Doc, Teat Sealants Don't Work at our Farm!

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In the summer of 2019, the bulk tank somatic cell count of a local dairy farm suddenly increased from the low to mid-200,000 range to above 340,000. We blamed it on new cases of mastitis associated with the heat/flies/humidity of summer, and expected it to go down with the cooler fall weather. By mid-October, the count was still running just under 300,000, so we decided to investigate a bit more.

The first step was to determine which cows (and how many) were contributing to the problem. This information can then be fed into the Mastitis Risk Assessment Management Program (RAMP) available on the www.SCC200.ca website (under the "identifying risks for mastitis" link), and comparing it to Ontario averages.

Fortunately, this producer was on a regular milk recording so we were able to quickly generate the necessary data (in chart below).

Test Date	July 2019	August 2019	September 2019	October 2019	December 2019	Target (or top 10% in Ontario)
New	7 (8%)	5 (4%)	10 (9%)	6 (6%)	3 (3%)	3 to 5%
Hi-Fresh	6 (16%)	5 (36%)	6 (43%)	2 (13%)	3 (23%)	10 to 15%
Chronic	18 (10%)	17 (15%)	20 (18%)	19 (17%)	17 (15%)	5%
DHI HA BTSCC	340,000	276,000	250,000	292,000	163,000	<120,000

Definitions:

New = New infections (percent of all cows over 200,000 that were under 200,000 on the previous test). Doesn't include fresh cows.

Hi-Fresh = Percent of cows that have a SCC over 200,000 and this is their first test in this lactation.

Chronic = Percent of cows that have a SCC over 200,000 in both this test and their previous test.

DHI HA BTSCC = The calculated herd average bulk tank SCC on test day.

If a herd isn't on a milk recording program, you need to examine individual cow treatment records and count the number of cases being treated each month. You also need to determine the number of days in milk each cow was when treated, attempting to find a pattern as to when the mastitis is occurring during the lactation.

The new infection rate for the herd had been acceptably close to the target range. The chronic mastitis group in this herd was higher than desired, but didn't change much over summer/fall. There were several "pet" cows in the herd that had chronic high SCC counts, but milked well and were helping to fill quota.

We were most concerned about the number of fresh cows that were developing mastitis in the first month after calving. This is one of the most common sources of elevated bulk tank Somatic Cell Counts (SCCs).

After additional investigation of DHI data, the fresh cow SCCs were averaging between 400,000 and 542,000! The recommended dry cow protocol was to use blanket dry cow antibiotic treatment followed by an internal teat sealant.

They had been short on straw inventory in spring 2019, so had reduced the weekly dry cow bedding amount by approximately 1/3 to try to stretch it out. The cleanliness of the fresh cows had gotten worse, so the cows were being exposed to more mastitis pathogens on their teat ends during the dry period. It was mid-October when we worked on the mastitis problem, so we were able to immediately increase the bedding as new straw inventory was available. The reduction in the Hi-Fresh numbers at their test 2 weeks later was obvious.

I suggested that the teat sealant should have been protecting the cows when the pen was dirtier, and that's when I was told that they had discontinued using it. The producer had continued to use blanket dry cow antimicrobial therapy. The producer reported that they had stopped using teat sealants "because they didn't seem to be working in the herd".

The producer elected to wait for a bit before re-starting teat sealant use. As luck would have it, the December DHI test showed a bulk tank SCC of 163,000 and a reduction in average first test SCC to 365,000. This was still too high for my liking, but the farm decided to monitor the situation a little longer. The January 2020 test provided the impetus to change, with the bulk tank climbing back to 363,000 and fresh cows averaging again above 400,000. This was despite much better cleanliness of the cows calving in.

A pail of teat sealant went out the late January, with the caution that we shouldn't expect a significant SCC drop until the treated dry cows calved. By mid-April 2020, the fresh cows showed a positive response, dropping to 231,000 average. The June 2020 calving group continued the trend, averaging 191,000 SCC at first test.

There were other factors contributing to fresh cow mastitis on this dairy. Fresh cows were housed together on a group pack for the first few days, and the cleanliness level of the pen was variable. When several cows calved at once, there wasn't always an opportunity to add additional straw. It is easy to test the cleanliness of a bedded pack – If you go onto your knees in a few areas of the pen – you shouldn't have wet manure soak through your coveralls. There were several times that I visited this dairy and would have been reluctant to perform this "test" after looking at the pen.

With increasing awareness of antimicrobial use on dairy farms, there has been a push to change from blanket dry cow therapy to selective antibiotic dry cow therapy. Producers are encouraged to discuss with their herd veterinarian to determine if they are good candidates for a selective dry cow therapy program.

Research tells us that cows are very susceptible to acquiring new udder infections in the first 2 weeks after dry- up, and a few weeks prior to their next lactation. These infections show up as mastitis and elevated Somatic Cell Counts (SCCs) up to a month after calving.

Dry cow antimicrobials do a very good job at treating and preventing many infections in the first few days of the dry period, but have no bacteria-killing activity beyond that time. Properly applied teat sealants can eliminate new infections in both high-risk periods. This has led many producers to administer a teat sealant after inserting a dry cow antibiotic. Using both antibiotic and sealant may be a wise decision in cases where a cow is being dried off with an active case of mastitis or a high SCC, but does substantially increase the cost of dry cow therapy. If the cow has no pre-existing infection and is at low risk of having bacteria enter her teat ends in the early dry period (clean, dry pen), the antibiotic will have no additional benefit.

There are definitely some difficulties in achieving the "properly applied teat sealant" status that I mentioned above. A high level of milk production (ie >15 kgs of milk on dry off day) makes it more likely that milk leaking, open teat ends and potential loss of sealant will occur after dry off. Reducing the energy content of the ration and milking frequency over a period of 10 to 14 days can help drop the level of milk production. Producers that fail to adequately disinfect the teat end prior to injecting teat sealant will also encounter less than ideal results.

A major concern regarding the use of teat sealants is ensuring that they are removed completely after calving. Complaints of "gumming up" milking equipment and teat sealants impacting cheese quality are valid and can't be ignored. In some cases, teat sealant residue can persist in the milk for up to 10 days! Aggressive hand stripping (approximately a dozen squirts per quarter for 3 to 4 days) prior to milking does mitigate this risk. This isn't always an easy task, especially in robotic milking systems. Additional research in this area is ongoing so that, hopefully, we will have new workable solutions to these problems in the near future.

Visit the website www.scc200.ca for more details and suggestions on herd mastitis evaluation and teat sealant use.