

INFECTION PATTERN IN 12 PIG FARMS DIFFERENTLY AFFECTED BY RESPIRATORY DISORDERS

Fablet C., Marois C., Rose N., Kuntz-Simon, G., Jolly J.P., Eono F., Eveno, E.,
Le Devendec L., Tocqueville V., Kobisch M. and Madec F.

French Food Safety Agency, Zoopôle Les Croix, B.P. 53, 22 440 Ploufragan, FRANCE

SUMMARY

The bacteriological and serological status towards Mhp, Pm, App, Hps, Ssuis, PRRSV, PRCV and SIV was assessed in 12 pig herds differently affected by respiratory disorders. Swabs and blood samples were obtained from 30 growing pigs. Pneumonia lesions were scored at the slaughterhouse and lung tissues taken. Swabs and lung tissues were analysed by PCR to detect bacterial pathogens. Serum antibodies related to viral agents were looked for. Hps, Ssuis and Pm were commonly detected in all farms and rarely at the slaughterhouse. Mhp and App were rarely identified from live pigs. They were isolated at the slaughterhouse in every farm whatever the pneumonia score. Extended pneumonia was mainly observed in herds co-infected with PRRSV and SIV.

Keywords: pigs, respiratory disorders, infection pattern

INTRODUCTION

Respiratory troubles are a worldwide issue responsible for important economic losses especially in intensive confined pig production systems. Multiple pathogens are involved in the disorders such as *Mycoplasma hyopneumoniae* (Mhp), *Pasteurella multocida* (Pm), *Actinobacillus pleuropneumoniae* (App), *Haemophilus parasuis* (Hps), *Streptococcus suis* (Ssuis), Porcine Reproductive and Respiratory Syndrome virus (PRRSV), Porcine Respiratory CoronaVirus (PRCV) and Swine Influenza Virus (SIV) (Thacker, 2001). The aim of the survey was to assess the bacteriological and serological status of 12 French herds in relation to the severity of clinical disease and lung lesions at the slaughterhouse.

MATERIALS AND METHODS

Data collection

The study was carried out from May 2004 to January 2005 in 12 single-site farrow-to-finish herds affected by respiratory disorders at different levels of severity. The farms were proposed by veterinarians of the farmer organisations. In each farm, nasal (VWR International, Fontenay-Sous-Bois, France), tonsillar (VWR International, Fontenay-Sous-Bois, France), oro-pharyngeal (Orifice Medical AB, Ystad, Sweden) swabs and blood samples were obtained from 30 pigs: 10 in the post-weaning section, 10 at the beginning and 10 at the end of the finishing phase. Clinical signs of cough and sneezing were recorded in farrowing, post-weaning and finishing sections. For

the batches of the sampled finishing pigs, lungs of at least 30 pigs were collected at the slaughterhouse. Macroscopic lesions of pneumonia were scored (scale: from 0 to 28 according to the consolidated surface) (Madec and Kobisch, 1982) and samples of lung lesions were taken to the laboratory.

Laboratory analyses

Swabs and lung tissues were examined by PCR for the detection of Mhp, App, Hps and Ssuis according to methods described elsewhere (Savoye *et al.*, 2000; Verdin *et al.*, 2000; Oliveira *et al.*, 2001; Marois *et al.*, 2004). For Pm, the PCR-test was developed in our laboratory. All sera were analysed for the detection of antibodies to PRRSV, SIV (subtypes A/sw/H₁N₁, H₃N₂ and H₁N₂) and PRCV (LDA 22, France). A pig was considered as carrier when at least one swab tested PCR positive. A farm was declared infected by PRRSV or PRCV as soon as 1 serum sample was positive. For SIV, a farm was considered infected when antibodies were detected in at least 2 pigs.

