



## TROUBLESHOOTING RECORDS TO DETERMINE UDDER HEALTH PROBLEMS

*Allen Young*  
Dairy Extension Specialist  
Utah State University, Logan, Utah

September 2002

AG/Dairy-05

Mastitis is a costly disease of the mammary gland. It has been estimated that each case of mastitis costs the dairy producer \$105 - 110; primarily in lost milk sales. Summers are the time of the year when the incidence of clinical mastitis goes up on most farms. However, frequent evaluation of your mastitis control program is important to help prevent the incidence of mastitis from becoming unmanageable. If you are currently having a problem, now is the time to fix it, especially if summer is approaching.

### How do you know if you have a problem right now?

If you are not on DHI, you can use records from your milk processor or your on-farm record system. If you are on DHI, you have at least one tool each month that will help. It is called the Herd Summary. On row two of the summary you will find a section entitled Somatic Cell Summary. The level of somatic cells in the milk is a window to the amount of subclinical mastitis in your herd. Most mastitis is subclinical, which means you don't see any flakes or clumps in the milk, but mastitis is still there. A copy of this section is shown below in Table 1.

**Table 1. From Herd Summary (row 2).**

L a c t	Somatic Cell Summary														
	Low 0-4	Med 5-6	High 7-8	% L	% M	% H	Avg L2	Avg SCC	30 Day Loss	Chg SCS		1 <sup>st</sup> Test	45 - 180	181 - 305	>305
										% UP	% DN				
1	42	1		98	2			1.3	0.37			2.0	1.2	1.4	1.7
2	25	4		86	14			2.6	1.97	7		3.1	1.4	3.0	4.2
3	60	12	1	82	16		1	2.2	2.36	8	3	5.0	1.4	2.4	3.6
T	127	17	1	88	12		1	2.0	1.80	6	1	3.7	1.4	2.3	3.3

## How can you use this section to evaluate your herd?

Table 1 is divided according to the percentage of cows which fall into three categories or levels of somatic cells in the milk: low, medium, and high based on linear score. Your goal is to have the highest percentage of your herd in the low (0-4) category. The greater the incidence of subclinical mastitis in your herd, the higher the percentage of cows that will fall into the medium and high groups. Herds with excellent udder health will have greater than 88% of their herd in the low (0 - 4) category. Values of 65% or less in the low category are considered poor and should be corrected immediately.

The second thing to look at is where the problem is occurring. You can look at this in two dimensions. The first is which groups of animals are having a problem (Lactations 1, 2, 3+) and second, at what point in their lactation (1st test, 45 - 180, 181-305, or >305 days in milk) is the problem occurring. To understand this you need to understand a little about how the Linear Score (LS or L2) scale works.

The LS (L2) is a mathematical way of converting the raw Somatic Cell Count (SCC) to a linear scoring system. For each unit increase of LS, the SCC doubles (see Table 2). At the lower linear scores, that isn't as much of a change in the somatic cell count for each unit change as at the higher scores. For example, going from a LS of 1 to a 2 is only a difference of 25,000 SCC, while going from a 4 to a 5 is 200,000. A herd with a LS of 4.5 and above is having problems. Currently there are proposals to lower the legal SCC limit from 750,000 down to 600,000 (LS 5.5) or 400,000 (LS 5). If these proposals are approved, then the LS at which herds approach the trouble zone will also decrease. My advice is to stay away from the line.

**Table 2. Somatic cell count as related to linear score and milk losses.**

Somatic Cell Count (Thousands)			Milk Yield Losses			
Linear Score (LS)	Average	Range	Per Day		Per 305 Lactation	
			1st <sup>1</sup>	2nd(+) <sup>2</sup>	1st <sup>1</sup>	2nd(+) <sup>2</sup>
0	12.5	0-17	<b>Pounds of milk loss relative to LS 2.0</b>			
1	25	18-34				
2	50	35-68				
3	100	69-136	.75	1.5	200	400
4	200	137-273	1.5	3.0	400	800
5	400	274-546	2.25	4.5	600	11200
6	800	547-1092	3	6.0	800	1600
7	1600	1093-2185	3.75	7.5	1000	2000
8	3200	2186-4371	4.5	9.0	1200	2400
9	6400	4372 or more	5.25	10.5	1400	2800

<sup>1</sup> Refers to 1st lactation animals.

<sup>2</sup> Refers to 2nd and older animals.

From Cornell University mimeo series # 124, 1987.

Now back to the example herd (see Table 1). Generally this herd is doing an excellent job with the 1st lactation animals and very good with the 2nd and 3+ lactation animals in terms of % cows in the low (0-4) category. The average LS is generally good. As a warning, be careful of the number of cows in a group. Groups that have only one or two cows decrease the accuracy of the evaluation and may give a false analysis of the problem or lack of a problem. If you look at the LS by stage of lactation (last four columns in Table 1), 1st lactation animals have an excellent somatic cell profile. The 2nd lactation animals are getting into the danger zone in late lactation (>305 DIM). The biggest problem here is that the 3+ lactation cows are calving at a very high LS (5.0), and then dropping. In this case, this is a herd that looks good at first glance, but does have one area that could be improved. This herd could help itself by looking at the calving area (possibly also the dry cow area) to make sure it is clean and sanitary.

One last thing to look at is the %UP or %DN. This is a measure of the percentage of cows, by lactation #, that had an increase in SCC from below a LS of 5.0 from the last test day to above LS 5.0 on this test day. The % DN is just the opposite; above a LS of 5.0 on last test day to below LS 5.0 on this test day. If you start seeing an increase in the %UP, then immediately start evaluating your udder health program and do something now before it becomes a major problem.

