UNIVERSITY OF MINNESOTA
EXTENSION

Gestation Sow Housing Systems: Which is Best?

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Introduction

Individual stalls are the current primary housing system used for pregnant sows in the United States. Public sentiment, however, has been pushing to move away from individual housing towards group housing of gestation sows. The recent announcement by both Smithfield and Maple Leaf that they will be transitioning from individual gestation stalls to group pens over the next 10 years will likely increase a similar transistion from other production groups as well.

The aim of gestation housing should be to:

1) Ensure a suitable environment for sows
2) Keep sows protected from other sows
3) Feed sows at levels to achieve acceptable body condition at farrowing
4) Maintain pregnancy, health, and well-being of the sows
5) Provide a safe workplace for animal caretakers
6) Ensure that the system is robust to errors in management
7) Meet these priorities economically

Which systems work best, individual stalls or group pens? The answer is “it depends”. There are many different sow gestation options, and many ways to evaluate whether one system is better than another. One can evaluate based on performance, animal behavior, physiological responses, or other criteria.

Gestation Housing Systems and Options

The individual gestation stall is a system that is fairly universal in type and management. Sows may be manually, but are generally automatically fed, with few other options other than size of the stall. Typical stalls will provide 2 ft width x 7 ft in length, although some larger stalls are now making their way onto the market. However, there are many options and differences in group sow housing systems.

Different feeding systems can be used, including dump or trickle feeding, use of feeding stalls, or electronic feeding stations (ESF). Dump or trickle feeding involves dispensing feed on the floor and allowing sows to eat simultaneously. It provides a simple, relatively inexpensive option to feed sows, and can be used for large or small groups, but does not allow for individual sow feeding. Because sows are not protected from one another during feeding time, larger “bully “ sows will consume feed disproportionately compared to smaller, more timid sows in need of a higher plane of nutrition. Use of

feeding stalls within group pens provides the opportunity to feed sows individually and protect them from fighting with each other during mealtime, but good observations skills are required to adjust feeding levels for each individual sow on the go. Additionally, this system may not be perceived by some as welfare friendly since it involves individually "crating" sows for short periods of time. A third option, use of electronic feeding stations (ESF), allows accurate individual sow feeding to occur, while easy identification of sick or off-feed sows can occur quickly. Generally, sows housed in a group will be tagged individually with ear tag transponders and have access to an electronic feeder station. Only one sow is allowed to consume feed at a time, and when the sow's daily allotment of feed has been consumed, no more feed is dispensed. Sows are not fed at once, so therefore aggression and fighting occurs while sows are waiting their turn to enter the feeder. This system does require a much greater level of management, especially when initially training gilts and sows to utilize the ESF, and a backup plan is needed in case the feeding system should fail.

Research Says . . .

So how do individual and group housing systems affect actual welfare and production of sows? Our sow research unit at the Southern Research and Outreach Center in Waseca, MN, has been collecting data for nearly 5 years attempting to answer many of the questions regarding differences in gestating sow housing systems. University of Minnesota researchers S. K. Baidoo, R. R. Morrison, R. D. Walker, J. Deen, and L. Anil have conducted numerous trials evaluating the behavior, health, welfare, and performance of sows in individual and group housing systems. The 800-sow unit contains both individual gestation sow stalls (2 ft x 7 ft) and large, 50-60 sow group pens (22 ft x 42 ft) with electronic feeding stations. All sows are maintained on fully-slatted concrete floors. The sow herd consists of GAP genetics (Genetically Advanced Pork, Winnipeg, Manitoba) and sows are maintained throughout their reproductive life in one of the two systems.

Injuries, Aggression, and Welfare

In general, the frequency of injuries, stress hormone levels and the level of aggression is higher in ESF group housed sows compared to stall-housed sows (Figure 1). Most of the aggression in the ESF system was related to the mixing of sows and feeder entry. Because the ESF system allowed only one sow to eat at a time, sows waited in front of the feeder for their turn, and this competition caused aggression among sows. Aggressions have been found to be proportional to waiting time. Bite injuries to the vulva and legs are most common for this type of system, but more substantial injuries to the legs and feet, resulting in reduced ability to walk comfortably, have also been noted to be much higher in prevalence in sows in the group housed pens, which are on concrete, compared to stall-housed sows. Stall-housed sows tend to have higher injury scores and stress hormone levels at late gestation compared to mid-gestation. Total injury scores in sows housed in stalls has also been found to increase with increasing body weight of the

sow. This is interesting, and suggests that the restriction in movement because of limited space in stalls causes problems more in late gestation and is much less significant during early- and mid-gestation. It may also indicate that our current industry stalls are not large enough to appropriately accommodate later parity and larger framed sows.

Performance and Longevity

Gestation housing has been observed to have little or no significant effect on sow weight and backfat changes during lactation. However, we have observed that ESF sows coming into farrowing crates tend to be in more ideal body condition compared to stall-housed sows. This may be more an effect of feeding system, since the ESF allows the individual to more easily adjust feeding rates compared to manually adjusting feeder drops in stall-housed sows. Actual differences in production performance, however, including conception rate, litter size, pigs born alive/litter, and stillborns/litter, have not differed between housing groups. Group-housed sows, however, have been observed to be more restless during parturition and early lactation, and this has resulted in an increase in pre-weaning mortality. Sow longevity has also been an issue with sows in group pens. Although sows in individual gestation stalls exhibit more shoulder lesions and abrasions, sows from the pens with ESF are removed/culled more frequently, and the major reason for removal is lameness.

Summary

The gestation stall vs. group pen debate just got turned up a notch with the announcement of Smithfield Foods and Maple Leaf Foods transitioning away from individual gestation stalls in the next 10 years. Observations from our research at the University of Minnesota would suggest no clear cut advantage to either group or stall housing. Gestation stalls have been designed to provide sows with protection from other aggressive sows. Restriction in movement, especially in late gestation, however, can increase injuries, and may suggest a need for larger space allowances and crates for individually-housed sows. Large group pens equipped with electronic feeding stations provide additional room for sows to roam and interact with each other, but also greatly increases stress level, aggression, and injuries in these sows, especially when they are initially mixed together. It is likely that modifications to the way group pens are designed and managed will be necessary in order to make them work more practically in today's modern production systems.

Figure 1. Average total injury scores of gestating sows over a 3 month post-weaning period in group pens with electronic feeding stations (ESF) or individual stalls (Anil et al., 2004).