RESULTS

Clinical signs of respiratory troubles were recorded in all farms, sneezing being the most reported one (Table 1). In 6 farms, pigs exhibited sneezing as soon as the farrowing phase. Cough was noticed in fattening sections in 8 out of the 9 farms affected by this symptom. Piglets of 3 farms showed cough outbreaks in the farrowing phase. Hps, Ssuis and Pm were identified from live pigs in the 12 farms. All herds were seropositive to PRCV. Pigs of 3 farms were seronegative to PRRSV and SIV (farms 02, 10 and 12) and those of 4 herds were seropositive to both viruses (farms 01, 04, 07, 08) (Table 1). Mean scores of pneumonia ranged from 0.9 to 10.4. Mhp and Pm were the most frequent bacteria detected in lung tissue showing pneumonia (Table 2).

Table 1. Respiratory symptoms, bacteriological results of swab samples from live pigs and serological profiles (12 pig farms, 30 pigs/farm, 2004–2005)

Farm	Clinical signs ¹		Number of positive pigs					Serological profile ²		
	Cough	Sneezing	Mhp	Pm	App	Hps	Ssuis	PRRS	SIV	PRCV
01	PW/F	Far/PW/F	0	4	2	29	13	+	+	+
02	F	PW/F	0	28	0	30	28	-	-	+
03	-	Far/PW	0	21	11	25	21	+	-	+
04	F	Far/PW/F	2	28	0	30	19	+	+	+
05	-	F	0	13	0	30	19	+	-	+
06*	F	PW	0	20	0	17	17	+	-	+
07**	Far/F	Far/PW/F	3	26	0	30	18	+	+	+
08	F	Far/PW/F	0	8	0	28	2	+	+	+
09	Far/PW/F	F	0	16	0	30	2	+	-	+
10	Far	Far/PW/F	1	19	0	30	13	-	-	+
11	-	PW	1	9	0	28	30	-	-	+
12	F	PW	0	8	2	29	0	-	+	+

* (10 growers and 10 market-aged pigs) ** nasal swabs

1: Far: Farrowing section, PW: Post weaning section, F: Fattening phase

2: +: positive; -: negative

Table 2. Pneumonia scores and PCR results from lung tissues for 12 farms (+: positive; -: negative)

Farm	Pneumonia score (/28) (σ)	mean	Pathogen detection in lung lesions				
			Mhp	Pm	App	Hps	Ssuis
01	6.4 (5.1)		+	-	-	+	-
02	2 (3.0)		+	+	-	-	+
03	2.8 (3.4)		-	-	-	-	-
04	3.7 (3.9)		+	+	-	-	-
05	4.4 (5.8)		+	+	-	-	-
06	9.6 (4.2)		+	-	+	+	-
07	10.1 (6.3)		+	+	-	-	-
08	10.4 (6.7)		+	+	-	-	-
09	2.1 (3.7)		+	+	-	-	-
10	3.3 (4.0)		+	-	-	-	-
11	0.9 (2.5)		+	-	-	-	+
12	5.4 (4.0)		+	+	-	-	-

DISCUSSION AND CONCLUSION

According to our results, respiratory symptoms are widely distributed in pig farms, sneezing being the most prevalent. Cough tended to be limited to the fattening sections. The results of the study showed that the upper respiratory tract of live pigs was commonly contaminated with Hps, Ssuis and Pm. Despite the high prevalence of Hps and Ssuis at the farm level, both pathogens were not systematically recovered from lung lesions. In contrast, although Mhp was rarely detected from live pigs at the farm stage, the pathogen was isolated at the slaughterhouse from lung lesions of pigs coming from all the farms, whatever the pneumonia scores. Although some bacterial pathogens associated with respiratory disorders seem to constitute a common flora in these farms, the viral patterns and intensity of lung lesions differed among herds. Severe lesions of pneumonia were mainly observed in herds co-infected with PRRS and SIV. Obviously, not only bacterial pathogens but also viral ones and other factors related to farming practices must be considered to properly understand the onset and severity of respiratory disorders in pig herds. In addition, the way we used to sample and to process material for pathogen detection in live pigs, especially for Mhp, needs further improvements (mainly sensitivity of detection in live pigs).

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