A NON CONFINED FARROWING SYSTEM: INFLUENCES ON SOWS' BEHAVIOUR, BODY TEMPERATURE AND PERFORMANCE

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Abstract

A farrowing pen allowing locomotion for the sow was compared with the conventional farrowing crate regarding to sows' activity behaviour, body temperature and performance. Therefore the behaviour of sows was recorded both on the two days ante partum and the two days post partum and also on the 20th and 21st day after farrowing. The activities standing, sitting, lying ventral, lying lateral and lying tilted as well as walking and position within the pen were taken into consideration. Every day while housing in the farrowing compartment the body temperature of sows was measured.

In comparison to sows housed in farrowing crates animals in farrowing pens were more active on all observation days. They chose significantly more often and for a longer time of the day upright positions (standing and walking). The possibility to move within the pen was utilised especially 24 hours before farrowing. Significantly higher body temperatures were measured on the first day post partum with sows housed in the farrowing crates. Between both housing systems no significant influence in total piglet losses were detected. However, with sows housed in farrowing pens a higher number of piglet crushing were determined, whereas with sows housed in crates more losses were due to runts.

1. INTRODUCTION

In pig production the number of weaned piglet per sow is the most important economical number. Directly or indirectly responsible for piglet losses are the housing conditions for the animals (AUMAITRE and LE DIVIDICH 1984). Mortality rate of live born piglets up to weaning amounts 15 % (ENGLISH and MORRISON 1984), 20 % (CUTLER et al. 1992) respectively. Nearly 50 % of these losses are due to crushing of piglets by sows (KUNZ 1986). This high rate of crushing led to the development of farrowing crates, which restrict sows in their movements and so minimise losses due to crushing. The sow is completely confined, a practice which is now considered intolerable by welfarists (AREY 1993). In the following the conventional farrowing crate is compared with a farrowing pen without confinement of sows.

2. ANIMALS, MATERIALS AND METHODS

In one experimental stable sows were housed in two different farrowing systems. Four conventional farrowing crates (2.40 m x 1.95 m) on one side of the feed alley were compared with four farrowing pens (figure 1) on the other side. In the farrowing pens sows had the possibility to move and to turn around. The amount of space for movements was about 4 m². In both housing variants the same slatted floor and the same heating for the piglets was used. Before stalling up into the farrowing house all sows were reared in groups with automatic feeding. The whole experiment

lasted one year, during which 36 sows (avg. 4.2 litters ± 2.4) gave birth in farrowing pens and 31 sows (avg. 4.0 litters ± 2.6) farrowed in crates. Statistical calculations were done using the SAS program package.

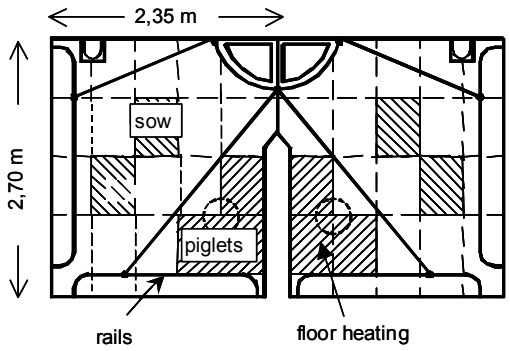


Figure 1. *Outline of the farrowing pen*

In order to compare these two housing systems the following performance parameters were taken into consideration: birth weight, number of life born, stillborn and weaned piglets on the 21st day, piglet losses and their reasons. Statistical analysis on performance data were carried out on 67 sows and their 637 piglets using the procedure "glm".

Every day behaviour of sows was recorded on video tapes during the whole trial. Activity behaviour was analysed continuously 48 hours before and 48 hours after farrowing as well as on the 20th and 21st day after farrowing. For this purpose activities like standing, sitting, lying ventral, lying lateral and lying tilted as well as walking and position within the pen were taken into consideration. In total 16,841 data sets of 27 sows were available for the statistical calculation of activity behaviour (procedure "mixed"). Twelve of these sows were housed in farrowing pens and 15 animals in crates.

Every morning body temperature of all sows in the farrowing house were taken rectally with a clinical thermometer. Overall 1,388 measurements of 54 sows were done and evaluated with the procedure "mixed".

3. RESULTS AND DISCUSSION

3.1 Active Behaviour

The active behaviour of sows consists of standing, sitting, and walking. On all observation days sows in pens showed more active behaviour compared with sows housed in crates (figure 2). On both days ante partum sows in farrowing pens were significantly more active compared with sows in farrowing crates. This difference amounts 6.24% (1.5 hours), 10.13% (2.3 hours) respectively. This relatively high portion of active behaviour before farrowing is due to the antenatal behaviour of sows. The higher portion of active behaviour with sows in pens seems to be based on the possibility to move within the pen. The ratio of active behaviour declined in both housing systems 48 hours post partum. Sows in pens showed only 5.90%, 8.19% respectively, active behaviour, sows in crates were 5.78%, 5.79% of the day active. At this time both sows housed in pens and sows housed in crates showed only a minimal need for active behaviour. On day 20 and day 21 after parturition active behaviour of sows in pens increased to 14.25% (3.4 hours), 16.62%

(4.0 hours) respectively, whereas with sows in crate only 9.39% (2.3 hours), 11.65% (2.8 hours) active behaviour occurred. Three weeks after farrowing sows again had a higher necessity to move.

