Thank you for participating in SowBridge 2010.

Geriatric Sows: Keep or Cull

Ken Stalder,
Professor & Extension Swine Specialist
Iowa State University

Parity profile of sow herd

◆ Influences
  ■ Performance
    1. Productivity (NB, NBA, weaning wts, etc.)
    2. Biological performance (immune status, colostrum quality, etc.)
  ■ Economic performance
  ■ Worker morale

Importance of parity profile

◆ Optimum parity
  ■ Mathematical function
    1. Sow removal rate
    2. Gilt availability
    3. Market price (sow and market hog price)
    4. Feed costs
  ◆ Removal rate
    ■ Sum culling rate and mortality rate

Ideal Shape of Herd Parity Profile.

Too Much Reliance on Older Sows

Bulge moves through the herd as reliance is too heavy on older sows and herd does not replace enough gilts. Productivity remains good.
Types of culls

- Voluntary – producer has some say or choice in which animals are culled
- Involuntary – producer really has no choice when to cull animal
  - Long wean-to-estrus
  - No estrus
  - Lameness

Reasons For Culling

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage Culled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproductive failure</td>
<td>30 - 35</td>
</tr>
<tr>
<td>Old age</td>
<td>15 - 20</td>
</tr>
<tr>
<td>Performance</td>
<td>15 - 20</td>
</tr>
<tr>
<td>Feet and leg problems</td>
<td>10 - 15</td>
</tr>
<tr>
<td>Death</td>
<td>5 - 10</td>
</tr>
<tr>
<td>Post-farrowing problems</td>
<td>3 - 5</td>
</tr>
<tr>
<td>Other</td>
<td>5 - 10</td>
</tr>
</tbody>
</table>

Target Levels

- What should replacement rates be?
  - Can certainly do better than currently
  - Can we achieve 35 to 40 percent replacement rate?
- Herd life average 4.5 to 4.8 parities
- Longer introduction periods
  - Increase their cost up to 15%
  - Payback far outweighs time, trouble, and money invested early on into the gilt and that first parity sow

Sow replacement-rate, related to the number of litters produced per sow

<table>
<thead>
<tr>
<th>Average Number of Litters / Sow</th>
<th>Litters per sow per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>70 78</td>
</tr>
<tr>
<td>4</td>
<td>52 59</td>
</tr>
<tr>
<td>5</td>
<td>42 47</td>
</tr>
<tr>
<td>6</td>
<td>35 39</td>
</tr>
<tr>
<td>7</td>
<td>30 34</td>
</tr>
<tr>
<td>8</td>
<td>26 29</td>
</tr>
<tr>
<td>9</td>
<td>24 27</td>
</tr>
<tr>
<td>10</td>
<td>21 24</td>
</tr>
</tbody>
</table>
Do we need to make culling decisions based on the need to keep up with genetic progress from gilt supplier?

Culling to maintain genetic performance

Assumptions

- Genetic Improvement Per Generation Interval
- Economic Value

- Number Born Alive: 0.3
- 21 Day Litter Weight: 3
- Days to Market: 3
- Backfat: 0

- Generation Interval (years): 1.5

Retention Rate: 0.811
Rate: 867

Culling to maintain genetic performance

<table>
<thead>
<tr>
<th>Parity</th>
<th>NBA</th>
<th>Weaned Pigs Sold</th>
<th>Pigs</th>
<th>Pre-wean Mort</th>
<th>Post-wean Mort</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.2</td>
<td>10</td>
<td>5</td>
<td>9.18</td>
<td>8.72</td>
</tr>
<tr>
<td>2</td>
<td>11.0</td>
<td>10</td>
<td>5</td>
<td>9.9</td>
<td>9.405</td>
</tr>
<tr>
<td>3</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>4</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>5</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>6</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>7</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>8</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>9</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>10</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>11</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>12</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>13</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>14</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
<tr>
<td>15</td>
<td>11.4</td>
<td>10</td>
<td>5</td>
<td>10.26</td>
<td>9.747</td>
</tr>
</tbody>
</table>

Importance of accurate records when making culling decisions

- All too frequently, decisions to modify a sow system or a grow-finish population are based on field-collected data and can lead to incorrect management decisions.
- Accuracy of farm data is essential when it is used by producers to make business and management decisions.
- Farm data also allows researchers to quantify the economic importance of culling factors and other key production indicators.

Breeding Herd Study Results:

Of the sows evaluated, 209/923 (23%) were found to have an inaccurate culling code.

- Cell code: Frequency: 100%
- Frequency of an improper culling code: 100%
Breeding Herd Study - Conclusions

- Concern over the accuracy of farm records for culling is raised from the magnitude of errors observed in the present study.

Reproductive

- Ovaries
  - Normal 85%
  - Cystic 6%
  - Acyclic 9%

- Pregnant 6%

Characterization of U.S. Midwestern cull sows

Results - heel lesions - hind 67.5%, front 32.9%

Foot lesions %

<table>
<thead>
<tr>
<th># of lesions</th>
<th>Front</th>
<th>Rear</th>
<th>Combined</th>
<th>Front/Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>48.5</td>
<td>19.5</td>
<td>13.6</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>43.8</td>
<td>51.3</td>
<td>29.5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>7.3</td>
<td>23.8</td>
<td>33.3</td>
<td></td>
</tr>
<tr>
<td>3+</td>
<td>.4</td>
<td>5.5</td>
<td>23.6</td>
<td></td>
</tr>
</tbody>
</table>

Why is it so popular to cull at the 6th parity?

