

REPORT OF THE COMMITTEE ON TRANSMISSIBLE DISEASES OF SWINE

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The Committee met on October 21, 2013 at the Town and Country Hotel, San Diego, California, from 1 to 6pm. There were 24 members and 43 guests present.

Chairman Snelson welcomed participants to the 2013 Transmissible Diseases of Swine Committee meeting and introduced himself and vice-chair, Dr. Lisa Becton. Dr. Snelson reviewed other house-keeping items including the changes to the sign-in sheet and requested any resolutions to be presented if they have not been submitted to date.

Dr. David Marshall brought up a new issue regarding pseudorabies virus (PRV) testing at the Kentucky laboratory and timeline for results. The problem was identified when two positive PRV sow samples were identified in North Carolina. The time from sample collection, submission to Kentucky, then to National Veterinary Services Laboratory (NVSL) for confirmation and back to North Carolina, was approximately five weeks. United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), NVSL was consulted to address the issue. The resolution included changing of testing protocol so that if there is a suspect positive sample, samples will then be automatically submitted to NVSL for expedited testing and by-pass the confirmatory testing at the Kentucky laboratory. The process will continue to be assessed for effectiveness. The update was for Committee information.

Iowa State University, Veterinary Diagnostic Laboratory (ISU-VDL) Update on Porcine Epidemic Diarrhea Virus (PEDv) Diagnostics: Events, Observations and Outcomes

Rodger Main

Iowa State University, Veterinary Diagnostic Laboratory

Dr. Main reviewed events with porcine epidemic diarrhea virus (PEDv) diagnostics and reviewed the different types of assays that are available. PCR still is the predominant assay that is being used. PCR is highly sensitive and can be run in same-day; and can detect acute cases but may not be appropriate for routine surveillance of non-acute cases. Positive <35, but will report out to 40. Utility of oral fluids testing for PED is under development; very good test due to non-invasive, quick and easy to do. The test has been very valuable for ante-mortem detection of virus. It is also very sensitive for picking up environmental issues as well. However, it cannot isolate virus at this point from samples.

Immunohistochemistry (IHC) is available for testing on fixed tissues, but the test appears to be relatively insensitive. Immunofluorescent antibody test (IFA) is also being utilized at this time. Good titer can be seen to PED 3-4 weeks post-exposure, but the titer does not remain for an extended period of time...data is still being collected for specific time frame of duration of titers. Multiple university efforts to develop an ELISA test. Current PED commercial assays are poor quality (international sourced). Virus isolation (VI) are underway to be completed but is a complicated and time consuming process. Sequencing does not appear to be changing from the original isolate identified from China. The S gene is the gene of interest and focus for epidemiologic purposes.

Do we know what a protective antibody would be? Not at the current time. Currently work is being done on a serum neutralizing focus. There appears to be a high amount of virus found in piglets even without clinical signs post-acute outbreak. Therefore, the serum neutralization (SN) assay will try to determine what the antibody levels mean. Virus can shed an extended amount of time in clinically normal pigs anywhere between 4-8 weeks post-outbreak.

The clinical effect on neonates is significant up to 100% mortality, but in older pigs, clinical presentation varies. Disease in growing animals could be readily missed.

Is there a more effective means to report ongoing cases versus what is being collected currently? The current information does show a barometer of what is going on in the industry. However, to understand national prevalence, different information and potentially another sample source would need to be incorporated. The PED event highlights the need for continued disease surveillance, rapid detection and appropriate response for swine disease issues.

Pork Industry Update on Porcine Epidemic Diarrhea Virus (PEDv)

Paul Sundberg, V.P. Science and Technology
National Pork Board

Dr. Sundberg provided an update on activities for PED by the Pork Board. Focusing on research and outreach efforts in response to the virus, new and ongoing cases of PED occurring within the industry were outlined. The current data that is available for case numbers cannot be used for disease analysis, so effort is being made to incorporate premise identification numbers for laboratory submissions. Producer permission has to be granted to be utilized and provide assurance it will be maintained correctly.

First issue was to convene groups that can identify specific needs. There was a real need to make sure that samples are continued to be submitted for PED and that there was guidance on how best to submit samples. Working groups were convened in order to address specific areas: biocontainment; biosecurity and transportation; and packing plant group. Different guidelines have been developed to address specific areas of biosecurity that could add risk of spread of the PED virus. Manure hauling guidelines were developed to address such an area. For more detailed information and the specific guidelines, go to www.pork.org/ped. A common biosecurity theme that has arisen is the concept of the line of separation to reduce chance of spread of PED. The concept highlights the need to keep people/equipment in respective areas so to not transmit disease.

