Feeding Gestating Sows

• Feeding sows in gestation based on body weight and back fat thickness is more precise and economical than methods of feeding based on visual observation of body condition score.

• Previously, we have used heart girth as an indicator of body weight and back fat thickness.

• Recently developed new procedure, using a flank to flank approach to simplify the procedure.
Procedures for comparing heart girth and flank to flank measurements

• Sow girth was measured on all three farms with flank measurements taken on two of the farms.
  – 605 sows from 3 farms were used for the girth measurement
  – 306 sows from 2 farms were used for the flank measurement.

• On all farms, sows were removed from the gestation stall and weighed on a platform scale.
Heart girth measurement  Flank to Flank measurement

K-State
### Percentage of Sows that were Accurately Categorized or Under or Overestimated for Weight Category

<table>
<thead>
<tr>
<th>Weight category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Girth measurement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct category</td>
<td>1.7%</td>
<td>10.7%</td>
<td>12.4%</td>
<td>13.7%</td>
<td>27.9%</td>
<td>66.4%</td>
</tr>
<tr>
<td>Underestimate</td>
<td>- - -</td>
<td>2.3%</td>
<td>3.0%</td>
<td>5.6%</td>
<td>8.9%</td>
<td>19.8%</td>
</tr>
<tr>
<td>Overestimate</td>
<td>1.7%</td>
<td>3.5%</td>
<td>2.8%</td>
<td>5.8%</td>
<td>- - -</td>
<td>13.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3.3%</td>
<td>16.5%</td>
<td>18.2%</td>
<td>25.1%</td>
<td>36.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Flank-to-flank measurement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct category</td>
<td>- - -</td>
<td>3.9%</td>
<td>13.7%</td>
<td>21.9%</td>
<td>32.7%</td>
<td>72.2%</td>
</tr>
<tr>
<td>Underestimate</td>
<td>- - -</td>
<td>- - -</td>
<td>1.0%</td>
<td>2.3%</td>
<td>10.1%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Overestimate</td>
<td>- - -</td>
<td>3.6%</td>
<td>6.5%</td>
<td>4.2%</td>
<td>- - -</td>
<td>14.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7.5%</td>
<td>21.2%</td>
<td>28.4%</td>
<td>42.8%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>
Weight Categories for Gestation feeding

Heart Girth, in

Flank to Flank, in

Iwasawa et al., 2004
Heart girth and flank to flank measurements

• The flank-to-flank measurement can be obtained faster with less risk of operator injury and with the same accuracy as compared to girth measurement.

• Either method should provide a more accurate estimation of body weight compared to visual estimation.
## Feeding level from day 0 to 101, lb/day

<table>
<thead>
<tr>
<th>Flank to flank, inches</th>
<th>Estimated weight, lb</th>
<th>Backfat at breeding, mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9 to 11</td>
<td>12 to 14</td>
</tr>
<tr>
<td>&lt; 35.5</td>
<td>250 to 325</td>
<td>5.1</td>
</tr>
<tr>
<td>35.6 to 38.0</td>
<td>325 to 400</td>
<td>5.7</td>
</tr>
<tr>
<td>38.1 to 41.0</td>
<td>400 to 475</td>
<td>6.1</td>
</tr>
<tr>
<td>41.1 to 44.0</td>
<td>475 to 550</td>
<td>6.6</td>
</tr>
<tr>
<td>&gt; 44.0</td>
<td>550 to 650</td>
<td>7.1</td>
</tr>
</tbody>
</table>

- Assumes diet with 1.5 Mcal ME/lb
- All sows fed additional 2 lb/d from d 101 to 115
- Sows maintained at or above 20°C
Feeding of group-housed gestating sows

Conceived by: Dr. Steve Henry and innovative Kansas producers

Concept: Divide feed allotment into 5 to 7 feedings per day

Initial response: Producers love it!
They believe there is less fighting
and less variation in weight gain

Research plans: We will be testing the concept in the near future.
Weaning Time – am or pm???

- **Objective** - to determine whether removing sows from the farrowing crates 12 h before moving pigs to the nursery would influence how weanling pigs adjust to the nursery environment.

- 25 litters had sows removed from crates on Thursday pm and 25 litters had sows removed Friday am (271 pigs per weaning time).

