Does Once-a-Day (OAD) Milking Improve Animal Welfare?

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Executive Summary

1. Once-a-day (OAD) milking causes slight shifts in the timing and amount of grazing.
2. Cows milked OAD spend more time lying down, but lie in similar positions compared to cows milked TAD.
3. OAD milking may cause an increase in lameness in peak lactation, but may reduce it by mid-lactation.
4. Cows milked OAD have lower body temperature than cows milked twice a day (TAD).
5. The evidence suggests that OAD milking improves animal welfare, especially later in lactation.

Introduction

There are concerns that cows milked only once daily may experience discomfort due to full udders, especially in early lactation. We conducted two studies to answer questions about the effect of OAD milking on animal welfare. We looked at two ways to use OAD milking: full season - from the time of calving, and part season - with a transition from TAD milking to OAD milking at mid-lactation in January.

Research Findings

Does OAD milking cause udder distension?

Yes and no. By peak lactation (50 days in milk), there is no difference in udder firmness or number of cows leaking milk when they come into the shed. In January, however, cows undergoing the transition from TAD milking to OAD milking had firmer udders and were more likely to leak milk than cows milked OAD or TAD from calving. This difference lasted about a week after the switch to OAD milking.

Does OAD milking change behaviour?

Behaviour did not change in any way that indicates that cows milked OAD are uncomfortable. Cows milked OAD spend less time grazing overall, especially at peak lactation. This result makes sense given that these cows produce less milk and likely have lower metabolic requirements. The pattern of grazing also changed with OAD milking. All cows began the afternoon grazing activity around the same time as the afternoon milking (Figure 1). However, when cows were milked TAD, this grazing activity was interrupted by milking. Cows milked TAD increased their grazing activity immediately following the return from afternoon milking (Figures 1 and 2). It is also interesting to note that cows were much more likely to graze at night in spring (Figure 1) than in summer (Figure 2).

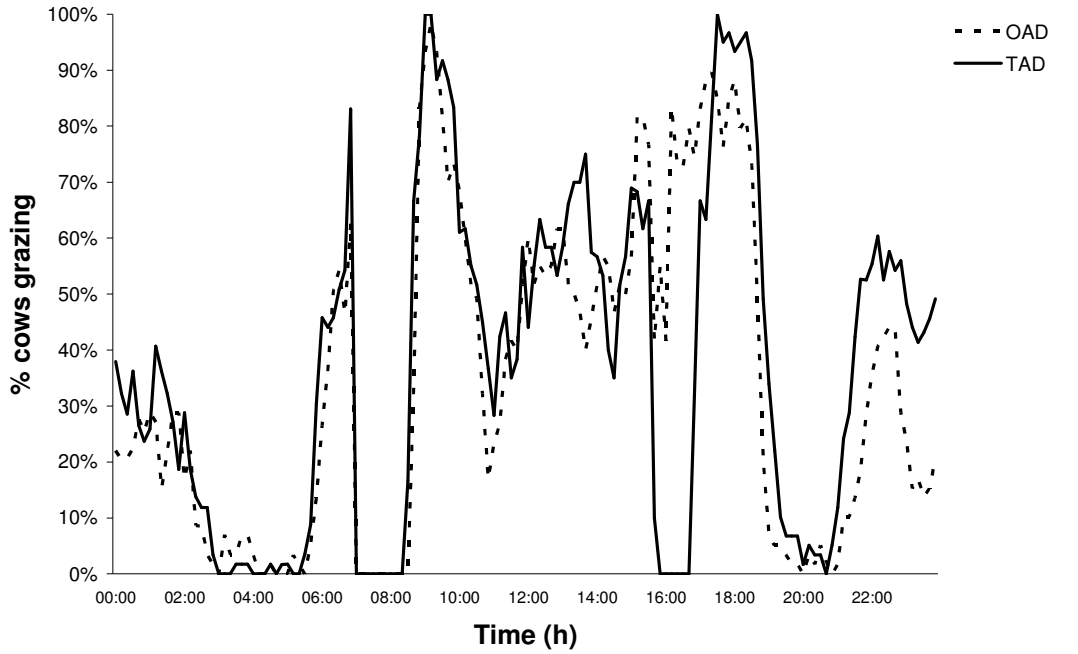

Figure 1. Percentage of cows grazing over a 24-h period at peak lactation (September). Cows were milked either once a day (OAD; dashed line) or twice a day (TAD; solid line) from the time of calving. From Tucker *et al*. (2007).

