



**DHI** *option*

Western Canadian Dairy Herd Improvement Services

# SOMATIC CELL COUNTS

## Objectives of the Somatic Cell Count option

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- to evaluate the udder health of all individual cows in the herd
- to determine the level of mastitis in the herd
- to aid in the detection and control of subclinical mastitis
- to evaluate the effectiveness of the mastitis control program
- to predict the milk loss associated with mastitis, for each cow and for the herd
- to summarize current and historical individual cow somatic cell count information
- to provide an analysis of somatic cell count (SCC) data in terms of trends in herd average SCCs, the effect of age on SCCs, and the effect of stage of lactation on SCCs.

## Individual Cow Report objectives

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- to provide current individual cow udder health information and trends, in terms of SCC and linear score results for the last 6 test dates
- to provide the current contributions made by individual cows to the herd average SCC
- to provide historical information on the udder health of individual cows through lactation and lifetime average linear scores
- to estimate the current lactation milk loss in dollars for each individual cow

## Herd Summary Report objectives

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### HERD SOMATIC CELL COUNT TEST DAY SUMMARY

- to detect herd trends in terms of the number of cows with no mastitis infections, new infections and chronic infections
- to evaluate the effectiveness of the mastitis control program in terms of herd average SCC, bulk tank SCC, herd average linear score and herd milk loss in dollars

### AGE SUMMARY

- to determine the effect of lactation number on the distribution of uninfected and infected cows in the herd

### STAGE OF LACTATION SUMMARY

- to determine the effect of stage of lactation on the distribution of uninfected and infected cows in the herd

### SOMATIC CELL COUNT PROBLEM COW LIST

- to list the cows making the greatest contribution to the herd average SCC
- to identify cows with possible new and/or chronic infections

## Individual Cow Report checklist

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- ✓ Are the CURRENT TEST DAY SCC results higher or lower than those for the PREVIOUS 5 TESTS?
- ✓ Is there a correlation between DAYS IN MILK (DIM) and SCC? By reviewing DIM and SCC are there any trends?
- ✓ Which cows are uninfected? These would most likely be the cows with a LINEAR SCORE (LS) below 4.0.
- ✓ Which cows have chronic mastitis (at least two consecutive test day LS results over 4.0)? What are the LACTATION AVERAGE and LIFETIME AVERAGE LINEAR SCORES of these cows?
- ✓ Are the LINEAR SCORES for all 1st lactation animals below 3.0?
- ✓ What are the SCC results for fresh cows? Is the dry cow treatment program working, or is there a problem with infections during calving or in early lactation?
- ✓ Which cows should be considered for milk culturing?
- ✓ What are the SCC results for cows treated since the last test? Are these cows cured? Milk culturing may be required to determine the infection status of these cows.
- ✓ Are there cows that should be dried off early because of a high SCC result?
- ✓ Should the milking order of the cows be changed? Should any cows from an uninfected group be moved to the infected group?
- ✓ Which cows made the greatest % CONTRIBUTION TO HERD AVE SCC? How much milk are these cows producing? What is the CURRENT LACTATION MILK LOSS \$ for these cows? What are their BCA deviations on the Cow Production Monthly Report? Do they have chronic mastitis? Should some of them be culled?

# Explanation and interpretation of Individual Cow Report output

This report provides information on the udder health of individual cows on test day, during the current lactation and over the cow's lifetime. An elevated SCC for a cow suggests a bacterial infection in one or more quarters. Although milk may appear normal, udder tissue damage and significant milk losses are taking place.

## HERD AND TEST DAY INFORMATION

HERD #	MAIL DATE
	93NOV08
TEST DATE	SERVICE LEVEL
93OCT29	OSAP

The four boxes in the top left hand corner of the Somatic Cell Count Individual Cow Report show the HERD #, TEST DATE, MAIL DATE of the report and the SERVICE LEVEL in which the herd is enrolled. All individual cow information on this report reflects the situation as of the TEST DATE shown here.

All cows in the herd (milking, dry and cows which left the herd at last test) are listed in the body of the SCC Individual Cow Report. The report is divided into 5 sections :

- COW IDENTIFICATION;
- CURRENT TEST DAY;
- PREVIOUS 5 TESTS;
- LINEAR SCORES, and;
- CURRENT LACTATION MILK LOSS \$.

## COW IDENTIFICATION

COW IDENTIFICATION
174
325
629

Cows may be identified by their chain number, registration number, cow name or a combination of any 2 of these methods. The order in which cows are listed may be chosen by the producer to suit the herd's management. Cows may be listed :

- alphabetically by cow name;
- numerically by chain number;
- by age of cow.

To aid in cross-referencing production and SCC information, it may be helpful to have cows listed in the same order as on the Cow Production Monthly Report.

