GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

Institute of Grassland Science

GreenGrass

The visibility of the invisible: Analysing heifers reactions while learning the virtual fence system

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Introduction

- Managing grazing areas that were previously unmanageable (Umstatter 2011)
- Prerequisite: learning to avoid the electric stimuli (Lee et al. 2008), by learning that the acoustic signal predicts it (Confessore et al. 2021).
- A period of intentional training is required (Verdon et. al. 2021; Hamidi et al. 2022; Animal Welfare Commitee, 2022).
- Unexperienced animals should be observed during their interaction with the virtual fence (Nofence, 2023)

Hypothesis

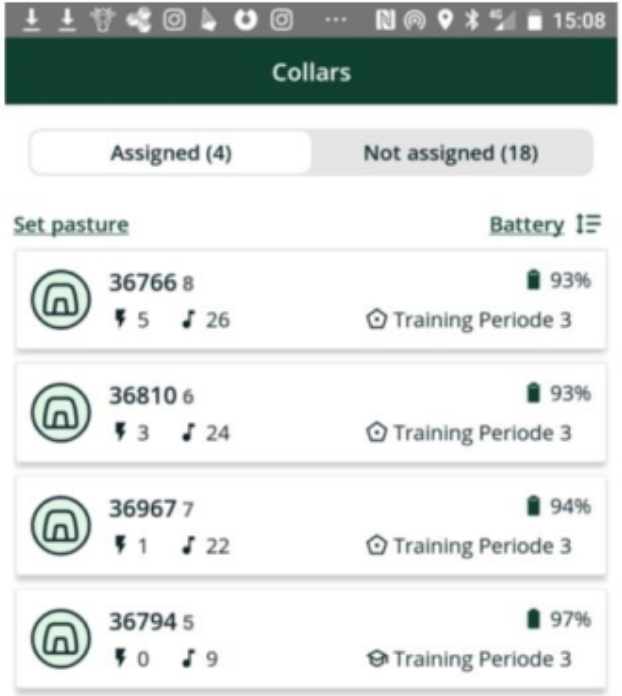
We expected more mild reactions and less strong reactions over time

Material & Methods

- 12 day period
- 2 groups à 8 heifers
- 4 focus heifers per group
- 2 observers
- 4 h per day

Reaction Score	Definition
1	Heifer continues to graze or walk slowly (< 3 steps) while turning around; away from the VF line; causing the signal to stop
2	Head shaking; walking (>3 steps), jumping (only with front legs); away from the VF line; causing the signal to stop
3	Running (trot or canter); jumping; bucking away from the VF line, causing the signal to stop
4	Breaking through the VF line

