



Circumvent[®] PCV

Technical Bulletin

FIELD PERFORMANCE EVALUATION OF CIRCUMVENT[®] PCV VACCINE

Study Objective

To assess the efficacy of Intervet/Schering-Plough Animal Health's Circumvent[®] PCV vaccine (INVT) versus non-vaccinated controls (CONTROL) in a herd that had experienced a moderate level of PCVAD over the previous year.

The following table summarizes mortality data from the six months prior to initiating the study:

| | |
|----------------|--------|
| PIGS ENTERED | 17,559 |
| % DEATHS | 4.4% |
| % CULLS | 8.8% |
| % DEAD & CULLS | 13.2% |



Experimental Design and Statistical Analysis

Measurements of efficacy and safety included mortality, growth performance and economic value at predicted market weight. The study herd was a 1,700 sow farrow-to-finish operation in the Midwest.

Pigs from two consecutive weekly weaning groups were split into treatment and control groups. Intervet/Schering-Plough Animal Health's Circumvent PCV vaccine (INVT) was administered according to label directions. Pigs were weighed at weaning, the end of the nursery phase, the end of the grower phase (approximately six weeks into the finishing facility) and for the final time during the finisher phase, two weeks prior to market.

Serology: A subset of pigs was selected within treatment, weaning group, gender, start weight and litter for periodic blood sampling. The selected pig was often the largest pig in the litter, and most litters had at least one pig sampled. Samples were collected at approximately 3, 6, 9, 12, 15 and 21 weeks of age. All samples were tested for PCV2 antibodies by ELISA at the Iowa State University Veterinary Diagnostic Laboratory (ISU-VDL). ELISA results are presented as group mean S/P ratios. Samples collected at 3 weeks of age were also tested for PCV2 antibodies by an indirect immunofluorescence assay (IFA) at the ISU-VDL. IFA titers are reported as the reciprocal of the highest dilution that blocked staining. The IFA titer of the pig(s) tested in each litter was also assigned to litter mates in order to provide a representative maternally-derived antibody (MDA) level for each pig at the time of vaccination.

Statistical analysis: Weight, weight gain and ELISA data were evaluated by ANOVA. All weight related data is presented in pounds. Weight gain data were calculated for each phase (nursery, grower and finisher) and phase combinations (grow-finish and wean-to-finish). If the P value generated by the ANOVA was <0.05, pair wise comparisons were performed by Least Significant Difference. Categorical data such as culls and mortality were evaluated by Chi Square. The impact of litter and individual pig IFA titers (log₂) on growth rate was evaluated by linear regression.



Results

Mortality and cull/light pig data

| TREATMENT GROUPS | | |
|---------------------|--------|---------|
| PARAMETER | INVT | CONTROL |
| No. of pigs | 241 | 245 |
| Mortality by phase: | | |
| Nursery | 1.66% | 2.04% |
| Grower | 1.66% | 3.67% |
| Finisher | 2.49% | 4.90% |
| Grower-Finisher | 4.15% | 8.57% |
| All phases | 5.81% | 10.61% |
| Other comparisons: | | |
| Lights | 7.05% | 9.80% |
| Lights and deaths | 12.86% | 20.41% |

Vaccination with Circumvent PCV reduced the mortality rate compared to non-vaccinated controls in each phase, and most significantly during the grower phase.

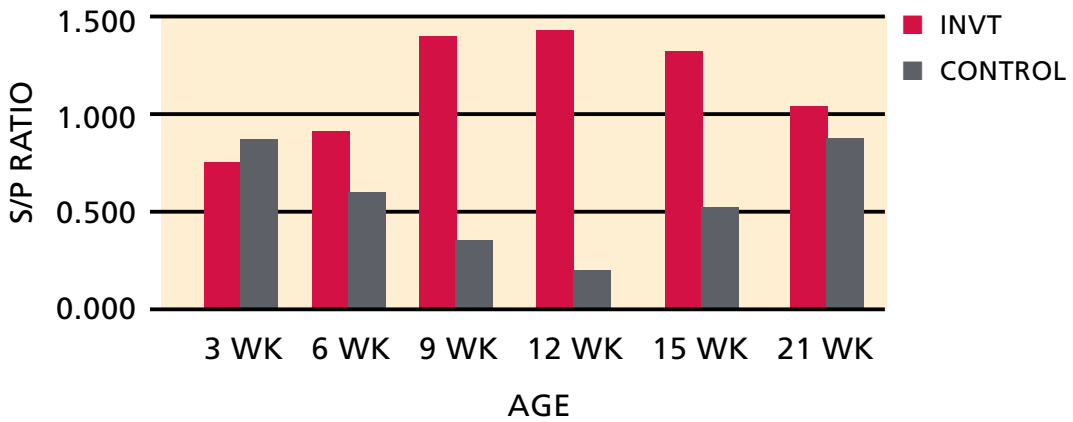
Growth data

| TREATMENT GROUPS | | |
|-----------------------|---------------------|---------------------|
| PARAMETER (in pounds) | INVT | CONTROL |
| Start weight | 16.4 ^a | 16.2 ^a |
| Daily gain by phase: | | |
| Nursery | 0.81 ^a | 0.83 ^a |
| Grower | 1.49 ^a | 1.39 ^b |
| Finisher | 1.72 ^a | 1.65 ^b |
| Grower-finisher | 1.61 ^a | 1.53 ^b |
| All phases | 1.35 ^a | 1.30 ^b |
| Predicted market: | | |
| Weight | 254.6 ^a | 246.9 ^b |
| Value | 112.86 ^a | 108.65 ^b |