- All weaned pigs moved to nursery pens on Friday am

Neill et al., 2004
Weaning time on performance, d 0 to 7

<table>
<thead>
<tr>
<th></th>
<th>ADG</th>
<th>ADFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P &gt; 0.84</td>
<td>SE = 0.05</td>
</tr>
<tr>
<td>pm</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>am</td>
<td>0.32</td>
<td></td>
</tr>
</tbody>
</table>

Neill et al., 2004

K-State
Weaning time on F/G, d 0 to 7

P < 0.003  SE = 0.05

Neill et al., 2004
Weaning time, d 0 to 28

<table>
<thead>
<tr>
<th>ADG, lb</th>
<th>ADFI, lb</th>
<th>Feed/gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>pm</td>
<td>am</td>
<td>pm</td>
</tr>
<tr>
<td>0.85</td>
<td>0.86</td>
<td>1.11</td>
</tr>
<tr>
<td>1.29</td>
<td>1.29</td>
<td></td>
</tr>
</tbody>
</table>

P > 0.68  
SE = 0.02

P > 0.82  
SE = 0.02

P > 0.50  
SE = 0.01

Neill et al., 2004

K-State

Neill et al., 2004
Weaning Time – am or pm???

- Overall, no differences in growth performance were observed based on weaning time.

- May allow for more flexibility for managers based on labor availability and to ensure sows are not omitted from a traditional weaning day feeding.
Recent data from Michigan State University evaluated the Berry Feeding System™

They compared -
- Ad-libitum, wet/dry feeder with the nipple waterer inside the feeder
- Hand-fed dry feeder with the nipple-cup combination waterer independent of the feeder
Influence of feeder design on sow average daily feed intake

Hand Fed | Berry feeder
---|---
13.0 | 14.6

P < 0.01
Nursery pig update
## Adjust Feed Budgets for Older Weaning Ages and Weights

<table>
<thead>
<tr>
<th>Diet, lb/pig</th>
<th>Weaning Weight, lb/pig</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEW</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Transition</td>
<td>5</td>
</tr>
<tr>
<td>Phase 2</td>
<td>13 to 15</td>
</tr>
</tbody>
</table>
Older weaning ages have not eliminated the need for identifying “starve out” pigs.
Percentage of Pigs that have Eaten by Hours after Weaning

Critical time period: 30 to 60 hours

Adapted from Bruinix et al., 2001
Identifying pigs that need to be taught feeding behavior:

- Mental status – alert or depressed
- Body Condition – normal or thin
- Abdominal shape – round or gaunt
- Skin – sleek appearance vs fuzzy
- Appetite – feeding at the feeder or huddled
- Signs of dehydration – normal or sunken eyes
Intensive Care Feeder
“The Cappuccino Feeder”
Addresses three needs of pigs that have not begun eating after weaning:

- **Water** – Young pigs are susceptible to dehydration
- **Nutrition** – Automated method of provided frequent meals
- **Behavior** – Cues to learn feeding behavior
Influence of feed antimicrobials on growth rate

Commercial Farm
(d 0 to 31 after weaning)

No Difference

Trial 1

Control: 0.70
Carbadox: 0.68

Trial 2

Control: 0.70<sup>a</sup>
Carbadox: 0.71<sup>a</sup>
Den/ CTC: 0.83<sup>c</sup>
Neo-Terra: 0.77<sup>b</sup>

Keegan et al., 2005

abc (P < 0.05)
Influence of feed antimicrobials on growth rate

KSU Swine Farm
d 0 to 28 after weaning

Commercial Farm 2
d 21 to 42 after weaning

ADG, lb

Control Carb DenCTC NeoTerra

ab (P < 0.05)
Antimicrobial Alternatives Tested in 2004

- Oregeno – Neill et al Poster
- BioSaf – Hilldabrand Poster
- KE-01 – Swine Day Report
- Little Response
Amino acid update
Influence of TID lysine and ME on ADG (Genetiporc pigs from 20 to 50 lb)

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Schneider et al., 2004
Influence of TID lysine and ME on F/G (Genetiporc pigs from 20 to 50 lb)

Schneider et al., 2004
Predicting TID lysine and ME from F/G (PIC pigs from 20 to 50 lb)

\[ y = 16.197x^2 - 54.056x + 46.089 \]

\[ y = 2.8752x^2 - 10.563x + 11.043 \]

