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Training behaviour of jersey and holstein calves on automatic feeders

Group housing of calves with automatic feeding is state-of-the-art technology for raising calves. Usually, individual housing and hand-feeding is set prior to group housing. Potential advantages in terms of nutritional physiology, in economic considerations, and in terms of work organization may lead to abdication of individual housing. By doing so, great demands are placed on the farmer in terms of management, i.e. health care, hygienic measures, and animal monitoring. Training of very young calves on automatic feeders is one challenge which was closer looked upon as a part of a trial on a North American dairy.

Keywords
Group housing, calf raising, automatic feeding

Abstract
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Group housing of calves from their 14th day of life onwards can be regarded as state-of-the-art technology on German dairy operations. In most cases, calves are individually housed in boxes or hutches before they are put in group housing. Some considerations lead to the idea of housing calves in groups with automatic feeding directly after the calves received their colostrum so that no individual housing is necessary anymore. If using combi feeders, feeding of colostrum and gradual change to milk replacer is possible [1]. No investments need to be made anymore in the equipment of individual housing if all calves are kept in group housing from their first day of life onwards. Potentially, labour time can be saved as working procedures do not apply anymore which are only needed in connection with individual housing and individual feeding such as cleaning and disinfection of hutches or boxes. Besides, calves need to be moved only once (but need to be moved more often if they are first kept individually and then moved into group housing). Rising degree of automation on the one hand leads to less need for labour time. But on the other hand requirements concerning health and hygienic management rise.

Keeping calves in groups from first day of life onwards and oberservations on their training behaviour on automatic feeders has been topic of different studies. PIRKELMANN et al. trained 16 calves which were housed in groups with 36 hours of age. In average, these calves needed to one to two times training before they were using the automatic feeder by themselves [2]. BÜSCHER at al. received similar results in a trial with 40 Holstein calves which were between two and three days old [3].

In the following study, training behaviour of Jersey and Holstein heifer calves is point of interest and looked upon closer.

Material and methods

Trial took place on a dairy in Minnesota (U.S.). Each 60 Jersey and Holstein calves were housed in separate groups with a size of 30 animals. Maximal of the calves in the groups was

24 hours. Age difference of calves within a group was three days at the maximum. Two feeding stations were available for each group of 30 calves. Difference in weight on housing date between Jersey and Holstein calves was 13.7 kg in average, with the Jersey calves weighing 26.5 kg in average. Colostrum was very accurately given to the calves in the calving pens at the dairy before the calves were housed in the groups.

Before, calf raising on the dairy had taken place in individual outdoor housing as common in the United States. Because of high death losses during winter months, new forced ventilated and completely insulated barns were designed and equipped with feeding technique produced by Förster-Technik. First calves were put in this barn in winter 2008/09.

Housing of calves in the new barn took place in the mornings for logistic reasons. First training of the calves was done the next morning (**table 1**). Calves which had found the station by themselves were not pushed into the feeding station again. Staff members were not fully accustomed to the new feeding technique but were highly motivated to develop new working routines.

„Training" included rousing the animal and directing it to the feeding station. Also, calves were aided to find the nipple and were watched until they had finished their portion of feed. Staff marked the trained calves on a list which was hanging at the wall. Calves which had found the station by themselves were identified with the help of the lists in the automatic feeder. These calves were also marked on the paper lists to avoid them being trained again

Training behaviour of Holstein calves

Figure 1 shows results concerning training behaviour of Holstein calves in the trial. Within the first two days, number of calves which needed to be trained was continuously decreasing. In the evening of the day two, 31 % of the calves needed to be pushed in the station. Pausing training in the morning of day 3 resulted in training only six calves in the evening of that day. During the following days, only calves which appeared to be weak were helped to find the station. Including all times of training until day 3 in the evening, Holstein calves needed an average of 2.7 times training.

Training behaviour of Jersey calves

Figure 2 shows results of training behaviour of Jersey calves in the trial. In the evening of day 2, 58.3 % of the Jersey calves needed to be pushed into the feeding station. Comparing to the Holstein calves, learning process of the Jersey calves was slower. In average, Jersey calves needed 3.2 times training. Differences in training behaviour by breed can be seen in **figure 3**. **Figure 3** shows the times of training per calf within the first three days. Differences are statistically significant (p=0.1).

Tab. 1

Training schedule for calves in the trial

Day	Training schedule
Arrival day	No training of the calves
Day 1	Training in the morning and in the evening
Day 2	Training in the morning and in the evening
Day 3	No training in the morning. Training in the evening for the calves who had not yet found the station on their own

