

Dominance hierarchy issues associated with group-housing of pigs.

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Introduction

The well being of animals under human care has increased in importance for producers over recent years because of the public demand to ensure humane treatment of farm animals, and the direct relationship between the well being of animals and productivity (Anil et al., 2003). Within the pig industry, the common response has been to move from stall to group-housing systems. This is been highlighted by recent amendments to European pig welfare legislation that require producers throughout the European Union to change to group-housing of sows by 2013 (O'Connell et al., 2003).

There are, however, welfare problems associated with group-housing of pigs. These relate to agonistic events of aggression and injury. Pigs display a dominance hierarchy, which is established within a group of unacquainted pigs when they are mixed together for the first time (Blackshaw, 1986). This "dominance hierarchy is important as a group stabiliser, but under adverse, intensive conditions, animals low on the hierarchy may be disadvantaged by lack of food and water" (Blackshaw, 1986). This can, according to English et al., (1988), lead to poor performance, increased variation in body weight, and higher incidence of agonistic responses. Recent research has been conducted to assess what factors will decrease the likelihood of dominance hierarchy disputes.

Discussion

Morrison et al., (2003) monitored factors such as increased group size and space allowance, and suggested these may affect the social behaviour and performance of pigs. They compared the social and feeding behaviour of growing pigs housed in deep-litter, large group (200 pigs) and conventional housing systems (20 pigs per pen).

Results indicated that pigs in the deep-litter, large group treatment had a higher frequency of social tactile interactions including offensive, defensive and submissive behaviour, compared with the conventionally housed counterparts. A limitation of this study was the very large number of pigs housed together, as a common estimate of the total numbers of group members that can be recognised by an individual pig is only 20-30 pigs (Fraser & Broom, 1998). Therefore groups larger than this may not form a stable hierarchy.

A study by Schmolke et al., (2003) tested this idea of stability within housing of different sized groups. It assessed the feasibility of producing growing-finishing pigs in various large groups (from 10 to 80 pigs per pen) by observing the effects of group size on performance and use of widely distributed feed resources. The authors proposed that if factors such as evenly distributed feed resources and adequate space allowance were sufficient, then average daily gain, feed efficiency and variability in body weight would not differ among different group sizes of pigs.

Results confirmed this theory, and showed that average daily feed intake, feed efficiency and variability in final body weight did not differ among group sizes over the entire period in this study. A difference was observed during the initial 2 weeks of the study during which average daily gain was lower in groups of 40 than in groups of 10. However as this was the only significant difference detected the authors suggested the result might be spurious (Schmolke et al., 2003). Therefore it was concluded that if adequate space and feed resources were provided, group size had no deleterious effects on productivity.

One concern regarding this study was that "to accommodate the videotaping involved in the behavioural portion of this study, a 24 hour continuous lighting regimen was followed" (Schmolke et al., 2003). Perhaps continual lighting alters normal behaviour of pigs, and thus the social patterns noted in this research may not be truly representative of pig behaviour.

Dominance hierarchies within static and dynamic groups were studied by O'Connell et al., (2003). Sows were kept in a static group for 5 weeks, with sows from this static group being added to another group of 40 sows, the dynamic group. The aim was to investigate the welfare of individuals within static versus dynamic environment in a group housing system. Social status per sow was calculated by observing the number of sows dominated divided by the number of sows dominated plus the number of sows that dominated her.

The rate of injury increased significantly when sows were transferred from static to dynamic groups. As discussed by Blackshaw (1986), it may be an advantage in a husbandry system to have stable social organisation of pigs, by avoiding changes in social group membership from birth to slaughter, as a way to reduce disturbances.

Results also indicated that sows of low social status were positioned lower in the feed order, lower in the drinking order, and were displaced from feeder queue more often. Lower body weight correlated with lower social ranking, and O'Connell et al., (2003) suggested that "increased body weight may enable sows to attain higher social status by making it physically easier to dominate pen mates in aggressive encounters".

Animal welfare implications

Dominance hierarchy disputes resulting in aggression and injury are a problem within group housing of pigs, as highlighted by these studies. Connell et al., (2003) concluded that low-ranking sows in groups might require extra-monitoring to ensure that they achieve adequate access to resources and do not suffer from excessive aggression. In the study by Morrison et al., (2003), the authors noted that the greater availability of resources such as total free space and availability of feeding places may eliminate the influence of a dominance hierarchy, which functions to control aggression when resources are limited. Results from Schmolke et al., (2003) concur with this theory, and also suggest that housing pigs in groups of up to 80 is not detrimental to productivity and health if space allowance is adequate and feed resources are evenly distributed.

Conclusion

Reports into group housing of pigs have shown that with adequate space and feeding points, disputes within a dominance hierarchy that eventuate in injury can be kept to a minimum, regardless of the size of the group. This can only improve the welfare of pigs, and be advantageous to producers who understand productivity is directly related to animal well being.

References

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