## CURRENT TEST DAY

CURRENT TEST DAY			
DAYS IN MILK	LACT NO.	SCC (x 1000)	% CONTRIB TO HERD AVE SCC
		LINEAR SCORE	
356	3	663	5
		5.8	
196	8	2861	18
		7.9	
39	3	2451	18
		7.7	

This section provides information on the udder health status of cows on the current test day. For each cow, it lists :

- DAYS IN MILK;
- LACTATION NUMBER;
- SOMATIC CELL COUNT;
- LINEAR SCORE, and;
- % CONTRIBUTION TO HERD AVERAGE SOMATIC CELL COUNT.

DAYS IN MILK

DAYS IN MILK is the number of days from the last calving date (listed on the Cow Production Monthly Report) to the current TEST DATE.

For cows less than 5 DIM, the code TOO FRSH (too fresh) appears in the SCC (x 1000) column. In the first two weeks post-calving, there may be a natural elevation of the SCC in the milk. However, current research indicates that an elevated SCC in this period may also be caused by coliform infections picked up at calving. Later in lactation, SCC does not increase significantly in uninfected quarters. An increase in SCC or LS at this time is more than likely caused by an infection.

LACT NO.

LACTATION NUMBER is the current lactation of the cow on TEST DATE.

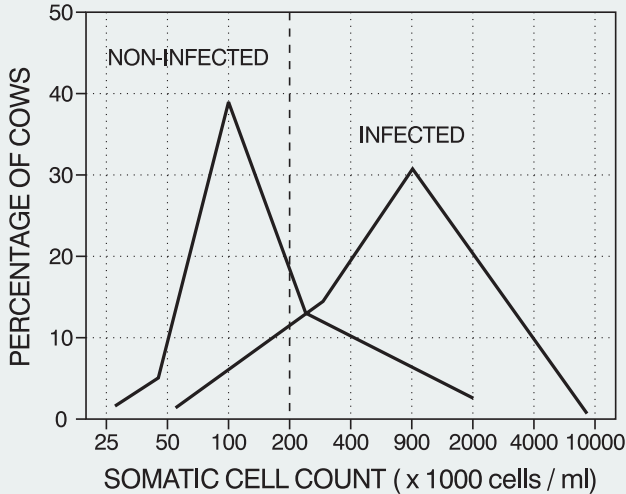
SCCs are not influenced by the number of lactations, although they are higher in older cows. As cows age, there is an increased risk of exposure to mastitis pathogens. This can result in a gradual increase in the number of infected quarters. Older cows tend to have infections of longer duration, causing more extensive tissue damage.

SCC (x 1000)

The somatic cell count (printed in '000s of cells / ml) is an indication of the test day milk quality and of udder health. The message DRY occurs when the cow is in her dry period. The TOO FRSH (too fresh) code appears if the cow is less than 5 days fresh on test day. NO TEST is printed if the test day sample was not available or not tested. SOLD or DIED appears if the cow has left the herd since the last test. The use of individual cow SCCs in making management decisions is described on page 9.

A threshold value of SCC must be established to differentiate between infected and uninfected cows. However, using a threshold value will result in some infected cows being inaccurately labelled uninfected and some uninfected cows being labelled infected (see figure 1). Research suggests that the best SCC threshold value is 200,000 cells/ml. Using this

Figure 1 : About 15% of infected cows may have SCCs below 200,000 cells/ml; an equal proportion of non-infected cows may have SCCs above this threshold.



value, approximately 85% of cows infected with mastitis causing bacteria are correctly identified as infected and, conversely, 85% of uninfected cows are correctly identified as uninfected.

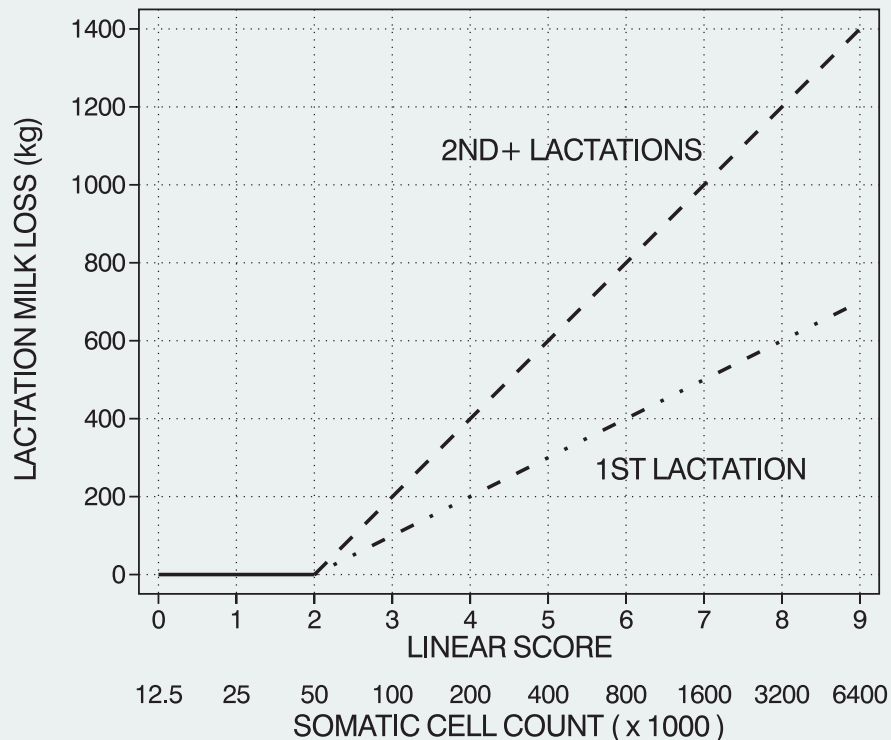
LINEAR SCORE (LS) is calculated from the somatic cell count. The relationship between LS and SCC is shown in table 1.

