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COMPARATIVE CHALLENGE STUDY WITH TWO-DOSE FOSTERA™ PCV VACCINE

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Introduction

Introduced in 2011, Fostera™ PCV from Pfizer Animal Health (PAH) is a PCV type 1-type 2 chimera, killed virus vaccine in a single 2-mL dose presentation for administration to healthy pigs 3 weeks of age or older as an aid in prevention of viremia and as an aid in the control of lymphoid depletion caused by PCV2. PAH obtained a label claim in 2012 for the additional vaccination option that FOSTERA PCV may also be administered as two 1-mL doses 3 weeks apart starting at 3 weeks of age or older. The objective of this study was to compare the efficacy of two-dose Fostera PCV with that of Circumvent® PCV M (Merck Animal Health) in pigs challenged with virulent PCV2.[1]

Materials and Methods

Conventional 3-week-old pigs, prescreened to be PCV2 viremia free and with low or negative antibody titers to PCV2, were randomly assigned to treatment using a generalized block design, with blocks determined by PCV2 antibody titer (Table 1). Pigs were challenged with virulent PCV2a at 9 weeks of age and necropsied at 12 weeks of age. Blood, nasal and fecal samples, collected periodically throughout the study, were tested for PCV2 at the Iowa State University Veterinary Diagnositic Laboratory (ISU- VDL) using qPCR with a cycle threshold (CT) of <35 considered positive. Lymphoid tissue samples collected at necropsy were tested as ISU-VDL for PCV2-associated lesions. Data were analyzed using a general linear mixed model or repeated measures mixed model, using two-sided tests ($P \leq 0.05$). This study was conducted in accordance wih the guidelines of the PAH Kalamzoo, MI, IACUC.

Table 1. Study Design

Group	# Pigs	Dose	Vacc	Chall	Necrop
Non-vacc	20	---	--	D49	D63
Fostera PCV	20	1 mL IM	D0 D21	D49	D63
Circumvent PCV M	20	2 mL IM	D0 D21	D49	D63

Results and Discussion

PCV2b virus was detected in some pigs in each group prior to challenge, indicating exposure of the pigs after the screening process. Pigs that were viremic on D-1 and D7 were removed from the study; however, this did not limit the natural PCV2b infection prior to the planned PCV2a challenge. Under the conditions of this study, the two-dose vaccines met the primary outcome for efficacy in that vaccinated groups demonstrated a reduction in PCV2 viremia compared to the nonvaccinated control group. None of the Fostera PCV vaccinated pigs were ever postive for PCV2 viremia post-challenge (Table 2). In addition, both vaccines reduced nasal and fecal PCV2 shedding and the percent of pigs positive for PCV2 antigen in tonsil and lymphoid tissues at necropsy.

Table 2. Number of Pigs Positive by qPCR (CT<35) for PCV2 Viremia

Group	# Pigs	Study Day (# Pigs Positive)		
		D41	D46	D49
Non-vacc	18	10	16	18
Fostera PCV	16	0	0	0
Circumvent PCV M	17	2	1	2
Group	Study Day (# Pigs Positive)			
	D53	D56	D60	D63
Non-vacc	18	16	16	14
Fostera PCV	0	0	0	0
Circumvent PCV M	2	2	2	1

Conclusions

- This study modeled field situations where PCV2 exposure can occur prior to or during scheduled PCV2 vaccination timing.
- Despite this unplanned exposure, the 2-dose PCV2 vaccines were efficacious in reducing PCV2 viremia, PCV2 nasal and fecal shedding and the detection of PCV2 in lymphoid tissues.

References

1. Data on file, Study Report No. 3120W-60-11-951, Pfizer Inc.