

Dry-off abruptly taking steps to reduce yield

The method used to dry-off cows can influence how many udder infections establish during the dry period.

[Technote 14](#) describes the closure of the teat canal during the dry period.

The aim is to shut down milk secretion and seal the teat canal as rapidly as possible – this usually takes about two weeks. Most new infections occur in quarters where the teat canal has not sealed.

16.1 Dry-off cows as soon as their production reaches 5 L or less per day.

A cow producing less than 7 L/day is trying to dry herself off. Continued milking of these cows prevents teat plug formation and makes them more prone to new quarter infections.

Cows producing less than 5 L/day may significantly increase bulk milk cell counts (BMCC), even when they do not have mastitis, due to cells concentrating in the reduced volume of milk. Furthermore the quality of milk from low-producing cows at the end of the season can cause processing problems for some dairy products due to changes in milk composition (especially serum protein) and increases in cell counts. To avoid adverse effects on milk quality, scientists in New Zealand recommend that cows be dried-off if milk yields fall to 5 L/day (Lacy-Hulbert et al 1995). This practice may also reduce the likelihood of mastitis infections at the following calving (Natzke et al 1975).

Confidence – High

The consequences of milking cows with low milk yield on milk quality and udder health are well documented.

Research priority – Low

Confidence – Moderate

There is widespread field experience with drying-off high producing herds in Australia and overseas.

Research priority – Low

16.2 Cease milking cows producing 12 L or less per day at drying-off.

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16.3 Take steps for cows producing more than 12 L/day, to reduce production to 12 L or less by the drying-off date. These steps involve reducing food intake and changing routine.

Dairy advisers need to emphasise the importance of planning for drying-off – so that farmers implement management changes for high producing cows with at least one week's lead-time before the drying-off date, and organise for the cows to go to clean paddocks immediately after drying-off.

Cows that are still producing more than 12 L of milk near drying-off time pose a considerable problem for producers and require special management if they are to spend 6-8 weeks dry and attain their production potential in the following lactation. The Countdown recommendations to take high-producing cows off concentrate feed and to change their environment to assist the drying-off process are consistent with those of the National Mastitis Council in the United States.

Involution of udder tissue is accelerated if the plane of nutrition is reduced prior to drying-off. This can reduce milk yields by up to 30% and is a more effective management tool for reducing milk yields of high producing cows than once daily milking (Holmes et al 1996, Lacy-Hulbert et al 1995, Lacy-Hulbert et al 1999). In high producing cows it is recommended that supplementary feed, especially concentrates, ceases at least one week before drying-off. This requires a balance in the ration to achieve the reduction in milk yield while maintaining sufficient energy for a cow that is 7-8 months pregnant.

As a guide to feeding, a 500 kg cow requires about 55 megajoules per day (MJ/day) to maintain body condition. Her energy requirements increase in the last two months of pregnancy.

Energy requirements of a 500 kg cow

A 500 kg cow	Energy requirements* (MJ/day)
Maintenance	55
7-8 months pregnant	70
A week before calving	80

* Where good quality hay is about 8.5 MJ/kg, pasture or grain is about 12 MJ/kg dry matter.

At the end of lactation, feed or water deprivation results in marked decreases in milk production and proportional increases in somatic cell counts (Harmon 1994). Water must not be restricted to comply with animal welfare codes. Furthermore, veterinarians in some districts have reported outbreaks of salmonellosis associated with restricted water intake.

Management changes, such as grazing cows in different mobs or unfamiliar paddocks or altering their routine, can accelerate drying-off.

16.4 Dry-off abruptly; do not skip days and preferably do not skip milkings.

Cows should be milked as usual at each milking until drying-off. Intermittent milking provides a stimulus to produce milk and impedes sealing of the teat canal. The risk of mastitis is greatly increased if cows are milked every second day (Zecconi et al 1995).

The impact of once daily milking on mastitis status has not been established, although it had no significant effect in a New Zealand study (Holmes et al 1996).

16.5 Don't leave cows in laneways or yards immediately after drying-off.

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16.6 Put the cows in a dry, clean paddock (not heavily soiled with manure, no bare ground, no exposure to dairy effluent) for 3-4 days after drying-off.

It is important to minimise the number of bacteria on teats by teat dipping after the last milking and not allowing cows to lie down on bare ground or areas that are soiled with manure in the two hours immediately after Dry Cow Treatment is given.

This is because the load of coliforms and streptococci in the environment are important predictors of new infection rates. Although the keratin plug makes the teat canal more resistant to penetration for the first three weeks of the dry period (measured by water pressure needed to open the canal), O'Brien (1989) says the canal is not well closed until four days after drying-off and that cows are particularly susceptible to infection during this time.

Pseudomonas mastitis infections are usually associated with contaminated water supplies and outbreaks have been recorded in situations where cows lie in wet conditions in the first few days immediately after drying-off. These infections may be very severe (often fatal) and virtually impossible to treat.

Rapid formation and maintenance of a teat seal will help prevent new infections (Capuco et al 1992, Williamson et al 1995). Keeping cows in a clean paddock well away from the milking herd and milking area reduces the possibility of triggering milkejection and therefore assists plug formation. An additional benefit of keeping cows out of the milking shed is that there is no chance that cups are mistakenly attached.

Confidence – High

It is clear that milking must occur every day prior to drying-off to minimise infection.

Research priority – Moderate

It is not clear if 'once-a-day' milking affects the risk of mastitis infection. Research to investigate methods of late lactation management to minimise cell counts and new mastitis infections could be of benefit.

Confidence – High

Experimental observations have shown the importance of the defence mechanisms of the teat canal at drying-off, and findings are consistent with field observations.

Research priority – Low

It is possible that use of teat sealants may lead to relaxation of the current critical requirement for a clean dry environment at drying-off.

16.7 Continue the 'maintenance only' diet for another 3-4 days for cows that were producing 12 or more litres/day in the week before drying-off.

Section 16.3 discusses maintenance requirements and diet changes at drying-off.

Key papers

- Capuco AV, Bright SA, Pankey JW et al. Increased susceptibility to intramammary infection following removal of teat canal keratin. *J Dairy Sci* 1992;75:2126-2130.
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- Natzke RP, Everett RW, Bray DR. Effect of drying off practices on mastitis infection. *J Dairy Sci* 1975;58:1828-1835.
- O'Brien BJ. Teat canal penetrability and mastitis. *Farm Food Res* 1989;20:6-7.
- Williamson JH, Woolford MW, Day AM. The prophylactic effect of a dry-cow antibiotic against *Streptococcus uberis*. *NZ Vet J* 1995; 43: 228-234.
- Zecconi A, Moroni P, Piccinini R, Ruffo G. Influence of some individual and management factors associated with drying off on bacteriological cure rate of the bovine mammary gland. *Milchwissenschaft* 1995;50:433-435.