LINEAR SCORE (units)	LINEAR SCORE (tenths)									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	----- SOMATIC CELL COUNTS ( x 1000 ) -----									
0	12	13	14	15	16	18	19	20	22	23
1	25	27	29	31	33	35	38	41	44	47
2	50	54	57	62	66	71	76	81	87	93
3	100	107	115	123	132	141	152	162	174	187
4	200	214	230	246	264	283	303	325	348	373
5	400	429	459	492	528	566	606	650	696	746
6	800	857	919	985	1056	1131	1213	1300	1393	1493
7	1600	1715	1838	1970	2111	2263	2425	2599	2786	2986
8	3200	3430	3676	3940	4222	4525	4850	5198	5572	5971
9	6400	6859	7352	7879	8445	9051	9701	10397	11143	11943

Table 1 : Conversion of linear scores to somatic cell counts.

Somatic cell counts increase with the severity of udder infection. However, the corresponding milk loss does not increase at the same rate. The use of linear scores simplifies the prediction of milk loss. For each doubling of the SCC the LS increases by one. For 2nd lactation and older cows, each LS unit increase above LS 2.0 equals a loss of 200 kg of milk per lactation or 0.66 kilograms of milk per day. The milk yield loss of first lactation animals is estimated to be one half that of older cows as shown in figure 2.

Figure 2 : The relationship between lactation milk loss and linear scores above 2.0 is a straight line. Milk loss for first lactation animals is only half of that for older cows.



Linear scores are used to evaluate the udder health status of a cow or herd. High SCC test results for one or two cows have less influence on the herd average LS than on the herd average SCC.

Table 2 shows the value of using a linear score average compared with a SCC average for individual cow analysis. In the table, three cows are compared. Cows 1 and 2 have the same lactation average SCC, but different lactation average linear scores and different milk production losses. For cow 2, a single high monthly SCC (Jun) makes her lactation average as high as that for cow 1. This happens even though cow 2 had only half as many cells as cow 1 for 9 of 10 months. The lactation average linear score is more reflective of true milk loss than the average SCC. Cows 2 and 3 have different monthly and lactation average SCC, but both have the same estimated losses in lactation milk production.

*Table 2 : Comparison of lactation average SCC with lactation average LS and milk production loss for three cows.*

TEST MONTH	COW 1		COW 2		COW 3	
	SCC x 1000	LS	SCC x 1000	LS	SCC x 1000	LS
Jan	200	4.0	100	3.0	132	3.4
Feb	200	4.0	100	3.0	132	3.4
Mar	200	4.0	100	3.0	132	3.4
Apr	200	4.0	100	3.0	132	3.4
May	200	4.0	100	3.0	132	3.4
Jun	200	4.0	1100	6.5	132	3.4
Jul	200	4.0	100	3.0	132	3.4
Aug	200	4.0	100	3.0	132	3.4
Sep	200	4.0	100	3.0	132	3.4
Oct	200	4.0	100	3.0	132	3.4
Average	200	4.0	200	3.4	132	3.4
Milk loss	400 kg		260 kg		260 kg	

% CONTRIB  
TO HERD  
AVE SCC

The contribution of each cow to the herd average SCC depends on the combination of her milk yield and her SCC. The cows with the greatest % CONTRIBUTION TO HERD AVERAGE SOMATIC CELL COUNT deserve immediate attention to determine the cause of their high linear score.