Schneider et al., 2004
## Predicting Lysine:ME ratio from F/G

<table>
<thead>
<tr>
<th>Feed/gain</th>
<th>TID lysine, %</th>
<th>ME, Kcal/lb</th>
<th>Lysine:ME ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.67</td>
<td>0.99</td>
<td>1421</td>
<td>3.15</td>
</tr>
<tr>
<td>1.63</td>
<td>1.01</td>
<td>1464</td>
<td>3.13</td>
</tr>
<tr>
<td>1.59</td>
<td>1.09</td>
<td>1517</td>
<td>3.25</td>
</tr>
<tr>
<td>1.55</td>
<td>1.22</td>
<td>1578</td>
<td>3.49</td>
</tr>
<tr>
<td>1.53</td>
<td>1.30</td>
<td>1612</td>
<td>3.65</td>
</tr>
</tbody>
</table>

*Schneider et al., 2004*
Optimal TID Lysine:ME ratio
(Genetiporc pigs from 20 to 50 lb)

Schneider et al., 2004
Optimal TID Lysine:ME ratio
(Genetiporc pigs from 20 to 50 lb)

K-State

Schneider et al., 2004
Influence of TID lysine and ME on ADG (PIC pigs from 20 to 50 lb)

Schneider et al., 2005
Influence of TID lysine and ME on F/G (PIC pigs from 20 to 50 lb)

<table>
<thead>
<tr>
<th>TID Lysine, %</th>
<th>F/G</th>
<th>ME, Kcal/lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11</td>
<td>1.19</td>
<td>1341</td>
</tr>
<tr>
<td>1.26</td>
<td>1.33</td>
<td>1408</td>
</tr>
<tr>
<td>1.40</td>
<td>1.40</td>
<td>1475</td>
</tr>
<tr>
<td>1.42</td>
<td>1.45</td>
<td>1542</td>
</tr>
<tr>
<td></td>
<td>1.33</td>
<td>1609</td>
</tr>
</tbody>
</table>

Schneider et al., 2005
## Predicting Lysine:ME ratio from F/G

<table>
<thead>
<tr>
<th>Feed/gain</th>
<th>TID lysine, %</th>
<th>ME, Kcal/lb</th>
<th>Lysine:ME ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.45</td>
<td>1.11</td>
<td>1402</td>
<td>3.61</td>
</tr>
<tr>
<td>1.41</td>
<td>1.20</td>
<td>1461</td>
<td>3.73</td>
</tr>
<tr>
<td>1.37</td>
<td>1.29</td>
<td>1527</td>
<td>3.84</td>
</tr>
<tr>
<td>1.33</td>
<td>1.38</td>
<td>1599</td>
<td>3.92</td>
</tr>
</tbody>
</table>

Schneider et al., 2005
Amino acid ratios relative to lysine
- TID basis -

- Valine
- Threonine
- Met & Cys
- Isoleucine

Weight, lb

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Amino acid ratios relative to lysine
- TID basis -

Weight, lb

Methionine

Tryptophan

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Regression equations to predict TID amino acid:lysine ratios

Threonine = 0.00000268*wt^2 - 0.000645*wt + 0.6387
Met & Cys= 0.00000234*wt^2 - 0.000572*wt + 0.5885
Methionine = 0.00000042*wt^2 - 0.000037*wt + 0.2806
Tryptophan = -0.00000041*wt^2 + 0.00022*wt + 0.1556
Valine = 65.0%
Isoleucine = 55%
Paylean and fat update
Effect of sorting and added fat level on performance of grow-finish pigs reared in a commercial facility

- A total of 1,032 pigs were individually weighed and fitted with electronic ear tags
- 2 x 3 factorials
  - Three weight groups
    - Light (59 lb)
    - Heavy (77 lb)
    - Mixed (68 lb)
  - Two fat levels
    - 0 or 6% Choice white grease

*K-State*
Influence of fat level on performance d 0 to 109

In the diagram, the ADG (average daily gain) and feed/gain ratio are presented for two different fat levels: 0% and 6%.

