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Strategies to Reduce Feeding Costs

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Kansas State University

www.KSUswine.org

Recent Ingredient Prices

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Corn, $/bu</td>
<td>$4.00</td>
<td>$3.20</td>
<td>$7.25</td>
<td>$6.00</td>
<td>$7.81</td>
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<tr>
<td>SBM, $/ton</td>
<td>$395</td>
<td>$285</td>
<td>$350</td>
<td>$400</td>
<td>$460</td>
</tr>
<tr>
<td>DDGS, $/ton</td>
<td>$150</td>
<td>$120</td>
<td>$200</td>
<td>$240</td>
<td>$260</td>
</tr>
<tr>
<td>CWG, $/cwt</td>
<td>$27</td>
<td>$33</td>
<td>$50</td>
<td>$46</td>
<td>$38</td>
</tr>
<tr>
<td>Dical, $/cwt</td>
<td>$23</td>
<td>$26</td>
<td>$28</td>
<td>$33</td>
<td>$33</td>
</tr>
<tr>
<td>L-lysine, $/cwt</td>
<td>$70</td>
<td>$110</td>
<td>$120</td>
<td>$113</td>
<td>$115</td>
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<tr>
<td>~cost/finishing pig</td>
<td>$64</td>
<td>$57</td>
<td>$90</td>
<td>$87</td>
<td>$104</td>
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</tbody>
</table>

Presentation Outline

• F/G to help control feed cost
  — Areas you cannot or have little control
  — Areas you have influence to control
• Alternative ingredients
• Current diet cost examples
• Additional resources

What defines optimal F/G?

• Does the best achieving F/G producers mean they are the most profitable? – NO
• Then is F/G tied to profitability? – YES, but is complicated based on individual situations.
Feed Efficiency

High feed disappearance

- Genetics
- Feed wastage
- Temperature
- Mortality
- Feed delivery
- Amino acid deficiency
- Low Energy diets

High Feed Disappearance (usage)

- Feed wastage
  - Poor adjustment with pans greater than 60% covered can increase feed wastage, especially in late finishing
  - Old feeders with poor feeder design or inability to adjust will increase wastage

High Feed Disappearance (usage)

- Effective temperature
  - If temperature is too low, pigs will increase their feed intake to maintain body temperature. Because the feed is going towards heat needs and not growth, feed efficiency will become poor.

High Feed Disappearance (usage)

- Effective temperature

Effect of environmental temperature on the performance of growing pigs (50 to 125 pounds)

<table>
<thead>
<tr>
<th>Item</th>
<th>Temperature, °F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td>ADG, lb</td>
<td>1.70</td>
</tr>
<tr>
<td>ADFI, lb</td>
<td>4.86</td>
</tr>
<tr>
<td>Feed/gain</td>
<td>2.91</td>
</tr>
</tbody>
</table>

1Summary of 3 experiments; Stahly and Cromwell, 1979, 1981.
High Feed Disappearance (usage)

- Mortality
  - Mortality late in the finishing period can lead to feed disappearance calculations being high for the pigs remaining at the end of the period.
  - Each 1% increase = 0.06 in F/G
  - $F/G = \frac{\text{Total feed delivered}}{\text{Weight out - Weight in}}$

- Feed delivery
  - Records of deliveries should be checked to ensure that feed credited to the group was not delivered to another group.
  - If two deliveries are noted closely together in a time period that is not feasible, it could be a data entry error.
  - Review feed budgets to make sure the correct amount of each diet is being fed.

High Feed Disappearance (usage)

- Diet deficient (amino acids)
  - Inadequate lysine or other amino acids will often lead to an increase in feed usage and lower ADG to make poorer F/G
  - Can be a problem if feed is not budgeted correctly (ex. switching diets too soon)

Influence of lysine level on feed efficiency

- Linear $P < 0.01$

Energy use by the pig

- Gross energy → fecal energy
- Digestible energy → urinary energy
- Metabolizable energy → maintenance
- Production
Low ADG

- Disease or other stress
  - Disease problems that lower ADFI will greatly lower ADG. High mortality will increase F/G by about 1.5% for each 1% increase in mortality.
  - Stressors are additive
    - Reducing stress will improve F/G

