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Effects of dry sow housing conditions on lying behaviour of sows

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Introduction

The majority of dry sows in the European pig industry are currently kept in permanent stalls or tethers, and are thus very restricted in the amount of locomotory exercise they can perform. Any difficulty in the movements necessary for standing and lying, due to a lack of muscular and cardiovascular fitness, can indicate poor welfare for the sow. Also, because the majority of piglet mortality is attributable to over-lying by the sow when she lies down or stands clumsily, there are also welfare implications for her litter. The objectives of the study described here were to investigate the time taken for sows to lie down in different dry sow housing systems, and to determine any relationships between the time taken and body dimensions of the sow.

Methods

The behaviour of lying down was split into 3 stages of movement, separated by 2 pausing stages, as categorised by BAXTER and SCHWALLER (1983).

Stage 1 - One forefoot is lifted and the sow drops to a halfkneeling position. The second forefoot is then lifted and the sow drops into a full kneel.

Stage 2 - Pause.

Stage 3 - The sow slides one knee forward along the floor and rotates part of her body to rest the corresponding shoulder and side of head onto the floor.

Stage 4 Pause.

Stage 5 - The sow lowers her hindquarters slightly and rotates so that the upper thigh of one leg lands on the floor.

The time taken to lie down was investigated in Study 1, using 32 Large White X Landrace sows housed in two different dry sow systems:

In ESF System-housed sows, there was no correlation between body parameters and time taken to lie down. In stall-housed sows, again there was no correlation between height or breadth of body and time, however, there was a positive correlation between body length and total time taken to lie down ($r = 0.846$) due more to some stages of lying than to others (see Table 2).

Tab. 2: Correlation between body length and time to lie down (Study 1 stall sows)

Stage	Average Time	r-Value	p-Value
1	3.01	0.476	0.237
2	7.44	0.701	0.0530
3	2.09	0.084	0.8450
4	5.23	0.719	0.0446
5	2.6	0.327	0.4297
Total	20.42	0.846	0.0082

The average time taken for sows in Study 2 to lie down, was 18.4 seconds. Again, there was a positive correlation between body length and time taken ($r = 0.764$), and there was significant correlation between body length and all stages except stage 5 (see Table 3).

Tab. 3: Correlations between body length and time to lie down (Study 2 stall sows)

Stage	Average Time	r-Value	p - Value
1	1.667	0.459	0.0108
2	8.402	0.732	0.0001
3	1.426	0.536	0.0023
4	5.101	0.441	0.0147
5	1.795	0.254	0.1751
Total	18.40	0.764	0.0001

Discussion and conclusions

The results from Study 1 would indicate that, given enough space to manoeuvre, sows can lie down relatively easily regardless of physical size. This is especially true, when a vertical surface is available to use as an aid. However, it is also clear that confined sows experience difficulty when lying down. All stages of lying down took significantly longer for stall-housed sows than group-housed sows. Overall, the total time taken for stall-housed sows to lie down increased as sow body length increased.

Study 2 confirms the findings of Study 1, in that total time taken to lie down is correlated with body length. The results also show correlation between body length and all stages of movement except stage 5. This may be the most difficult movement to control. Stages 1-4 result in a body position which has the centre of gravity of the hindquarters unsupported by the hindlimbs. The sow is therefore unable to control the descent of the hindquarters to the ground.

In the dry sow environment, these results demonstrate that confined sows experience difficulty when carrying out essential posture changes and that this difficulty increases with the body length of the sow, leading to poorer welfare. There may also be consequences for piglet mortality for sows farrowing in crates. ALGERS (pers. comm.) reports that sows in a pig park are well controlled when lying and do not crush piglets. As confined sows take longer to lie down, there may be a greater chance of piglets wandering back underneath the sow between stages of movement, and thus being at risk of death by crushing when the sow completes her change of posture. This is currently being investigated.

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References

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