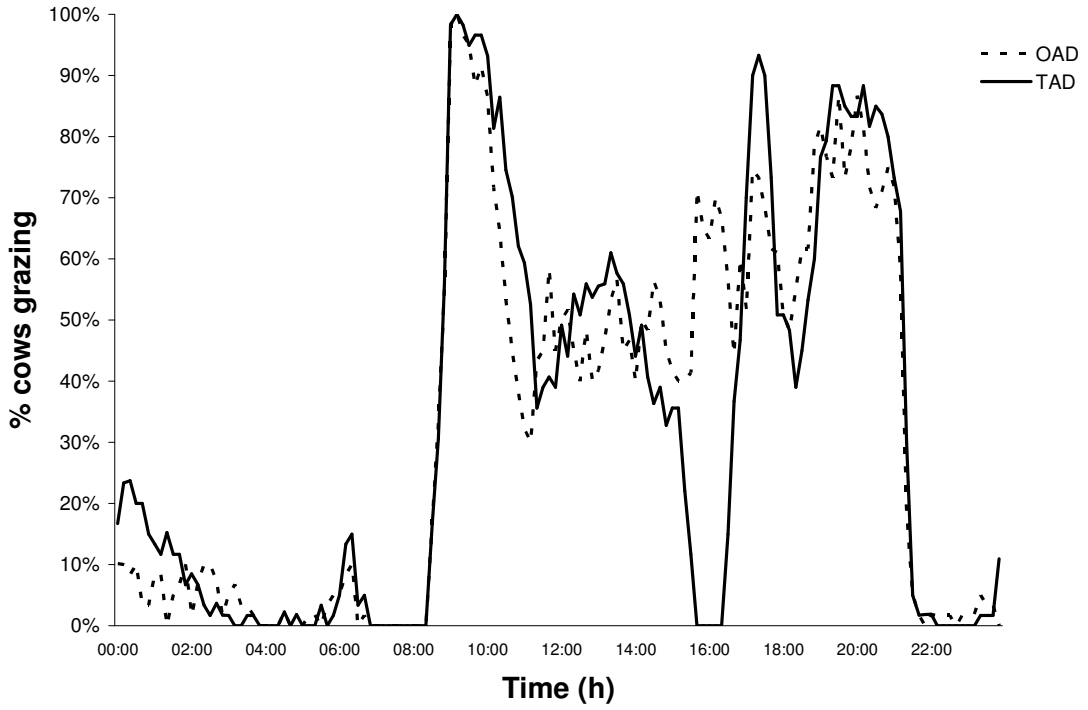

Figure 2. Percentage of cows grazing over a 24-h period at mid-lactation (January). Cows were milked either once a day (OAD; dashed line) or twice a day (TAD; solid line) from the time of calving. From Tucker *et al*. (2007).

Cows milked OAD spent 1.5 hours more per day lying down at peak lactation than cows milked TAD. We also looked at the postures of cows while they were lying down. We predicted that if cows were uncomfortable, they would lie with their hind legs away from the udder. However, there were no differences in lying postures at peak or mid-lactation.

Cows with painful teat injuries are more likely to kick while being milked. At peak lactation, cows were just as likely to kick in the shed, regardless of whether they were milked OAD or TAD.

Does OAD milking affect lameness?

At peak lactation, Irish researchers have found that cows milked OAD were more likely to be lame (Gleeson *et al*., 2007). Cows were more likely to swing the hind legs out at this time, indicating that there was some discomfort around the udder. Under NZ conditions, we did not find any differences in stride length between cows milked OAD or TAD at peak lactation. However, we would need to look at more than 40 cows to fully answer this question.

Cows with healthier hooves take longer strides than lame cows. At mid-lactation, cows milked OAD took slightly longer strides than cows milked TAD, under NZ conditions. Irish researchers have also found that cows milked OAD are less likely to be lame and have sole lesions later in lactation. OAD milking likely reduces hoof wear and the susceptibility of cows to lameness after early lactation.

