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Using the somatic cell count report

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Abstract

High-producing dairy herds can consistently average a somatic cell count (SCC) <200,000. Herds with consistently higher averages can decrease SCC and realize higher profits. The SCC report discloses the pitfalls that need to be addressed before improvement can be made.; Dairy Day, 1996, Kansas State University, Manhattan, KS, 1996;

Keywords

Dairy Day, 1996; Kansas Agricultural Experiment Station contribution; no. 97-115-S; Report of progress (Kansas Agricultural Experiment Station and Cooperative Extension Service); 771; Somatic cell count

USING THE SOMATIC CELL COUNT REPORT

J. R. Dunham

Summary

High-producing dairy herds can consistently average a somatic cell count (SCC) <200,000. Herds with consistently higher averages can decrease SCC and realize higher profits. The SCC report discloses the pitfalls that need to be addressed before improvement can be made.

(Key Words: Somatic Cell Count.)

Introduction

Mammary gland health and milk quality have a direct effect on a dairy's profit. In fact, these are the most costly health problems on dairy farms. Yet, many producers are unaware of losses from mammary health because subclinical mastitis, which is not visually observed, is the most common problem. In most cases, a high somatic cell count (SCC) is the only indication that mammary health and milk quality need to be improved.

The SCC is an excellent evaluation of mammary gland health and milk quality. Since 1980, most DHIA programs have provided SCCs for dairy farmers. The SCC program has proven to be very popular and useful. However, misunderstanding still exists about the interpretation and use of the SCC reports. This review will suggest recommendations for using the SCC information to develop a profile for managing mammary health and milk quality.

Terminology

SCC reports show the counts in thousands of cells per milliliter and linear score (LS). The cell count is more easily understood by producers and field representatives. The LS is a logarithm conversion of the SCC and is not as well understood.

The herd average SCC is a weighted average and corresponds to the bulk tank SCC, whereas LS correlates with the amount of milk loss per cow per day. Figure 1 shows the relationship of LS to milk loss. First lactation losses are half those of older cows.

Herd average LS is not weighted by pounds of milk from each cow, because milk loss is not related to production level of each cow. Example: two cows with an LS of 4 would have a calculated production loss of 3 lb per day regardless of their individual production level. Yet one cow could be producing twice as much milk as the other and would be contributing twice the number of cells to the SCC average. Therefore, both SCC and LS are useful measures of udder health.

Herd Average SCC

Figure 1 shows the herd average SCC for the last six test dates and the current average for the top 25% of herds in the Mid-States area. The history of the last six test dates shows the trend of the mammary health profile. A realistic goal for a herd is to have consistently an average SCC <200,000.

Individual Cow SCC

An SCC report for individual cows (Figure 2) shows each cow's SCC for the last six test dates. The profile for each cow is useful for selecting potential mammary health culls. Cows with several consecutive high counts should be considered for culling. However, a cow with an occasional high count may be self-curing (spontaneous recovery). Cow number 2024 in Figure 1 is an example of a spontaneous recovery. This indicates that the cow's somatic cells were able to control the mammary infection.

During the early days of SCC reports, dairy farmers selected cows with several high counts to double dry treat at dryoff. This practice has not proven to be effective. The most recent SCC history is most useful for selecting culls.

Milk Loss

Figure 1 shows the milk loss per cow per day and for the herd. The loss is converted to dollar values according to milk price. Milk loss is determined by the LS average for the herd. This section illustrates the economic impact of subclinical mastitis in the herd.

Animals over 300 SCC

Cows with SCC >300,000 are shown in this section of the SCC report (Figure 2). These animals are assumed to be infected with mastitis-causing pathogens and most have subclinical mastitis. Those with an asterisk are new on the list since the previous test day.

This section illustrates the effects of weighted average SCC and LS. The percentage contribution value in Figure 2 indicates each of the high SCC cow's contribution to the herd's average SCC. Cows 2030, 2294, and 2293 each have a 7.9 LS with comparable SCC. However, cow 2294 is contributing 7% to the total herd SCC average, whereas cows 2030 and 2293 are contributing only 1%. Obviously, cow 2294 is producing much more milk than the other two cows.

This report is useful to indicate from which cows to save milk to feed calves. Five of the first seven cows listed on the report contribute 41% of the herd average. Hence, if this milk is used for feeding calves, quality premiums could be increased.

Some dairy farmers have used this list to select cows for antibiotic treatment in an attempt to lower herd average SCC. However, treating lactating cows to lower SCC is not usually worthwhile and, in most cases, will be futile. Dry cow treatment has been shown to be the only effective antibiotic treatment program to lower SCC.

