

# Shortening the dry period for dairy cows

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The advice to dry off cows at six to eight weeks before calving dates back to the early twentieth century and has been applied in dairy farming ever since.

On the other hand, dry cow management becomes more and more an enormous challenge for farmers. Despite all efforts, the continued selection for high milk yields and the feed intake depression around calving inevitably results in a negative energy balance for high producing cows in early lactation.

The negative energy status increases the susceptibility of cows for metabolic and reproductive disorders in early lactation. Recently, it was shown that shortening the dry period improves the energy balance and consequently the health status of cows in early lactation. The main objection to shorter dry periods has generally been the reduced milk yield in the subsequent lactation.

However, the potential for improvement of cow health and fertility justifies further exploration of this strategy. In any case, it puts the question forward how long the dry period really needs to be?

To answer this, all consequences of a shorter dry period should be carefully evaluated.

## Function of the dry period

What exactly is the function of the dry period? Formerly, it was thought that cows needed a dry period to replenish their body reserves. Nowadays, the dry period is mainly considered to be important for the renewal of milk secretory cells.

During lactation, the milk secreting cell population is constantly changing due to formation of new cells (cell proliferation) and elimination of senescent cells (apoptosis). In dry cows, rates of mammary cell proliferation and apoptosis are increased to enhance replacement of senescent cells and maximise milk production in the subsequent lactation.

Shortening the dry period may reduce cell renewal in mammary tissue prior to parturition, which could explain the reduction in milk yield in the next lactation. However, the

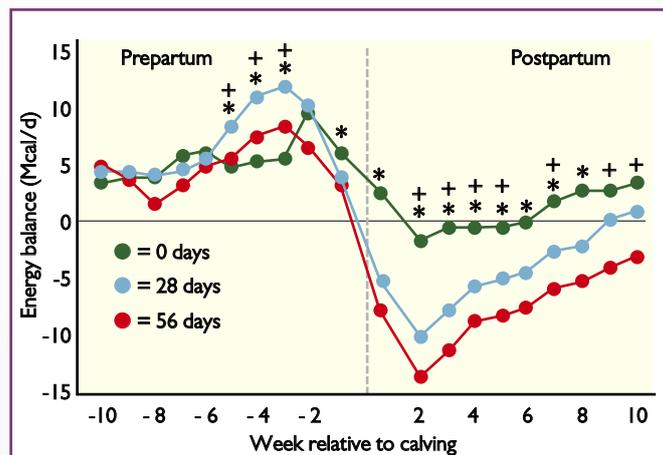


Fig. 1. Effect of dry period length (0, 28 or 56 days) on energy balance around calving (Rastani et al., 2005).

number of days dry required for an adequate recovery of mammary tissue has not been extensively studied. In any case, the need for a dry period of eight weeks lacks scientific validation.

## Milk yield and composition

When the dry period is reduced to four weeks, cows produce up to 10% less milk in the early phase of the next lactation. When cows are continuously milked, milk yield losses

amount to around 20% (Table 1).

Multiparous cows seem to be more tolerant to fewer dry days than heifers. As studies are scarce, it is difficult to draw conclusions on milk yield persistency, but there are indications that yield losses diminish when lactation progresses (Table 2). Total yield loss is expected to be only a few percent with a dry period of four weeks.

When calculating the financial consequences of a shorter dry period, it is obvious that the extra milk yield before calving at least partly com-

pensates the reduced milk yield in the next lactation (Table 3).

Moreover, milk from cows that had fewer days dry has a higher protein content and an increased protein to fat ratio compared to a traditional dry period.

Finally, shortening the dry period shifts milk production from the critical period shortly after calving to the weeks before calving, when the energy demand for milk production can easily be matched by the feed intake. It can be hypothesised that this favours cow's health and longevity, although long term effects of a reduced dry period length are still unknown.

## Health and fertility

Shortening the dry period improves the energy status of cows around calving (Fig. 1) by a higher feed intake, a lower milk yield and the prevention of overfattening before calving. It can be expected that the improved energy status will reduce the incidence and severity of metabolic disorders (for example fatty liver; Fig. 2).

However, due to the complex interrelationship between disorders, it is difficult to estimate the corresponding cost saving effect of an improved health status. Similarly, the relationship between shorter dry periods and fertility has not been examined frequently, although a shorter interval postpartum until first ovulation has been reported with a dry period of four weeks and continuous milking (Fig. 3).

