

Data Collection Rating (DCR) *by George Cudoc*

Years of finding testing methods to best suit the needs of dairy businesses has led to the evolution of almost countless DHI testing programs. As these testing programs were developed we needed a method to evaluate the data produced from each program. In the world of dairy genetics a plan has been in place for more than five years now that rates data based on the frequency of collecting data at the farm and the level of DHI supervision.

Data Collection Ratings (DCR) although not actually new, are for the moment initiating some conversation and questions about what they are, how they are calculated and how they are used. Recent changes at the nation's largest dairy processing center, Dairy Records Management Systems (DRMS), has seen the addition of the DCR Milk for a herd printed on the Herd Summary DHI-202 report.

A majority of Dairy One herds process their data at DRMS and more than 90% of those herds receive the printed 202 report. For those who have not yet noticed, this DCR Milk can be found on page 2 of the Herd Summary DHI-202 below the Identification and Genetic Summary and to the left of the Current Somatic Cell Count Summary.

IDENTIFICATION AND GENETIC SUMMARY			
NUMBER ID CHANGES	NO. ANIMALS WITH MERIT \$	AVERAGE MERIT \$	
		ANIMAL	SIRE
47	380	+117	+163
52	589	+132	+212
205	351	+124	+183
304	1320	+126	+185
NUMBER HEIFERS IN 13+ AGE GROUP OVER 30 MONTHS OF AGE			

HERD MERIT \$ OPTION	GENETIC PROFILE OF SERVICE Sires		
NM	PROVEN A.I. Sires	A.I. YOUNG Sires	ALL OTHER Sires
	% OF HERD BRED TO	49	27
NUMBER OF BULLS USED	16	61	20
AVERAGE MERIT \$	+325	+441	
AV. PERCENTILE RANK (NET MERIT)	68	87	

DCR MLK	CURRENT SOMATIC CELL COUNT SUMMARY	
95.4	HERD PRODUCTION LOST FROM SCC	MILK =

A DCR is a numerical value expressed as a percentage indicating the relative value to be placed on that data or record. DCR values can range from 0 to 104 and for each individual cow can grow during the lactation as we record more and more data for that cow. In the chart you will see that DCR increases each time that we test a cow during her lactation. This is accounted for when cows only finish partial lactations. There are also subtle differences in DCR when comparing parity. There is a 5% drop-off between the older and more traditional 2x testing program and the more commonly used AM-PM program of today.

DCR is determined by the number of milk weights and component test results that were measured during the cow's lactation as well as the supervision level by a certified trained DHI technician. The chart below indicated both the frequency of the data collection as well as the level of supervision. **As a caution, please note that when we refer to the 10 total tests in a 305 day record, this refers to an individual cow and not the herd. For a dairy to capture the highest DCR for the herd, each cow would need to have 10 tests in her 305 day lactation and that would only be possible when the herd tests on 30 day intervals or 12 times per year.**

Looking at the chart from the top down you can see that herds with automatic milk recording equipment and interfaces can achieve the highest rating over 100. This is due to the established 100 DCR base, that is the traditional monthly testing plan in which a supervisor weighs and samples milk during all milkings (two or three times daily), for each animal, each month. Unsupervised test plans are weighted 75 percent as much as supervised test plans in the calculations.

DCR Changes within Lactation

Table 2. Data collection ratings (DCRs) for records of < 305 days with supervised monthly testing.

Days in Test Milk	First-lactation DCR		Later-lactation DCR		
	All ¹	a.m. - p.m. ²	All	a.m. - p.m.	
1	15	36	27	23	18
2	45	49	42	39	33
3	75	61	53	54	47
4	105	71	63	67	60
5	135	80	72	78	70
6	165	87	80	86	79
7	195	92	86	92	85
8	225	96	90	96	90
9	255	99	93	99	93
10	285	100	95	100	94

¹ Milk weights were obtained from all milkings on each test day.

² Only one of the two milkings was weighed on each test day.