Extensive communication efforts have been underway to make sure that this information is available to producers, veterinarians, and other stakeholders to assist in ongoing disease management. Other information that is available includes updates on all research that has been funded to date for PED. There are currently nine projects underway. Updates on progress are reported bi-weekly.

Many key lessons have been learned including the need for premise identification on laboratory submissions for disease surveillance, biosecurity focus is needed on all production fronts, biocontainment is also critical, and the industry and government have definitive roles that will continue to be refined.

Continued focus should be in preventing contamination of trailer cabs with the virus (PED or even porcine reproductive and respiratory syndrome (PRRS)).

Centers for Epidemiology and Animal Health (CEAH) Update on Porcine Epidemic Diarrhea Virus (PEDv) Epidemiology Efforts

Andrea Beam, VMO (Epidemiology)
USDA, APHIS, VS, CEAH

Presentation provided by teleconference.

Dr. Beam gave a review of the investigations for PED as well as an update on the 2012 National Animal Health Monitoring System (NAHMS) swine study. The first epidemiologic study was to look at the first cases of PED and to identify potential risk factors or commonalities between these first index cases. CEAH assisted with questionnaire development and data analysis. Data confidentiality covered by Confidential Information Protection and Statistical Efficiency Act (CIPSEA) and would not be subject to Freedom of Information Act (FOIA). The first study was completed and results were published by American Association of Swine Veterinarians (AASV). Several feed variables were associated with this being a case farm. No smoking gun has been identified at this point in time, but cannot completely rule these out due to low sample size.

The second epidemiologic study is to do spatial analysis and a prospective study. University of Minnesota, College of Veterinary Medicine (CVM) is performing this study. This study is to better understand risk factors for lateral spread of PED. An Oklahoma case is utilized to look at the spatial analysis. Additional information and updates can be found on www.pork.org/ped. The second component is the prospective study. North Carolina is the focus for evaluation of lateral spread which will have both case and non-infected controls for the data analysis. CEAH has developed the biosecurity questionnaire with data analysis. Spatial analysis is ongoing and should be available within the next few weeks. Data for airborne spread is also being analyzed and will be available within the next several weeks. The prospective study is underway and data collection will occur soon.

The 2012 NAHMS swine study has two parts: farms with herds > 100 head and the second with < 100 head. Data analysis is ongoing for both studies. Biologic collection datasets are currently being validated.

Feral Swine Brucellosis/PRV Subcommittee Report

Dr. Joe Corn, Southeastern Cooperative Wildlife Disease Study (SECWDS)
University of Georgia

Southeastern Cooperative Wildlife Disease Study (SECWDS) collects and distributes data for feral swine populations. They began distributing maps in 2002 with over 600 additions made since 2008. There are 36 states reporting populations of feral swine. Monitoring of feral swine is done on high risk populations and will test for swine brucellosis (SB), pseudorabies virus (PRV) and other diseases. In 2013, 3000 samples were collected in 34 states. For 2014, more aggressive management of feral swine funding will be looked at.

National Center for Foreign Animal and Zoonotic Disease Defense (FAZD) gave a presentation on the impact of feral swine for commercial populations and the impact if a foreign animal disease (FAD) enters the US. An intensive feral swine study was performed in California and utilized global positioning systems (GPS) data to track movements of existing feral swine.

Another presenter provided an update on the incidence of *B. suis* in dairy cattle and potential problems associated with consumption of raw milk. This project was initiated and ongoing in Georgia.

Members approved the report as given.

Secure Pork Supply Project Update and Vaccine Needs for a Potential Foot and Mouth Disease (FMD) Outbreak

Dr. Jim Roth, Director Center for Food Security and Public Health
Iowa State University College of Veterinary Medicine

Dr. Roth reviewed the changes in North American agriculture and the difficulties of dealing with a Foot and Mouth (FMD) outbreak. Traditional methods for dealing with FMD (stop movement and stamping out) would not be easily accomplished within the United States for many different reasons. Stamping out would be a logistical issue due to large sizes of operations. Another issue is the extensive movement of animals in transit at any given time. This also provides another logistical challenge for dealing with a foreign animal disease (FAD). Pork export value is rising and was at \$6.3 billion for 2012. Events such as a FAD could create a devastating reduction of value for pork products abroad. The varied sizes of swine operations create a challenge for identifying and providing data to show freedom of disease. These challenges have led to the development of a Secure Pork Supply (SPS) Planning Committee that represents all stakeholders within industry and government to assess what can be done during an outbreak. Diseases to be assessed for SPS plan: FMDv, Classical Swine Fever (CSF), African Swine Fever (ASF), and Swine Vesicular Disease (SVD). None are zoonotic diseases and all but one are swine-specific diseases. The first draft was circulated in July 2013 and requested back by August 31. The comments will be integrated into the updated document and the next draft will be available soon. There are voluntary pre-outbreak preparedness components to the plan. Plans will be based on current capabilities and will evolve with science, risk assessments and new capabilities. Final decisions will be made by responsible officials during an outbreak. There will be outreach and training pre and post outbreak.