Lactation Average

This section of the SCC Report (Figure 1) illustrates the effects of lactation number on SCC. Almost every herd's report will show that SCCs of 1st lactation cows are lower than those of 2nd lactation cows, which are lower than those of 3+ lactation cows.

This section is very useful when evaluating problem herd situations. Even though the SCC rankings by lactation number in high SCC herds will be normal, those of first lactation cows may be too high and the following lactations will be higher. In this situation, the herd average SCC could be improved by freshening heifers with lower SCC.

The goal for SCC average of 1st lactation cows should be <100,000, and 5% or less of the heifers should have counts >300,000. If this is not the case, then heifers are likely becoming infected with mastitis-causing pathogens before calving. Look for wet and(or) unsanitary conditions in the springer lot.

The days in milk averages shown in Figure 1 are useful for evaluating dry cow programs and milking management. This is actually a stage of lactation profile for SCC.

The top 25% of herds show that the lowest SCC cows are 50 to 100 days in milk. Then the SCC increases slightly after 100 days. It also shows that cows in milk <50 days have lower SCCs than those in milk >300 days. In many high SCC herds, this is not the profile.

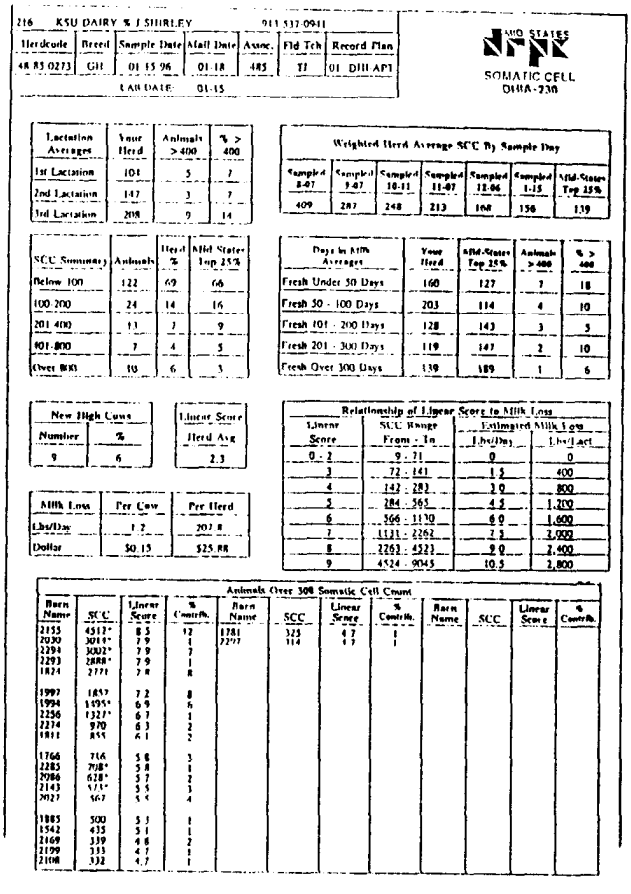
When the SCCs are higher for cows in milk < 50 days than for late lactation cows, suspect a problem during the dry period, Dry cow treatments may be ineffective. However, in many cases, high SCCs are caused by cows becoming infected as they approach parturition. If the SCC average is higher in cows during early lactation than during late lactation, usually, the average in 1st lactation cows also will be high.

To evaluate milking management, compare the SCC of cows in milk < 50 days with that of cows in milk 50 to 100 days. If the second group is higher, suspect a problem with milking management. A higher SCC indicates that the milking management program is stressful, and the cows respond with higher SCC after 50 days in milk. Usually, the SCC will increase with advancing stage of lactation.

Stresses causing higher SCC in cows as lactation advances can include poor milking techniques, poor sanitation in the parlor, and(or) faulty milking equipment. The first two situations are most common.

If milking management does not seem to be the cause of higher SCC as lactation advances, then the problem is probably narrowed down to the condition of lots and the housing system. Systems that do not provide dry and comfortable conditions in the feeding and lounging areas will cause high SCC.

In too many systems, cows do not use free stalls unless the weather is extremely severe. Look for conditions in the free-stall barns that may not be comfortable for cows. These include: condition of the free-stall surface and ventilation in the barn. Cows often will congregate in the alleys of the free-stall barn where air movement occurs. Of course, this area becomes sloppy, and high SCCs usually follow.