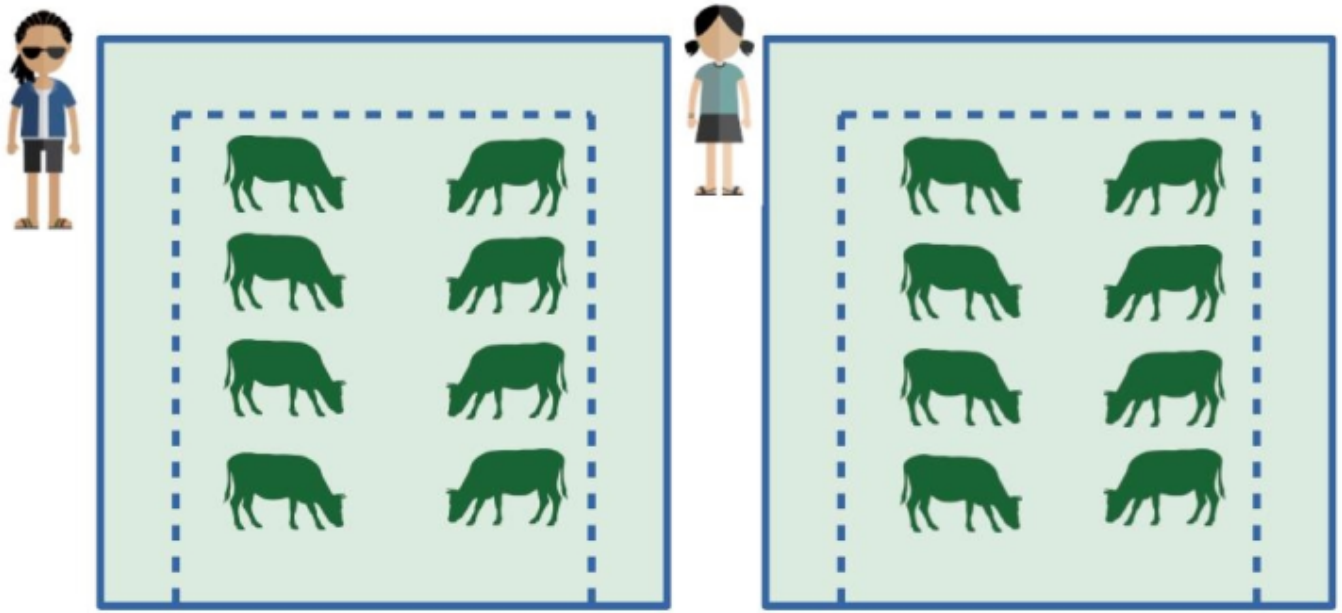
Material & Methods



Material & Methods

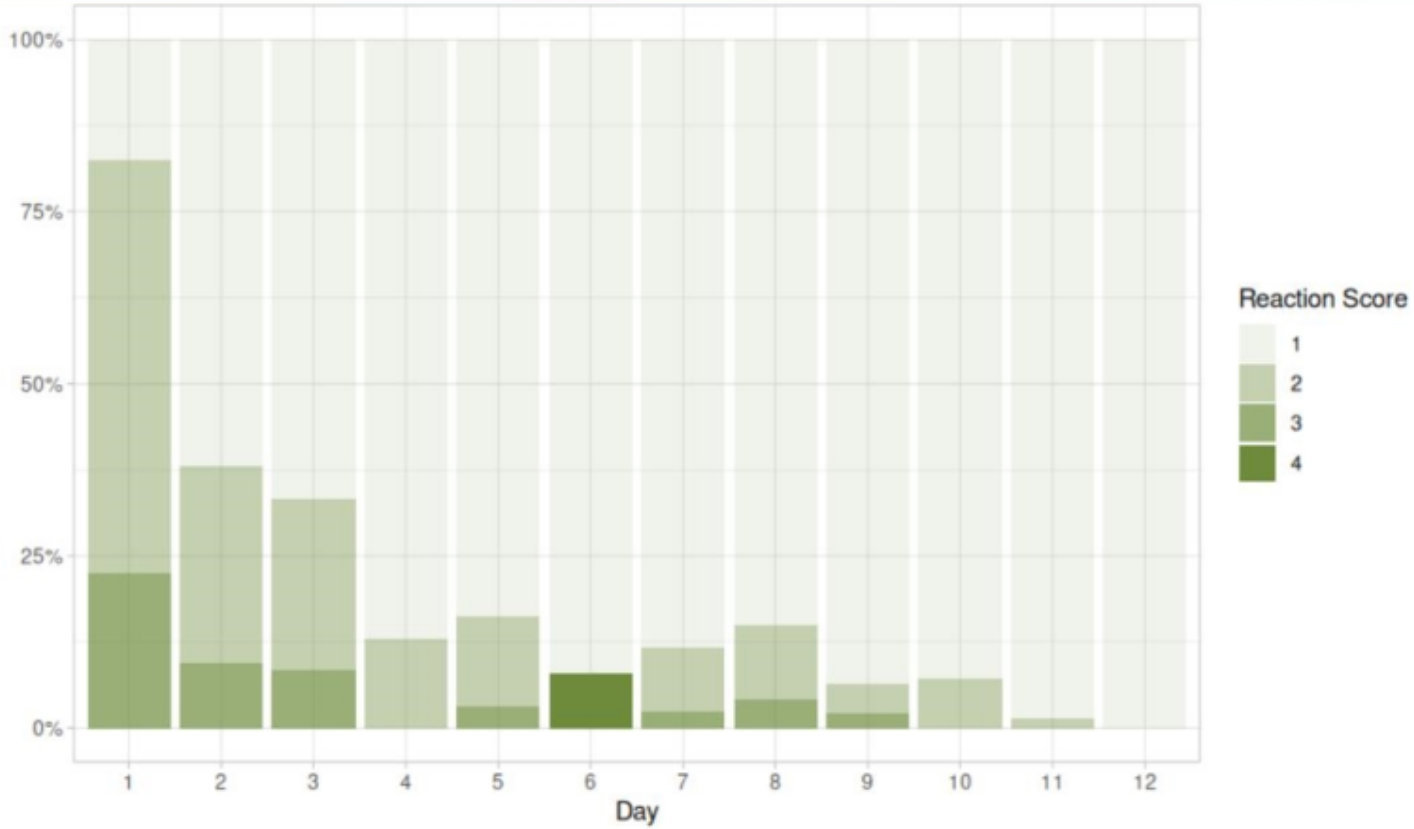
Virtual fence

Physical fence



Results

- Averaged over all individuals



Results

First day of training:

RS 1: 18 %

RS 2: 60 %

RS 3: 22 %

Second day of training:

RS 1: 61 %