## PREVIOUS 5 TESTS

This section shows the **SOMATIC CELL COUNTS** (top line) and **LINEAR SCORES** (bottom line) for each cow from the previous 5 test dates. Test

PREVIOUS 5 TESTS				
SEP 28	AUG 30	JUL 10	MAY 29	APR 29
SOMATIC CELL COUNT (x 1000)				
LINEAR SCORE				
100	56	21	38	18
3.0	2.2	0.8	1.6	0.5
1911	24	413	1043	NO
7.3	1.0	5.1	6.4	TEST
		148	252	73
DRY	DRY	3.6	4.3	2.5

dates are shown at the top of each column. Message codes **TOO FRSH** (too fresh), **NO TEST** and **DRY** are printed if appropriate for that test. Used in conjunction with the **CURRENT TEST DAY** section, the **PREVIOUS 5 TESTS** section provides producers with a concise summary of the udder health status of a cow for the past 6 months. It is possible to see trends

emerging when several consecutive SCCs are observed. Being aware of these trends is helpful in management decision-making, and in evaluating the effectiveness of a mastitis prevention and/or treatment program (see page 9 : Using Individual Cow Somatic Cell Counts for Management Decisions).

## LINEAR SCORES

LINEAR SCORES	
LACTATION AVERAGE	LIFETIME AVERAGE
1.7	1.5
5.5	2.3
7.7	1.8

**LACTATION AVERAGE LINEAR SCORE** is the average of all linear scores accumulated over the current lactation of the cow. Average linear scores are less influenced than average SCCs by one or two high SCC results. The value of utilizing **LACTATION AVERAGE LINEAR SCORES** over a SCC average for individual cow analyses is explained on page 7.

The **LACTATION AVERAGE LINEAR SCORE** should be compared to the **CURRENT TEST DAY LINEAR SCORE** to monitor changes in udder health during the current lactation. Cows with chronic mastitis have a high **LACTATION AVERAGE LINEAR SCORE** and should be considered for culling.

The **LIFETIME AVERAGE LINEAR SCORE** is the average of all linear scores over the lifetime of the cow (or the time on the DHI Somatic Cell Count option). The **LIFETIME AVERAGE LINEAR SCORE** should be compared to the **LACTATION AVERAGE LINEAR SCORE** to compare udder health from previous lactations with the current lactation.

## CURRENT LACTATION MILK LOSS \$

CURRENT LACTATION MILK LOSS \$
321
561

Mastitis causes reduced milk production. The **CURRENT LACTATION MILK LOSS \$** column lists the estimated dollar loss due to reduced production by individual cows in the current lactation. The calculation is based on :

- the **LACTATION AVERAGE LINEAR SCORE**;
- the assumption that each unit increase in the linear score above 2.0 represents a 100 kg decrease in milk yield per lactation for first lactation animals, and a 200 kg decrease in milk yield per lactation for older cows;
- current milk prices (or MCP), specific to each province.



## Using Individual Cow Somatic Cell Counts for Management Decisions

There are a number of vital management decisions that can be made based on the SCCs of individual cows. These decisions can result in considerable improvement in the overall udder health and profitability of a herd. Some of these management decisions are :

- Cows to Culture
- Cows to Treat During Lactation
- Dry Cow Treatment
- Cows to Cull
- Cows to Dry Off Early
- Grouping of Cows
- Milking Order

### Culturing Decisions

Culturing is essential for the accurate identification of organisms responsible for mastitis. Individual cow SCCs provide a basis for the selection of cows whose milk should be sampled and cultured. It is impossible to develop an effective mastitis control program without first correctly identifying the organism(s) responsible for the infection(s). Samples collected for these bacterial cultures *must* be 'clean' - results from contaminated samples are worthless in this identification process. Possible sources of contamination are milkers' hands, cows' sides, or improperly cleaned teats.

### Lactation Treatment Decisions

The decision to treat a cow for subclinical mastitis during lactation should not be based solely on an increase in SCC. The response to treatment is dependant upon the type of organism, its drug sensitivity and the duration of the infection. A milk culture should be carried out to ensure that a cure is feasible.

### Dry Cow Treatment Decisions

The most effective dry cow treatment program is still 'all cows, all quarters'. This program has the advantage of reaching all infected quarters, and is most effective in helping to prevent infections during the dry period. Selective treatment may fail to reach all infected quarters and miss some cows that become infected during the dry period. However, if selective dry treatment is practised, the decision as to which cows should be dry treated can be based on an individual cow's SCC record.

### Culling Decisions

Cows that repeatedly have high counts, in spite of dry treatment and a good mastitis control program, should be considered for culling. The LACTATION AVERAGE LINEAR SCORE and the LIFETIME AVERAGE LINEAR SCORE are good indicators of cows that are harbouring infections. As well, cows infected with *Staphylococcus aureus* should be considered for culling, especially if more than one quarter is infected. *Staph aureus* is very contagious and infections with this bacterium have a poor cure rate and a high incidence of reinfection. Culling high SCC cows with *Staph aureus* eliminates a potential source of new infections.

### Cows to Dry Off Early Decisions

The best method for eliminating infections in the udder is treatment with a long-acting antibiotic at the beginning of the dry period. Some cows with high SCCs and low production should be dried off early. In addition, teat dipping for one week after the last milking and for one week prior to calving reduces the rate of new infections.

