

Mastitis, Somatic Cell Counts, Animal Health and Once-a-Day (OAD) Milking

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Executive Summary

1. Milking once a day (OAD) does not by itself increase the risk of mastitis
2. Cows milked OAD tend to show more clear visible signs of clinical mastitis
3. Cows milked OAD have a somatic cell count (SCC) that can be twice as high as cows milked twice a day (TAD), especially in later lactation
4. Switching from TAD to OAD milking will require some planning and an increased focus on mastitis detection
5. Ensure a good degree of teat coverage with teat sanitiser and use dry cow antibiotic therapy at the end of lactation to reduce the existing infection levels and lower the risk of calving with mastitis
6. Treat clinical mastitis as for a cow being milked TAD, but avoid antibiotics requiring 12-hourly treatment
7. Ensure cows are well milked out at every milking

Introduction

Farmers contemplating a long-term switch from TAD to OAD milking are able to plan for an estimated 15-20% drop in milk yields. Strategies such as increasing the stocking rate or using the LIC OAD selection index are options for mitigating some of the milk yield losses associated with OAD milking. However, there have been conflicting reports of the effects of OAD milking on milk somatic cell count (SCC) and very few studies have looked at the infection status of cows exposed to OAD milking. The previous OAD milking trial conducted in Taranaki provides a realistic demonstration of the long-term effects of OAD milking on milk quality. By determining the bacteriological status of individual quarters at regular intervals, the study also allowed the effects of mastitis on milk SCC to be disentangled from that of OAD milking. The study showed that the incidence of new infections at calving and drying off were similar between the two milking frequencies. This was true for infections caused by both major pathogens, such as *Streptococcus uberis* and *Staphylococcus aureus*, and for minor pathogens, such as coagulase negative staphylococci or *Corynebacterium bovis*. Other results from this four-year study have helped to answer several frequently asked questions, as detailed in the following section.

Research Findings

Are cows milked OAD more at risk of developing mastitis?

Cows milked OAD or TAD are at a similar level of risk for developing new infections. That is, milking OAD does not by itself increase the risk of mastitis. However, cows milked OAD tend to show more clear visible signs of clinical mastitis.

Do cows milked OAD have a higher SCC?

Research shows that cows milked OAD have an individual SCC that can be twice as high as cows milked TAD (Lacy-Hulbert *et al.*, 2005). This relationship holds true for cows that are uninfected, or cows that have a sub-clinical infection, as well as for

cows that have had clinical mastitis. This difference starts to show once cows have moved beyond peak lactation (weeks 6-8 after calving) and remains until the end of lactation. Figure 1 shows an example of this relationship for uninfected cows during the 2003-04 season.

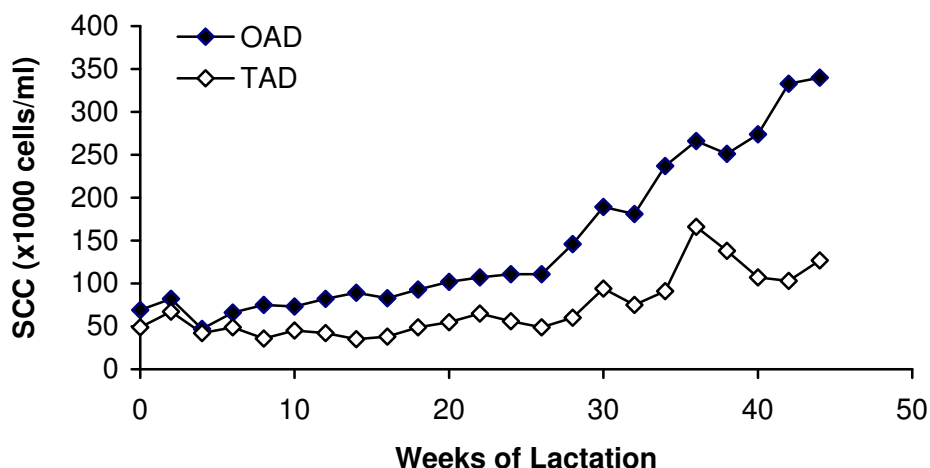


Figure 1. Variation in individual cow SCC over the 2003-04 season, for uninfected cows milked either once a day (OAD) or twice a day (TAD) for a whole lactation.

