Welcome to Swine Day!

KANSAS STATE UNIVERSITY

SWINE INDUSTRY DAY

K-State
- Reducing sow feed cost
- Remember the importance of iron
- Recent copper/zinc data
- Antibiotic regimens in the nursery
Impact of diet ingredient options on gestation feed cost per weaned pig

<table>
<thead>
<tr>
<th>Diet Options</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>$9.86</td>
</tr>
<tr>
<td>Phytase</td>
<td>$9.70</td>
</tr>
<tr>
<td>Milo</td>
<td>$9.14</td>
</tr>
<tr>
<td>DDGS</td>
<td>$9.32</td>
</tr>
<tr>
<td>Milo/DDGS</td>
<td>$8.93</td>
</tr>
<tr>
<td>Midds</td>
<td>$9.75</td>
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</tbody>
</table>
Impact of sow productivity on feed cost per weaned pig

<table>
<thead>
<tr>
<th>Item</th>
<th>$ or lb /sow</th>
<th>PSY, $ or lb / weaned Pig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestation</td>
<td>$197</td>
<td>$9.85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$8.76</td>
</tr>
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<td></td>
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<td>$7.88</td>
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<tr>
<td>Lactation</td>
<td>$84</td>
<td>$4.20</td>
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<td></td>
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<td>$3.73</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$3.36</td>
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<tr>
<td>Total</td>
<td>$281</td>
<td>$14.05</td>
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<tr>
<td></td>
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<td>$12.49</td>
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<td>$11.24</td>
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<tr>
<td>Feed</td>
<td>2,175</td>
<td>109</td>
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<tr>
<td></td>
<td></td>
<td>97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>87</td>
</tr>
</tbody>
</table>
Don’t Forget the Basics: Importance of Iron Injection at Birth
Trial Design

Birth

Weaning

None 200 mg
None 200 mg
None 200 mg

Peters and Mahan, 2008
Influence of injected iron at birth on piglet weaning weight

Iron effect, P < 0.01

Weight, lb

Iron, mg/pig

12.2

14.0

0

200 mg

Peters and Mahan, 2008
Influence of injected iron at birth on piglet hemoglobin at weaning

Iron effect, P < 0.01

Hgb, g/dl

Iron, mg/pig

0

11.5

200 mg

4.1

Iron at birth on piglet at weaning

Peters and Mahan, 2008
Influence of injected iron at birth and weaning on weight at d 28 after weaning

Birth x weaning effect, $P < 0.05$

<table>
<thead>
<tr>
<th>Iron at birth/weaning, mg/pig</th>
<th>Weight, lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/0</td>
<td>31.9</td>
</tr>
<tr>
<td>0/200</td>
<td>33.8</td>
</tr>
<tr>
<td>200/0</td>
<td>38.3</td>
</tr>
<tr>
<td>200/200</td>
<td>38.0</td>
</tr>
</tbody>
</table>

Peters and Mahan, 2008
Copper Zinc Data
Interaction between high zinc and copper for nursery diets

Zinc × Copper (P < 0.01)

Smith et al., 1997

NCR 42 and 145 Regional Committees, 2000
Effect of adding ZnO and copper chloride (TBCC) on ADG from d 0 to 28 (Trial 1)

Copper x Zinc (P > 0.37)
Copper (P < 0.007, SE=18)
Zinc, Linear (P < 0.003, SE=19)

![Graph showing the effect of adding ZnO and copper chloride (TBCC) on ADG from d 0 to 28 (Trial 1). The graph includes data points for no added copper and added TBCC at different zinc levels (0/0, 1500/1000, 3000/2000 ppm). The data is from Shelton et al., 2008.](image-url)
Effects of dietary zinc and copper source on ADG from d 0 to 28 (Trial 2)

Zinc x Copper (P > 0.91)
Copper (P < 0.01, SE=15)
Zinc (P < 0.01, SE=14)

