RESEARCH ABSTRACT

ANIMAL WELFARE

Title: Systematic Literature Review and Needs Assessment of Housing Systems for Gestating Sows in Group Pens with Individual Feeding - **NPB #08-276**

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1.0 INTRODUCTION

Over the past 10 years, animal scientists, veterinarians, producers, and animal rights groups have debated the welfare implications of either housing sows in gestation stalls or in groups. Recent examples of this in the United States can be seen in the prolificacy of editorial letters written by animal experts arguing their opinions on the best course of action with regard to gestation sow housing legislation and position statements (Baker, 1996; Forsythe, 2002; Davidson, 2003; Kornheiser, 2004; Hansen and Bowden, 2005; Koltveit et al., 2005), especially as they pertain to the American Veterinary Medicine Association's (AVMA's) task force report on the housing of pregnant sows (AVMA, 2005; Koltveit, 2006) and the sow confinement issue (Rollin, 2001).

In the United States, the general public is expressing their disapproval of gestation stalls by voting to ban them. Legislation to ban sow gestation stalls has occurred in the following states: Florida in 2002, Arizona in 2006, Oregon in 2007, Colorado in 2008, California in 2008 and Maine in 2009. Gestation stalls and tethers have already been banned in the United Kingdom since 1999. The rest of Europe is phasing out gestation stalls by 2013. On the surface, it may appear that this is a step forward towards improving gestating sow welfare; however, without sound science to help producers decide which group housing system will best meet the needs of their sows and themselves, the switch to group housing could initially result in poorer gestating sow welfare.

However, decisions regarding sow housing can be made objectively if based on expert opinion. For example, experts have ordered the following housing systems according to sow welfare from low to high: tethers and stalls (lowest); indoor group housing (middle); group housing with outdoor and substrate access (highest) (Bracke et al., 2002).

In any event, as stalls are phased out, and group housing is phased in, more research is required to understand how to best manage group housing systems. Most of the research conducted on sow housing has involved comparing group housing with stall housing. Some research suggests that it may be more cost efficient to produce pigs from gestating sows in naturally ventilated hoop shelters with deep bedding, individual feeders and approximately 4.8 m^2/pig, than from stall housed sows in confinement facilities (Lammers et al., 2008). However, only comparing group and stall housing will not provide adequate information that one system is better than another regarding sow welfare. Further complicating the fundamental question of how confinement affects pregnant sow welfare is the issue of the number of alternative group sow housing designs and management regimes which are available. Group housing can be a complex system and comes in many forms. There is a lack of research comparing all of the different options. For example, there is a variety of feeding methods to choose from: sows may be fed as a group (either on the floor or in troughs) or individually. Individual feeding methods can include:

- Free access stalls (provides some protection during feeding, but the back of the stall is open)
- Feeding stalls (where sows are manually locked in for feeding)
- Electronic Sow Feeders (ESF; where sows are recognized by their ear transponder and are fully protected during feeding)
- Biofix or trickle-feeding system (sows can eat simultaneously as feed is delivered slowly and in small portions, but there is not much protection or control over individual feed intake)
- Walk-in/lock-in stalls (sows are free to exit the stall at any time by backing up, which pushes the back gate up; they are fully protected while in the stall)
- Fitmix (unprotected ESF; sows are recognized by an ear transponder, and feed is delivered through a nozzle into the pig's mouth)
- In addition to the variety of feeder types available, there are many pen layouts, group sizes, group types, genetics, enrichments, and feeding regimes to choose from.

Overall, a system's welfare status can be judged based on the 'Five Freedoms'. If sows have freedom from: 1) malnutrition, 2) thermal and physical discomfort, 3) injury or disease, 4) suppression of normal behavior, and 5) fear and stress, then their welfare requirements are considered to be met (Webster, 1987). For producers, an ideal group housing system would result in: 1) high biological performance, 2) low labour input, 3) ease of

management, 4) acceptable capital cost, and 5) acceptable financial return (Edwards, 1990). While these two sets of requirements initially appear to be at odds with one another, taken holistically, they can be achieved (or partly achieved) through an integrated evaluation of housing systems.

When evaluating the various sow housing methods, researchers use a variety of outcome measures including: behavior (i.e., aggression, responses to behavioral tests, general behavioral time budgets, stereotypies), injuries (i.e., scratches, lesions, vulva bites, lameness), physiology (i.e., cortisol concentration, heart rate, muscle/bone strength) and productivity (i.e., fertility, litter size, litter weight, piglets/sow/year, backfat, body condition, longevity).

The objective of this review paper is not to compare the use of gestation stalls versus group sow housing, but to take an in-depth look at group sow housing systems which utilize individual feeding and to conduct a needs assessment on these types of gestation sow housing systems.