

RISK FACTORS ASSOCIATED WITH PMWS IN US SWINE HERDS

MJ Engle¹, EJ Bush²

¹PIC North America, FRANKLIN, United States of America

²Centers for Epidemiology and Animal Heal, FORT COLLINS, CO, United States of America

Introduction

A new clinico-pathological condition characterized by ill-thrift and high mortality was first identified in western Canada and termed Post-weaning Multisystemic Wasting Syndrome (PMWS) by Harding in 1996. Since the late 1990's, PMWS has been identified as a significant problem in many parts of the world(1). Today, PMWS appears to be a re-emerging disease in pigs in hog dense regions of Canada and the US.

Porcine circovirus type 2 (PCV2) is considered by many to be the primary causative agent of PMWS(2). Although PCV2 is the postulated causative agent of PMWS, PCV2 is a ubiquitous virus that has been present for at least 3 decades in almost 100% of the pig populations around the globe. Multiple factors, such as co-infections, vaccine induced immunostimulation, overcrowding, mold, stress, and genetics have been reported to contribute to the ability for PCV2 infection to express itself as PMWS(3). Based on epidemiological investigations, many industry experts believe an unidentified, novel agent is the primary pathogen causing PMWS and PCV2 is secondary. The objective of this study was to identify risk factors associated with the positive diagnosis of PMWS in U.S. field cases.

Materials and Methods

A pilot project was conducted over a 12 month period in 2003-2004 utilizing seventeen sentinel veterinary practices across Midwest US. With minor modifications, a well-accepted clinical case criterion for PMWS was utilized as a standard to enroll farms(4). Herds meeting the clinical case definition were enrolled in the study. Practitioners submitted predetermined samples to one of two diagnostic laboratories and completed a producer survey for each enrolled herd. The positive and negative cases were compared in an attempt to determine risk factors for the development of PMWS. Univariate analyses were performed using logistic regression and Chi Square to screen variables. Those variables with a *P* value of less than or equal to 0.25 were candidates for the multivariate regression.

Results

Over a twelve month period, 101 herds met the clinical case definition for PMWS and were enrolled. Of the 101 submissions, 69 submissions were determined to be PMWS positive and 32 were determined to be PMWS negative based on the laboratory case criteria for diagnosis of PMWS.

The most frequent coinfections identified in submissions diagnosed as PMWS positive were PRRSV (porcine reproductive and respiratory syndrome virus) (72%), *Mycoplasma hyopneumoniae* (69%), *Streptococcus* *sps.*(69%), SIV (swine influenza virus) (55%), and *Salmonella sp* (13%).

Management variables demonstrating a significant association with a positive PMWS diagnosis are listed in Table 1.

Table 1 Significant management variables

Variable	Level	% Positive	<i>P</i> value
Average Age (days)	< 75	45.5	0.005
	75-144	81.8	
	> 144	58.8	
Pig flow	Continuous	48.1	0.002
	AI/AO Building	74.5	
	AI/AO Site	86.4	
Floor type	Slatted	64.2	0.03
	Solid	89.5	

Health variables demonstrating a significant association with a positive PMWS diagnosis are listed in Table 2.

Table 2 Significant health variables

Variable	Level	% Positive	<i>P</i> value
History of PMWS diagnosis in nursery pigs	Yes	66.7	0.09
	No	33.3	
History of HBS diagnosis in grow finish (GF) pigs	Yes	82.6	0.05
	No	64.1	
History of Ascarid diagnosis in GF pigs	Yes	94.4	0.02
	No	68.7	
History of PMWS diagnosis in GF pigs	Yes	78.4	0.02
	No	45.5	
Nursery pigs on site	Yes	48.1	0.004
	No	78.3	

Discussion

AI/AO pig flow, history of ascarid infestation, and solid floors provided increased risk of a positive PMWS diagnosis. In this study continuous pig flow was sparing for PMWS and is consistent with anecdotal data from some swine veterinarians. Interestingly, other industry professionals promote AI/AO pig flow as a key tool to manage PMWS. Lastly, the possibility of immune stimulation from ascarid migration triggering clinical PMWS deserves additional consideration.

References

- Segales, J. et al. (2002). Vet Q. 24, 109-124
- Bolin, S.R. et al. (2001). J Vet Diagn Inv. 13, 185-194.
- Krakowka, S., et al. (2001). Vet Pathol. 3,:31-42.
- Sorden, S.D. (2000). SHAP 8, 133-136.