No Added Zn
Added Zn

Shelton et al., 2008
Conclusions

- Our recent studies have shown additive responses to feeding high levels zinc and copper in weanling pigs diets.
- This is in contrast to our earlier work and work of others that indicated a lack of additive response.
- More research is needed to validate the circumstances as to why the change in the response.
Influence of dietary antibiotics on ADG (d 0 to 10)

Steidinger et al., 2008
Influence of dietary antibiotics on ADG (d 10 to 21)

Steidinger et al., 2008
Influence of dietary antibiotics on ADG (d 21 to 42)

Steidinger et al., 2008
Influence of dietary antibiotics on ADG (d 0 to 42)

Steidinger et al., 2008
Influence of dietary antibiotics on pig wt (d 42)

Steidinger et al., 2008
Diet Source and Vaccine Impact on Nursery Performance

- Exp. 1: Diet source x vaccination
- Exp. 2: PCV$_2$ vaccine source x *M. hyo* vaccine
- Exp. 3: PCV$_2$ vaccine response in wean-to-finish barn
Effect of diet source on nursery ADG within diet phases (Exp. 1)

Diet source

A B C D

Day 0-4

0.40 bc
0.48 a
0.36 c
0.42 b

Day 4-8

0.54 a
0.48 b
0.42 b
0.44 b

Day 8-20

0.68
0.68
0.69
0.71

a, b: P < 0.05 within phase

Kane et al., 2008
Effect of diet source on overall ADG (d 0-20) (Exp. 1)

P = 0.26

Kane et al., 2008
Effect of PCV2 vaccination timing on ADG within diet phases (Exp. 1)

- Day 0-4: 0.40 (Day 0), 0.43 (Day 8), $P = 0.20$
- Day 4-8: 0.44 (Day 0), 0.50 (Day 8), $P < 0.01$
- Day 8-20: 0.71 (Day 0), 0.68 (Day 8), $P = 0.05$

Kane et al., 2008
Effect of PCV2 vaccination timing on ADFI within diet phases (Exp. 1)

Day 0
Day 8

Day 0-4
Day 4-8
Day 8-20

0.26
0.26
0.48
0.55
0.94
0.92

P = 0.94
P < 0.01
P = 0.44
Kane et al., 2008
Effect of PCV2 vaccination on nursery pig ADG immediately after vaccinations and overall – Exp 2

- No PCV2
- Circumvent
- CircoFLEX

Day 0-4: 0.21, 0.23, 0.26
Day 4-8: 0.35, 0.29, 0.32
Day 21-25: 1.02, 0.87, 1.04
Day 0-35: 0.89, 0.85, 0.90

a, b: $P < 0.05$ within phase

Potter et al., 2008
Effect of *M. hyo* vaccination on nursery pig ADG immediately after vaccinations and overall – Exp 2

Potter et al., 2008
Effect of PCV2 and *M. hyo* Vaccination on Nursery Pig Weight (d 35; Exp. 2)

PCV2 × *M. hyo*: $P = 0.68$

PCV2: $P < 0.01$

*M. hyo*: $P = 0.06$

Potter et al., 2008
Effect of PCV2 vaccination on nursery pig ADG in a commercial wean-to-finish barn (Exp. 3)

Potter et al., 2008
Influence of protein source on nursery performance (Exp. 1; Day 7 to 21 after weaning)

Fishmeal Quad; P < 0.08
Combination linear, P < 0.06
Combination vs fish meal, P < 0.05
Combination vs PepSoyGen, P < 0.01
SE 0.04

ADG, lb

Control 3.00% 6.00% 3.75% 7.50%

Fish meal 0.58 0.63 0.56 0.57 0.58

PepSoyGen 0.65 0.65

DPS 50 & PepSoyGen 1.88% + 3.75% + 3.75%

Jones et al., 2008
Influence of protein source on nursery performance (Exp. 2; Day 7 to 21 after weaning)

Jones et al., 2008
Diet cost reduction

- Phytase sources
- DDGS
- Milo vs corn
- Fat
Nearly 2 times more phosphorus release in pigs

