

Tennessee Quality Milk Initiative

Using DHI Reports to Troubleshoot Mastitis

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Studying DHI reports will help narrow your focus when troubleshooting mastitis. Monthly DHI reports can be used to determine if there is a mastitis problem within the herd, when the problem began and where the problems originate (ex: early lactation cows, heifers, etc.).

Basic DHI and SCC information:

- Somatic cell count (**SCC**) = Number cells present in 1 ml (~ ¼ teaspoon) of milk
- Somatic cell score (**SCS**) = Conversion of somatic cell counts to a linear scale
- Weighted average SCC or SCS = Adjusts SCC or SCS to milk volume. For example: two cows, one milking 60 lbs with a SCS of 6 and the other milking 100 lbs with a SCS of 4. The weighted SCS would be ~ 4.75 because the cow producing more milk has a lower SCS, bringing the average down from the non-weighted average SCS of 5.
- **Normal** milk has < 200,000 cells/ml or a **SCS < 4**. In normal milk these cells are mostly mammary cells and white blood cells.
- An infection causes neutrophils, a special type of white blood cell, to enter the gland and help fight the infection. Therefore, milk with > 200,000 cells/ml or **SCS > 4** is considered **infected**.
- Clinical signs of infection may not be apparent until SCC > 400-600,000 cells/ml or greater.

Table 1. SCS comparison to SCC. Loss in milk yield associated with each increase in SCS.

SCS	SCC (x 1000) per ml	Lost milk production per lactation (lb) for 2nd+ lactation cows
0	0 – 18	0
1	19 – 35	0
2	36-71	0
3	72 – 141	400
4	142 – 283	800
5	284 – 565	1,200
6	566 – 1,130	1,600
7	1,131 – 2,262	2,000
8	2,263 – 4,523	2,400
9	4,524 – 9,045	2,800

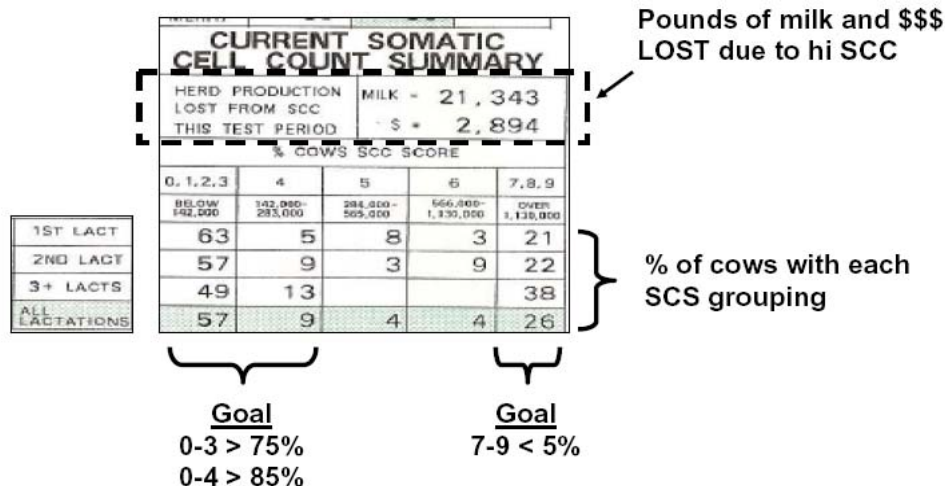
Reasons why cows may have elevated SCC:

- Cows have experienced a mastitis infection! This could be due to:
 - × Poor milking time hygiene practices – i.e., teat dipping, drying
 - × Dirty or uncomfortable environment – i.e., stalls, alleyways & lots
 - × Ineffective dry cow antibiotic therapy and/or management
 - × Ineffective lactating cow antibiotic therapy
 - × Faulty milking equipment – i.e., vacuum, old inflations

DHI Herd Summary Sheet (DHI-202)

The herd summary sheet has 3 locations to evaluate a herd.

I. Current Somatic Cell Count Summary



- This is the **FIRST** place to look.
- Calculates herd loss in milk production (lbs) and **\$\$\$\$ not earned** due to elevated SCC based on current milk prices. **This figure represents only ONE test period!**
- Identifies the percentage (%) of cows having SCS of 0-3, 4, 5, 6, 7-9.
- Review cows of all lactations first, then break down by 1st, 2nd, and 3+ lactations.
- **GOALS**
 - × 75% of herd with SCS < 3
 - × 85% of herd with SCS < 4
 - × 90% of herd with SCS < 5
 - × < 5% of herd with SCS 7-9
- Other expectations...
 - × Majority of 1st lactation cows should have a SCS 0-3.
 - × As cows have more lactations, the SCC/SCS will generally rise because the udder has been exposed to more bacteria.

DHI Herd Summary Sheet (DHI-202)

1. Current Somatic Cell Count Summary - Continued

- If cows are meeting expectations – GREAT! If not, you need to identify why. Start by using information from the DHI herd summary sheet.
 - × Do all age groups have cows with high SCC/SCS? Or is it tied to a certain age group?
 - × Is the problem associated with a certain stage of lactation? If so, evaluate the Stage of Lactation Profile (See Section #2).
 - × Did the problem start during a particular period in time over the last year? If so, evaluate the Yearly Summary (See Section #3).