## Mammary health aspects

The dry period is often used for the treatment of (sub)clinical mastitis. Conversely, new mammary infections can also occur in especially the first part of the dry period. Little is known about the effect of shortening the dry period on the incidence of mastitis in early lactation, but there are indications it has no adverse consequences. It is possible, that a tailor made recommendation

Table 1. Summary of results of studies in which cows had a shorter dry period or were continuously milked

Researchers	No. of cows	Days dry	Milk yield (kg/day)	Milk yield (% of control)	DIM
Sorensen et al. (1991)	237	30	22.0	90	1-84
		50	24.5	-	-
Gulay et al. (2003)	57	30	-	-	1-70
		60	-	-	-
Annen et al. (2004)	20	30	46.6	98	1-119
		60	47.7	-	-
Fernandez et al. (2004)	67	0	37.1	79	1-183
		40	46.3	98	-
		60	47.1	-	-
Rastani et al. (2005)	65	0	33.9	80	1-70
		28	37.9	89	-
		56	42.4	-	-
Andersen et al. (2005)	283	0	32.1	79	1-35
		56	40.9	-	-

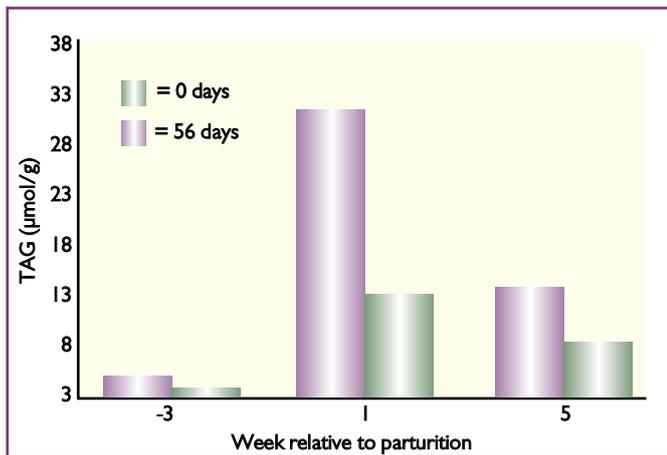


Fig. 2. Effect of a 56 day dry period versus continuous lactation on liver fat content (triacylglycerol, TAG) around calving (Andersen et al., 2005).

Continued from page 9 for individual cows is necessary, depending on their udder health status. A short dry period may be an option for animals with high milk somatic cell counts (SCC), provided that suitable, short-term mammary injectors are available. Continuous milking, on the other hand, may suit high producing cows with low SCC.

### Practical advantages

A shorter dry period or continuous milking has potential to ease cow management for a number of reasons. First, discrimination between

far off and close up groups is no longer necessary. Secondly, nutritional management on the farm will be simplified: cows can be kept on higher energy diets before calving, the risk of over feeding before calving is reduced and there are less ration transitions.

Thirdly, with a reduction in regroupings and different rations fed, cows will be exposed to less stressors just before calving. Fourthly, cows no longer need to be forced to dry off if they still produce considerable amounts of milk at eight weeks before calving. Finally, an improved energy status will reduce veterinary costs

Table 2. Effect of shortening the dry period on the 305 day milk yield of dairy cows.

Research	No. of cows	Days dry	Milk yield	Milk yield (% of control)	Days lactation
Bachman (2002)	34	34 57	9799 9978	98	1-305
Gulay et al. (2003)	57	30 60	9586 9700	99	1-305

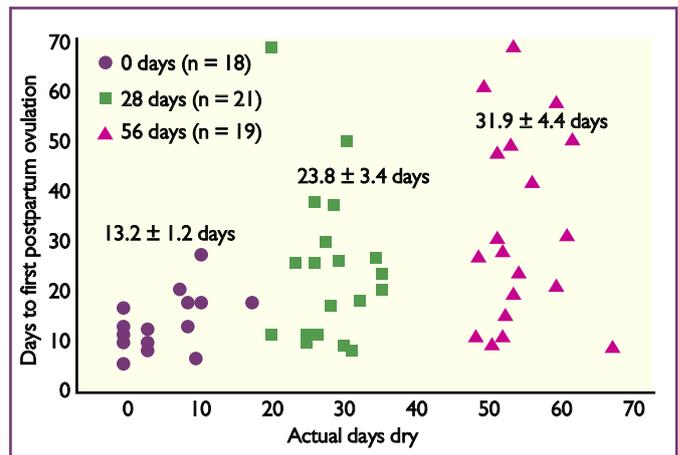


Fig. 3. Effect of the length of the dry period on the interval between calving and first ovulation (Gumen et al., 2005).

At this moment, it is not possible to determine the optimal dry period length for high producing dairy cows, because each cow probably needs an individual approach to achieve a healthy and sustainable production.

Moreover, effects on mastitis, colostrum quality, longevity and net farm returns still need to be addressed.

In addition, the shorter dry period strategy should also fit the individual farmer, as ration management and

insemination strategy has to be reconsidered as well. Finally, it is important to consider whether a maximal milk production is still the aim of dairy farming, especially when milk prices are low, health and longevity of cows are increasingly important for the profitability of the dairy farm.

Shortening the dry period may offer new perspectives supporting this view. In any case, experimental results justify the traditional dry period to be reconsidered. ■

Table 3. Compensation of yield losses after calving by additional milk produced before calving with a shorter dry period or with continuous lactation.

Rastani et al. (2005)	0 days	28 days	56 days
Milk production before calving (kg)	750	422	0
Milk production 1-70 days in milk (kg)	2373	2653	2971
Total	3123	3075	2971
Andersen et al., 2005	0 days	49 days	-
Milk production before calving (kg)	438	0	-
Milk production 1-35 days in milk (kg)	1124	1432	-
Total	1562	1432	-