Dairy Cow Performance Associated with Two Contrasting Silage Feeding Systems

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Introduction As a result of increasing labour costs, the lack of skilled labour, and the desire of many farmers to reduce their working hours, there is considerable interest in using simple feeding systems for dairy cows. A study was conducted to compare two silage feeding systems that differed in complexity.

Materials and methods This study involved eighty-six winter calving (mid September – late February) Holstein-Friesian dairy cows. Twenty-four of these animals were primiparous, while the remainder were in their second lactation. Animals were of high genetic merit, and had a predicted transmitting ability for fat + protein yield (PTA_{2000}) of 37 kg. Animals were allocated to two winter feeding systems, CD and EF (43 animals per system), within 48 h of calving, and remained on these systems until 9 April, a mean of 146 d. The rations offered comprised grass silage, maize silage (introduced into the ration at proportionally 0.3 of forage DM from 13 November onwards) and concentrates. The level of concentrate supplementation was increased incrementally from calving until d 20 post-calving (4.0, increasing to 10.4 kg/d with primiparous animals; and 6.0, increasing to 13.0 kg/d with second lactation animals). Of the daily concentrate allowance, 1.0 kg/d was offered through the milking parlour at the time of milking, 0.5 kg at each milking, the remainder being offered as detailed below. With treatment CD, the forage and concentrate components were offered in the form of a 'complete diet', with this ration prepared using a 'mixer wagon'. This mixed ration was prepared daily, and offered via a series of feed boxes, access to which was controlled via a Calan gate feeding system. An average of three animals shared each Calan gate. With system EF, animals were offered the forage component of the ration twice weekly, in quantities sufficient for the following three- or four-day period. Silage blocks were placed along a feed passage, perpendicular to a series of feed barriers, with maize silage and grass silage blocks 'inter-mixed' along the barriers. The feed barriers used were mounted on wheels, while a hinge mechanism allowed the barriers to extend 112 cm beyond their 'resting' position. Thus cows were able to push the barriers out whilst eating their way through the blocks of silage placed along the barriers. The feed barriers were subdivided into individual 'dovetail' feed spaces, with an average of three animals sharing each feed space. With system EF, the concentrate component of the ration, was offered via electronic out-of-parlour feed stations.

Results While the grass silage offered had a relatively poor feed value (dry matter and crude protein concentrations of 216 g/kg and 109 g/kg DM respectively), the maize silage offered had a high feed value (dry matter and starch concentrations of 282 g/kg and 241 g/kg DM respectively). As a consequence of the feeding systems used, individual animal intakes were not measured. Nevertheless total DM intakes, based on group intake data, were similar for both treatments. With treatment EF, it was noticeable that animals initially selected maize silage in preference to grass silage, with grass silage consumed once maize silage became inaccessible. Silage feeding system had no significant effect on milk yield or milk composition and body tissue reserves were similar with both treatments at the end of the study ($P>0.05$). These findings are in close agreement with those of an earlier study (Ferris *et al*., 2002).

Table 1 Animal performance with two winter feeding systems

	CD	EF	s.e.m.	Significance
Total dry matter intake (kg/d)	18.7	18.5		
Total milk output during winter period (kg)	4170	4264	106.5	NS
Daily milk yield (kg)	30.0	30.6	0.75	NS
Milk fat (g/kg)	41.8	40.2	0.75	NS
Milk protein (g/kg)	33.9	33.9	0.38	NS
Live weight at end of study (kg)	561	556	5.5	NS

Conclusions Animal performance was unaffected by the two different feeding systems compared in this study. The results suggest that simple silage feeding systems can be adopted without adverse effects on animal performance.

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Reference:

Ferris, C.P., R.C. Binnie, J.P. Frost & D.C. Patterson (2002) A comparison of two silage feeding systems, involving different labour inputs, for dairy cows. *Proceedings of the XIIIth International Silage Conference,* Auchincruive, Scotland, pp. 382–383.