Production and Management Strategies to Minimize the Effects of Higher Feed Costs on Pork Profitability

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Introduction

- **Goal:**
  - Provide maximum return or profit for pork produced

- **Options:**
  - Decrease cost of production
  - Increase revenue
  - Optimize vs. maximize
Introduction

- Assess
  - Genetic merit
  - Animal health
  - Diet
  - Feeding management
  - Environment
  - Marketing
Assess Genetic Merit

- Genetics drive what is possible for growth or reproductive performance
  - ↓ performance = ↑ cost per pig
- Current market desires leaner, later-maturing market hogs

Lean Gain Per Day

<table>
<thead>
<tr>
<th>Breed</th>
<th>Lean Gain Per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berk.</td>
<td>0.58</td>
</tr>
<tr>
<td>Danbr. HD</td>
<td>0.6</td>
</tr>
<tr>
<td>Duroc</td>
<td>0.62</td>
</tr>
<tr>
<td>Hamp.</td>
<td>0.64</td>
</tr>
<tr>
<td>NGT Large White</td>
<td>0.66</td>
</tr>
<tr>
<td>NE SPF Duroc</td>
<td>0.68</td>
</tr>
<tr>
<td>Newsh. Hybrid</td>
<td>0.7</td>
</tr>
<tr>
<td>Spot</td>
<td>0.72</td>
</tr>
<tr>
<td>York.</td>
<td>0.74</td>
</tr>
</tbody>
</table>
Relative composition of lean and fatty tissues
Genetic Improvement

- Key to genetic improvement is maximizing heterosis

<table>
<thead>
<tr>
<th>Trait</th>
<th>Heritability (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td># pigs born</td>
<td>10</td>
</tr>
<tr>
<td># pigs weaned</td>
<td>10</td>
</tr>
<tr>
<td>Litter wean weight</td>
<td>25</td>
</tr>
<tr>
<td>Average daily gain</td>
<td>35</td>
</tr>
<tr>
<td>Feed conversion</td>
<td>45</td>
</tr>
<tr>
<td>Backfat</td>
<td>55</td>
</tr>
</tbody>
</table>
Animal Health

Disease:
- Clinical vs. subclinical
- Pigs go off feed
  - Greater proportion of nutrients used for maintenance vs. growth
- Energetic cost of activating immune system
## Effect of Immune Stimulation on Pig Performance (27-112 kg)

<table>
<thead>
<tr>
<th>Trait</th>
<th>Immune System Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Daily feed, kg</td>
<td>2.63</td>
</tr>
<tr>
<td>Daily gain, kg</td>
<td>.95</td>
</tr>
<tr>
<td>Feed/Gain</td>
<td>2.78</td>
</tr>
<tr>
<td>Hot carcass wt., kg</td>
<td>80.0</td>
</tr>
<tr>
<td>10th rib backfat, mm</td>
<td>25.4</td>
</tr>
<tr>
<td>Dissected muscle, kg</td>
<td>45.4</td>
</tr>
<tr>
<td>Dissected fat, kg</td>
<td>20.0</td>
</tr>
</tbody>
</table>

Williams, 1996
Maintaining Animal Health

- Strict biosecurity
  - Clothing and boots
  - Rodent/bird/animal control
  - Personnel traffic between barns/units
  - Vehicle traffic
  - Feed and/or grain
  - AI-AO mgmt w/ thorough cleaning and disinfecting between groups

- Minimize stress
  - Provide proper diet and environment
  - Use good animal handling techniques
Maintaining Animal Health

- Update herd health plan with your veterinarian
  - Do not cut corners with vaccinations or treatments
  - Ensure using health products properly and getting value from them

- Establish and enforce euthanasia program
  - Poor-doing pigs consume disproportionate amounts of feed for amount of gain
    - Extra expense of medications also
  - Fall-behind pigs harbor disease pathogens
  - Continually improve identification of at-risk pigs
    - Daily walk-through of pens
    - Timely treatment and euthanasia if needed
Examine Diets