Jones et al., 2009
Influence of phytase source and level on bone ash (Exp. 1)

Jones et al., 2009
Influence of phytase source and level on bone ash (Exp. 2)

Jones et al., 2009
Influence of *E. coli*-derived phytase source and level on percentage bone ash

$R^2 = 0.77$

Jones et al., 2009
Available phosphorus release based on AOAC phytase assay

Y = -0.000000125x^2 + 0.0002362x + 0.0155

R^2 = 0.73

Jones et al., 2009
Available P release with phytase when analyzed on an AOAC basis

KSU curve adopted from Kornegay review
### Effects of DDGS source and enzyme addition on nursery pig ADG

<table>
<thead>
<tr>
<th>Source</th>
<th>Control</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>1.05</td>
<td>1.03</td>
<td>1.03</td>
<td>1.01</td>
<td>0.98</td>
<td>1.02</td>
<td>1.04</td>
</tr>
<tr>
<td>Milo 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milo 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Jones et al., 2008
Effects of DDGS source and enzyme addition on nursery pig F/G

Corn DDGS vs Milo P < 0.05

<table>
<thead>
<tr>
<th>Source</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>1.53</td>
<td>1.57</td>
</tr>
<tr>
<td>Milo 1</td>
<td>1.63</td>
<td>1.60</td>
</tr>
<tr>
<td>Milo 2</td>
<td>1.65</td>
<td>1.63</td>
</tr>
</tbody>
</table>

Jones et al., 2008
Effect of enzyme addition to 15% DDGS diets on pig performance

Jacela et al., 2008
Effect of DDGS level and enzyme addition on pig ADG

Jacela et al., 2008
Effect of DDGS level and enzyme addition on pig F/G

Jacela et al., 2008
# High Protein Distiller Grains

<table>
<thead>
<tr>
<th>Item, %</th>
<th>Lifeline Foods, St. Joe MO</th>
<th>White Energy, Russell KS</th>
<th>Traditional DDGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Protein</td>
<td>36.5</td>
<td>44.5</td>
<td>27.2</td>
</tr>
<tr>
<td>Fat</td>
<td>5.4</td>
<td>3.2</td>
<td>10.7</td>
</tr>
<tr>
<td>Calcium</td>
<td>0.04</td>
<td>0.13</td>
<td>0.03</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>0.32</td>
<td>0.82</td>
<td>0.71</td>
</tr>
<tr>
<td>Lysine, %</td>
<td>1.22</td>
<td>1.60</td>
<td>0.78</td>
</tr>
<tr>
<td>Lysine digest, %</td>
<td>67.8</td>
<td>56.9</td>
<td>62.3</td>
</tr>
<tr>
<td>ME, kcal/lb</td>
<td>1,392</td>
<td>1,479</td>
<td>1,551</td>
</tr>
</tbody>
</table>

As-fed basis

Jacela et al, 2008
Frobose et al, 2008
## DDGS Value Calculator with no performance change

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milo $/bu</td>
<td>$2.80</td>
</tr>
<tr>
<td>SBM, $/ton</td>
<td>$225.00</td>
</tr>
<tr>
<td>Monocal, $/ton</td>
<td>$900.00</td>
</tr>
<tr>
<td>Limestone, $/ton</td>
<td>$40.00</td>
</tr>
<tr>
<td>Lysine HCl, $/lb</td>
<td>$0.95</td>
</tr>
<tr>
<td>DDGS, $/ton</td>
<td>$170.00</td>
</tr>
</tbody>
</table>

### DDGS, %

<table>
<thead>
<tr>
<th>DDGS, %</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>$1.78</td>
<td>$4.65</td>
<td>$9.35</td>
</tr>
<tr>
<td>20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Change in diet cost, $/ton

- 10%: $1.78
- 20%: $4.65
- 30%: $9.35

### Approximate savings, $/pig

- 10%: -$0.53
- 20%: -$1.40
- 30%: -$2.81

### Breakeven price, $/ton

- 10%: $152.19
- 20%: $146.73
- 30%: $138.82
## DDGS Value Calculator with no performance change

