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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.**
(Dirksen 2002, Drolia et al., 1991, Freitag et al., 2017, Heers et al., 2017, Hofmann 2007, Kordowitzki, 2015)

+ 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).

+ Knowlegde 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

Source	Scoring	Type	Prevalence
Bertocchi et al., 1973		Bulls	5%
Drolia et al., 1991	A-E	Feedlot cattle	34.5%
Freitag et al., 2017	1-6	Bulls Cows	78% 30%
Heers et al., 2017	1-6	Bulls Cows	60% 37%
Hoedemaker, 2014		Cows	2.5-7.7%
Kordowitzki, 2015	0-3, Amputation	Bulls (<300 kg) Bulls (>300 kg)	50.0% 87.4%
Schrader et al., 2001		Bulls	up to 60%

Aim of the study

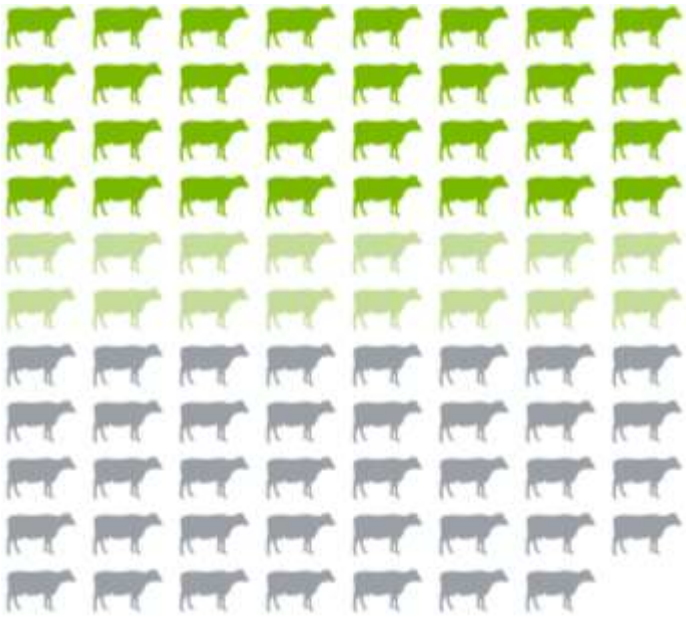
Tail tip alterations in dairy cows…

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

Every 2 weeks	Monthly	Once
▪ Tail Scoring ▪ Body Condition Scoring (Edmonson et al., 1989) ▪ Locomotion Scoring (Sprecher et al., 1997)	▪ Milk performance testing including: Milk yield, fat and protein, SCC	▪ Thermal images ▪ Urine density

Material and Methods

Data analysis

+Data were prepared and analysed using R (4.0.3)

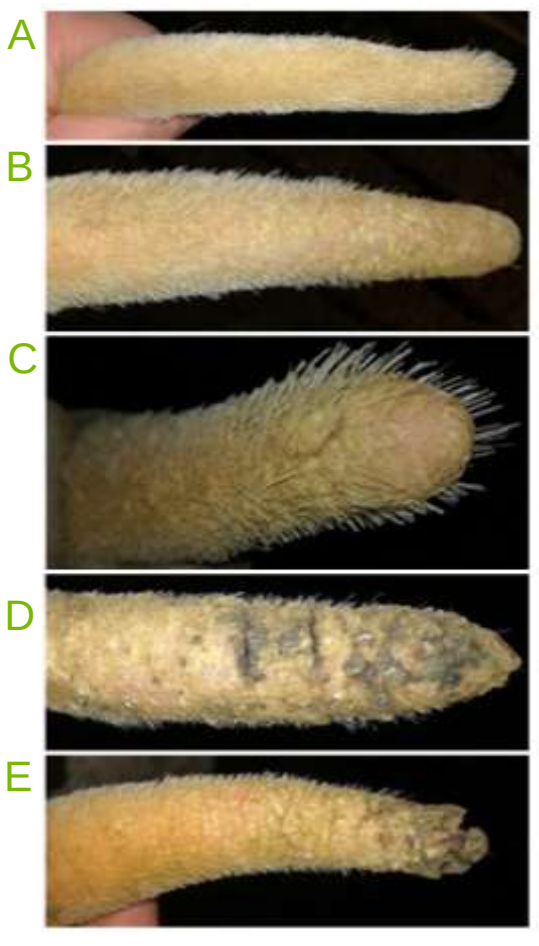
$$+Prevalence_i = \frac{number\ of\ affected\ cows}{total\ number\ of\ cows\ under\ investigation}$$

