Improving udder quality traits in sows to aid survival, health and lifetime performance of piglets

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Pre weaning mortality in the UK is 11.5% of which 70% occurs during the first 4 days.

Quality Colostrum intake is the key solution:

- Passive immunity
- Energy for thermoregulation and body growth
- Gut Growth factors
- Colostrum production decreases after 12 hours

A good udder reduces the time to suckle
OBJECTIVES
Define udder conformation traits measurable in a reliable way

METHODS
24 sows of different parity: measured every day until farrowing (1-4 days later); twice a day; in a Standing up & Lying down posture; from both rows.

RESULTS
• Do not change in the days shortly prior to farrowing
• Repeatable within sow
• Do not differ between side and posture
• High variability between sows
## Experiment 2

### Udder morphology variation

#### OBJECTIVES

Define udder conformation traits main variation between sows

#### METHODS

124 sows (Large White X Landrace) of different parity measured: **once** shortly prior to farrowing; in a **Lying down posture**; from **one row**.

#### RESULTS

- Small length
- Small diameter
- Close to the abdominal mid-line
- Long inter teat distance

- Large diameter
- Large distance from abdominal mid-line
- Short inter teat distance

Sow parity number had a significant effect on teat length and diameter.
**Experiment 3**

**On-Farm colostrum IgG methodology**

<table>
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<tr>
<th><strong>OBJECTIVES</strong></th>
<th>Evaluation of Brix refractometer to assess colostrum quality</th>
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<tr>
<td><strong>METHODS</strong></td>
<td>Colostrum sample of sows of different parity, collected when freely available.</td>
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<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Analytical method</th>
<th>Tested hypothesis</th>
<th>P-value</th>
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<tr>
<td>BRIX repeatability</td>
<td>BRIX</td>
<td>High repeatability ( r = 0.99 )</td>
<td>&lt; .0001</td>
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<tr>
<td>Refrigerated at 24-48-72h</td>
<td>BRIX</td>
<td>No differences</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>BRIX</td>
<td>No differences</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>Brix-RID correlation</td>
<td>BRIX &amp; RID</td>
<td>Positive correlation ( r = 0.67 )</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Sampling time</td>
<td>BRIX &amp; RID</td>
<td>4h after farrowing lower IgG</td>
<td>&lt; .05</td>
</tr>
</tbody>
</table>

![BRIX Refractometer](image1.png)  
![Agar plate Radial immunodiffusion RID](image2.png)
Experiment 4
Variation of litter performance

**OBJECTIVES**
Study the effect of maternal and birth characteristics on litter weight and serum IgG at 24h.

**METHODS**
120 litters & 1426 piglets alive. 38 litter serum samples.

**MATERIAL**
Piglet birth weight, 24h weight, 24h serum sample from 4 piglets per sow.

**RESULTS**
- Immunocrit offers a simple on-farm test for piglet Ig intake.
- Variation in litter serum immunoglobulin concentration was not explained by any maternal and birth characteristics.
# Experiment 5
## Relationship between piglets and udder traits

<table>
<thead>
<tr>
<th><strong>OBJECTIVES</strong></th>
<th>Study the link between udder morphology and piglet suckling behaviour</th>
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<td><strong>METHODS</strong></td>
<td>75 sows of different parity &amp; 377 piglets</td>
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<tr>
<td><strong>MATERIAL</strong></td>
<td>Udder data (exp.1). Piglet birth weight, vitality score, birth interval, time elapsed from birth to the udder &amp; from the udder to suckle.</td>
</tr>
</tbody>
</table>

### RESULTS

The latency to suckle from birth was significantly less on the posterior teats compared with the middle ones.

Vitality and birth weight did not have any effect on the time elapsed from birth to suckle.
Experiment 5
Piglets teat preference

- Teat preference greater for front and rear teats
- 72% of sibling choose the same teat
• Time elapsed from Udder to suckle shorter for front and rear teats
• Time elapsed from birth to suckle: average 27:48 minutes (00:02 to 02:51)
• From udder to suckle: average 09:29 minutes (00:00 to 01:34)
Experiment 5

Piglets teat preference

Udder morphology mean values

ANTERIOR & POSTERIOR
- Small length
- Small diameter
- Close to the abdominal mid-line
- Long inter teat distance

Perfect udder following piglet teat preference

AN IDEAL UDDER:
- Least 12 functional teat
- Placed equal distance the one from the other
- Small length and diameter
- Close to the abdominal mid-line
Study in progress

• Assess how udder conformation changes in consecutive parities of the sow

• Genetic study on selected traits and colostrum quality
  • heritability will be estimated for key udder traits
  • genetic correlations with other maternal selection criteria

Industry focus

• Allow a breeding company to take udder conformation and colostrum quality into account
  • Repeatable and reliable methods for gilt selection
• Increase number of weaned piglets
  • Allowing the selection of sows with better nursing capacity
  • Improving colostrum accessibility and quality
Acknowledgements

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Questions?