

Bulletin

Boehringer Ingelheim Vetmedica, Inc.

TECHNICAL

Using Ingelvac® CircoFLEX™ to Protect Multiple Ages of Quebec Pigs Against PCVAD

Vaccine Profile

Porcine circovirus type 2 (PCV2) is considered an essential element for the development of postweaning multisystemic wasting syndrome, now called porcine circovirus associated disease (PCVAD) in North America and Porcine circovirus disease in Europe (PCVD). This paper describes results obtained with a novel PCV2 sub-unit vaccine, Ingelvac® CircoFLEX™ in Quebec pigs that were vaccinated at different ages.

Farm Description

The study farm was a 1300-sow, three site herd, negative to PRRS and *Mycoplasma hyopneumoniae*. PCVAD had been causing losses for about 18 months, exclusively in finishing units, starting 3-4 weeks post placement. The performance of the sow herd (27 pigs/sow/year) and nursery (~ 1% mortality) was excellent.

Pigs were randomly allocated by coin toss to receive either 1 mL placebo or 1 mL Ingelvac® CircoFLEX™ vaccine in a blinded fashion. In each nursery room, six pens contained control pigs and six pens contained vaccinated pigs, alternating between control and vaccinated pigs.

All pigs were vaccinated on a single day at the following ages:

- Barn 1 - 45 to 59 days of age
- Barn 2 - 38 to 45 days of age
- Barn 3 - 22 to 36 days of age
- Barn 4 - 19 to 22 days of age

In all barns, group A pigs alternated with group B pigs after random assignment by coin toss. The oldest vaccinated pigs, in Barn 1, moved to finishing just three days after vaccination. No injection site reactions or anaphylaxis was noted on any observation day (the day of the injection, daily for the next three days and weekly thereafter).

Results

Nearly 3800 pigs entered the study with approximately 50% receiving placebo and 50% receiving the test vaccine. Mortality rate in the nursery for the study pigs was only 0.4%.

Pigs began to show clinical signs of PCVAD three to four weeks post placement in all four finishing units at 80 to 90 days of age. Clinical signs included:

- Weight loss
- Lack of response to treatments
- Paleness
- Diarrhea
- Increased mortality

Gross lesions were consistent with those reported for PCVAD.¹ A few pigs also had splenic infarcts, which have been reported with PCVAD elsewhere. Skin lesions suggestive of PDNS were present in <0.5% of pigs, often accompanied by nephropathy. Histological lesions and IHC PCV2 loads were compatible with a diagnosis of PCVAD as the main condition involved in clinical disease of finishing pigs². These lesions and PCV2 loads were graded from negatives to grade 3. Vaccinated pigs were 20% more likely to have only negative and grade 1 results.

Table 1 shows the mortality results (dead + euthanized) for pigs injected at different ages and placed in the four different finishing units. For each of the finishing batches, the vaccinated pigs had a statistically significant reduction in mortality (p<0.001; Analysis of Variance):

- 74% average reduction in mortality
- 95% reduction in mortality for pigs vaccinated at 19 - 22 days of age

Table 1
Mortality Rate Ingelvac® CircoFLEX™ Trial

	Treatment	Number of pigs introduced	Age (days) at vaccination	Mortality ^a Percent	p value
Barn 1	Sterile water	647	45-59	9.6	< 0.001
	Vaccine	633	45-59	3.0	
Barn 2	Sterile water	260	38-45	8.1	= 0.002
	Vaccine	286	38-45	2.1	
Barn 3	Sterile water	745	22-36	10.6	< 0.001
	Vaccine	717	22-36	2.8	
Barn 4	Sterile water	275	19-22	7.6	< 0.001
	Vaccine	274	19-22	0.4	
Wtd Avg*	Sterile water	1,927	19-59	9.5	< 0.001 ^c
	Vaccine	1,910	19-59	2.4	

^a Mortality includes the animals that died and those euthanized for autopsy because of their poor condition.

^c Weighted average numbers as a weighting of each barn.

* Difference in numbers of pigs from barn to barn.

Conclusions

Excellent efficacy was obtained in pigs regardless of age at vaccination, which ranged from as young as 19-22 days to as old as 45-59 days of age. These results suggest that pigs can effectively be vaccinated at 3 weeks of age. Protective immunity developed rapidly, as pigs vaccinated less than four weeks before the onset of clinical signs were protected.

References:

1. AASV PCVAD Case Definition, AASV October 3, 2006.
2. Sorden SD. Update on porcine circovirus and postweaning multisystemic wasting syndrome (PMWS). Swine Health Prod. 2000; 8(3):133-136.