Optimising Weaned Pig Quality – It’s not a line…..It’s a circle

Jonathan French, ForFarmers
November 19th 2014
Facts & Figures

Core activities

Advice on and sale and production of animal feeds (compound feeds, specialties, co-products and raw feed)

Sales of agricultural trade items (fertilisers, crop protection, seeds and seedlings)

Compound feed sales volumes

~9%
~22%
~32%
~37%

#1 in Europe: total feed to farm solutions
Turnover of €2.6 billion
Sales of 6.4 million tonnes of compound feed
> 20,000 clients (agrarian companies)
37 production facilities in 4 countries
1 centrally-managed innovation unit (NIC)
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Topics to discuss

• Optimising weaned pig quality
  – Gilt selection
    • What do we want the gilt to achieve?
  – How do we improve the quality of the new born piglet?
    • Increasing viability of born piglets
    • Birthweight variability
    • Maximising birth weights
  – How can we improve growth and survival from birth to weaning?
    • Gestation feeding
    • Lactation feeding
    • Milk Quantity and Quality (Colostrum)
It’s a circle

Lactation

Feeding the piglet

Birth

Gestation

Flushing

Gilt Introduction
Increase in sow productivity

Source: BPEX
Variation between Farms on Birth Weight

Every live born piglet = -35 gram birth weight

Source: Pig vitality check - ForFarmers
Litter Uniformity under Field Conditions

+ 130,000 piglets
Weight <24 hrs of life
It’s a circle

Gilt Introduction

Lactation

Flushing

Feeding the piglet

Birth

Gestation
Importance of Gilt Selection – Breeder Recommendations

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Weight (Kgs)</td>
<td>135 – 140</td>
<td>135 min</td>
</tr>
<tr>
<td>Physiological Age</td>
<td>2\textsuperscript{nd} or 3\textsuperscript{rd} heat</td>
<td>2\textsuperscript{nd} heat</td>
</tr>
<tr>
<td>Chronological Age (days)</td>
<td>210 – 240</td>
<td>196 – 224</td>
</tr>
<tr>
<td>Back Fat</td>
<td>13 – 15mm</td>
<td>n/a</td>
</tr>
</tbody>
</table>

But what about protein?
It is becoming more apparent that the relationship between body fat level and the sow’s lifetime productivity is very poor. This may reflect the fact that the majority of tissue mobilisation in young lactating sows is protein not fat.

High health helps gilts perform
Gilts’ health status cannot be underestimated. Last year, herd performance on producer Chris Forayden’s unit had bottomed out at about 16 pigs reared per sow per year, mostly due to poor health. He had tried everything to get numbers back up but nothing helped.

Fortunately, he found a financially viable way to re-stock. His neighbours were nearing the end of re-stocking their four herds and had spare capacity at their gift rearing site. The results from the neighbour’s re-stocked herds were superb, giving some assurance of success. They were able to deliver a new herd for Chris so he ran down his old batch, gazing just ten days postwean and eight weeks without re-introduction. The first gilts farrowed in April last year.

A year later, Chris production is up by more than six pigs reared, at 24.4 pigs per sow per year. Farrowing rate is around 95% and sows are producing 2.4 pigs per year. Locally, heeds are even all of a similar high health strain. To help maintain this, Chris uses his own herd of pigs as the neighbouring unit and have adopted the same management practices such as using natural service instead of AI.

