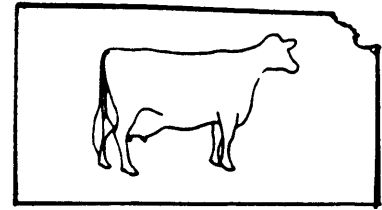




FOCUS ON DAIRY



Characteristics of Low Somatic Cell Count (SCC) Herds

Mastitis continues to be the most costly and perplexing disease facing dairy producers. While clinical mastitis (abnormal milk) is easily detected, the major loss is due to subclinical mastitis when milk appears normal to the eye but the udder is still infected. Subclinical mastitis can only be detected by bacterial culture or the somatic cell count (SCC). There is a high correlation between SCC and rate of infection. Consequently, routine SCC on each cow in the herd is an effective monitor of the degree of subclinical mastitis and is an excellent management tool to evaluate a mastitis control program (Table 1).

Table 1. Relationship between herd SCC, percent quarters infected and milk production losses per cow.

Herd SCC	Quarters infected %	Daily milk Loss (lb)
200,000	6	—
500,000	16	3.3
1,000,000	32	9.0
1,500,000	48	14.6

Somatic Cells—What are They?

Somatic cells in milk are primarily leukocytes or white blood cells (WBC) along with sloughed epithelial or milk secreting cells. The level of SCC in milk is related directly to the degree of stress on the udder. An inverse relationship exists between SCC and milk quality. High SCC milk yields less cheese. High SCC milk has a reduced flavor score because of an increase in salts. Because of these facts, the Interstate Milk Shippers Commission will reduce the allowable SCC in milk to 1 million by mid-1986. Research has shown that milk losses start at about 100,000 SCC. As SCC double, milk losses are 1.5 lb milk/day for older cows and one-half that amount for first calf heifers. While some milk marketing agencies pay milk quality premiums based in part upon SCC, the primary goal of a mastitis control

program is to improve udder health and allow the cow to produce at her inherent ability under each dairy producer's level of feeding and management.

Some herds rarely exceed 200,000 average SCC while others are never under 1,000,000. Observations of low SCC herds indicate that equal emphasis is placed upon the four basic considerations for providing a healthy environment for cows:

1. Sanitation
2. Machine function
3. Managed milking
4. Mastitis control program



Figure 1. Sunshades and graded dry lots provide a favorable environment to minimize stress on the cow and her udder.

SANITATION: A cow will spend 2-4 hours a day in the milking facility and the remainder of the time in the housing area. Low SCC herds place just as much emphasis on sanitation in the housing area as in the parlor. Adequate shelter against the elements, sun, snow or rain, better assures cow comfort which is more conducive to producing milk.



Figure 2. Properly constructed and maintained free stall shelters will offer effective housing and adequate sanitation for a mastitis control program.

Likewise, properly maintained and bedded free stalls and well-drained dry lots minimize possible contamination of the teat ends from mastitis-causing organisms. In the parlor, most producers appreciate the need of milking clean teats to produce quality milk. Others are not aware that milking wet teats can be one of the causes of high SCC and lends itself to more clinical cases. Mastitis causing organisms **must** enter the udder through the teat opening or streak canal. Milking a dirty teat or one that is wet greatly increases the chance of forcing bacteria into the quarter whenever there is a liner slip or "squawk." A similar problem can occur if the unit is removed before shutting off the vacuum. If cows are washed, use only enough water to wet the teats as an aid in removing soiled material. At all cost, do not use a common towel or sponge between cows. Dry the teats with a single service towel. Spraying water up on the udder, generally results in rivulets of dirty water running down the top of the teat cup during milking.

Machine Function: The milking machine is the most used piece of equipment on a dairy and the only instrument in contact with living tissue. The principles of machine milking include:

1. Adequate vacuum at the teat end (11-12 in).
2. Stable vacuum from beginning to end of milking.
3. Pulsation to provide milk: rest (milk:massage).

Most low SCC herds conduct periodic machine checks using qualified dealers. Machine companies design their equipment to be operated at specific standards. Usage decreases efficiency with any equipment. Pulsators become dirty and do not allow adequate air flow. Air lines can become

clogged and vacuum gauges may become inaccurate. While low milk lines are preferred for vacuum stability, weigh jars can accomplish the same results. Weigh jars have a distinct advantage in monitoring daily milk production.

MANAGED MILKING: Drastic changes have occurred in the way cows are milked, but the principles of milk let-down have not been altered. While number of cows milked per hour is important, it is secondary to pounds of milk produced per cow per hour. Low SCC herds do an exemplary job of stimulating let-down followed by quick removal of milk. Thirty seconds (30 sec) of manual massage and removing two squirts of milk are essential followed by machine attachment within one minute (1 min). With experienced milkers and relatively clean cows, two cows may be prepped and then the machines attached. If cows are quite dirty, it is best to prep the cow and then put the machine on immediately. In double walkthrough systems with one unit per two stalls, the opposite cow should not be prepped until the unit is detached from the other side. Automatic detachers have demonstrated that over-milking is not as serious a problem as removing the claw without first shutting off the vacuum supply.

