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Technology against Boredom

Is an Automatic Grooming Brush Accepted by Calves?

Automatic grooming brushes for dairy cows are standard equipment in free stall barns nowadays. In contrast, using automatic brushes for calves is uncommon. To evaluate their acceptance of an automatic brush, a group of 72 housed calves was tested six times. An automatic grooming machine, consisting of a vertical and a horizontal rotating brush was used in an exercise yard. 98 % of all calves in all of the three age groups used the automatic brush, and the head was the favourite part of the body to be groomed. The calves frequented the brush throughout the day and night, with maximum use between 8 and 10 pm.

Automatic brushes are today's standard equipment in free stall dairy barns, despite the fact that an increased milk yield could not be proved. Cow brushes are going to be standard inventory, because they support animal well-being and partly replace missing natural grooming objects like trees or brushes [2]. Group housed calves, often kept with minimum space to achieve maximum profit, do not have any wellness toys like cows have [3, 5]. Even if boredom of calf housing is generally recognised as a housing problem by applied animal welfare [5], only a few studies consider toys as elements of housing environment [1, 4]. Due to positive results of automatic brushes for dairy cows we rose up the question, if calves would accept an automatic brush. Thus, embedded in a project on organic group housing of calves the acceptance of automatic brushes was examined as an element to encourage natural behaviour.

Material and Methods

72 female German Holstein calves of one origin were used and grouped to six repetitions. The calves were borrowed from one dairy farm at a mean age of 35 days and housed in an open barn with a structured exercise yard. The lying area with deep litter of straw bedding measured 2.25 m^2 per calf; the feeding area with an attached environmental enriched zone was 1 m^2 / calf. The exercise yard of 11 m^2 area per calf was covered with a 10 to 15 cm deep and soft layer of pine woodchips. Besides the automatic calf-brush, the exercise yard was equipped with a plastic ball (red colour) of 55 cm diameter and structuring elements.

The automatic brush we used was originally developed for sows. It consisted of a horizontal and a vertical rotating brush and could easily be switched on by lifting it slightly up. The operating time of the brush was digitally recorded with a frequency of 1 Hz. 24 hour video observational data were used from three selected dates. Calves at date 1 aged between 40 an 71 days (age group 1), at date 2 calves were 72 up to 84 days old (age group 2) and the last observation date (3) covered a range from 85 to 98 days of age (age group 3). Only healthy calves were included in the video analysis, so that 68 calves belonged to age group 1, 57 to age group 2 and 50 to the third age group.

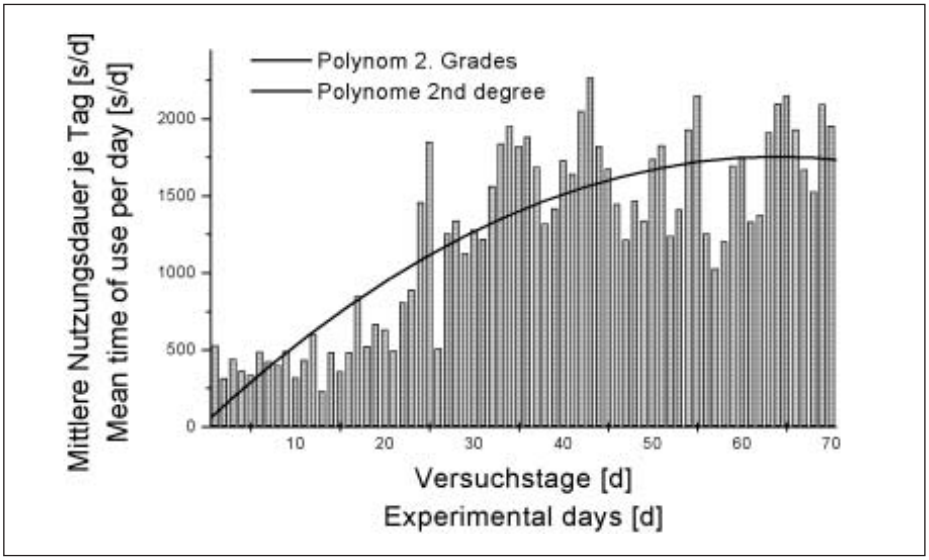

Fig. 1: Mean operating time per day depending on duration of experiment

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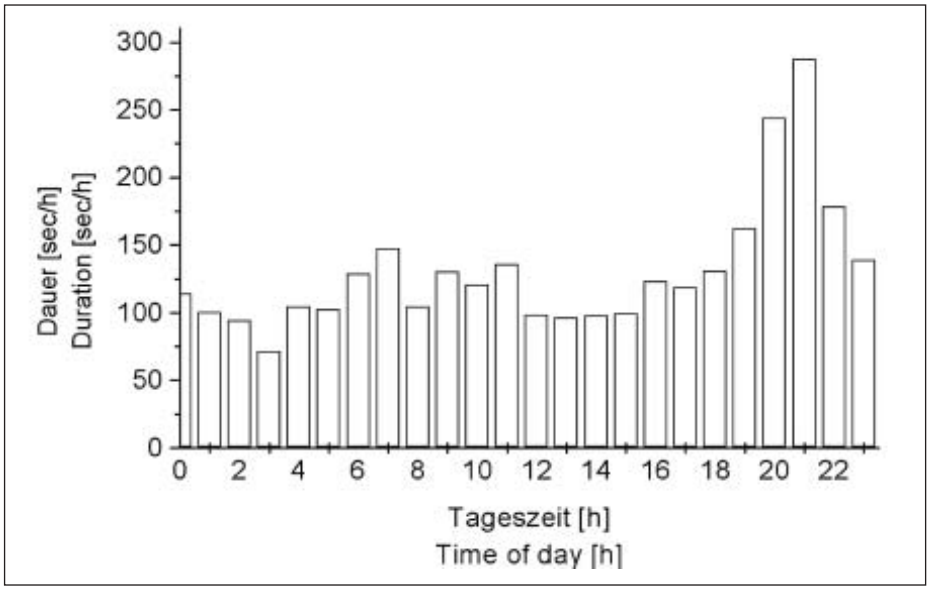

Fig. 2: 24 h – profile of calf brush usage

The video analysis considered the passive grooming activities as well as the active grooming. Thus, a difference between (active) operating time and observed activity (active and passive) exists. Data analysis of the recorded operating time was done by Kendall's τ-b (tau-b) correlation coefficient to show the effect of learning ability of the calves. The analysis of the video data was made according continuous sampling method using an Excel-spreadsheet for data acquisition. The resulting data were processed and tested using SAS 9.1 statistical package. As a consequence of a negative result of testing normality, all data were analyzed by non-parametric procedures.

Results

Analysis of video data indicates a total use of the automatic brush of 98 % within all age groups. The mean operative time per day increased from 500 sec per day to 1300 sec per day. Older calves used the brush more often, the rising period ended between day 30 and 40 (experimental day, not age). The function of learning ability for calves using the automatic brush followed a polynome of 2nd degree (*Fig. 1*). The diurnal profile of daily use showed more activity from 8 to 10 p.m with 150 to 300 sec per hour compared to a mean of 100 sec operating time per hour (*Fig. 2*). The overall time of using the brush (active and passive) decreased with increased age from 9 min/d (age group 1) to 4:30 min/d in age group 3. 72 to 75 % of the time was spent grooming the head. The body was groomed 7 % of total time (age group 1) and 17.5 % of the total time in age group 3. The neck was used 18 % of time in age group 1 and decreased to 9 % in age group 3.

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Fig. 3: Calf using automatic brush