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ASSESSMENT OF SOME WELFARE PARAMETERS IN LACTATING SOWS

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Abstract

In this paper, some welfare problems of sows during period of the lactation are considered. The study was conducted on 40 randomly selected sows in 2 to 4 weeks of lactation, housed in separate facility at the commercial pig farm and in common farrowing pens. Using appropriate protocols, the following parameters have been assessed: body condition, cleanliness, skin condition, body lesions in general and in different body regions, and claws condition. According to the results, body condition of the sows was significantly influenced by period i.e. week of the lactation ($p < 0.001$), and 20% sows were too thin. Skin was not clean enough in 15% of the animals, 30% had some signs of skin inflammation and in 42.5% claws lesions have been recorded. The strongest positive correlations between skin condition and total surface under lesions ($p < 0.001$), and between total lesions and hindquarters lesions (both $p < 0.01$) were found. The results show that welfare of lactating sows had been impaired in all of observed aspects. More attention should be given to monitoring of sows' condition, to minimize the occurrence of welfare problems and to reduce production losses.

Keywords: lactating sows, body condition, cleanliness, skin, claws, lesions

Introduction

Commercial pig farming faces numerous animal welfare problems in all production categories. Animal welfare of sows during the lactation period is an increasing concern and the widely used farrowing crates are under discussion (Lambertz et al., 2015).

In last few decades, different welfare assessment protocols for pigs have been developed. They are based on various combinations of welfare indicators related to the production system, husbandry routines, and animal responses such as behavior and health. Special attention is paid to animal-based indicators, such as body condition, body marks, lameness, cleanliness etc. Regularly scoring appropriate outcome measures can identify welfare problems and be used to set targets or benchmark for improvements through an active program. Actually, in a broader sense, the goal of a welfare assessment system may be to certify the level of welfare on specific farms, compare the welfare in different production systems, or serve as an advisory tool that allows the farmer to identify, prevent or rectify

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welfare problems on the farm (Johnsen et al., 2001; Bonde, 2003; Welfare Quality, 2009; Sommerville, 2016).

Data on the extent of welfare problems at Serbian pig farms are limited, considering number of the study in this field is not large. The aim of this paper is to give an overview of general condition of sows in lactation and to point on the presence of some welfare problems at one typical commercial farm.

Material and Methods

The study was conducted on total 40 sows in a farrowing facility of the commercial pig farm. The sows were randomly selected (every third box); selected animals have been in second to fourth week of lactation (17 in second, 3 in third and 20 in fourth week). Dimensions of single farrowing pen with semi-slatted floor were 3 x 2.5 m, with area for the sow inside the pen of 0.65 x 2.20 m (1.43 m²).

In the sows, several welfare parameters have been visually assessed using following protocols: body condition, cleanliness, skin condition, lesions in general and in specific body regions - shoulder, hindquarters, flanks, legs, ears and head (AssureWel, 2015), and claws condition - toes length and dew claw condition (according to ZinPro classification; Feet First Team, 2010).

For assessment of the most of the parameters, three levels scale (from 0 to 2) is used: (0) refers to normal (or desirable) condition or mild changes, (1) is worse and (2) is the worst condition of the parameter which is observed (in the protocols, a detailed description for the each score of single parameter is given). However, the protocols for body and claws condition assessment have different scales. For performing statistical analyses, their scales were adjusted using description in their protocols, what is shown below the tables with results.

Data were processed by SAS® 9.3 Software and Microsoft Office EXCEL 2010.

Results and Discussion

In table 1 the average scores for body condition of lactating sows in different weeks of lactation are presented.

Table 1. Body condition of the sows in lactation

BODY CONDITION		Sows in different weeks of lactation (%)		
score*	description in the protocol	2 nd	3 rd	4 th
1	thin	/	/	20.0
2		29.4	100	80.0
3	moderate	70.6	/	/
4	fat	/	/	/
5		/	/	/

* adjustment from 1-5 scale to 0-2 scale: 1 = 2, 2 = 1, 3 = 0

Results show that body condition of the sows decreased with the length of lactation. One-way ANOVA and LSD test confirmed that week of the lactation significantly influenced sows' body condition ($p < 0.001$), with significant difference between 2nd and 4th week ($p < 0.001$).

Sows should not enter the farrowing house with a condition score of less than 3. Body condition should not drop more than 1 point during lactation (Sommerville, 2016). The condition of the sow may reduce to score 2 during the lactation period but it is unacceptable for any sow to have a condition score of less than this (Anon., 1998). In our study, 20% of sows in the fourth week of lactation were in poor condition.

Table 2 shows results for skin and claws condition parameters assessment.

Table 2. Skin and claws condition of the sows in lactation

Score	Sows (%)			
	Cleanliness	Skin condition	Body lesions	Claws condition*
0	85.0	70.0	70.0	57.5
1	15.0	27.5	25.0	37.5
2	/	2.5	5.0	5.0

* adjustment from 1-3 scale to 0-2 scale: 1 = 0, 2 = 1, 3 = 2

According to AssureWel protocol (2015), it is preferred to have >80% pigs with score 0 and <5% with score 2. In our study, skin of the majority of sows (85%) was clean. It means that <20% of their body was soiled with slurry/urine/feces (protocol description). In other animals (15%), body surface was dirty between 20 and 50% (almost all in the second week of lactation), and there were no animals whose body is $\geq 50\%$ soiled.

