

# Application of rumen boluses to receive welfare parameters from fattening bulls

**Kay Fromm**, Julia Heinicke, Thomas Amon,  
Gundula Hoffmann

# Motivation

The aim of the study is to ascertain if a rumen bolus based animal welfare monitoring system for dairy cows is reliable under conditions in bull husbandry.

# Common sensor systems in dairy production

- Milking system (composition)
- Accelerometers / Pedometers
- Neck collars
- Rumen bolus



blogspot.com

# Rumen bolus



- Weight: 210gr, size: 105 x 35mm
- Battery duration: 5 years
- Possible to equip with 350 kg live weight
- Captures values every 10 minutes
- Wireless connection through base station
- WiFi transfer over Messenger service or Smartphone App
- Early warning alarm



Source: smaxtec.com

# Validation for dairy cattle



J. Dairy Sci. 102:10471–10482  
<https://doi.org/10.3168/jds.2019-16442>

© 2019, The Authors. Published by FASS Inc. and Elsevier Inc. on behalf of the American Dairy Science Association®.  
This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Developing and evaluating threshold-based algorithms to detect drinking behavior in dairy cows using reticulorumen temperature

J. A. Vázquez-Diosdado,\* G. G. Miguel-Pacheco,\* Bobbie Plant, Tania Dottorini, Martin Green,  
and Jasmeet Kaler†

School of Veterinary Medicine and Science, University of Nottingham, Sutton Bonington Campus, Leicestershire LE12 5RD, United Kingdom



THE GLOBAL STANDARD  
FOR LIVESTOCK DATA

Network. Guidelines. Certification.

### Challenges of integration and validation of farm and sensor data for dairy herd management

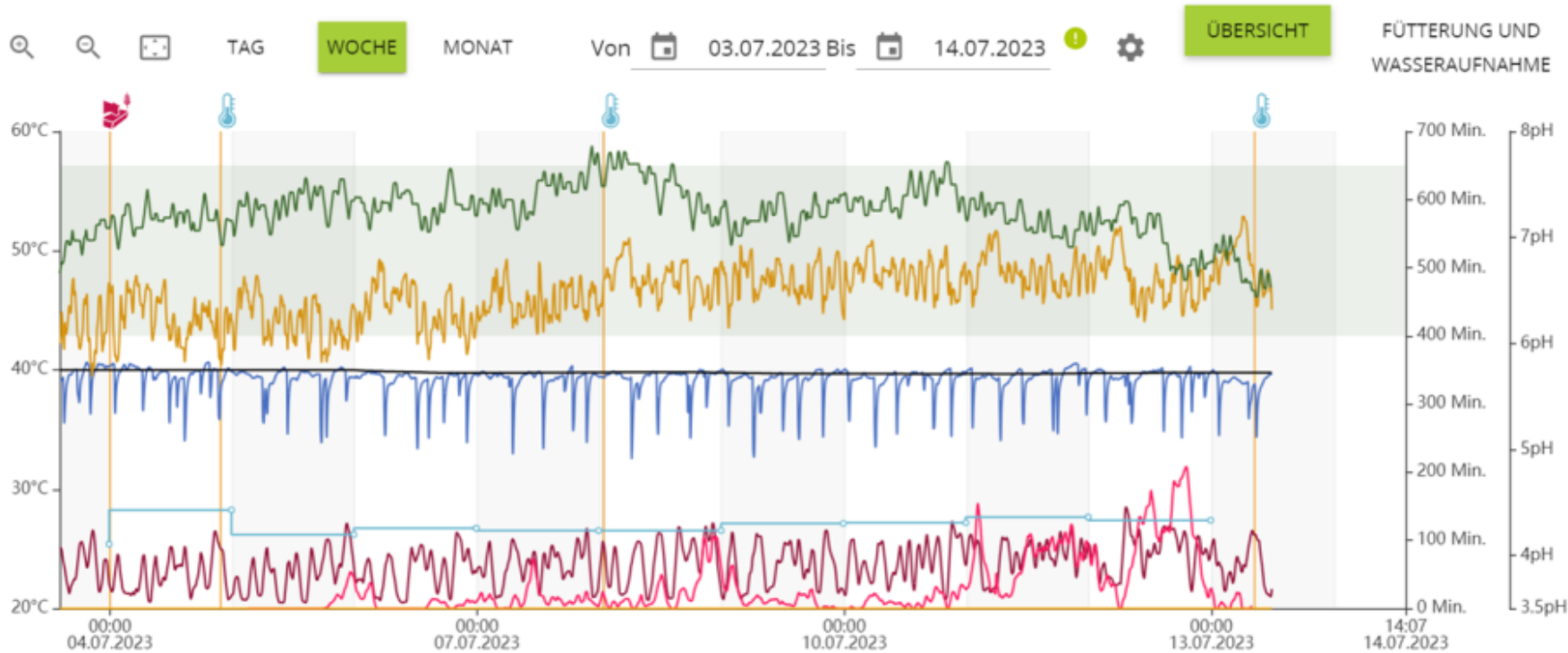
K. Schodl<sup>1,2</sup>, B. Fuerst-Waltl<sup>1</sup>, H. Schwarzenbacher<sup>2</sup>, F. Steininger<sup>2</sup>, M. Suntinger<sup>2</sup>,  
F. Papst<sup>3,4</sup>, O. Saukh<sup>3,4</sup>, L. Lemmens<sup>5</sup>, D4Dairy-Consortium<sup>2</sup> and C. Egger-Danner<sup>2</sup>

