

Extended lactation: could it work for UK dairy farmers?

C H Knight

University of Glasgow, Faculty of Veterinary Medicine, Division of Cell Sciences, Institute of Comparative Medicine, Glasgow, G61 1QH, U.K.

E-mail c.knight@vet.gla.ac.uk

Introduction Extended Lactation is a production system whereby dairy cows are managed for increased lactation persistency and rebred to calve at around eighteen months rather than twelve; the emphasis is on modest daily yield sustained over a long period rather than on peak yield. The potential benefits are avoidance of the health and reproduction problems increasingly associated with high peak milk yield. The potential costs are reduced per-annum milk yield and compromised milk quality. Both of these costs could be avoided if it were possible to increase lactation persistency, and modelling studies incorporating the use of rBST have predicted significant health and economic advantages to extended lactation (Allore and Erb, 2000; De Vries, 2006). For extended lactation to be successful under UK conditions, strategies for increasing persistency that do not include rBST are necessary. The introduction of automated milking systems has introduced the possibility of milking more frequently throughout lactation. Accordingly, we have examined the effect of frequent milking on lactation persistency in cows managed for eighteen-month extended lactations. Additional factors examined were nutrition and calving season. All three factors affected persistency, with the greatest improvement being attributable to milking thrice- rather than twice-daily. Milk quality was also maintained.

Materials and methods 24 Holstein:Friesian cows were used in a factorial design to study the effects of milking frequency (3X versus 2X), calving season (Spring vs Winter) and nutrition (High vs Low) on lactation characteristics during 18-month extended lactation cycles. Experimental treatments were applied from week 9 of lactation. Milking frequency treatments were applied on a half-udder basis to all cows. Low cows were fed a grass silage-based total mixed ration containing 15% crude protein during winter months and grazed pasture during summer supplemented with sugar-beet pulp during times of poor grass quality. In addition, in-parlour concentrate containing 18% crude protein was fed according to milk yield. High cows were fed identically except that they received an additional 3kg/d of concentrate. Cows were blocked onto treatment in groups according to calving date taking into account parity, body weight, body condition score and pre-treatment milk yield. Half-udder milk samples were collected at monthly intervals and analysed for processing quality by determination of casein number (casein as a proportion of total protein). Statistical analysis was performed using analysis of variance (Minitab Release11, Minitab Inc, State College, PA16801 USA). For analysis of lactation persistency, best-fit linear regression of weekly-averaged milk yields was performed from week 9 onwards.

Results Persistency was significantly improved by milking more frequently and non-significantly improved by supplementary feeding. Persistency was higher in Winter and Second than in Spring (Figure 1). Data shown are for the period prior to rebreeding. The beneficial effect of frequent milking (but not of season) persisted until week 20 of recurring pregnancy, at which point a negative effect of pregnancy became apparent. Extrapolations of actual persistency slopes were used to calculate the theoretical effect of improved persistency on lactation length in the absence of recurring pregnancy. Frequent milking increased lactation length from 68 ± 3 to 102 ± 8 weeks ($P < 0.001$), whilst other treatments had no significant effect. Casein number decreased across the course of lactation, but this deterioration was prevented by the combination of frequent milking and nutritional supplementation (figure 2).

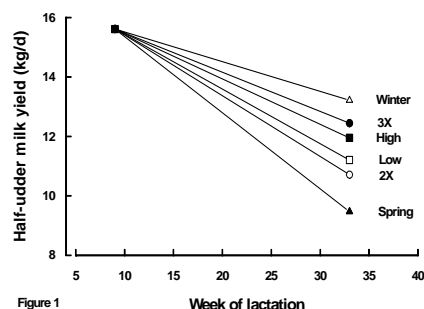


Figure 1

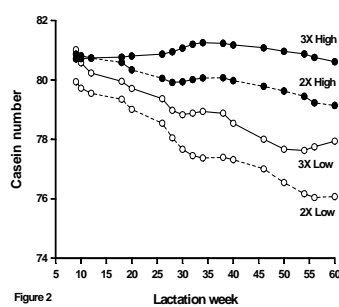


Figure 2

Conclusion By demonstrating that lactation persistency is plastic and can be improved by simple management interventions, the data lend support to the welfare and economic arguments in favour of extended lactation cycles.

References

- Allore, H.G. and Erb, H.N. (2000). Simulated effects on dairy cattle health of extending the voluntary waiting period with recombinant growth hormone. *Preventive Veterinary Medicine* 46: 29-50.
- De Vries, A. (2006). Economic value of pregnancy in dairy cattle. *Journal of Dairy Science* 89: 3876-3885.