### Grouping of Cows Decisions

Since some mastitis-causing bacteria are very contagious, an effective means of stopping their spread is the segregation of infected cows from non-infected cows, with the milking of the clean (non-infected) cows first. Individual cow SCCs are useful in the selection of cows for each group. Of course, it is extremely important that the clean group remain clean.

### Milking Order Decisions

The spread of contagious mastitis-causing bacteria takes place primarily during milking. In tie stalls, infected cows should be clearly marked. These cows should be milked last, or with a separate milking unit. Where this is not possible, an alternative practice would be to sanitize the teat cup after milking a high SCC cow. An alternative for some producers may be the use of a backflush system. A backflush system provides the milking unit with a rinse, a sanitizing and a drying cycle after a cow has been milked. This system reduces the transmission of contagious mastitic bacteria by means of the milking unit.

# Herd Summary Report checklist

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## HERD SOMATIC CELL COUNT TEST DAY SUMMARY (PREVIOUS 12 TESTS)

- ✓ Are 85% of all cows UNINFECTED (SCC < 200,000)? What is the trend for the estimated uninfected cows? Can the trend be explained? Is the mastitis control program working effectively or are changes necessary?
- ✓ What is the NEW infection rate in the herd? Is progress being made or is contagious mastitis being spread among the cows?
- ✓ Are cows with CHRONIC infections staying in the herd or is an effective culling program in place for these cows?
- ✓ What is the quality of the milk shipped? What is the trend for HERD AVERAGE SOMATIC CELL COUNT and/or BULK TANK SCC?
- ✓ What is the trend for the HERD AVERAGE LINEAR SCORE? How much is the HERD MILK LOSS SINCE LAST TEST \$ and the dollar loss over the last 12 months? Is a mastitis control program affordable?

## AGE SUMMARY

- ✓ Are 100% of the 1ST LACTATION animals UNINFECTED?
- ✓ Are 80% of 2ND and 3RD+ LACTATION cows UNINFECTED?
- ✓ In which lactation are the cows with CHRONIC mastitis? Can this be corrected?
- ✓ What is the trend of AVERAGE LINEAR SCORE by lactation? Is contagious mastitis being spread from one lactation group to another?

## STAGE OF LACTATION SUMMARY

- ✓ Are 85% of the cows UNINFECTED in each stage of lactation category?
- ✓ How many cows in the 1-65 DAYS IN MILK stage have NEW or CHRONIC infections? Is it possible that the dry cow treatment program is not working adequately or are fresh cows picking up new infections?
- ✓ Is mastitis being spread by cows 200+ DAYS IN MILK? Do these cows have more NEW and CHRONIC infections than cows earlier in lactation?

## SOMATIC CELL COUNT PROBLEM COW LIST

- ✓ Which cows made the greatest % CONTRIBUTION TO HERD AVE SCC? How much MILK KG are these cows producing? What is the CURRENT LACTATION MILK LOSS \$ for these cows? What are their BCA deviations? Do they have chronic mastitis? Should some of them be culled?
- ✓ Which cows have 2 or more tests under LINEAR SCORE - # TESTS >4.0, indicating chronic or recurring mastitis?
- ✓ What is the most effective approach for each cow listed? What is the best decision for the udder health status of the herd? What strategy should be used to reduce the CURRENT LACTATION MILK LOSS \$? Write down the action to be taken for each cow in the NOTES section of the list.

## Explanation and interpretation of Herd Summary Report output

This report summarizes herd results for the last 12 test dates and also gives SCC distribution summaries by lactation number and stage of lactation. Cows with high somatic cell counts are identified for management attention.

### HERD SOMATIC CELL COUNT TEST DAY SUMMARY (PREVIOUS 12 TESTS)

SCC information for the last 12 test dates is shown in this section. This summary provides a concise source of herd trend information.

DATE TESTED
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The DATE TESTED column lists the current test date and 11 previous test dates, with the most recent test appearing at the top of the list and the least recent at the bottom. It is important to assess herd udder health by monitoring SCC trends over time, rather than on the basis of one test day result.

The MILKING COWS WITH SOMATIC CELL COUNT section gives a breakdown of the cows with valid somatic cell counts on each test day,

MILKING COWS WITH SOMATIC CELL COUNT						
#	UNINFECTED (EST) (SCC < 200,000)		ESTIMATED INFECTIONS (SCC 200,000 +)			
	#	%	NEW		CHRONIC	
	#	%	#	%	#	%

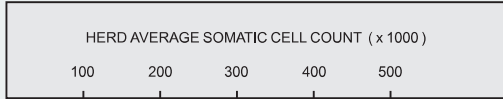
into 3 infection categories :

- UNINFECTED (EST) (SCC <200,000) - cows that were probably uninfected on DATE TESTED;
- ESTIMATED INFECTED (SCC 200,000+) NEW - cows that were probably infected, where the SCC was 200,000+ on the DATE TESTED and < 200,000 on the previous test;
- ESTIMATED INFECTED (SCC 200,000+) CHRONIC - cows that were probably infected on the DATE TESTED *and* on one or more *consecutive* previous tests.

