Milking frequency and milk production in pasture-based lactating dairy cows

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OBJECTIVE

To determine the effect of short-term changes in milking frequency on milk production and body condition score change in pasture-based dairy cows.

INTRODUCTION

- Evidence of long-term increased milk production from short-term (14-21 day) increases in milking frequency in total mixed ration-fed cows
- Pasture-based cows are limited in their dry matter intake ability
- Pasturing involves walking long distances for milking. Any physiological benefit of increased milking frequency may be lost in activity-related energy expenditure
- Data required on short-term increased milking frequency for pastured cows
- Increased interest in using once-daily milking (1X) during calving period
- Little data on lactation-long effect of short-term 1X on milk production, body condition score (BCS) change or reproduction outcomes.

MATERIALS AND METHODS

- 150 multiparous Holstein-Friesian cows
- 60 cows milked three times/day (3X) for the first 21 or 42 days post-calving (n=30)
- 60 cows milked 1X for the first 21 or 42 days post-calving (n=30)
- All cows subsequently milked twice/day (2X) and compared with 2X control (n=30)
- All cows grazing fresh pasture and fed 4 kg DM/day of a cereal grain-based concentrate
- Milk yield recorded daily and milk composition on 2 milkings each week
- BCS (1-10 scale) and live weight recorded weekly.

RESULTS

Milking cows 3X for a short period in early lactation

- Increased milk yield during the period of 3X (1.6 kg/day: 6.7% increase: $P<0.05$) (Figure 1)
- Did not affect fat, protein or lactose yield (Figure 1)
- Did not affect milk production after the period of 3X. However, this may reflect a lack of statistical power (difference = 1 kg milk/day: 4.5% increase 3X: $P=0.16$)
- Did not affect BCS loss or the post-partum anoestrous interval (PPAI).

Milking cows 1X for a short period in early lactation

- Reduced ($P<0.001$) milk (-3.3 kg/day: -13.7%), fat (-0.2 kg/day: -17.7%), protein (-0.1 kg/day: -12.4%) and lactose (-0.2 kg/day: -15.1%) yield during the period of 1X (Figure 2)
- Reduced ($P<0.01$) fat (-0.09 kg/day: -9.3%) and protein (-0.06 kg/day: -6.9%) yield during the remainder of lactation (Figure 2)
- Tended ($P<0.1$) to reduce milk yield and lactose yield below 2X control when returned to 2X
- Did not affect BCS loss until week 6. OAD milking for 42 days increased BCS at week 6
- PPAI was not affected by treatment.

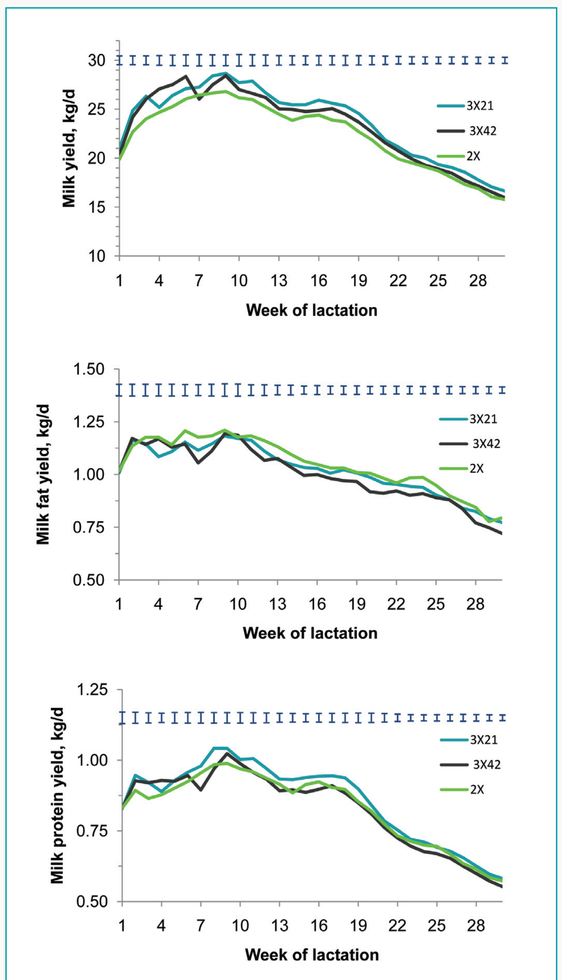

Figure 1. Impact of milking cows 3X for the first 21 or 42 days of lactation on milk production.

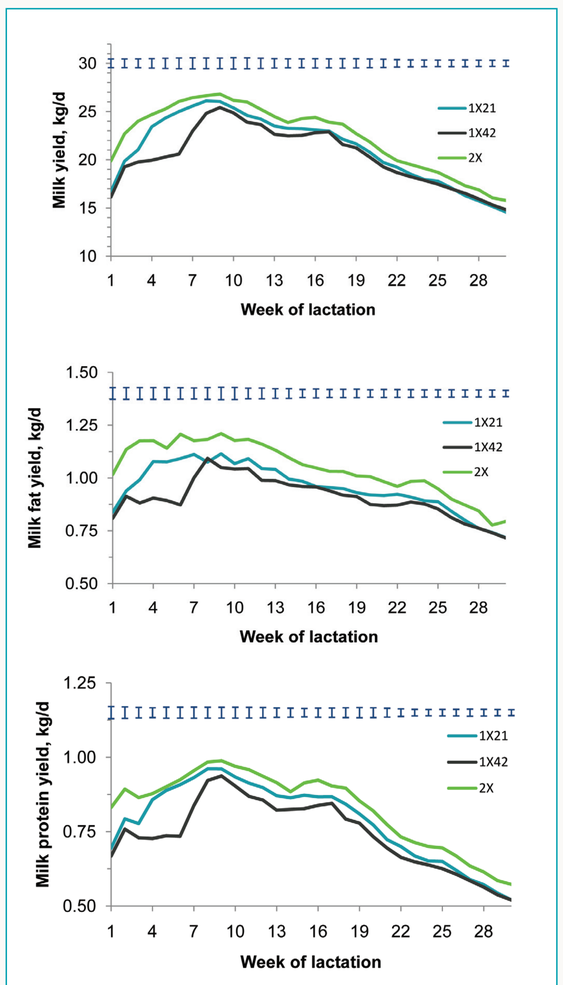

Figure 2. Impact of milking cows 1X for the first 21 or 42 days of lactation on milk production.

CONCLUSIONS

- Short-term changes in milking frequency (either increased or decreased) affect milk yield
- Milking 3X did not increase milk component yield in cows fed primarily a fresh pasture diet (low supplementation)
- Milking 1X for even a short period post-calving has lactation-long effects on milk production
- The negative effect of 1X on total milk production increases with time spent on 1X
- Milking frequency did not affect PPAI.

IMPLICATIONS

- In pastured cows offered low levels of supplementation, 3X milking does not increase milk production
- Although short-term use of 1X milking in seasonal calving systems may have benefits in labour productivity, losses in milk production are considerable. If used, the duration of 1X should be minimised
- Effects of milking frequency on BCS during the first five weeks of lactation are small and biologically insignificant.

Acknowledgements

This project was supported by New Zealand dairy farmers and the Foundation for Research, Science and Technology (DRCX0801). We thank them and the DairyNZ staff for their invaluable help.

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