Introduction

Somatic cell count is one of the key indicators of udder health and has a major impact on milk production and farm costs. The DeLaval ICC mobile device allows for somatic cell count testing to be performed anywhere – without the need for specialized bulky machinery and at a price that is a fraction of the cost of sending samples to the lab. Using the DeLaval ICC, a combination of one or more of the following user strategies can be implemented in your dairy operation.

1. Bulk Tank Sampling

Plotting the bulk tank somatic cell count (BTSCC) on a daily basis lets you view the ongoing status of the herd’s cell count. It indicates if the trend is flat, increasing or decreasing. It can also highlight short-term changes that may be related to known causes such as mechanical issues or a change in the milking routine. This ongoing view makes the situation clear to management and the milking staff. If a problem appears, everyone should discuss it and determine what needs changing.

A cow’s milk somatic cell count will normally vary day-to-day by at least 10 percent. This daily swing represents a normal biological variation and is typically unrelated to a specific mastitis condition. The BTSCC also fluctuates within a range that reflects normal day-to-day variation for the overall herd. Determining when ‘real’ BTSCC changes occur is important. These may be short-lived major swings caused by some short-term issue, or they may be a gradual and persistent movement away from the average value. When these occur in sufficient cow numbers, it can cause the average BTSCC to move beyond the limits of normal biological variation. If this trend occurs over an extended period, it indicates a real problem which must be examined to determine a cause.
DeLaval Cell Counter ICC
User Strategies Guide

2. String Sampling

When large herds develop cell count problems, the first approach in identifying the source is to determine whether it is mainly in a particular string or batch. String sampling and testing can help determine if a string is normal or experiencing difficulties.

String sampling is a smaller unit to measure than the BTSCC and contains a blend from several strings of cattle. A string sample can be obtained using an in-line sampling device inserted in the milk transfer line past the milk pump.

As milk is pumped through this line, a proportional milk sample can be collected from a particular string of cows. This sample is a representative sample of all the cows in the string. The collected sample can be tested with the ICC to determine the cell count and based on that count, decisions can be made. If the string sample’s SCC is acceptable, no action needs to be taken with the string. If it’s unacceptable, closer screening of that string will be needed to determine the high cell count cows. These cows can then be sampled for bacterial determination and a treatment strategy can begin.

A concern for dairies is that contagious pathogens such as Staph aureus or mycoplasma species may gain entry and rapidly spread from cow to cow. The more cows that become infected, the greater the likelihood of others becoming contaminated as it spreads on the liners and milkers’ hands. The rate of spread is dependent on the number of infected cows and duration of infections, so the sooner it can be identified, treated and stopped, the better.

3. Fresh Cow Strategies

Testing quarter or whole udder samples three to four days after freshening can help determine the infection status early in lactation. This can be done with the California Mastitis Test (CMT), but results are often too subjective to clarify the true status of the quarter – especially if the cell count is in the 200,000 to 600,000 range.

A case of clinical mastitis that develops in early lactation is a major setback. Such cows have to be treated and their milk discarded, so their maximum peak milk output is reduced.

Consider testing the cell count status of all quarters of all fresh cows using the ICC. Those with a count of more than 200,000 at day three can be treated and the milk withheld until the antibiotic has cleared. The aim is to eliminate new infections early when they are more easily treated and the cows have not yet been assigned to their milking string.

Much less individual attention can be paid to each cow once she is in the regular milking string. If she develops an infection at this stage, it is more difficult to find her, pull her from the milking string and treat her.
Somatic cell counts can be checked quickly and accurately at dry-off and around calving (three to four days post-calving) with the ICC. The objective is to determine which cows are possibly infected with mastitis based on elevated cell counts. Use the ICC test at the end of lactation to screen cows with a single SCC test - or two tests - at more than than 400,000. Selectively treat any suspect quarters for a few days before drying off the cow normally, dry treating all four quarters.

Heifers raised as replacements incur substantial costs during their first two years and will not have repaid their investment until close to the end of their first lactation. If they develop mastitis and lose a quarter, their value drops to that of a cull cow. If they are treated and kept milking, they produce less total milk and this delays the point when they are profitable.

Heifers’ mastitis status should be tested soon after calving. Staph aureus is a mastitis-causing bacteria that can do significant damage if not treated and eliminated early in the infection cycle. Monitoring the somatic cell count soon after calving provides a reasonable indication of whether or not the heifer has a mastitis problem.

Heifers with a high cell count need to be tested to determine the species of infecting organisms and then treated immediately.

