

Welfare of housed dairy cows

By Nadine Fiani

Introduction

During the past twelve months, several published papers have reflected a growing interest in and concern for the welfare of housed dairy cattle. Objective methods and indicators are required to assess the welfare of livestock in different environments (Fregonesi and Leaver, 2001). The amount of time spent lying down resting by dairy cows is an important indicator of comfort and welfare (Fisher et al., 2003). Disturbed rest may affect milk production by reducing the secretion of growth hormone (Manninen et al., 2002). The following three articles examine the probable effects that some important factors, namely: bedding material, floor friction and space allowance, may have on the resting behaviour and welfare of dairy cows.

Discussion

Manninen et al. (2002) studied the preferences of 44 Friesian dairy cows for different kinds of stall bedding materials in unheated cubicle housing in winter and in summer. Three types of materials were examined: concrete with large amount of straw, soft rubber mat with a thin layer of straw (2-3mm), and sand without straw. Three groups of cubicles each containing only one material were randomly distributed in the same building. During "forced choice" periods, cows had access to only one type of cubicle for three days, while the other types were closed off. The cows were filmed to record the total duration and frequency of lying down as an indicator of comfort. In the "preference tests", each group of cows was allowed to choose between two of the three types of material (one group of cubicles being closed off). The cows were filmed seven days during each four-week test period.

The results showed that the total time lying down in cubicles was significantly shorter on sand than on straw or rubber mats, in both winter and summer. Although sand is recommended because of its hygienic properties (lower bacteria content), the findings of that short-term experiment indicated that cows avoided using it. Long-term effects have to be investigated before deciding whether sand bedding is ever suitable. The results also indicated that the cows preferred straw to soft rubber mats in winter. This is possibly due to the fact that straw provides insulation reducing thermal discomfort. There was no significant difference in summer. The duration of lying down on soft rubber mats indicated that they were comfortable for the cows. This is in agreement with the earlier findings of Wechsler et al. (2000). The use of non-organic bedding reduces the amount of straw required, thus reducing costs and the risk of mastitis.

Phillips and Morris (2002) conducted experiments to determine the preference of eight Friesian cows for floors with different levels of friction, produced by surface-dressing an epoxy resin coating (smooth) with various sizes of beauzite aggregates (0.5, 1.2 and 2.5 mm). Groups of dairy cows were trained over a period of ten days to associate the presence of a food reward with a selected floor surface. In an initial 'discrimination test' cows were allowed to walk down paired floor surfaces with different friction coefficients. One half of the cows were rewarded when they selected the floor with the greater friction and the other half were rewarded when they selected the floor with the least friction. The results clearly indicated that the cows could distinguish between floors with different levels of friction. 'Preference tests' were then carried out, where the cows were offered a choice of walking down passageways of paired lanes of different degrees of friction, with an equal reward at the end of each passageway. The aggregate surfaces were laid on boards rather than directly onto the concrete so that the floor texture could be exchanged between the two lanes in order to prevent side preferences. The results indicated that there were no consistent preferences for floor type. This lack of preference, together with the fact that the cows did not change their walking speed (although adjusting their stride), suggests that the cows

felt no immediate discomfort. Floors coated with large aggregates may thus be used in livestock buildings where there is a danger of the animals slipping. However, long-term implications on hoof abrasion have yet to be investigated.

Fregonesi and Leaver (2002) studied the influence of space allowance on the productivity, behaviour, and health of 56 dairy cows housed in strawyards and cubicles. The effect of current milk yield level was integrated in the study by having equal numbers of high and low yielding dairy cows in each trial. Two different housing areas were designed to simulate strawyard systems (experiment 1) with bedded area per cow 9.0 m² for high and 4.5 m² for low space allowance; and cubicle systems (experiment 2) with corresponding values of 3.9 and 2.3 m². The experiments used a changeover design of two periods each lasting four weeks, with two replicate groups of six cows at each space allowance and each milk yield level. The results indicated that in strawyards, with a low space allowance, cows were dirtier and milk lactose levels were lower, with some prevalence of mastitis. This was more evident in high yielding cows, and was related to their higher feed intake and defaecation rates. In cubicles, both high and low yielding cows had a greater number of agonistic interactions at the low space allowance. Displacement of animals from cubicles by other animals was also observed. Lower values for the total lying time were recorded in cubicles. The pattern of lying behaviour was disturbed, especially for high yielding cows which spent less time lying at night and had higher lying times in the morning. Space allowance had no significant effect on milk production, liveweight or body condition of dairy cows for any of the measurements. Longer-term responses have yet to be investigated.

The researchers concluded that in the case of strawyards, cleanliness of the cows was a key welfare indicator, which could be controlled by management of the straw beds. They also found that under the cubicle system, it was essential to have at least one cubicle per cow, and that the design and management of these cubicles should favour longer lying times, for the welfare of the cows.

Conclusion

Significant results have been presented in relation to the effects of bedding, flooring and space allowance on the welfare and comfort of housed dairy cows. However, long-term investigations are still essential in order to validate the obtained results and further refine the understanding and methods of dairy cattle welfare.

References

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