MERCK ANIMAL HEALTH
TECHNICAL SERVICES BULLETIN

Longitudinal Evaluation of Porcine Circovirus Type 2 Antibody Levels in Field Study Pigs using Three Assays

Brad Thacker, DVM, PhD, MBA, DABVP[1]
John Johnson, DVM[2]
[1]Merck Animal Health, DeSoto, Kansas; [2]Iowa State University, Ames, Iowa

Introduction:

Porcine circovirus Type 2 serotesting is performed to determine the time of infection, evaluate maternal antibody levels and measure post-vaccination responses. Several types of tests are available worldwide. In the U.S., IFA performed by several laboratories and an ELISA performed by the ISU-VDL are the main tests used. In a previous report and subsequent field experiences, the ISU-VDL ELISA and IFA test results sometimes disagree, especially with regard to maternal antibody status and the antibody response following vaccination with Circumvent® PCV (Merck Animal Health, Summit, NJ).[1] To provide insight into these discrepancies, sera from a vaccination field study was evaluated by IFA, the ISU-VDL ELISA and a commercially available ELISA not commonly used in the U.S.

Materials and Methods:

The sera were obtained from a field study to evaluate the growth and viremia status of pigs until market weight.[2] Pigs were vaccinated at 3 and 6 weeks of age with Circumvent® PCV M (Merck Animal Health, Summit, NJ).[1] or kept as non-vaccinated controls. Field exposure began as early as 1 week of age based on PCV2 PCR testing. In addition to the 4-dilution IFA testing previously reported,[2] the samples were tested by the ISU-VDL in-house ELISA (ISU-ELISA) and a commercial ELISA (COM-ELISA; Ingezim Circo IgG, Ingenasa, Madrid, Spain). All testing was performed at the ISU-VDL. Titer results are presented for each sampling age as the group geometric mean and S/P ratios as averages. Each group contained 20-25 pigs.

Results:

In general, the tests provided similar results. At 1 week, the maternal antibody levels measured by the COM-ELISA were at low to moderate levels while the IFA showed low levels. With regard to post-vaccination titers, all three assays detected a slight rise in titers after the first vaccination. Following the second vaccination, titers peaked at 8 weeks for the ISU-ELISA and at 10 weeks for the COM-ELISA and IFA. For all assays, titers in the control group started to increase at 10 weeks and peaked at 19 or 25 weeks. Titers in the vaccinated group were declining by 25 weeks, especially with the COM-ELISA and IFA.

Test: Unit	Group	Age (in weeks)						
		1	3	6	8	10	19	25
Ingenasa ELISA: Titer	PCVM	2,231	633	998	20,172	15,010	1,563	878
	CONT	2,070	639	274	268	996	8,017	5,706
ISU ELISA: S/P Ratio	PCVM	ND	0.398	0.942	1.911	1.714	1.269	1.209
	CONT	ND	0.381	0.387	0.417	0.664	0.878	1.261
4-dilution IFA: Titer	PCVM	35	ND	303	893	1,178	640	338
	CONT	53	ND	127	143	604	983	1,076

Conclusions and Discussion:

Each test has positive and negative attributes. IFA is labor intensive and tends to be subjective. The ISU-ELISA sometimes provides confusing results, and the scale of S/P ratios is less discriminating than a titer. The COM-ELISA appears to work well with regard to evaluating post-vaccination responses, but more evaluation is needed.

References:

1. Thacker, B. et al. (2008) Proc AASV, 153.
2. Thacker, B. et al. (2013) Proc AASV, 217.

Merck Animal Health
Summit, New Jersey 07901
www.merck-animal-health-usa.com Technical Service: 1-800-211-3573 Customer Service: 1-800-521-5767

MERCK Animal Health