- Large herds operate on a proforma basis
  - Replacements are ordered up well in advance or prepared in gilt pools for automatic entry
  - Done at a convenient parity
  - Done when it fits pig flow
- Naturally acquired immunity tends to fall off in sows at this age in general
  - Can threaten younger animals
  - Viral diseases often peak again at this time
- Exercise restricting conditions for sows in large herds tend to cause culling from leg and physical problems by parity 6
  - Even as sows are otherwise healthy and productive enough
- Breeding companies encourage rapid turnover to maximize genetic improvement in the commercial operations

Parity distribution given maximum parity and culling rate

<table>
<thead>
<tr>
<th>Culling Rate</th>
<th>0.15</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.85</td>
<td></td>
</tr>
</tbody>
</table>

Avg. Parity of sows that farrowed 3.5
Average No. Born Alive 10.2
No. of Sows farrowed per group 100
Parity distribution given maximum parity and culling rate

<table>
<thead>
<tr>
<th>Parity</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pigs</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Pigs/</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Produced</td>
<td>1109</td>
<td>1135</td>
<td>1147</td>
<td>1153</td>
<td>1155</td>
<td>1153</td>
<td>1153</td>
<td>1147</td>
<td>1145</td>
<td>1143</td>
<td>1142</td>
<td>1141</td>
</tr>
<tr>
<td>Avg Parity</td>
<td>1.45</td>
<td>1.89</td>
<td>2.29</td>
<td>2.67</td>
<td>3.03</td>
<td>3.36</td>
<td>3.67</td>
<td>3.95</td>
<td>4.21</td>
<td>4.46</td>
<td>4.87</td>
<td>4.87</td>
</tr>
</tbody>
</table>

Effective sow culling begins with effective culling / selection of replacements gilts.

- Cull all gilts with extremely small or infantile vulvas.
- Cull all gilts with a vulva that is tipped up excessively.
  - Reproductive and urinary tract infections
- Cull gilts having fewer than 6 functional well-spaced, properly positioned teats.
  - 7 or even 8 functioning teats per side is desirable.
  - Poor spacing (maybe difficult for two piglets to nurse adjoining teats at the same time) or position is not correct (may not be accessible when sow lies down to nurse)

Effective sow culling begins with effective culling / selection of replacements gilts.

- Cull gilts that have buck knee'd front legs.
- Cull gilts that have straight rear pasterns and are post legged.
  - Appear high topped and have a steep rump.
- Cull gilts that are extremely sickle hocked.
- Cull gilts that are narrow based and light muscled.
- Cull gilts that are excessively muscled so much so that normal movement is impaired which typically causes "goose stepping" rear legs.

Effective sow culling begins with effective culling / selection of replacements gilts.

- Cull gilts that have "swaying" hind quarters.
  - Seen in really long bodied gilts.
  - These animals can often cross their rear feet when walking.
- Cull gilts that fail to cycle normally and after hormone treatment.
  - Note gilts that were treated with hormones so they can be followed as sow for breeding problems.

Effective sow culling begins with effective culling / selection of replacements gilts.

- If grow-finish daily gain is in the lower 25th percentile of contemporary group.
  - Would prefer that gilts are in the top 50-60% for growth in their contemporary group.
  - Consider taking top 75% of gilts for growth rate.
  - After culling for other criteria (underline feet and legs, etc.), if the number of replacements available exceeds those needed, additional culling for growth rate is possible.
Culling recommendations

- Once the decision to cull has been made, the sow should be immediately removed from the herd, and replaced as soon as possible by a served-gilt. Holding on to a sow to try to restore condition prior to sale is not economically justifiable as sows have an FCE of about 7:1.
- Following the above guidelines should ensure that a stable and productive parity profile is maintained on the unit, thus maximizing herd output, and therefore, profitability.

Sow culling recommendations

- Cull sow if she is ill (unhealthy) or lame with little prospects of getting better with treatment.
  - Choice between treating or culling immediately without treatment.
  - Concerned with withdraw times
  - How often do they respond to treatment
- Cull sow that has had two consecutive low number of total born after the first parity.
  - Sow cannot be culled for low number of piglets born until the 3rd parity at the earliest.

Sow culling recommendations

- Found open after attempting to breed the sow two consecutive estrus cycles.
- Cull sow based on parity only after the 10th parity (keep a watchful eye on parity distribution).
- Cull sow if there are more than 3 negative comments on the sow card
  - (i.e. crushes allot of pigs, difficult to get into the crate, is aggressive with employees when moving. Etc.)

Sow culling recommendations

- Found open after attempting to breed the sow two consecutive estrus cycles.
- Cull sow based on parity only after the 10th parity (keep a watchful eye on parity distribution).
- Cull sow if there are more than 3 negative comments on the sow card
  - (i.e. crushes allot of pigs, difficult to get into the crate, is aggressive with employees when moving. Etc.)

Sow culling recommendations

- If sow has had two consecutive litters where 25% or more of the litter have a birth weight of 2 lbs. or less.
- Cull sow after sixth parity if over 50 percent of the piglets were still born.

Suggest culling thresholds based on the sow’s history of pigs raised per litter.

<table>
<thead>
<tr>
<th>Parity</th>
<th>Cumulative pigs raised</th>
<th>Pigs raised in Previous 3 litters</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>60 under 30</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>70 under 30</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>79 under 30 (gilt litter + parity 2 + parity 3 = 30)</td>
<td></td>
</tr>
</tbody>
</table>

Thus, this number can be adjusted based on the numbers from your herd.
Thank You for Your Time and Attention

Are there any questions?

IOWA STATE UNIVERSITY
Department of Animal Science