216 KSU DAIRY % J SHIRLEY 913 537 0911

Herdcode	Breed	Sample Date	Mail Date	Assoc.	Fld Tch	Record Plan
48 85 0273	GH	01 15 96	01 18	485	TJ	01 DHI.APT

CAN DATE: 01-15

MID STATES SOMATIC CELL DHIA-230

Lactation Averages	Your Herd	Animals > 400	% > 400
1st Lactation	101	5	7
2nd Lactation	147	3	7
3rd Lactation	208	9	14

Weighted Herd Average SCC By Sample Day

Sampled 8-07	Sampled 9-07	Sampled 10-11	Sampled 11-07	Sampled 12-06	Sampled 1-15	Mid-States Top 25%
409	287	248	213	168	156	139

SCC Summary	Animals	Herd %	Mid States Top 25%
Below 100	122	69	66
100-200	24	14	16
201-400	11	7	9
401-800	7	4	5
Over 800	10	6	5

Days in Milk Averages	Your Herd	Mid-States Top 25%	Animals > 400	% > 400
Fresh Under 50 Days	160	127	7	18
Fresh 50 - 100 Days	203	114	4	10
Fresh 101 - 200 Days	128	143	3	5
Fresh 201 - 300 Days	119	147	2	10
Fresh Over 300 Days	139	189	1	6

New High Cows	
Number	%
9	6

Linear Score
Herd Avg
2.3

Milk Loss	Per Cow	Per Herd
Lbs/Day	1.2	207.8
Dollar	$0.15	$25.88

Relationship of Linear Score to Milk Loss

Linear Score	SCC Range From - To	Estimated Milk Loss Lbs/Day	Lbs/Lact
0 - 2	9 - 71	0	0
3	72 - 141	1.2	400
4	142 - 282	2.9	800
5	284 - 565	4.5	1,200
6	566 - 1130	6.0	1,600
7	1131 - 2262	7.3	2,000
8	2263 - 4523	8.0	2,400
9	4524 - 9045	10.5	2,800

Animals Over 300 Somatic Cell Count

Barn Name	SCC	Linear Score	% Contrib.	Barn Name	SCC	Linear Score	% Contrib.	Barn Name	SCC	Linear Score	% Contrib.
2155	4512*	8.5	12	1781	325	4.7	1				
2030	3019*	7.9	1	2297	114	4.7	1				
2294	30027*	7.9	7								
2293	2888*	7.9	1								
1824	2771	7.8	8								
1997	1857	7.2	8								
1994	1595*	6.9	6								
2256	1327*	6.7	1								
2274	970	6.3	2								
1811	855	6.1	2								
1766	716	5.8	3								
2285	708*	5.8	1								
2086	628*	5.7	2								
2143	573*	5.5	1								
2027	567	5.5	4								
1885	500	5.3	1								
1542	455	5.1	1								
2169	339	4.6	2								
2199	335	4.7	1								
2108	332	4.7	1								

Figure 1. Somatic Cell Count Averages and High Cow List

Herdcode	Sample Date	Lab Date	Mail Date	Page
48-85-0273	01-15-96	01-15-96	01-18-96	1

