



Hypothetical Welfare Assessments for the Sow and Her Litter

Authors

Anna K. Johnson, Iowa State University
Jeremy N. Marchant-Forde, USDA-ARS

Reviewers

Yuzhi Li, University of Minnesota
Ed Pajor, University of Calgary

Objectives

- Illustrate why welfare assessments in the farrowing/lactation phase are the most challenging.
- Propose hypothetical welfare assessments across various farrowing/lactation systems.

Introduction

The assessment of welfare within farrowing systems presents a unique challenge for pork producers, veterinarians, and animal scientists. Welfare assessment within all other phases of swine production involves pigs at a single stage of their productive life. Within the farrowing environment, the sow and her piglets are at two very different stages of their life, and have different requirements in regards to their thermal, social, and physical environments [1]. A system that may be ideal for the welfare needs and requirements of the sow may be far from optimal for her piglets, and vice versa. In order for objective and science-based assessments to be conducted on swine farms, we must have an appreciation of the sow's and her piglets' welfare during farrowing and lactation.

Overall Assessment of Welfare in Different Farrowing/ Lactation Systems

The information presented is based on hypothetical systems used in commercial swine practice. The comparison tables are divided into six distinct parts that have already been identified that sows pass through when preparing for birth and subsequent lactation, these are: (i) isolation and nest site seeking, (ii) nest building, (iii) farrowing, (iv) nest occupation, (v) social integration, and (vi) weaning [1]. However, note some caveats; these are generalizations to illustrate concepts based on scientific literature. On any given farm, welfare within a farrowing system will be influenced by many things including system design, herd health, genetics, feeding system, gestation system, and the skill of the caretakers. Extrapolation of the discussion below to a specific system not described would not be applicable and is therefore ill-advised. The scoring system is purely qualitative rather than quantitative and is not weighted. We also make the assumption that the sows exhibit good maternal behavior, so that the limitations of the system, rather than the sow, are highlighted.

Sow Versus Piglet

The most important aspects that this exercise highlights are perhaps the fact that conventional stalls rank poorly for both sow and piglet welfare, based on the review of the scientific literature, but that modifications including bedding, mixing of litters pre-weaning, increasing weaning age slightly and offering creep feed can certainly improve welfare within the system. For the sows, group-housing appears to offer welfare advantages, but these systems certainly increase the management skills needed by the stockperson and without these, welfare scoring could be considerably lower. Also, and the real crux of the welfare assessment problem, where the sow is loose-housed, piglet welfare during the nest occupation phase tends to be disadvantaged, with the disadvantage being an increase in early pre-weaning mortality. This remains

the key problem with alternative farrowing systems as it represents a major economic loss to the producer as well as a welfare issue.

Summary

The assessment of welfare within farrowing systems remains a difficult area of research due to the conflicting needs of the sow and her litter. Conventional farrowing stalls can safeguard piglet welfare during the nest occupation phase of farrowing, especially limiting early pre-weaning mortality, which is an extremely important factor for the welfare of the individual piglet and also for the profitability of the commercial producer. However, conventional stalls also have some disadvantages with respect to sow welfare during other stages of lactation. Many alternative systems exist, albeit at an economic cost to the producer, and most confer welfare benefits during some of the farrowing stages. For increased piglet mortality not to be a problem which currently it is, there needs to be a greater reliance on the selection of our gilts and sows for positive maternal traits (i.e. rooting, pawing and being responsiveness to their piglets) and a greater reliance on caretaker skills to manage the farrowing and lactating systems optimally.

Table 1. Hypothetical systems descriptions and scoring rationale (authors have picked the inputs of the system.)

