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Assessing the impact of maternally derived immunity on active immunization of pigs against PCV2

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Introduction and Objectives

Porcine circovirus associated disease (PCVAD) is caused by porcine circovirus type 2 (PCV2). Most sows and gilts develop antibodies after natural exposure to or immunization against PCV2 that become passively acquired by their nursing offspring.[1] The objective of this study was to assess potential maternal interference with active immunization when vaccinating weaned piglets around 3 weeks of age against PCV2.

Materials and Methods

Piglets were weighed and ear tagged within 24 hours of birth and weaned at approximately 3 weeks of age. All pigs were individually blood sampled for PCV2 IFA antibody measurement and classification as low (≤1:320) or high (≥1:640) titer just prior to vaccination at approximately 3 weeks of age (Day 0) based upon previously reported experiments.[2,3] Four treatment groups were created balancing for pig weight and gender: low pig titer/non-vaccinated pigs (L-NV), high pig titer/non-vaccinated pigs (H-NV), low pig titer/vaccinated pigs (L-V), and high pig titer/vaccinated pigs (H-V). Vaccinated groups were intramuscularly injected with 1mL of Ingelvac CircoFLEX® (Boehringer Ingelheim Vetmedica, Inc., St Joseph, MO). Body weights were individually recorded at pre-determined intervals and a subset of pigs were serially blood sampled for diagnostic serology. Pigs from all groups were commingled within nursery and finishing pens. Individual pig was the experimental unit with Day 0-128 average daily gain as the primary outcome of interest. The main effect of Day 0 pig PCV2 IFA titer and pig treatment were assessed using ANCOVA with the model including dam parity, pig gender, and day 0 pig weights as co-variates. Pairwise comparisons utilized Tukey HSD (JMP v8.0).

Results

Mortality rate did not differ between treatment groups, consistent with the classification of this flow as subclinically affected by PCVAD. Vaccination of pigs significantly increased D0-128 weight gain parameters compared to non-vaccinates regardless of pig PCV2 IFA titer status at the time of vaccination at 3 weeks of age (L-V vs L-NV; H-V vs H-NV; Table 1). D0-128 weight gain parameters did not differ among vaccinated groups from low or high PCV2 IFA titer groups of pigs (L-V vs H-V; Table 1).

Table 1. Least square means for performance data by main effect of pig PCV2 IFA (L ≤ 1:320, H≥1:640) titer at 3 weeks of age and pig treatment (V=vaccinated; NV=non-vaccinated).

Parameter	L-NV	H-NV	L-V	H-V
Number of pigs	239	222	174	286
Body weight, D128, lbs	218.86[b]	219.25[b]	226.57[a]	225.61[a]
ADG, D0-128, lbs	1.59[b]	1.59[b]	1.65[a]	1.64[a]

[ab]Means with different superscripts within a row differ significantly (Tukey HSD, P ≤ 0.05).

Discussion and Conclusions

High levels of maternally derived PCV2 IFA antibodies (≥ 1:640 or >1:320) did not interfere with achieving significantly increased weight gain by active immunization of piglets with Ingelvac CircoFLEX at 3 weeks of age. Groups of pigs with subclinical PCVAD perform significantly better if vaccinated.

References

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