Removal of cisternal milk following milk accumulation for 9 hours does not increase total yield during once-daily milking

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INTRODUCTION

Once-daily milking (ODM) of dairy cows in New Zealand results in a yield loss of 15-25% (Carruthers V.R. *et al.,* (1993)). This loss is not associated with the total storage capacity of the udder, although some studies have shown that increase in the volume of milk in the cistern is associated with reduced yield loss during ODM (Knight C.H. and Dewhurst R.J. (1994)). The following experiment was undertaken to determine whether removal of cisternal, but not alveolar milk, at the p.m. milking, decreased the production loss during ODM.

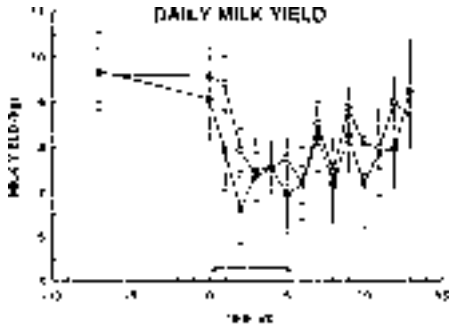
MATERIALS AND METHODS

Eighteen Jersey and Friesian cows in their first to fourth lactation were used. The animals were in late lactation (250+4 d) and the normal, twice-daily milking regime was at 7.00 am and 4.00 pm. During the first treatment period all cows were milked once-daily (7 am) for 5 d. Then, during a second 5 d period, all animals were injected with adrenaline (3 mg) via the jugular vein (Farr V.C. *et al.*, (1995)), at the p.m. milking. Half the cows were then machine milked, the adrenaline blockade allowing specific removal of the cisternal fraction through inhibition of milk ejection (Farr V.C. *et al.*, 1995). The remaining animals were not milked. All cows then returned to twice-daily milking. Milk yield was recorded, and samples were analysed for fat, protein, lactose and SCC. Data was analysed using the students' paired t-test.

RESULTS

Mean daily milk yield decreased by 19.4±4.6 % during the first ODM period relative to previous twice-daily yields (9.5±0.2 kg vs 7.6±0.3 kg, $p<0.01$) (Fig). During the second ODM period, cisternal drainage after 9 h of accumulation yielded an average of 1.5±0.1 kg of milk (range 0.35 to 5.27 kg, 5 to 56 % of the total daily yield), but total milk production was unaffected (see Figure). There was no correlation between the size of the cisternal fraction (kg or %) and milk yield loss during the first ODM period.

FIGURE 1: Daily milk yield during twice-daily milking(-7,0 d) once-daily milking (0-5 d) and once-daily with (-○-) or without (-■-) removal of cisternal milk at the pm milking (5-10 d). Thereafter, cows were milked twice daily.



Protein and fat content of milk from drained glands was reduced by 7% and 6% respectively in a.m. milk samples ($P< 0.05$).

CONCLUSIONS

These results show that the production loss during once-daily milking was associated with the accumulation of milk in the alveolar rather than in the cisternal compartment. The implication of these data is that frequent removal of milk from the alveoli (through drainage or ejection) is required to maintain secretion. Mechanisms through which alveolar distension might act to reduce milk secretion are under investigation.

REFERENCES

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