

Step Up your SCC Management: Think in Terms of Infections

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One day you wake up feeling tired; little things make you feel angry. Your eyes are tired, and it's pleasant to close them. You work through the day, emphatically telling everyone you are not angry. Then you go to bed and wake up feeling normal again.

You fought off an infection, just as your immune system is supposed to. Somewhere in your environment you became infected, your body fought off the infection, and you never even knew it.

These infection-immune system battles occur much the same way in cows. Infections occur one at a time, and a cow, supported by its immune function, either beats the infection, remains subclinically infected, or becomes clinically infected.

The ideal situation is for herd managers to manage their animals' environment to minimize their risk of infection. They improve cows' health and comfort so their immune systems can fight off any infection. Consequently, only a small portion of infections become clinical.

In other herds a large number of infections become subclinical as animals and infections vie for the upper hand. The best case scenario is for the animal's health and environment to defeat infections, which show up as a blip on their Somatic Cell Count (SCC).

If you break a herd into infection-status segments, you can more precisely identify the causes behind an infection, get some clues on where to focus your attention and track your progress at managing the environment to control infections, such as mastitis.

It's impossible to know how to reduce mastitis issues in a herd by looking at your bulk tank SCC or even the number of clinical cases in the last week. The herd average Linear Score (LS) is a much better measure but still not enough to help you make a plan to manage the environment.

LS vs. SCC

As a way to manage mastitis, looking at the portion of a herd that's infected is far superior to looking at average LS. Your DHI herd summary is the most accessible tool to help you think about your herd's mastitis in terms of the portion of infected animals.

To show how the herd summary can help you, we summarized 1,140 Northeast Holstein herds with more than 100 cows. They were tested in September 2007 and averaged more than 60 pounds of milk on DHI test day.

We used the Dairy Metrics web application provided by DRMS Raleigh to assemble the information. Find your herd's level of infection on the bottom of the Raleigh Herd Summary "Stage of Lactation Profile" in the SCC Score>3.9 section. Animals with a SCC LS greater than 3.9 are likely infected.

The average herd we selected for our benchmarks milked 289 cows and gave 72 pounds of milk per cow at 188 days in milk. It had a weighted average SCC of 296,000 and a 2.9 LS. One standard deviation of LS was .5, which we used to divide the herds into four groups based on their average LS:

1. < 2.5 = the best
2. 2.5 to 2.9
3. 3.0 to 3.4
4. > 3.4 = the most opportunity

When you manage a bulk tank, you must use SCC. But when you're managing groups of cows, it's best to look at the Somatic Cell LS. Straight averages of SCC can't be interpreted because: bulk tank SCC is weighted by how much milk a cow gave, and there's a much greater range in SCC than in LS (Table 1).

Table 1. LS vs. Raw SCC

<u>LS</u>	<u>SCC (cells per milliliter)</u>
2	50,000
3	100,000
4	200,000*
5	400,000
6	800,000
7	1,600,000
8	3,200,000

* Generally accepted as the point where animals are likely infected.

Note: When the LS changes by one, the SCC either doubles or halves.

Table 2, illustrates the LS to SCC relationship by looking at 10 test days for one cow.

Table 2. SCC - LS relationship

<u>Test</u>	<u>LS</u>	<u>SCC</u>
1	2	50,000
2	2	50,000
3	2	50,000
4	9	6,400,000
5	2	50,000
6	2	50,000
7	2	50,000
8	2	50,000
9	2	50,000
10	2	50,000
Avg.	2.7	685,000

This cow had nine great SCC tests and one that popped up when she was challenged by an infection and fought it off. The average LS, which is less affected by one high count, better characterizes the quality of this animal's udder health than the average SCC Raw Count where one high score has more influence.

Manage cows, their environment

Thinking in terms of the portion of a herd that's infected can be constructive. A high LS - 4 or greater - means an animal is likely to have mastitis. Some people use 4.5 or even 5.0 as a cut off point. The important point is to think in terms of reducing the number of infected animals by managing the cows and their environment.

