

Improving milking efficiency

John Upton, Martin Browne and Pablo Silva Bolona

Teagasc, Animal & Grassland Research and Innovation Centre, Moorepark, Fermoy, Co. Cork

Summary

- Cluster removers eliminate over-milking and provide consistency of milk-out.
- Increasing the ACR threshold from 0.2 kg/min to 0.8 kg/min reduced daily milking duration by 14% over a 31-week period.
- Increasing the ACR threshold to 0.8 kg/min did not affect milk yield, SCC or the amount of milk left behind in the udder after milking.

Introduction

Milking is the main chore on dairy farms and typically consumes over 30% of total labour input. With high labour costs and problems accessing skilled labour, the recent trend has been to install milking parlours with a greater number of clusters to be handled by one operator. Automatic cluster removers (ACRs) are a useful automation to facilitate one operator to manage a greater number of milking clusters, they also offer consistency around the end-point of milking and can eliminate over-milking of cows. Over-milking should be avoided to keep teats in good condition and to maintain cow comfort during milking. Much work has already been conducted providing strong support for significant reduction in milking duration without impact on milk yield through increasing the flow-rate at which the ACRs detach the milking cluster (ACR threshold). However, in practice many farms have not adopted this labour saving technology on the basis that it may increase milk SCC. Typically the ACR threshold is set at a flow-rate of 0.2 kg/min (i.e. completely milking the cow out). The objective of this study was to increase the ACR threshold from 0.2 kg/min to 0.8 kg/min in steps of 0.2 kg/min and document the effects on milk yield, milking duration, average milk flow-rate, strip milk (milk left behind after cluster removal) and SCC over a 31-week period.

Materials and methods

Four treatments, consisting of ACR thresholds increasing from 0.2 kg/min to 0.8 kg/min in steps of 0.2 kg/min (ACR0.2, ACR0.4, ACR0.6, ACR0.8), were deployed for 31 weeks to cows at the Teagasc Research Centre at Moorepark. A mid-line 30-unit Dairymaster herringbone, swing-over milking system was used to milk the cows on the trial twice per day. The milking system utilised simultaneous pulsation (i.e. 4x0 pulsation) and was fitted with automatic cluster removers and weigh-all milk meters. The standard farm ACR threshold was 0.2 kg/min with a three second time delay. The milking cluster weight was 2.8 kg and was fitted with 916SL milking liners. The milking parlor software was modified to apply a pre-defined ACR threshold to a specific cow regardless of when she presented for milking. Cows were managed in a pasture-based system and were milked twice per day with a 16:8 h milking interval. Cows were an average of 81 days in milk at the beginning of the study. Average parity was three ranging from one to eight. Each experimental group had 27 cows at the beginning of the study. Strip milk was recorded on four separate occasions over the course of the study. This was carried out by reattaching the cluster to the cow after it had been removed by the ACR, adding a 2.5 kg weight to the cluster, and removing the unit once milk flow had ceased. The strip milk yield was then recorded from the milk meter. The strip milk data of 64 randomly selected cows spread evenly across all four treatments were collected.

Results

The milking duration for ACR0.8 was significantly shorter, by 95 s (14%), than ACR0.2 (Figure 1). Similarly, the average flow rate for ACR0.8 was significantly larger, by 0.26 kg/min (16%), than ACR0.2. There was no treatment effect on milk yield or strip milk, i.e. increasing the ACR threshold did not affect the milk yields of the cows or the amount of milk left behind in the udder after milking. There was no significant effect of treatment on SCC. The SCC values were 71,700, 67,000, 69,900 and 67,700 cells per ml for the ACR0.2, ACR0.4, ACR0.6 and ACR0.8 treatments respectively. We found a significant effect of week on milk SCC, whereby the SCC of the cows on the experiment increased as lactation progressed in a similar way across all treatments. There were 10 cases of clinical mastitis among the cows on the study. There were two cases on ACR0.2, one case on ACR0.4, four cases on ACR0.6 and three cases on ACR0.8. *Strep. Uberis* was identified in four cases, *Staph. Aureus* was identified in three cases and in three cases no bacteria was identified.

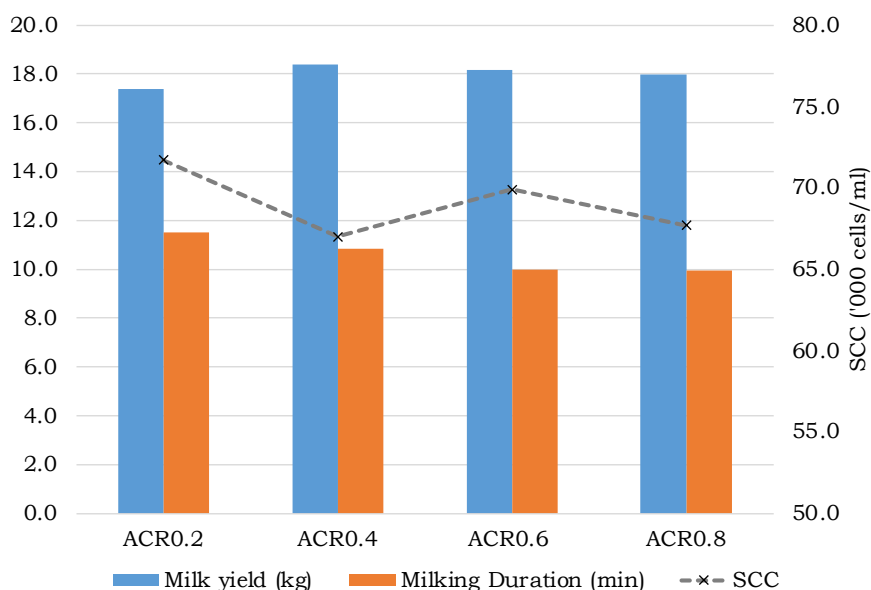


Figure 1. Results for milk yield, milking duration and SCC across ACR thresholds

Conclusions

We did not find a significant effect of increasing the ACR threshold from 0.2 to 0.8 kg/min on milk SCC in this long term study. We found a significant effect of week on milk SCC, whereby the SCC of the cows on the experiment increased as lactation progressed. We can also conclude that increasing the ACR threshold from 0.2 kg/min to 0.8 kg/min reduced daily milking duration by 14% without any significant reductions in milk production or significant increase in strip milk in this pasture based study.

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