IRIS / UNIBO / 4 - Contributo in Atti di convegno / 4.01 Contributo in Atti di convegno

### Assessment and validation of individual water intake of dairy cows from reticular boluses

Costa Angela; Cavallini Damiano; Mammi Ludovica; Visentin Giulio; Formigoni Andrea

2023

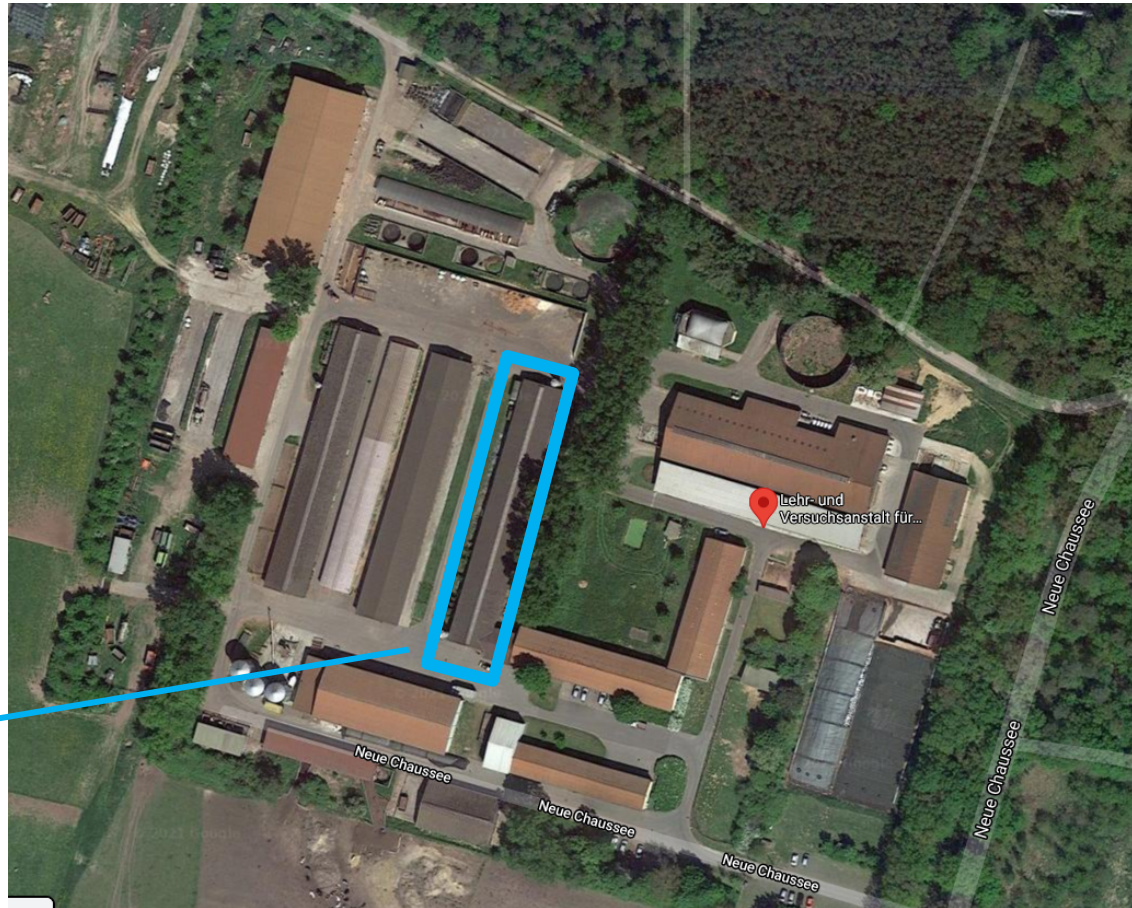


— rumination — water intake — rumen temperature — activity  
— pH value



# Facilities/barn

- Germany, Brandenburg
- Closed barn
- Slatted floor
- 150 animals (bulls + heifers)
- Total mixed ration