The # column on the far left of this section gives the total number of cows in the herd with a valid SCC on each DATE TESTED. This total is distributed by # and % across the three infection categories described above.

A large shift in the % of cows in the UNINFECTED category to the ESTIMATED INFECTIONS categories indicates an increase in the number of infections. Should this occur, further investigation is warranted. The AGE SUMMARY and STAGE OF LACTATION SUMMARY (described below) are useful in locating the source(s) of the new infections. The SOMATIC CELL COUNT PROBLEM COW LIST (also described below), and the Individual Cow Report identify cows with somatic cell counts exceeding the 200,000 cells/ml threshold (LS > 4.0). These cows are also identified in the DHI Management Tips option.

HERD AVERAGE SOMATIC CELL COUNT is the average SCC for the herd, weighted by each cow's milk production. A cow with a high SCC and high production will contribute more to the herd average SCC than a cow with the same high SCC but lower production.



Therefore, HERD AVERAGE SOMATIC CELL COUNT can fluctuate as the proportion of the herd with high SCC

shifts and as milk production changes. These factors have more influence in small herds where individual cows are responsible for a larger percentage of milk in the tank than in larger herds.

The HERD AVERAGE SOMATIC CELL COUNT graph provides a quick picture of the herd's milk quality over the last 12 test dates.



BULK TANK SOMATIC CELL COUNT is determined from a sample of pooled milk, taken on test day. Its actual value will be different from bulk tank SCCs determined periodically by provincial milk quality authorities, because those samples are not taken at the same time. If a bulk tank sample was not taken on test day, or otherwise became unavailable, N/A (not available) will appear on the report.

Table 3 : HERD AVERAGE SOMATIC CELL COUNT interpretation.

HERD AVG SCC (x 1000)	MILK QUALITY	UDDER HEALTH STATUS	% MILK LOSS
< 100	Excellent	Very little mastitis is present. Monitor individual cows.	< 2
100 to 200	Very Good	You do <i>not</i> have a major mastitis problem but there may be problems with individual cows. Assess your mastitis control procedures.	2 - 4
200 to 500	Needs Improvement	Mastitis infection is present. Check all management and control measures.	4 - 8
500 to 750	Poor	Mastitis infection is present. Mastitis control program needs improvement. Consult your veterinarian and/or dairy consultant for assistance. Your license to sell milk is at risk.	8 - 10
> 750	Serious Problem	You have a serious problem. Check your milking equipment, milking routines and cow management practices.	> 10

As a general rule, BULK TANK SOMATIC CELL COUNT is expected to be somewhat lower than HERD AVERAGE SOMATIC CELL COUNT.

Two examples of this are:

- milk from cows with clinical mastitis is not added to the bulk tank but it is included in the herd average SCC calculations;
- milk from cows with high SCC is often fed to calves.

Bulk tank somatic cell count and DHI herd average SCC are used to assess the quality of milk produced. Table 3 sets out the general guidelines for interpretation of HERD AVERAGE SOMATIC CELL COUNT, as well as the actions they may necessitate.

HERD  
AVERAGE  
LINEAR  
SCORE

The HERD AVERAGE LINEAR SCORE is calculated from individual cow LS values. The average LS for a herd is a good indicator of milk production loss, as well as an excellent measure of the overall udder health of the herd. A HERD AVERAGE LINEAR SCORE over 4.0 indicates a herd mastitis problem. HERD AVERAGE LINEAR SCORE cannot be directly calculated from the HERD AVERAGE SOMATIC CELL COUNT.

An elevated HERD AVERAGE SOMATIC CELL COUNT may indicate either a herd problem (many cows infected), or an individual cow problem. To distinguish between these two possibilities, examine individual cow SCCs and the HERD AVERAGE LINEAR SCORE.

In table 4, two herds with the same HERD AVERAGE SOMATIC CELL COUNT are compared. In herd A there is only one problem cow causing the high count, while in herd B all cows have counts above 200,000 cells per ml. The HERD AVERAGE LINEAR SCORE for herd A is below the infection level (4.0), while that for herd B is above the infection level, indicating a herd problem.

