

# Effects of Stall Width and Sow Size on Behaviour of Gestating Sows

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## Summary

It is recommended that gestating sows of various weights should be kept in different sizes of stalls. However the proper size of stall has not been well defined. A study was conducted to evaluate stall width by assessing the interaction between stall width and sow size on behaviour. As stall width decreased, sows spent less time standing, more time sitting, and their udders extended into the adjacent stall more frequently. Using udder extension during less than 50% of lateral lying as a criteria for stall width, a 65 cm (26") stall is adequate for gilts and small sows, but a 70 cm (28") stall is required for larger sows if in stalls for the entire gestation period.

## Introduction

Gestation stalls are usually uniform in size within a farm in North America despite the wide range in body weights among gestating sows (150 to 350 kg). The adequacy of typical stalls to accommodate large sows is questioned. The Code of Practice suggests producers use different sizes of stalls to accommodate various sized sows. However the proper stall size for sows of different body size is not well defined. As an inadequate stall size is likely to affect the behaviour of the sow, a study was conducted to evaluate stall width by determining the effects of stall width, sows size and the interaction on sow behaviour.

## Experimental Procedures

A total of 184 gestating females were weighed post breeding and before taken for farrowing. Based on their parity and body weight post breeding, they were categorized into gilts, small sows, medium sows, and large sows. They were assigned to each of four widths (55, 60, 65 and 70 cm; 22, 24, 26 and 28") of stalls for the entire gestation period, with the exception that gilts were not assigned to 70 cm stalls. During wk 4 and 14 of gestation, 24-h behavioural observations were conducted to assess sow postures (lying, standing, and sitting), posture changes, and whether their udder extended into the next stall while lying laterally.

## Results and Discussion

At post breeding, average body weights of gilts, small, medium and large sows were 145, 180, 216, and 259 kg, respectively, and the animals gained 60-80 kg during pregnancy (Table 1). At wk 14 of gestation, sows spent more time lying (82.5% vs 77.5% of their total time;  $P < 0.001$ ) and less time standing (14.4 vs 19.8%;

Table 1. Body weight of animals

Item	Gilts	Sows		
		Small	Medium	Large
N	39	47	45	53
Avg. Parity	0	1.4	2.8	4.8
BW1, kg	145±13	180±14	216±10	259±21
BW2, kg	223±20	250±24	282±21	316±22
ΔBW, kg	78	70	64	57

BW1 = average body weight post breeding  
 BW2 = average body weight before farrowing  
 ΔBW = BW2 - BW1

$P < 0.001$ ) than at wk 4. The proportion of time spent standing increased in wider stalls (Fig 1,  $P = 0.02$ ), but sitting decreased ( $P = 0.001$ ). Extension of the udder into the adjoining stall was expressed as a proportion of time spent lying laterally. This increased from wk 4 to wk 14 (20.8 vs 60.0%;  $P < 0.001$ ), with larger sows (51.0 vs 77.8%, for gilts and large sows during wk 14;  $P = 0.01$ ) and in narrower stalls (23.5 vs 91.7%, for 70 and 55 cm stalls during wk 14;  $P < 0.001$ ). Extension of the udder into the adjoining stall was significantly affected by the interaction of stall width and sow size ( $P < 0.05$ ), indicating that large sows in narrower stalls were quite crowded (Fig 2). Using the criteria that the udder should not extend into the adjoining stall more than 50% of the time that a sow is lying on her side, we suggest that a 55 cm stall is suitable for gilts and small sows, a 60 cm stall for medium sows, and a 65 cm stall for large sows during the early stage of gestation (wk 4), as would be the case if sows were moved into group housing after implantation. But in later stages (wk 14) gilts and small sows should be housed in 65 cm, and medium and larger sows in 70 cm stalls.

## Conclusions

Pork producers should use a variety of stall widths to accommodate various sized gestating sows. If stalls are used for the entire gestation period, 65 cm stalls appear to provide adequate space for gilts and small sized sows, and 70 cm stalls for larger sows.

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