

PRAIRIE SWINE CENTRE

Considerations for Successful Conversions:

What does Science say about Effective Group Sow Housing

Dr. Yolande Sedon
 Post-doctoral fellow Ethology
 Prairie Swine Centre
 Saskatchewan

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

Animal Welfare

- Animal Welfare is concerned with how the animal copes and feels in the environment we provide
- Concern for animal function: how is the animal coping (productivity, health, stress, behaviour)
- Concern for affective states: how the animal feels (pain, frustration, boredom)
- Concern for natural living: the ability of the animal to live according to its nature

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

Fit the farm to the animal

- Stalls are behaviourally and physically restrictive of the sow
 - Confinement housing generates one of the greatest concerns for welfare (Fraser, 2011)
- Alternatives have been shown to work
 - Strengthens the argument that stalls are not required
- Group housing removes confinement
 - But consider what else is required to provide good welfare for the sow

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

Canadian Update

- **Maple Leaf**- followed Smithfield's 2007 announcement to phase out sow stalls by 2017
- 2012 – Fast food retailer commitments to stall free
- Poor returns to producers and little change...
- **The revised Canadian Code of Practice: group housing expected to be standard**
- Understand how to convert within your limits and with success

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

National Sow Housing Conversion Project

- Demonstration barns across Canada
- A central database for help and assistance
- Before and after comparisons
- Providing a chance for producers to fully explore and evaluate different group housing systems prior to investment
- Starting off in Manitoba and Saskatchewan
- If you are going to perform a conversion, to get it right

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

Group sow housing options

Feeding	Flooring	Grouping	Timing	Total
Floor	Slat	Static	Wean	} = 72
Trickle			Dynamic	
Feed-stall	Bedded	Post-Impl.		
ESF				

Celebrating 20 Years OF INNOVATION

Gonyou, 2006

Barn Renovations- a first glance


Feed System	Floor Fed	Non-gated Stalls	ESF	Gated Stalls
Floor type	Some solid required	Solid, Part or Full slats	Solid, Part or Full slats	Part of full slats
Floor space	*	**	*	***
Cost	*	**	**	***
Management	***	**	**	*

* Low; **Medium; ***High

Celebrating 20 Years OF INNOVATION

Group Sow Housing Options

Competitive: gain feed by fighting/aggression



Drop/spin feeding



Non-gated short stalls

Celebrating 20 Years OF INNOVATION

Group Sow Housing Options

- Non-competitive: Cannot gain feed by fighting
- Competition for entry to feeding space




Gated feeding stalls



Electronic sow feeder

Celebrating 20 Years OF INNOVATION

Floor Space

- Important consideration:
 - Influences what can be achieved with existing barn space
- Experience shows: do not provide too little space 
- EU recommendations on space:
 - Gilts: 1.64m² (18sqft) Sows: 2.25m² (24sqft)
 - Groups of less than 6 individuals, offer 10% greater space
 - Groups of greater than 40 individuals, offer 10% less space
- Codes of Practice expected to follow similar, but not as stringent

Celebrating 20 Years OF INNOVATION

Grouping & Group size

- Group size is largely influenced by:
 - Herd size (breeding cohorts)
 - The feeding system of choice
- Static grouping: all sows grouped and remain together for the duration of gestation
- Dynamic grouping: addition of sows from different breeding groups over time

Celebrating 20 Years OF INNOVATION

Static vs Dynamic

- Static: sows grouped once – less aggression
- Dynamic: Multiple groupings – aggression ensues each time
 - Pen design important to allow sows to escape
 - Large dynamic groups – social sub-grouping takes place
 - Stagger mixing over different pen groups

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

Grouping strategies

- Competitive feeding systems
 - Grouping important
 - Even out competition between sows
 - Group on size, body condition, parity
 - Trickle feeders – can group on eating speed also
- Non-Competitive feeding systems:
 - Sub-grouping is less important
 - ESF: experience is important – keep gilts separate

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

Grouping: use of free space

Parity	% Total Time Out
0	~2
1	~5
2	~10
3	~65
4	~45
5	~25
6	~5

Older sows spend more time in the free space area

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

Interaction: system and Space

System	Loafing	Feeding
ESF	Large	Small
Gated stalls (Free Access)	Medium	Medium
Non-gated stalls	Small	Large

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

Barn Design options

- New barn or renovation?
- New barn may be cheaper- esp. if changing farrowing crates, ventilation etc
 - Turn sow barn into finishing barn?
 - Turn finisher into sow barn?
- Renovations estimated at \$500/sow
- Renovation options & Costs- much depends on flooring/ placement of manure pits

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

Management Pros and Cons

- **Floor feeding** – Lower cost conversion
 - Most competitive system
 - Uneven feed intake can ensue (15% fallbacks)
 - Typically 10% higher feed use
 - Group by parity, size & body condition
 - Multiple feed blue times and sites
 - Pen dividers can help in larger pens
- **ESF's** – more technical management required

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE

Management Pros and Cons

- **Gated stalls** – Higher conversion cost
 - Good individual sow control
 - Social management not as important
- Loafing area takes up considerable space
- Failure of some sows to use the space removes the benefits of the group housing

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE Quality vs Quantity of space

- Quality of space is as important as quantity
- Pen design as important to manage aggression as pen space (Barnett et al. 1992)
- Can help better manage the sows
 - Promote calm and comfort within the group
 - Especially good for dynamic grouping
- Solid partitions: hide/escape from bully sows
- Provision of bedding: Comfortable lying, leg health and satiety
- Bedding free: manipulable enrichment/rubber mats

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE ESF: Clear division of areas

- Provision of a part slatted flooring system, with bedding in one area



Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE Barn Design

- **ESF:** success with large dynamic groups
 - Eg. Eagle Creek Colony, MB
 - 3 gestation pens
 - 250 sows and 6 ESF feeders per pen
- **Pig Flow:** Feed -> Drink -> Loaf

Celebrating 20 Years OF INNOVATION



PRAIRIE SWINE CENTRE Drop feeding with dividers



Celebrating 20 Years OF INNOVATION


PRAIRIE SWINE CENTRE Considering conversion.....

