The Welfare of Gestating Sows in Different Housing

Ioana Andronie, Monica Pârvu, Viorel Andronie, Alina Radu

University "Spiru Haret", Faculty of Veterinary Medicine, 021127 Bucharest, Masina de Paine, 47, Romania

Abstract

The aim of our study was to assess the welfare of pregnant sows housed in collective pens, based on indicators such as behavior, skin lesions and lameness in two commercial farms where the floor area (A- continuous, B- slatted) and environmental enrichment have been different. Observations were made on 120 pregnant sows (LandracexLarge White), during pregnancy period. Behavior was assessed by direct observation, and each event was expressed in terms of total active behavioural manifestation. Skin lesions were rated on a three degree scale from 0 to 2 (absence of lesions, surface lesions, severe lesions). Investigation behavior was clearly shown in B pens (67%) compared with A (52%) in the first and last weeks of gestation; a high incidence of positive social interactions was recorded in A pens (21%). Number of sows with lameness was higher in A pens (3,9%) compared with B pens (1,7%), and the skin lesions of 4,5% in B pens. All indicators monitored have recorded changes in both pen types. The welfare of pregnant sows should be evaluated using different criteria depending on breeding technology.

Keywords: behaviour, housed, pregnant sows, welfare

1. Introduction

While in their natural environment, the pigs display preferential behaviors for food, water, companionship as well as manifestations of danger avoidance. Likewise, they invest a lot of time and energy both in the environmental investigation behavior and monitoring its diversity [1,2].

Pigs living conditions are entirely different in intensive farming compared to their natural environment, as they are constantly subject to stressful procedures generated by various activities such as: castration, tail docking, teeth trimming, animal mixing and at the end of the production cycle transport to slaughter house.

The negative implications of long term exposure to suffering are often obvious in the critical stages of animal production and reproduction, as they are menacing and negatively impact their welfare. Behavioral displays are also important indicators in assessing animals' necessities, preferences and finally their welfare level.

De Wood-Gush and collaborators (1990) have shown that sows prefer to have social contact and interact in a friendly manner with the other individuals much more so than acting aggressively as long as space is sufficient and the environment is adequate. The sows also visibly manifest themselves when they want to avoid other sows, which might attack them. The time spent by sows housed in groups depending on the housing floor and the pen environment may be conducive to more or less intense aggressive behavior displays, which may increase the probability to catch the attention of or challenge the more dangerous individuals [3].

A partial behavioral response to stress may be the interruption of the normal behavior. Poor animal welfare is due both to individuals' inability to control their interactions with the environment they are living in and direct negative effects of lack of resources by means of physiological mechanisms.

Since the housing conditions and management on the farm may influence animal welfare and health, our study monitored the welfare levels of group housed pregnant sows in different housing conditions, by monitoring their behavior and number of lesions at body and limb level.

* Ioana Andronie, ioanaandronie@innovet.ro

2. Materials and methods

The study aimed to assess the welfare of gestating sows (n: 120, Landrace x Large White) which had been housed in two commercial farms in similar shelters in terms of construction, organized in collective pens and provided with a computerized microclimate control and monitoring system. The study period was March to October, when animals were not taken out of the production cycle and were identified by means of a marker spray for easier observation.

Depending on the housing surface, the sows were grouped in lots (n: 30) throughout the gestation period in collective pens as follows: A lot, discontinuous flooring pens, and B lot – concrete continuous flooring pens provided with various occupational materials. Housing surface was the same regardless of the flooring type, while the pens had the same feeding and drinking utilities. Feeding was carried out on age and production specific formulas and all animals had free access to water.

The behavior was assessed by direct observation in one of the farms (A lot), three times a day (9.00,13.00, and 18.00 hours respectively), for 10 minutes weekly (1, 3, 9, 15 week of pregnancy). Each behavioral display was expressed in relation to the total amount of active behavior. The behavior was assessed via a recording system in the other farm (B lot), continuously 24/h.

The monitored behaviors (table 1) were: resting, laying down (lateral or ventral position), walking, investigation, socializing, aggressiveness, others (feeding, watering,).

Table 1. The behavior of pigs participant to the research, monitored throughout the period

Observed behaviour	Description of behaviour manifestations
Investigation behaviour	examination of pen walls, flooring; movement around the pen, manipulating objects
Resting behaviour	lying down, eyes closed
Social behavior	interacting with other congeners,
Aggressive behavior	fight between two animals from the same pen
Other behavior	standing position without activity, watering, feeding, others who not mentioned above

Skin lesions were assessed by pointing, depending on their presence and protuberance on a 0 to 2 degree scale (0 - no lesions; 1- surface lesions and limb diseases; 2 – severe skin lesions, severe limb diseases).

Statistical analysis of data included the t test in order to be able to compare the prevalence of behavioral manifestations of gestating sows from the two farms and the standard deviation, in order to highlight the skin lesion and limb diseases occurrence in animals participant in the study.

3. Results and discussion

Behavioral manifestations of animal can provide indications about the preferences, needs and health status of the animals.