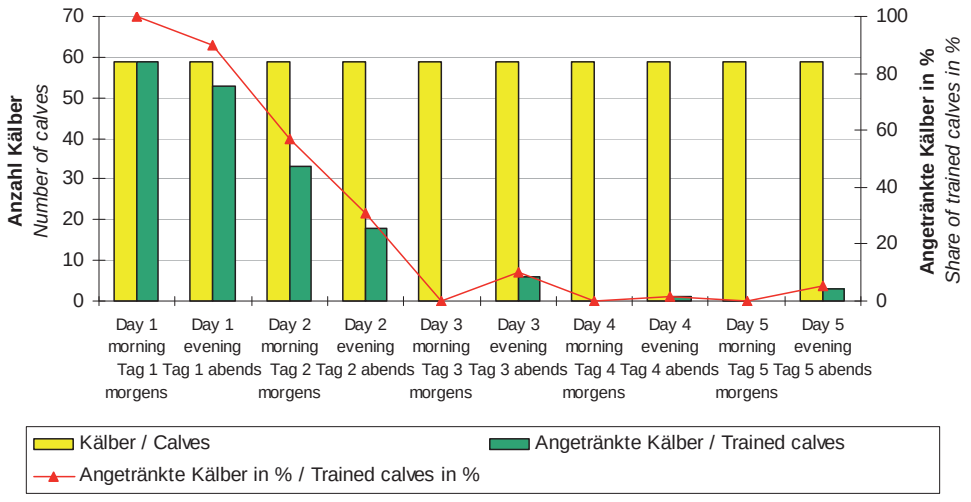
Results

Results of earlier studies [2, 3] concerning training behaviour were below average numbers in the presented trial. Calves in this study needed more training in average. Starting conditions for the calves in the different trials were not comparable.

It has to be considered that starting conditions for the calves of the trial have to be taken into account. First of all, calves in the trial were kept on concrete slats. These conditions altered the calves voluntarily going into the station. This circumstance can be explained with limited exploration and moving behaviour of the calves. Besides this fact, it has to be taken into account that the whole facility had only been used for two months at the time when the trial was started. Therefore, working routines such as training were new for the staff.

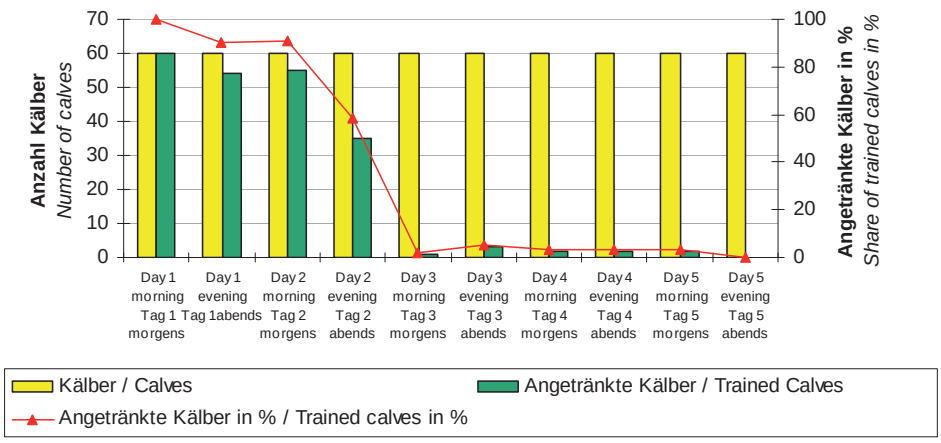
No direct reasons can be given for higher need of training in the Jersey calves. One explanation can be race inherent differences in learning behaviour. Another explanation could be

Fig. 1



Training behaviour of holstein heifer calves

Fig. 2



Training behaviour of jersey heifer calves

differences in health. In general, Jersey calves seemed to be less vital compared to the Holstein calves, potentially caused by lower birth weights.

Work routine

Training calves were considered exhausting by the staff. Especially identifying certain calves in the group of 30 animals was not easily done. Besides, staff found it displeasing to be exposed to the other calves' suckling and playing while training one calf at the feeder.

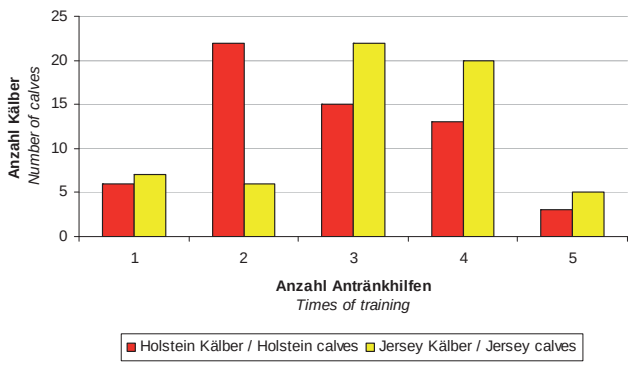
Conclusions

In the presented study, calves with a maximum age of 24 hours were housed in groups and trained on automatic feeders. All calves learned how to use the automatic feeder by themselves. Race inherent differences concerning training behaviour were found in the trial. Disadvantageous design of flooring has to be considered as influence on all calves in the trial. The importance of improvements concerning this topic was mentioned towards the management of the farm.

Further studies comparing individual housing followed by group housing and group housing from first day of life onwards are necessary to make a statement whether cost and labour time savings can be achieved by group housing.

Advantages and disadvantages of this system need to be discussed in a cost-benefit-analysis for the individual farm. After improving the flooring system in the calf raising facility where the trial took place, group housing of calves will overall result in a positive résumé as expectations for humans and animals are going to be met.

Fig. 3



Times of training within the first three days with five possible times of training by breed

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