Legs and Claws Condition and Lameness in Sows

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Abstract

Lameness is a multi-factorial condition that depends on managerial as well as genetic variables, but often is related to legs and feet condition of the animals. The aim of the study was to give an overview of the condition of legs and claws, and the presence of lameness in sows in one industrial farm. A total number of 130 animals (90 dry i.e. pregnant and 40 lactating sows) were observed. The occurrence of joints swellings, claw problems (long toes, dew claw problems, cracked hoof walls) and lameness (in animals in collective boxes) were visually recorded and then classified according to the appropriate protocols. The results showed the occurrence of one or more of the assessed conditions in 40% of pregnant sows and in 45% of sows in lactation. More than 20% of the pregnant sows were lame. A statistically significant positive correlation was found between the prevalence of lameness and leg swellings and between lameness and claw problems in pregnant sows (in both cases $p<0.0001$). The results proved that lameness is a significant problem in the studied farm. In general, more attention should be given to the monitoring of sows' physical condition and behaviour, to minimize the occurrence of welfare problems and to reduce production losses.

Keywords: *claw lesions, lameness, leg swellings, sows, welfare*

INTRODUCTION

Problems in locomotion are very common in pigs kept in industrial farming conditions. Lameness is a multi-factorial condition that depends on managerial as well as genetic variables, but often is related to legs and feet condition of the animals (Pluym *et al.*, 2011; Nalon *et al.*, 2013). It is proven that specific types of claw lesions are associated with an increased risk of lameness (Anil *et al.*, 2007). Furthermore, lameness is often a reason for lower reproductive performances and premature culling of sows (Anil *et al.*, 2005; Pluym *et al.*, 2012; Lisgara *et al.*, 2015).

Claw lesions and lameness have a negative impact on welfare and production, causing important losses to the pig sector. The possibility to recognise, treat and prevent these disorders depends on the availability of reliable and valid assessment methods, as it is described in paper by Nalon *et al.* (2013).

Data on the extent of the leg and claw problems in the Serbian pig farms are not easily available. In farm records these problems are registered as one of the reasons for sows' culling. However, continuous monitoring for lameness is not a common praxis and the number of the animals at risk is not exactly known. The aim of the study was to give an overview of leg and claws problems and the presence of lameness in sows in a commercial farm.

MATERIALS AND METHODS

This study was carried out in a high capacity commercial pig farm in Serbia with a total number of 1285 sows. During the gestation period the sows were group-housed in boxes with, solid,

slatted and combined floors without bedding (4 to 5 animals in 7.5 m^2 box). During lactation they were in standard farrowing crates with semi-slated floors (1.43 m^2 for the sow, 6.07 m^2 for her piglets; total box surface 7.5 m^2).

About 10% of total number i.e. 130 animals (90 pregnant i.e. dry and 40 sows in lactation) were assessed in their boxes for leg swellings and claw lesions, and the dry sows also for lameness. The boxes have been randomly selected (every third box in the row) as well the sows in collective boxes (3 animals in each collective box). All three parameters were assessed visually, using a scale from 0 to 2 from appropriate protocols: for leg swellings the AssureWel swine protocol (AssureWel, 2015), for claw lesions identification (toes length, dew claw condition and cracked wall) modification of ZinPro method (Feet First Team, 2010), and for sows locomotion assessment the Welfare Quality assessment protocol for pigs (Welfare Quality®, 2009), respectively were used. Data on the reasons for culling and number of sows culled in the previous year were taken from the farm records.

The obtained data were processed using Kruskal-Wallis test, by SAS® 9.3 Software and Microsoft Office EXCEL 2010.

RESULTS AND DISCUSSION

Table 1 shows the data regarding the prevalence of leg swellings in dry and lactating sows.

According to table 1, the results were similar for both categories, no significant difference was found and showed that differences are not significant ($p > 0.05$). Most of the animals were without any leg swellings (96.67% dry and 95% lactating sows), what is better result than in a study of Knage-Rasmussen (2014). In some animals small sized swellings were noticed (in 3.33% of the dry and 5% of the lactating sows), and there were no animals with large swellings on their legs.

Much higher number of animals with leg tumefactions can be expected to be found in farrowing houses, considering that these spend most of their time lying on a hard surface. Leg swellings are caused by inadequate environment and are associated with poor flooring conditions and lack of bedding material. Most often, they are manifested as bursitis, a specific condition, which arises from constant pressure and trauma to the skin overlying any bony prominence. Bursae are most prevalent in the hock region of the hind limbs. Leg swellings may be associated with abnormal posture, locomotion and foot lesions of the hind limb and therefore especially if painful, have a detrimental effect on pig welfare (Gillman *et al.*, 2009; WelfareQuality®, 2009; AssureWel, 2015).

Examination of claws condition gave similar results, namely the differences between the two categories of sows were not significant ($p > 0.05$):

Dew claws: 0 - slightly longer than normal; 1 - claws extend to floor surface when the pig is standing; 2 - claw is torn and/or partially or completely missing.

