



PED Research and Control Measures

SECD International Meeting

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National Pork Board Focus

- When PED was first identified in the United States, very limited information was available.
- Research on PEDV and resources for U.S. producers was urgently needed.
- Steps beyond research:
 - Development and communication of producer information/resources
 - Deliver that information out to all stakeholder audiences

Development of Research Priorities

- Swine Health Committee – producers, veterinarians, advisors (university, government, industry)
- PED Strategic Task Force
- American Association of Swine Veterinarians and National Pork Producers Council membership
- State Pork Associations

PEDV Research Efforts

- Since June of 2013, the National Pork Board:
 - Approved **\$>3 million** for use for PEDV/PDCoV research
 - Funded more than 35 research projects
- Majority of projects completed within 6-month timeframe

PEDV Research Priorities 2013

Initial Research Priorities 2013:

- Initial focus:
 - Pathogenesis, virology and transmission of PEDV
 - Development of diagnostic tests and growth methods for PEDV
 - Survivability in feed, water, manure, slurry and in trailers
- Secondary focus: (sow immunity)
 - Duration of immunity
 - Optimizing exposure protocols
 - Diagnostic tests to assess sow and piglet immunity to PEDV

PEDV/PDCoV Research 2014

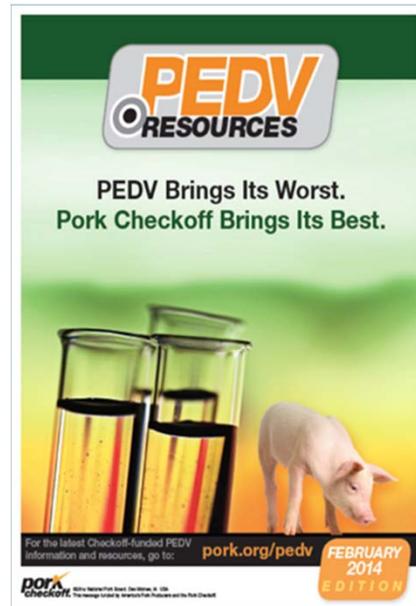
- **Feed & Feed Systems Focus:**
 - Feed consortium to develop research priorities
 - Risk assessment for feed/systems as transmission source
 - Intervention methods for feed (pelleting/additives)
 - Post-processing time on virus

- **Animal Focus:**
 - Diagnostic test updates
 - Viral growth alternatives
 - PDCoV testing and pathogenicity studies
 - Novel bioassay models

Communication of Research Results

(All research information is posted at www.pork.org/PEDV)

- Provide producers with “real-time” results
- Created a PEDV-specific site for all information
- Research updates available bi-weekly until project completion



Producer Biosecurity Focus

- From initial research, we know PEDV spreads fecal/orally and:
 - **Easily survives in the environment** (trailers, manure, slurry, dry and slurried feeds, water, etc.)
 - **Requires very little amounts of virus** to infect a herd
 - PEDV survives in cold conditions
- Biosecurity needs:
 - To focus on limiting virus exposure
 - To create **barriers** between farm/pigs and potentially contaminated areas/equipment

General Sanitation is Important!



PED Transportation Guidelines

Swine Health Producer Guide

Feed Delivery Biosecurity for Control of PEDV

The recent introduction of the Porcine Epidemic Diarrhea (PED) Virus into the United States presents a new challenge for the industry. PED virus transfers via feces and survives in manure for extended periods of time. Contamination of trucks, equipment, and clothing with PED virus can create tremendous financial losses to the producer. It is important that everyone do their part to prevent spread of this disease.

- Transport drivers arrive at work wearing clean clothes and footwear which hasn't been worn around livestock.
- Carry cover-ups (clean, disinfected rubber boots or disposable boots) in a clean container in the truck cab. As exiting the truck, put on the cover-ups.
- Stay as close to the truck as possible to minimize the areas you access.
- To keep you on your side of the Line of Separation between you or your equipment and the production facilities. Whenever possible, communicate with the farm staff and ask them to open and close the bin lids.
- Remove cover-ups by climbing back into truck and contain and dispose of garbage in a separate container.
- Apply a clean cover-up.
- Apply a clean cover-up.

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Transportation Biosecurity Protocols for PEDV Control

Key Point

Infection with Porcine Epidemic Diarrhea (PED) virus can create tremendous financial losses to a pork producer. PED virus transfers via feces and survives in manure for extended periods of time. Any object is contaminated with pig manure can be a source of infection for pigs. Live haul is an essential part of the industry and plays a key role in the control of disease. Live haul drivers should be educated about the PED virus in the pork industry.