While research results showed elevated SCC with OAD milking, this has not always been the case on commercial farms. In several instances farms have observed a decrease in SCC when OAD milking has been adopted. This drop in SCC may be attributed to better management of mastitis and individual high SCC cows by farmers, and in some cases, a reduction in the stress levels of the cows through less walking and less time spent on laneways and in cow yards.

What impact does milking OAD have on the bulk milk tank SCC (BMSCC)?

There are likely to be greater increases in BMSCC during the second half of lactation, which may require high SCC cows to be dried off early.

What changes can I expect when switching from TAD to OAD milking?

Switching from TAD to OAD milking will require some planning and an increased focus on mastitis detection. If the switch is made during lactation, the BMSCC will need to be able to accommodate a short-term increase in BMSCC, usually in the order of a doubling. This spike will calm down within a few days, but some cows may also develop clinical mastitis in this time.

In the long term, a switch to OAD milking will require dedicated attention to mastitis detection and treatment. OAD milking tends to magnify and expose deficiencies in mastitis management practices. Managing the BMSCC proactively, particularly in the second half of lactation, will be required in order to meet milk quality requirements.

The Waimate West Demonstration Farm (WWDF) comparison has provided valuable information on the impact of full- and part-season OAD milking on average BMSCC (Table 1) and trends in BMSCC throughout the season (Figures 2 and 3). While the average BMSCC rose slightly in the second year of the trial (2005-06 season) the OAD milking herd was below the district average for all but 3 pickups during the season (Figure 2). The BMSCC can be very sensitive to undetected cases of clinical mastitis, as depicted by the spike in cell count in late October in Figure 2. For the part-season OAD milking herd (Figure 3) the switch to OAD milking in late January

was followed by a period of higher and more variable BMSCC than the previous month and cell count rose slowly till the end of the season. Dry cow therapy in all years has been administered according to the SAMM plan.

Table 1. Average bulk milk SCC (cells/ml) for the last season (2003-04) on twice-a-day (TAD) milking, and the first 2 seasons (2004-06) with full- or part-season once-a-day (OAD) milking at the WWDF.

	2003-04	2004-05	2005-06
TAD	185 866	-	-
TAD/OAD	-	181 885	208 972
OAD	-	173 854	197 307

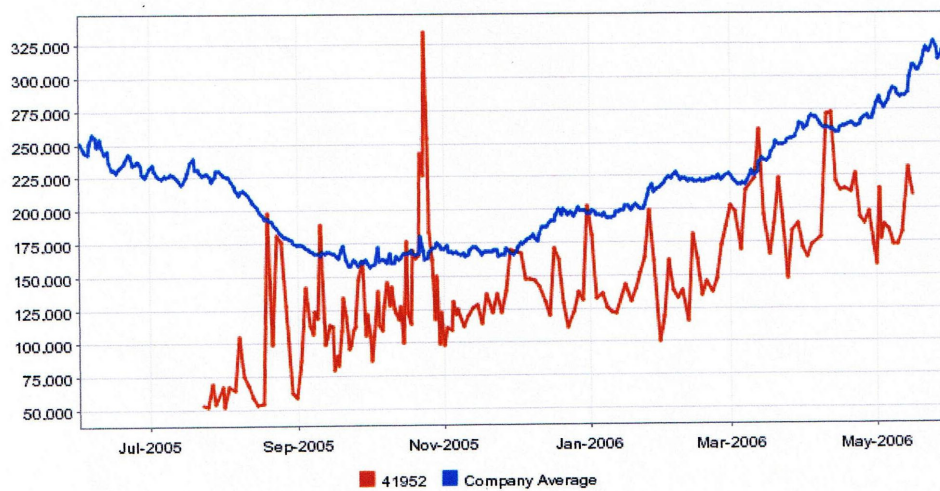


Figure 2. Bulk milk SCC (cells/ml) for the full-season once-a-day (OAD) milking herd at the WWDF during the 2005-06 season, compared with the dairy company average.

