Organic management strategies and its effect on clover-based grassland production

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Introduction In Ireland, there is a price premium if 50% of annual milk produced on organic farms is supplied during the winter (September to March). Organic systems of production operate at low stocking rates compared with conventional systems, offering the potential to extend the grazing season throughout the autumn, winter and early spring.

Materials and methods In 2008/2009, an experiment was conducted at Solohead Research Facility; latitude 52° 51' N, longitude 08° 21' W. The aim of the experiment was to substantially lower winter feed costs for organic winter milk production systems, through the supply of 0.50 of the diet from grass-clover swards during the autumn and winter. The systems of production compared had: (i) a mean calving date of 17 February, stocking density of 2.15 cows/ha, receiving 90 kg/ha of annual fertilizer N input (Control); (ii) a mean calving date of 17 February, stocking density of 1.6 cows/ha, receiving no fertilizer N input (S-NFN) and (iii) a mean calving date of 16 April, stocking density of 1.6 cows/ha between calving and 1 September and a stocking density of 1.2 cows/ha between 1 September and 18 February, receiving no fertilizer N input (W-NFN). Cows were turned out to pasture after calving and the number of days at pasture was recorded as 1 day when cows were outside both day and night and 0.5 when cows were outside only by day. Exceptionally high rainfall was recorded during the summer and autumn 2008 (28% above normal; 641 mm compared to 10-year average, 501 mm). Cows were randomised into four main groups on the basis of lactation number (1, 2, 3 & ≥4) within 1 week of parturition and then sub-divided into sub-groups of three on the basis of calving date. From within each sub-group one cow was randomly assigned to each herd. Herds were randomly assigned to each system. There were 18 cows per system. Animal production data (milk production, milk composition, live-weight and body condition score (BCS)) were subjected to ANOVA using SAS, 2008. Pre-calving live-weight and BCS were used as covariates when analysing live-weights and BCS.

Results There were no (P >0.05) differences between systems in production of milk yields and milk composition or live-weight and BCS during or at the end of lactation (Table 1). The W-NFN system produced 0.48 of milk between 1 September and 18 February. High rainfall had lead to difficult grazing conditions consequently cows in the control system were housed by night from 7 October and fulltime from 23 October. This is approximately five weeks earlier than normal at Solohead for spring calving herds resulting in 220 days at pasture for the control group. Lower stocking densities on the NFN systems allowed cows to be kept outside for longer (P < 0.001), although there was no (P >0.05) difference in days at pasture between the NFN systems (Table 1).

Table 1 Production of milk, fat, protein and lactose, milk composition for 290 d lactation, the mean number of days that cows were at pasture, concentrates fed, mean cow live-weight during lactation, and body condition score (BCS; scale 1 to 5) during and at the end of lactation

	Control	S-NFN	W-NFN	s.e.m.	P value
Milk (kg/cow)	6371	6511	6605	182	NS
Fat (kg/cow)	274	282	273	18.8	NS
Protein (kg/cow)	230	236	228	5.9	NS
Lactose (kg/cow)	301	308	309	8.5	NS
Fat + Protein (kg/cow)	504	518	502	13.0	NS
Fat (%)	4.31	4.34	4.18	0.096	NS
Protein (%)	3.62	3.63	3.48	0.050	0.065
Lactose (%)	4.73	4.72	5.04	0.144	NS
Days at pasture (days/cow)	220	234	231	1.7	***
Concentrate fed (kg/cow)	590	590	847	21.3	***
Live-weight (kg/cow)	602	594	590	9.2	NS
Mean BCS during lactation	3.00	3.03	2.97	0.039	NS
BCS at the end of lactation	3.02	2.97	2.89	0.068	NS

Conclusions A long grazing season was possible with the late-calving W-NFN herd. A later mean calving date than 16 April is necessary to produce 0.50 of annual milk between September and March.

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