Are you Using the DHI "Hot Sheet" to Manage your Herd Somatic Cell Count?

COOPERATIVE EXTENSION SERVICE

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The DHI "hot sheet" is often described as the single most useful DHI report provided to dairy producers. An example hot sheet is depicted in Figure 1. The concept of the hot sheet is fairly straightforward. The results printed on this report are based on the collection of milk samples from individual cows in a herd, the recording of the milk production of those cows and the analysis of those milk samples for somatic cell count, butterfat percent, protein percent and if desired milk urea nitrogen (MUN). Each cow in the herd contributes somatic cells to the herd's bulk tank. How many cells an individual cow contributes is a factor of the somatic cell concentration within her milk (measured in cells per mL) and the volume of milk she produces. From DHI testing, we have both SCC concentration and milk volume. So, each cow's contribution of somatic cells to the herd average can be calculated using these two pieces of information. A "weighted average SCC" is calculated for the bulk tank using this information from all cows. Then, using the cells contributed by each cow and her milk production, the percentage of cells in the bulk tank for each cow is calculated. Cows on the hot sheet are ranked with the cow contributing the most cells in the tank on the top of the list and the cow contributing the least cells in the tank on the bottom of the list. The column farthest to the right on the hot sheet shows the percentage of cells in the tank from each cow in the herd. Moving left, the next column lists what the weighted average bulk tank SCC *would be without that cow and all cows above her* in the bulk tank. For most producers, these are the only two columns that need to be examined though the other columns may provide additional useful information such as that cow's somatic cell count (in thousands) and milk yield.

Let us walk through an example using the information provided in Figure 1. For this herd, the weighted average SCC was 492,000 cells/mL. Cow 7 contributed the most somatic cells to the weighted SCC average. Her SCC was 7,352,000 cells/mL. She was responsible for 25.6% of the somatic cells in the bulk tank. Without including her in this average, the weighted average SCC for this milking would have been 373,000 cells/mL. Cow 56 contributed an additional 15.9% of the cells with a SCC of 6,400,000. Without these top two cows (Cows 7 and 56) the weighted average SCC for this milking would have been 297,000 cells/mL. Quickly, we can see the impact that only two cows had on the herd's SCC. Cows with particularly high SCC or high milk production with moderately high SCC can have a huge impact on herd SCC, particularly in small herds. With larger herds, the impact that one cow has on SCC is smaller because this milk is diluted by the milk from other cows. This information can prove very valuable for dealing with a short-term high SCC problem.

It is important to discuss a few limitations of the "hot sheet."
1. First, the numbers reflect the samples collected from and the milk production of the cows on that particular milking on test day. SCC fluctuates considerably among individual cows from milking to milking.

2. Second, the weighted average SCC may not match on-farm bulk tank SCC exactly because of differences in cows tested versus those included in the bulk tank and the fact that cows are

sampled one milking of the 2 or 4 milkings included in the bulk tank. For example, if cows sampled on DHI test are treated and their milk withheld from the bulk tank, differences between the two herd SCC measures may occur.

3. Finally, if the highest SCC cows are removed from the herd, other cows will take their place on the top of the list. Part of this is just simple math indicating that some cow has to be the highest SCC cow in the herd.

Nevertheless, it is also important to realize that eliminating high SCC cows is only an emergency treatment of the problem without getting at its root cause. If you only focus on removing high SCC cows from the herd without determining why these cows have high SCC and how to incorporate preventive practices, you will continue to cull or dump milk from high SCC cows test after test. To fully benefit from the DHI hot sheet, you may want to consider collecting milk samples for bacteriological culture for all cows with SCC greater than 200,000 for two consecutive months or at least the top 10 or 20 cows on the list. This would provide valuable information for developing prevention strategies and making individual cow treatment or culling decisions. Another caution is to not be too quick in culling high SCC cows. It is best to make decisions based on multiple SCC values and trends instead of a single cell count for a particular cow. The use of three consecutive monthly SCCs improves decision-making, especially when combined with other cow factors such as age, and stage of lactation, and time of year. First, check to see if high cows are chronically high SCC cows ("chronic cows" are defined as those with two consecutive months with a cell count greater than 200,000 cells/ml in a single lactation). Those cows are the most likely culls. If the SCC is high on a single test, the cow may recover on her own or with the assistance of treatment.

Figure 1. An example of a DHI hot sheet.

Hot Sheet

Mid-South Dairy Records   *******   HOT SHEET   *******   Page 1
                41 samples   collected 4-28-10   tested 5-03-10

Index	Barn	Milk	Fat	Pro	SNF	MUN	SCC	Count	DIM	Lac	CAR	B#
Avg	41 cows	59.8	3.9	3.3	9.0		3.6		140			

Highest 20 SCC Cows   Weighted Average SCC: 492

Index	Barn	Milk	Fat	Pro	SNF	MUN	SCC	Count	DIM	Lac	CAR	W/O	%
7	7SWISS	42.1	4.7	4.0	8.8		9.2	7352	12	1		373	25.6
56	56	30.2	5.3	4.6	8.3		9.0	6400	180	3		297	15.9
54	TESSY	81.5	3.6	3.2	8.7		6.9	1493	12	2		254	10.1
302	GLITTER	83.1	3.3	3.0	8.2		6.3	985	47	3		226	6.8
14	IZZIE	62.7	3.6	3.3	9.1		6.5	1131	145	5		200	5.9
457	NIKKI	81.4	3.2	2.9	8.1		5.9	746	34	2		179	5.0
554	AIDA	44.8	4.3	3.4	9.2		6.3	985	150	1		161	3.7
289	WHITCHA	61.7	3.2	3.2	9.0		5.4	528	308	4		149	2.7
68	5639556	85.1	4.0	3.0	8.8		4.9	373	15	1		139	2.6
17	M17	47.2	2.9	3.0	8.8		5.6	606	41	1		127	2.4
608	ELIZABE	36.1	4.1	3.2	8.9		5.8	696	107	2		116	2.1
47	PEYTON	68.2	4.8	3.3	9.0		4.8	348	117	6		106	2.0
35	SQUIRRE	58.0	3.8	3.4	9.3		4.7	325	50	1		99	1.6
119	BGEORGE	66.2	3.0	3.1	8.7		4.4	264	162	2		92	1.4
113	BETH	72.4	3.4	3.4	9.0		4.1	214	316	3		86	1.3
4	GRACEFU	56.9	6.0	3.7	9.3		4.4	264	204	4		80	1.2
285	ANN	60.5	4.2	3.7	9.2		4.3	246	210	4		72	1.2
42	42	76.0	3.6	3.3	9.1		3.7	162	28	1		67	1.0
86	86	65.3	2.4	3.1	8.9		3.9	187	26	1		61	1.0
282	WITCHIE	68.1	3.9	3.1	8.6		3.7	162	137	3		55	0.9