Energy use by the pig

Gross energy → fecal energy
Digestible energy → urinary energy
Metabolizable energy → maintenance

Effect of PCV2 Vaccination on Feed Efficiency

<table>
<thead>
<tr>
<th>Feed/gain</th>
<th>Control</th>
<th>Vaccine</th>
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</thead>
<tbody>
<tr>
<td>2.57</td>
<td>2.52</td>
<td></td>
</tr>
</tbody>
</table>

Low ADG

- Genetics
  - Genetics with low ADFI will usually have lower ADG

Feed availability

- Limiting feed intake intentionally or unintentionally (plugged or empty feeders or bins) will lower ADFI and ADG
- High stocking density will decrease ADFI and ADG
Low ADG

• Water availability
  – Lack of water availability will reduce ADFI and ADG and F/G will get worse
    • Plugged nipples, dirty cups, low water pressure

• Diet deficient (amino acids, salt, energy, other)
  – Amino acid deficiencies will reduce ADG
  – Reducing the energy density of the diet will lower ADG in most on-farm situations
  – Diets with inadequate salt levels will greatly reduce ADG

Low ADG

• Effective temperature
  – High environmental temperature will decrease ADFI and ADG.
  – Feed efficiency is not altered much by high temperature unless it is so high that feed intake is close to maintenance requirement. Then, F/G will become poorer because there less energy available for ADG because more of it is going towards maintenance requirements.

Feed Efficiency

Other factors

– Particle size
– Diet form

Grain Particle Size

• F/G directly impacted by particle size change
• Research in high co-product diets
  – Less corn in rations – Finishing pigs still respond similarly to improved F/G with reduced corn particle size
  – Grind it fine then pellet for flow ability
  – DDGS grinding – data is mixed, more data is needed
  – Whole diet grinding – not a benefit in meal diets
• Takes more time/energy to grind finer, however, less total tonnage is manufactured by the mill.

Every 100 microns =
1. F/G improves by ~1.2%
2. 7 lbs less feed/finishing pig
3. Current $0.98/pig savings in feed cost
Pelleting on growth performance of grow-finish pigs 2005 to 2011

<table>
<thead>
<tr>
<th>Reference</th>
<th>Meal ADG</th>
<th>Meal F/G</th>
<th>Pellet ADG</th>
<th>Pellet F/G</th>
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<tbody>
<tr>
<td>Groesbeck et al. (2005)</td>
<td>0.83</td>
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<td>Groesbeck et al. (2005)</td>
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<td>Potter et al. (2009)</td>
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<td>2.06</td>
<td>2.07</td>
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<td>Potter et al. (2009)</td>
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<td>Myers et al. (2010)</td>
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<td>1.94</td>
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<td>Potter et al. (2010)</td>
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<td>Frobose et al. (2011)</td>
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<td>Frobose et al. (2011)</td>
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<td>1.51</td>
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<td>Faulk et al. (2011)</td>
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<td>Faulk et al. (2011)</td>
<td>2.31</td>
<td>2.50</td>
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<tr>
<td><strong>Average</strong></td>
<td><strong>1.61</strong></td>
<td><strong>2.14</strong></td>
<td><strong>1.69</strong></td>
<td><strong>2.06</strong></td>
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</table>

Average response = 5.0% for ADG and 4.0% for F/G

### Alternative Feed Ingredients

<table>
<thead>
<tr>
<th>Cost</th>
<th>Processing</th>
<th>Storage</th>
<th>Quality Control</th>
<th>Agronomics</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

### Added Fat Recommendations

- **Should I have fat in my diets currently?**
  - Long on space = No
    - Gain improvements not required while increasing feed cost
  - Short on space = Yes/No/Maybe
    - Evaluate net return and determine optimum level by dietary phase.
    - Strategy should be different as economics change

- **Which season are pigs to be marketed?**
  - Pigs placed in midsummer/fall/early winter months can/should forgo added fat due to growth rate improvements to come with cooler weather.
  - Late Spring/Summer marketed pigs should begin to receive added fat in February/March to capture growth rate.