<table>
<thead>
<tr>
<th></th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn, $/bu</td>
<td>3.50</td>
</tr>
<tr>
<td>SBM, $/ton</td>
<td>225.00</td>
</tr>
<tr>
<td>Monocal, $/ton</td>
<td>900.00</td>
</tr>
<tr>
<td>Limestone, $/ton</td>
<td>40.00</td>
</tr>
<tr>
<td>Lysine HCl, $/lb</td>
<td>0.95</td>
</tr>
<tr>
<td>DDGS, $/ton</td>
<td>170.00</td>
</tr>
</tbody>
</table>

### Change in diet cost, $/ton

<table>
<thead>
<tr>
<th>DDGS, %</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>$0.31</td>
<td>$1.35</td>
<td>$4.07</td>
</tr>
<tr>
<td>20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Approximate savings, $/pig

<table>
<thead>
<tr>
<th>Approximate savings, $/pig</th>
<th>-$0.09</th>
<th>-$0.40</th>
<th>-$1.22</th>
</tr>
</thead>
</table>

### Breakeven price, $/ton

<table>
<thead>
<tr>
<th>Breakeven price, $/ton</th>
<th>$166.89</th>
<th>$163.26</th>
<th>$156.42</th>
</tr>
</thead>
</table>

www.KSUswine.org
## DDGS Value Calculator with no performance change

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>Corn, $/bu</td>
<td>$ 3.50</td>
</tr>
<tr>
<td>SBM, $/ton</td>
<td>$ 225.00</td>
</tr>
<tr>
<td>Monocal, $/ton</td>
<td>$ 900.00</td>
</tr>
<tr>
<td>Limestone, $/ton</td>
<td>$ 40.00</td>
</tr>
<tr>
<td>Lysine HCl, $/lb</td>
<td>$ 0.95</td>
</tr>
<tr>
<td>DDGS, $/ton</td>
<td>$ 130.00</td>
</tr>
</tbody>
</table>

### Change in diet cost, $/ton

<table>
<thead>
<tr>
<th>DDGS, %</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>-$3.69</td>
<td>-$6.65</td>
<td>-$7.93</td>
</tr>
<tr>
<td>20%</td>
<td>$1.11</td>
<td>$2.00</td>
<td>$2.38</td>
</tr>
<tr>
<td>30%</td>
<td>$166.89</td>
<td>$163.26</td>
<td>$156.42</td>
</tr>
</tbody>
</table>

### Approximate savings, $/pig

- 10%: $1.11
- 20%: $2.00
- 30%: $2.38

### Breakeven price, $/ton

- 10%: $166.89
- 20%: $163.26
- 30%: $156.42
### Milo price relative to corn

<table>
<thead>
<tr>
<th>Year</th>
<th>Relative Price</th>
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<tbody>
<tr>
<td>2007</td>
<td>100 to 110%</td>
</tr>
<tr>
<td>2008</td>
<td>70 to 80%</td>
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</tbody>
</table>

**Keys:**
- Particle size (roller mill)
- Replace corn lb/lb
- F/G will be 5 to 7% higher
Historic choice white grease price
Prices

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn, $/bu</td>
<td>$3.50</td>
</tr>
<tr>
<td>SBM, $/ton</td>
<td>$225.00</td>
</tr>
<tr>
<td>Fat, $/cwt</td>
<td>$16.00</td>
</tr>
<tr>
<td>GMD, $/ton</td>
<td>$12.00</td>
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</tbody>
</table>

www.KSUswine.org

K-State
<table>
<thead>
<tr>
<th></th>
<th>Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn, $/bu</td>
<td>$ 4.80</td>
</tr>
<tr>
<td>SBM, $/ton</td>
<td>$ 400.00</td>
</tr>
<tr>
<td>Fat, $/cwt</td>
<td>$ 18.00</td>
</tr>
<tr>
<td>GMD, $/ton</td>
<td>$ 12.00</td>
</tr>
</tbody>
</table>
Thank you to J-Six Farms
Our new field research partner
How to Improve F/G by Feed and Feeder Management

