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Michael Klatt

Layout and CD-ROM
David Brown

Logo Design
Ruth Cronje, and Jan Swanson;
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Protocol to investigate the impact of PCV2-associated disease in growing pigs

J Kolb, K Okkinga, N Henke, G Anderson
Boehringer Ingelheim Vetmedica, Inc. Ames, Iowa, USA

Introduction and Objectives

Disease associated with Porcine Circovirus Type 2 is a complex set of clinical signs and lesions. Clinical signs may range from weight loss and mortality in nursery pigs (classic PMWS), diarrhea in finishing pigs (Jensen, et al) to dramatically increased mortality in finishing pigs. While questions remain regarding the full pathogenesis of the disease, making an accurate diagnosis of PCV2 Associated Disease (PCVAD) is a critical first step in taking action (Halbur, et al).

This paper describes a diagnostic process utilized in cases of high mortality in growing pigs. Based on the accepted diagnosis of PCV2 in individual pigs (Segales, et al), and a proposed definition of herd level disease, the protocol samples a statistical sample of pigs to provide for a clear diagnosis in cases of elevated finishing mortality.

Case Description

A standard diagnostic protocol was developed to identify the presence of swine pathogens when the estimated prevalence of disease is at least 10%.

Serum was collected from a cross section of animals including the breeding herd (20 animals) and growing herd (50 animals, 10 per age group at approximately 4, 10, 14, 18 and 22 weeks of age).

Tissue diagnostics were designed to identify primary pathogens and collect tissues to allow for identification of any novel pathogens. These tissues were collected at peak mortality, two to three weeks prior to the peak mortality, and 5-6 weeks prior to peak. These time frames were selected to match onset of PCV2 circulation, viral build up and peak impact of the virus, respectively. Four case pig and one control pig were selected at each time point.

Table 1 – Tissue Sample Collection Schedule

RESP.	ENTERIC	SYSTEMIC	LYMPH
Cranial lobe	Mid Jejunum	Liver	Tonsil
Middle lobe	Proximal ileum	Spleen	Resp. Nodes
Caudal lobe	Distal ileum	Kidney	Mesen. Nodes
Hilar section	Cecum		Subiliac Nodes
	Spiral Colon		

Testing methods included serum antibody tests, PCR on hilar lung sample and intestines, and tissue Immunohistochemistry. PRRS, SIV, *Mycoplasma hyopneumoniae*, PCV2 were screened, along with bacterial culture.

Results

While the diagnostic process is ongoing, over 60 farms have been sampled to date. Lesions consistent with PCVAD, including lymphoid depletion and mutifocal granulomatous inflammation of lymphoid tissues, liver, intestine and lungs were detected in all farms, with concurrent positive detection of PCV2 antigen. Only two of 180 time points had no PCVAD identified. PRRS virus was the second most common pathogen identified.

Conclusions

A thorough diagnostic protocol is needed to clarify the roles of various swine pathogens in cases of high finishing mortality. Timing of pathogen exposure may be determined via serum antibody profiling. These measures allow for control measures directed at the specific agents involved in mortality, with appropriate timing.

References

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2. Halbur P et al (2003). Vet Pathol 40:521-529.
3. Segales J, et al (2001). Vet Pathol 38(3):343-346.