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Efficacy of PCV2 vaccination of pigs, dams, or both on pig performance

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Introduction and Objectives

Porcine Circovirus type 2 (PCV2) is the necessary etiologic agent of Porcine Circovirus Associated Disease (PCVAD). The purpose of the study was to assess PCV2 vaccine efficacy (Ingelvac CircoFLEX[®], Boehringer Ingelheim Vetmedica, Inc.) in pigs vaccinated at 3 weeks of age from vaccinated or non-vaccinated sows in a commercial pork production system.

Materials and Methods

A multiple site, PRRS and *Mycoplasma hyopneumoniae* negative, 2400 sow system was used in this study. Two hundred fifty two (252) pregnant dams received either Ingelvac CircoFLEX[®] (administered at 3 and 6 weeks pre-farrow) or no-vaccine (n=124 vaccinated and n=128 non-vaccinated dams). After normal pre-and post-farrowing dam attrition, and exclusion of litters involved with necessary cross-fostering, litters from 173 dams (n=78 vaccinated and 95 non-vaccinated dams) entered the pig phase of the study. Pigs from those dams were not allowed to be cross-fostered, were blocked by weight within litter, and randomly assigned to receive vaccine at 3 weeks of age (weaning) or no vaccine. This protocol resulted in 4 different groups of pigs: Vaccinated dams/Vaccinated pigs (V-V), Non-Vaccinated dams/Vaccinated pigs (N-V), Vaccinated dams/Non-Vaccinated pigs (V-N) and finally Non-Vaccinated dams/Non-Vaccinated pigs (N-N). Individual pigs were the experimental unit and were ear tagged at processing and weighed at weaning (3 weeks of age). Individual pig weights were taken at 3, 10 and 22 weeks of age. Day 0-125 average daily gain was analyzed using analysis of covariance (JMP, Cary, N.C., USA). The model included treatment, barn and sex with day 0 (weaning) weight as a covariate, and the interaction of treatment by barn. Insignificant interactions (treatment by sex) were removed from the model. Differences among means were tested using Tukey HSD. Wean to finish mortality and cull rate data were analyzed by Pearson's Chi-square (JMP) and

pair-wise comparisons were made using Fisher's Exact test. Culling rate was based on pigs weighing <180 lbs on study day 125. Mortality and cull rates are expressed as the percentage of all pigs placed on test in each group.

Results

Mortality and cull rates were significantly decreased in vaccinated pigs compared to non-vaccinated pigs regardless of dam vaccination status (P<0.01 and P≤0.0002 respectively, Table 1). Day 0-125 rate of average daily weight gain (ADG) was significantly increased in vaccinated pigs compared to non-vaccinated pigs (P<0.05, Table 1), regardless of dam vaccination status.

Table 1. Performance of PCV2-vaccinated or non-vaccinated pigs from PCV2-vaccinated or non-vaccinated sows.

	Dam Vaccination - Pig Vaccination V=Vaccinated ; N=Non-vaccinated			
	V-V	N-V	V-N	N-N
Number of pigs	393	491	396	483
Mortality rate, %	0.51 ^a	2.04 ^a	6.57 ^b	5.18 ^b
Culling rate, %	1.53 ^c	1.63 ^c	6.82 ^d	6.63 ^d
Day 0-125 ADG*, lbs	1.78 ^e	1.79 ^e	1.70 ^f	1.70 ^f

ab: Fisher's Exact P<0.01.

cd: Fisher's Exact P≤0.0002.

ef: Tukey HSD P<0.05.

* LS means.

Conclusions

Mortality and cull rates, and average daily gain were improved by pig vaccination, regardless of dam vaccination status. Dam vaccination by itself did not improve pig performance, nor did dam vaccination interfere with active immunization of pigs. Pig vaccination is the key to PCVAD prevention.