



IFEEDER Funded PEDV Research Update

Following the May 2013 outbreak of porcine epidemic diarrhea virus (PEDV) in the U.S., the Institute for Feed & Education Research partnered with the National Pork Board, state pork associations and Cargill to fund research in regards to the virology, pathology and modes of transmission of the virus. Very little was known about PEDV, as it had not previously been identified in the U.S; however, since the first case nearly four years ago, almost every pork-producing state has felt the effect of the virus. That is why funding the project was critical.

Research Priorities

To date, more than \$3.5 million has been used to help manage the disease, which includes \$100,000 from IFEEDER. In 2013, 2014 and 2015, the research priorities touched different

areas, all of which identified gaps in knowledge that could rapidly be translated into action to manage and control PEDV.

In 2013, research priorities included the basic understanding and characterization of the virus, developing a standardized set of tissues and reagents for further use, diagnostic test development and basics of disease survivability and transmission. A targeted focus in fall 2013 looked more in-depth at development and duration of immunity, optimizing feedback protocols and diagnostic test development to assess sow and piglet immunity.

2013	2014	2015
~\$1 million for research	~\$2 million for research	~\$150,000 for research
Funded 14 projects	Funded 30 projects	Funded 2 projects
Basics of disease	Feed focus	Vaccine platform
Sow immunity (initial work)	Animal focus	Chemical mitigants for feed
Foundation for biosecurity	Biosecurity validation	
	Disease monitoring	

The following year, research zoned in on key areas of feed focus, animal-based focus and validation of biosecurity. For feed issues, priorities included:

- Performing a risk assessment for feed as a transmission source;
- Researching intervention methods (pelleting/additives); and
- Understanding post-processing time on virus survivability and development of novel bioassay models.

For animal-based research, priorities included a continued focus on the development of protective immunity, performing the pathogenicity model for Porcine Deltacoronavirus and subsequent development of tests. Biosecurity validation, the final area of focus in 2014, included the evaluation of manure management practices and spread, as well as the impact of lime as a chemical mitigant in pits, compost and soil.

In 2015, research efforts were based on the results from the development, duration and optimization of sow immunity. Additional projects focused on the use of medium chain fatty acids as an intervention and understanding its mode of action. The evaluation of novel vaccine administration technologies was also initiated in 2015.

Research Findings and Implementation

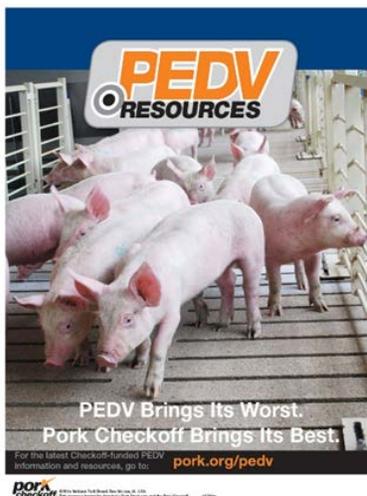
Virus Survivability: Through IFEEDER-funded research, it was determined that PEDV can survive in numerous conditions (pits; feed slurry; manure; water-fresh and recycled; and feed ingredients) including cold weather conditions, especially when the temperatures plummet below freezing. The survivability of the virus in pits is time dependent.

Transportation Management: The research also determined packing plants present a high risk for the spread of PEDV at grow-finish and sow farms. However, certain procedures for trucks can kill the virus:

- Increasing the temperature to 160°F for 10 minutes kills PEDV;
- Cleaning, disinfecting (according to label) and heat can kill PEDV and other pathogens; and
- Removing raw manure can minimize the risk of spread.

Feed Management: Findings determined it takes only a very small amount of the virus to infect pigs. Certain products can help to eliminate viruses in animal feed: organic acids, essential oils, other additives and formaldehyde. While the pelleting temperature can be effective for point-in-time virus control, the feed can easily be contaminated post-processing. It is important to maintain appropriate temps consistently--avoid pellet plugs or start up to assume the virus has been killed.

It was learned, sequencing batches of feed can aid in mitigation of risk. Also, feed mill dust may be contaminated with PEDV. The key is to reduce mechanisms by which products and ingredients can become contaminated. To do this, it was discovered that limiting external contamination; covering receiving grain pits; avoiding sweeping spills or dust from the mill back into processed feeds; and sequencing batches of feed can reduce levels of PEDV and reduce potential risk.



Feed truck sanitation is an important factor. Sanitation interventions for live-haul pigs can work for feed trucks to reduce contamination. Also, keep the cab areas of tractors clean to minimize contamination.

Moving Forward

Once the three-year research project was complete, the [Pork Board's PEDV Biosecurity Booklet](#) was revised in 2016 to include the most recent research information with actionable steps for producers for the management and control of PEDV. Additionally, Kansas State University is conducting a comprehensive review of completed PEDV research. The target date for release is June 2017 during World Pork Expo.

AFIA continues to work with both the Pork Board and the Swine Information Center to further refine future research in the areas of feed and foreign animal diseases.

For more information, contact [Richard Sellers](#), AFIA senior vice president of public policy and education, at (703) 558-3569.

Coming Soon...

IFEEDER has selected its next project! The foundation will fund an economic analysis and animal food consumption report for the animal food industry. These two projects, rolled into one, will provide American Feed Industry Association members and staff with additional tools for legislative and regulatory efforts. The economic analysis will include economic impact data for the animal food industry such as jobs, wages, taxes and other economic growth indicators.

The animal food consumption report will provide AFIA with insight into how much animal food is consumed in the U.S., what species consume the food, where that food is consumed and what macro ingredients are used in the creation of that animal food. All of this information will be invaluable as AFIA members and staff work to create a more positive legislative environment for the benefit of AFIA members.