COMPUTER NUMBER	PREVIOUS 5 SAMPLE DAY SCC SCORES					CURRENT LACTATION						
	8-07	9-07	10-11	11-07	12-06	1-15	LINEAR SCORE	BARN NAME	LACT NO	FRESH DATE	DAYS IN MILK	MILK LBS
1792	44	59	59	25	18	161	3.7	1302	8	4-01	290	63.9
1944	1269*	507*	467*	348	DRY	DRY		1462	7	12-31	DRY	
1974	DRY	DRY	180	64	182	31	1.3	1486	7	10-02	106	85.3
1982	55	53	65	65	88	92	2.9	1488	6	10-26	447	50.8
1992	123	263	215	161	168	271	4.4	1504	7	7-01	199	46.7
2024	462*	887*	DRY	DRY	2544*	32	1.4	1527	7	11-21	56	42.6
2028	822*	114	3854*	418*	179	435*	5.1	1542	7	7-14	186	50.8
2036	215	3031*	2039*	DRY	DRY	DRY		1552	6	12-21	DRY	
2041	372	DRY	DRY	DRY	331	278	4.5	1558	6	11-21	56	54.8
2067	72	182	142	131	200	DRY		1585	5	1-05	DRY	
2091	99	53	13	38	75	263	4.4	1611	6	2-28	322	14.2
2108	294	11	17	15	12	27	1.1	1635	6	5-09	252	53.8
2125	91	4028*	DRY	DRY	177	18	.5	1652	6	11-26	51	109.6
2156	29	96	53	77	DRY	DRY		1690	5	1-09	DRY	
2178	XXX	34	67	DRY	DRY	46	1.9	1713	6	1-01	15	32.5
2217	146	154	219	DRY	DRY	DRY		1757	4	12-07	DRY	
2219	187	407*	DRY	DRY	111	96	2.9	1759	5	11-23	54	98.5
2221	906*	DRY	DRY	DRY	XXX	25	1.0	1763	5	12-02	45	128.9
2224	DRY	56	26	1965*	776*	716*	5.8	1766	5	8-17	152	81.2
2229	DRY	241	64	81	107	167	3.7	1771	5	8-13	156	50.8
2240	1781*	284	83	62	88	325	4.7	1781	5	8-05	164	40.6
2242	6131*	3899*	4783*	2705*	DRY	DRY		1783	4	11-23	DRY	
2268	228	92	181	167	137	85	2.8	1809	4	1-03	378	36.5
2270	2119*	614*	3590*	863*	1256*	855*	6.1	1811	4	1-09	372	44.7
2273	153	DRY	DRY	XXX	36	23	.9	1814	5	11-02	75	99.5
2283	310	477*	DRY	DRY	2692*	2771*	7.8	1824	5	11-14	63	54.8
2323	DRY	DRY	DRY	17	55	115	3.2	1867	4	10-11	97	95.4
2336	20	28	82	30	44	93	2.9	1880	4	7-06	194	56.8
2341	534*	939*	358	922*	972*	500*	5.3	1885	4	3-23	299	42.6
2568	DRY	DRY	497*	461*	761*	283	4.5	1889	4	10-01	107	93.4
2349	100	171	149	DRY	DRY	DRY		1893	3	10-04	DRY	
2355	131	5408*	2385*	80	67	64	2.4	1900	3	1-24	357	42.6
2357	114	324	DRY	DRY	87	16	.4	1902	4	11-27	50	95.4
2360	109	DRY	DRY	8	10	18	.5	1905	4	10-08	100	89.3
2365	182	DRY	DRY	24	24	150	3.6	1910	4	10-19	89	75.1
2373	80	112	16	38	49	131	3.4	1921	3	2-23	327	58.9
2377	6894*	1810*	1006*	21	9	4		1925	3	3-21	301	75.1
2378	DRY	358	99	75	23	134	3.4	1926	3	8-13	156	71.1
2384	300	DRY	DRY	DRY	9	5		1932	4	11-22	55	109.6
2393	84	96	433*	DRY	DRY	DRY		1941	3	2-08	DRY	
2400	22	19	37	68	DRY	DRY		1948	3	1-24	DRY	
2410	14	25	42	43	106	67	2.4	1960	3	6-10	220	62.9
2415	403*	361	422*	449*	304	DRY		1965	3	1-25	DRY	
2420	75	14	20	27	19	69	2.5	1970	3	7-16	184	36.5
2617	23	24	29	48	DRY	DRY		1971	3	2-23	DRY	
2424	DRY	DRY	194	76	15	95	2.9	1974	3	9-26	112	79.2
2441	32	15	12	119	25	53	2.1	1991	3	7-02	198	60.9
2443	DRY	DRY	80	64	51	79	2.7	1993	3	9-16	122	66.6
2444	163	354	377	DRY	DRY	1495*	6.9	1994	3	1-08	8	74.1
2446	528*	1916*	513*	290	207	DRY		1996	3	3-09	DRY	
2447	DRY	596*	1990*	5115*	1451*	1857*	7.2	1997	3	8-15	154	81.8
2455	230	271	DRY	DRY	71	DRY		2003	3	11-23	DRY	
2453	DRY	DRY	141	70	21	85	2.8	2004	3	10-03	105	65.6
2457	32	22	33	45	87	DRY		2007	2	12-17	DRY	
2458	DRY	DRY	42	23	8	12		2009	3	10-05	103	71.1
2460	43	150	106	91	59	56	2.2	2011	3	6-15	215	58.9
2461	37	33	16	32	34	73	2.5	2012	3	7-17	183	60.9
2462	42	75	DRY	DRY	DRY	15	.3	2013	3	12-08	39	74.7
2464	25	27	DRY	DRY	115	13	.1	2019	3	11-26	51	111.7
2465	120	DRY	DRY	34	33	40	1.7	2020	3	10-11	97	81.2

XXX=SAMPLE MISSING OR INSUFFICIENT *COUNT OVER 400,000

Figure 2. Somatic Cell Count Report for Individual Cows