*Table 4 : Individual cow SCCs for two herds with the same herd average SCC.*

	----- Herd A -----				----- Herd B -----			
	SCC	LS	MILK KG	% CONTRIB TO HERD AVG SCC	SCC	LS	MILK KG	% CONTRIB TOHERD AVG SCC
Cow 1	106	3.1	30	9.5	237	4.3	29	19.5
Cow 2	89	2.8	32	8.5	321	4.7	23	20.9
Cow 3	164	3.7	24	11.7	254	4.4	30	21.6
Cow 4	985	6.3	21	61.5	356	4.8	18	18.2
Cow 5	176	3.8	17	<u>8.9</u>	232	4.2	30	<u>19.7</u>
				100.0				100.0
Herd Avg SCC (x 1000)				271				271
Herd Avg LS				3.94				4.48
Herd Avg Milk kg				24.8				26.0
Milk Loss due to SCC kg				<u>0.61</u>				<u>0.96</u>
Total Potential Avg Milk kg				25.41				26.96

HERD MILK LOSS SINCE LAST TEST \$
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HERD MILK LOSS SINCE LAST TEST \$ shows the estimated dollars lost, due to reduced production by the herd, between test days. The calculation is based on the following:

- AVERAGE LINEAR SCORE for each lactation group (see AGE SUMMARY below);
- the assumption that each increase of one unit in the LS, above LS 2.0, represents a 100 kg decrease in milk yield per 305-day lactation for first lactation animals (0.33 kg per day), and a 200 kg decrease in milk yield per 305-day lactation for older cows (0.66 kg per day);
- current milk prices (or MCP), specific for each province.

HERD MILK LOSS SINCE LAST TEST \$ is calculated as follows :

MILK LOSS FOR EACH LACTATION GROUP

$$= (\text{AVE LS for lactation group} - 2) \times \# \text{ OF ANIMALS in lactation group} \times \text{MILK LOSS PER LS UNIT kg / day}$$

HERD MILK LOSS SINCE LAST TEST kg

$$= (\text{1ST LACT LOSS} + \text{2ND LACT LOSS} + \text{3RD+ LACT LOSS}) \times \text{DAYS SINCE LAST TEST}$$

HERD MILK LOSS SINCE LAST TEST \$

$$= \text{HERD MILK LOSS SINCE LAST TEST kg} \times \text{MILK PRICE \$ / kg}$$

An example of this calculation is shown in table 5.

*Table 5 : Example calculation of HERD MILK LOSS SINCE LAST TEST \$.*

LACTATION NUMBER	AVERAGE LINEAR SCORE	AVERAGE LINEAR SCORE - 2.0	# OF ANIMALS	MILK LOSS PER LS UNIT kg / day	MILK LOSS FOR LACT GROUP kg
1ST	1.7	0.0 (LS < 2)	54	0.33	0.0
2ND	3.1	1.1	36	0.66	26.1
3RD+	3.1	1.1	33	0.66	24.0
HERD MILK LOSS SINCE LAST TEST kg = (0.0 + 26.1 + 24.0) x 31 = 1553 kg					
HERD MILK LOSS SINCE LAST TEST \$ = 1553 x \$0.50 = \$777					
<ul style="list-style-type: none"> <li>• AVERAGE LINEAR SCORE and # OF ANIMALS for each lactation group are from the AGE SUMMARY (TEST DAY) table shown on page 17</li> <li>• DAYS SINCE LAST TEST is DAYS IN PERIOD value from Monthly Herd Summary Report</li> <li>• a MILK PRICE of \$0.50 / kg is assumed</li> </ul>					



The AGE SUMMARY (TEST DAY) table divides the herd into 3 age groups based on their LACTATION NUMBER. This breakdown allows herd owners to determine the age at which their cows become infected, as demonstrated by changes in the distribution of somatic cell count results.

AGE SUMMARY ( TEST DAY )								
LACTATION NUMBER	#	MILKING COWS WITH SOMATIC CELL COUNT						AVERAGE LINEAR SCORE
		UNINFECTED (EST) (SCC < 200,000)		ESTIMATED INFECTIONS ( SCC 200,000 + )				
		#	%	NEW		CHRONIC		
		#	%	#	%	#	%	
1ST	54	51	94	2	4	1	2	1.7
2ND	36	26	72	9	25	1	3	3.1
3RD+	33	24	73	6	18	3	9	3.1

LACTATION NUMBER is the current lactation of cows on test day. It is important to obtain the lactation number of purchased cows so that they can be included in the correct lactation group. If no lactation number is available, animals are included in the first lactation group.

The MILKING COWS WITH SOMATIC CELL COUNT section presents a breakdown by infection status for each lactation group. The # column (far left) gives the total number of cows in each group with valid somatic cell counts on the current test day. These totals are distributed by # and % across three infection categories :

- UNINFECTED (EST) (SCC <200,000) - cows that were probably uninfected on test day;
- ESTIMATED INFECTED (SCC 200,000+) NEW - cows that were probably infected, where the SCC was 200,000+ on the DATE TESTED and < 200,000 on the previous test;
- ESTIMATED INFECTED (SCC 200,000+) CHRONIC - cows that were probably infected on the current test day *and* on one or more *consecutive* previous tests.