Why should you care or put any effort into keeping the SCC low? I have three reasons: MONEY, MONEY, and MONEY. It is less costly to prevent mastitis, than treat it. It costs money to treat mastitis cases and dump milk, it costs money in lost quality bonuses, and it costs money in decreased milk production per cow. Your DRPC estimates production losses and reports averages in the column called “30 Day Loss” (Table 1). In our example, they are losing, on average, \$1.80 per cow per 30 days. For a 100-cow herd this would be \$180 milk per month. Assuming you maintained this level for one year, it would come to \$2160. This herd has a low SCC and is losing a relatively small amount of money, but in herds with problems, the amount of money being lost is quite large. This doesn't include lost quality bonuses, the possibility of dumping milk, possible loss of milk license, or the aggravation of dealing with the problem. Table 2 shows how much milk can be lost due to mastitis.

Milk loss (Table 2) is compared to a cow with a LS of 2.0 (SCC = 50,000 cells/ml). For each increase in LS of 1.0 unit, milk production decreases by 0.75 lb/cow per day for a 1<sup>st</sup> lactation cow and 1.5 lb/cow per day for a 2<sup>nd</sup> + lactation cow. This is the equivalent of 200 and 400 lb/cow for a 305-day lactation for 1<sup>st</sup> and 2<sup>nd</sup> + lactation cows, respectively. A cow that has an average LS of 5.0 (SCC = 400,000 cells/ml) would be losing 2.25 lb/cow per day (600 lb in a 305-day lactation) for 1<sup>st</sup> lactation cows and 4.5 lb/cow per day (1200 lb in a 305-day lactation) for 2<sup>nd</sup> + lactation cows. For a 100-cow dairy with 35% 1<sup>st</sup> lactation cows, the weighted average loss per cow in the herd would be 990 lb per 305-day lactation. At \$11/cwt milk, the herd loss due to decreased milk production would be \$10,890.

## **Developing a Plan to Handle Mastitis Problems**

The previous section has tried to help you become familiar with where to look for information on how your herd is doing in the area of udder health and the cost of mastitis to an average dairy. Mastitis costs you money in terms of lost production and the costs associated with treatment of the disease. The next step is to determine if you have a problem and places you should look to determine the cause of the problem.

## **Troubleshooting Your Own Dairy - How do you know if you have a problem?**

The simple answer to this question is one word - RECORDS. You need to be monitoring every piece of information available to you in order to get on top of the problem. Prevention is preferable to waiting until the problem is out of control. Records that are useful are DHIA

records, lists of high SCC cows, SCC by DIM and Strings, and bulk tank SCC. I consider herd average DHIA or bulk tank SCC above 300,000 (LS = 4.5 or above) as indicating serious problems. Some herds that have been at 100,000 and then suddenly go up to 200,000, even though this is still satisfactory, should be checked. Monitoring the number of clinical cases of mastitis is also recommended. I suggest graphing the cases per 100 cows on a regular basis and watch for changes. The number of cases should equal less than 2% of the herd per month.

### **If You Determine That A Problem Exists, Where Should You Start To Look For A Problem?**

When I start looking for potential sources of a mastitis problem, I try to consider 3 main areas. The relative importance of each will vary according to where the problem is on your dairy. They are:

1. Milking equipment
2. Milking procedures
3. Cow environment/facilities

I have been surprised to see the number of problems that can be traced back to faulty milking equipment. I have seen problems from cracks in the vacuum lines, cracks in hoses, faulty pulsators, clogged air filters, etc. You should have a regularly scheduled visit by a competent milking systems technician whose purpose is to go through the whole system checking vacuum levels, graph all pulsators, check hoses, etc. You (or this same person) should check inflations and change them on schedule according to manufacturer recommendations - usually about every 1200 milking. Some people like to stretch the limit on inflations, but even though they look fine, the inner lining starts to break down. This creates an environment for bacteria to colonize.

Overlooked milking procedures can be a big contributor to mastitis problems. You should be milking clean, dry cows. The milking machine is good at cleaning the teats, but that isn't its purpose. Standardize milking procedures (I recommend the One-Step method from Minnesota), wear gloves, pre-dip and post-dip cows, and remember to stimulate cows properly for adequate milk let-down. These are all important components of a successful program.

Many cases of mastitis originate from the environment of the cow. Freestalls should be bedded often, with adequate amounts of material to provide a comfortable place to lie AND keep the cow clean and dry. Try the knee drop test to see if they meet these criteria by kneeling in a stall, then stand up and look at your knee. If it is clean and dry, congratulations, you are doing a good job. The stalls should be properly groomed so that they slope properly (front to curb) and don't look or feel like craters on the moon. Scraping alleys at least daily is critical to keeping cows clean. In addition, flame or clip udders to remove hair (as needed) to maintain a clean environment around the cow.

Although the above list is very brief and simplistic about things to consider, tracking down the cause of mastitis is necessary and sometimes can be frustrating. Having a good attitude and working with your veterinarian, consultant, or extension specialist can help to overcome the problem. The public wants a quality product, and I think you can provide it.

---

Utah State University is committed to providing an environment free from harassment and other forms of illegal discrimination based on race, color, religion, sex, national origin, age (40 and older), disability, and veteran's status. USU's policy also prohibits discrimination on the basis of sexual orientation in employment and academic related practices and decisions.

Utah State University employees and students cannot, because of race, color, religion, sex, national origin, age, disability, or veteran's status, refuse to hire; discharge; promote; demote; terminate; discriminate in compensation; or discriminate regarding terms, privileges, or conditions of employment, against any person otherwise qualified. Employees and students also cannot discriminate in the classroom, residence halls, or in on/off campus, USU-sponsored events and activities.

This publication is issued in furtherance of Cooperative Extension work. Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Jack M. Payne, Vice President and Director, Cooperative Extension Service, Utah State University. (EP/09-02/DF)