We compared infection in fresh animals - less than 41 days in milk - with the whole herd's level of uninfected cows. The more mastitis is under control in a herd, the lower the percentage of fresh cows that are infected and the lower the whole herd infection percentage.

As herd average LS increases, there's a greater likelihood of animals being infected in later lactation relative to the fresh-cow rate. This is because the infection "challenge" is greater throughout the herd. Also, existing cases may be less likely to become cured in higher infection level herds (Table 3).

What should you do if this situation exists on your dairy? Manage the environment to minimize new infections and cure current infections. Look for ways to minimize the sources of infection - animals shedding bacteria and the environment that harbors and facilitates their transfer to other animals.

DHI report reveals mastitis situation

What does the DHA Herd Summary of this 180-cow dairy tell you about the herd's mastitis circumstances?

The herd had an overall average 3.1 LS. Yet of 25 fresh animals from one to 40 days in milk, only one (4 %) was infected. Overall, 25% of the herd is infected. Despite having a higher average LS, the portion of the animals infected is relatively low. This suggests that the herd's rate of infection is under control in the dry period and early lactation.

What about the group of animals running very high LS, particularly older lactation animals in late lactation?

They have average LS values of 4.2 and 4.4, with 38% infected. This herd will benefit from the manager closely investigating animals with high LS. My advice is to perform milk cultures on the high LS cows. Then map out a strategy for those specific animals and their infections. Think of your herd's SCC information as gauges to help you see more closely how the cows' environment is supporting their udder health.

The important point is to think in terms of reducing the number of infected animals by managing the cows and their environment.

Refine your mastitis assessment

Looking at the portion of the herd that is infected is far superior for managing mastitis than looking at the average Linear Score (LS), but we can refine that even further. The next steps are to quantify:

1. The portion of the herd chronically infected.
2. The rate at which animals are getting new infections.
3. The rate at which animals are cured.

If you have Dairy Comp 305, break these out further by using the command: Plot LS=4.0 by LS\RY. (See Figure 1.) Then select the Report Tab, located between Grid and Graph towards the bottom of the screen, after running the command. (The Graph tab will be displayed first.) It will show you the overall infection rate for your herd, plus display the percentages of new and chronic infections.

The test dates across the top (Figure 1) show the most recent test to be 1.16 and the previous on 12.19. Based on the way we ran this command, animals are considered infected if they have a SCC LS greater than 3.9. The results on 1.16 show:

- 19% of the herd, or 90 animals, were high last month and this month. They're considered chronically infected.
- 10%, or 49 animals, were newly infected. They were low last month and are high this month.
- 5%, or 22 animals, were cured. In other words, they were high last month and low this month.
- 25% of the fresh cows were high on their first test after calving and 75% were low.
- The current overall average LS is 3.0 on 547 animals, up from 2.7 the previous month.

Figure 1. Sample Dairy Comp 305 report
Command : PLOT LS=4 BY LS\RY

DCFARM1 ----- Dairy One ----- 1/16---													
TEST DATES													
	12	12	13	13	15	15	15	13	14	17	14	15	19
Chronic %	12	12	13	13	15	15	15	13	14	17	14	15	19
#	52	63	66	67	78	78	80	71	76	86	64	72	90
New Inf %	8	9	6	10	9	13	6	12	12	10	12	10	10
#	36	46	33	49	45	65	34	63	64	51	54	47	49
Cured %	7	7	7	5	5	8	8	8	10	7	10	9	5
#	32	34	36	24	26	42	42	44	55	37	45	44	22
Clean %	73	72	74	72	71	64	70	67	64	66	65	65	66
#	329	371	380	365	369	328	370	365	342	335	306	306	318
HiFresh %	19	16	18	24	38	32	30	46	41	19	33	20	25
#	21	9	11	15	23	24	16	25	14	6	16	10	17
LoFresh %	81	84	82	76	62	68	70	54	59	81	67	80	75
#	91	49	51	48	37	52	37	29	20	25	33	40	51
Average	2.2	2.3	2.2	2.5	2.7	3.0	2.7	2.9	2.9	2.8	2.9	2.7	3.0
#	561	572	577	568	578	589	579	597	571	540	518	519	547

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