Sponsors

University of Minnesota

College of Veterinary Medicine

College of Food, Agricultural and Natural Resource Sciences

Extension Service

Swine Center

The 2009 Allen D. Leman conference proceedings book is made possible by the generous support of **IDEXX**.

We also thank the following sponsors:

AgStar Financial Services

Alpharma Inc.

American Association of Swine Veterinarians

Applied Biosystems

Bayer Animal Health

Boehringer-Ingleheim Vetmedica, Inc.

Elanco Animal Health

Fort Dodge Animal Health

IDEXX

Invervet/Schering-Plough Animal Health

National Pork Board

Newsham Choice Genetics

Novartis Animal Health US, Inc.

Pfizer Animal Health

PIC

PigCHAMP

PRRS CAP2

Formatting
Tina Smith

CD-ROM
David Brown

Logo Design
Ruth Cronje, and Jan Swanson;
based on the original design by Dr. Robert Dunlop

Impact of PCV2 viremia in vaccinated and non-vaccinated pigs

Petra Maass, Bernd Grosse Liesner, Francois-Xavier Orveillon and Vicky Fachinger
Boehringer Ingelheim Animal Health GmbH, D-55216 Ingelheim

Objective

Porcine circovirus type 2 (PCV2) vaccines have proven to be very effective in protecting pigs against the negative impact of PCV2 infection. PCV2 viremia was used in initial vaccine efficacy trials because it had been established that non-vaccinated pigs with a high viral load are more likely to develop porcine circovirus associated disease (PCVAD). The objective of this study was to determine if PCV2 viremia is a useful tool to assess vaccine efficacy in field studies.

Materials and methods

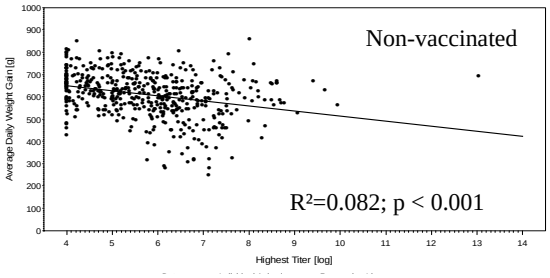
The study included 4 different sites in Europe (N. Germany, S. Germany, France, UK) with different types of co-infections. Three of the four sites were positive for PRRS and *Mycoplasma hyopneumoniae*.[1-4] Piglets were injected with a single dose (1 ml) of Ingelvac CircoFLEX® (Boehringer Ingelheim Vetmedica, Inc., St Joseph, MO)(n=2854) or placebo (n=2748) at 2 to 4 weeks of age. A subset of pigs were periodically bled (490 vaccinates, 475 controls) and tested by qPCR for PCV2 viremia and viral load. Pigs were individually weighed at the start and end of the trial to determine average daily gain (ADG).
A linear regression model was used to test for correlation between the highest viral load (genomic equivalents/ml serum) found in each individual animal during the trial and its ADG (SAS System, SAS Inst., Cary, NC, v8.2).

Results

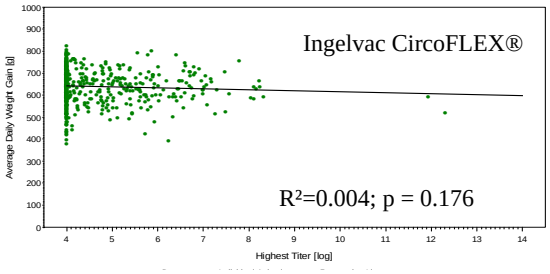
In all 4 study sites the number of viremic animals, duration of viremia and viral load were significantly reduced in vaccinated animals compared to the control group, as reported earlier.[1-4] A significant, though weak, negative correlation between the highest viral load and ADG was detected in non-vaccinated animals ($p < 0.001$, Figure 1a). In contrast, no correlation was found in the vaccinated pigs ($p = 0.176$, Figure 1b).

Fig. 1: Correlation of viral load and ADG

a) Significant correlation in control group (n=475).



b) No correlation in vaccinated group (n=490).



Highest titer (x-axis) shown as logs of PCV2 genomic equivalents per ml of serum.

Discussion and conclusion

Residual viremia has been found in vaccinated animals in various studies, independent of the PCV2 vaccine used.[1-6] This study confirmed the findings of Diaz et al[7] that residual PCV2 viremia does not affect the performance of PCV2 vaccinated pigs, in contrast to the situation in non-vaccinated animals. This is consistent with a trial that showed no relation between the number of viremic pigs and the mortality rate in groups vaccinated with different vaccines.[6] PCV2 viremia might be a useful parameter when comparing vaccinated and non-vaccinated animals but not when assessing efficacy among vaccinated animals.

References

(1) Fachinger et al. (2008) Vaccine: 1488-99
(2) Orveillon et al. (2008) Proc Allen D. Leman Swine Conference, Recent Research: 14
(3) Kixmoeller et al. (2008) Vaccine: 3443-3451
(4) Von Richthofen et al. (2008) The Pig Journal:62
(5) Urniza et al (2008) Proc 20th IPVS Congr: 55
(6) Connor et al (2009) Proc AASV Annual Meeting: 269-270
(7) Diaz et al (2009) Proc Allen D. Leman Swine Conference, Recent Research, submitted