

Cough Control Program for the identification of respiratory pathogens in PRDC farms



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INTRODUCTION

In fattening pigs, the porcine respiratory disease complex (PRDC) is the main factor for reduced performance globally. Main pathogens for PRDC are *Mycoplasma hyopneumoniae* (Mhyo), Porcine Reproductive and Respiratory Syndrome virus (PRRSv), Porcine Circovirus type 2 (PCV2) and Swine Influenza Virus (SIV). Especially in farms vaccinated for some or all of these pathogens, the evaluation of any responsible pathogen for respiratory problems is difficult. In countries where farmers do not that easily agree to diagnostic necropsies for proper investigation, the efficacy of Mhyo vaccines is quite often in doubt. In Denmark, a program called "three-in-one diagnostics"¹ revealed promising results with regard to a first insight of possible pathogens responsible for the respiratory problems by investigating cough index, Mhyo serology and antigen detection in oral fluids. The objective of this investigation was the evaluation of European farms with a slightly modified program.

MATERIALS AND METHODS

In total, 25 farms were investigated from which 8 served as controls (no relevant respiratory symptoms, cough index (CI) < 2.5) and 17 as case farms where cough was observed in pigs at the age of 5 to 20 weeks. The program consisted of collecting 9 Oral fluid (OF) samples with 3 ropes each in the group of coughing pigs, a group of pigs about 3 weeks younger and a group about 3 weeks older, respectively. OFs were investigated by PCR for SIV, Mhyo, PRRSv and PCV2. In addition 20 blood samples for serology of the oldest fattening pigs in the farm were investigated for Mhyo and in case of inconclusive PCR results additionally for SIV, PRRSv or APP. Cough index of the coughing group was evaluated according to the method described by Nathues et al.² (CI = (counted bouts/(number of pigs observed x observation time in minutes)) x 100). A rate of Mhyo seropositive samples of 50% or lower in the end of fattening was rated to be an indication that Mhyo is not a relevant pathogen in this farm.

RESULTS

In the 8 control farms, the mean CI was 1,28 (median 1,22) and in the 17 case farms the mean and median CI was 6.21 and 5.42, respectively. In contrast to the paper of Nathues et al.², no relationship could be identified between CI and Mhyo-PCR positive OFs at the time of coughing or % total PCR positive OFs per farm (data not shown), which is probably due to vaccination for Mhyo in most investigated farms or cough caused by other pathogens. The detection rate of investigated pathogens in OFs in the different farm categories together with the vaccination rate for the investigated pathogens is summarized in table 1. In 13 of the 17 case farms (76%) Mhyo could mainly be excluded due to the low serological prevalence and/or very low detection rate ahead, at and after cough (≤ 2 of 9 OFs pos) as well as detection of other pathogens (table 1). In these 13 farms cough was most likely due to PRRSv (4x), SIV (6x) and in 3 of these farms the reason was unclear.

In 3 farms (18%) an Mhyo involvement was obvious but other pathogens might as well be the primary pathogen for cough and in only 1 farm (6%) Mhyo was probably the dominating pathogen.

CONCLUSION

Due to a systematic evaluation the program provides indications with regard to the relevant pathogen to allow better conclusions. We were able to demonstrate that in the majority of investigated farms, cough was not related to Mhyo even though it was in most cases highly suspected. However, in some farms further diagnostics are required, preferably full post mortems of clinical cases, especially when a 100% reliable diagnosis is required. It has to be considered that the program provides just a snapshot in time and results may change some weeks later as batch or farm conditions change.

REFERENCES

1. Bak et al. (2014), IPVS Proceedings p. 193
2. Nathues et al. (2012), Veterinary Journal p. 443 – 447

Table 1: Results and vaccination status of case and control farms

Farm category	# Farms (%)	Sero prevalence Mhyo	Mean CI	Mean age at cough (weeks)	M hyo detection in OFs		Detection of other relevant pathogens in OFs at cough	% farms vaccinated for			
					at cough	in all OFs		M hyo	PCV2	PRRS	SIV
Control farms	8 (100)	0 – 100	1,3	n.a.	n.a.	$\leq 6/9$	n.a.	87,5	87,5	25,0	0,0
Case farms A	6 (35)	< 50%	7,4	12,2	< 1/3	$\leq 3/9$	4 farms: PRRS ± others 2 farms: SIV ± others	66,7	66,7	33,3	0,0
Case farms B	7 (41)	$\geq 50\%$	6,7	17,0	$\leq 1/3$	$\leq 2/9$	4 farms: SIV ± others 3 farms: no Mhyo, no others	100,0	100,0	42,9	0,0
Case farms C	3 (18)	$\geq 50\%$	3,4	17,0	$\leq 1/3$	$\leq 5/9$	1 farm: PRRS 1 farm: PCV2 1 farm: SIV	100,0	66,7	0,0	0,0
Case farms D	1 (6)	$\geq 50\%$	4,2	19,0	3/3	8/9	none but PRRS serology positive	100,0	0,0	0,0	0,0

