Welfare-enhancing stockmanship and feeding systems for group-housed gestating sows

By Lawrence Baker

Introduction

Amendments to the Australian *Model Code of Practice for the Welfare of Animals: Pigs* (Model Code) that would place time limits on the use of sow stalls are currently being considered. At least one review has concluded that, because of aggressive behaviour, it is not clear whether group pens produce preferable welfare outcomes compared with stalls (Rhodes *et al*., 2005). However, recent research indicates that superior stockmanship and welfare-enhancing feeding systems can reduce aggressive behaviour in group pens (Anil *et al*., 2006; Kongsted, 2006) and improve reproductive performance (Kongsted, 2006; Munsterhjelm *et al*., 2006). These findings augment both the ethical imperative and the commercial incentive to adopt welfare-improving group-housing practices.

Discussion

Approximately 25% of sows in Australia are kept in sow stalls (typically 200cm long by 60cm wide) for almost the entirety of each of their 16-week gestations (RSPCA, 2005). Proposed amendments to the Model Code would limit the use of sow stalls to no more than six weeks during gestation, applicable from 10 years after the revised Model Code's ratification (Animals Australia, 2005). Several European countries have already banned the use of sow stalls and a European Union Directive requires all member states to ban their use from 2013 (European Commission, 2001). There is emerging research on welfare-related aspects of group-housing that could be instructive for Australian piggeries as they move to an increasing use of group-housing systems.

Anil *et al*. (2006) conducted a study to assess the effect of group structure on sow welfare and reproduction performance. The study compared welfare indicators of three types of group structures. The 'dynamic' group involved mixing (adding/replacing sows) every 14 days, the 'twice-mixed' groups involved two instances of mixing each and the 'static' groups involved no mixing throughout gestation. Their study used salivary cortisol concentration, injury and behaviour as indicators of welfare.

The study found that the 'dynamic' group showed the highest incidence of fighting wounds as well as the lowest frequency of non-agonistic social interactions. Although cortisol concentrations were found not to differ statistically between the groups, there was a positive correlation between aggressive acts and cortisol. In addition, aggressive behaviour was positively correlated with the frequency and duration of queuing at the electronic sow feeder in all three groups.

The findings suggest that the welfare of group-housed sows can be improved by decreasing the frequency with which group mixing occurs and by decreasing queuing and other competitive behaviour for food. Thus good stockmanship and the improved design of feeding systems are two important management tools that can be employed to enhance welfare.

One question that follows from these findings is whether there are commercial reasons for piggeries to alter their group-stocking strategies. Although Anil *et al*. (2006) did not find a positive relationship between correlates of sow welfare and reproductive performance, a separate study by Munsterhjelm *et al*. (2006) did. Observing 28 Finnish sow farms over a year, Munsterhjelm *et al*. (2006) applied a welfare index to score specific attributes of housing, management and health parameters known to correlate with animal welfare. Points were awarded for positive attributes, so that the higher the score the greater the likelihood of good welfare outcomes.

Attributes were grouped into six categories, two of which, 'health and stockmanship' and 'feeding', are pertinent to this discussion.

The study found a correlation between high scores for 'health and stockmanship' and litter size and litter frequency. 'Health and stockmanship' comprised a number of attributes, including the absence of lesions. Although this category did not include aggressive acts *per se*, it is reasonable to conclude, based on earlier research (Barnett *et al.*, 1992), that a lower number of lesions corresponds to a lower incidence of aggression. Thus the study supports the view that as good stockmanship decreases the number of aggressive acts, so too is it likely to improve reproductive performance.

In relation to the 'feeding' category, points were awarded for a high body condition with little variation between individual sows. The study found that while feeding scores correlated positively with litter size, they correlated negatively with the number of litters born per sow per year. Accordingly, Munsterhjelm *et al*. (2006) concluded that the relationship between a welfare-enhancing feeding strategy and reproductive performance remained unclear. A separate study by Kongsted (2006), which focused on feeding systems, clarifies this relationship.

Kongsted (2006) examined the relationship between reproductive performance and indicators of food intake, stress and fear, in group-housed sows. The study examined 14 Danish group-housed sow herds over an 11-month period. The herds were selected to cover a range of different feeding systems and layouts, including group feeding (floor and trough-based) and individual feeding (free-access stalls, individual feeding stalls, electronic sow feeder and automatic nipple feeder). The results indicated that sows with less access to food in the period from weaning to three weeks had lower pregnancy rates and litter size. The author concluded that individual variation in food intake may be large enough to affect reproduction performance and suggested that the impact on production may partly be due to social stress accompanying low food intake.

The Kongsted (2006) findings also help to clarify an issue raised by the Anil *et al*. (2006) study. Anil *et al*. (2006) suggested that one explanation for the lack of a correlation between welfare and performance in their study may be that all three groups experienced aggression associated with queuing at the electronic sow feeders. Kongsted's results highlight the significance of access to food that supports Anil *et al*.'s posited explanation.

Conclusion

Reforms to the Model Code would reduce the period of confinement of gestating sows to advance the welfare of intensively housed sows. Recent research indicates that as Australian piggeries move to greater use of group pens, welfare and thus reproductive performance could further be improved with stockmanship and feeding systems that reduce aggressive behaviour and variation in individual food intake. Additional research into optimal group size, structure, mixing strategies and feeding systems, would further encourage the adoption of welfare-enhancing industry practices.

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