Ensure you are Prepared for Swine Transportation

- The market truck should be prepared for hauling market hogs.
 - The cab of the truck, including floor-boards, pedals, steering wheel, gear shift handle, door handles, etc, should be cleaned and disinfected between loads.
 - The trailer should be
 - Washed clean and free of any visible manure or shavings,
 - Disinfected with an appropriate disinfectant, at the correct rate, for the proper contact time, and applied so that all surfaces are covered, and
 - Allowed to dry completely (Thermal assisted drying truck bakers speed this process greatly).
 - All equipment, including sort-boards, rattle-paddles, electric prods, etc. need to be thoroughly cleaned, disinfected, and dried.
 - Clean boots, coveralls, gloves, knee pads, etc. should be used for each load and stored in a designated clean area. A separate area for storage should be used for these articles after they are used and until they can be cleaned and disinfected for future use.
- The Production Site should be ready for animal movement
 - All load out equipment should be clean and in good working order
 - The load out area and chute should be ready to market pigs
 - Communicate where the production facilities, if from trucks, trailers or production facility.
 - An effective of the trailer the chute
 - Be sure if the place if the
 - There should be available
- Communication and Education
 - Live haul drivers should be educated about the PED virus in the pork industry.

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Biosecure Truck Wash Protocols for PED Control: Recommendations for Truck Wash Facilities

Key Point

Infection with Porcine Epidemic Diarrhea (PED) virus can create tremendous financial losses to a pork producer. PED virus transfers via feces and survives in manure for extended periods of time. Any object that is contaminated with pig manure can be a source of infection for pigs. Truck wash facilities are an essential part of the pork industry and plays a key role in the control of disease. All truck wash personnel should be educated about the risks PED virus is to the pork industry.

Basic Guidelines for Sanitation, Disinfection, Drying and Downtime

- Proper cleaning prior to disinfection is a critical step for preventing disease spread. The truck and trailer must be thoroughly cleaned, washed, disinfected and completely dry.
- This involves 5 steps
 - Removal of all manure and bedding
 - Soaking with soap and/or degreaser
 - Pressure washing with hot water
 - Disinfecting by foaming with an appropriate disinfectant
 - Drying
- The trailer and all equipment must be free of visible manure, shavings or dirt prior to disinfection.
- The use of wash soap or degreasers can decrease cleaning time versus just using water alone.
- Disinfectants should be used on trucks and trailers only **after** they have been cleaned because manure and dirt will inactivate and reduce the effectiveness of most disinfectants.
- Check on the disinfectant's label to ensure it mixes safely with any cleaning product or wash soap that is being used.
- Follow label directions when using disinfectants to ensure the disinfectant is being used at the proper concentration and temperature.
- Follow label directions for adequate contact time to ensure effectiveness.

Drying helps inactivate pathogens that cause disease and maximizes the benefit of disinfectants.

- Heat delivered to a trailer for the appropriate temperature and time can assist in disinfection.
- If heat isn't available, fans or enough drive time to allow complete drying will help.

All manure and shavings for bedding cleaned from a trailer may contain pathogens that could cause disease.

- Dispose of these in a way that will prevent their spread to other trailers or locations.

Be aware of the source of water used for cleaning.

- Recycled wash water may still contain pathogens that could cause disease so disinfecting and adequate drying are especially important.

Pork producers will expect clean trailers are free of PED and other diseases. On the other side of this document are key elements of a biosecure cleaning process.

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PEDV Manure Hauling Guidelines

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Biosecure Manure Pumping Protocols for PED Control: Recommendations for Pork Producers

Key Points

The recent introduction of the Porcine Epidemic Diarrhea Virus (PED) into the United States presents a new challenge for manure pumping. Infection with PED can create tremendous financial losses to a producer. PED virus transfers via feces and survives in manure for extended periods of time. Any object that becomes contaminated with pig manure can be a source of infection for pigs.

COMMUNICATE with the Manure Hauler:

- When scheduling with the manure hauler:
 - Find out when the manure hauling crew has been coming to the farm and require to be notified when they arrive.
 - Ask where the manure hauling crew will be prior to coming to your site.
 - Ask what biosecurity procedures the manure hauling crew uses between customers to understand disease risks to your herd.
 - Share contact information between the manure hauling crew and farm personnel.
- Discuss your biosecurity expectations for the manure hauling crew.
 - Plan entrance and exit to the site with minimal cross-over with the path for the manure hauling crew and the rest of farm traffic or areas used by farm staff.
 - Explain the routes that will be used to transport manure to fields.
 - Discuss how any manure spills are to be handled.

Explain with the set-up:

- This manure hauler
- Do not

Info

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Biosecure Manure Pumping Protocols for PED Control: Recommendations for Commercial Manure Haulers

Key Points

The recent introduction of the Porcine Epidemic Diarrhea Virus (PED) into the United States presents a new challenge for manure pumping. Infection with PED can create tremendous financial losses to a producer. PED virus transfers via feces and survives in manure for extended periods of time. Any object that becomes contaminated with pig manure can be a source of infection for pigs.

Prior to the time of going to a site to pump COMMUNICATE with the producer:

- Contact the producer to discuss the upcoming pumping season and the biosecurity plan.
- Communicate on when you will be going to the farm.
- Share the contact information between the manure pumping crew and farm personnel.
- Be prepared to share the history of sites where the pumping crew has been.
- Plan entrance and exit to the site with minimal cross-over with other farm traffic or areas used by farm personnel. Ask the routes that will be used to transport manure to fields.
- Ask where the "Line of Separation" is between the set-up, hauling equipment and farm site. This defines the area that is to be used by the manure haulers and the area to be used by daily farm traffic and personnel. *Don't cross over the line.*
- Discuss how any manure spills will be handled.
- Inform all your employees of the biosecurity requirements discussed with the producer.