“protein mass is more important than back fat in gilts for lifetime performance”
Importance of Feed Programme for the Replacement Gilt

D.B. de Koning et al (2014)
# Effect of Feed Regime on Incidence of Osteochondrosis

<table>
<thead>
<tr>
<th></th>
<th>AA</th>
<th>AR</th>
<th>RA</th>
<th>RR</th>
</tr>
</thead>
</table>
| Nº Affected | 32  
аб | 30  
a | 41  
b | 23  
a |
| % Affected   | 60.4 | 56.6 | 78.8 | 44.2 |

D.B. de Koning et al (2014)
It’s a circle

Lactation → Flushing → Feeding the piglet → Birth → Gestation
In the heat of the moment: Flushing

More and better follicle development due to nutrition

Blood glucose ↑ — Insulin ↑ — LH and FSH ↑ —
Starch Sugar — Ovulating follicles ↑ — Quality of the oocytes ↑ — More vital embryos
Impact of Maternal Condition on Ovarian Function

Clowes et al., 2003
The Effect of Lactation Body Condition Change on Subsequent Litter Uniformity

<table>
<thead>
<tr>
<th>Body Weight Loss during Lactation (%)</th>
<th>≤ 3.5</th>
<th>3.5 – 13</th>
<th>&gt; 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.D. Birth Weight (gms)</td>
<td>279 (a)</td>
<td>299 (ab)</td>
<td>307 (b)</td>
</tr>
</tbody>
</table>

It’s a circle

Lactation ➔ Flushing ➔ Birth ➔ Gestation ➔ Feeding the piglet

Flushed piglet ➔ Lactation ➔ Flushing ➔ Birth ➔ Gestation ➔ Feeding the piglet
Gestation

- Day 1 tot 35: Development of the embryos, placenta and uterus; Recovery of sow condition
- Day 35-70: Development of organs and muscles in the piglets; Recovery of sow condition (less predominant)
- Day 70-birth: Growth of the piglets to a good birthweight and no sow condition loss
Fetal Development

- Ovulation
- Elongation of the blastocyst
- Development of the placenta
  - Development until day 35 well correlated with birth weight!
  - Dependant of follicle development before and after weaning
Feeding strategies

"Gilts are different?"
End of gestation

- Feeding the sow and piglet
- Higher requirements in Energy and amino acids
- Preparing for birth and first milk production
- 2-7 days before birth, feed a lactation diet or a special transition diet
It’s a circle

Lactation → Flushing

Feeding the piglet

Birth ↔ Gestation
Topics during birth

• **Problem**
  – “Weak piglets”
  – High mortality within the first 3 days after birth

• **Bigger litters**
  – Lower birth weights
  – Less uniform litters

• **Vitality**
  – Time from birth to first udder contact
  – Colostrum intake
  – Body temperature
  – Growth

• **Sow factors influencing piglet vitality**
  – Birth process (duration)
  – Colostrum production
Prepare the sow

- Fibres
- Amino Acids
- Energy
Transition Diet

- Can be fed in the last week of gestation, when sows enter farrowing room
  - More energy (Type of energy)
  - More amino acids
  - Good transition gestation – lactation diet
  - Supportive
    - Liver
    - Anti-oxidants
    - Vitamins
Effect of Feeding Additional Amino Acids prior to Farrowing - Piglets

- Birth Intervals (min)
- Vitality Score (0-3)
- Colostrum Intake (g)
- Daily Growth Rate to Day 7 (gms)
- Blood IgG at 24 hours (mg/ml)

<table>
<thead>
<tr>
<th></th>
<th>T</th>
<th>C</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth Intervals (min)</td>
<td>17</td>
<td>20</td>
<td>0,09</td>
</tr>
<tr>
<td>Vitality Score (0-3)</td>
<td>2,45</td>
<td>2,43</td>
<td>0,71</td>
</tr>
<tr>
<td>Colostrum Intake (g)</td>
<td>273,16</td>
<td>265,44</td>
<td>0,35</td>
</tr>
<tr>
<td>Daily Growth Rate to Day 7 (gms)</td>
<td>152.57</td>
<td>143.35</td>
<td>0,04</td>
</tr>
<tr>
<td>Blood IgG at 24 hours (mg/ml)</td>
<td>120.48</td>
<td>89.59</td>
<td>0,01</td>
</tr>
</tbody>
</table>

Source: NIC ForFarmers
It’s a circle

Lactation → Flushing

Feeding the piglet

Birth ← Gestation
Colostrum

• Placenta sow
  – IgG doesn’t pass the placenta

• Energy in new born piglet
  – Lowest of all farm animals
  – “Slow” piglets
  – Hypothermic
  – -> mortality first 3 days

• Nutritional values
Can We Influence Colostrum Quantity and Quality?

