Cattle welfare: a review of the main issues

Improving Animal Welfare: A Practical Approach

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What is animal welfare?

The Five Freedoms

Freedom from thirst, hunger and malnutrition
Freedom from thermal and physical discomfort
Freedom from pain, injury and disease
Freedom from fear and distress
Freedom to express normal behaviour

FAWC 1992 FAWC updates the five freedoms. Veterinary Record 17: 357.
Some considerations about drinkers

- Length (6 cm/cow)
- Number
- Are they clean? Water quality and temperature
- Other considerations
Hunger in calves

• Traditional practice is to feed 10 % BW
• Evidence shows that this results in chronic hunger
• Feeding 20% BW has AW and performance benefits
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Heat stress

- When heat production is higher than heat loss
- High producing cows are at higher risk (a cow producing 30 l. of milk per day produces 50% more heat than a dry cow)
- When temperature $> 20\text{-}25 \degree C$.
- However, effective temperature is more important than ambient temperature.
Figure 1. Temperature-humidity index table for dairy producer to estimate heat stress for dairy cows. Deg = Degrees.
Relative humidity expressed as percentage. (From Frank Wierzba, 1990, Department of Agricultural Engineering, The University of Arizona, Tucson.)
Consequences

- Reduction of DMI
- Increase of energy requirements
- In summary, reduction in milk production (0.2 l/day per each THI unit above 72)
Consequences II

• Reduction of LH secretion and, therefore, estradiol production

• Reduction of estrous behaviour and estrous detection

• In summary, reduction in fertility
Economic consequences

- 30º C and 75% HR
Figure 1. Temperature-humidity index table for dairy producers to estimate heat stress for dairy cows. Deg = Degrees. Relative humidity expressed as percentage. (From Frank Wienra, 1990, Department of Agricultural Engineering, The University of Arizona, Tucson.)
Economic consequences

- 30º C and 75% HR = THI 82
- 10 x 0,2 = 2 l less per cow and day
- If heat lasts for 2 months and we have 500 cows
  
  2 x 60 x 500 = 60,000 l less
Economic consequences

• 30° C and 75% HR = THI 82

• 10 x 0.2 = 2 l less per cow and day

• If heat lasts for 2 months and we have 500 cows
  
  \[2 \times 60 \times 500 = 60,000 \text{ l less}\]

• Multiply by 2
Strategies to reduce heat stress

• Increase water intake
• Increase air speed
• Provide shade
• Reduce other sources of stress
## Water requirements

<table>
<thead>
<tr>
<th>$T^a$ (°C)</th>
<th>Requirements (l / Kg DM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;35</td>
<td>8-15</td>
</tr>
<tr>
<td>25-35</td>
<td>4-10</td>
</tr>
<tr>
<td>15-25</td>
<td>3-5</td>
</tr>
<tr>
<td>-5-15</td>
<td>2-4</td>
</tr>
<tr>
<td>&lt;-5</td>
<td>2-3</td>
</tr>
</tbody>
</table>
Shade

- **Cheap and effective (30-50% reduction of heat stress)**
- **4-6 m² / cow**
- **Consider area really available to cows**
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Resting behaviour

- Important for welfare and production reasons

- Cows need a lying place which is soft, dry and clean, and that allows normal movement
Dirty cows (%) vs. Cows with mastitis (%)
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Pain in cows

- Veterinary interventions
- Disease
- Calving
• Increase work safety

• Reduce social stress and risk of lesions in cows
# Dehorning / disbudding

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>BEHAVIOUR</th>
<th>CORTISOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dehorning</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Disbudding</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Dehorning + local anesthesia</td>
<td>+/-</td>
<td>++</td>
</tr>
<tr>
<td>Dehorning + analgesia</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Dehorning + analgesia + local anesthesia</td>
<td>+/-</td>
<td>+</td>
</tr>
</tbody>
</table>
Tail docking

- Evidence of acute and chronic pain
- Increased stress caused by insects
- No positive effect on mastitis reduction
Pain in cows

- Veterinary interventions
- Disease
- Calving
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Effect of social competition on feeding time
Effect of social competition on feeding time

60-75 cm per cow
% of affected livers

<table>
<thead>
<tr>
<th>Category</th>
<th>T8</th>
<th>T4</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abscesses</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Abscesses + other lesions</td>
<td>7</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Discarded livers</td>
<td>8</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>
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Sucking from cow: 8 – 12 minutes each sucking episode
Drinking from bucket: 1 minute

(Loberg & Lidfors, 2001)

The calf is hard – wired to suck for 10 m after initiating milk intake
Milk in mouth

CNS

Need to suck for 10 m

If there is nipple
- Normal behaviour

If there is no nipple
- Alternative stimulus
  - Abnormal behaviour
Sucking from a nipple increases the release of several hormones and enzymes

- Renin (Grosskopf, 1959)
- Pepsin (Grosskopf, 1959)
- Colecystokinin (de Passillé et al., 1993)
- Insulin (de Passillé et al., 1993)