At the time of pumping with the producer:

- Manure haulers and areas or walk over should never come in contact with the producer's pigs.
- Avoid any direct contact with the producer's pigs.
- Use always clean boots and clothing.
- If personnel must enter the site, separation the manure hauling equipment from the producer's pigs.
 - Cover-up (gloves).
 - Dispose of manure.
 - Clean and disinfect the manure hauling equipment at the next site.

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Biosecure Manure Pumping Protocols for PED Control: Recommendations for Land Owners

Key Points

The recent introduction of the Porcine Epidemic Diarrhea Virus (PED) into the United States presents a new challenge for manure pumping. Infection with PED can create tremendous financial losses to a producer. PED virus transfers via feces and survives in manure for extended periods of time. Any object that becomes contaminated with pig manure can be a source of infection for pigs.

Producers and Manure Haulers face some challenges in order to control the risks of spreading PED virus when pumping:

- The steps necessary to prevent PED from being moved from farm to farm during manure pumping and hauling take planning and may impact the timing of getting your fields applied.
- Increased time between sites may be required for washing and cleaning of equipment.
- Previously known positive sites for PED virus are strongly suggested to be last in the sequence of sites for a producer or system.
- Communicate and find out when the manure haulers will be going to pump manure and ask when you can expect your fields to have manure application.

At the time of pumping and spreading manure:

- Farm land personnel and your farm equipment need to avoid any direct contact with manure, manure hauling personnel or the manure hauling equipment because disease can be spread to other farms through accidental transfer from manure contamination of people or your vehicles and equipment.

PED virus infection at the sow farm can create near 100% mortality of piglets. Cleaning, disinfecting and drying all equipment is mandatory if moving to a sow site.

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Producer Biosecurity Focus

Developing a barrier to disease entry

- **Line of Separation:** *is defined as the line between the area that is to be used by the non-farm personnel and the area to be used by farm personnel*

Identify the “Line of Separation”

No cross traffic at this point !



Examples of the Line of Separation



Cover Up: Use of disposable boots & coveralls



Cover up for entry into a trailer...



Clean up: To remove any contaminated manure, etc.



Other PED Resources

- Recommendations available for:
 - Exhibit Organizer Biosecurity
 - Exhibitor Biosecurity
 - Positive in Breeding Herd
 - Positive in Nursery/Grow-Finish
 - Line of Separation
 - Create Clean Crossing
 - Additional resources...



Additional Research

- Diagnostic test development ongoing to:
 - Detect the virus: exposure vs. immunity
 - Determine level of protective immunity needed
 - Identify changes in virus genome
- Sow immunity:
 - Can be developed by exposure
 - After natural infection, immunity appears to be at least 4 months (tests ongoing)
 - Commercial vaccines available

Additional Research

- Focus on feed systems for control:
 - Sanitation is critical for reduced spread
 - Risk assessment ongoing
 - Evaluating interventions for feedstuffs
- Research is ongoing for 2014-2015

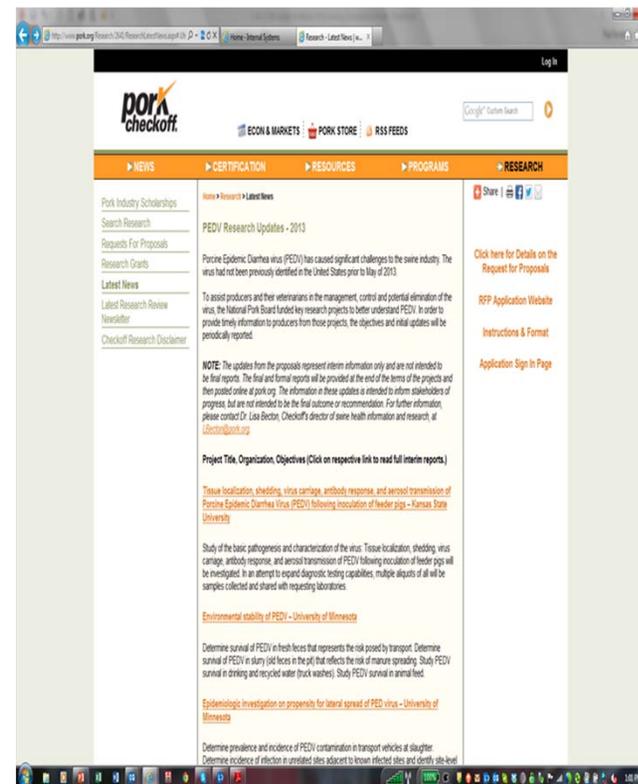
Summary

- Research has provided a good foundation for knowledge of PED
- Conversion of knowledge to practical biosecurity protocols and support of control measures is ongoing.

Summary

All of the National Pork Board PEDV-related research and resources are available online at:

www.pork.org/PEDV





Thank you!

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