washing trucks needs to be considered...prohibitive)
- Could be considered insurance for protecting your pigs
- Specific biosecurity measures need to be defined
- Alternatively, can the pigs be removed from the farm at the property line (off the premises)
- Pigs moving onto the farm (personnel practices will make or break biosecurity measures)
3. As time and/or years pass, will the practice of feedback remain an important management tool?
   a. What vaccine criteria would be needed to replace feedback as a management tool?
Feedback as a management tool, criteria for vaccine replacement or other alternatives....

- “Controlled exposure”
- Could be spreading other pathogens and encourages reassortment
- SPF swine could be used as a source (like bursal dz virus vaccine)
- Requires 100% of the animals get treated
- What is the goal? Control or eradication of the disease by vaccination
Feedback as a management tool, criteria for vaccine replacement or other alternatives ....

- “Feed back is better than nothing”
- Need a vaccine that provides cross protection
- Killed autogenous vaccines may be effective (difficult to grow the virus)
- Need a good sow vaccine
- Basic research is needed (duration of immunity and level required for protective immunity)
Feedback as a management tool, criteria for vaccine replacement or other alternatives ....

- Vaccine needed for active and passive immunity (protect sows and piglets)
- Production of Ab’s in chick embryo that could be fed to pigs
4. Knowing PCR positive samples have been obtained from many non-farm locations such as convenience station floors, what biosecurity preventative measures do you foresee as necessary for preventing the introduction of disease from employees, farm workers, visitors etc.?
Biosecurity measures for prevention of disease introduction by employees, visitors....

- Need to work as hard to keep disease in as you do to keep disease out
  - Aerosol reduction is there an engineering/mechanical fix
- Quality control program for biosecurity
- There is a cost, so need to identify what the goal is
- Backyard production herds are a huge risk for the introduction of many diseases
- Pet pigs as a pathway?
What are the needs for Ab based testing in the US and in other countries?

• Is there any value in a snap test
  – Validation requires panel of samples (are they available)
  – Perhaps a test for swabbing pigs or trucks prior to loading a truck

• Ag capture ELISA helpful in herd testing

• PCR, rt-PCR preferred by some (more accurate than ELISA)

• ELISA valuable when large numbers of samples need to be tested
Emerging Transboundary Diseases

• Knowledge gaps for emerging diseases
• No planning done for non-reportable transboundary disease before PED
• Epidemiological investigation important
• PEDv wasn’t a surprise (foreign literature and research papers...an emerging risk to the swine industry)
Emerging Transboundary Diseases

- From a list of known swine diseases from NVSL
- AASV asked to rank them (top 10 below based on score)
  - FMD, ASF, SIV, CSF, PRV, SVD, VSV, PRRS, JEV, Nipah, Vesicular exanthema, PED, porcine teschovirus, porcine rubulavirus
Emerging Transboundary Diseases

- RESOURCES:
  - Diagnostics
  - Epidemiology
  - Routes of transmission
  - Viral viability
  - Immunity
  - Pathogenesis
  - Global distribution
Emerging Transboundary Diseases

• Next Steps
  – Group to monitor emerging issues daily
  – Literature search for each ranked virus and fact sheet development
  – Establish “trip wires”
Emerging Transboundary Diseases

• Focus on global production dz’s
• Establish mechanism for evaluating dz implications and prioritizing threats
• Work towards recognizing and filling resource/knowledge gaps
• Establish dx/surveillance system that searches for the introduction of emerging dz’s
Group Session B1 - Strain Variation/Impacts

Moderator: Leo Koster
Reporter: Susan Skorupski

1. What virus sequencing efforts are countries having detected PEDv or other novel swine enteric coronaviruses undertaking?
   a. How often are submissions sequenced?
   b. How are results shared with the international community?
Virus sequencing efforts...

- In US and Italy, both Next Generation and Sanger sequencing are being done on isolates (US) and diagnostic material (US and Italy).
- In Italy, recent NextGen sequences need to be completed and deposited. Sanger sequences on S gene have been completed and will be deposited soon.
- US state diagnostic labs sequence some diagnostic samples and some have been shared.
- Sequences are shared through GenBank
2. Have variations in the sequence of viruses been detected?
Variations in virus sequences detected...

• Some variations in sequence have occurred.
• In Italy, three different groups of virus identified and are temporally separated. Potentially, recombination events between PED and TGE/PRCV.
• In the US, there are more than one group identified by different insertions or deletions
3. Have variations in clinical presentations with viruses been observed?
   a. What are those observations? (rate virulence according to virus type)
Variations in clinical presentation...

- One virus OH851 has been identified anecdotally as having lower virulence but infection and pathogenesis studies involving deletions of regions of virus will need to be completed before more definitive answers can be given.
4. How can we best share quickly when new virus sequences are detected?
Timely sharing of information...

- Email is the fastest but a more important question to answer is “What is new/different?” What should be added to common database?
- Genbank takes 2-6 weeks to add new sequences but the distribution is worldwide.
5. *How has strain variation impacted vaccination success and vaccine design?*
Strain variation impacts on vaccination success and vaccine design...

• We don’t know enough about strain variance and any associated immunologic effect to answer this question at this time.
Other discussion highlights from morning and afternoon sessions...

- There was a discussion about Next Generation Sequence assembly and the importance of depositing high quality sequences. Software for assembly is getting better but assemblies need to be carefully scrutinized for complete coverage and accuracy.
- Impacts – have had opportunity to exercise communication plans, enhanced biosecurity, and other aspects of state and industry response plans. Collaboration is key.
1. What key response actions lead to rapid control?
Early detection

• Syndromic surveillance – look for abnormal
• EPS-Enhanced Passive Surveillance
• Rapid Control/response
  – needs to be based on clinical signs vs a confirmed Dx test
  – 2 week turnaround on development is considered typical
Response

- First 48 hrs – What threshold needs to be crossed for the industry to put movement controls in place?
- What agreements or assessment processes need to be in place ahead of time?
What constitutes movement control?

- not just quarantine
- Diverting movements
- Permitting
• **Canadian Experience Case Study**
• Benefit of 9 months of preparation
• Frequent and robust communication between industry, provinces and CFIA
• Biosecurity emphasis at farm level
• Emerging diseases reportable in Provinces
• Voluntary movement controls - Producers
Emerging Risks to Animal Health

- Multiple factors increasing risk
- Uncertain consequences and unknown pathways
- Emerging disease an issue in US and globally
  - Chikungunya, H1N1, nSECD
  - MERS-CoV, H5N8, Hendra, Schmallenberg, Ebola
  - USDA Framework for Emerging Animal Disease Response to be published for comment soon
- Timely information to stakeholders needed
  - for quick response to minimize impact
Emerging Risks to Animal Health

- Various detection methods and information sources
  - Passive and active surveillance, databases, etc.
  - National Partners, Academia, Industry, International
- Products for decision-makers can be shareable
  - Watch list, Notices, Assessments, Risk Analyses
- Collaboration possible at multiple steps
  - Collection of surveillance information
  - Evaluation and analysis
  - Actions on products
Emerging Risks to Animal Health

Conclusions

• Emerging diseases are a shared issue
  – Hot Spots are distributed globally
  – Diseases can travel quickly

• Collaboration is key
  – Outcomes and their improvements are measurable
  – Tools need not be reinvented
A collaborative effort from around-the-world to share experiences and perspectives about SECD