RS 2: 29 %

RS 3: 10 %

Last day of training:

RS 1: 100 %

RS 2: 0 %

RS 3: 0 %

RS 4: Observed twice on the sixth day of training

Results

Acoustic signals without electric pulse

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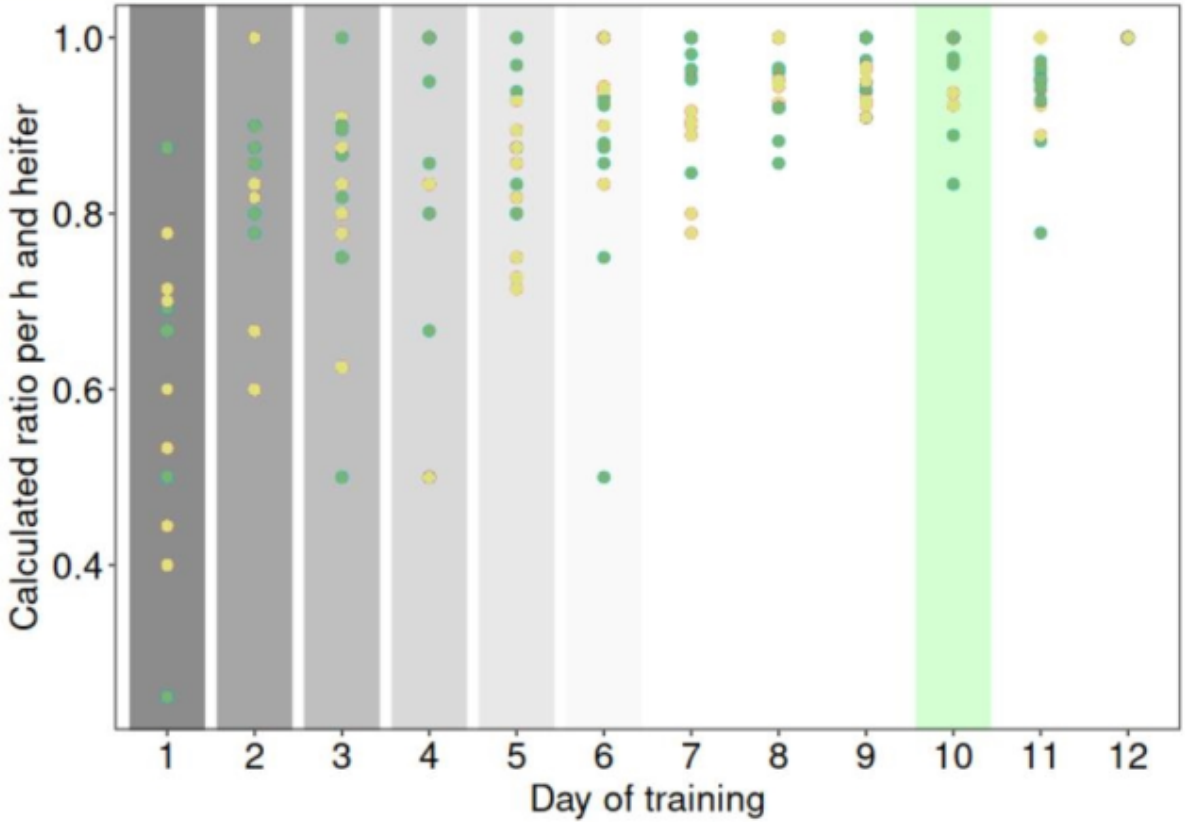
sum of acoustic signals

