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SDEC Partners Research Update

Project Update: Examination of Colostral PCV2 Neutralizing Antibody Levels and Viremia in Sows

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Funded by Boehringer Ingelheim Vetmedica, Inc.

Background

- Nearly all pigs in the US are vaccinated against PCV2 around weaning to prevent PCVAD.
- PCV2-specific antibodies and PCV2 virus are often observed in the same animal, even though vaccination prevents disease.
- PCV2 capsid-specific ELISA antibody levels may not be indicative of a protective immune response. Vaccination does not always induce ELISA detectable antibodies, but vaccination protects against PCVAD.
- Anti-PCV2 neutralizing antibodies may be a more effective indicator of a protective immune response against PCV2.

Objective

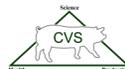
To determine if neutralizing antibody titers are an indicator of a protective immune response against PCV2 infection.

Results

- Placental umbilical cord (PUC) blood collected at birth during routine pig screening was PCR-positive for PCV2 in <5% of samples on most farms. However, >50% of samples were positive on two farms (Table 1). No significant health differences between farms were noted.
- Anti-capsid antibodies levels (ELISA) varied within and between farms independently of PCV2 status (Table 1).
- Neutralizing antibody titers in colostrum were extremely high ($\geq 1/25,000$ average on all farms). Higher levels were observed in farms with no PCV2 positive animals (Table 1).



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Conclusions

- ⇒ PCV2 capsid antibody titers do not correlate with viral titers.
- ⇒ High neutralizing antibody titers in colostrum were observed in all animals.
- ⇒ Higher PCV2 neutralizing antibody levels correlate with lower viral titers.

FARM	Virus positive PUC samples (%)	Avg ELISA S/P ratio (PUC)	Avg 50% Neutralizing Antibody titer (1/X) (colostrum)
1	0/111 (0%)	0.50	117,000
2	0/100 (0%)	0.73	41,000
3	33/52 (63%)	0.57	25,000
4	44/87 (51%)	0.74	28,000

Table 1. PCV2 viral and antibody levels in 4 commercial sow farms.

Note: There was a significant difference in neutralizing titers observed between the PCV2 negative farms (Farms 1 and 2) and farms 3 and 4, which had a high % of virus positive animals ($p < 0.0001$).

Final summary

The negative correlation between neutralizing antibodies and viral titers suggests that neutralizing antibodies help in controlling PCV2 infection. PCV2 capsid-specific antibodies (ELISA) are not a good indicator of a protective immune response. Even though farms may have a high percent of PCV2-positive animals, neutralizing antibodies are present at high levels that may help prevent infection in piglets.