K-State Research and Extension

KSUswine.org
Feeder management and feeder type

- Feeder adjustment
- Wet/dry vs dry feeders
- Byproducts with wet/dry feeders
Impact of feeder adjustment setting on growth rate and feed efficiency
Each pen is fed with:

1 Staco/Choretime dry feeder

• 60 inch feeder with 5 feeding spaces
• Feeders have 5 Settings (1 to 5)
  - Pens were randomly assigned to feeder settings of:
    – 1, 2, 3, 4, 5
    – With 1 being the most gap width and 5 being the least
Feeder Setting 1

95%

80%

65%
Feeder Setting 3

75%

55%

35%
Feeder Setting 5

5%

15%

25%
Influence of feeder setting on ADG, Exp. 1

No Difference (P > 0.10)

Duttlinger 2008

Feeder Settings

1.77  1.80  1.81  1.76  1.75

ADG, lb
Influence of feeder setting on feed efficiency, Exp. 1

No Difference (P > 0.10)

Duttlinger 2008

K-State
Influence of feeder setting on ADG, Exp. 2

Duttlinger 2008

K-State

Quadratic, (P < 0.03)
Influence of feeder setting on feed efficiency, Exp. 2

Quadratic, (P < 0.08)

Duttlinger 2008

K-State
Influence of feeder setting on off test weight, Exp. 2

![Graph showing the influence of feeder settings on weight](image-url)

Duttlinger 2008

K-State

New Horizon Farms LLP
Influence of feeder setting on feed cost, Exp. 2

Assuming 220 lb of gain and feed at $.12/lb

<table>
<thead>
<tr>
<th>Feeder Settings</th>
<th>Cost/pig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$63.23</td>
</tr>
<tr>
<td>3</td>
<td>$61.78</td>
</tr>
<tr>
<td>5</td>
<td>$62.57</td>
</tr>
</tbody>
</table>

Duttlinger 2008

Open → Close
Influence of feeder setting on facility cost, Exp. 2

Assuming 220 lb of gain, $.11/day and 90% Barn utilization

Duttlinger 2008
Influence of feeder setting on feed and facility cost, Exp. 2

Duttlinger 2008
Percentage of pan covered with feed at different high gap opening measurements

Pan coverage, %

High gap opening, in.

$y = 91.16x - 50.63$

$R^2 = 0.80$
Feeder adjustment conclusions

- On the basis of this data, our recommendation is for feeders to be adjusted to allow feed to cover slightly more than half of the feed pan without feed accumulating in the corners.
Effects of feeder type on finishing pig growth

Bergstrom et al. 2008
Effects of feeder type on ADG

Exp. 1

- P < .01
- Dry: 2.10 lb
- Wet/Dry: 2.26 lb

Exp. 2

- P < .01
- Dry: 1.90 lb
- Wet/Dry: 2.01 lb

Bergstrom et al. 2008
Effects of feeder type on F/G

Exp. 1

Dry: 2.44
Wet/Dry: 2.47

Exp. 2

Dry: 2.62
Wet/Dry: 2.68

P < .01

Bergstrom et al. 2008
Effects of feeder type on final weight

Exp. 1

P < .01

216, 227

Dry, Wet/Dry

Exp. 2

P < .01

261, 273

Dry, Wet/Dry

Bergstrom et al. 2008
Effects of feeder type on carcass traits - Exp. 2

**Hot carcass weight**
- Dry: 195 lb
- Wet/Dry: 200 lb

**Yield**
- Dry: 76.9
- Wet/Dry: 75.2

P < .06
P < .02

Bergstrom et al. 2008
Effects of feeder type on carcass traits - Exp. 2

Back fat

<table>
<thead>
<tr>
<th>Feeder Type</th>
<th>Thickness (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry</td>
<td>0.64</td>
</tr>
<tr>
<td>Wet/Dry</td>
<td>0.70</td>
</tr>
</tbody>
</table>