- Nutrient needs of pigs
  - Pigs require daily amounts of nutrients, not %
    - Maintenance, growth, and/or reproduction
    - Meet requirement by intake x diet % of nutrient
  - Estimate or determine fat-free lean gain & actual feed intake for given pigs and facilities/mgmt
    - More than recommendation from genetic supplier
    - May be able to glean most information from existing records
    - May need to run well-designed on-farm trial
## Split-Sex Feeding

<table>
<thead>
<tr>
<th>Trait</th>
<th>Gilt advantage</th>
<th>Barrow advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed intake</td>
<td></td>
<td>10-12%</td>
</tr>
<tr>
<td>Growth rate</td>
<td>10-14 days, 8-10%</td>
<td></td>
</tr>
<tr>
<td>Feed gain</td>
<td>0-4%</td>
<td></td>
</tr>
<tr>
<td>Back fat</td>
<td>8-10%</td>
<td></td>
</tr>
<tr>
<td>Lean percentage</td>
<td>2-3%</td>
<td></td>
</tr>
<tr>
<td>Loin muscle area</td>
<td>10-12%</td>
<td></td>
</tr>
</tbody>
</table>
Phase Feeding

- Avoid over- or under-feeding nutrients as much as possible
Problem - All pigs are not equal!

- Provide margin of safety with formulation levels
Feed Budgeting

- System to ensure right feed is fed for right period of time at the right phase of production
  - Only works if check periodically to ensure you are on feeding to the budget
    - Is pig weight correct when switching diets?
    - Is feed intake and F/G on target?
  - How do you determine # of diets and where breaks should be in the budget?
    - Often due to size of bin
    - More phases = more management, chance for error
Alternative Ingredients

- Important to consider now with ↑ corn price
- Rules to remember:
  - Providing nutrient, not ingredients, so think from standpoint of cost/nutrient
    - Energy, protein/amino acids, phosphorus
  - Use digestible levels when formulating diets
    - Necessary for accurate comparison
  - Need consistent supply and quality
  - Ensure no other factors that may affect intake, growth, carcass value, reproduction, etc…
- Wheat, other cereal grains, coproduct ingredients
Alternative Ingredients - DDGS

- Coproduct from ethanol industry
  - Significant increase in supply
- Fits better in beef and dairy rations
- Concerns in swine diets
  - Nutrient levels and variability
  - Effect on feed intake and/or growth
  - Mycotoxin potential
  - Flowability and handling
- UMN research indicates
  - 10 – 20% inclusion in GF diets
  - 30 – 40% inclusion in gestating sow diets
  - 10 – 20% inclusion in lactation sow diets

www.ddgs.umn.edu
Alternative Ingredients - DDGS

- Economical fit in swine diets?
  - Based on price relationships and ingredient substitution levels

<table>
<thead>
<tr>
<th>Add:</th>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td>200 lbs DDGS ($ ???/ton)</td>
<td>$ ???????</td>
<td></td>
</tr>
<tr>
<td>3 lbs limestone</td>
<td>$ 0.09</td>
<td></td>
</tr>
<tr>
<td>3 lbs limestone</td>
<td>$ 0.09</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Less:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>178 lbs corn ($3.75/bu)</td>
<td>$ 11.92</td>
<td></td>
</tr>
<tr>
<td>19 lbs SBM (46% CP, $200/ton)</td>
<td>$ 1.90</td>
<td></td>
</tr>
<tr>
<td>6 lbs dicalcium phosphate</td>
<td>$ 0.90</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity cost: ($14.72 - $0.09) x 10 =</td>
<td>$ 146.30</td>
<td></td>
</tr>
</tbody>
</table>

DDGS @ $130/ton provides savings of $1.63/ton feed at 10% level
Growth Promotants / Repartitioners

- **Antibiotics**
  - 5 – 10 % ↑ in ADG, 3 – 6 % ↓ in F/G

- **Antibiotic alternatives**
  - Prebiotics, direct fed microbials, botanicals, supranutritional trace mineral levels, diet acidifiers, exogenous enzymes

- **Metabolic repartitioners**
  - Ractopamine (Paylean™)
    - Increases lean growth
    - Use final 28 days at 4.5 g/ton
      - Improve feed conversion and growth 10 - 15%
Optimize Feeding Management