- **ADG, lb**
  - 0% Added Fat: 1.73 lb
  - 6% Added Fat: 1.77 lb
  - P < 0.06

- **Feed/gain**
  - 0% Added Fat: 2.65
  - 6% Added Fat: 2.40
  - P < 0.001

The data suggests that increasing the fat level from 0% to 6% significantly improves ADG and feed/gain ratio.
Influence of fat level on performance d 0 to 109

- Fat P < 0.06
- Weight P < 0.001
- Interaction P = 0.25

<table>
<thead>
<tr>
<th>Added fat</th>
<th>Light</th>
<th>Heavy</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.65</td>
<td>1.83</td>
<td>1.71</td>
</tr>
<tr>
<td>6%</td>
<td>1.71</td>
<td>1.82</td>
<td>1.77</td>
</tr>
</tbody>
</table>
Influence of fat level on economic return from 0 to 109

- Light: Added fat 0 - Margin over feed: 98.04, Added fat 6% - Margin over feed: 99.23
- Heavy: Added fat 0 - Margin over feed: 107.90, Added fat 6% - Margin over feed: 105.81
- Mixed: Added fat 0 - Margin over feed: 102.75, Added fat 6% - Margin over feed: 101.97
Fat x variation summary

• Light pigs have a greater economic benefit from fat.
• Additional research is being conducted to verify this response.
Influence of fat level on performance from 144 to 180 lb

ADG, lb

<table>
<thead>
<tr>
<th>Added Fat</th>
<th>0</th>
<th>6%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.72</td>
<td>1.78</td>
</tr>
</tbody>
</table>

Feed/gain

<table>
<thead>
<tr>
<th>Added Fat</th>
<th>0</th>
<th>6%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.54</td>
<td>2.41</td>
</tr>
</tbody>
</table>
Influence of fat level on performance from 180 to 220 lb

180 to 220 lb:
- 0% fat: 2.01 lb
- 6% fat: 1.99 lb
- 3% fat: 2.03 lb
- 6% fat: 1.98 lb

144 to 180 lb:
- 0% fat: 1.87 lb

6% fat:
- 6% fat: 1.98 lb
Influence of fat level on performance from 180 to 220 lb

<table>
<thead>
<tr>
<th>Fat Level</th>
<th>ADFI, lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>5.27</td>
</tr>
<tr>
<td>6%</td>
<td>4.89</td>
</tr>
<tr>
<td>0%</td>
<td>4.87</td>
</tr>
<tr>
<td>3%</td>
<td>4.87</td>
</tr>
<tr>
<td>6%</td>
<td>4.72</td>
</tr>
</tbody>
</table>

164 to 180 lb: 0% fat
180 to 220 lb: 6% fat
144 to 180 lb: 6% fat
Influence of fat level on performance from 180 to 220 lb

Feed/gain

180 to 220 lb:

- 0% fat: 2.62
- 6% fat: 2.47
- 0% fat: 2.61
- 3% fat: 2.4
- 6% fat: 2.38

144 to 180 lb:

- 0% fat: 2.62
- 6% fat: 2.47
- 6% fat: 2.61
## Paylean withdrawal experiment

<table>
<thead>
<tr>
<th>Days on experiment</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 21</td>
<td>Control</td>
<td>Paylean</td>
<td>Paylean</td>
<td>Control</td>
</tr>
<tr>
<td>21 to 35</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
</tr>
<tr>
<td>35 to 56</td>
<td>Control</td>
<td>Control</td>
<td>Paylean</td>
<td>Paylean</td>
</tr>
</tbody>
</table>
### Effects of Paylean from d 0 to 21

<table>
<thead>
<tr>
<th>Treatments</th>
<th>ADG, lb</th>
<th>F/G</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2.10</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>2.34</td>
<td>2.72</td>
</tr>
<tr>
<td>C</td>
<td>2.34</td>
<td>2.51</td>
</tr>
<tr>
<td>D</td>
<td>2.12</td>
<td>2.47</td>
</tr>
</tbody>
</table>

**Note:**
- **ADG** (Average Daily Gain) and **F/G** (Feed to Gain) are measured.
- Values with different superscripts (a, b, c, etc.) indicate significant differences.
- **SE** (Standard Error) and **P** (Probability) values are provided for each comparison.