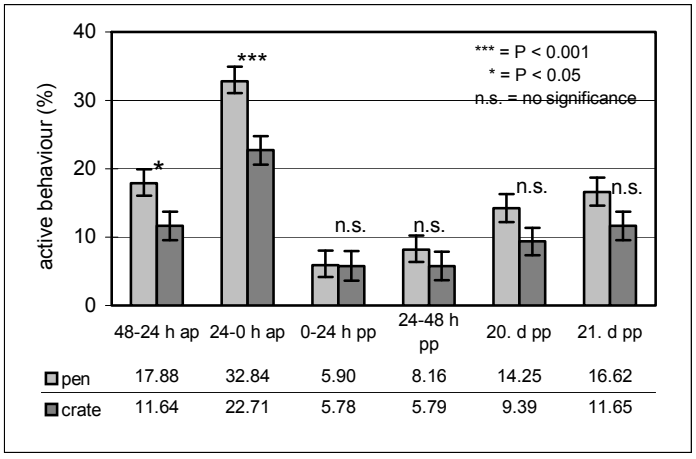


Figure 2. *Least Square Means and Standard Error of active behaviour depending on observation day and housing system*

Sows housed in pens used the possibility to walk within the pen on all observation days (figure 3). On the first observation day (48-24 hours ap) 20.59 walking activities were observed. 24 hour ante partum sows made significantly most often use of walking. At this time the frequency averaged 43.59 activities. After farrowing the frequency declined to 10.23, 13.34 respectively, walking activities. Three weeks after parturition the frequency of walking was increased to 23.42, 26.74 respectively.

24 hours before parturition sows walked significantly the longest time compared with the other observation days. At this time they walked 15.19 % of the day, which corresponds to 3.6 hours. Especially on the first and second day after parturition sows walked very little with 2.98 %, 4.48 % respectively. After three weeks of nursing time spent with walking increased, already at this time sows again seemed to have a higher necessity for exercises.

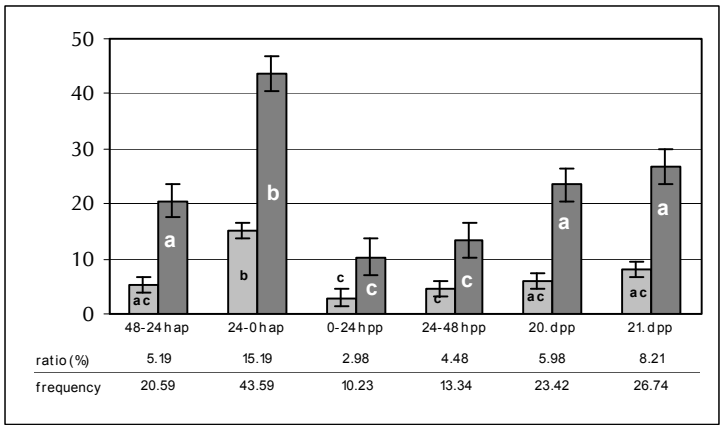
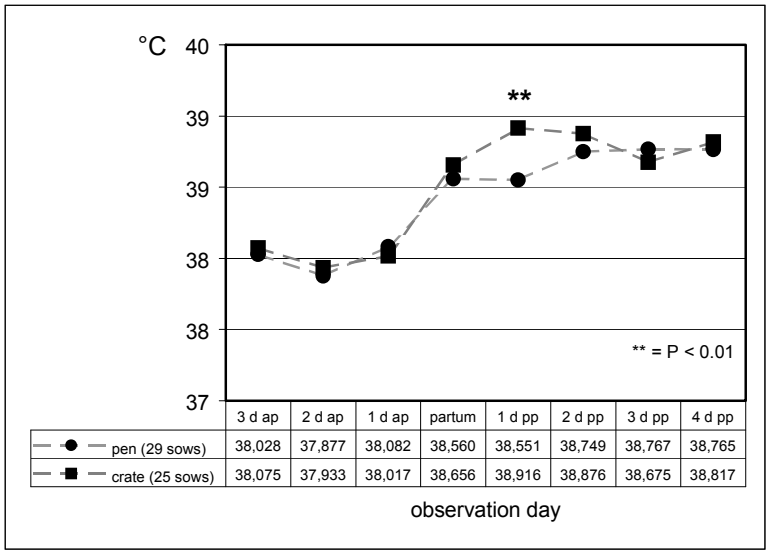


Figure 3. *Least Square Means (LSM) and Standard Error of walking depending on observation day. LSM with different letters are significantly different.*

3.2 Body Temperature

Body temperature of sows housed in the farrowing compartment was measured every morning. Until the day of parturition body temperatures of sows were on lower level than postnatal (figure 4).

The temperature charts of both sows housed in pens and sows housed in crates show uniformly run. On the first day after parturition temperature increased by 0.25°C with sows housed in crates, on this day body temperature of sows differed significantly depending on the housing system. It could to be interesting to investigate physiological parameters e.g. body temperature of sows housed in different farrowing systems more specifically, in order to glean, if housing systems for farrowing sows influence body temperatures and probably other physiological parameters.



	3 d ap	2 d ap	1 d ap	partum	1 d pp	2 d pp	3 d pp	4 d pp
pen (29 sows)	38,028	37,877	38,082	38,560	38,551	38,749	38,767	38,765
crate (25 sows)	38,075	37,933	38,017	38,656	38,916	38,876	38,675	38,817

Figure 4. *Least Square Means of body temperature depending on observation day and housing system*

3.3 Performance

Between both housing systems no significant influence in performance could be detected. Piglet losses of sow housed in pens amounted 17%, the ratio of losses of sows reared in crates was 19.5%.

No significant differences in total piglet losses could be detected between these systems. But in contrast the reason for piglet losses varied significantly depending on the housing system. Whereas the main reason for piglet losses in pens were crushing with 47%, most of the piglet losses in the farrowing crate were due to runts (55%).

No piglet losses were detected with 25 % of sows housed in pens and with 23% of sows housed in crates. The ratio of sows causing piglet crushing averaged 44% with sows in pens and amounted 43% with sows housed in crates.

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