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A survey on finishing pig mortality associated with porcine circovirus diseases in Quebec

Sylvie D'Allaire, Camille Moore, Geneviève Côté

In late 2004 and early 2005, an increase in finishing-pig mortality was reported by several veterinarians. It was attributed to porcine circovirus diseases (PCVD) and more specifically to postweaning multisystemic wasting syndrome (PMWS). This prompted the Quebec association of swine veterinarians (AVIA: Association des vétérinaires en industrie animale du Québec) in conjunction with the Fédération des producteurs de porcs du Québec (FPPQ) to conduct a survey to confirm the extent of these losses and to assess the prevalence of PMWS.

A short questionnaire was developed to gather information on the number of pigs marketed and, for the year 2004 and the first 8 mo of 2005, the percentage of mortality in finishing pigs (number of dead and euthanized pigs divided by average inventory), the average age at death, the percentage of lightweight pigs sold (< 70 kg carcass weight), and the type of data recording system and quality of performance data used. For the period of January to August 2005, presence or absence of PMWS and porcine reproductive and respiratory syndrome (PRRS) was also noted and, when present, whether the diagnosis was based on postmortem examination or on clinical signs typical of these conditions. The information gathered through the questionnaire referred to the performances and health status in the finishing phase solely.

The list of all CQA® (Canadian Quality Assurance) certified sites where marketing pigs were produced, in either farrow-to-finish or finishing operations, was obtained from the FPPQ. For each type of production, a random sample was obtained, stratifying on herd size. The sample size was selected assuming an expected prevalence of PMWS of 35% and 50% for farrow-to-finish and finishing herds, respectively. Each selected producer was contacted by telephone and asked for his/her participation and the name of the herd attending veterinarian. The surveys were then sent to the veterinarians along with instructions on how to complete them. Also, veterinarians had previously been contacted at a professional meeting and given explanations on the objectives of the study and the case definition of PMWS. A total of 48 veterinarians were involved. Differences in performances between periods, groups, and health status were determined by using general linear model with post-hoc Tukey's test

or logistic regression (SAS version 9.1, Cary, North Carolina, USA). A *P*-value of 0.05 was used.

The response rate (74%) was fairly good, with slight differences according to the size of the herds. Results for each type and size of operation are reported in Table 1. The mortality in finishing pigs was significantly greater in 2005 than in 2004 for both types of herds. The difference in mortality between 2004 and 2005 was 2.4%, with 2.2% and 2.8% for farrow-to-finish and finishing operations, respectively, representing an average increase in mortality of 42% and 56% for 2005 compared with 2004. In this sample, nearly half of the herds (111/244) reported an increase of more than 50% in mortality for the first 8 mo of 2005 compared with 2004, whereas 25% of the herds reported no increase. Therefore, several herds would probably fulfill one of the clinical criteria for the case definition of PMWS on a herd level, as described by the European PCVD consortium (1), which is an increase exceeding the regional level by 50% over a minimal period of 1 or 2 mo.

The average age at death of finishing pigs was lower in farrow-to-finish than in finishing herds (13 vs. 15 wk), and no difference was observed between 2004 and 2005. This might be a consequence of the type of animal flow within these herds. Finishing operations are more easily conducted with "all in — all out" by building; thus, the infection of animals by pathogens may be slightly delayed in finishing compared with farrow-to-finish herds, which are more often run in a continuous flow within a building. Analysis of percentage of lightweight pigs sold could not be performed because of too many missing data.

The average prevalence of PMWS was 56%, being significantly higher in finishing than in farrow-to-finish operations (75% vs. 48%; Table 1). One hypothesis is that commingling of pigs from several sources, a practice observed only in finishing herds, might favor the occurrence of PMWS. As for several infectious diseases, larger herds were more likely to have a positive diagnosis for PMWS than were smaller ones, with the odds ratio ranging from 2.4 to 6.2. In 53% of the herds reporting PMWS, a laboratory had confirmed the diagnosis. Porcine reproductive and respiratory syndrome was reported

Table 1. Performance data and prevalence of postweaning multisystemic wasting syndrome (PMWS) in finishing pigs for year 2004 and first 8 mo of 2005^a in Quebec farrow-to-finish and finishing herds