In 70% of the sows skin was without signs of diffuse inflammation or discoloration. Mild changes were noticed in 27.5% animals (mostly in the second week of lactation), and in 2.5% (in second week of lactation) more than 10% of the skin had an abnormal color or texture.

Similar result is for skin condition regarding the existence of different lesions (grazed/broken skin, fresh i.e. bleeding wounds and healing lesions i.e. scabs): the majority was without lesions or they were less severe than described as mild changes (70%), 25% had mild changes (linear lesion longer than 10 cm, or ≥ 3 linear lesions, or a circular area 1-5 cm diameter), and lesions in 5% of sows were assessed as severe (circular lesion or area of lesions ≥ 5 cm diameter, or lesion extends into deeper layers of skin, or the lesions cover >25% of the skin).

Single mild lesions probably have little impact on the animal, whereas increased numbers of lesions or more severe lesions are likely to be painful and cause distress. Anyhow, skin lesions provide a route for infection into the body. A high percentage of pigs with mild lesions is an evidence of unrest within the pigs or poor housing maintenance. In lactating sows, wounds and lesions can be consequences of poorly designed pens with rough flooring or sharp edges. Also, they may occur earlier, as a result of agonistic interactions among dry sows in group pens.

Claw lesions are very common problem in sows, associated with lameness, poor reproduction results and a high risk of early culling (Pluym et al., 2012; Lisgara et al.,

2015). Among all common claws' problems, we paid attention on toe and dew claws length: there were 57.5% animals with one or more toes and/or dew claws slightly longer than normal, and 37.5% with one or more toes significantly longer than normal or dew claws extend to floor surface when the pig is standing. The other 5% have had very long toes or dew claw is torn and/or partially or completely missing.

The next table shows the incidence of lesions in certain body regions of the sows.

Table 3. Lesions in different body regions of the sows

Score	Sows with lesions (%)				
	Shoulder	Flank	Hindquarters	Legs	Ears and head
0	70.0	92.5	92.5	95.0	100
1	27.5	5.0	7.5	5.0	/
2	2.5	2.5	/	/	/

Lesions on the shoulder are typically round and likely to be very painful. They are usually present long periods of time, and they are also often reoccurring. They indicate inappropriate housing, feeding or management. Marks on the hindquarters are likely to indicate competition around the feeders – but can also be the result of social fighting where the defeated pig is unable to escape the aggressor. Marks on the back and flanks (especially parallel scrape marks) indicate mounting behavior (which can indicate disturbance or excitement in the pen, as well as increased sexual maturity). Marks on the legs are likely to indicate an issue with flooring, e.g. abraded bursae are associated with rough/uneven surfaces. Marks on the head and ears often indicate bite marks from fighting to establish or maintain social rank. The goal in the herd is to have minimal number of minor lesions and no severe lesions across all individuals (Mullan, 2013; Sommerville, 2016).

According to the results, in 70% sows were no skin damage on the shoulder; 27.5% had mild changes (grazed or broken skin or swelling), and in the rest (2.5%) lesions were severe (>5x5cm or deep tissue injury). Lambert et al. (2015) have had better results in their study: they have also found shoulders lesions as a dominant type of injuries, but only in 14% of lactating sows.

The most of the sows have had no lesions in flank and hindquarter region (both 92.5%), and no lesions or swellings in the region of legs (95%). Mild lesions were found in all three regions (5%, 7.7% and 5%, respectively), but severe lesions were found only in the flank region in 2.5% of the animals. The sows have had no lesions at their ears and/or head.

In table 4, only significant correlation found between observed welfare parameters are presented.

Table 4. Significant correlations between welfare parameters in lactating sows

Parameters	r_s^*	p-level
Cleanliness & Skin Condition	0.365	0.021
Cleanliness & Lesions Total	0.348	0.028
Skin Condition & Lesions Total	0.886	0.000
Skin Condition & Shoulder Lesions	0.328	0.039
Skin Condition & Claws Condition	0.339	0.032
Lesions Total & Hindquarters Lesions	0.462	0.003
Leg swellings & Shoulder lesions	0.336	0.034
Leg swellings & Hindquarters lesions	0.370	0.019

* r_s – Spearman's rank correlation coefficient

According to the results, there were significant positive correlations between following parameters: cleanliness and skin condition, and cleanliness and body lesions total (both $p < 0.05$); skin condition and lesions total ($p < 0.001$), skin condition and shoulder lesions, and skin condition and claws condition (both $p < 0.05$); lesions total and hindquarters lesions ($p < 0.01$); leg swellings and shoulder lesions, and leg swellings and hindquarters lesions ($p < 0.05$). Body condition and flank lesions were not correlated with any other parameter ($p > 0.05$).

Conclusion

The results showed that welfare of selected lactating sows had been impaired in all of observed aspects. It is particularly worrying bad condition of sows in the fourth week of lactation, as well as claws condition in general and number of animals with lesions in the area of shoulders. Applied methods proved to be useful in obtaining quick insight into some welfare aspects of sows. Deeper analysis of the causes and age of the processes on animals' body is subject of other types of research.

We can recommend that more attention should be given to monitoring of sows' condition in all segments of production cycle, to minimize the occurrence of welfare problems and to reduce production losses.

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