

PEDV Research Updates 2013

Porcine Epidemic Diarrhea virus (PEDV) has caused significant challenges to the swine industry. The virus had not been previously identified in the United States prior to April of 2013. To assist producers and their veterinarians in the management, control and potential elimination of the virus, the National Pork Board funded key research projects to better understand PEDV. In order to provide timely information to producers from those projects, the objectives and initial updates will be periodically reported.

NOTE: The updates from the proposal represent interim information only and are not intended to be a final report. The final and formal reports will be provided at the end of the terms of the projects and then posted online at pork.org. The update information is intended to inform stakeholders of progress but are not intended to be the final outcome. For further information, please contact Dr. Lisa Becton at lbecton@pork.org.

#13-226: Iowa State University

Oral fluid testing for cost-effective and efficient surveillance and control of porcine epidemic diarrhea virus in swine population

Objectives:

1. Determine if oral fluids can be sample matrix to detect PEDv and/or virus-specific antibody.
2. Evaluate the performance of PEDv diagnostics on oral fluid samples.
3. Assess the utility of oral fluid sampling and testing for PEDv monitoring on farm.

Update: 11-17-13

No new report as sampling is still on-going.

Update: 11-13-13

No new report this week. Sample collection is ongoing.

Update: 10-28-13

To evaluate oral fluid samples for PEDV monitoring in the field, paired samples (feces/fecal swabs and oral fluids) are being collected from cooperating commercial production systems through collaborating swine practitioners. No results/data summary is available at this time.

Update: 10-16-13

Sample evaluation is ongoing and additional results will be reported the week of October 21st as new information becomes available.

Update: 10-3-13

An animal challenge study was conducted to characterize the basic pathogenesis, virus shedding and immune response. Pigs at 4 weeks of age were inoculated orally with a cell-culture derived PED virus isolate at 10^3 PFU/ml. Fecal swabs (individual animals), oral fluids (pen-based) and sera were collected periodically while observing clinical responses and lesions for 70 days post inoculation (dpi). The following is the summary of observations or laboratory test results available at this time:

1. Clinically the inoculated pigs started diarrhea on 2-3 dpi which continued for 7-8 days. After 10 dpi, diarrhea was no longer observed.
2. Fecal shedding of PEDV from inoculated pigs was evident on 1 dpi as determined by a real-time PCR. By 2 dpi, 100% of the inoculated pigs shed the virus. No viral shedding was observed after 35 dpi.
3. PEDV RNA was detected in all of oral fluids collected from pens housing inoculated pigs on 1 dpi through 28 dpi. Testing is in progress.

The study observations to date show a good correlation in PEDV detection between oral fluids and fecal swabs under experimental conditions, suggesting that oral fluid sampling can be a good tool for monitoring PEDV circulation on farm. In addition, relatively long fecal shedding of PEDV from nonclinical pigs (i.e., no diarrhea) after infection should be taken into consideration for prevention and control plan including biosecurity.

Update: 9-21-13

Fecal and oral fluid samples are being collected and testing is ongoing. Additional information will be reported in October.

Update: 9-2-13

Oral fluid testing for cost-effective and efficient surveillance and control of PEDV in swine population

Update: 9-2-13:

- There are no new updates for this project since 8-21-13. Objectives are still in process to develop an effective test for oral fluids for PED. This project will determine if oral fluids can be used as a dependable diagnostic tool.
- As of now, a PEDV challenge study in post-weaned pigs is underway.
- Fecal swabs and oral-fluid samples are being collected to see if a correlation between the two exists.

Quick Take

PEDV strains need to be able to be identified quickly by oral fluids to assist in on-farm surveillance for the disease.

Update: 8-21-13

1. A PEDV challenge study in post-weaning pigs (n=96) started with a virus isolate. At the time of this update (8/19/2013), it is 35 days post inoculation.
2. Individual fecal swabs and pen-based oral fluid samples (2 control and 4 infected pens) have been and are being collected periodically.
3. PCR testing on these paired samples will be conducted on these samples after 35 dpi to assess fecal virus shedding and a correlation in virus detection between OF and fecal samples.
4. The animals will be held until 77 dpi with periodical sampling.