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Comparative efficacy of three U.S. commercially available PCV2 vaccines using two-dose protocols in a commercial production system

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Introduction and Objectives

Commercial porcine circovirus type 2 (PCV2) vaccines are effective when administered appropriately, either as one- or two-dose regimens per their USDA-approved labeling.[1] Some decision makers feel a two-dose protocol for injectable vaccines enhances compliance in large commercial settings. The objective of this study was to evaluate the efficacy of six two-dose PCV2 vaccination protocols.

Materials and Methods

This study was completed in a large production system's wean-to-finish facility. Pigs were weaned at three weeks of age and allocated to seven groups (Table 1). Pigs in vaccinated groups were vaccinated one day after weaning and again three weeks later. Pigs were individually weighed at initial vaccination and again 22 weeks later. Average daily gain (ADG), mortality and cull rates were determined. Quantitative PCV2 PCR (qPCR) tests were completed on serum samples collected throughout the study (3, 6, 9, 14, 18 and 22 weeks of age) to confirm PCV2 challenge. Individual pig was the experimental unit and pigs from all groups were commingled within pens during finishing. One-way ANOVA and ANCOVA were used to analyze starting weights and ADG, respectively. LS mean ADGs were calculated using starting weight as a covariate. Tukey HSD was used to discern differences between treatment groups. Chi-square was used to analyze mortality and cull rate differences.

Table 1: Treatment group descriptions

Group	Treatment	n	Protocol
A	Control	146	No vaccine
B	BIVI – Split Full	363	0.5 ml x 2
C	BIVI – Split Half	366	0.25 ml x 2
D	Intervet - Full	366	2 ml x 2
E	Intervet - Half	359	1 ml x 2
F	Fort Dodge - Full	363	1 ml x 2
G	Fort Dodge - Half	362	0.5 ml x 2

BIVI=Ingelvac CircoFLEX®; Intervet=Circumvent® PCV; Fort Dodge=Suvaxyn® PCV2

Results

Starting weights of the pigs in the treatment groups were not significantly different (Table 2). PCV2 challenge was confirmed in control pigs by increased incidence and magnitude of qPCR positive samples (>4 logs) at 18 and 22 weeks of age. Mortality and cull rates did not differ among groups. All vaccinated groups had reduced incidence and magnitude of PCV2 viremia compared to controls but there were no differences among vaccinated groups. Only treatment group B had significantly higher ADG compared to control pigs.

Table 2: Production results

Group	Starting Wt.,lbs	LSMean ADG,lbs	Mortality Rate,%	Cull Rate,%
A	13.80	201.64[a]	7.78	1.37
B	13.48	208.50[b]	6.34	1.10
C	13.50	203.48[ab]	6.28	3.28
D	13.70	205.27[ab]	4.37	2.73
E	13.44	203.65[ab]	7.78	3.06
F	13.62	202.83[a]	7.14	1.37
G	13.70	204.46[ab]	4.97	3.04

Values within columns with different superscripts differ significantly at $P \leq 0.05$.

Discussion and Conclusions

Some of the vaccine regimens tested were not used according to their approved labeling. It is notable that all vaccine regimens reduced the incidence and magnitude of viremia but only one of them (group B: Ingelvac CircoFLEX split full dose) increased ADG. While a previous study showed that a single full dose of Ingelvac CircoFLEX was as efficacious as two half-doses[2], a single full dose group was not included in this study to confirm those findings. But if compliance with a single dose regimen is a concern, this study demonstrates that a full dose of Ingelvac CircoFLEX can be split into two-half doses and improve ADG compared to non-vaccinated pigs.

References

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2. Loula T, Jeske P. BI Swine Health Seminar, March, 2009, Dallas Texas