- **SE = 0.064**
  - **P < 0.0001**
All treatments fed control from d 21 to 35

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ADG, lb

Treatments

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADG</td>
<td>2.12</td>
<td>1.96</td>
<td>1.92</td>
<td>2.20</td>
</tr>
</tbody>
</table>

F/G

Treatments

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>F/G</td>
<td>3.09</td>
<td>3.22</td>
<td>3.32</td>
<td>2.98</td>
</tr>
</tbody>
</table>

SE = 0.060
P = 0.0069

SE = 0.14
P = 0.066
Effects of Paylean from d 35 to 56

**ADG, lb**

- **A**: 1.98<sup>b</sup>
- **B**: 1.93<sup>b</sup>
- **C**: 2.25<sup>c</sup>, 2.27<sup>c</sup>

SE = 0.033
P < 0.0001

**F/G**

- **A**: 3.45<sup>b</sup>
- **B**: 3.48<sup>b</sup>
- **C**: 2.94<sup>c</sup>, 2.95<sup>c</sup>

SE = 0.099
P < 0.0001

Treatments

K-State
Effects of Paylean from D 0 to 56

![Graph showing ADG (lb) for different periods and treatments.]

- **D 0 to 21**
  - Control
  - Paylean
- **D 21 to 35**
  - Control
  - Control
  - Control
- **D 35 to 56**
  - Control
  - Paylean

**Statistical Data**
- SE = 0.029
- P = 0.0034

**Notes:**
- ADG values: 2.06 (b), 2.09 (b), 2.20 (c), 2.20 (c)
Effects of Paylean from D 0 to 56

<table>
<thead>
<tr>
<th>Period</th>
<th>Control</th>
<th>Paylean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D 0 to 21</td>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>D 21 to 35</td>
<td>Control</td>
<td>Control</td>
</tr>
<tr>
<td>D 35 to 56</td>
<td>Control</td>
<td>Paylean</td>
</tr>
</tbody>
</table>

F/G values:
- D 0 to 21: 3.07
- D 21 to 35: 3.00
- D 35 to 56: 2.83
- Control: 2.84

SE = 0.075, P < 0.0001
Paylean withdrawal conclusions

- Paylean increased ADG and improved F/G over the 56 d trial
  - Feeding Paylean and then withdrawing it for a period of time did not improve or reduce overall performance
  - Re-feeding Paylean after the withdrawal period resulted in the same overall performance as pigs that only received Paylean for the last 21 days prior to market
Feed Processing and Ingredient Update
Summary of diet flow ability research

• Roller mill better than hammer mill
  – More uniform particle size (less fines)
  – Particle shape

  – Allows use of higher fat levels or other ingredients with poor flow ability
Specialty protein sources influence flow ability

Protein source × level interaction $P < 0.0001$

Select Menhaden fish meal
SDBC, powdered
SDBC, granulated
SDAP, powdered
SDAP, granulated

Carney et al., 2005
Will Mixing Time Influence Pig Performance?
## Diet Composition

<table>
<thead>
<tr>
<th>Component</th>
<th>Phase I</th>
<th>Phase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>52.25</td>
<td>65.36</td>
</tr>
<tr>
<td>Soybean meal, 46.5%</td>
<td>25.26</td>
<td>29.97</td>
</tr>
<tr>
<td>Monocalcium P, 21% P</td>
<td>1.00</td>
<td>1.60</td>
</tr>
<tr>
<td>Limestone</td>
<td>0.50</td>
<td>1.00</td>
</tr>
<tr>
<td>Fine mixing salt</td>
<td>0.30</td>
<td>0.35</td>
</tr>
<tr>
<td>Vitamin premix</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Trace mineral premix</td>
<td>0.15</td>
<td>0.15</td>
</tr>
<tr>
<td>Neoterramycin 10/10</td>
<td>0.70</td>
<td>0.70</td>
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<tr>
<td>Zinc oxide</td>
<td>0.25</td>
<td>0.00</td>
</tr>
<tr>
<td>L-Threonine</td>
<td>0.12</td>
<td>0.13</td>
</tr>
<tr>
<td>Lysine HCl</td>
<td>0.30</td>
<td>0.35</td>
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<tr>
<td>DL-Methionine</td>
<td>0.18</td>
<td>0.15</td>
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<tr>
<td>Select Menhaden Fish Meal</td>
<td>3.75</td>
<td>0.00</td>
</tr>
<tr>
<td>Spray Dried Whey</td>
<td>15.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
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</table>
## Diet Coefficient of Variation

