The compost barn – an innovative housing system for dairy cows

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What is a compost barn?

- Two-area system
  (bedded lying area, feeding alley with solid or slatted floor)
- Lying area: bedded with sawdust or wood shavings
- Bedding material is added every 2 – 7 weeks (0.4 – 1.3 m³/animal)

Plan: Holzeder (2012)
What is a compost barn?

- Once or twice a day bedding material is loosened with a grubber or rotary hoe, working in any faeces and urine
- Mixture can decompose with the help of aerobic microorganisms
- Compost removal (mucking out): twice a year (spring and autumn)

Materials and methods

- Joint research project between HBLFA Raumberg-Gumpenstein (A) and ISS Tänikon (CH)
- Aim: Analysis of overall conditions involved in the construction and running of compost barns for dairy farming
- Five Austrian farms with compost barns
- Herd size: 18 – 35 cows per farm
- Investigations:
  - Cleanliness of the animals
  - Integument alterations (hairless patches, lesions, swellings)
  - Animal behaviour (especially lying and standing)
  - Lameness
  - Questionnaire survey (7 farms)
Cleanliness of the animals – Method
(Faye and Barnouin, 1985)

- Five areas of the body (zones)
- Five scores (0 – 2)

Cleanliness of the animals - Results

Dirtiness [Index]

Base of tail
Rear of udder
Lower Leg
Side of udder
Upper leg

Farm

Ø 0.44
Integument alterations - Method
(Ekesbo, 1984)

- Tarsal joint
- Tarsus
- Carpus

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Integument alterations - Results

Alterations per 100 animals [\(n\)]

Lying area

- Hairless < 2 cm
- Hairless > 2 cm
- Scabs and wounds < 2 cm

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**Lameness assessment**
(Model of Winckler & Willen, 2001)

Lameness scores (values):
1 – normal gait
2 – uneven gait
3 – short striding gait with one limb
4 – short striding gait with more than one limb or strong reluctance to bear weight on one limb
5 – does not support on one limb or strong reluctance to put weight on limb in two or more limbs

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**Results of lameness assessment**

<table>
<thead>
<tr>
<th>Lameness score</th>
<th>Compost barns (n = 138)</th>
<th>Cubicle housing systems (n = 175)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35%</td>
<td>20%</td>
</tr>
<tr>
<td>2</td>
<td>28%</td>
<td>15%</td>
</tr>
<tr>
<td>3</td>
<td>15%</td>
<td>12%</td>
</tr>
<tr>
<td>4</td>
<td>10%</td>
<td>7%</td>
</tr>
<tr>
<td>5</td>
<td>2%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Compost: Ø 25.4 % lame
Cubicle: Ø 45.7 % lame
**Summary**

- **Cleanliness of the animals**: The dirtiness of animals averaged 0.44, while the udder was the cleanest and the lower leg the dirtiest area.
- **Integument alterations**: Only a few lesions in carpal and tarsal joints could be found.
- **Lying behaviour**: Concerning lying behaviour cows showed no differences between times of day and temperatures. Large differences in lying behavior were evident between farms.
- **Lameness**: In lameness assessments 25% of cows were scored to be lame in compost barns. This percentage is significantly lower than a series of results on cubicle housing systems (31 – 46%).
- **Questionnaire survey**: According to the farmers, animal welfare in compost barns is better than in the housing system previously used.

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**Conclusions**

From the present results, the compost barn can be seen as an animal-friendly system. Further investigations are desirable to analyze other factors affecting animal health and to resolve any outstanding issues concerning economy and alternative litter materials.