Management strategies to improve the performance of gilt progeny

Background

• Piglets from gilts (compared to older parity sows):
  – Lighter at birth and weaning
  – Poorer post-weaning growth and survival
    = ~ 30% growing herd - $ to farmers (fewer, lighter pigs)

• Susceptible subpopulation leads to ↓ herd health
  – Segregation of piglets by dam parity

• This project:
  – ID risk factors for poor performance of gilt piglets
  – Particularly look at role of weaning wt, disease transfer and immunity
3 main risk factors

- Gilt piglets performance is poorer than sow piglets mostly due to diff in:

1. Birthweight
2. Milk intake
3. Transferred immunity
Gilt piglets lighter than sow piglets
1.4 kg vs 1.6 kg

![Birthweight range graph showing comparison between gilt (G) and sow (S) piglets](image)
Birthweight influences survival (+growth)

Quartiles
3.00 - 1.76 kg
1.76 - 1.54 kg
1.54 – 1.28 kg
1.28 – 0.40 kg
Can you inc. gilt piglets birthweight?

• Yes - with diet… but doesn’t seem to go above ~1.4kg

• Beyond that – probably need to inc age at first mating… not cost effective (↑ piglet wt not number)

• Other ideas are still in research
Difference in pre-weaning piglet growth…

Predicted means of piglet weights (kg) adjusted for birthweight (1.6kg).

<table>
<thead>
<tr>
<th>Replicate</th>
<th>Dam parity</th>
<th>Weaning</th>
<th>10 wks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>Gilt</td>
<td>6.8 a</td>
<td>24.1 b</td>
</tr>
<tr>
<td>Summer</td>
<td>Sow</td>
<td>6.8 a</td>
<td>23.2 b</td>
</tr>
<tr>
<td>Winter</td>
<td>Gilt</td>
<td>7.0 a</td>
<td>21.7 a</td>
</tr>
<tr>
<td>Winter</td>
<td>Sow</td>
<td>7.6 b</td>
<td>24.6 b</td>
</tr>
</tbody>
</table>

Different superscripts within column within replicate indicates significance (P<0.05)
Higher pre-wean piglet growth from sows than gilts in winter but not summer

- Winter (21°C; 14-26°C) vs Summer (26°C; 20-36°C)

- Drip coolers – inadequate for sows?

- Might need ↑ wet skin surface area for heat exchange
Why gilts have lower milk yield

• Immature mammary glands
  – Not as much tissue to remodel as sows

• Lower litterweight / suckling pressure

• Parity difference in milk yield / piglet growth if the environment is optimal for milk production

• Other ways of ↑ piglet growth pre-weaning??
Supplemental milk

• Increased weights
  – weaning and carry-on

• Not change mortality or medication rates pre- or post-weaning

• Not cost effective in this experiment
  – Labour – major cost
  – Need to have max piglet intake
    • Don’t provide earlier than 10 days of age
    • Clean, warm milk at all times.
But it is not all about birthweight and milk yield…

Dam parity independently affects survival…
On to immunity…

• Colostrum/milk provides energy for growth and survival… as well as antibodies and cells…
• Contributes to pre- and post-weaning health

• Pre-weaning:
  – ↑ diarrhoea tmt in gilt vs sow litters (50% vs 20%)

• Post-weaning – gilt piglets:
  – ↑ mortality
  – ↑ medication rate
  – ↓ piglet growth
Tetanus toxoid (TT) specific IgG relative concentrations higher in gilts compared to sows post-vaccination.
No diff between gilts and sows in colostrum and milk tetanus toxoid specific IgG

- Change in IgG conc. over time was expected.
Management strategies

• Maximise birthweight
  – Through nutrition and others (still being investigated)
  – Improve piglet lifelong survival
  – Improve mammary development of gilts

• Maximise piglet milk intake
  – Through bwgt and good milk-producing environment
  – Will improve piglet pre- and post-weaning growth

• Repeated exposure of gilts to on-farm diseases

• Consider gilt and sow piglets separately when determining timing of vaccination.
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