*Values with the same superscript within a row are similar (P > 0.05)

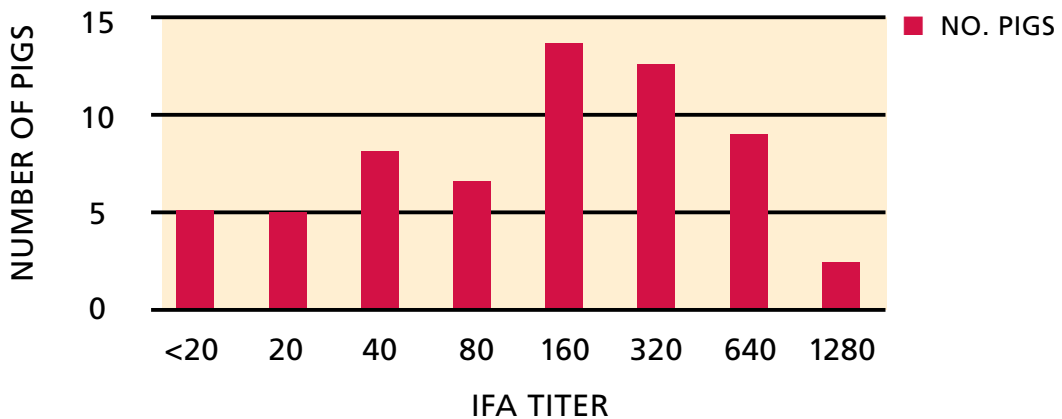
The vaccinated group outperformed the control group during the grower and finisher phases. Growth rates in the nursery or the immediate post-vaccination phase indicate vaccination did not have a negative impact on pig growth.

Results of serotesting by PCV2 ELISA



These data indicate that the Control pigs lost most of their maternal antibodies by 12 weeks of age and started seroconverting at 12-15 weeks of age. Accordingly, field exposure to PCV2 appears to have occurred after the pigs entered the finishing facility. The group vaccinated with Circumvent PCV exhibited a marked titer increase by 9 weeks of age or 3 weeks after the second vaccination. Thereafter, the antibody levels declined throughout the study.

Regression analysis of wean-to-finish growth rate and IFA titers of individual pigs and the litter values at vaccination yielded no significant associations. Accordingly, the levels of maternal antibodies at vaccination did not appear to influence vaccine efficacy in this study. The distribution of the IFA titers is shown in the following graph:





Circumvent® PCV-The best defense against PCVAD

- PCV2 vaccine for use in swine 3 weeks of age or older.
- 2 mL intramuscular dose, given twice for optimal immune response.
- High protective antigen content in each dose from advanced vector technology for maximum immunogenic response.
- With Microsol Diluvac Forte® adjuvant for optimal immune response.
- Proven to significantly reduce PCV2 viremia and shedding.
- Proven effective, even when pigs were co-challenged with PRRS virus.
- Proven in field studies to significantly reduce mortality, reduce medication costs and improve growth performance.
- Two dose regimen affords greater administration compliance and predictable results.
- Titer response: Produces IFA and ELISA detectable titers.

Conclusions

The greatest differences in growth rate between vaccinate and control groups occurred during the grower phase, supporting the common observation that pigs are often infected with field virus at this age. Serological data from the control pigs also indicated exposure to field virus during the grower phase.

Vaccination with Circumvent PCV reduced mortality rates and the number of light weight pigs compared to the non-vaccinated control group.

The vaccinate and control groups performed comparably through the nursery phase, where vaccination occurred, based on both mortality and daily gain data. There was no observed set-back due to vaccination.

The economic benefit of vaccination per pig was estimated to be \$4.23 for additional pounds produced and \$3.32 for reduced mortality in the grow-finish phase, providing a total benefit of \$7.55 per vaccinated pig. Using an estimated vaccine plus labor cost of \$1.65 per pig, the predicted net benefit per pig would be \$5.90 and the return on investment would be 3.6 to 1.0.

In summary, the Circumvent PCV vaccination was effective in reducing mortality and improving weight gain, resulting in an overall economic benefit of \$5.90 per pig compared to controls in a herd facing moderate PCV2 challenge.

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