Compost Barn Basics

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Minnesota’s only research university

Compost Barns

- Composting Bedded Pack
- Alternative housing
  - Milking herd
  - Special needs
Post frame or hoop barn

Not Bedded Pack / Pen
Conventional Bedded Pack

Anaerobic
60-110 F
Ideal growth conditions for pathogens

Observational study of temperature, moisture, pH and bacteria in straw bedding (pack).

Ward et al., Vet Record (2002)

- Temperature, moisture content and pH values found in straw yards are conducive to the multiplication of *S. uberis* and *E. coli*.
- It is not surprising, therefore, that such yards have a reputation for promoting mastitis.
Compost barn owners report

- Unexcelled cow comfort
- Reduced SCC
- Increased milk production
- Bedding management critical
  - Stir & aerate 2 times per day
  - Clean cows

Stirring and Composting

Stirring and composting the bedded pack is critical
**Stirring**
- Freshens surface
- Mixes manure and urine
- Aerates and loosens pack

**Composting**

Composting Temperatures and Bacterial Growth Phases

- Temperature
- Mesophiles
- Thermophiles

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Composting bedded-pack

- Aerobic process
- Composting generates heat and temperatures from 130 to 150 F
- Composting inactivates pathogens, viruses, weed seeds, & fly larvae

Bedding

- Dry fine wood shavings or sawdust
  - Straw and corn stalks not recommended
  - Avoid green or wet wood shavings
- Add semi-load fine wood shavings every three to five weeks when bedding sticks to cows
- Start with 18 to 20 in.
Stir and Aerate

- Stir bedded pack at least 2 times per day or each milking
- Aerate pack 10 to 12 inches deep with cultivator

Mastitis Bulk Tank Culture Results

<table>
<thead>
<tr>
<th>Microorganism</th>
<th>Count</th>
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<tbody>
<tr>
<td>Strep ag</td>
<td>0</td>
</tr>
<tr>
<td>Staph aureus</td>
<td>68</td>
</tr>
<tr>
<td>Non-ag Strep</td>
<td>175</td>
</tr>
<tr>
<td>Coliforms</td>
<td>195</td>
</tr>
<tr>
<td>Staph spec</td>
<td>210</td>
</tr>
</tbody>
</table>

Excellent Cow Prep a MUST!

Monthly BT Culture results need to look like these
Manure handling

- Composting bedded pack provides storage
- Smaller external manure storage
- Concrete alley scraped 2 times/day and stored
- Composted pack land applied in fall
- Follow manure management plan

Building elements

- Freestalls & alleys replaced with composting bedded pack
- 80 ft² bedded pack per cow
- 4-ft wall surrounds composting pack
- Concrete feed alley
- Access for cows, stirring & aerating 2 times a day, & bedding semi truck
Ventilation & location

- Naturally ventilated
- Sidewall height 16 ft suggested
  - Ventilation
  - Equipment & semi access
- Mixing fans
- Open ridge
- Locate in open area
- Eave overhang – 3 ft

Waterer options

- Adjacent to feed platform
- Adjacent to resting space
Cost/Benefit - Benefits

- Cow comfort & increased productive life - reduced replacement costs
- Lower SCC
- Increased milk production
- Smaller manure storage size & cost
- Lower building costs for less concrete curbing, no freestalls, freestall alleys, & smaller equipotential plane

Cost / Benefit - Costs

- Increased building costs
  - Lower cow occupancy - 80 ft²/cow
  - Increased height
- Concrete wall surrounding pack
- Solid and slurry manure handling equipment
- Bedding $0.34 to $0.50/day-cow
**Compost Barns**

- Bedding management is critical
- Stir and aerate pack 2x per day
- Dry fine wood shavings or sawdust
- Excellent pre-milking cow prep
- 80 ft²/cow composting bedded pack

Questions?

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