i = 1-6 tail tip alterations

Results

Tail tip alterations

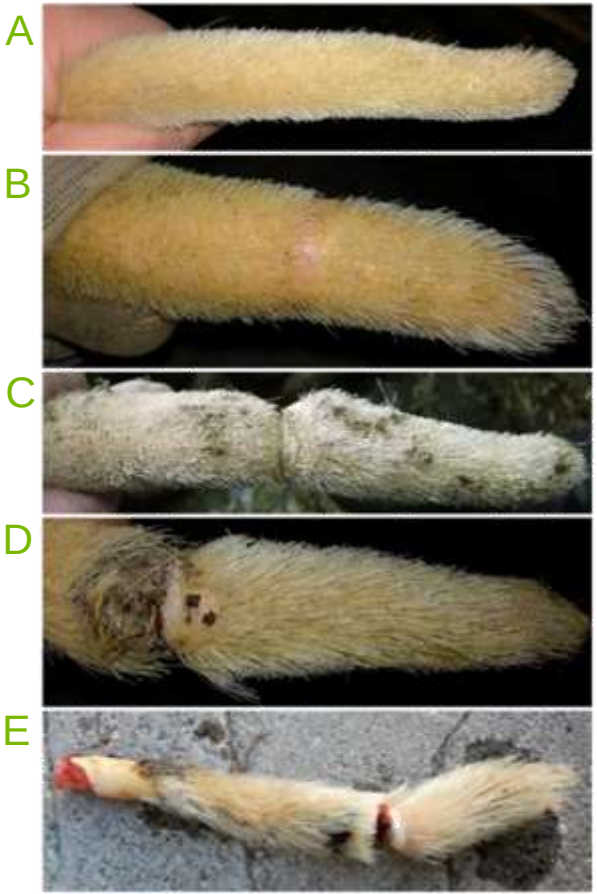
A. Physiological (?)
B. Hairless, scurf, swelling
C. Hairless, scurf
D. Skin lesions/scab, swelling
E. Necrotic tissue
F. Scurf (fir cone-like), swelling
G. Thinning (axis anomalie)
H. Verruca-like mass