Source: ATB/Fromm

# Material and Methods

## Housing conditions

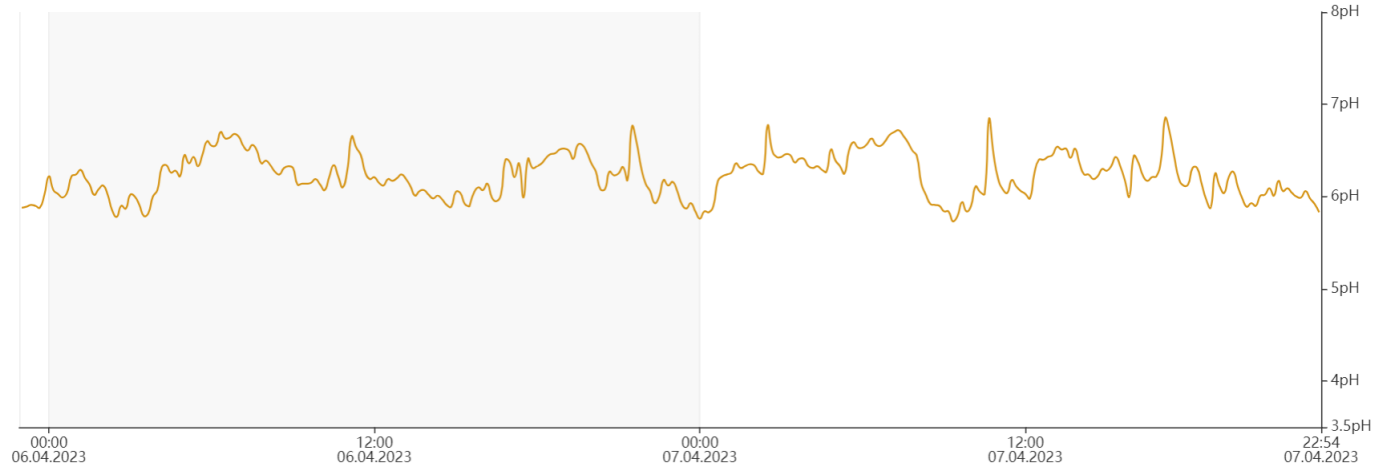
- Groups of 10 animals (50m<sup>2</sup>)
- 70 bulls selected (age of 10 months)
- Investigation period: 6-8 months
- Equipment with bolus at a weight of 350 kg
- Staggered stabling beginning in September 2022
- Breedings: Uckermärker, Hereford, Angus



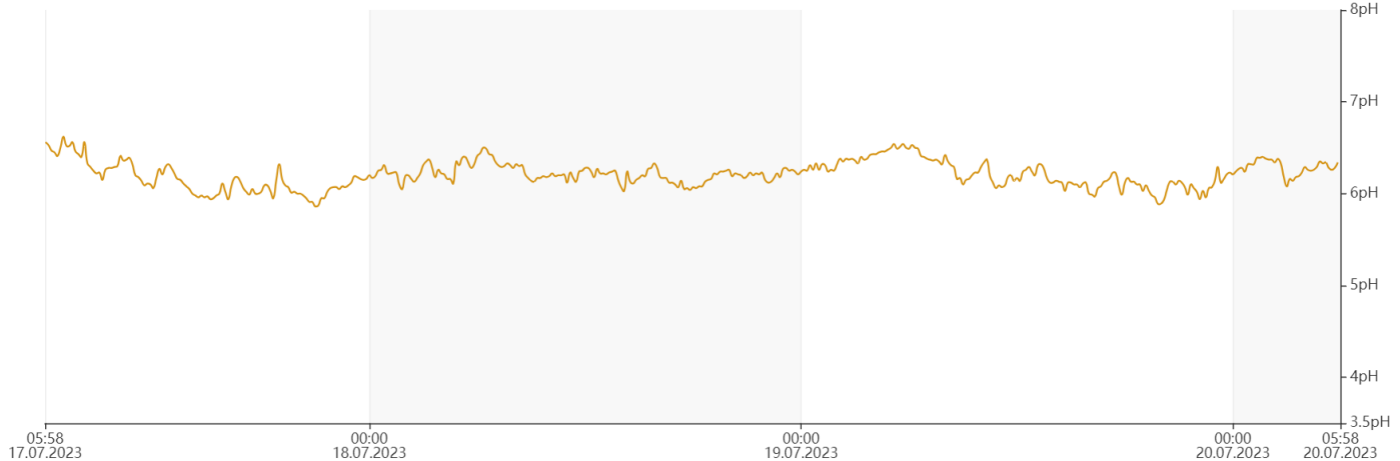
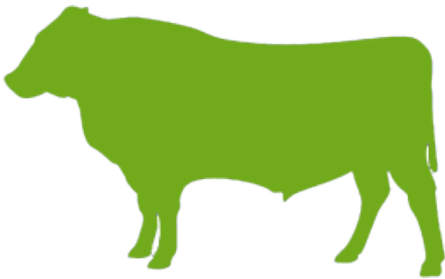
Source: ATB/ Fromm