Does OAD milking reduce heat stress?

Yes, it is very likely that OAD milking reduces heat stress in cows. Cows' body temperature peaks in the afternoon, when the weather is warmest. When cows are only milked in the morning, their body temperature is lower and they do not have the same rise in body temperature as cows milked TAD (Figure 3). Many factors may contribute to lower body temperatures in cows milked OAD, including lower heat production because of less feed intake and not walking to the shed in the afternoon.

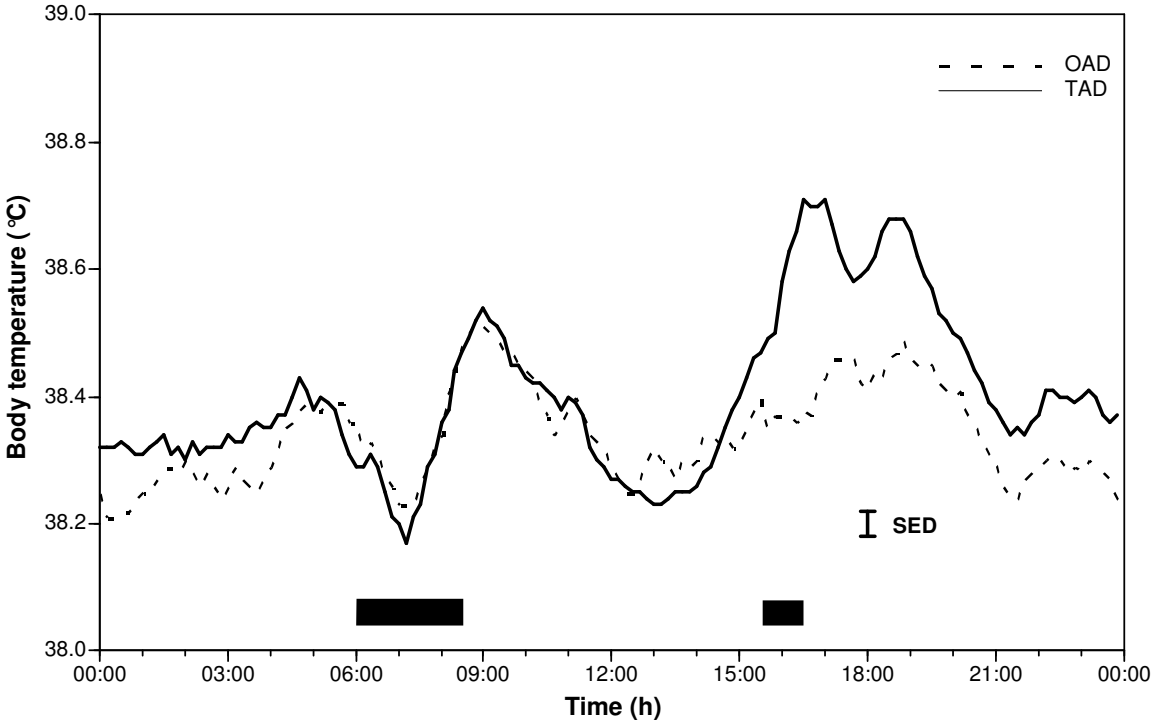

Figure 3. Body temperature (°C) over a 24-h period of cows milked once a day (OAD; dashed line) or twice a day (TAD; solid line) at mid-lactation (January). The solid black bars show when the cows were milked.

Conclusions

So, does OAD milking improve animal welfare?

Yes, the evidence suggests that OAD milking improves animal welfare, especially later in lactation. There is still some concern that cows milked OAD from calving may experience discomfort in the first few weeks of lactation, but further research is required to understand more about that time period. Switching to OAD milking in January provides many benefits, including reduced risk of heat stress and lameness.

References

Gleeson, D.E.; O'Brian, B.; Boyle, L.; Earley, B. (2007): Effect of milking frequency and nutritional level on aspects of the health and welfare of dairy cows. *Animal, **1:***125-132.

Tucker, C.B.; Dalley, D.E.; Burke, J.-L.K.; Clark, D.A. (2007): Milking cows once daily influences behaviour and udder firmness at peak and mid lactation. *Journal of Dairy Science, **90***:1692-1703.