For biosecurity, there will be Level 1 and 2 biosecurity for producers and veterinarians to follow. Level 1 is pre-outbreak and recommended for prevention of endemic diseases. Level 2 will be required to move your pigs during an outbreak. Pre-outbreak will be voluntary and will involve certification.

Biosecurity standards are being reassessed after experience with PEDv. There is a traceability component to include the use of Premises Identification Number (PIN). The focus is on where the animal was for the last 28 days and also trace forward for 28 days. Surveillance will be incorporated in the event of an outbreak in order to move animals, and then show proof of virus freedom (for OIE and trading partners). Controlled movement of animals would be utilized vs. stop movement. Decisions need to be made on how to handle the start of an outbreak and then determine how movements will restart as the outbreak becomes under control. Specific requirements for controlled movement are outlined in the draft document. The draft document has been sent to Food Safety and Inspection Service (FSIS). A new working group will be formed next to include FSIS, packers and Animal and Plant Health Inspection Service (APHIS).

Vaccines for FMD outbreak are needed in order to manage the disease. USDA has stated the FMD stocks are not at a sufficient quantity to support the outbreak and provide vaccination in high animal dense areas. A white paper was developed for the industry and delivered to Dr. Paul Sundberg at the National Pork Board for review last week. There are several potential options for securing FMD vaccines if needed. However, none of the options are ideal or approved at this time. Ideally, a combination of approaches would be utilized to secure adequate supplies of vaccine, with necessary funding: immediate availability; short-term availability; and long-term availability. There is the potential for use of novel technologies for vaccine development for FMD – there are four different technologies that could gear up and produce vaccine quickly and safely.

Pork Industry Update on Flu and Fairs

Jennifer Koeman, Director, Producer and Public Health
National Pork Board

Dr. Koeman provided an update on National Pork Board's update on activities surrounding influenza in swine. Influenza is a common disease of swine. Activities for surveillance were initiated prior to 2009. However, the H1N1 pandemic initiated a more aggressive approach for influenza surveillance for swine. Several educational materials were developed for both veterinarians and producers. The passive surveillance plan was undertaken by USDA-APHIS-VS and is an anonymous plan. Objectives include development of diagnostics, awareness of current influenza isolates in circulation and determine vaccination needs. The plan does include a component of coordination and collaboration with Center for Disease Detection (CDD) to encompass human health issues. Results of the influenza surveillance plan are reported by USDA, National Surveillance Unit (NSU), isolates go to National Veterinary Services Laboratory (NVSL) and then can be shared within Genbank to show genetic diversity. Through July 2013, more than 8,300 case submission have been submitted to the plan. The influenza report can be viewed in the National Animal Health Laboratory Network (NAHLN) Quarterly report.

The 2012 diagnosis of influenza associated with swine exhibitors at fairs was of concern. The viruses identified were seen in the swine surveillance plan since 2010. Observation and evaluation of those isolates is ongoing. The response to this outbreak was different than what occurred in 2009. The focus was on biosecurity on-farm, at exhibits and with exhibitors. Messaging was discussed between both human health and animal health organizations and a standardization of language for naming of variant viruses was an outcome of that collaboration. Additional resources included an updated biosecurity document for exhibitors. A working group was convened to assess the experiences from the summer, evaluated the risk factors and then developed additional guidelines for handling exhibitions and influenza. Subsequent documents were developed in 2013 from the National Association of State Public Health Veterinarians (NASPHV) and also from the National Assembly of State Animal Health Officials (NASAHO). Additional evaluation of the swine influenza virus (SIV) surveillance data is ongoing in collaboration with USDA, Agricultural Research Service (ARS). The 2013 fair season showed fewer cases with influenza. Continued work is ongoing to understand what is going on through animal surveillance and also to increase and implement proper biosecurity.

