Overview of Manure Acidification for Odor and Emission Control

Manure Acidification

Manure acidification is used to reduce ammonia and methane emissions from manure storages.

Why Manure Acidification

Manure acidification can be very effective at reducing ammonia emissions and improving in-barn air quality.

Poultry Litter Treatment

Poultry Litter Costs

- Estimated cost of about $500 to treat a broiler barn
- Expected savings of $900 a barn
  - Improve bird performance
  - Reduced energy costs
  - Increased manure fertilizer value
What about slurry manure

• Technology not as well developed and tested
• Requires more acid to drop pH
• Concern of foaming of manure from off-gassing of CO2 when the acid is added

Swine manure acidification

• Feeding practices
• Weak fermentable acids
• Strong acids

Swine slurry cost estimates

• Assume we need about 5 kg of sulfuric acid per 1000 L of slurry
• This means acidifying manure from a 1000-head finisher would cost about $6000 per year
• Research suggests that about 2.5 kg NH3 are lost per finished pig
• A 70% reduction in this emission would result in retaining $4000 worth of N fertilizer value

Effectiveness

<table>
<thead>
<tr>
<th>Component</th>
<th>Reduction</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH3</td>
<td>50 to 85%</td>
<td>Depends on pH achieved and storage condition</td>
</tr>
<tr>
<td>H2S</td>
<td>5 to 0%</td>
<td>Expected to increase slightly</td>
</tr>
<tr>
<td>Odor</td>
<td>0%</td>
<td>No evidence of impact</td>
</tr>
<tr>
<td>Particulate Matter</td>
<td></td>
<td>Ammonia contributes to PM 2.5, so probably lowered</td>
</tr>
<tr>
<td>Greenhouse gases</td>
<td>20 to 60%</td>
<td>Acidification causes drastic reduction in methane</td>
</tr>
<tr>
<td>Cost</td>
<td>$</td>
<td>Usually cost effective, but must be done every year and pH must be maintained acidic</td>
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For Further Information:

• If you are an educator and wish to have copies of PowerPoint files, contact Dan Andersen (dsa@iastate.edu).

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