P < .02

FFLI %

<table>
<thead>
<tr>
<th>Feeder Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry</td>
<td>57.1</td>
</tr>
<tr>
<td>Wet/Dry</td>
<td>55.9</td>
</tr>
</tbody>
</table>

P < .10

Bergstrom et al. 2008
Effects of feeder type on carcass traits - Exp. 2

Feed Cost / pig

- Dry: $56.23
- Wet/Dry: $61.12

Net Income /pig

- Dry: $26.15
- Wet/Dry: $24.28

P < .01

P < .36
Take Home Message

- Feeder adjustment
  - 50% clear and no build-up at corners

- Feeder Type
  - Wet/dry = Greater ADG and ADFI
  - Dry = Improved F/G and carcass
  - More research needed
Lysine studies

- Experiments with 85 to 130 lb and 185 to 245 lb gilts were conducted last fall, right before swine day.

- Experiment with 120 to 180 lb gilts was conducted this spring after the PRRS outbreak.
Influence of lysine level on performance of PIC 337 x 1050 gilts (85 to 140 lb)

Linear, $P < 0.001$
Quadratic, $P < 0.003$
SE = 0.024

Main et al., 2002
(2.82 g/Mcal)

Shelton et al., 2008
Influence of lysine level on performance of PIC 337 x 1050 gilts (85 to 140 lb)

Main et al., 2002
(2.82 g/Mcal)

Linear, P < 0.001
Quadratic, P < 0.001
SE = 0.014

Shelton et al., 2008
Influence of lysine level on margin over feed cost for PIC 337 x 1050 gilts (85 to 140 lb)

Main et al., 2002 (2.82 g/Mcal)

Shelton et al., 2008

SID Lysine:Calorie ratio (g/Mcal ME)
Influence of lysine level on performance of PIC 337 x 1050 gilts (185 to 245 lb)

Main et al., 2002 (2.12 g/Mcal)

Linear, $P < 0.001$
Quadratic, $P > 0.89$
$SE = 0.032$

SID Lysine:Calorie ratio (g/Mcal ME)

Shelton et al., 2008
Influence of lysine level on performance of PIC 337 x 1050 gilts (185 to 245 lb)

Main et al., 2002 (2.12 g/Mcal)

Shelton et al., 2008
Influence of lysine level on margin over feed cost for PIC 337 x 1050 gilts (185 to 245 lb)

- Linear: $P < 0.001$
- Quadratic: $P > 0.63$
- SE = 0.036

Main et al., 2002
(2.12 g/Mcal)

K-State

Shelton et al., 2008
Influence of lysine level on performance of PIC 337 x 1050 gilts (120 to 180 lb)

Main et al., 2002
(2.56 g/Mcal)

Shelton et al., 2008

K-State

SID Lysine:Calorie ratio (g/Mcal ME)
Influence of lysine level on performance of PIC 337 x 1050 gilts (120 to 180 lb)

Main et al., 2002
Linear, P < 0.001
Quadratic, P > 0.34
SE = 0.040

Shelton et al., 2008
Influence of lysine level on margin over feed for PIC 337 x 1050 gilts (120 to 180 lb)

Main et al., 2002
(2.56 g/Mcal)

SID Lysine:Calorie ratio (g/Mcal ME)

11.50 12.00 12.50 13.00 13.50 14.00 14.50

$/pig

1.89 2.12 2.35 2.58 2.81 3.04


Shelton et al., 2008
Lysine Requirement x PCV2 Vaccinated or Unvaccinated Study Underway
Effects of glycerol and Paylean on growth performance of finishing pigs (28 days)

Paylean, P < 0.01
SE = 0.05

1.93 1.93

2.15 2.22

6.75 g/ton

K-State

Duttlinger et al., 2008
Effects of glycerol and Paylean on growth performance of finishing pigs (28 days)