(Eftang et al. 2022)

- Group 1
- Group 2



Discussion

- success of virtual fencing technology
  → not only be based on animals remaining within inclusion zone
  → but as a reduction of electric pulses over time (Lomax et al. 2019)

- Analyses of a reaction score is interesting to quantify the impact and the learning behaviour of the animals

- Animal observation is time consuming

Conclusion

The reaction score and therefore, the behavioural changes over time are a visible sign of the invisible virtual fencing collar cues and its developement over the training period

More mild reactions and less strong reactions and the increase of the success ratio indicate succesful learning

With regard to the quick change from day one to day two, the training time of the heifers could possibly be shorter

Thank you for your attention

References

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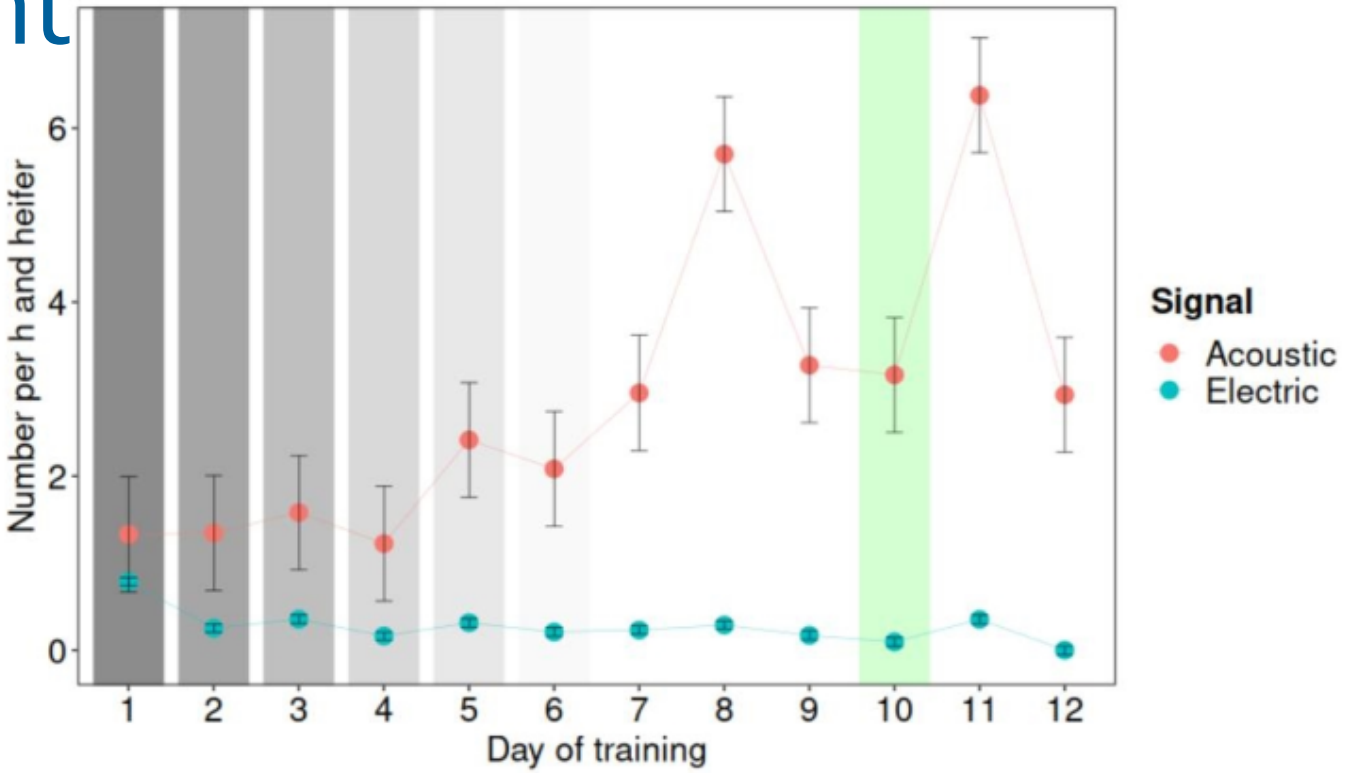
Supplement


Number per h and heifer
0
2
4
6
1
2
3
4
5
6
7
8
9
10
11
12
Day of training
Signal
Acoustic
Electric