The effect of different dietary energy levels during rearing and mid-gestation on gilt performance

Signe Lovise Thingnes, Elin Hallenstvedt, Ellen Sandberg & Tore Framstad
Background

• Maternal breed: Norwegian Landrace x Yorkshire (LY)
• Genetic progress
• Feed efficient, lean and productive
• Old feed recommendations

Are present feeding recommendations still valid for the modern sow?
Introduction

• Is age and body composition at first mating important for sow productivity and longevity?
• Literature often describes five common strategies for rearing of gilts
• Our strategy: increase fat deposition without restricting the protein
**Trial design**

- **250 gilts**
  - Higher energy diet
  - **13.2-29.0 MJ NE/d**
  - **+ 25 %**

- **250 gilts**
  - Norm energy diet
  - **10.6-22.9 MJ NE/d**

- **250 gilts**
  - **Selection**
  - **Flushing & mating**

- **250 gilts**
  - **Confirmed pregnant**

- **125 gilts (High/high)**
  - **27.3 MJ NE/d**

- **125 gilts (High/norm)**
  - **22.3 MJ NE/d**

- **125 gilts (Norm/high)**
  - **27.3 MJ NE/d**

- **125 gilts (Norm/norm)**
  - **22.3 MJ NE/d**

**Flushing & mating**

- **HH**
- **HN**
- **NH**
- **NN**

**Rearing (25-110kg)**

**Interim period**

**Mid-gestation (d 42-95)**

**Lactation**

Drawing: Siw Storøy
Materials & methods

• Data collection
  – Gilt age, weight and backfat thickness
  – Litter size and weight
  – Time of culling and reasons

• Statistical analysis
  – Repeated measures
  – Linear mixed models
  – Log-linear regression
  – Logistic regression

All results are based on field data collected in a commercial sow-pool
Main findings

<table>
<thead>
<tr>
<th>Selection for mating</th>
<th>Norm energy diet</th>
<th>Higher energy diet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LS mean</td>
<td>LS mean</td>
</tr>
<tr>
<td>Age, d</td>
<td>211&lt;sup&gt;a&lt;/sup&gt;</td>
<td>206&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Backfat, mm</td>
<td>11.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>12.4&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a-b</sup> Between columns LS means with different lettering differ $P < 0.05$

<table>
<thead>
<tr>
<th>Gilt development strategy</th>
<th>HH</th>
<th>HN</th>
<th>NH</th>
<th>NN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 95 of gestation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, d</td>
<td>324&lt;sup&gt;a&lt;/sup&gt;</td>
<td>330&lt;sup&gt;B&lt;/sup&gt;</td>
<td>330&lt;sup&gt;B&lt;/sup&gt;</td>
<td>336&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>225&lt;sup&gt;a&lt;/sup&gt;</td>
<td>218&lt;sup&gt;b&lt;/sup&gt;</td>
<td>222&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>220&lt;sup&gt;B&lt;/sup&gt;</td>
</tr>
<tr>
<td>Backfat, mm</td>
<td>17.7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>17.3&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>17.4&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>16.8&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a-b</sup> Between columns LS means with different lettering differ $P < 0.05$

<sup>A-B</sup> Indicates statistical trend $P$ – value between 0.05 - 0.10
Risk of removal at different ages and weight

Rearing strategy

Gilt development strategy
## Culling reasons

<table>
<thead>
<tr>
<th></th>
<th>Rearing diet</th>
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<th>Gilt development strategy</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Norm energy</td>
<td>Higher energy</td>
<td>HH</td>
<td>HN</td>
<td>NH</td>
<td>NN</td>
<td></td>
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<tr>
<td><strong>Reproduction</strong></td>
<td></td>
<td></td>
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<tr>
<td>*anestrus</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td></td>
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<tr>
<td>*Return to estrus</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>*abortion</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>*Not in pig</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td></td>
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<tr>
<td><strong>Lameness &amp; injuries</strong></td>
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<td></td>
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</tr>
<tr>
<td>*Lameness/foot lesions</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>*injuries</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td>11</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
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<td>5</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>22</td>
<td>17</td>
<td>14</td>
<td>30</td>
<td>29</td>
<td>29</td>
<td></td>
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</table>
Main conclusions

- Gilts offered more dietary energy during rearing were younger and had more fat reserves at selection for mating.
- Before parturition, the HH sows were the youngest, heaviest and had more backfat compared to the other three gilt development strategies.
- Risk of removal tended to be lower among higher energy reared gilts.
- More gilts from the HH group made the transition from first to second parity.
Thank you for your attention!