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Summary of findings from a pilot study on vaccination of mature boars with porcine circovirus type 2 vaccine

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Introduction

Porcine Circovirus Associated Disease (PCVAD) caused by Porcine Circovirus type 2 (PCV2) has become a significant problem in some swine herds in the United States in the past few years. While almost all herds are positive for PCV2, not all herds infected with PCV2 develop PCVAD. A variety of co-factors appear to be involved in the development of the disease, including, but not limited to: immune stimulation, stress, vaccine adjuvents, physical stress (crowding, improper ventilation, etc.), co-infections[1,2] and PCV2 strain[3].

Work reported in 2006 indicated that boars naturally infected with PCV2 demonstrated a sporadic and long-term pattern of shedding PCV2 DNA in semen, although sperm quality did not appear to be affected[4] .Given the limited knowledge of the possibility of transmission of PCV2 via semen (given the known infectivity of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) found in semen)[5] and the recent availability of PCV2 vaccines, we undertook a project to:

- Evaluate shedding of PCV2 in semen from vaccinated and non-vaccinated boars as a potential risk for introduction of novel strains of PCV2 into sow herds.
- Evaluate viremia and duration of viremia in non-vaccinated and vaccinated boars entering a stud.
- Compare results of serum PCR, fecal PCR and semen PCR for detection of PCV2.
- Evaluate fecal PCR as a monitor/indicator of viremia and viral shedding.

Materials and methods

A boar stud in Western Illinois was selected as the project site. The herd is PRRS negative and serum samples are collected from boars at the same time semen is collected. The serum is pooled into groups of 5 and run on a multiplex PCR for detection of North American and European Strains of PRRSV.

The farm has an isolation building with 40 boar crates located approximately 200 feet from the main stud. The isolation building is fully slatted, curtain sided and naturally ventilated. The facility has 40 boar crates in two rows of twenty crates each facing each other.

Boars enter the isolation facility and are tested by PRRS PCR and PRRS ELISA at entry into the stud and tested again via PRRS ELISA and PRRS PCR 30 days after arrival, prior to being allowed to enter the stud.

Commercial boars from 2 sources entered the isolation of the boar stud at an average age of 174 days (range 161-190 days). Fifteen boars we received from herd H and boars arrived from source herd M. Genetic line and source herd were completely confounded.

Boars were blocked by line and randomly allocated to a vaccinate or non-vaccinate group within. Boars in the vaccinate group were vaccinated with a single dose of PCV2 vaccine (Suvaxyn PCV2, Ft. Dodge Animal Health) 14 days after arrival at the isolation. Vaccine was administered per label directions. Boars received other routine vaccinations per the stud protocol.

Blood samples were collected bi-weekly and evaluated by ELISA and PCR. Fecal samples were also collected bi-weekly and tested by PCR. Semen was collected after the boars were entered into the stud. Samples from the ejaculate were collected and tested by PCR.

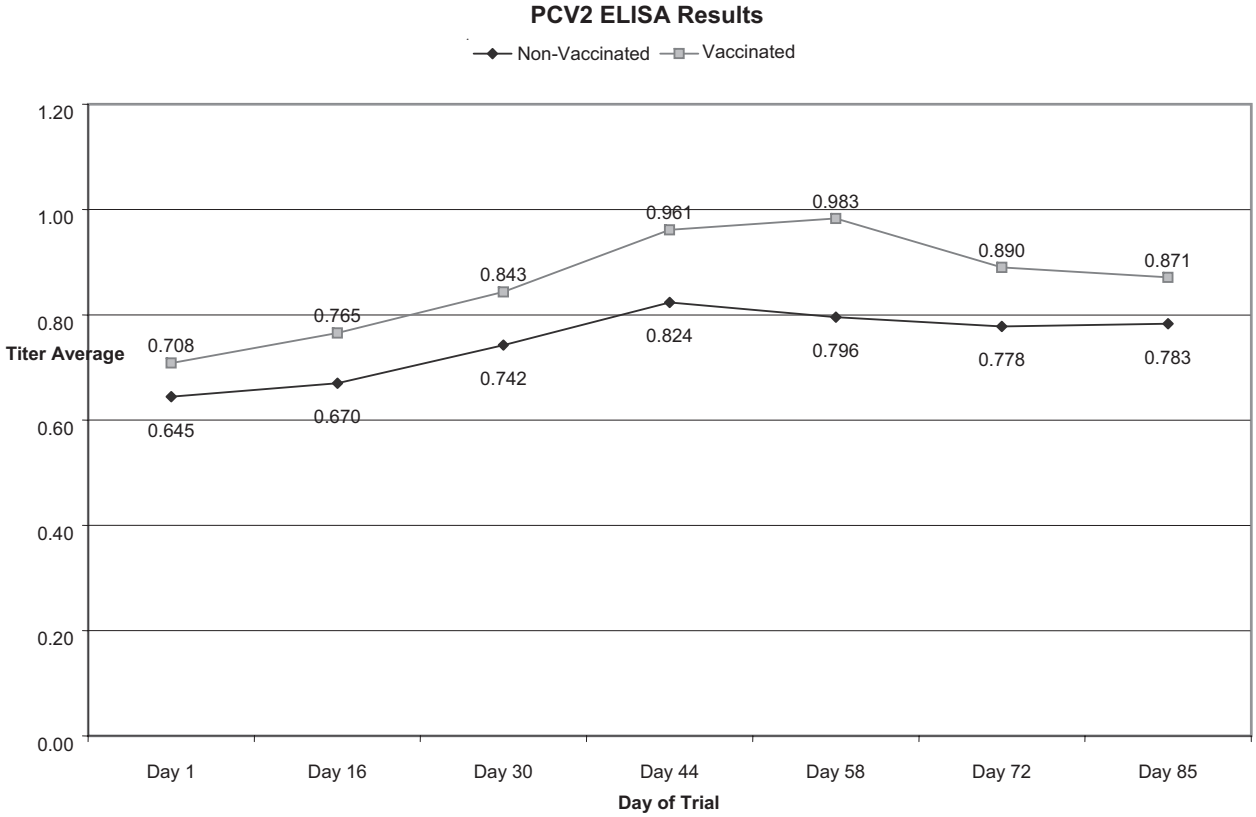
Results

PCV2 ELISA

All boars were seropositive for PCV2 antibodies by ELISA upon arrival. Boars remained seropositive throughout the trial. **Figure 1** shows the average S/P ratio of the vaccinated and unvaccinated groups. Although the vaccinated groups were randomly allocated, The vaccinated group had a higher mean ELISA S/P ratio throughout the trial. A multivariate analysis of variance (MANOVA) was performed which indicated that there was a statistically significant difference in average S/P ratio between the two groups at the outset of the trial. Given the significant MANOVA result, a two tailed T-test was performed comparing the vaccinated and unvaccinated groups at each sampling point. Vaccinated and unaccented groups were found to be statistically different by t-test at each time point.

Average S/P ratios for vaccinated boars increased from day 0 and peaked at day 56 of the study. Average S/P ratio for unvaccinated boars increased from day 0 and peaked on day 42 of the trial.

Figure 1: Average PCV2 S/P ratios



A MANOVA was performed using source herd as the variable of interest and there was found to be no difference between the average S/P ratios of the two source herds.

Serum PCR, fecal PCR, semen PCR, and viral sequencing

Results for Serum PCR, Fecal PCR, Semen PCR and Viral Sequencing will be addressed in the presentation.

Acknowledgements

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