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A comparison of a full time grazing and a partial storage feeding system, for dairy cows

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Introduction Partial storage feeding has been adopted by a number of Northern Ireland dairy farmers in recent years. This is due in part to increasing cow numbers, and as such, insufficient pasture close to the milking parlour to permit full time grazing. Partial storage feeding may also have environmental benefits, as well as reducing labour requirements associated with 'droving' and pasture management. In view of this, a study was undertaken to examine animal performance with either a full-time grazing, or a partial storage feeding regime.

Materials and methods Seventy-six Holstein-Friesian dairy cows, including 22 primiparous animals, were allocated to one of two treatments - full time grazing (FG) or partial storage feeding (PSF). Animals were 171 d calved when the study started on 5 May. With treatment FG, animals were given access to grazing both by day (morning through to evening milking) and by night (evening through to morning milking). With treatment PSF, animals grazed by day, and were housed by night. During the day the two treatment groups grazed perennial ryegrass swards separately within fixed paddock grazing systems, with FG paddocks 0.3 ha in size, and PSF paddocks 0.18 ha in size. Six grazing cycles were completed during the study, with these being 24, 21, 24, 24, 27 and 27 d in length respectively. Animals were given access to a fresh paddock following morning milking, while concentrates were offered in the parlour during milking at a flat rate of 3.0 kg/d. Animals on treatment PSF were offered grass silage during the period of night-time housing. The silage offered was of medium feed value, and had dry matter (DM), crude protein, and ammonia N concentrations of 257 g/kg, 117 g/kg DM, 114 g/kg total N respectively, and a DM digestibility (determined *in vivo*) of 706 g/kg. Silage was offered twice weekly alongside a feed barrier mounted on wheels. This allowed the cows to push the barrier out, while eating their way through the blocks of silage. Animals remained on the study for a mean of 127 (s.d., 22.8) d, being removed either eight weeks pre-calving, or on completion of the study on 29 Sept.

Results Mean stocking rates and residual sward heights were 5.2 and 8.6 cows/ha, and 6.3 and 6.7 cm, with treatments FG and PSF respectively. Throughout the season grazing conditions were good, and grass quality remained high. Total milk output and milk protein content was significantly higher with treatment FG than with treatment PSF ($P < 0.001$), while milk fat content and somatic cell counts were unaffected by treatment ($P > 0.05$). Although the differences were small, animals on treatment FG had significantly higher condition scores and live-weights at the end of the study, compared to animals on treatment PSF. The lower milk yield with treatment PSF conflicts with the findings of Ferris *et al.* (2003) who observed the opposite effect. This is probably due to differences in silage quality and grazing conditions between the two studies, with grazing conditions during the current study being ideal, while silage quality was medium, while the reverse was true in the study described by Ferris *et al.* (2003).

Table 1 Animal performance with a full time grazing system and a partial storage feeding system

	FG	PSF	s.e.m.	Significance
Daily milk yield (kg)	20.0	18.4	0.341	**
Milk fat (g/kg)	42.4	41.0	1.14	NS
Milk protein (g/kg)	35.8	33.4	0.20	***
Milk fat + protein yield (kg/day)	1.538	1.358	0.0413	***
Somatic cell count (log ₁₀)	2.22	2.16	0.083	NS
Condition score at end of study	2.6	2.5	0.02	**
Live weight at end of study (kg)	594	580	4.8	*

Conclusions Milk output and milk protein content were reduced with partial storage feeding in this study. The response to partial storage feeding appears to be largely influenced by the quality of the forage supplement on offer and the grazing conditions encountered.

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References

Ferris, C.P., J.P. Frost, R.C. Binnie & D.C. Patterson (2003). A comparison of full-time grazing and a part-grazing part-housing management regime for dairy cows. *Seventh Research Conference of the British Grassland Society*, 31-32.