The earlier infections are detected and dealt with, the more successful treatment will be. The ICC allows heifers to be tested within three to four days of calving to determine their somatic cell count. This allows early detection of problem animals, as well as earlier follow-up and treatment. The result is a lower likelihood of mastitis-causing heifers to be culled.
6. Screening Purchased Cows/Heifers

Purchased cows infected with Staph aureus, Strept agalactiae or mycoplasma will cause a serious problem once they are integrated into the main herd. These organisms are highly contagious and spread quickly. They can infect many cows in an uninfected herd if precautions are not taken.

Cows with abnormally high milk somatic cell counts should be considered suspicious. An additional milk sample should be taken and tested to determine what bacteria species may be involved in causing the elevated cell counts. These animals should remain at the seller’s location until the bacteria test results are available. If the cows have been moved to the new farm, they should be separated from the main herd until their infection and SCC status is determined.

It is beneficial to test cows before purchase by using the ICC to determine if their cell counts are normal. This can also be done by sellers to assure potential buyers they are not selling infected cattle. It would be appropriate for buyers to always do an independent test even if the seller provides this information.

Another less complicated approach is to sample from the bulk milk on farms where cattle will be purchased to determine if the cell count is low or high. A high count is a warning signal while a low count provides evidence that mastitis problems may be minimal. Check past BTSCC records to determine if there has been an ongoing problem.

7. Sick Pen and Hospital Barn Monitoring

The first hurdle to cross with cows treated with intramammary antibiotics is determining when the milk is free of residues. The next decision is based on the overall response to treatment. If the cell count in the affected quarter(s) was high prior to treatment, it should be somewhat lower after treatment.

Returning cows to the milking string before the clinical symptoms have improved puts milk with very high cell numbers into the tank. In a small herd, one or two such cows may significantly elevate the BTSCC.

Occasionally, the cell count remains high or rises higher than when the cow was first treated, so it is dangerous to return her to the regular milking string without checking her cell count status. This may have occurred because the treatment failed so another round of treatment, drying off the quarter or possibly culling the cow is needed. Another common occurrence with clinical mastitis is that cows may develop a second infected quarter, so clinical cases have to be monitored closely.

Hospital barns and “sick pens” typically hold cows being treated for a variety of ailments including mastitis. Unfortunately, sick pens are a potential source for spreading disease. Cows that enter the sick pen for one problem may encounter another while in there. For this reason, it would be wise to check every cow scheduled to leave the sick pen with the DeLaval ICC.

Each cow entering the sick pen should be screened for somatic cell counts. Before release, she should be tested again to be certain she has improved – especially if it was mastitis that put her in the sick pen initially.
Using the ICC to test each tank of milk gives quantitative cell count records which can be shared with your milking staff. The tank’s daily cell counts can be plotted in a spreadsheet or wall chart so that everyone can see the current status and any changes over time. Initially, the subject needs to be discussed with the milking staff so they understand the relationship between milking procedures, mastitis and cell counts based on ICC measurements. Once an average BTSCC has been determined based on historical data, a cell count target needs to be established. Everyone needs to understand and accept the goal, then determine what changes need to be implemented to accomplish it.

BTSCC monitoring using the ICC is an objective way to assess overall mastitis control efforts and monitor developments over time. Once a cell count goal has been met, the objective should be to maintain it and search for a new goal. The ultimate objective is to minimize mastitis problems and gain maximum bonus payments for high quality milk.

Using the ICC to test each tank of milk gives quantitative cell count records which can be shared with your milking staff. The tank’s daily cell counts can be plotted in a spreadsheet or wall chart so that everyone can see the current status and any changes over time.

Initially, the subject needs to be discussed with the milking staff so they understand the relationship between milking procedures, mastitis and cell counts based on ICC measurements. Once an average BTSCC has been determined based on historical data, a cell count target needs to be established. Everyone needs to understand and accept the goal, then determine what changes need to be implemented to accomplish it.

BTSCC monitoring using the ICC is an objective way to assess overall mastitis control efforts and monitor developments over time. Once a cell count goal has been met, the objective should be to maintain it and search for a new goal. The ultimate objective is to minimize mastitis problems and gain maximum bonus payments for high quality milk.

8. Milk Quality – The Team Approach

Using the ICC to test each tank of milk gives quantitative cell count records which can be shared with your milking staff. The tank’s daily cell counts can be plotted in a spreadsheet or wall chart so that everyone can see the current status and any changes over time. Initially, the subject needs to be discussed with the milking staff so they understand the relationship between milking procedures, mastitis and cell counts based on ICC measurements. Once an average BTSCC has been determined based on historical data, a cell count target needs to be established. Everyone needs to understand and accept the goal, then determine what changes need to be implemented to accomplish it.

