Cattle Confinement Considerations

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ISU Extension and Outreach
What Affects Cattle Comfort?

- Air temperature
- Wind
- Precipitation
- Relative humidity
- Shelter
- Solar radiation
- Pen surface
- Animal body condition
- Animal surface/unit wt.
- Hair coat
What About Animal Welfare?

Is this good animal welfare?
Advantages of Confinement Barns

- Control manure runoff
- Animal comfort
  - Winter
  - Summer
- Improve performance?
  - Gain – 3.5%
  - Feed efficiency – 3.85%
- Reduce animal sickness
- Value of manure
When a Confinement Barn Excels

- Light-weight calves
  - Muddy
  - Rain and <35º
  - Cold and windy
- Market ready animals
  - Muddy
  - Hot and sunny
- Black-hided cattle
- Dairy steers
# Value of Manure

## Open Feedlot

- **Total N/ton**: $11 \text{ lbs} \times $0.31 = $3.41 \text{ Total N/ton}
- **P$_2$O$_5$/ton**: $14.0 \text{ lbs} \times $0.43 = $6.02 \text{ P}_2\text{O}_5$/ton
- **K$_2$O/ton**: $17.0 \text{ lbs} \times $0.30 = $5.10 \text{ K}_2\text{O}/ton
- **Cost**: $14.53/\text{ton} \quad (5 \text{ tons/space/yr})
- **Annual Cost**: $73/\text{space/year}$

## Mono-Slope Barn

- **Total N/ton**: $21.7 \text{ lbs} \times $0.31 = $6.73 \text{ Total N/ton}
- **P$_2$O$_5$/ton**: $14.1 \text{ lbs} \times $0.43 = $6.06 \text{ P}_2\text{O}_5$/ton
- **K$_2$O/ton**: $14.6 \text{ lbs} \times $0.30 = $4.38 \text{ K}_2\text{O}/ton
- **Cost**: $17.17/\text{ton} \quad (10 \text{ tons/space/yr})
- **Annual Cost**: $172/\text{space/year}$
## Disadvantages of a Confinement Barn

### Increased Cleaning

<table>
<thead>
<tr>
<th>Frequency</th>
<th>% Producers</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 times/week</td>
<td>6.7</td>
</tr>
<tr>
<td>3 times/week</td>
<td>6.7</td>
</tr>
<tr>
<td>2 times/week</td>
<td>13.3</td>
</tr>
<tr>
<td>1 time/week</td>
<td>46.7</td>
</tr>
<tr>
<td>Every 2 weeks</td>
<td>26.6</td>
</tr>
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</table>

### Increased Bedding

<table>
<thead>
<tr>
<th>Bedding</th>
<th>Lb/hd/d</th>
</tr>
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<tbody>
<tr>
<td>Average</td>
<td>4.25</td>
</tr>
<tr>
<td>Range</td>
<td>2-10</td>
</tr>
</tbody>
</table>
Orientation of a Confinement Barn

Mostly east-west; seldom north-south
Bunk Space Sets Barn Length Minimum = 12” per Head

South Bunk

North Bunk
Animal Density

- **Solid floor**
  - Avg: 40 sq ft/hd
  - Range: 38-50 sq. ft/hd
- **Slatted floor**
  - Avg: 25 sq ft/hd
  - Range: 22-28 sq ft/hd
- **Dependent on animal**
Floors of a Confinement Barn

Solid

Slotted

Russ Euken, ISUEO
Enhancing the Floors in a Confinement Barn

Scored Solid Floor

Mats for Slatted Floors
Back of Building – Split Curtain

- Upper curtain
  - attached 2” below eave
  - Extends down 3’

- Lower curtain
  - Attached below upper curtain
  - Extends to wall
  - Rolls up from bottom (reduces rodent damage)

- Concrete wall is 5’ high
Ventilation in a Confinement Barn

- Set by the opening of the curtain in the back
- Roof may be insulated to control condensation
- Goals:
  - Keep cattle dry
  - Protect from wind
  - BUT still have air movement
How the Curtain is Managed
Slotted Floor, Deep Pit Beef Barn
Adding Bedding to a Pen
Types of Bedding

- Cornstalks
  - Most common
- Soybean Stover
- Straw
  - Oat
  - Wheat
- Woodchips
**Estimated Absorption of Bedding**

<table>
<thead>
<tr>
<th>Material</th>
<th>Lbs Water/Lb Bedding (10% moisture)</th>
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<tbody>
<tr>
<td>Pine chips</td>
<td>3.0</td>
</tr>
<tr>
<td>Pine sawdust</td>
<td>2.5</td>
</tr>
<tr>
<td>Pine shavings</td>
<td>2.0</td>
</tr>
<tr>
<td>Hardwood</td>
<td>1.5</td>
</tr>
<tr>
<td>Shredded newspaper</td>
<td>1.6</td>
</tr>
<tr>
<td>Shredded corn stover</td>
<td>2.5</td>
</tr>
<tr>
<td>Ground corn cobs</td>
<td>2.1</td>
</tr>
<tr>
<td>Oat straw</td>
<td>2.5</td>
</tr>
<tr>
<td>Wheat straw</td>
<td>2.2</td>
</tr>
<tr>
<td>Chopped, mature hay</td>
<td>3.0</td>
</tr>
<tr>
<td>Soybean stover</td>
<td>2.8</td>
</tr>
</tbody>
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Bedding Management

Deep-Bedded Pack

Shallow-Bedded Pen
## Effect of Bedding Management on Pack Characteristics (Apr/June 09)

<table>
<thead>
<tr>
<th></th>
<th>Deep Bedding</th>
<th>Shallow Bedding</th>
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<tbody>
<tr>
<td>Pack Moisture, %</td>
<td>63.1</td>
<td>67.2</td>
</tr>
<tr>
<td>Pack Temp, °F</td>
<td>70.2</td>
<td>65.2</td>
</tr>
<tr>
<td>pH</td>
<td>7.69</td>
<td>6.90</td>
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<tr>
<td>Gen E. coli, log CFU/g</td>
<td>6.02</td>
<td>6.72</td>
</tr>
<tr>
<td>Branch Chain VFA</td>
<td>2.57</td>
<td>3.81</td>
</tr>
<tr>
<td>Aromatics</td>
<td>1.95</td>
<td>4.42</td>
</tr>
<tr>
<td>Surface Temp, °F</td>
<td>63.5</td>
<td>61.4</td>
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</tbody>
</table>
Manure Storage

Manure Speed Bump
This kind of hair loss on the lower round has been observed in some deep bedded facilities.

Cause not known – too wet, manure pH, abrasive surface??
Why Worry About Mud/Manure Scores?

- ↑ heat & cold stress
- ↓ ADG & FE
- ↓ dressing percent
  - 1% on 1400# steer = 14#
  - 14# x $1.1889 = $16.64
- ↓ value of hide (~$30)
- ↑ potential for E. Coli 0157:H7
- Recall cost – recovery, ↓ investment value
- ↓ consumer confidence

October, 2015
Thank You!

Questions!