

Profile and agreement of dam and piglet PCV2 IFA titers

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Introduction

Porcine circovirus associated disease (PCVAD) is caused by porcine circovirus type 2 (PCV2). Following natural exposure to or immunization against PCV2, Most sows and gilts develop antibodies that become passively acquired by their nursing offspring. The objective of this evaluation was to illustrate the immunological status of a sow herd, and to assess the correlation of dam and offspring IFA antibody titers.

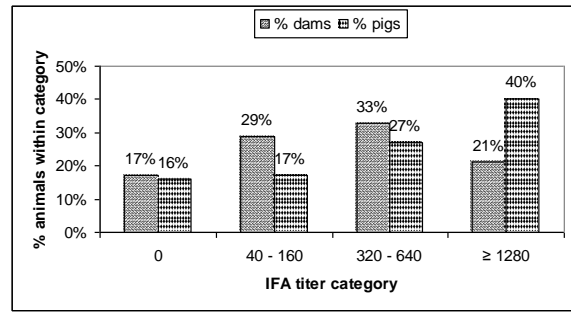
Materials and Methods

A 4,200 sow, PRRS-negative farm was selected for this evaluation. This herd had a young parity structure with no dams older than parity 3. Typical of commercial production, dams had been PCV2-vaccinated as weanling gilts but never booster vaccinated. Two hundred and five gestating dams (sows and gilts) were blood sampled 2 weeks prior to scheduled farrowing. Sera were tested by immunofluorescent antibody (IFA) assay at Kansas State University. Based upon these results, dams were assigned to either low titer (≤ 160) or high titer (≥ 1280) groups. Dams with intermediate titers (320-640), and their associated litters, were excluded from the evaluation. Piglets were ear tagged within 24 hours of birth and the existing cross-fostering practices of the farm were allowed with the following restrictions: pigs could only be cross-fostered after 24 hours of age, and only to a dam of like-titer status (i.e. high-titer dam to high-titer dam or low-titer dam to low-titer dam). All pigs were individually blood sampled for PCV2 IFA antibody measurement and classification as low ($\leq 1:320$) or high ($\geq 1:640$) titer at approximately 3 weeks of age based upon previously reported experiments.^{1,2} A contingency table was constructed and dam titer-pig titer percent agreement and Kappa statistic were calculated.

Results

The titer distributions of all dams are illustrated in Figure 1, while pig titers from only the designated low and high titer dam categories are represented. Dam and pig titers by designated low/high categories appear in Table 1. Percent agreement of low dam-low pig and high dam-high pig titers [(305 + 349)/921] was 71% with a Kappa³ of 0.42 (SE 0.03).

Figure 1. Distribution of dam* and pig** PCV2 IFA titers.



*All dams, n=205. **Pigs from designated low and high dam litters only, n=921.

Table 1. Contingency analysis between low and high dam and pig PCV2 IFA titers.

Dam titer	Pig titer	
	Low ($\leq 1:320$)	High ($\geq 1:640$)
Low (≤ 160 ; n=94)	66% (n=305)	34% (n=159)
High (≥ 1280 ; n=44)	24% (n=108)	76% (n=349)

Discussion

There was moderate strength of agreement³ between low dam – low pig and high dam – high pig titers. Low titer pigs from high titer dams may be explained by insufficient passive transfer of maternal antibodies. High titer pigs from low titer dams are more difficult to explain. A likely contributing factor is the designated pig IFA titer limits being only a single dilution apart (320:640) and the inherent subjectivity of reading IFA results. It may also be possible that some of the piglet antibody measured was of active (pig) rather than passive (dam) origin. Another explanation could be a higher antibody concentration in colostrum than in sow serum and a high uptake of colostrum in the high titer pigs.

References

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- Hesse, R. *Proc AASV* 2009, 499-504.
- Landis JR, Koch G. The measurement of observer agreement for categorical data. *Biometrics* 1977, (33)159-174.