

TECHNOTE

15

Cull persistently infected cows

Culling infected cows is a key strategy in mastitis control as it is the only way to eliminate some infections.

Antibiotic Dry Cow Treatments (DCT) do not cure all infections despite the potency of the formulations. The likelihood that DCT will eliminate bacterial infections decreases with increases in the chronicity and degree of infection, the age of cows, and the presence of *Staph. aureus* (Buddle *et al* 1987, Sol *et al* 1994).

Results from a comparison of two dry cow antibiotic formulations in New Zealand (McDougall, 2010) showed lower bacteriological cure rates for cows with *Staph. aureus* infections (62 or 75%) when compared with minor pathogens or *Strep. uberis* infections (>89%). Lower cure rates were observed for cows of ≥ 8 years in age compared to cows of ≤ 4 years (89% versus 94% respectively).

A survey of NZ herds with high quality records (Xu and Burton 2003) found that udder or mastitis-related reasons for culling accounted for 10.4% of the culled cows, third highest behind infertility and low production.

Although culling is an important mastitis control tool, it is an expensive option and cell count problems will only be solved if concurrent measures are taken to prevent new infections. Halassa *et al* (2009) reported that culling was the most important factor contributing to the annual costs of mastitis for a herd, and these culling costs were most pronounced for mastitis caused by *Staph. aureus* mastitis.

15.1

Consider culling any cow when you find her third clinical case for this lactation.

Treatment is less likely to be successful in cows that have had multiple cases of mastitis, with reported cure rates of 75% for first cases, 45% for second cases and 12% for cows being treated for the third time in NZ (NMAC, 2000).

Confidence – High

Between 1-2% of total cows in the herd, culled annually for reasons directly related to mastitis, appears to be a realistic and practical benchmark.

Research priority – Low

The SmartSamm Gap Calculator allows a herd's culling performance for mastitis to be compared with industry targets.

New Zealand studies have found that the bacteriological cure of quarters with clinical mastitis varies depending on the:

- causative pathogen (approximately 70 to 90% for *Strep. uberis*, and 30% to 40% for *Staph. aureus*),
- age of cow (88% for 2 year olds compared to 71% for cows ≥ 7 years), and
- number of days from calving at diagnosis (84% for cases on the day of calving versus 68% for >7 days since calving) (McDougall *et al* 2007a; McDougall *et al* 2007b).

Overseas findings are similar, with cure rates for *Staph. aureus* mastitis decreasing with increasing cow age, increasing SCC, increasing duration of infection, increasing colony counts of bacteria in the milk, increasing numbers of quarters affected and for rear compared to fore quarters and presence of beta-lactamase producing genes in the bacterial isolate (Barkema *et al* 2006; Sol *et al* 1994).

There is general industry agreement that it is uneconomic to keep recurrent clinical mastitis cases in the herd. If three clinical episodes occur in a single quarter, a practical solution may be to dry off the quarter for the rest of the lactation, until she is culled.

15.2

Consider culling cows with high cell counts in two consecutive lactations.

High cell counts in two consecutive lactations, despite antibiotic DCT in the intervening dry period, indicate possible extensive or refractory infections. Cows that are unlikely to cure should be considered for culling if this action is economically justifiable. Bacterial cultures can help justify this decision.

Whether or not it is economic to cull high cell count cows depends on:

- their impact on the bulk milk SCC and consequently on the milk payment;
- the risk of mastitis spreading to other cows in the herd; and
- the cost of replacement cows.

Before culling, always check the history of the cow. Those that have had a very high cell count in only one lactation are candidates for antibiotic DCT, rather than immediate culling.

Note that the SmartSAMM Mastitis Focus report identifies the number of cows that have had a high SCC ($>150,000$ cells/mL) for **three** consecutive lactations, despite intervening antibiotic DCT. These represent cows that have had multiple opportunities to cure and are therefore high priority culls.

Acknowledgements

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Confidence – High

Treatment is less likely to be successful in cows that have multiple mastitis episodes.

Research priority – Low

The “culling to control mastitis” box on the SmartSAMM Mastitis Focus indicates the effectiveness of the culling policy in the herd.

Technote 4.13 discusses the options for drying off chronically infected quarters.

Confidence – High

High cell counts in two consecutive lactations, with intervening Dry Cow Treatment, indicate chronic infections or cows that are highly susceptible to reinfection.

Research priority – Low

Technote 12.1 shows how to calculate the impact of high cell count cows on penalties for bulk milk SCC.

Technote 8.3 discusses segregation of infected cows.

These SmartSAMM adapted resources are made available to NZ dairy farmers and advisors through a Memorandum of Understanding between Dairy Australia and DairyNZ.

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Key papers

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