

Once-a-day Milking in Late Lactation

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Once-a-day (OAD) milking has been used as a management strategy for many years in New Zealand. Current records indicate that 4% of herds are milked OAD for the whole season, but many more farmers use OAD for part of the season. Generally, part season OAD is used during three key times:

- the colostrum period;
- through early lactation/mating;
- and, probably the most common use of OAD, from late lactation through to dry off.

The effect of part season OAD on cow performance differs depending on the timing and duration of OAD milking, as well as on various cow and feed management factors, such as breed and level of nutrition.

Late lactation OAD

If cows are switched to OAD milking from January onwards, daily milksolids (MS) production per cow will immediately decrease by approximately 10 – 15% (Table 1). For example, cows producing 1.5 kg MS/d in January would be expected to drop to 1.3 kg MS/d when switched to OAD milking. Generally, they will continue to produce about 10 – 15% less MS/d for the remainder of the season, compared with if they had continued to be milked twice daily.

The effect on whole season production will depend upon how much of the season's milk has already been collected (i.e., before the switch to OAD). In the Waikato region, if cows are calving in June/July and have already produced 70% of their seasonal production by January, switching to OAD until dry of will reduce whole season production by about 3-4% (Table 1).

The drop in production is also influenced by both cow and feed management factors, as discussed below.

Table 1. The milk production, body condition score (BCS), and feed intake response to part season once-a-day (OAD) milking in late lactation from January to dry off.

Milking cows OAD for 90 days	Difference (%)	Difference (unit)
Milksolids (kg/cow)		
Daily during OAD milking	↓ 10 -15%	↓ 0.15 kg MS/d
Total season	↓ 4%	↓ 10 – 20 kg MS
Next season	≡	0 kg MS
Days in milk	≡	0 days
BCS gain		
Total during OAD milking	↑ 180%	↑ 0.25 BCS unit
Dry matter intake		
Daily during OAD period	↓ 3%	↓ 0.5 kg DM/d
Total required for BCS gain during dry period	↓ 25%	↓ 40 kg DM

Cow factors

Cow breed affects the decrease in MS production when cows are switched to OAD.

Jersey cows are the most tolerant of OAD milking, i.e. they have a lower percentage MS loss when they are switched to OAD compared with Holstein Friesians. The tolerance of cross bred cows is in between.

However, even within each breed, there are individual cow effects. Some cows will continue to perform well on OAD milking while others can reduce MS production by up to 50%. Research has investigated several factors to try to identify a predictor of cow performance under OAD. Factors such as MS concentration, udder size and capacity, and cow Production Worth (PW) were investigated and while these can explain some of the variance in the MS loss under OAD milking, none of these factors explain the variance in individual cow response to OAD milking. Generally, however, cows that have a greater PW under twice-a-day milking will also produce more milk when switched to OAD milking.

Based on farmer experience and data from commercial whole season OAD herds, selective culling of individual cows that do not perform well when milked OAD (in addition to improvements in management strategies and decision making), results in smaller losses in production in future seasons when OAD milking is used.

Feed management

Feed management will also impact on the milk production response when cows are milked OAD.

Reducing milking frequency from twice a day to OAD acts from within the udder (mammary gland) to reduce the number and activity of the cells that secrete milk and milk components. This is a result of the negative feedback mechanisms that are initiated as milk accumulates in the udder.

In contrast, if feed intake is restricted, this acts from “outside the udder”, reducing the nutrients that are available for uptake by the milk producing cells in the udder. Therefore, when cows are milked OAD and underfed, there is an additional loss in MS production.

Consistent with this effect, if dry matter (DM) intake is increased in cows milked OAD, there is a positive milk production response. In a research experiment, DM intake was increased from 12 to 14 kg DM/d in cows milked OAD in late lactation and MS increased by 140 g, indicating a 70g MS/kg DM response. This is similar to the response predicted at this stage of lactation in cows milked twice a day.

