Feeding concentrates based on individual cow requirements improves the yield of milk solids in dairy cows grazing restricted pasture

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Abstract

A grazing experiment involving 50 lactating Holstein–Friesian dairy cows was conducted to test the hypothesis that feeding concentrates (range 3–7 kg as fed/cow.day; average 5 kg/cow.day) to grazing cows based on individual (I) cow requirements would increase milk solids yield in comparison to fixed rate (F) allocation to the whole herd (average 5 kg/cow.day for all cows). The experiment comprised two sequential periods that differed only in the way maize silage was offered to cows (either 100% on a feed pad at night or 75% on a feed pad at night, with 25% in a paddock in the morning). Intake of individual cows was estimated using the ^{13}C and *n*-alkanes method. The rumen degradability of the feeds (lucerne pasture, maize silage and commercial dairy pellets) was measured in parallel, using six rumen-fistulated sheep. Compared with cows in the F group, milk yield and milk fat yield for the I cows increased ($P < 0.05$) by 3.0 and 11.1%, respectively. As neither milk protein content nor milk protein yield was affected ($P > 0.05$) by treatment, total milk solids yield (milk fat plus milk protein) was 7.0% higher ($P < 0.05$) for I cows than for F cows. The increase in milk fat yield was presumably associated with an improved diet nutrient balance in the I cows, as indicated by a significant correlation between fibre intake and milk fat yield for cows in the I group but not for cows in the F group. This is also supported by the results of the rumen degradability of the feeds. In this study, higher-producing cows compensated for their higher requirements by increasing intake of maize silage, rather than pasture, as the former was the less restricted feed on offer. This highlights the importance of offering at least one feed to cows in a less restricted way, in order to enable high-producing cows in the herd to compensate for their higher intake requirements. In conclusion, under the conditions of the present study, feeding concentrates to cows based on individual cow requirements increased milk solids yield at no extra cost.

Keywords: concentrate allocation, forage restriction.

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