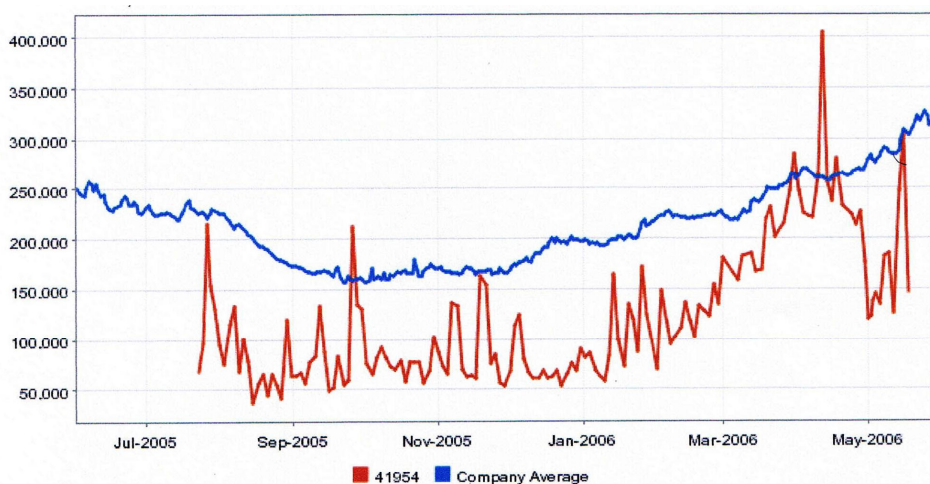


Figure 3. Bulk milk SCC (cells/ml) for the part-season once-a-day (OAD) milking herd at the WWDF during the 2005-06 season, compared with the dairy company average.

How do I manage and prevent mastitis on OAD milking?

Using teat spraying during lactation and improving the degree of teat coverage with teat sanitiser will reduce the risk of bacterial contamination on the teat end and, therefore, reduce the risk of mastitis.

The use of dry cow antibiotic therapy at the end of lactation will reduce the existing levels of infection and lower the risk of calving with mastitis in the following season. Starting the next season with a “clean slate” should make mastitis detection and treatment more manageable.

How do I detect and treat mastitis on OAD milking?

Cows with sub-clinical mastitis are a major contributor of somatic cells to the BMSCC. Detection via regular herd testing and use of SCC information will be an important tool for keeping SCC levels within appropriate levels. Cows with a high SCC should be checked for mastitis by stripping out the foremilk and examining for visual signs, or by using the rapid mastitis test (RMT), or by testing foremilk conductivity. Advice on sub-clinical treatment options should be sought from the veterinarian.

Treat clinical mastitis as for a cow being milked TAD. Antibiotic treatments with 12-hr treatment intervals should be avoided; they require extra labour and should be applied after milk removal only. As milk is removed from the udder only once daily there may be slight changes in the withholding periods required when using lactating antibiotic therapy. The veterinarian will be able to advise. No research has been conducted on antibiotic residue levels in milk from cows milked OAD.

Farmer case study – Rakaia Island Dairies

Rakaia Island Dairies adopted OAD milking in July 2004. They were acutely aware of the potential SCC issues associated with OAD milking, but have been very pleased with the SCC levels achieved. For herd 37463 (one third of the milk supplied), the average SCC for the last season on TAD milking was 172 285 cells/ml (Figure 4). This had increased to 202 235 cells/ml during the second season on OAD milking (Figure 5). In general, the farm has observed higher SCC at the end of the season with the Jersey herds compared with the Friesian and Crossbred herds. They have experienced no problems with curing mastitis. For cows with multiple infected quarters in spring they use Mastacillin, a practice they also adopted when milking TAD. Oxytocin is used on heifers holding their milk to ensure that all animals are completely milked out in early lactation.

One issue that has arisen with the adoption of OAD milking is an increase in the incidence of black mastitis. In their first season of OAD milking 12-15 cows out of 5000 developed black mastitis. This compares with 1-2 cases annually with TAD milking. Most of the cases occur in cows that have held their milk while in oestrus. While the incidence seems static it is an important health issue associated with OAD milking.

