THE INVESTIGATION OF SEASONAL REPRODUCTIVE DISORDERS IN LITHUANIAN WHITE FEMALE PIGS

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ABSTRACT

Despite domestication, the reproductive performance of female pigs can exhibit strong seasonal trends. Reproduction can be affected by the season and breed. So the purpose of our investigation was to analyse the seasonal reproductive performance in Lithuanian White pig breeding farm.

The investigation of reproductive performance was carrried out in 2006. The role of porcine parvovirus (PPV), porcine reproductive and respiratory syndrome virus (PRRSV), Aujeszky's disease virus (ADV), classical swine fever virus (CSFV), bovine viral diarrhea virus (BVDV), porcine cirvovirus 2 (PCV2), *Chlamydiaceae* (*Chlamydia suis* and *Chlamydophila abortus* infections in reproductive failure was not detected using epizootological, serological and molecular biology methods.

The seasonal differences in losses due to reproductive disorders were observed. Altogether 3154 pigs were inseminated and 572 (18.1%) returned to oestrus. It was found that 12.9% (97/752), 13.4% (107/796), 16.4% (124/755) and 28.7% (244/851) inseminated pigs returned to oestrus in I, II, III and IV quarters, respectively. Altogether 1956 (85.6%) pigs farrowed and 330 (14.4%) pigs aborted. It was found that 90.0%, 89.1%, 85.5% and 77.8% pigs (farrowings/ confirmed to be pregnant after insemination) farrowed in I, II, III and IV quarters.

KEY WORDS: Swine reproduction, PCR.

INTRODUCTION

Pig farms experience big economic losses due to infectious and noninfectous reproductive disorders in Lithuania from time to time. It is well-known that infectious pathogens can play essential role in reproductive performance [3]. The role of some noninfectious factors (temperature [2], season [5], breed [7, 8] and others) are often underevaluated but it can be overevaluated also, when infectious agents are not excluded. The development and introduction of PCR methods for diagnosis of PPV, PRRSV, ADV, CSFV, BVDV, PCV 2, *Chlamydiaceae* infections enabled us to confirm or deny the etology of infectious reproductive disorders [5]. So now the evaluation of seasonal reproductive disorders can be performed more reliably.

Considerably higher prevelance of "undiagnosed" abortions is observed in some swine farms from September through December every year [1]. But its influence on reproduction is different in various farms. Seasonal reproduction disorders can be very problematic for some breeding farms. For investigation we chose Lithuanian White pig breeding farm which experienced big losses due reproduction disorders and sent us samples of pathological material for testing with respect to infectious diseases. It was suspected that sows may abort form 30 to 110 days after breed and affected sows do no show signs of fever or toxemia. In addition, the aborted fetuses are normal in size, devoid of pathologic lesions and infectious agents are absent mostly. Serologic testing of affected sows fails to demonstrate a pathologic agent [1].

So the purpose of our investigation was to analyse the seasonal reproductive performance in Lithuanian White pig breeding farm in 2006.

MATERIAL AND METHODS

The investigation was made in Lithuanian White pig breeding farm in 2006.

Epizootoological methods. The epizootic situation was estimated. The analysis of reproduction data was made. The changes in occurrence of reproduction disorders during different months and quarters was studied.

Serological methods.

HI. HI was performed using V-type microplates and 0.75 % human 0 group red blood cells suspension [4]. HI was performed to detect seroconversion in stillbirths.

Molecular biology methods.

Altogether 13 samples of stillbirth and mumified fetus were taken.

DNA extraction. The total DNA was extracted from the homogenized tissues by phenol chloroform isoamyl alcohol method [6]. Extracted DNA was used for detection of PPV, ADV, PCV and *Chlamydiaceae (Clamydia* and *Chlamydophila).*

RNA extraction. Trizol method was used. Extracted RNA was used for detection of PRRSV, CSFV and BVDV [6].

PCR. Different PCR methods (Table 1) were used to diagnose the infections of PPV (nested PCR), PRRSV (nested PCR), BVDV (nested PCR), CSFV (nested PCR), ADV (PCR), PCV2 (PCR) and *Chlamydiaceae (Clamydia* and *Chlamydophila,* nested PCR) [6] .

RESULTS AND DISCUSSION

First of all the investigation of epizootic situation was carried out. No clinical or epizootological signs characteristic for CSF and ADV was found (Table 1). Boar semen samples were checked and it was found to be suitable for insemination.

The role of PPV, PRRSV, ADV, CSFV, BVDV, PCV 2, *Chlamydiaceae* (*Chlamydia suis* and *Chlamydophila abortus)* infections in reproductive failure was not determined using clinical, epizootological, serological and molecular biology methods.

