Impact of housing on mastitis

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Mississippi State University
Industry Changes

- Etiology of mastitis has changed from contagious to environmental pathogens
- Contagious mastitis used to be a problem of small dairies with stanchion barns (Myllys et al. 1998)
- Environmental mastitis used to be a problem with larger freestall dairies (Schukken et al. 1989; Shpigel et al. 1998)
- No longer the case
  - Reducing the efficacy of traditional mastitis control strategies
Role of Housing

- Have made considerable progress in understanding mastitis epidemiology, immunology, diagnostics and pathogenesis

- Cow welfare and comfort are key issues for animal and udder health (Anderson 2000)

- Understand housing has a major role in mastitis prevention
  - Need clean, dry cows with healthy teat ends

- But every housing situation is very different
  - How do we adapt?
# Lactating Dairy Cow Housing Type

<table>
<thead>
<tr>
<th>Housing Type</th>
<th>% Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tie Stall</td>
<td>42.2%</td>
</tr>
<tr>
<td>Freestall</td>
<td>39.0%</td>
</tr>
<tr>
<td>Bedded pack</td>
<td>6.8%</td>
</tr>
<tr>
<td>Pasture</td>
<td>6.8%</td>
</tr>
</tbody>
</table>

(NAHMS, 2014)

In MS, this is over 90%
Lack of Housing is Common
Why is the SE So Different?

• Loss of interest from future generations
• History
• Loss of infrastructure and resources
• Management deficiencies
• Heat stress
Cow Response
Why is the SE So Different

You can make excuses or you can make progress. Your choice.

catrinaishungry.com
Freestalls

- Good ventilation
- Adequate water
- Don’t overstock
- Build stalls to size of cows
- Clean, dry bedding
- Scrape or flush alleys at least twice daily
- Provide sprinklers (not misters) in feed alleys
- Provide and correctly angle fans – and clean them
Fan Priority

- Holding pen
- Parlor
- Close-up dry cow area
- Calving area
- Fresh cow area
- High producing group area
- Low producing group area
Pasture

- Keep cows clean
- Provide adequate water
- Cool holding pens and feed bunks
- Reduce time spent in sun and in holding pen
- Reduce walking distance to parlor
- Control flies
- Provide shade or center pivot
How Not to Cool Cows
Potential benefits:

- Reduce supplemental feed
- Alternative to freestall barns
- Reduce heat stress

Benefits are operation-specific.

Increased profitability depends on current practices.

Reduced heat stress can increase production and quality.

Can use if leave dairy business.
**Cost of 42 Acre Center Pivot System**

<table>
<thead>
<tr>
<th>Fixed Costs</th>
<th>Operating Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Center Pivot (Sprinklers &amp; Gun)</strong></td>
<td><strong>Repair and Maintenance</strong></td>
</tr>
<tr>
<td>$40,000</td>
<td>$996</td>
</tr>
<tr>
<td><strong>Well</strong></td>
<td><strong>Electricity</strong></td>
</tr>
<tr>
<td>$16,250</td>
<td>$2,500</td>
</tr>
<tr>
<td><strong>Pump, motor, and electrical</strong></td>
<td><strong>Total Operating Cost per Year</strong></td>
</tr>
<tr>
<td>$17,500</td>
<td>$3,496</td>
</tr>
<tr>
<td><strong>Total Investment</strong></td>
<td><strong>Annual Operating Costs per Acre</strong></td>
</tr>
<tr>
<td><strong>$73,750</strong></td>
<td><strong>$83.24</strong></td>
</tr>
<tr>
<td><strong>Salvage Value</strong></td>
<td></td>
</tr>
<tr>
<td><strong>$0.00</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Average years of life</strong></td>
<td></td>
</tr>
<tr>
<td><strong>20</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Interest/Discounting Rate</strong></td>
<td></td>
</tr>
<tr>
<td><strong>4.00%</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Annual Fixed Cost per Acre</strong></td>
<td><strong>Annual Fixed and Operating Costs per Acre</strong></td>
</tr>
<tr>
<td><strong>$129.21</strong></td>
<td><strong>$212.44</strong></td>
</tr>
</tbody>
</table>
Profitable Scenarios

• Since do not (yet) have adequate data to measure the true benefits, considered what impacts lead to profitability

• In order to be profitable, a producer must:
  • Decrease milk loss during summer months by 4%
  • OR reduce feed costs by $106.22 per animal
  • A combination of increased production and reduced feed costs would increase profitability
### Assumptions

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Per Cow (lbs)</td>
<td>16,500</td>
</tr>
<tr>
<td>Price per cwt</td>
<td>$17.00</td>
</tr>
<tr>
<td>Revenue per cow</td>
<td>$2,805.00</td>
</tr>
</tbody>
</table>

### Increased Revenue Per Cow

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4 %) Lower milk loss due to heat stress</td>
<td>$112.20</td>
</tr>
</tbody>
</table>

Total Annual Benefit                                                                 $112.20
### Sensitivity Analysis Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total annual benefit</td>
<td>112.20</td>
</tr>
<tr>
<td>Annual cost per cow</td>
<td>-106.22</td>
</tr>
<tr>
<td>Total benefit</td>
<td>$5.98/cow</td>
</tr>
</tbody>
</table>
Factors Not Considered

• Assumes all other costs stay the same
• Milk quality not considered
• Pivot installation costs can vary
• Forage production costs might be higher with center pivot due to increased management
• Milk loss benefits are dependent on milk prices
Conclusions

- Heat stress is a problem in the SE
- Not an unsolvable one
- Need to find methods that work for each individual farm
  - Not one size fits all
- Need to think about more things than heat stress with housing
  - A lot more affects milk quality and production than heat abatement
Would Not Be Possible Without...

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Thanks for your support!
Questions?

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