- Pre Farrowing Feeding
  - Nutrient Supply?

- Dietary Fat Type
  - Long Chain Omega 3

- Energy Source
### Effect of Nutrient Supply and Body Condition Score on Colostrum Yield (C.Y.)

<table>
<thead>
<tr>
<th>Nutrient Supply (day 108 – Day 3)</th>
<th>CY/Kg Piglet (gms)</th>
<th>Av Piglet Wt Gain Birth-24 hrs (gms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>239 (b)</td>
<td>110</td>
</tr>
<tr>
<td>Low</td>
<td>200 (a)</td>
<td>90</td>
</tr>
</tbody>
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<tr>
<th>Body Condition @ Day 108</th>
<th>CY/Kg Piglet (gms)</th>
<th>Av Piglet Wt Gain Birth-24 hrs (gms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (&lt;17mm)</td>
<td>215 (ab)</td>
<td>100</td>
</tr>
<tr>
<td>Mod (17-23mm)</td>
<td>245 (b)</td>
<td>130</td>
</tr>
<tr>
<td>High (&gt;23mm)</td>
<td>178 (a)</td>
<td>60</td>
</tr>
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</table>

Relation between IgG and Growth

**IgG & Growth until weaning**

<table>
<thead>
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<th>IgG Range</th>
<th>Growth (gram/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=10</td>
<td>210.0</td>
</tr>
<tr>
<td>&gt;10 &lt;=20</td>
<td>212.9</td>
</tr>
<tr>
<td>&gt;20 &lt;=30</td>
<td>227.8</td>
</tr>
<tr>
<td>&gt;30 &lt;=40</td>
<td>235.1</td>
</tr>
<tr>
<td>&gt;40 &lt;=50</td>
<td>230.4</td>
</tr>
<tr>
<td>&gt;50</td>
<td>230.6</td>
</tr>
</tbody>
</table>

IgG < 20 mg/ml significant lower growth p<0.01

Source: ForFarmers
Reduction of IgG content in Colostrum with time after birth of first piglet

Source: ForFarmers
Highly Productive Sows and the Importance of Colostrum

- Target 250 gram colostrum per piglet
- Average colostrum production 3.7 kg/sow
  - Wide distribution (1.9 Kg – 5.3 Kg)
- 16 Live Born
  - 16 x 250 = 4 kilo
- Problem
  - Under production of Colostrum
  - Do all piglets get the same quantity?
  - Reduction of IgG in time
    - Farrowing length
    - Birth order
    - Vitality of piglets
“Colostrum Score”
It’s a circle

Flushing

Lactation

Flushed

Feeding the piglet

Birth

Gestation
Effects of Early Growth Rate on Lifetime Performance

“The key to a good finish is a good start”

Liveweight

42.3 kgs
39.1 kgs
16.03kg
15.39kg
8.3 kg

28 days 53 days 97 days slaughter

+ 43 g/d

+3.2kgs

Assume 5kg

Source: BOCM PAULS 2011
It’s a circle

Flushing

Gestation

Birth

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Feeding the piglet

Gilt Introduction

For Farmers: The total feed business
Take Home Messages

- Key to successes:
  - Gilt selection
    - Understand the rearing process and adapt as necessary
    - Feed for body development as well as production
  - Feed to optimise follicle development (number and uniformity)
  - Gestation
    - Feed according to the important periods (3 phases)
    - Gilts are different!!
Take Home Messages

• Key to successes:
  – Birth
    • Prepare the sow well
    • Possibility of a transition diet?
  – Lactation
    • Colostrum management!
    • Consider feed intake and diet density (Gilt Lactation diet)
  – Feeding the piglet
    • Maintain the growth curve
    • “The key to a good finisher is a good start”