Common Feed and Water Mistakes in Finishing Facilities

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Out of Feed Events
More Often Than We Think!
Out of Feed Events

- Empty bulk bins – human error
- Increases with toll milling
- Bridging of feed
  - Fat + hammermill + 700 microns
  - DDGS inclusion
- Equipment failures
  - Proximity switches
  - Motors, etc

Out of Feed Events

- Increase with increasing facility age
- Equipment
- Caregiver malaise
Out of Feed Events

- Estimates of impact – does the pig recover?
  - Increased variation
  - Health
    - Hemorrhagic bowel syndrome (HBS)
    - Ileitis
    - Ulcers
    - Tail biting?
  - Welfare

Experimental Outline – NPPA Funded

- Experiment 1
  - Out-of-feed 20 hrs
    - 0, 1, 2 or 3 x every 2 weeks for 16 weeks

- Experiment 2
  - Out-of-feed 0 vs 1x weekly
  - 700 vs 1000 micron particle size

The impact of out-of-feed

2005 Nebraska Swine Report

http://ianrpubs.unl.edu/swine/pigpdf.htm
Water

Getting the Plumbing Right!

Drinker comparison and water wastage

Bowl drinker < Swinging drinker < Nipple drinker
Water Flow Rate Recommendations

<table>
<thead>
<tr>
<th></th>
<th>Cups/Min</th>
<th>ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursery Pigs</td>
<td>1-2</td>
<td>250-500</td>
</tr>
<tr>
<td>Finishing Pigs</td>
<td>2-4</td>
<td>500-1000</td>
</tr>
<tr>
<td>Lactating Sows</td>
<td>4</td>
<td>1000</td>
</tr>
</tbody>
</table>

2 Issues of Concern with Water

1) Daily water needs – total usage per day
   - University of Nebraska grow-finish
     - Nipples – 1.5 gal/pig/day
     - Cups – 1+ gal/pig/day

   \[
   \text{330 days} \times 1000 \text{ hd} \times 1.5 \text{ gal/d}
   \]
   \[
   = 495,000 \text{ gal}
   \]
   \[
   = 18.2 \text{ acre inches}
   \]

Water meters to predict oncoming health problems
Water and feed as predictors of illness

Medication begun

http://Porkcentral.unl.edu
http://www.ipic.iastate.edu/information/WaterchartV100.xls
2 Issues of Concern with Water

1) Daily water needs – total usage per day
   • University of Nebraska grow-finish
     - Nipples – 1.5 gal/pig/day
     - Cups – 1+ gal/pig/day

2) Instantaneous Delivery Rate
   • Can we meet the need at the moment?

Max recommended flow in plastic pipe - MWPS

<table>
<thead>
<tr>
<th>Nominal Diameter, in</th>
<th>Flow, gpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>½</td>
<td>1.5</td>
</tr>
<tr>
<td>¾</td>
<td>3.1</td>
</tr>
<tr>
<td>1</td>
<td>5.7</td>
</tr>
<tr>
<td>1¼</td>
<td>12</td>
</tr>
<tr>
<td>1½</td>
<td>18</td>
</tr>
<tr>
<td>2</td>
<td>35</td>
</tr>
</tbody>
</table>

Ignores friction loss due to elbows, etc. 4 ft/sec max flow
Let’s do the math!

¾” ID pipe

\[ A = \pi r^2 \times 4 \text{ ft/sec} \times 60 \text{ sec/min} \times 7.5 \text{ gal/ft}^3 \]

\[ = 5.5 \text{ gal/min} \]

40 nipple drinkers per side (2/pen x 20 pens/side)

4 cups/min flow (0.25 gal/min)

40 x 0.25 = 10 gal/min need

1” line = 5.7 gal/min flow

1¼” line = 12 gal/min flow
Drinkers and Water

Other Common Restrictors of Water

- Water Medicator
  - 5/8” hose bib on 1”+ line – 4 gpm max?

5/8” OD plastic elbow
5/8” ID hose

1/2” washing machine hose

Taken at 2005 Iowa Pork Congress
Other Common Restrictors of Water

- Water Medicator
  - 5/8” hose bib on 1”+ line – 4 gpm max?

- Filters
  - ¾” inlet on 1”+ line

Incoming line from well
Follow manufacturers recommendations for water pressure

10 psi wet/dry
20 psi drinkers

Effect of pressure on flow

\[ \frac{P_1}{P_2} = \sqrt{\frac{20 \text{ psi}}{40 \text{ psi}}} = 0.71 \]

Reducing pressure 50% reduces flow to 71% of original
Doubling pressure increases flow to 141% of original

Electrolytes being added to water line by medicator pump
Abigail Van Buren

If we could sell our experiences for what they cost us,
We would all be millionaires!

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