Influenza at Fairs and Exhibitions Study

Dr. Andy Bowman
Ohio State University, College of Veterinary Medicine

Dr. Bowman provided an update on activities at fairs and exhibitions. There is evidence of pigs playing a role in the ecology and epidemiology of influenza A virus infecting humans. Zoonotic transmission of influenza involves direct contact between humans and pigs. Fairs provide a unique

situation for increased chance of influenza infections to spread between humans and pigs. The group wonders if there were pigs in the population that were shedding virus without showing clinical signs and what is the impact for the transfer of virus? Nasal swabs were taken at the end of Ohio fairs and then tested. Sampling occurred in 2009-2011. There were 12 fairs that did have sick pigs and flu infected pigs. Eighteen percent of subclinical pigs were seen for influenza. The summer months of June and July showed the most amount of influenza at fairs. Subclinical influenza A was present in swine at fairs. Visual inspection alone could not predict infection status of swine. Therefore, the quantifiable risk to humans for subclinical pigs with influenza was unknown. Genomic evaluation was performed on isolates identified from the pilot study. Different constellations of virus within fairs and by year were visible. There could be assortment within fairs and that remaining for future fairs. Surveillance was also accomplished during 2012 at 40 different Ohio fairs. At the same time, the H3N2v isolate was identified. Human cases had prolonged exposure/contact with swine. Seven of the 14 fairs that had H3N2v identified were already in the surveillance project. The dendrogram of influenza shows that human and swine isolates are clustered closely together. The dendrogram also showed a very quick dissemination of influenza within shows. Additional steps should be taken to stop bi-directional spread of virus. The fair recommendations that were developed mirrored what is needed to better manage the risk of influenza infections.

For 2013, there were additional fairs samples across the U.S. and targeted 100 fairs. There seems to be 25% of influenza identified for the fairs sampled. Two thousand forty eight samples tested to date included 4,217 pigs; 17.4 % positive by polymerase chain reaction (PCR); 205 isolates have been recovered. (These are all initial results). There is a mixed set of strains that have been identified within pig and within fairs. There is a different assortment going on within the isolates identified at fairs (H3N2 isolates).

Another project is to utilize snout wipes at the entry to fairs. The wipes seem to coordinate well with nasal swabs. This may be an additional tool to use for understanding status of pigs at entry. Evaluating an infrared thermometer, but not as useful to sort out influenza pigs vs. not. Also evaluating the use of air sampling to see level of virus in the air and what risk that might pose. All of this work has been a very collaborative effort to address influenza status for swine.

National Animal Health Laboratory Network (NAHLN) Update (via conference call)

Sarah Tomlinson, NAHLN Coordinator

USDA-APHIS-VS

Presentation provided by teleconference.

Dr. Tomlinson reviewed the purpose of NAHLN, the current activities, what is next and the impact for the swine industry. NAHLN is 10 years old and is a network partnership between USDA – Animal and Plant Health Inspection Service (APHIS), National Institute of Food and Agriculture (NIFA), and American Association of Veterinary Laboratory Diagnosticians (AAVLD). The focus is on early detection, rapid response and showing proof of freedom of disease.

The NAHLN concept paper was developed in 2011 by the NAHLN Coordinating Council that described the restructuring of the NAHLN to increase capacity and flexibility for detecting and responding to emerging and zoonotic diseases. In 2012, the council further developed the paper and it was then published in the Federal Register. The next steps after receiving comments will be to develop responses and incorporate those comments moving forward with Code of Federal Regulations (CFR) writing and development of program standards. A revision of the NAHLN strategic plan will be developed. There is a concerted focus on Quality Management Systems Training (QMST) that started in 2010 and has increased in demand through 2013. This training will continue through 2014. The NAHLN Information Technology (IT) system is converted to Lab Messaging Service (LMS) with the Health Level 7 (HL7) standards. Swine influenza virus (SIV) messaging is now a part of this system. Pseudorabies virus (PRV) will be next. National Veterinary Services Laboratories (NVSL) is now messaging. Next phase is to work with other Veterinary Services (VS) systems. This is also a concurrent effort with State Animal Laboratory Messaging Service (SALMS) (B. Akey – Cornell). Also in development is the NAHLN Portal in conjunction with Kansas State University (KSU) and University of Minnesota (UMN). Modules are under development and will be deployed within the month and through the end of 2013. National surveillance is accomplished by NAHLN for various diseases of swine, both foreign and emerging disease.

NAHLN also participates in preparedness activities for Foreign and Emerging Diseases (FAD's). This includes the Lab Capacity Estimation Model (LCEM) and has an Exercises and Drills Working Group

(EDWG). The group is developing a routine exercise program for NAHLN laboratories available through the NAHLN Portal.