<table>
<thead>
<tr>
<th></th>
<th>Mixing Time, minutes</th>
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<th></th>
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<tbody>
<tr>
<td></td>
<td>0</td>
<td>0.5</td>
<td>1.0</td>
<td>2.0</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>Phase 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mixer</td>
<td>178</td>
<td>38</td>
<td>26</td>
<td>21</td>
<td>5</td>
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<tr>
<td>Bag</td>
<td>26</td>
<td>20</td>
<td>16</td>
<td>11</td>
<td>7</td>
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<tr>
<td><strong>Phase 2</strong></td>
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<td>Mixer</td>
<td>172</td>
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<td>60</td>
<td>48</td>
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<tr>
<td>Bag</td>
<td>56</td>
<td>45</td>
<td>40</td>
<td>33</td>
<td>12</td>
</tr>
</tbody>
</table>
Effects of inadequate diet mixing
d 0 to 14

Linear P < 0.005
Quadratic P < 0.10
SE = 0.05

Linear P < 0.09
Quadratic P < 0.06
SE = 0.15

ADG, lb

F/G
Effects of inadequate diet mixing d 14 to 28

Linear P < 0.003
Quadratic P < 0.12
SE = 0.11

Linear P < 0.08
Quadratic P < 0.12
SE = 0.07
What to do with the increases in soybean meal price?

- Ruminant Meat and Bone Meal
- DDGS
- Crystalline Amino Acids
Influence of Meat and Bone Meal Level on Average Daily Gain

SE = 0.61

Quadratic, P<0.02
Control vs MBM, P<0.09

Gottlob et al., 2004
Meat and Bone Meal Breakeven Price Depending on Soybean Meal Price

<table>
<thead>
<tr>
<th>Soybean meal $/ton</th>
<th>M &amp; B Meal, $/ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>$140</td>
<td>$150</td>
</tr>
<tr>
<td>$160</td>
<td>$165</td>
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<tr>
<td>$180</td>
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<tr>
<td>$200</td>
<td>$195</td>
</tr>
<tr>
<td>$220</td>
<td>$210</td>
</tr>
</tbody>
</table>

K-State
“You can add just about 10% of anything to a finishing pig diet.”
Effect of Increasing DDGS on Finishing Pig Growth

Fu et al., 2004 University of Missouri

(Linear P < .001)
Effects of DDGS on feed intake when pigs are given a choice of diets

Hastad et al. (2004)

a, b, c, d differ P < 0.05
Wk 1 -3 ; Linear P <0.001
Effects of DDGS from Different Plants on Feed Intake

K-State

Hastad et al. (2005)
### Prices

- **Corn, $/bu**: $1.90
- **SBM, $/ton**: $160.00
- **Fat, $/cwt**: $13.50
- **Grind/mix/delivery, $/ton**: $12.00
- **Carcass price**: $72.00
- **Est. live price**: 55.50

### Fat Analysis Spreadsheet

- **Diet 1**: Net return, $/pig
- **Diet 2**: Net return, $/pig
- **Diet 3**: Net return, $/pig
- **Diet 4**: Net return, $/pig
- **Diet 5**: Net return, $/pig
- **Diet 6**: Net return, $/pig

- **3% fat**
- **6% fat**

Click to print summary sheets.
Fat Analysis Spreadsheet

Prices

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn, $/bu</td>
<td>$1.90</td>
</tr>
<tr>
<td>SBM, $/ton</td>
<td>$160.00</td>
</tr>
<tr>
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</tr>
<tr>
<td>Grind/mix/delivery, $/ton</td>
<td>$12.00</td>
</tr>
<tr>
<td>Carcass price</td>
<td>$72.00</td>
</tr>
<tr>
<td>Est. live price</td>
<td>55.50</td>
</tr>
</tbody>
</table>

Click to print summary sheets

Increase in feed cost, $/pig

- 3% fat
- 6% fat

Diet 1  | Diet 2  | Diet 3  | Diet 4  | Diet 5  | Diet 6  |
--------|--------|--------|--------|--------|--------|
$0.10   | $0.15  | $0.20  | $0.50  | $0.40  | $0.20  |

Click to print summary sheets
“It’s pretty hard to beat a milo-soybean meal added fat diet.”
Summary

- Develop gilts correctly
- Don’t over feed in gestation
- Don’t under feed in lactation
- Get nursery pigs off to a good start
- Adjust energy and amino acid ratios
- Use Paylean and market at the right weights
- Use a roller mill and thoroughly mix feed