

The Effect of Housing on Sow and Piglet Welfare

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Introduction

The housing of sows is one of the most controversial issues of conventional pig production as there are many factors which may compromise the welfare of the animal. Growing numbers of countries are converting to loose housing for pregnant sows in the belief that it is beneficial to the pigs' welfare. Recent studies, however, comparing housing styles at different stages in the sow's reproductive cycle indicate disadvantages of this system and various other considerations to welfare. The studies not only compare conventional housing systems but also suggest and test new alternatives and prototypes for the effect on sow and piglet welfare.

The homeostasis approach to animal welfare assessment was adopted in the following studies. This approach regards welfare as the state of an animal as it attempts to cope with its environment. The risks to the animal's welfare by an environmental challenge can be assessed on the basis of relative changes in behavioural and physiological responses and corresponding decreases in fitness, for example, growth rate, reproductive performance, injury and immunology.

Housing for pregnant pigs

A common housing system for pregnant pigs is stalls which were introduced predominantly to control feed intake and reduce aggression. They are small rectangular pens or cages that house individual pigs. Approximately 26% of sows are stall-housed in Australia for most of their reproductive cycle while up to 62% may be in stalls for part of their cycle (Barnett J.L., Hemsworth P.H., Cronin G.M., Jogman E.C., Hutson G.D., 2001). Barnett et al (2001) found pigs in stalls with only horizontal bars on the stall divisions showed evidence of a chronic stress response, based on a sustained elevation of basal free cortisol concentrations. Pigs housed in stalls comprised of vertical bars showed lower cortisol concentrations similar to group housed pigs.

Indoor group housing is the other frequently adopted housing system for pregnant pigs. They are kept in group sizes commonly ranging from two to around twenty sows on slatted or concrete floors with or without bedding. Housing sows in groups is widely perceived as promoting good animal welfare. Consequently, in the UK there is a ban on individual housing of pregnant sows. However, by allowing social interaction between the sows other problems are created. In groups, sows can be exposed to the stress resulting from low social rank and aggressive interactions. An important welfare consideration in group housing is the space allowance for the individual sows and the group size. Turner S.P., Ewen M., Rooke J.A., Edwards S.A. (2000) found greater skin lesion scores and poorer humoral immune responses in pens with restricted space allowance suggesting that stress was experienced to a greater extent when space allowance was low. Further research is required to determine the optimum group size for pregnant pigs.

Current research exposes advantages and disadvantages to various housing systems. It is difficult to balance reduced aggression in stalls with the lack of ability to move around freely. It would appear that both individual and group housing can meet the welfare requirements of pregnant pigs depending on the physical design features of the system and not the system itself. As all systems have their problems and the advantages and disadvantages for overall welfare remain to be determined, housing in stalls for a defined period less than the period of gestation may be a reasonable compromise.

Not only must the immediate welfare of pregnant sows be evaluated whilst they inhabit the gestation housing but consideration must also be given to the effect housing will have on the sow in its farrowing environment. With 93% of sows in Australia farrowing in crates, recent

studies have recognised the importance of comparing gestation housing systems in terms of the responses they elicit in the pig when it enters the farrowing around parturition.

A study by Boyle L.A., Leonard F.C., Lynch P.B. and Brophy P.(2000) was designed to gather information about the effect of three gestation housing systems on the initial responses of sows to the farrowing crate and on welfare at parturition. Three housing systems - stalls, bedded loose pens and unbedded loose pens - were evaluated for their effects on behaviour, heart rate and skin lesions (as indicators of welfare) of sows in farrowing crates.

The experiment used Large White X Landrace gilts reared in groups of six to eight and mated at seven to eight months of age. At pregnancy diagnosis twenty-eight days after service, the gilts were divided between the treatments, being assigned to either a stall, bedded or unbedded pen. The twenty-three stalls consisted of individual concrete floored stalls 2.0m x 0.6m in dimension with a slatted dunging area. Gilts in loose-unbedded housing were in groups of four in fourteen concrete floored pens 2.6m x 3.0m including slatted dunging area. The fifteen loose-bedded pens were of the same design with a 12cm peat moss covering over the concrete. All gilts were moved into 2.3m x 0.5m farrowing crates on day 110 of pregnancy.