# Results



## Ruminal Temperature

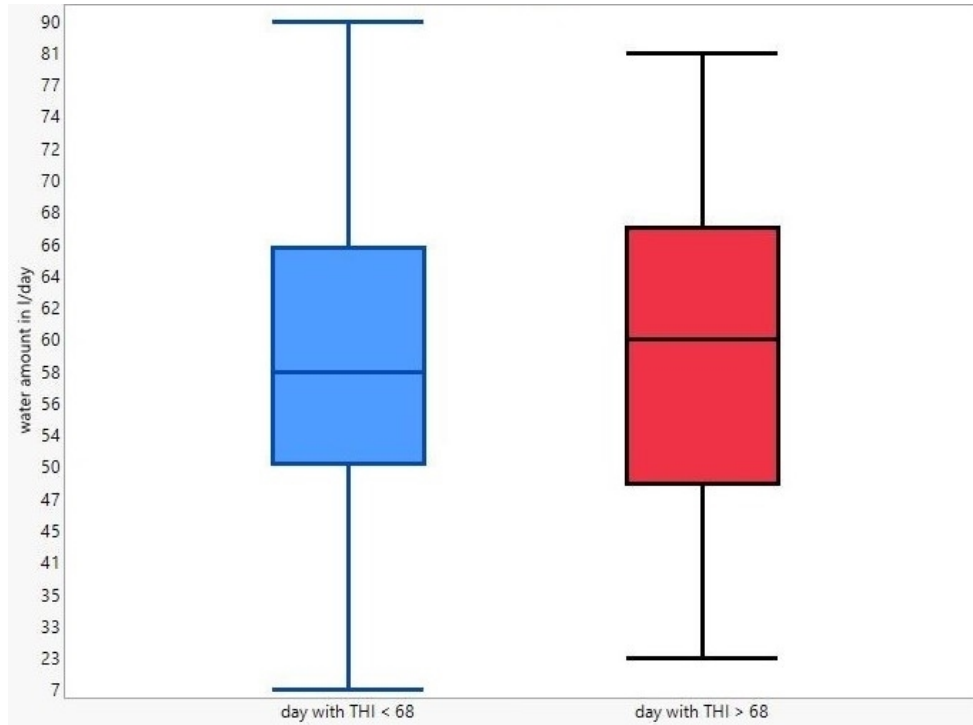


31.08.2023

EAAP Annual Meeting 2023 Lyon- Session 67

Source: ATB/Fromm

# Results - Heat stress detection via water intake



Source: ATB/Fromm



Daily water intake  $58 \text{ l} \pm 7,9 \text{ l}$  at  $\text{THI} < 68$

Daily water intake  $60 \text{ l} \pm 9,1 \text{ l}$  at  $\text{THI} \geq 68$

# Results - Challenges



# Conclusion

- Application safely possible for bull and user
  - Reliable values for rumen temperature and activity
  - Early detection of diseases and stress situations
  - Convenient customer handling
- 
- Prone to interference
  - Expensive



**Innovationsnetzwerk Rind – sustainable cattle farming in Germany, taking into account animal welfare, environmental impact and social acceptance**

With support from



Project manager



by decision of the  
German Bundestag

**Financially supported by funds of the Federal Ministry of Food and Agriculture (BMEL) based on a decision of the Parliament of the Federal Republic of Germany via the Federal Office for Agriculture and Food (BLE) under the innovation support program**

# Thank you for your attention!



[kfromm@atb-potsdam.de](mailto:kfromm@atb-potsdam.de)