Results

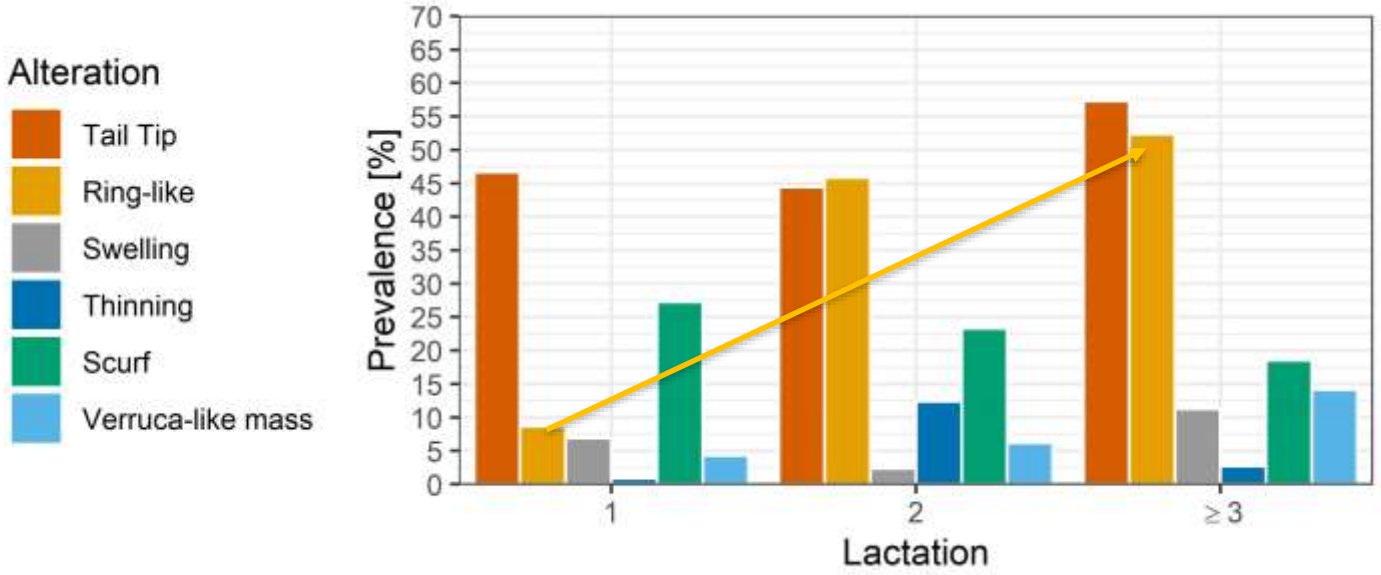
Ring-like alterations

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



Results

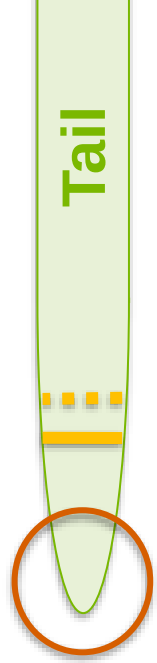
Prevalence of tail alterations / Lactation



Results

Tail Scoring

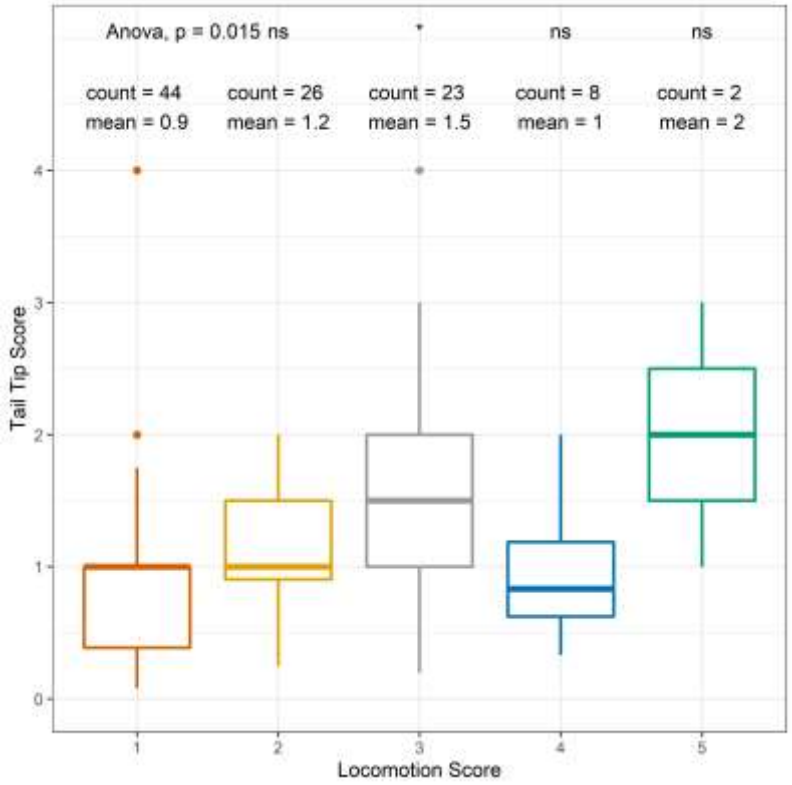
Score	Tail Tip	Ring-like	Anomalies
0	physiological	physiological	swelling thinning scurf verruca-like mass
1	hairloss	hairloss	
2	scab	constriction	
3	bloody lesions	bloody constriction	
4	necrosis / part loss	part loss	



Results

Locomotion Score

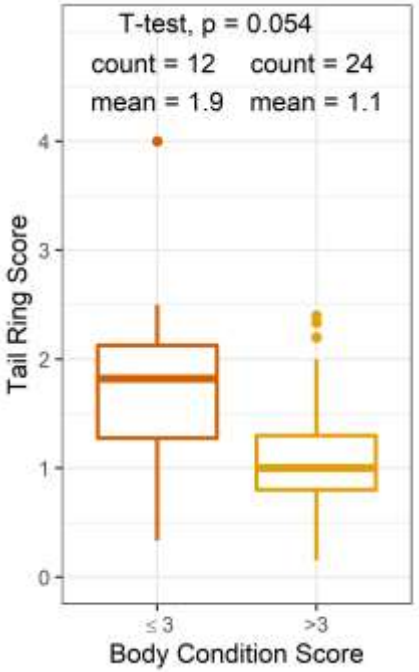
+Higher **Tail Tip Scores** were often attended by higher **Locomotion Scores**.



