Development of a Tail Scoring as Health Indicator for Dairy Cows

ICAR Animal Welfare workshop

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Introduction

Tail tip alterations

+ In fattening bulls tail tip necroses are often described related to technopathies, as well as to (sub)acute rumen acidosis and laminitis. 

+ In buffalo and rats tail tip necroses or ring constrictions are described as a result of heat stress (Barakat et al., 1960).

+ In pigs the Swine Inflammation and Necrosis Syndrome (SINS) causes necrotic tail tips and tail ring constrictions (Reiner et al., 2019).

+ Knowledge regarding tail tip alterations in dairy cows is scarce. Investigations performed on dairy cattle in-vivo often suffer from small sample sizes (Ural et al., 2007).
## Literature

### Scorings and Prevalences for Tail (Tip) Alterations

<table>
<thead>
<tr>
<th>Source</th>
<th>Scoring</th>
<th>Type</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bertocchi et al., 1973</td>
<td>Bulls</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Drolia et al., 1991</td>
<td>A-E Feedlot</td>
<td>34.5%</td>
<td></td>
</tr>
<tr>
<td>Freitag et al., 2017</td>
<td>1-6 Bulls</td>
<td>78% 30%</td>
<td></td>
</tr>
<tr>
<td>Freitag et al., 2017</td>
<td>1-6 Cows</td>
<td>60% 37%</td>
<td></td>
</tr>
<tr>
<td>Hoedemaker, 2014</td>
<td>Cows</td>
<td>2.5-7.7%</td>
<td></td>
</tr>
<tr>
<td>Kordowitzki, 2015</td>
<td>0-3, Amputation Bulls (&lt;300 kg), Bulls (&gt;300 kg)</td>
<td>50.0% 87.4%</td>
<td></td>
</tr>
<tr>
<td>Schrader et al., 2001</td>
<td>Bulls</td>
<td>up to 60%</td>
<td></td>
</tr>
</tbody>
</table>
Aim of the study

Tail tip alterations in dairy cows...

1. Identification

2. Prevalence

3. Scoring system

4. Associated traits
Material and Methods

Animals

- 1st Lactation
- 2nd Lactation
- ≥3rd Lactation

10,149 kg milk
4.10% fat
3.55 % protein
Material and Methods

Data collection

+ 12/2019 to 11/2020

<table>
<thead>
<tr>
<th>Every 2 weeks</th>
<th>Monthly</th>
<th>Once</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tail Scoring</td>
<td>Milk performance testing including: Milk yield, fat and protein, SCC</td>
<td>Thermal images</td>
</tr>
<tr>
<td>Body Condition Scoring (Edmonson et al., 1989)</td>
<td></td>
<td>Urine density</td>
</tr>
<tr>
<td>Locomotion Scoring (Sprecher et al., 1997)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Material and Methods

Data analysis

Data were prepared and analysed using R (4.0.3)

\[ \text{Prevalence}_i = \frac{\text{number of affected cows}}{\text{total number of cows under investigation}} \]

\( i = 1-6 \) tail tip alterations
Results

Tail tip alterations

A. Physiological (?)  
B. Hairless, scurf, swelling  
C. Hairless, scurf  
D. Skin lesions/scab, swelling  
E. Necrotic tissue  
F. Scurf (fir cone-like), swelling  
G. Thinning (axis anomalie)  
H. Verruca-like mass
Results

Ring-like alterations

A. Physiological (?)  
B. Hairless ring  
C. Ring constriction  
D. Bloody ring constriction  
E. Part loss/amputation
Results

Prevalence of tail alterations / Lactation
## Results

### Tail Scoring

<table>
<thead>
<tr>
<th>Score</th>
<th>Tail Tip</th>
<th>Ring-like</th>
<th>Anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>physiological</td>
<td>physiological</td>
<td>swelling</td>
</tr>
<tr>
<td>1</td>
<td>hairloss</td>
<td>hairloss</td>
<td>thinning</td>
</tr>
<tr>
<td>2</td>
<td>scab</td>
<td>constriction</td>
<td>scurf</td>
</tr>
<tr>
<td>3</td>
<td>bloody lesions</td>
<td>bloody constriction</td>
<td>verruca-like mass</td>
</tr>
<tr>
<td>4</td>
<td>necrosis / part loss</td>
<td>part loss</td>
<td></td>
</tr>
</tbody>
</table>
Results

Locomotion Score

+Higher Tail Tip Scores were often attended by higher Locomotion Scores.
Results

Body Condition Score

+ Lighter cows (BCS ≤ 3) showed higher Ring-like Alteration Scores compared to heavier cows.
Discussion

Tail Scoring could indicate imbalances

+ In our sample **six different tail alterations** were described. **Prevalence** was high (94%), only five cows were unaffected. Scoring system of tail tip alterations increased by higher grades in **LMS**, whereas the severeness of ring-like alterations tend to be influenced by **BCS**.

+ Milk yield performance data did **not** show an effect on the scoring.
Conclusion

Take a look at the tail!

+ Since findings of tail alterations in fattening bulls and other species (rats, pigs, buffalo) are in association with health disorders, the tail tip could also be an indicator for health disorders in dairy cows.
+ If there is SINS (affecting tails, ears, and claws), is there BINS? (Bovine Inflammation and Necrosis Syndrome)
Thank you for your attention!

Feel free to contact us:

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