### Example Diets with Alternatives

- Phase = 125 – 170 lb of body weight
- Corn = $7.81/bu
- SBM, 46.5% = $460/ton
- DDGS = $260/ton
- Wheat midds = $255/ton
- Meat and Bone = $450/ton
- Moncal P, 21% = $660/ton
- L-Lysine = $1.15/lb

### Added Fat Calculator available at www.KSUswine.org

<table>
<thead>
<tr>
<th>Component</th>
<th>Price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn, $/bu</td>
<td>$7.81</td>
</tr>
<tr>
<td>SBM, $/ton</td>
<td>$460.00</td>
</tr>
<tr>
<td>Fat, $/cwt</td>
<td>$38.00</td>
</tr>
<tr>
<td>Grind/mix/delivery, $/ton</td>
<td>$15.00</td>
</tr>
<tr>
<td>Carcass price</td>
<td>$86.00</td>
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<tr>
<td>Est. live price</td>
<td>$65.93</td>
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</tbody>
</table>

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**Added Fat Calculator**

Cost of Fat

- 2.5% fat = $0.23
- 5% fat = $0.38

- 2.5% fat = $0.15
- 5% fat = $0.03

- 2.5% fat = $(0.14)
- 5% fat = $(0.54)

- 2.5% fat = $(0.06)
- 5% fat = $(0.38)

- 2.5% fat = $(0.56)
- 5% fat = $(0.10)

- 2.5% fat = $(0.20)
- 5% fat = $(0.70)

- 2.5% fat = $(0.40)
- 5% fat = $(0.10)

- 2.5% fat = $0.20
- 5% fat = $0.50

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**Example Diets with Alternatives**

<table>
<thead>
<tr>
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</tr>
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</tr>
<tr>
<td>DDGS</td>
<td>$260.00</td>
</tr>
<tr>
<td>Wheat midds</td>
<td>$255.00</td>
</tr>
<tr>
<td>Meat and Bone</td>
<td>$450.00</td>
</tr>
<tr>
<td>Moncal P, 21%</td>
<td>$660.00</td>
</tr>
<tr>
<td>L-Lysine</td>
<td>$1.15</td>
</tr>
</tbody>
</table>

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**Average Response for ADG and F/G**

- ADG: 5.0%
- F/G: 4.0%
<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Normal</th>
<th>Higher AA</th>
<th>Meat &amp; bone</th>
<th>DDGS</th>
<th>Wheat midds</th>
<th>DDGS &amp; midds</th>
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</thead>
<tbody>
<tr>
<td>Corn</td>
<td>1529</td>
<td>1607</td>
<td>1576</td>
<td>1120</td>
<td>1318</td>
<td>828</td>
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<tr>
<td>BSM, 46%</td>
<td>425</td>
<td>342</td>
<td>307</td>
<td>236</td>
<td>231</td>
<td>126</td>
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<td>Meat &amp; bone meal</td>
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<tr>
<td>DDGS</td>
<td>600</td>
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<tr>
<td>Wheat middlings</td>
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<td>Lysine HCl</td>
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<td>Monocal P, 21% P</td>
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<td>Limestone</td>
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<td>VTM &amp; Salt</td>
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<td>12</td>
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<tr>
<td>ME, kcal/lb</td>
<td>1.515</td>
<td>1.515</td>
<td>1.513</td>
<td>1.522</td>
<td>1.483</td>
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<tr>
<td>CP, %</td>
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<td>15.1</td>
<td>19.6</td>
<td>18.7</td>
<td>18.6</td>
<td>19.2</td>
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<tr>
<td>Available P, %</td>
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<td>0.28</td>
<td>0.23</td>
<td>0.23</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Diet w/ processing:
- $335.43
- $332.00
- $333.93
- $312.63
- $317.49
- $298.55

Budget, lb/pig:
- 120.0
- 120.0
- 120.2
- 119.6
- 122.7
- 122.3

Feed cost, $/pig:
- $20.13
- $19.92
- $20.07
- $18.68
- $19.47
- $18.26

F/G:
- 2.67
- 2.67
- 2.67
- 2.66
- 2.73
- 2.72

K-State Web Resources

- DDGS Calculator
- Synthetic Amino Acid Calculator
- Fat Analysis Calculator
- Feed Budget Calculator
- Feeder Adjustment Cards
- Particle Size Information
- Marketing Calculators
- Gestation Feeding Tools

Thank you!

WWW.KSUswine.org