Table 1

The results of laboratory and epidemiological diagnosis for infectious agents in 2006

No.	Infectious agent	Epizootology and clinical signs	Molecular biology	
			PCR method and results	2006, XI[1]
				Samples tested, n
1.	PPV	Negative	Nested PCR negative	13
2.			HI negative	8
3.	PRRSV	Negative	Nested PCR negative	13
4.	BVDV	Negative	Nested PCR negative	13
5.	CSFV	Negative	Nested PCR negative	13
6.	ADV	Negative	PCR negative	13
7.	PCV2	Negative	PCR negative	13
8.	*Clamydia*	Negative	Nested PCR negative	13
9.	*Chlamydophila*	Negative	Nested PCR negative	13

Note. XI[1] – November.

Of course, our results can not exclude as the direct affect, as the indirect affect of infectious diseases on reproductive performance totally, but at least it should not be overestimated.

As it is shown in Table 2, 3154 Lithuanian White pigs were inseminated in farm and 572 (18.1%) ones returned to oestrus. It was found that 12.9% (97/752), 13.4% (107/796), 16.4% (124/755) and 28.7% (244/851) inseminated pigs returned to oestrus in I, II, III and IV quarters, respectively. The worst situation was in November. It was found that percent of returned to oestrus pigs ranged from 9.9% to 36.4% in different months in 2006. The seasonal prevalence of reproductive failure was evident.

Table 2

The results of insemination and return to oestrus of pigs in 2006

Period		Inseminated pigs		Pigs returned to oestrus			
Month	Quater	n	n	n		%	
I	I	273	752	27	97	9.9	12.9
II		218		42		19.3	
III		261		28		10.7	
IV	II	246	796	32	107	13.0	13.4
V		286		37		12.9	
VI		264		38		14.4	
VII	III	256	755	43	124	16.8	16.4
VIII		259		44		17.0	
IX		240		37		15.4	
X	IV	275	851	72	244	26.2	28.7
XI		286		104		36.4	
XII		290		68		23.4	
I-XII	I-IV	3154		572		18.1	

As it is shown in Table 3, 1956 pigs farrowed in 2006. It was found that 330 (14.4%) sows aborted in 2006. The worst situation was in November of 2006. It was found that percent of "not in pig" sows ranged from 5.2% (March) to 27.0% (October).

It was found that in the first quarter of 2006 88.9% inseminated and confirmed pregnant pigs farrowed, in second – 87.8%, in third – 83.1% and in fourth one – 71.4%.

Altogether 1956 (85.6%) pigs farrowed and 330 (14.4%) pigs aborted. It was found that 90.0%, 89.1%, 85.5% and 77.8% pigs (farrowings/ confirmed to be pregnant after insemination) farrowed in I, II, III and IV quarters. And respectively 10.0%, 10.9%, 14.5% and 22.2% pigs aborted in I, II, III and IV quarters.

Table 3

The data about pig farrowings and abortions in 2006

Period		Farrowings, n		Abortions m			
Month	Quater	n	n	n		%	
I	I	143	496	23	55	13.8	10.0
II		172		22		11.3	
III		181		10		5.2	
IV	II	175	525	18	64	9.3	10.9
V		175		29		14.2	
VI		175		17		8.8	
VII	III	157	484	31	82	16.5	14.5
VIII		180		18		9.1	
IX		147		33		18.3	
X	IV	180	451	66	129	27.0	22.2
XI		151		20		11.7	
XII		120		43		26.4	
I-XII	I-IV	1956		330		14.4	

Many producers and veterinarians overlook seasonal patterns of reproductive performance in swine farms . As mentioned previously, accurate records are essential to characterize seasonal infertility and the severity of this problem varies from year to year and from farm to

farm. Unfortunately, the diagnosis of seasonal infertility is often made after the detrimental effects have decreased performance. Consequently, producers have insufficient time to institute management changes. Like so many other management procedures, prevention is the most cost effective approach to seasonal infertility [1]. Seasonal infertility is a photoperiod induced phenomenon that can be manipulated by changes in photoperiod and by accounting for season as a significant factor when feeding strategies are applied in commercial piggeries [5].

A stringent pregnancy diagnosis program is useful, particularly in the autumn months. Due to the increased incidence of pseudopregnancies and autumn abortions, producers must identify these open females as soon as possible. The forementioned procedures should prove useful to reduce the number of non-productive sow days and maintain optimum productivity [1].

However seasonal reproductive problems have a lot of (co)factors and to solve problems it is not easy [9]. Various dominating factors can be different in farms and periods.

CONCLUSIONS

1. The role of porcine parvovirus, porcine reproductive and respiratory syndrome virus, Aujeszky's disease virus, classical swine fever virus, bovine viral diarrhea virus, porcine cirvovirus 2, *Chlamydiaceae* (*Chlamydia suis* and *Chlamydophila abortus)* infections in reproductive failure was not detected.
2. Symptoms of reproductive disorders and changes in frequency during different seasons are characteristic to Autumn Abortion Syndrome.
3. Losses due to Autumn Abortion Syndrome are significant and predisponing factors should be determined.

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