Thank you for participating in SowBridge 2014-2015.

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Feeding and Management of Sows in Pens

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Societal Perceptions
Reality

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Feeding Group-Housed, Pregnant Sows

• Feeding for changes in biological needs

• Feeding to address management and welfare needs
Effect of Gestation Housing System on Liveborn Litter Size

Johnston et al. (2013)

Pigs/litter

Stalls 12.3
Large Pens 12.5
Small Pens 12.2

P > 0.05

Li et al. (2014)

Pigs/litter

Stalls 11.5
Dynamic group pen 11.05

P = 0.07
• Parity 2 sow
  • 360 lb at mating
  • 500 lb at farrowing

• Diet characteristics
  • 1,500 kcal ME/lb
  • 9% fermentable fiber

• Feed wastage = 5%
Room Temperature Effects on Energy Needs – Stalled Sows

- Room Temperature
  - 68 °F: Daily ME, Mcal - 6.89
  - 50 °F: Daily ME, Mcal - 9.05
  - Daily feed, lb - 4.85, 6.37
Room Temperature Effects on Energy Needs – Group-Housed Sows

Daily ME, Mcal: 7.20
Daily feed, lb: 5.10

Room Temperature: 68 °F

Daily ME, Mcal: 7.92
Daily feed, lb: 5.58

Room Temperature: 50 °F
Housing System Effects on Energy Needs at 50 °F

- **Stalls**: Daily ME, Mcal = 9.37
- **Groups**: Daily feed, lb = 7.92
- **Housing System**: Daily ME, Mcal = 6.59

**Daily feed, lb**

**Daily ME, Mcal**

**University of Minnesota**
Effects of Sow Activity on Energy Needs

- Sow activity (min/day)
- Daily ME, Mcal
- Daily feed, lb

<table>
<thead>
<tr>
<th>Sow activity (min/day)</th>
<th>Daily ME, Mcal</th>
<th>Daily feed, lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>6.89</td>
<td>4.85</td>
</tr>
<tr>
<td>240</td>
<td>7.20</td>
<td>5.07</td>
</tr>
</tbody>
</table>
Practical Implications

Huddling

- Activity
- Wastage?

Dietary Energy Savings

Dietary Energy Costs

Outcomes to monitor:
- Sow body wt. and condition
- Farrowing performance
- Sow longevity
### Parity Segregation Can Improve Performance in Group Housing

<table>
<thead>
<tr>
<th>Item</th>
<th>Sow - pen</th>
<th>Gilt - pen</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. pens</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>No. sows mated</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Farrowing rate, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All females</td>
<td>83</td>
<td>88</td>
</tr>
<tr>
<td>P1 females</td>
<td>$67^a$</td>
<td>$94^b$</td>
</tr>
<tr>
<td>Old females</td>
<td>88</td>
<td>-</td>
</tr>
<tr>
<td>Gilts</td>
<td>-</td>
<td>85</td>
</tr>
</tbody>
</table>

$^a_b$ $P = 0.03$

Li et al. (2012)
Relationship of Backfat Gain and Pregnancy Rate of Group-Housed Sows

Kongsted (2006)
Approaches to Reducing Aggression at Mixing

- Mix sows after confirmed pregnant
- Increase feed intake before and 2 days after mixing
- Mix previously grouped sows
- Keep gilts & P1 sows together
- Introduce young females to pen before old females
- Provide “hides” for sows
- Include a V-boar in pen?
- Feeding elevated tryptophan (unsuccessful)
Hides to Reduce Aggression
Use of Barriers at Feeding
Effect of Dietary Fiber and Feeding Level on Sow Behavior

Bergeron et al. (2000)
## Effects of High-Fiber Diet on Gestating Sow Behavior

<table>
<thead>
<tr>
<th>Behaviors</th>
<th>Control</th>
<th>High Fiber</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lying(^1)</td>
<td>0.689</td>
<td>0.765</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Standing(^1)</td>
<td>0.293</td>
<td>0.226</td>
<td>0.05</td>
</tr>
<tr>
<td>Exploration(^1)</td>
<td>0.296</td>
<td>0.217</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Aggressive encounters(^2)</td>
<td>0.05</td>
<td>0.05</td>
<td>NS</td>
</tr>
<tr>
<td>Head thrusts(^2)</td>
<td>0.02</td>
<td>0.00</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Biting(^2)</td>
<td>0.02</td>
<td>0.01</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>

1. Percent of observation time recorded during 12 periods over 3 weeks after mixing
2. Occurrences/min of observation time; Observed for 4 h after mixing

Source: Stewart et al. (2010)
Effect of Dietary Fiber Source and Feeding Level on Feeding Motivation of Sows

Responses for last reward, No.

- Control: 86^a
- Pectin: 79^a
- Potato: 74^a
- Beet Pulp: 84^a
- Semi ad lib: 28^b

\( a \) Compared to control and pectin diets, no significant difference was found.
\( b \) Significantly different from control and pectin diets. 

\( \overline{ab} \) Significantly different from control and pectin diets with a trend toward significance. 

(P < 0.05)

Jensen et al. (2012)
Influence of Soy Hulls on Stereotypic Behavior of Sows Around Feeding (Day 80 of Gestation)

Holt et al. (2006)

Feeding behavior
Stereotypic behavior

ab (P < 0.05)
• Dietary fiber likely has limited value in reducing aggression
  • Highly fermentable fiber would have the most utility

• Restricted feeding seems to overwhelm most beneficial effects of dietary fiber on behavior

• Non competitive feeding systems are most useful to reduce aggression at feeding time
Workers must adapt to group housing just as sows adapt.

Workers need an “animal-directed” approach to groups:
  - Look for disadvantaged sows

Animal care may be intuitive to some but not others.

Use a consistent approach to animal care.
Suggestions for Walking Barns

• Sow condition/behavior:
  - Are sows behaving normally considering the time of day?
  - Are there “loner” sows?
  - Are some sows dominating the waterers?
  - Do some sows have excessive scratches or injuries?

• Equipment:
  - Is water flow appropriate?
  - Is there damaged flooring/partitions/equipment?
  - Feed wastage present?
Suggestions for Walking Barns

• Environmental management in rooms:
  • Are floors wet, drafty, slippery?
  • Are fans and heaters operating normally?
  • Is air quality acceptable in rooms?

• Manure handling system:
  • How much capacity is left in pits?
  • Are scrapers working properly?
Summary

• Dietary energy needs may change when moving sows into groups

• Dietary approaches to reduce aggression probably require increased feed intake
  • Consider a non-competitive feeding system

• Stockmanship is key to success of the system
It is easy to notice the big things!
But what about the small things?
But what about the small things?
Bedding Reduces Energy Needs

- No bedding: Daily ME, Mcal = 7.92
- Straw bedding: Daily ME, Mcal = 7.44
- Daily feed, lb:
  - No bedding: 5.58
  - Straw bedding: 5.25