BTSCC monitoring using the ICC is an objective way to assess overall mastitis control efforts and monitor developments over time. Once a cell count goal has been met, the objective should be to maintain it and search for a new goal. The ultimate objective is to minimize mastitis problems and gain maximum bonus payments for high quality milk.

DeLaval ICC – User Strategies In Summary

**Bulk Tank Sampling**
- Monitor daily bulk tank status and milk shipments quickly.
- Reduce the risk of losing milk quality premiums.
- Opportunity to act early if the BTSCC trend is increasing
- Determine destination shipments based on milk quality.
- Track daily monitoring on a spreadsheet or wall chart.

**Dry Cow Strategies**
- Test problem cows at dry off.
- Determine if a cow should have additional treatment instead of normal dry cow treatments.
- Record results for fresh cow monitoring.
- A dairyperson may decide not to give dry cow treatment to cows with a low SCC and no mastitis history.

**String Sampling**
- When BTSCC trends are outside normal variances, string sampling will help show were the problem originated.
- Determining and building a history of SCC counts per group helps to determine any changes occurring.
- Milking teams can be notified to look more closely for suspicious cows.
- Pens or groups are monitored on weekly basis using an inline sampler.
- Action can be determined for any string or pen exhibiting a high SCC.

**Fresh Cow Strategies**
- Use the ICC device on each fresh cow three to four days after calving.
- Further treatment can be determined.
- Animals with a high SCC should be further evaluated to determine the infecting organisms.
- Develop fresh cow/heifer monitor programs with ICC information to determine high SCC cows.
- Addressing fresh cow/heifer mastitis problems early – before they are released into the general herd – will help prevent more costly problems.

**DeLaval ICC – User Strategies In Summary**

**Bulk Tank Sampling**
- Monitor daily bulk tank status and milk shipments quickly.
- Reduce the risk of losing milk quality premiums.
- Opportunity to act early if the BTSCC trend is increasing
- Determine destination shipments based on milk quality.
- Track daily monitoring on a spreadsheet or wall chart.

**Dry Cow Strategies**
- Test problem cows at dry off.
- Determine if a cow should have additional treatment instead of normal dry cow treatments.
- Record results for fresh cow monitoring.
- A dairyperson may decide not to give dry cow treatment to cows with a low SCC and no mastitis history.

**String Sampling**
- When BTSCC trends are outside normal variances, string sampling will help show were the problem originated.
- Determining and building a history of SCC counts per group helps to determine any changes occurring.
- Milking teams can be notified to look more closely for suspicious cows.
- Pens or groups are monitored on weekly basis using an inline sampler.
- Action can be determined for any string or pen exhibiting a high SCC.

**Fresh Cow Strategies**
- Use the ICC device on each fresh cow three to four days after calving.
- Further treatment can be determined.
- Animals with a high SCC should be further evaluated to determine the infecting organisms.
- Develop fresh cow/heifer monitor programs with ICC information to determine high SCC cows.
- Addressing fresh cow/heifer mastitis problems early – before they are released into the general herd – will help prevent more costly problems.
DeLaval ICC – User Strategies Guide

DeLaval ICC – User Strategies In Summary (Continued)

Screening Purchased Cows/Heifers
- Obtain bulk tank samples to determine if there are problems with the herd. Compare to the previous BTSCC.
- Cows with abnormally high somatic cell counts should be considered suspicious.
- Cows infected with contagious pathogens like Strep Ag, Staph Aureus and Mycoplasma can lead to major problems.
- Cows with abnormally high counts should be segregated for further evaluation and treatment.

Sick Pen and Hospital Dismissal
- When testing the milk for residues, you can also test the sample with the ICC.
- To protect milk quality, no cow’s milk should be allowed back into the tank unless it’s proven she has healed from an infection.
- Did the clinical mastitis treatment have any effect? Is her SCC level low enough for the bulk tank? Status can be monitored and recorded.
- Get cows back from treatment as early as possible.

Milk Quality – A Team Approach
- The dairyperson will set SCC goals that have a real economic impact on the dairy’s income - to achieve bonus programs or reduce deductions for SCC counts.
- Get employees involved so they all understand the dairy’s goals.
- Use the ICC to sample every milking session and to compare SCC counts between milking sessions.
- Develop a strategy for milking practices and routines for high milk quality.
- Communicate the dairy’s SCC goals and track them in a spreadsheet or wall chart.