Type and size of herds	n	Average number of marketed pigs/herd/year	Response rate (%)	Mortality (%) 2004 mean <i>s</i> ^b	Mortality (%) 2005 mean, <i>s</i> ^b	% of herds		
						PMWS + ve ^b	PMWS-ve	PMWS unknown
Farrow-to-finish (number of sows)								
< 150 sows	69	2080	87.5	5.49 ^c , <i>s</i> = 7.35	7.69 ^c , <i>s</i> = 7.72	34 ^c	32	34
150–300 sows	77	3996	68.7	5.05 ^c , <i>s</i> = 3.68	7.71 ^c , <i>s</i> = 6.02	56 ^d	26	18
> 300 sows	22	9262	56.4	5.64 ^c , <i>s</i> = 8.12	6.39 ^c , <i>s</i> = 5.05	63 ^d	27	10
Subtotal	168	3888	73.2	5.31, <i>s</i> = 6.07	7.53, <i>s</i> = 6.67	48	28	24
Finishing (number of marketed pigs/year)								
< 3000	33	1931	86.8	4.28 ^c , <i>s</i> = 2.34	6.62 ^c , <i>s</i> = 3.97	61 ^c	12	27
3000–6000	22	4117	66.7	4.24 ^{cd} , <i>s</i> = 1.87	8.79 ^{cd} , <i>s</i> = 6.02	82 ^{cd}	13	5
> 6000	21	9610	77.8	6.48 ^d , <i>s</i> = 4.59	8.13 ^d , <i>s</i> = 4.66	90 ^d	10	0
Subtotal	76	4686	77.6	4.88, <i>s</i> = 3.15	7.66, <i>s</i> = 4.85	75	12	13
Total (1 013 208 marketed pigs/year)	244	4136	74.5	5.18, <i>s</i> = 5.34	7.57, <i>s</i> = 6.15	56	23	21

^a Significant difference in mortality between year 2004 and first 8 mo of 2005 at *P* < 0.01

^b Within a specific type of herds, different superscripts (^{c,d}) within a column indicate significant difference (*P* < 0.05)
s = standard deviation

Table 2. Mortality (%) in finishing pigs for the first 8 mo of the year 2005 according to the health status in regard to postweaning multisystemic wasting syndrome (PMWS) and porcine reproductive and respiratory syndrome (PRRS)

Type of herds	PMWS -ve PRRS -ve	PMWS -ve PRRS +ve	PMWS +ve PRRS -ve	PMWS +ve PRRS +ve	Status unknown ^a
Farrow-to-finish					
Finishing mortality ^b	3.80 ^c	5.06 ^{cd}	5.89 ^{cd}	11.35 ^e	7.53 ^d
Number of herds (%)	37 (22)	9 (5)	20 (12)	53 (32)	49 (29)
Finishing					
Finishing mortality	2.81 ^c	7.05 ^{cd}	5.91 ^c	9.98 ^d	6.76 ^{cd}
Number of herds (%)	6 (8)	2 (3)	17 (22)	33 (43)	18 (24)
Total					
Finishing mortality	3.66 ^c	5.42 ^{cd}	5.90 ^{de}	10.82 ^f	6.56 ^e
Number of herds (%)	43 (18)	11 (4)	37 (15)	86 (35)	67 (27)

^a Status unknown for one or both of these diseases

^b Within a row, values with different superscripts (^{c,d,e,f}) are statistically different (*P* < 0.05)

in 50% of the herds, with no difference observed between the 2 types of farms.

The mortality in 2005 was significantly higher in herds affected by both PMWS and PRRS than in any other herds; almost double that observed in herds affected by either PMWS or PRRS alone. These diseases have a major economic impact, considering the high prevalence of herds affected by both pathogens (35%). Health status regarding the 2 pathogens was unknown for 27% of the farms surveyed, suggesting that the prevalence may even be higher than reported herein. Moreover, results were only for the finishing phase and did not include losses from the nursery stage or for deterioration in other performance data.

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References

1. The Control of Porcine Circovirus Diseases (PCVDs): Towards Improved Food Quality and Safety [database on the Internet]. United Kingdom: Meat and Livestock Commission 2005. Available from <http://www.pcvd.org/news.php>. Last accessed October 10, 2006.

Sylvie D'Allaire, Faculté de médecine vétérinaire, Université de Montréal, C.P. 5000, St-Hyacinthe, Québec J2S 7C6; Camille Moore, 2505 place Guilbault, St-Césaire, Québec J0L 1T0; Geneviève Côté, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, 200 chemin Ste-Foy, 11^e étage, Québec, Québec G1R 4X6.

Address all correspondence to Dr. Sylvie D'Allaire; e-mail: sylvie.dallaire@umontreal.ca