Name	Design features	Bedding	Social	Sow to litter	Creep feed	Length	Weaning
Standard farrowing stall	Conventional tubular metal farrowing stall on fully-slatted floor [2]. Sow cannot isolate or seek nest site. Inability to nest-build can result in disturbed farrowing, placing newborn piglets at risk of crushing or stillbirth.	No bedding but heated creep area for piglets.	Litters kept intact with sow – no mixing	Help newborn piglets locate udder more easily.	Often no	2 to 3 weeks	Piglets moved and mixed with unfamiliar piglets.
Turn around stall	Conventional tubular metal farrowing stall on solid floor [3]. Sow cannot isolate but does have limited nest building capabilities.	Long-stem straw and a heated creep area for piglets.	Litters are kept intact for 10 days and then partitions between 3 pens are removed allowing litters only to mix.	As for standard farrowing stalls	After 2 weeks	4 weeks	Piglets are moved at weaning but are not mixed with any unfamiliar piglets.
Hinged stall	Hinged tubular metal crates on solid floor [4].	As for modified stalls	Sow kept in closed stall until litter is 7 days of age. Stall is opened. No mixing.	As for standard farrowing stalls	No	3 to 4 weeks	Piglets moved and mixed with unfamiliar piglets.
Open pens	Solid floor Partial/slatted floor	Long stem straw bedded floor with/ without protection rails [1]. Creep area.	No litter mixing	Risk of crushing is higher. Sow has more control over nursing and movement.	No	3 to 4 weeks	Piglets moved and mixed with unfamiliar piglets.
Outdoor hut	Insulated steel English style arks [5] 'A' frame, and other plastic and plywood models in paddock for single sow, ringed by an electric fence. Piglets are contained within the ark for 7 to 10 days by a fender and then released into the paddock.	Some grass cover and bedding inside ark	Sow kept on own.	As for open pens	No	3 weeks + (depends on the marketing scheme)	Piglets have been able to mix.

Table 1. (continued)

Swedish style multi-suckling pens						
Ljungstrom	Sows housed individually solid-floored pens with piglet protection rail around perimeter [6]. Heated creep.	Straw	Sow and litter kept intact for 14 days and then moved together to a deep-bedded multi-suckling pen with 9 other sows and litters.	As open pens	After 2 weeks	6 weeks
Thorstensson	Eight sows group-housed in a large, deep straw-bedded pen with 8 individual temporary pens down one side [7].		Piglets kept in nest for 10 days and then mixed	As for outdoor huts	After 3 weeks	6 weeks
Grouped Arks	Insulated farrowing arks ([5] in a group paddock for 6 sows ringed by an electric fence. Piglets contained in nest for 10 days and then mixed.	As for single arks	Sow is grouped before and during a 3 to 4 week lactation period.	As for single ark	No	3 weeks + (depends on the marketing scheme)

Table 2. Qualitative sow and litter welfare scores for each hypothetical system over six separate phases of farrowing [9].

System	Isolation & Nest-site seeking		Nest-building		Farrowing	
	Sow welfare	Litter welfare	Sow welfare	Litter welfare	Sow welfare	Litter welfare
1. Standard farrowing stall	xx		xx		x	-
2. Turn around stall	xx		-		-	-
3. Hinged stall	x		-		-	-
4. Open pens	-		✓		✓	✓
5. Outdoor huts	✓		✓✓		✓	✓
6. Swedish style multi-suckling pens: Ljungstrom system	-		✓		✓	✓
7. Swedish style multi-suckling pens: Thorstensson system	✓		✓✓		✓	✓
8. Grouped outdoor huts	✓		✓✓		✓	✓

Table 3. Qualitative sow and litter welfare scores for each hypothetical system over six separate phases of farrowing [9].

System	Nest occupation		Social integration		Weaning	
	Sow welfare	Litter welfare	Sow welfare	Litter welfare	Sow welfare	Litter welfare
1. Standard farrowing stall	xx	✓✓	xx	xx	xx	xx
2. Turn around stall	xx	✓✓	xx	✓	x	✓
3. Hinged stall	x	✓✓	x	xx	xx	x
4. Open pens	-	xx	x	xx	xx	x
5. Outdoor huts	✓	xx	x	✓✓	✓	✓
6. Swedish style multi-suckling pens: Ljungstrom system	✓	xx	✓	✓	✓	✓✓
7. Swedish style multi-suckling pens: Thorstensson system	✓✓	xx	✓✓	✓✓	✓	✓✓
8. Grouped outdoor huts	✓✓	xx	✓✓	✓✓	✓	✓

- ✓✓ large positive effect on welfare
- ✓ positive effect on welfare
- neutral effect on welfare
- x negative effect on welfare
- xx large negative effect on welfare

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