Cracked wall horizontal: 0 - haemorrhage evident, short/shallow horizontal crack in toe wall; 1 - long but shallow horizontal crack in toe wall; 2 - Multiple or deep horizontal crack(s) in toe wall.

Cracked wall vertical: 0 - short/shallow vertical crack in toe wall; 1 - long but shallow vertical crack in toe wall; 2 - multiple or deep vertical crack(s) in toe wall.

Claw lesions are of various types and prevalence. Of particular importance, due to their high prevalence and association with lameness, Anill *et al.* (2008) stand out cracks of the outer wall and white line lesions. In our study, in most of the animals (57.63% dry and 57.50% lactating sows), mild changes were noticed, usually slightly longer dew claw. However, in 36.66% dry and 42.50%

Tab. 1. The prevalence of leg swellings in dry and lactating sows

Score*	Sows (%)	
	Dry	Lactating
0	96.67	95.00
1	3.33	5.00
2	0	0

*0 - no evidence of swelling; 1 - swelling present up to 5cm in diameter (walnut-sized); 2 - swelling present larger than 5cm diameter (walnut-sized) or any swelling that is eroded.

lactating sows more serious problems have been noticed, scored as 1 and 2. Cracks are visible if the wall of claw is sufficiently clean, so it is possible that some cases were missed.

According to other authors (Anill *at al*., 2007; Pluym *et al.*, 2011, 2013) prevalence of claw lesions in the breeding herd could be up to 80-90%. However, our results could be influenced by the fact that we did not take into account lesions at the heels' level. Changes in that region are visible only if the animal is not in standing position; the point of this study was to check animals causing minimal disturbance, without forcing them to lay down.

Claw lesions in pigs may cause lameness immediately due to the pain associated with the lesion or may act as an entry point for infections that spread upwards, affecting the internal structures of the foot. Group housing makes high demands on the locomotor system, particularly the feet of sows. It has been reported that about 80% of lameness in these systems is associated with foot problems (Anill *et al.*, 2008).

Table 3 shows the prevalence of lameness in dry sows kept in groups, in collective boxes.

The most of the sows (76.67%) have had no problems in locomotion or they were barely noticeable. In 23.33% of dry sows severe problems in locomotion were presented (score 1 and 2). In a couple of papers of Pluym *et al.* (2011, 2013) data on the average prevalence of lameness about 10% or below this value are provided, but it can reach up to 28%.

Strength and significance of correlation between observed parameters is shown in Table 4.

In a research of Pluym *et al.* (2011) locomotor disorders are the second reason for the (early) culling of sows. According to the records, in previous year 10.70% sows from the examined farm were culled because of lameness or immobility related to problems in legs or claws. Results from this study shows that 40% of the dry and 45% of the lactating sows have had changes in one or more of the examined parameters. In dry sows, 12.22% have had problems with claws

Tab. 2. Occurrence of claw lesions in dry and lactating sows

Score*	Sows (%)	
	Dry	Lactating
0	57.63	57.50
1	34.44	37.50
2	2.22	5.00

**Toes length*: 0 - one or more toes slightly longer than normal; 1 - one or more toes significantly longer than normal; 2 - long toes that affect gait when walking.

Tab. 3. The prevalence of lameness in dry sows

Score*	Dry sows (%)
0	76.67
1	20.00
2	3.33

***** 0 - normal gait, or the animal has difficulties walking but is still using all its legs; 1 - severe lame (asymmetric walking); 2 - no weight-bearing on the affected limb, or the animal is unable to walk.

Tab. 4. Correlation between different parameters assessed in dry and lactating sows

Sows	Parameters	N	r_s	p-value
Dry	Leg swellings & Lameness	90	0.4038	<0.0001
	Leg swellings & Claw problems	90	0.1092	0.3054
	Claw problems & Lameness	90	0.4381	<0.0001
Lactating	Leg swellings & Claw problems	40	0.0228	0.8888

N - number of sows; r_s - Spearman correlation coefficient

and lameness and 2.22% had all three problems simultaneously.

The relation between leg and claw problems and appearance of lameness is well known (Anill *et al.*, 2007). In our study significant positive correlations were found ($p < 0.0001$, both) between leg swellings and lameness, leg swellings and claw problems and lameness (Table 4).

CONCLUSIONS

This study showed that in both categories of the assessed sows almost half of the animals have had some problems in their legs, claws or both. The appearance of leg swellings was not frequent in the investigated farm. Claw lesions were more noticeable, and more than third of animals in both categories, dry and lactating sows, have had some lesions of their claws. The prevalence of lame animals was not low but it was in accordance with the findings of other authors, as well as the significant positive correlation between leg swellings and claw problems with lameness, found in dry sows.

This research gave the overview of the current situation at the farm, taking into account the selected sample of animals. As such, they represent a good basis for further research on this and other pig farms, and for creating strategies to minimize the problems.

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