The AVERAGE LINEAR SCORE for each lactation group helps in evaluating the severity of infection and the potential milk loss.

Normally, 100% of first lactation animals will be in the UNINFECTED group. If a large number of heifers are in the SCC 200,000+ categories, an evaluation of the heifer management program, especially around calving time, is in order. Older cows that do not have mastitis infections will maintain a low SCC. However, in the usual course of events, the longer a cow milks the greater the risk of becoming infected. The AGE SUMMARY (TEST DAY) table identifies the age at which problems begin.

The STAGE OF LACTATION SUMMARY (TEST DAY) table provides a breakdown of levels of infection at various stages of lactation defined by

STAGE OF LACTATION SUMMARY ( TEST DAY )							
DAYS IN MILK	#	MILKING COWS WITH SOMATIC CELL COUNT					
		UNINFECTED (EST) ( SCC < 200,000 )		ESTIMATED INFECTIONS ( SCC 200,000 + )			
		#	%	NEW		CHRONIC	
		#	%	#	%	#	%
1 - 65	29	25	86	4	14	0	0
66 - 200	37	33	89	2	5	2	5
200 +	57	43	75	11	19	3	5

three DAYS IN MILK (DIM) intervals :

- 1 - 65 DIM;
- 66 - 200 DIM, and;
- 200+ DIM.

This breakdown identifies the period in which a mastitis problem begins. Refer to the description of the AGE SUMMARY table for an explanation of the layout.

All cows should have low SCCs during the 1 - 65 DIM period. If SCCs are high at the beginning of the lactation, infections may be occurring during the dry period and/or at calving time. When cows are not infected with mastitis, there is little or no change in SCC in late lactation. An upward shift into the 200,000+ group during the 66 - 200 DIM and 200+ DIM periods indicates the level of infection is increasing, and may indicate that a contagious infection is being transmitted.

The SOMATIC CELL COUNT PROBLEM COW LIST (TEST DAY) identifies the high SCC cows that are the greatest contributors to the HERD AVERAGE SOMATIC CELL COUNT for the current test, shown in the HERD SOMATIC CELL COUNT TEST DAY SUMMARY table. For the most part, these are animals with very high SCCs and LSs for more than one test. The SOMATIC CELL COUNT PROBLEM COW LIST shows SCC information for cows with linear scores over 4.0 on the current test day. The cow contributing the most to the HERD AVERAGE SOMATIC CELL COUNT is at top of the list, with the remainder ranked in descending order. A maximum of 10 problem cows are printed.

SOMATIC CELL COUNT PROBLEM COW LIST ( TEST DAY )									
COW IDENTIFICATION	DAYS IN MILK	LACT NO.	SCC	MILK KG	% CONTRIB TO HERD AVE SCC	LINEAR SCORE		CURRENT LACTATION MILK LOSS \$	NOTES
			( x 1000 )			# TESTS > 4.0	LACTATION AVERAGE		
325	196	8	2861	32.1	18	4	5.5	321	
629	39	3	2451	37.2	18	1	7.7	561	
174	356	3	663	35.3	5	1	1.7		
614	73	3	490	38.0	4	1	5.3	305	
607	147	3	883	20.0	4	3	5.3	304	
668	263	2	412	29.0	2	1	2.3	26	
558	15	4	279	37.2	2	1	4.5	243	
693	215	2	532	19.5	2	1	1.6		
217	56	2	228	41.0	2	1	4.2	222	
608	125	3	300	26.7	2	1	2.7	70	



Most of the information on the SOMATIC CELL COUNT PROBLEM COW LIST is taken from the Somatic Cell Count Individual Cow Report and the Cow Production Monthly Report, including :

- COW IDENTIFICATION;
- DAYS IN MILK;
- LACTATION NUMBER;
- SCC ( x 1000 );
- LINEAR SCORE;
- MILK KG;
- % CONTRIBUTION TO HERD AVERAGE SOMATIC CELL COUNT;
- LINEAR SCORE - LACTATION AVERAGE, and;
- CURRENT LACTATION MILK LOSS \$.

Refer to those reports for a full explanation of the above.

The LINEAR SCORE - # TESTS > 4.0 column shows the number of tests each cow has had with a linear score over 4.0 in the current lactation. When the current test is the first time in this lactation that this cow has had a LS > 4.0, a 1 appears in this column. A number greater than 1 indicates that the LS has been > 4.0 more than once in this lactation. If a recurring or chronic infection is the cause of the repeated high linear scores, these cows should be considered for culling.

The NOTES area is provided to allow for the recording of additional information concerning problem cows and any action taken .

## For more information

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[DHI Monthly Herd Summary User Guide](#)

[DHI Cow Production Monthly User Guide](#)

[Staph Aureus and Bulk Tank Culturing. Alberta Dairy Management](#)