- Looking to the future
 - Consider the effect of long term running costs
- Balance practicality, manageability with welfare options
- Making the system work to derive benefits for:
 - You and your staff
 - The sow, her productivity and longevity

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE The benefits of group housing

- Increased movement improves sow fitness & muscle tone
 - Linked to reduce farrowing duration (Ferket & Hacker, 1985)
- Sows in groups 30% greater bone strength than those in stalls (Marchant & Broom, 1994)
- Group housed sows perform equal or superior to sows housed in stalls (Séguin et al. 2006, Bates et al. 2003)



Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE Sow lameness & longevity

- Lameness: one of the most common reasons for culling SOWS (Changnon et al. 1991)
 - Hoof condition contributes to development of lameness
- Concrete flooring is associated with greater hoof and leg problems (Kilbride et al. 2010)
- Hoof cracks shown to alter lying posture
 - Hoof condition associated with levels of pre-weaning mortality from crushing (Fitzgerald et al. 2012)


Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE Sow lameness study


- Lameness believed to be underreported
- Lameness needs to be addressed for group housing
- Survey of 3,286 sows on a 6,000 sow herd
 - Sows stall housed on part slatted concrete floor
 - Parities ranged from 0 - 10
 - 59% of sows showed lameness in at least one leg
 - Over 50% of sows in parities 0-3 were lame

Celebrating 20 Years OF INNOVATION



PRAIRIE SWINE CENTRE Sow claw lesions



67% sows long dew claws



52% sows had heel overgrowth

26% of sows had white line cracks and 36% of sows hoof wall cracks

Celebrating 20 Years OF INNOVATION

PRAIRIE SWINE CENTRE Sow claw lesions

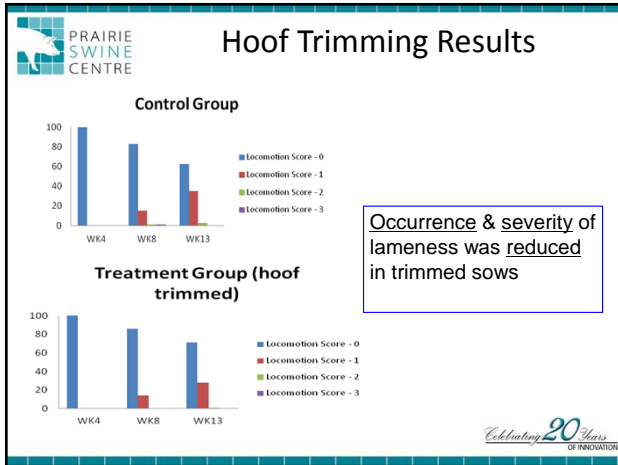
- A treatment/prevention for unbedded systems
- **Prevention:** can trimming increase longevity?
- **Treatment:** can trimming reduce lameness?



Zinpro FeetFirst Chute



Celebrating 20 Years OF INNOVATION



Floor Type and Welfare

- A large capitol cost, good flooring crucial
- Balance manure management & sow comfort

Full slats Partial slats Mats Bedded

welfare and sow longevity

- Sows spend a **large proportion** of time **lying**
- Prefer to lie on solid floors (support, heat transfer)
- Liquid manure can be combined with partial bedded
- Slat/gap widths?

Celebrating 20 Years OF INNOVATION

Improving sow longevity

- Bedded pens leads to less sow lameness (Ehlorsson et al. 2002)
- 14% fewer sows culled from lameness in straw bedded pens compared to unbedded pens (Fynn, 2010)
- Economic analysis:
 - A Straw bedded ESF more profitable compared to an unbedded ESF (Fynn, 2010).
 - Sows in bedded pens lasted longer beyond 3rd parity

Celebrating 20 Years OF INNOVATION

Alternatives for unbedded systems

- Sows show a preference for rubber over concrete (Elmore et al. 2011)
- Fewer skin lesions, more postural changes

- Rubber matting increased use of free space areas (Rioja-Lang et al. 2013)
- Provision in selected areas could be of use

Celebrating 20 Years OF INNOVATION


Rubber mats- T pens

Celebrating 20 Years OF INNOVATION

Projects in Sow Housing

- Recent Research at PSC
 - Use of free space in group housing
 - Social management: grouping sows by parity
 - Sow temperament and longevity
 - Hoof trimming- lameness treatment/prevention
 - Evaluation of mixing times for optimising breeding of sows

Celebrating 20 Years OF INNOVATION

 PRAIRIE SWINE CENTRE

Concluding remarks

- Get a true economic picture:
 - Think ahead and holistically – what can benefit you, your staff and the sow
- University of Manitoba
 - Developing producer info and barn renovation models, with cost evaluation
- National Sow Housing Conversion Programme
 - System & cost evaluation, demonstration barns

Celebrating 20 Years
OF INNOVATION

 PRAIRIE SWINE CENTRE

Thanks for your time

yolande.seddon@usask.ca
Jennifer.brown@usask.ca

Celebrating 20 Years
OF INNOVATION

 PRAIRIE SWINE CENTRE



Celebrating 20 Years
OF INNOVATION