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SDEC Partners Research Update

Evaluation of the dynamics of PEDv infection in terms of shedding and seroconversion of weaned pigs under field conditions

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Background

- Porcine epidemic diarrhea virus (PEDv) continues to challenge the US swine industry.
- Since PEDv was introduced in 2013, extensive collaboration and research efforts have been made to further understand PEDv epidemiology to help control and eliminate the virus from infected swine herds.
- While studies suggest shedding duration in breeding herds is prolonged due to continuous introduction of newborn piglets, facilitating viral dissemination, further research is needed for weaned pigs.

Objective

Evaluate the dynamics of PEDv infection in terms of duration of shedding and seroconversion in weaned pigs under field conditions.

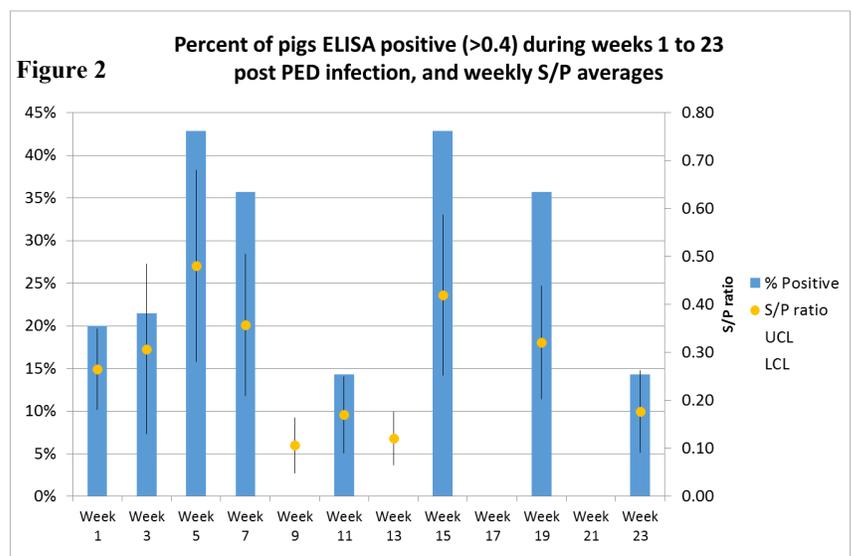
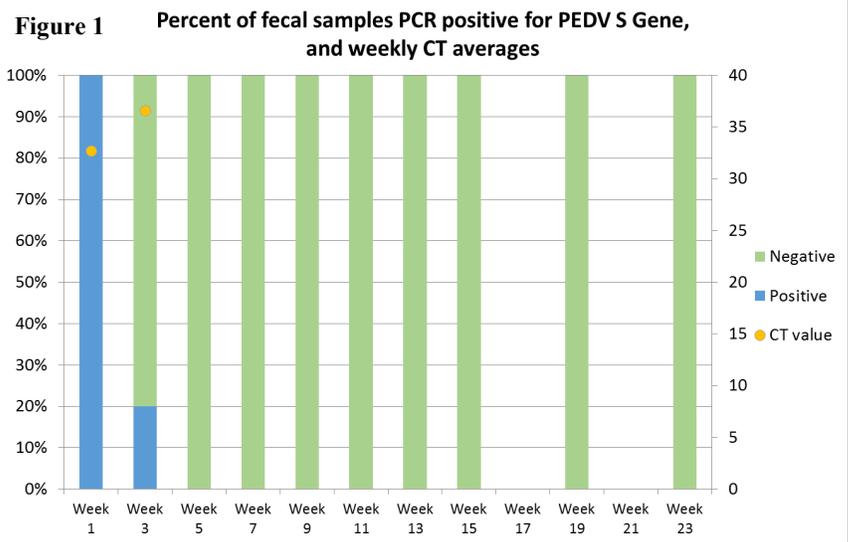
Methods

- An all-in/all-out wean-to-finish site that received pigs from an acutely infected farm with PEDv was selected.
- A group of pigs was selected and tested every two weeks for virus and antibodies detection.
- Sentinel pigs were added to assess transmission.
- Pit manure assessed throughout the study.



Results

- S gene PCR on feces from infected pigs confirmed PEDv shedding week 1 and decreasing in week 3, with 15 of 15 and 1 of 5 samples testing positive, respectively. All consecutive fecal tests were negative (n=62) for the remainder of the study. See figure 1.
- Oral fluid PCR testing was positive (Ct<35) for 5 weeks after weaning. At week 7 there were two suspects, and at weeks 9 and 11 there was still 1 suspect. Rest of the tests were negative (n=12).
- ELISA tests confirmed PEDv seropositives week 1. The majority of positive tests were observed in weeks 5 and 15 with a significant reduction in weeks 9 and 13. See figure 2.
- IFA blood testing indicated seroconversion starting at week 3 postweaning with titers remaining elevated at >1:40 (range 40-320) for the entire observation period.
- Sentinel pigs introduced at the end of the finishing period (wk 28) remained negative, although fecal material from the pits tested PCR positive at that time (Ct 33.58) and throughout the study.



Conclusions

- Shedding in weaned pigs appeared short lived, it was detected for 3 weeks post weaning and resolved by 6 weeks as measured by PCR in oral fluids. Sentinel pigs added at the end of the study confirmed lack of PEDV transmission at that time.
- Results on IFA and ELISA did not fully agree. Although both tests detected positive animals, the patterns of seroconversion were different. IFA seroconversion was sustained throughout the study while ELISA results detected scattered seroconversion and two peaks of positives at 5-7 weeks and 15 weeks.

Implications

- PEDv infections in closed growing pig populations can be self limiting.
- Further research is necessary to develop tests that measure effective antibody response.
- Positive PCR results from fecal material in pits does not imply transmission to susceptible pigs.
- Continuous research is necessary to further evaluate what factors influence PEDv shedding.