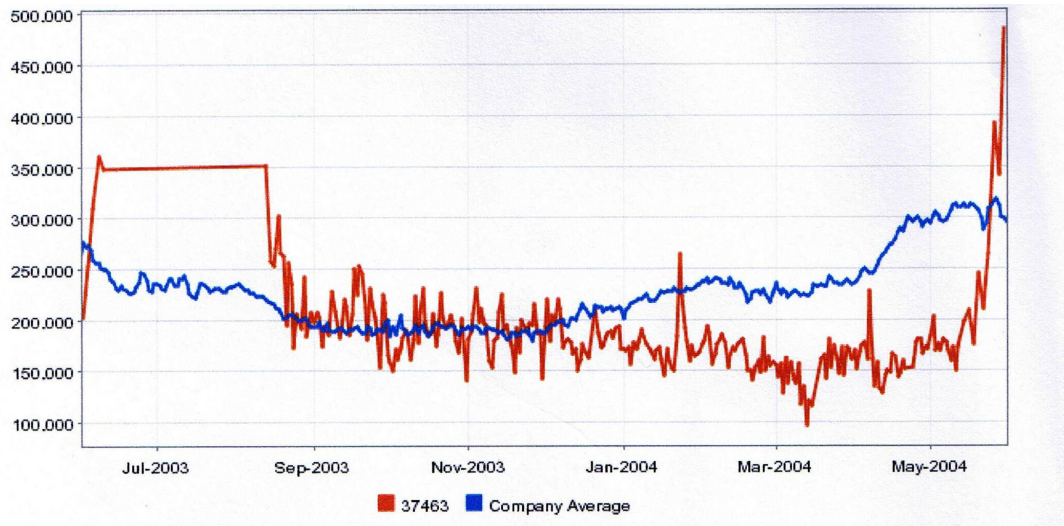


Figure 4. Bulk milk SCC (cells/ml) for herd 37463 at Rakaia Island during the final season on twice-a-day (TAD) milking, compared with the dairy company average.

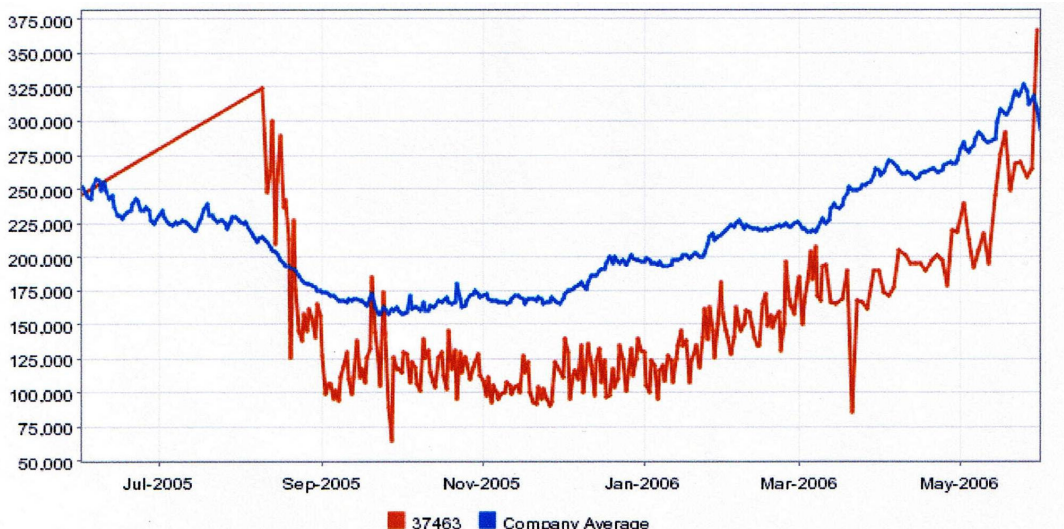


Figure 5. Bulk milk SCC (cells/ml) for herd 37463 at Rakaia Island during the second season on once-a-day (OAD) milking, compared with the dairy company average.

The farm now experiences a lower incidence of milk fever at calving which they attribute to cows being in better pre-calving condition. Magnesium supplementation has remained the same and milking cow minerals are used over the transition period.

Lameness has been almost eliminated with the adoption of OAD milking. On TAD milking the prevalence of lameness was very much dependent on the track conditions, however, at peak lactation it was not uncommon to have 40-50 cows out of 1200 in the lame mob. The annual incidence of lameness on TAD milking was about 5%. A manager recently had the dilemma of what to do with the 1 lame cow in the herd!! On TAD milking the cows were often reluctant to leave the shed and wouldn't go onto the yards. Consequently, more force was required to get them moving to the paddock. This is not an issue with OAD milking.

On TAD milking the farm spent 15.6 c/kg milksolids (MS) on animal health. This has reduced to 13.3 c/kg MS in the second season of OAD milking. Therefore, provided good mastitis management is in place, OAD milking can potentially reduce animal health problems and their associated costs.

References

Lacy-Hulbert, S.J.; Dalley, D.E.; Clark, D.A. (2005): The effects of once a day milking on mastitis and somatic cell count. *Proceedings of the New Zealand Society of Animal Production*, **65**: 137-142.