- Feed processing / form
  - Pelleting
    - Decreases feed wastage 20%
    - Improves feed efficiency slightly (↑ nutrient utilization)
    - Must weigh against increased feed process cost
  - Complete feed vs. basemix vs. VTM
    - Need to evaluate by accounting for all costs
      - Equipment
      - Energy usage
      - Labor and time
Optimize Feeding Management

- Feed quality
  - Establish feed quality control program
    - Whether ingredients/feed is purchased, home-grown, or home-mixed
  - Evaluate nutrient and physical characteristics
    - Sampling and testing guidelines
    - Main nutrients to monitor
      - Proximate analysis – GE, CP, CF, EE
      - Amino acid analysis
      - Vitamin and mineral analysis
    - Mycotoxins
    - Particle size – goal of 650 – 750 microns
      - Improve F/G 1.2% for each 100 micron ↓
Optimize Feeding Management

- Feeder Management
  - Starting pigs: $\frac{1}{2} - \frac{2}{3}$ of feed trough covered
  - After started: $\frac{1}{3} - \frac{1}{2}$ of feed trough covered
Properly adjusted feeder

Source: Kansas State University
Properly adjusted feeder

Source: Kansas State University
Ingredient Purchasing

- Large quantities often qualify for a volume discount
  - Bulk vs. bagged
  - Consider forming a purchasing cooperative
  - Use for ingredients, drugs, or other expendable supplies
Evaluate the Environment

- In a typical swine facility, 85 – 90% of heat loss is associated with ventilation
  - Reducing ventilation could cost you more
  - Proper ventilation management is the key

Cold | Comfortable | Hot
Environment Control

- Meet pig’s thermoneutral temperature zone
- Minimize temperature fluctuations

![Graph showing Mcal intake, Feed/gain, and ADG, lbs with LCT, TNZ, and UCT zones.]
Environment Control

- Tendency in many barns is to minimize ventilation and have temps on the high end of the TNZ

<table>
<thead>
<tr>
<th>Avg Temp</th>
<th>Gallons LP</th>
<th>Annual Cost</th>
<th>Difference from Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>72 F</td>
<td>712 gal</td>
<td>$1054</td>
<td>- $419</td>
</tr>
<tr>
<td>74 F</td>
<td>837 gal</td>
<td>$1238</td>
<td>- $235</td>
</tr>
<tr>
<td>76 F</td>
<td>995 gal</td>
<td>$1473</td>
<td>Base</td>
</tr>
<tr>
<td>78 F</td>
<td>1154 gal</td>
<td>$1708</td>
<td>+ $235</td>
</tr>
<tr>
<td>80 F</td>
<td>1361 gal</td>
<td>$2014</td>
<td>+ $541</td>
</tr>
</tbody>
</table>

Source: Jay Harmon, ISU, 1000 hd nursery, $1.48/gal propane
Marketing Pigs

- Choose packer/contract that best matches your situation and hogs
  - Weight and leanness grid
- Determine optimum marketing weight
  - Minimize sort loss to maximize premiums
  - Higher feed costs may mean reduced optimal market weights
    - Not at cost of discount for being too light
  - Partial budgeting
Figure 5. Added costs and returns by genetics - 250 vs. 290 lb
Marketing Pigs

- Consider feed withdrawal prior to slaughter
  - Reduce feed cost
  - Pigs move easier, less stress
  - Improve pork quality, ↓ contamination risk
- Remove feed 12 hours prior to slaughter
Summary

Minimizing feed or production costs does not necessarily mean skimp on costs

- Sample and test diets
- Analyze rations
- Check and maintain feeding system equipment

Look for hidden cost factors

- Over- or under-feeding nutrients
- Lean gain and feed efficiency deficiencies
- Provide proper environment at economical cost
- Utilize purchasing arrangements
Summary

- Look to add value to production
  - Improve efficiency of system
  - Improve quality of pigs produced
  - More closely meet packer’s needs and arrange contracts accordingly
- Start with most economically important areas
  - Grow-finish
  - Energy
Thank You

University of Minnesota Swine Extension website:

www.extension.umn.edu/swine