Paylean x glycerol, P < 0.10
Paylean, P < 0.01
Glycerol, P < .04
SE = 0.05

Duttlinger et al., 2008
Swine manure value

- Finishing pig with 2.90 F:G will excrete:
  - 9.1 lb N  ($0.85 / lb value)
  - 3.6 lb P2O5  ($1.09 / lb value)
  - 119 total gallons

- The value of the manure accounting for nutrient loss (85% retained N) and application cost of $0.01/gallon is a manure value per pig = ~$7.50

Dhuyvetter et al., 2008
Swine manure value

- Nursery pig with 1.70 F:G will excrete:
  - 0.96 lb N  ($0.85 / lb value)
  - 0.64 lb P2O5  ($1.09 / lb value)
  - 20 total gallons

- The value of the manure accounting for nutrient loss (85% retained N) and application cost of $0.01/gallon is a manure value per pig = ~$1.00

Dhuyvetter et al., 2008
### Determining the Value of Livestock Manure: Based on the Cost of Commercial Nitrogen Fertilizer

**FROM: Your Manure Analysis:**

**MANURE ANALYSIS (from your report) -- liquid or solid**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>mg/l</th>
<th>ppm</th>
<th>lbs/acre-in</th>
<th>lbs/ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total N</td>
<td>5090</td>
<td>5090</td>
<td>1152.9</td>
<td>0.0</td>
</tr>
<tr>
<td>Organic N</td>
<td>1930</td>
<td>1930</td>
<td>437.1</td>
<td>0.0</td>
</tr>
<tr>
<td>NH4-N</td>
<td>3084</td>
<td>3084</td>
<td>698.5</td>
<td>0.0</td>
</tr>
<tr>
<td>NO3-N</td>
<td>76</td>
<td>76</td>
<td>17.2</td>
<td>0.0</td>
</tr>
<tr>
<td>P2O5</td>
<td>1590</td>
<td>1590</td>
<td>360.1</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Manure Application Method:** Incorporated

**Instructions:**

- **Yellow Cells:** Enter values from reports or price sheets
- **Light Blue Cells:** Select from drop down list.

Manure values come from your manure analysis sheet.

Dry manure may be reported in %. If so, multiply % times 10,000 to get mg/kg (ppm)

**Figuring Available N from manure analysis:**

<table>
<thead>
<tr>
<th></th>
<th>Organic N x .33 Avail. 1st year</th>
<th>NH4-N x Availability</th>
<th>NO3-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid</td>
<td>437.15</td>
<td>698.5</td>
<td>523.89</td>
</tr>
</tbody>
</table>

**Available N**

<table>
<thead>
<tr>
<th></th>
<th>Organic N</th>
<th>NH4-N</th>
<th>NO3-N</th>
<th>Total N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid</td>
<td>144.26</td>
<td>523.89</td>
<td>17.21</td>
<td>685.37</td>
</tr>
</tbody>
</table>

(lbs/acre inch)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid</td>
<td>25.38</td>
</tr>
</tbody>
</table>

(lbs/1000 gallons)*

**Figuring P2O5 from manure the first year:**

| P2O5    | 13.34 |

(lbs/1000 gallons)*
A SPECIAL THANKS TO THE FOLLOWING DONORS TO THE KSU SWINE FINISHING BARN

- Kansas Pork Association
- Livestock and Meat Industry Council
- Lonza Inc.
- Eli Lilly and Company
- Frontier Farm Credit
- Henning Construction Co., Inc.
- Feedlogic Inc.
- PIC USA
- Ajinomoto Heartland LLC
- Henry’s Limited
- Murphy Brown LLC
- Husky Hogs LLC
- Automated Production Systems
- Midwest Livestock Systems, Inc.
- Plymouth Industries
- Walters-Morgan Construction Inc.
- Energy Panel Structures, Inc.
- New Horizon Farms LLC
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- Land O’Lakes Foundation

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