
THE FEEDING BEHAVIOUR OF DIARY COWS AND THEIR WELFARE

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SUMMARY

In an intensive production, whole system of feeding is organized around of milking procedure. Diary cows in such circumstance modified their natural feeding activities in the level which farmers allowed them to express, and their instincts in the cases of feeling hungry and for free grazing are changeable in the way of expressing. In that sense, the aim of this study was to show that feeding behaviour of diary cows is under strong influence of breeders. Farmers, with applied technique of feeding can create certain activities of diary cows during the feeding. When the ration of feed is not proper and when feed distribution is not regular, diary cows react with anxiety and frustration. In such cases, welfare of breeding animals is at risk.

Keywords: feeding, behaviour, video recording, sequential analyses, diary cows, hunger, welfare

ORIGINAL ASPECTS OF THE RESEARCH

System of breeding of diary cows is very important because it has influence directly on the level of feed consumption and milk production. In that reason, feeding behaviour of diary cows can help us to understand why different practice of breeding the same species of cattle have different milk production.

In natural environment cows can always behave according to their instinct of grazing animal and voluntary will when they want take the feed. This instinct is a part of motivational power of natural behaviour of cows. Diary cows in intensive industrial systems are completely deprived of these congenital activities and they have to modify feeding behaviour to special demands of farmers. In such cases, when they feel hungry, animals have to reduce instincts for grazing, because the only that they can do is to wait the feed from farmers. This motivation of waiting for eating in the case of chronic frustration is a special kind of stress feeding and can produce serious digestive disorders.

In this work, basic hypothesis were: that there is a difference between feeding activities in the different systems of breeding; that some activities are repression by the farmer and that this repression has influence on feeding. According to this, the basic hypothesis in this work was that it is possible to create welfare of diary cows in the aspect of feeding behaviour with regular distribution of feed, always the same time-table and with correct amounts of feeds.

OBJECTIVE OF THE WORK AND METHOD

Research was done in two farms of dairy cows which are different in the way of breeding, free and tied, during three months of examination in the summer period. In the farm with free system of breeding, feeding was one time daily, and in the farm with tied system, feeding was two times daily. The work consisted of video recording of feeding in the following categories: high pregnant heifers, lactating cows and dry cows. Periods of recording with video camera started 15 minutes before feeding and lasted 45 minutes during the feeding. Every category of animals was recorded in several repetitions, by the recommendation of Blackshaw (examination, duration, number and kind of activities). This kind of behaviour measuring is “limited recording of behaviour”; it considers continual observation of the certain activities only. With this method video record could be divided on individual sequences. Each sequence represent particular pattern of activities. The Beckeman’s method was used to define: function of sequence (transport the new information from breeder to the cows), and kind of interaction (giving-taking the feed). The used method of sequential analyses gives the possibilities of creating the schemes of activities of which feeding behaviour consist. The chart 1 shows model of video recording feeding behaviour of diary cows which is used in this work.

Continual observing behavior of living being by the method of sequential analysis can be applied when the researcher wants to keep some aspects of natural appearance in the time function. Also, video record offers more repeating and can give more reliable measuring of activities. That way, the error of human components decreases to minimum. Using the sequential analyses as a method give the possibilities to express activities of behaviour in the numerical data. This data are finally statistically analyzed with analyses of variance and *Tuckey’s honest significant difference test*.

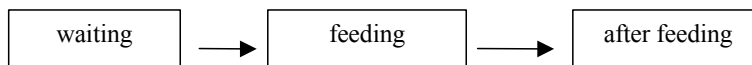


Chart 1. Model of sequential analyses of feeding behaviour used in this work

We record a large number of activities and because of that we choose by three activities in every sequence. In the sequence of waiting this was activities: standing, watching and mooing. In the sequence of feeding we choose activities: taking the feed, selection and defending from stable fly. In the third sequence this was activities of searching for more feed, rumination and lying. The way how we defined observed activities was that every one be in the function of representing the sequence.

EXPERIMENTAL DATA AND RESULTS

In this research we made interactions of feeding activities of dairy cows between two experimental farms. The first exam category was high pregnant heifers. Common behaviour characteristic of on the both farms was in the sequence of waiting the ration, where all observed head were standing and watching, expecting the entrance of feed-dispenser. This activity indicates on already created feeding behaviour with farmers training because the high pregnant heifers were learned to the feeding schedule. Maybe the farmers were not quite conscious about the fact that

they on this way created new feeding activities. In captivity systems which are unnatural environment for diary cows, such activities are good example of response in adapt behaviour, because the only allowed activities when they feel hungry (natural this would be grazing) is to stand ready in expecting with a head turning around left and right, watching the entrance in stable. One of visual excitement is seeing feed-dispenser and hearing excitement is the sound of same machine. On both excitement observed animals reacted with anxiety. Moo activity of high pregnant heifers in the sequence of waiting had a statistically important interaction between two farms.

