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Stall housing for pregnant sows: Size and injury levels

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Introduction

The savings in terms of space, labor, and energy, combined with the possibility of reducing aggression and increasing the ease of inspection have made the stall housing system the preferred option for pregnant sows in the US. As we know, the use of stall housing for sows is central in criticisms of the welfare of sows. One criticism has been that the size of stalls is not dependent on the size of the sow in it. In fact, many countries have outlawed extended confinement of pregnant animals on tethers or in stalls. The majority of gestation stall designs are based on the static space requirements of the sow without allowance for the dynamic space requirements during standing up and lying down. The problem of spatial restriction increases as the size of the sow increases with advancement of pregnancy. On the other hand, the main alternative suggested, the group housing system, also has shortcomings, such as the loss of control over individual feed intake and aggression between sows, both of which affect the sows' well-being and subsequent reproductive performance.

Animal welfare and stall size

There are various ways to assess welfare of animals in any housing system, but the most direct and obvious indicators of welfare at farm level are injuries and mortality. Physical injuries can cause welfare problems as they cause pain and suffering. The extent of lesions on the skin reflects the quality of the animal's physical and social environment. Though there are a few studies on the injury levels in sows (Jensen et al., 1995; De Koning, 1984), none of them have considered the animal measurements in relation to the stall measurements while evaluating the injury levels. Ekesbo (1981) suggested that the state of the skin could be a parameter for estimating the well being of the sow. We think that this is a good method of evaluation of the ability of the sow to move easily in the space allotted by the stall as most of the injuries are produced during postural changes within the restricted space.

In one initial study, we examined the relationship between injury levels and sow measurements in relation to stall measurements. As a summary, the average measurements and injury scores are shown in **Table 1**.

Table 1: Mean sow, stall, and injury measurements.

Measurements (cm) / scores	Mean
Stall length (excluding feeder)	183.1
Stall width	58.4
Stall height	102.0
Animal length (tail to scapula)	117.8
Animal height (at shoulders)	75.2
Animal breadth (at shoulders)	39.2
Total injury score	1.55
Head	0.54
Fore limbs	0.29
Hind limbs	0.41
Top of the back	0.19
Tail base	0.08
Vulva	0.01

We examined the correlation between injury scores and sow size, both length and height, and observed that when the length and height of the sow increase in relation to stall length and stall width respectively, the injury score also increases significantly. A similar relationship exists between limb and back injury scores and body measurements in relation to stall measurements. Head injuries, though relatively high, were not related to stall width or length. The back injuries were associated with stall width and not with stall height. These injuries were produced when the back was pressed forcefully against the bars on the sides of the stall during lateral recumbency due the inadequate width of the stall in relation to the height of the animal; this was further aggravated where the bars were devoid of smooth and round edges.

In further studies, we have shown that the relative size of the sow also predicts the level of activity in the stall, with markedly lower frequency of rising up as the length of the sow relative to the length of the stall increases. The time needed for getting up and lying down also increases with increase in sow length in relation to stall length.

Thus, the stall size in relation to the animal size is an important factor affecting two major aspects of animal

well being, the freedom from injury and freedom of movement.

Based on these results, our preliminary conclusion is that one size of stall cannot fit all sows. In our discussions with producers, it is evident that some levels of amelioration are possible by opting measures like the following:

- Creating differing sizes of stalls in a facility to manage differing sizes of sows
- Making the edges of the iron bars of the stall smooth and round
- Culling sows based on size
- Choosing genotypes based on maturation size

It is probable that the relationship between external injuries and stall size reflects the potential of lameness and culling as well. This demand further study and emphasis.

Funding for this study was provided by the Minnesota Pork Producers' Association

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