Milking tends to become a habit and bad habits are adopted more easily than good milking procedures. Challenge yourself to get every drop of milk that is due you by placing primary emphasis on maximal let-down and speedy milk removal.



Figure 3. For proper milk let-down, massage the udder using a light water spray on the teats for 30 seconds. Remove two squirts of milk and exam for clinical mastitis. **DO NOT USE** a common rag or sponge between cows.

Predipping with an effective teat dip has been shown to reduce the number of new mastitis infections. Using spray bottles for predipping is recommended to avoid contamination of the teat dip solution. Care must be taken to dry teats thoroughly before attaching the claw to avoid contaminating milk.



Figure 4. After washing, dry the teats (and udder) with a single service towel. Single service wash cloths are very effective.



Figure 5. Teat dip after each milking regardless of weather with an approved teat dip. Blot off excess in cold weather.

MASTITIS CONTROL PROGRAM: There is little hope that mastitis will be eradicated or an effective vaccine developed. The disease is much too complex. A control program starts with: 1. Sanitation-24 hr a day. 2. Functional milking machine. 3. Managed milking procedure. Once these three factors are in order, then a mastitis control program has a chance to be effective. The steps involved in a control program are:

1. Monthly SCC on each cow in the herd.
2. Teat dip every cow after every milking regardless of weather (blot excess when cold).
3. Periodic screening of bulk tank milk for antibiotic sensitivity.
4. Dry cow treat every quarter with a sensitive antibiotic.
5. Re-treat problem cows-10 to 14 days later.
6. Practice sanitary procedures with springer cows to minimize new infections at calving.
7. Milk out all fresh cows completely beginning with the first milking.
8. Cull chronic cows.

Can high SCC cows be treated effectively? NO! In fact, the probability of curing mastitis in the lactating cow is very low. Treatment may effect a change from clinical to subclinical based upon the appearance of the milk. In low SCC herds, spontaneous recovery may be the most effective cure for mastitis. In such herds, cows with low SCC may flare up into the millions one month, only to return to low levels the following month. In essence, the stress of subclinical mastitis causes a mobilization of somatic cells whose purpose is to combat and destroy mastitic-causing organisms.

HIGH SCC HERDS—WHAT TO DO: Consider the four point program:

SANITATION-MACHINE-MILKING-CONTROL

It is foolhardy to practice perfect managed milking and then let the housing area be hock-deep in mud. In most cases, high SCC result from a number of factors. The fastest way to lower SCC is to remove high cows from the bulk tank. Thus, the monthly DHIA SCC listing is essential. For high count late lactation cows, dry off early and double dry cow teat. Again, the DHIA SCC list will identify such cows. Proper antibiotic selection is critical since some mastitic organisms are resistant. Periodic bulk tank cultures and antibiotic sensitivity tests will aid in selecting the correct antibiotic(s). No matter the level of the SCC in the herd, some chronic cows must be culled. The difference between high and low SCC herds is the percent of cows needed to be culled as chronics.

INTERPRETING SCC REPORTS

HIGH COWS THIS MONTH: Lists cows over 400,000. An aid in removing problem cows that are causing high bulk tank readings.

COW HISTORY—SIX MONTHS: Provides the last six SCC on each cow. A basis for culling chronic cows or selecting cows for double dry treatment.

HERD AVERAGE—SIX MONTHS: Shows trends in herd SCC over time. May indicate equipment failure, weather or changes in sanitation and milking management.

LINEAR SCORE: Research shows a negative relationship between SCC and daily milk production. The average linear score estimates the milk loss per day for the average cow in milk.

HERD COMPARISON—TOP 25%: Compares your herd with the best 25 percent of all herds in the Mid-states DHIA. Provides a herd goal.

EFFECT OF STAGE OF LACTATION: Early fresh cows (50 days) usually are higher than mid-lactation cows who are lower than late lactation cows. Problem herds usually show an increase in SCC from early to late lactation.

Early fresh cows' SCC should average less than those in late lactation (300 days) if dry cow treatment and management programs are effective.

EFFECT OF LACTATION: In exemplary herds, average SCC increases with each succeeding lactation.

**James R. Dunham
John F. Smith**

Extension Specialists, Dairy Science



COOPERATIVE EXTENSION SERVICE, MANHATTAN, KANSAS

MF-789 (revised)

October 1985

Issued in furtherance of Cooperative Extension Work, acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils Extension Districts and United States Department of Agriculture Cooperating, Richard D. Wootton, Director. All educational programs and materials available without discrimination on the basis of race, color, national origin, sex, age, or disability.

10-85—3M; 8-87—3M; 8-95—3M

File Code: Dairy Science—6