Validation studies are also a key component of NAHLN laboratories. Review inter-laboratory comparison and negative cohort studies (i.e. FMD studies). Collaborating partners include NVSL, Foreign Animal Disease Diagnostic Laboratory (FADDL) and National Center for Foreign Animal and Zoonotic Disease (FAZD) and other collaborators. In evaluation, the negative cohort of an FMD penside antigen assay (Lateral Flow Device). Upcoming studies include an FMD 3 ELISA that will include swine for fall of 2013.

What's next? Communications and policies will be of focus for the future. Issues exist with commercial test kits and use of those kits. International collaboration is needed moving forward as well. The focus on early detection is critical. Need to address the immediate needs with information technology and integrate with other systems both internal to VS and external systems. Focus on ASF as well as FMD testing.

USDA Swine Health Programs Update

LeeAnn Thomas, Director Aquaculture, Swine and Avian Health Center
USDA-APHIS-VS

Dr. Thomas provided an update on swine health activities to date. Covered were basics of PED management and have shown that PED is not a regulatory disease. Plans are still being formulated on how to deal with a non-regulatory disease. Partnering of USDA and industry is critical for moving forward with non-regulatory diseases. USDA will work with FDA on importation of feeds and feedstuffs and how that is evaluated for risk to industry. Agricultural Research Service (ARS) will be funded for PED study to gain further learning.

Pseudorabies virus/Brucella suis (PRV/SB) program – concept paper was published in February of 2013 and comments are being reviewed. The next step is to discuss with stakeholders and develop a future plan. This will potentially incorporate the use of non-regulatory concepts for moving forward. Sample streams were reviewed for surveillance of current PRV. The cull sows and boars line were also surveyed for swine brucellosis. There were no commercial herds identified as PRV positive for FY2013. The intent of looking at surveillance is to see where efficiencies can be gained and still be able to provide necessary disease surveillance information for the industry and international standards for slaughter surveillance. Need to be able to prove that less than 1% of herds are infected (fewer than 1 in 100,000 are infected). Communications are ongoing with states and industry. For FY2014, continue PRV at NAHLN labs and possibly look at SB testing to NAHLN.

Influenza A virus in swine – surveillance is ongoing. Much activity is taking place for management of influenza at fairs and exhibitions. (See previous information from Drs. Koeman and Bowman for specifics of response and subsequent materials and recommendation development.) Funding for surveillance is good through 2014 and will become tight in 2015 as funds are finite.

Classical Swine Fever (CSF) - surveillance in ongoing in various streams. No current samples are positive. Over 9,000 samples tested.

Swine Health Protection Act – garbage feeding is still permitted in 28 states plus Puerto Rico (PR) and the Virgin Islands (VI). These areas are considered high risk and are targeted at a higher rate for diseases. Garbage feeders are inspected for compliance for adherence to recommendations. One hundred sixty non-licensed feeders have been found and it does present potential risk for introduction of unwanted diseases.

Feral Swine Initiative – developing a goal to reduce feral swine population. Potential funding for 2014 could be up to \$20 million, which would go for operations to control or eradicate where possible. There will also be funds for surveillance and modeling. Plans are progressing. One million was provided for a pilot in Mexico and initiated in 2013 by Wildlife Services. WS will work closely with state counterparts for control of feral swine.

Committee Business:

Existing Resolution Review:

1. Seneca Valley Virus (SVV) - #14; Agricultural Research Service (ARS) has had conversation with North Carolina (NC) on obtaining samples to evaluate this disease. Funding sources are limited to be able to address this issue. ARS does not currently have tissues or virus from NC; ARS and NVSL did obtain samples from Hawaii, but samples were too degraded to work with. Samples will be obtained from

NVSL to evaluate this. Testing for real-time PCR is under development for SVV and potentially available for use.

2. CISS 2011 – the resolution was passed and a response was given in 2012. Dr. Snelson read the response from 2012 and is available through USAHA archives. A suggestion was made to update the dates and language for the resolution and resubmit for consideration. The Committee wants to make sure that the issue of CISS continues for development and implementation. ***Final Committee decision is to ask for an update at NIAA for 2014.*** Motion was made and seconded. Passed by majority voice vote.

New Resolutions:

1. **Information Sharing for Herd Health:** There is a mechanism available to allow producers to access premises identification and be able to have that information. Motion was made to accept the resolution as written and seconded. Passed by majority voice vote.
2. **Emerging Disease Response Infrastructure and Planning:** Motion made to accept the resolution as written and seconded. This also supplements the Swine Futures Project from the 1990's for disease surveillance and response. Passed by a majority voice vote.
3. **Risk Analysis:** Motion made to accept the resolution and seconded. A friendly amendment was accepted. The motion passed by a majority voice vote.