The same pattern in the sequence of waiting represents the source of stress and frustration. In the case where farmers did not give to the observed high pregnant heifers the meal in the learned time for feeding, they reacted with moo, roaring and with anxiety. This reaction was the same in the examination categories of lactating cows and dry cows, as well. We assume that feeling of hunger physiological reinforced the fear and make specific feeding stress. In both farms, during the examination period this was very often (only 5% recording diary cows were feeding in the learned time).

Interesting difference was in the number of activities in high pregnant heifers in defending from the bites of stable flies. High pregnant heifers in the farm with free system had less activity then the same group in the farm with tied system of breeding. This trend during the observation was the same at the lactating cows and dried cows. Cow that was bitten by stable flies stop eating, take of her head from feed-bunk, swing with tail or turn her head left-right drive away the insect and then again return for feeding. On the next stable fly bite cow again stop to eat with the same reaction.

Activity of selection of feed during the last feeding sequence had a statistically very important interaction between examination farms in the all category of observed diary cows (high pregnant heifers, lactating cows, dry cows). In the way of expressing this activity was gradually increased. In the first part of feeding, from the moment of giving the feed to 15 minutes of consumption, between the high pregnant heifers on the different farms is obtain statistically important interaction. After that, in the same feeding sequence, but in the last part of video recording the consumption, from 15 to 30 minutes, in the categories of lactating cows, dried cows and high pregnant heifers, is obtained statistically very important interaction.

We recorded the next pattern of feeding behaviour in the second and third sequences. In the beginning of feeding, cows were concentrate on consumption with choosing the meal activities (pushing with snout), but how the amount was decrease the level of selection for better feeding place get increased. Feeding behavior of diary cows in the farm with tied system in the sequence after feed, (when they eat all feed), was consist from activities of licking the empty crab and licking the feeding alley. In farm with free system, in the feeding sequence diary cows (all category) of breeding were choose the feed with activities of mutual struggle who get increased how the amount of feed decreased. These activities, in two ways, can indicate to the feeding practice. First, when the amount of feed is not sufficient, cows in free system of breeding express competition fight with strong mutual head pushing or with completely body struggle. Stronger animal will secure for herself more feed then the weak one (who produce more milk than dominate in herd). Second, diary cows in tied system of breeding in such cases can develop stereotype activities such as licking the empty feed-bunk and feed alley or licking another animal.

CONCLUSION

Practical implication of the work

Motivation for feeding behaviour consists from hunger feeling and appetative behaviour that eliminate this unpleasant feeling. Feel hunger is subjective and each animal experience subjectively but with mutual physiological mechanism and neurology regulation of feeling hungry and satiety. The ways how diary cows express their feeding behaviour are different in the different systems of breeding. Application of sequential analyses offer possibilities to estimate behaviour activities between animals and represent one of the paths for define welfare of the diary cows.

Expressed activities in examined diary cows, in the farm with tied system and farm with free system of breeding, in the sequences of waiting, feeding and after feeding indicated that: before feed distribution cattle were anxious, that when the meal is given diary cows concentrate on taking the feed, and how the amount of feed is decrease they again express anxiety. Method of sequential analyses with video recording can help in feeding behaviour observation.

In this research we made: etograms of feeding activities of diary cows, their interaction between different sequences and their interaction between two experimental farms. It was obtain very small number of statistical high important interaction between two farms and this are: activity of cows moo show high pregnant heifers and activity of feed selection in the sequence of feeding at high pregnant heifers, lactating cows and diary cows. The others observed activities did not give interaction between different systems of industrial breeding.

These results can show that feeding behaviour of dairy cows is strongly influenced by breeder. Farmer, with amount of feed offered and with the way of distribution can make particular good or bad activities of feeding behaviour and on that way he has influence on welfare of dairy cows. Definition by Broom that “welfare of one individual is her state in the her ability to adjust to the environment” clearly show to us how important role of breeder is and his influence on welfare of dairy cows by proper feeding which can help animals to avoid stress of captivity.

REFERENCES

- Bakeman R. and Deckner D. F., 2000. Analysis of Behavioral Streams. University of Barcelona and Georgia State University
- Blackshaw J. K., 2003. Notes on some topics in applied animal behaviour. Animal Behaviour, University of Queensland
- Encyclopedia of farm animal behaviour, 2004. United States Department of Agriculture, Agriculture Research Service, Southern Plain area, Livestock Issues Research Unit, Multimedia Division, version 3.0.1. Fraser. A.F. and Broom, D.M., 1990. Farm Animal Behaviour and Welfare. Bailliere Tindall, 3rd ed., London