The most commonly used DHI service for Dairy One is a monthly AM/PM test. This test is done 12 times a year and a DHI technician collects milk weights and samples for each cow at one of the daily milkings. The calculated DCR in this case would be 95 if the herd was being milked 2x and 90 if the herd was 3x. Again this is based on the frequency of testing and the level of supervision. A 2x milked herd is being observed at one half of the daily milkings each of 12 months resulting in each cow having 10 tests during a 305 day lactation while the 3x herd similarly tested is observed one third of the milkings thus lowering the DCR.

In the section listed as 10x/yr, you will see that on average cows will have 8 tests during their 305 day lactation and the resulting DCR will drop. Compared to cows with 10 tests on a 2x milking schedule the DCR will drop 2 points when tested 8 times and supervised each test.

DCR is used in a number of places across the dairy industry. Notable among these is application of records used for genetic evaluations. DCR dictates the level of contribution that a lactation record is used in proving an individual sire. Cows tested less frequently or supervised less at test are used but less weight is put on that record. This has been an invaluable tool for genetics because now we can use owner-sampler type records only at a different value than supervised.

Breed associations display DCR on pedigrees and require a particular level of DCR to differentiate participation in some programs. Some bull stud companies determine reward levels paid to participants in programs like data collection incentives for young sire usage and calving ease reporting.

In summary, Data Collection Rating is used to compare the accuracy of lactation records from different DHI testing plans. Separate DCRs are calculated for milk yield, component yield, and Somatic Cell Score. **The DCR printed on the DHI-202 is for DCR Milk only.** Some factors improve the DCR from the standard established for a 10 test per lactation with all milkings per day supervised resulting in a 100 DCR. Herds using automatic milk recording to combine multiple days into an average for milk yield will see this improved DCR to 103 or 104. Other factors detract from the DCR such as measuring only some portion of daily yields and calculating the remained like the AM/PM programs. Owner testing programs while invaluable to producing data to make management decisions also are rated as less accurate and a lower DCR.

While a DCR may not be a determining factor in the type of testing program you participate in, it is useful to understand how your testing frequency and interval may affect the overall data pool. If you have questions about your data collection rating, please contact your local DHI Farm Service Technician, or call 800.344.2697 and ask for the DHI service team.

DCR for Testing Plans

Test Plan	305-Day Records		Data Collection Rating (DCR)	
	Total # Test	# Supervised Tests	Milk	Components (Fat, Protein, Scc)
Daily	305		104	
Labor Efficient Records (electronic)				
7 day average	70		103	See Options Below
5 day average	50		103	
Monthly	10	10	100	100
All milkings weighed and sampled	10	5	98	98
	10	0	77	77
Monthly AM/PM (12/year)				
2 out of 3 milkings weighed and sampled	10	10	97	97
	10	5	94	94
	10	0	75	75
1 out of 2 milkings weighed and sampled	10	10	95	95
	10	5	91	91
	10	0	74	74
1 out of 3 milkings weighed and sampled	10	10	90	90
	10	5	87	87
	10	0	71	71
10x/Yr	8	8	99	99
All milkings weighed and sampled	8	4	96	96
	8	0	76	76
10x/Yr AM/PM	8	8	96	96
2 out of 3 milkings weighed and sampled	8	4	92	92
	8	0	74	74
	8	8	93	93
1 out of 2 milkings weighed and sampled	8	4	89	89
	8	0	72	72
	8	8	88	88
1 out of 3 milkings weighed and sampled	8	4	83	83
	8	0	68	68
Bi-monthly	5	5	95	97
All milkings weighed and sampled	5	3	94	94
	5	0	75	75
	4	4	95	95
Bi-monthly AM/PM	5	5	90	92
2 out of 3 milkings weighed and sampled	5	3	89	89
	5	0	72	72
	4	4	90	90
	5	5	88	88
1 out of 2 milkings weighed and sampled	5	3	86	86
	5	0	69	69
	4	4	85	85
1 out of 3 milkings weighed and sampled	5	5	81	81
	5	3	78	78
	5	0	65	65
	4	4	76	76
Quarterly				
All milkings weighed and sampled	3	3	92	92
Quarterly AM/PM				
2 out of 3 milkings weighed and sampled	3	3	85	85
1 out of 2 milkings weighed and sampled	3	3	79	79
1 out of 3 milkings weighed and sampled	3	3	70	70