

# Project *brief*

Thünen Institute of Organic Farming

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## Out of parlour feeder for horned dairy goats

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- **Farmers want to feed dairy goats concentrates individually to reduce overfeeding and consider individual performance regardless if goats are horned or polled.**
- **The out of parlour feeder for concentrates investigated in the project was well accepted by the goats.**
- **Health and behaviour of the goats were not affected by the out of parlour feeder.**

In dairy goat husbandry in Germany, predominantly horned animals are kept. Disbudding of goat kids within the first week of life by destroying horn bud cells is legally prohibited in Germany. Nevertheless, it is common practice in other countries and in most cases it is done without any pain relief.

### Background and objectives

The horns of dairy goats serve to establish and maintain the dominance hierarchy and are sometimes used for grooming. In loose housing of dairy goats there are few problems with horns, if there is sufficient space and unnecessary re-grouping is avoided. Up to now, concentrates are mainly fed twice daily with an equal amount in the milking parlour on German dairy goat farms. An additional feeding of concentrates using out of parlour feeders is demanded by goat farmers, because of the advantages of feeding individually and electronic control of feeding behaviour as potential health indicator.

A concentrate feeder that only allows one goat at a time to feed could become a problem, if all animals want to feed at the same time, as is their natural behaviour as gregarious animals. The

concentrate feeders currently on the market are not designed for horned goats. A welfare friendly feeding technique for horned dairy goats must be adapted to the natural behaviour and requirements of horned animals and should not increase risk of injury. Therefore, innovative technical solutions are needed, which must be evaluated using animal-based indicators, basic activity, body condition and by recording skin alterations.

### Approach

After the installation of video recording systems, data collection was carried out three times a year (beginning, middle and end of lactation) on a commercial dairy goat farm between 2018 and 2020. For this purpose, data on animal health and behaviour were collected on site. This included the recording of body condition (BCS), body weight using an electronic weighing scale, the assessment of skin alterations on the animals' bodies, the electronic recording of lying behaviour and activity using accelerometers, and the assessment of social behaviour and the intensity of use of functional areas in the barn using video footage.

The data collection was initially carried out without a concentrate feeder in order to be able to carry out a sequential comparison based on the behavioural data with and without a concentrate feeder. An experimental set-up with a classical case-control design, as is common on experimental farms, was not possible under practical farming conditions.



Horned dairy goat in a loose housing system.

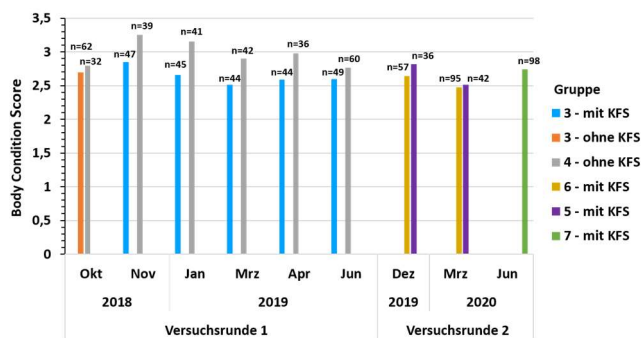


Accelerometer for automatic recording of behaviour.

## Results

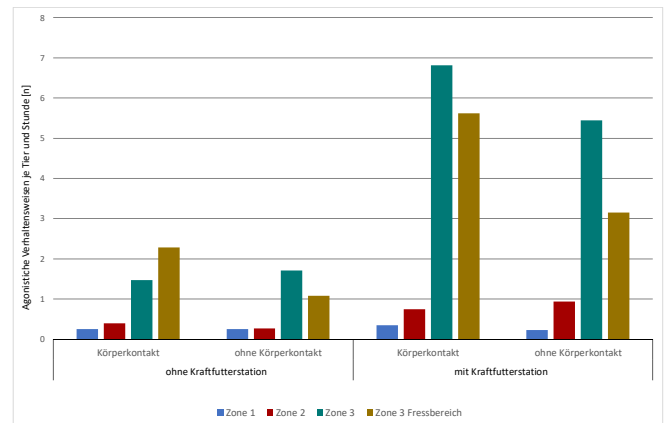
A learning effect was observed in both, horned and polled goats in terms of a decrease in the length of stay in the concentrate feeder. With the exception of the injuries on the pelvis of the goats, the skin changes on the body of the goats do not allow any conclusions to be drawn about the concentrate feeder as the "causative factor". The hairless patches observed on the pelvis can be attributed to the mechanical exit stimulation device in the concentrate feed station. The goats' pushing against the mechanical exit stimulation device caused hairless patches on the pelvis. Besides that, the udder of the goats was most affected by skin lesions deriving from horn kicks, but not related to the out of parlour feeder.

The temporal observation of the number of affected goats with udder lesions and the comparison between the goat groups indicated a seasonal influence with a higher prevalence at peak lactation in the freshly lactating goats and a decrease at the end of lactation. The observations on the competitive behaviour of the goats with and without (active) concentrate feeder implied that there were more agonistic interactions in the exit area of the concentrate feeder. The exit area was close to the feeding table, so that a higher number of agonistic interactions was due to roughage feeding.



Body condition score with and without concentrate feeder

The results also show a dominant behaviour of the horned goats. The analysed video data on agonistic behaviour were nevertheless too low to draw clear conclusions with regard to the concentrate feed station as a "disturbance variable" and the risk of horn-related injuries. It is interesting to note that the installation of a concentrate feeding station did not change the lying behaviour of the goats as documented by the accelerometers.



Agonistic interaction during feeding with and without concentrate feeder.

## Conclusions

- The elevated construction of the concentrate station (1 m above floor level) in the barn has been proven successful, as the goats cannot block the entrance and exit.
- Access to the feeder via narrow ramps enables orderly access by separating the goats.
- The lying behaviour of the goats as welfare indicator did not change after installation of the out of parlour feeder.
- Increased agonistic behaviour around the out of parlour feeder could not be observed.
- Problems were caused by electronic ear tags, which were not applied evenly to one side of the goats or were defect.

## Advice

Animal-specific feeding with a concentrate station for horned goats should include the following aspects:

- The electronic identification (RFID) should work quickly and safely.
- Feeding animals entering the feeder should be protected by fast closing doors.
- Feeding should be linked the milk recording data.
- The interfaces between out of parlour feeder and milking technology must be improved.
- In future, grazing should be taken into account in the design of the out of parlour feeder. However, there is still a need for more in-depth research on this topic.

## Further Information

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<https://ec.europa.eu/eip/agriculture/en/find-connect/projects/entwicklung-eines-tiergerechten-f%C3%BCtterungssystem>

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### Partners

**Lead Partner:** Hochschule für Wirtschaft und Umwelt Nürtingen-Geislingen (HfWU)

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### Support