Results

Body Condition Score

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



Discussion

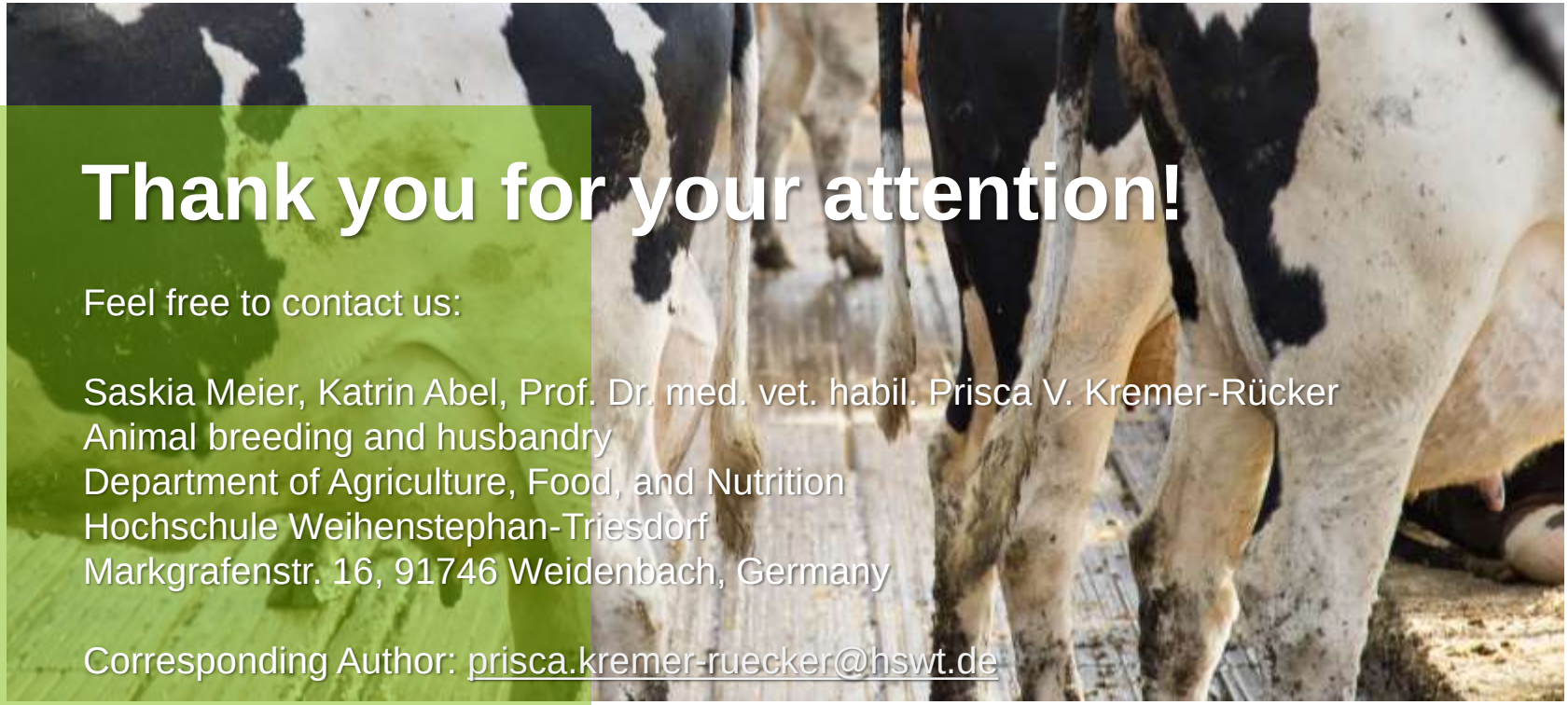
Tail Scoring could indicate imbalances

+ 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**? (**B**ovine **I**nflammation and **N**ecrosis **S**yndrome)



Thank you for your attention!

Feel free to contact us:

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Photo: Henrik Sørensen