Behavioural observations of the gilts were taken on day one of introduction to the crate and two to three days post partum. The length of time spent standing, bar-biting, vocalizing, weight shifting, dog-sitting and lying was determined as an indicator of comfort and distress levels. Skin lesions were noted to indicate decreases in fitness of the pigs due to compromised welfare and the lesions scored from zero to six in increasing severity. Heart rate measurements were taken with monitors one minute after introduction to farrowing crates and at later intervals. Finally, farrowing performance was determined at parturition by a count of the number of piglets born alive and dead and the mean piglet birth weight.

Gilts that had been housed in the loose systems attempted to turn more often and were more active than gilts that had been housed in stalls during gestation. This was interpreted as a stress reaction in response to the close confinement of the farrowing crate. During parturition these gilts were also more active or restless than those of the other treatment leading to greater skin lesion scores. The conclusion drawn was that the welfare of gilts at farrowing was adversely affected by loose housing at gestation probably due to greater frustration of maternal responses such as rooting and nesting activity. In accordance with these data, heart rate measurements stayed higher for longer in the loose-bedded gilts suggesting that they were more distressed by the change in environment than gilts in the other treatments. Skin lesion scores for these animals were high in the first twenty-four hours presumably due to their increased activity. However, they appeared to heal faster because their skin was healthier on entry to the farrowing house.

Although the stalled gilts did not show a vigorous behavioural response on first introduction to the crates they grunted at twice the frequency of loose bedded gilts. This is thought to be indicative of a passive coping mechanism which is expected to develop in physically and socially barren environments.

No effect on reproductive success was determined in this study but this is likely to be a result of the small numbers of animals used in the research.

Although gilts from the three housing systems responded differently to the change in housing environment, the increase in skin lesions twenty-four hours after entering the crate suggests that animals in all treatments were adversely affected by the change. Therefore, the farrowing environment is the next important consideration in the welfare of sows.

Housing for farrowing

The farrowing crate is the predominant form of housing for the farrowing and lactating sow. They were developed largely to counteract the problem of high piglet mortality. Issues

important for sow welfare in farrowing crates include:

- a) the degree of physical confinement imposed on the sow
 - b) the need for bedding/nesting material for sows before farrowing
 - c) the duration of confinement
 - d) restricted social contact.
 - e) inability to escape increased temperatures designed for piglet comfort
- Although these factors may affect the stress response of the sow, her health and injury status there may also be direct or indirect effects on piglet welfare.

Alternative farrowing systems may include an individual pen containing a farrowing hut or group housing with a farrowing hut provided for each sow. Two major welfare problems exist for piglets in these systems. The sow may not choose to farrow in the hut or nest increasing the risk of chilling and starvation of piglets. Alternatively, two may share the same nest increasing the risk of piglet mortality from crushing.

The 'Werribee Farrowing Pen' was recently developed as a loose housing alternative to the conventional farrowing crate. The number of piglets weaned per sow was found to be similar in the Werribee Farrowing Pen and the conventional farrowing crates (Cronin G.M., Lefebure B., McClintock S., 2000). The perceived benefits, however, are that sows are not restrained during farrowing and have more possibility to perform maternal behaviour. However, the added cost and increased floor space requirement make the pen an unlikely commercial alternative despite the possible welfare benefits.

Conclusions

Housing of sows and piglets involves many welfare considerations. Recent studies have compared various housing systems for different stages of the reproductive cycle to find each has benefits and disadvantages. It has also been observed that the housing at one stage can affect the welfare of the sow once it is moved into a different environment. An industry practice of limiting the time that sows are individually housed is a sensible precaution because of the lack of welfare data on continuous individual housing. Further research into an economically viable housing system with sound design features would greatly benefit sow and piglet welfare.

References

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