Mixing the sows in collective pens during gestation period led to diverse behavior manifestations in terms of time. In the continuous flooring, enriched environment pens the occupational under bedding (straw) and manipulation of objects (wooden and plastic objects) have led to a higher percentage of investigative behavioral (36,72%) and socializing display (5,12%) was different in the first week following mixing and the last week of gestation, compared with 25,2 % behavior of environment investigation and 10,7% socializing behavior in the pens that had no occupational materials - A lot (table 2).

The animal investigation behavior may be associated with fear in a new environment. Eduards et al. (1993) have shown that welfare of sows housed in groups may be affected as a result of interactions contributively to fear and anxiety (during mixing and feeding time), depending on group size and pen construction (surface, flooring type and occupational materials).

In our observations fear was clearly manifested at the humans presence and less obvious in animals newly introduced in the pen.

Aggressiveness displays (table 2) were recorded in a larger number in A lot sows (1,2%) compared to (0,14%) in the B lot. Together with the animals' uncertainty within the group, stressful events may trigger aggressive behavior. Its appearance may be normal and sought for as it might sit well with the animal's adjusting behavior. Aggression was lower in the last week of gestation from the first week since the group hierarchy was already established.

Table 2. Behavioral manifestations (%) of pregnant sows in the different environmental pen

Gestation week/ lots/	1		9		15	
behavioral manifestation (%)	A lot	B lot	A lot	B lot	A lot	B lot
Resting	29,54	23,87	49,6	54,2	71,12	65,10
Investigative behavior	25,2	36,7	12,6	14,2	14,2	16,1
Social behavior	10,7	5,12	9,9	3,66	0,4	1,9
Agresive behavior	1,2	0,14	0,8	0,10	0,12	0,6
Other	33,36	34,17	27,1	26,84	14,6	16,3

Previous research has shown that an enriched raising environment facilitates the enhancement of pigs social behaviour, and is reduced to the aggressive behaviour, towards pigs raised in a non-enriched environment [5].

The gestating sows from the A lot which had been housed on discontinuous floor, without occupational materials spent 29,54 % of their time to rest during the first week, and reached 71,12% of their time during the last week of gestation. Compared to these values, the same behavioral display recorded values of up to 23,87% during the first week in the B lot, and reached 65,10% in the last week of gestation.

The data obtained during research points to the fact that welfare was affected when there was no opportunity to explore the environment or to manipulate the materials. We correlated the above data with the rather high number of skin lesions as well.

The occurrence of lesions was higher in sows from the A lot compared to the ones from the B lot. The results have demonstrated that skin lesions were prevalent (4,9%) as recorded during the first week following mixing (A lot), compared to 4,5% from the B lot (table 3), while the laminitis cases prevailed in the A lot (3,9%) compared to only 1,7% in the B lot.

Lesions in the first week were more numerous as a consequence of the aggressions after mixing animals in pens. The high incidence of lesions recorded in the first week, was due to competition among sows for the feeding place. Lameness registered has also implications in welfare sows depreciation by inducing pain.

Some of these lesions appeared during aggressive social encounters whereas others as a result of fights to take a better feeding place or when the new sows were introduced in the pens (A lot).

Table 1. Skin lesions and lameness (%,±) of pregnant sows in the different environmental pen

Lesions, and lameness score (%±,)		Animals lots A lot	B lot
Lameness	0	96,1±1,8	98,3±0,8
	1	3,0±0,2	1,1±0,5
	2	0,9±0,1	0,6±0,1
Skin lesions	0	95,1±2,1	95,5±1,1
	1	4,0±0,2	3,9±0,2
	2	0,9±0,08	0,6±0,05

These indicators are very useful in practice for determining the welfare of animals depending on growth conditions.

4. Conclusions

Behavioral displays, which negatively influence the welfare of gestating sows, housed in collective pens with discontinuous flooring and without occupational materials (A lot) consisted of aggressiveness 1,2% compared to 0,14% in the B lot, investigative behavior 67% in the B lot compared to 52% in the A lot, and social interactions 21% in the A lot compared to 11% in the B lot.

The sows from the continuous floored pens featuring also occupational materials were able to better express their behavior which ultimately led to better health maintenance, with fewer skin lesions (4,5%) and laminitis cases (1,7%). They also had a permanent control over their environment as they dedicated more time to exploring behavior and opportunities to manifest positive social interactions.

Keeping sows in collective pens ensures their completely adequate welfare under the following circumstances: there are occupational materials in the pens, the group is relatively stable and sows return to this group after they give birth and animal mixing is carefully handled.

References

1.Wood-Gush, D.G.M., Vestergaard, K.,Exploratory behavior and the welfare of intensively kept animals, Journal of Agricultural Ethics, 1989, 2, 161-169.
2.Wood-Gush, D.G.M., Jensen, P., Algers, B., Behaviour of pigs in a novel semi-natural environment, Biology of Behaviour, 1990, 15, 62-73.
3.Mendl M, Zanella A.J., Broom D.M., Physiological and reproductive correlates of behavioural strategies, Animal Behaviour, 1992, 44:1107 –1121.
4.Edwards, S.A., Experimental welfare assessment and on-farm application, Animal Welfare, 2007, 16: 111-115.
5.Beattie, V.E., N.E. O'Connell, B.W. Moss - Influence of environmental enrichment on the behaviour, performance and meat quality of domestic pigs, Livestock Production Science, 2000, 65:71–79.