2. Stage of Lactation Profile

		STAGE OF LACTATION (DAYS)						TOTAL OR AVERAGE
		1 THRU 40	41 THRU 100	101 THRU 199	200 THRU 305	306 +		
MILKING	1ST LACT	10	5	17	25	23	80	} # cows each stage
	2ND LACT	4	9	4	6	5	28	
	3+ LACTS	5	8	2	9	16	40	
	ALL LACTS	19	22	23	40	44	148	
SCC SCR	1ST LACT	3.7	3.5	3.6	2.9	3.4	3.3	} SCS or SCC
	2ND LACT	3.2	.9	1.2	3.6	3.9	2.4	
	3+ LACTS	3.9	4.0	4.7	5.3	4.7	4.6	
	ALL LACTS	3.6	2.6	3.3	3.5	3.9	3.5	
SCC SCORE > 3.9	NUMBER	8	6	5	15	24	58	} # Cows with SCS >4
	PERCENT	42	27	22	38	55	39	

- Lactation is broken into differentiating periods by Days in Milk (DIM): days 1-40; 41-100; 101-199; 200-305; 305+.
- Producers can choose to have data presented as SCS or SCC.
- Two types of information are presented and can be used to identify **which group** may be affected.
 - × The mean SCC or SCS for cows in each DIM and lactation number.
 - × The number and percent of cows having a SCS > 3.9 or SCC > 200,000.
- Expectations....
 - × The percentage of cows in each DIM category with SCS >4 should be less than 15-20%.
 - × As milk production drops, SCC will increase.
 - × As cows have more lactations, SCC generally increase.
 - × Generally SCS should be ≤ 4.
- **Beware of....**
 - × Number of cows representing each DIM category. If data from only 1 cow is represented, there may not be an overall problem, just a problem with that one cow. Also, this number can influence the percentage of cows with SCS > 4, causing a high percentage. For example, if 1 of 2 cows has SCS > 4, the percentage of cows with a SCS > 4 would be 50%.

DHI Herd Summary Sheet (DHI-202)

2. Stage of Lactation Profile - Continued

- Use data from preceding months to search for trends.
 - × Is there one stage of lactation that consistently has greater scores?
 - × Is there one age group that consistently has greater scores – regardless of DIM?
 - × Example. 1st lactation cows have SCS >4 during 1-40 DIM = Suggests a problem with heifer mastitis and management.
 - × Example. 1st, 2nd, and 3+ lactation cows have SCS >4 during 1-40 DIM = Suggests dry and/or transition cow management may be a problem.
 - × Example. All cows are high, during all stages of lactation = Suggests general management issue.

3. Yearly Production and Mastitis Summary

Test date	DATE OF TEST	DAYS IN TEST PERIOD	NUMBER COWS IN HERD ON TEST DAY	SCS					AVG. SCC SCORE	WT. AVG. ACTUAL SCC
				0-3	4	5	6	7-9		
MONTHS DROPPED		29	162							
	12-14-05	27	182	54	20	11	8	7	3.2	321
	1-16-06	33	193	52	21	9	8	10	3.6	408
	2-21-06	36	183	64	12	9	6	9	3.1	397
	3-20-06	27	190	58	13	12	5	12	3.3	585
	4-24-06	35	194	63	14	8	7	8	3.1	367
	5-24-06	30	200	65	11	11	4	9	3.0	411
	6-19-06	26	198	65	14	6	5	10	2.9	324
	7-10-06	21	194	56	12	14	7	11	3.4	428
	9-06-06	58	192	48	21	10	9	12	3.6	417
	10-11-06	35	188	39	20	22	8	11	4.0	517
	11-08-06	28	191	49	23	12	6	10	3.6	423
				49	22	15	8	6	3.5	334
AVERAGES		32	191	54	17	12	7	10	3.4	419

% Cows in each SCS category for each test date in past year

- Provides a summary of each test day for the past year.
- It is set up similar to Current Somatic Cell Count Summary but also provides average SCS and weighted average SCC.
- Scan data for the past year to identify **when** a problem may have started. It may be related to a significant event or management change.
- Expected trends...
 - × There is typically a rise in SCC during summer months due to a drop in milk production. Clinical mastitis rates also tend to be higher during hot and humid weather.
 - × For seasonal operations, SCC may rise during months associated with early lactation.

DHI Herd Summary Sheet (DHI-202)

3. Yearly Production and Mastitis Summary - Continued

- Search for trends...
 - × Is there a point in time when percentage of cows with SCS > 5 increased? Or weighted SCC remained elevated?
 - ◇ Change in milking personnel, milking time hygiene, teat dips, etc.
 - ◇ Switch in bedding type or bedding maintenance
 - ◇ Liners or other equipment changes (or problems)
 - ◇ New cows brought into the herd
 - ◇ Others

Individual Cow Reports also Available

- Use individual reports to *identify problem cows*.
- **DHI-242 - Individual Cow SCC.** Lists cows in ID order. Provides current SCC, DIM, milk production and current SCS. It also provides milk production and SCS for previous 11 months, current lactation ME Milk projection, current average SCS, previous lactation ME Milk production and previous lactation SCS average.
- **DHI-340 - SCC Management Report & Cows With Highest Linear SCC This Month.** Ranks cows by current test day SCS from highest to lowest. Also includes current lactation average SCS, current milk production, projected milk production, milk loss, percent contribution to bulk tank, date cow was first infected and other management factors. It also includes current distribution of cows by SCS, number of new infections, number of chronic infections, losses due to high SCC (milk and money), and stage of lactation profile - indicating number of new infections for each stage.
- **DHI-520 - SCC Report.** Ranks cows by their percent contribution to bulk tank SCC – high to low and identifies whether SCC increase is new or chronic. It also provides previous test day SCS data, what the bulk tank SCC would be without each cow, current lactation average SCS, number of test days SCS > 3.9 during current lactation and other management factors. This is a very useful report when herd is in crisis and immediate action is needed to reduce bulk tank SCC.
- Other profiles, reports and graphs are available. Producers with PCDart7 can create their own reports using a large variety of parameters.