Postnatal – the second window of opportunity

S. Paredes
LifeStart....

Welfare

Economic implications
Birth weight - the limiting factor??
Birth weight is NOT always the limiting factor
Birth weight is NOT always the limiting factor

- Permanent effect?
- Problem is not efficiency-related
Nursery exit weight is determined:

- 30% by birth weight
- 30% by weaning weight
- 70% by weight during the first weeks after weaning

Paredes et al., 2012
Relation to market weight

- BiW < 20%
- WeaW ≤ 20%
- 10 wk weight 35%
- Finishing period < 20%

78% accuracy to determine slaughter weight

Paredes, unpublished
Light weight piglets are NOT that different

Paredes et al., 2013
Light weight piglets are NOT that different

Paredes et al., 2014
They suffered from an earlier stressor

Paredes et al., 2013
for which they can compensate

Move to average performance group
Within a time frame
Alternatives from 14 to 42 days of age

Early feed intake = Faster adaptation to challenges
LifeStart key pillars

- Genetics
- Management
- Genetics

Processes in gut wall

- Digestion & absorption
- Immune competence
- Adequate immune response

Health and growth

Over/Under immune response

Reduced health and growth
Different genetics = different needs
One diet DOES NOT fit all

Average daily gain (g/d)

Genetic 1

Genetic 2

days postweaning

100

7-14

14-21

21-28

28-36

7-36

trouw nutrition

a Nutreco company

Agresearch, 2013
Creep feed

Healthier colon, lower signs of inflammation

Also
- Lowest removals
- Less ß-haemolytic bacteria

Enhances the resilience to weaning

Creep (day 19-27)
Progeny of multiparous sows

Adapted from Edwards, 2010
Early post-weaning intake is stimulated by diet composition.

- Day 0–14 post-weaning:
  - 30 g/d extra feed intake
  - 30 g/day extra growth
  - 6.5% less diarrhoea
Complex diet = Higher % piglets eating

Wellock, 2013
Complex diet increases microbial richness in colon

Paredes et al. (in preparation)
Complex diets = lower PWD

![Graph showing average score over day post weaning for simple and complex diets.](image)

- **Simple diet**: Blue line
- **Complex diet**: Pink line

E. Coli infection tests at SRC

**Day post weaning**

<table>
<thead>
<tr>
<th>Day</th>
<th>Simple diet</th>
<th>Complex diet</th>
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<tbody>
<tr>
<td>1</td>
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</table>
Complex diet help in a Strep suis challenge

- BW, kg
  - Nursery phase: Complex diet vs Simple diet
  - Finishing period: Complex diet vs Simple diet

- FCR
  - Nursery phase: Complex diet vs Simple diet
  - Finishing period: Complex diet vs Simple diet

- ADG, g/d
  - Nursery phase: Complex diet vs Simple diet
  - Finishing period: Complex diet vs Simple diet

De Lange, 2015
Complex diet provide increase disease resistance

<table>
<thead>
<tr>
<th>Gene</th>
<th>Gene Name</th>
<th>Fold change</th>
<th>P value</th>
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<tbody>
<tr>
<td>ARG1</td>
<td>Arginase 1</td>
<td>1.79</td>
<td>0.056</td>
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<tr>
<td>CPS1</td>
<td>Carbamoyl phosphate synthase 1</td>
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<td>SLA-DMA, B</td>
<td>Swine leukocyte antigen DMA</td>
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<td>&lt;0.078</td>
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<tr>
<td>SLA-DQA, B1</td>
<td>Swine leukocyte antigen DMA</td>
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<td>&lt;0.057</td>
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<tr>
<td>SLA-DRA, B1</td>
<td>Swine leukocyte antigen DMA</td>
<td>0.56</td>
<td>&lt;0.070</td>
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<tr>
<td>GPX1</td>
<td>Glutathione peroxidase 1 (cellular)</td>
<td>1.52</td>
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<tr>
<td>GPX3</td>
<td>Glutathione peroxidase 3 (plasma)</td>
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<td>NR3C1</td>
<td>Glucocorticoid receptor</td>
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<td>TXNIP</td>
<td>Thioredoxin interacting protein</td>
<td>0.59</td>
<td>0.057</td>
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</table>

Rudar et al., 2012
Complex diet ≠ Higher costs

MOF, $/pig Complex feeding program: 23.40 vs. Simple feeding program: 20.50
Muscle growth rather than fat deposition

![Graph showing muscle growth and fat deposition](image)

Yin et al., 2010, 2013
Welfare implications

- Reduction in nr of light weight piglets
- Reduction in mortality
- More prepared piglets for the nursery challenges

Adapted from Edwards, 2010
Early investment = lower days to market

LifeStart

Common practice

Days to market

116
115
114
113
112
111
110
109

4
Trans-generational effect
Higher shoulder %
Leaner carcasses

Braunschweig et al., 2012
• Reduction in embryo survival d 45 gestation
• Decreased uterus weight and size
Benefits of investing in early life
Earlier feed intake PW

Microbial host relation

Better immune response

Higher within-batch homogeneity

Protein accretion

≥4 days less to market

Lower mortality

Higher ROI
Take home message
Take home message

1. A light piglet at birth is not deemed to be the lightest

2. The first weeks post-weaning are more important than birth weight determining the fate of a piglet

3. Light weight piglets will benefit the most of complex feeding scheme

4. Complex feeding ≠ higher costs - Complex feeding = MOF

5. Targeted nutrition rather than a simple feeding will determine future performance

6. Not only economical but welfare benefits of investing in early life

7. Investing in the first 6 weeks of a pig’s life will pay off in the long term
Thank you