Body condition score gain

Cows milked OAD during late lactation have a greater body condition score (BCS) at dry off, compared with those milked twice a day. In a research experiment, cows were milked OAD from mid-February until dry-off (3 months) and gained 0.4 BCS units compared with a 0.15 BCS unit gain in cows milked twice a day. The difference in BCS gain was not apparent until after 6 weeks of OAD milking. Cows milked OAD for 3 months were, therefore, 0.25 BCS units heavier at dry off (Table 1).

Anecdotal reports suggest that the greater BCS gain through late lactation will enable these cows to be milked on for longer; however, in the controlled research experiment there was no difference in days in milk between cows milked OAD and those milked twice a day (Table 1). This was because cows milked OAD were dried off based on low milk production decision rules (< 5 L milk/d for 7 days), whereas cows milked twice a day were dried off due to low BCS.

Although this means there is less BCS gain required during the dry period to reach BCS targets at calving, care must be taken in some herds to ensure cows are not overfat (> BCS 5.0) at calving as this increases the risk of metabolic diseases.

Dry matter intake

Milking cows OAD during late lactation results in a small decrease in DM intake (0.5 kg DM/d, which equates to 45 kg DM over the 90 day period (Table 1)). This amount is less than is often predicted, but is consistent with the reduced milk production and increased energy partitioned towards BCS gain.

The increased BCS at dry off will also reduce the DM intake requirements during the dry period to reach BCS targets at calving. Cows require approximately 160 kg DM pasture or maize silage to gain 1 BCS during the dry period. Therefore, on average, cows milked OAD during late lactation, require 40 kg DM less during the dry period to reach target BCS at calving (Table 1).

Somatic cell count

The rule of thumb when switching a herd to OAD in late lactation is to allow for a doubling of the bulk milk somatic cell count (BMSCC). Cows that have mastitis or high SCC should continue to be milked TAD or culled. The initial spike in BMSCC

reduces after 2 – 3 days, so an option for a herd that has a slightly higher BMSCC is to stagger the switch to OAD across the herd.

Animal health

The exact impact of OAD milking on animal health is hard to predict. If long walking distances or poor surfaces are causing lameness then OAD milking can help to reduce this. If temperatures and humidity are high enough to cause heat stress, removing the afternoon milking, where cows may be walking long distances in the heat, can alleviate heat stress. Furthermore, cows that are energy restricted (e.g. due to a feed deficit) are in a better metabolic state when they are milked OAD, and thin cows will gain more BCS. However, if these situations do not exist, then OAD milking will not impact on cow health or welfare.

Subsequent season performance

Cows milked OAD during early lactation, for 3 weeks or more, continue to produce less milk after switching to twice-a-day. This negative carry-over effect is due to the decrease in number and activity of the cells in the udder that secrete milk and milk components. In contrast, when cows are milked OAD during late lactation there is no carry-over effect into the next season/lactation. This is because the udder ‘resets’ itself during the dry period and old secretory cells are replaced with a new population of cells. Thus, there is no difference in production during early lactation between cows milked OAD or twice a day during the previous season.

Economics

There is no exact calculation that can be used to determine if the switch to OAD in late lactation is economical. The best way to determine this is to look at the benefits and losses in every situation and put a dollar figure on these for each individual farm. The benefits and losses of OAD milking in late lactation that farmers have provided are listed in Figure 1. For some of the costs and benefits, it is relatively easy to put dollar figures against them, such as the loss in milk production or savings from less feed required; however others, such as time spent with the family or not having to contend with flies on a hot summer’s afternoon, are hard to assign a dollar figure to and the value of these will vary for every individual.

Summary

OAD milking in late lactation is a management strategy that can be employed to reduce the demand on both cows and people during this period. There are benefits and losses associated with this management choice and the economics of this strategy must be calculated for each individual situation. The main considerations are:

- be proactive,
- monitor SCC, and

- if deciding to milk cows OAD, do it early enough to gain the benefits from increased BCS before dry-off (e.g. at least 6 weeks) and ensure there is still sufficient feed available for the herd.

Figure 1. Potential benefits and costs of part season once-a-day (OAD) milking in late lactation.

