

The effect of early and delayed spring grazing on the milk production, grazing management and grass intake of dairy cows

E. Kennedy^{1,2}, M. O'Donovan¹, J.P. Murphy¹, L. Delaby³ and F.P. O'Mara²

¹Teagasc, Dairy Production Research Centre, Moorepark, Fermoy, Co. Cork, Ireland, Email: ekennedy@moorepark.teagasc.ie, ²Faculty of Agri-Food and Environment, NUI Dublin, Belfield, Dublin 4, Ireland, ³INRA, UMR Production du Lait 35590 St. Gilles, France

Keywords: dairy cows, grazing date, stocking rate

Earlier access to pasture can increase the overall proportion of grazed grass in the diet of the spring calving dairy cow. Further benefits can also be achieved from early turnout, including improved animal production, increased sward utilisation and enhanced sward quality (O'Donovan *et al.*, 2004). The objective of this study was to compare the effect of initial spring grazing date and stocking rate on the performance of spring calving dairy cows.

Materials and methods Sixty-four spring calving dairy cows, 32 primiparous and 32 multiparous, were randomly assigned to one of four grazing treatments ($n=16/\text{treatment}$) which were balanced for lactation number (1.9 ± 1.47), days in milk (58 ± 9.0), milk yield ($28.7 \pm 5.47\text{kg}$), milk fat content ($39.6 \pm 4.26\text{ g/kg}$), milk protein content ($32.1 \pm 2.23\text{ g/kg}$), bodyweight ($511 \pm 52.0\text{ kg}$) and body condition score (2.8 ± 0.35). Eight 'filler cows' were used to achieve the required stocking rate. Two swards, early grazed (E) and late grazed (L), were created, and two stocking rates (SR), high (H) and medium (M), were applied across them. Half of the area was grazed between 16 February and 4 April creating the early grazed sward. The rest of the area (late grazed sward) remained ungrazed. The study was completed over four 21-day rotations from 16 April to 3 July 2004. Twenty-one paddocks, previously measured and permanently fenced, were allocated to each treatment, each with a residency time of 24 hours. The SR imposed were 5.5 cows/ha (EH), 4.5 cows/ha (EM), 6.5 cows/ha (LH) and 5.5 cows/ha (LM). The SR on the LH treatment was reduced to 5.9 cows/ha for the final rotation. Subsequent to each grazing 60 kg N/ha was applied therefore the early grazed sward received an extra 60 kg N/ha. Milk yield was recorded daily and milk composition was determined weekly. Live weight was recorded weekly and body condition score was measured every three weeks. Milk production carryover effects of each of the feeding regimes were measured for 8 weeks subsequent to this study. During this period all cows were managed as a single herd and offered a DHA (daily herbage allowance) of 22 kg DM/cow per day.

Results There was a significant difference between treatments for milk yield ($P<0.001$), SCM yield ($P<0.001$), milk protein concentration ($P<0.001$), milk fat yield ($P<0.01$) and milk protein yield ($P<0.001$). The EM treatment recorded superior performance levels for these parameters when compared to all other treatments. The LH treatment recorded the lowest production performance while the production performance of the EH and LM treatments were between those of the EM and LH treatments. No significant differences in liveweight or BCS were recorded. During the carryover period there were no significant differences between treatments for milk yield, milk composition, bodyweight or BCS.

Table 1 Effect of initial grazing date and stocking rate on milk production performance bodyweight and body condition score of spring calving dairy cows

	EH	EM	LH	LM	Rse	Sig.
Milk yield (kg/day)	22.7 ^a	24.5 ^b	20.9 ^c	22.4 ^a	2.05	***
Fat (g/kg)	38.9 ^a	37.8 ^a	40.0 ^a	37.8 ^a	3.42	NS
Protein (g/kg)	32.9 ^a	34.1 ^b	32.1 ^c	32.7 ^a	0.91	***
SCM yield (kg/day)	20.9 ^a	22.5 ^b	19.4 ^c	20.4 ^{ac}	1.71	***
Fat yield (g/cow per day)	871.8 ^a	917.8 ^b	829.5 ^a	845.9 ^a	77.69	**
Protein yield (g/cow per day)	744.4 ^a	831.4 ^b	670.2 ^c	733.2 ^a	65.07	***
Liveweight (kg)	503 ^a	514 ^a	509 ^a	516 ^a	28.4	NS
BCS	2.76 ^a	2.75 ^a	2.71 ^a	2.73 ^a	0.159	NS

NS=Non-significant, **= $P \leq 0.01$, ***= $P \leq 0.001$. ^{abc}values in the same row not sharing a common superscript are significantly different.

Conclusions The results suggest that increased milk production is achievable with early grazed swards. If a medium SR is imposed across such swards a high production performance can be obtained. The date of initial spring grazing and the subsequent stocking rate imposed have direct effects on milk production performance.

References

O'Donovan, M., Delaby, L. and Peyraud J.L. (2004) Effect of time of initial grazing date and subsequent stocking rate on pasture production and dairy cow performance. *Animal Research* 53, 489-502