

Using Peak and Summit Milk to Evaluate Your Dairy's Management Programs

By: Donna M. Amaral-Phillips, Ph.D.

Using records and the summary of data collected from your dairy herd is critical in helping you improve the overall management and profitability of your herd. This article is another part of the series on explaining how to use the information on your DHI sheets. This article will review how to use Peak Milk and Summit Milk found on the second page of your Herd Summary sheet (DHI-202).

What is Peak Milk?

Peak Milk is the highest daily milk production for a test day prior to 150 days in milk. Peak Milk is determined once a cow is 100 days in milk from available test day milk production data for the current lactation and, if necessary, is updated until she is 150 days in milk. Peak Milk can occur before 100 days in milk but will not be calculated until this time point. For each lactation group of cows (i.e. 1st, 2nd, 3rd+, and all ages), the Peak Milk is averaged within each group of cows and reported on the DHI-202 summary.

HERDCODE	DATE TESTED	BREED	STRING
55-99-9999	12-27-11	HO	

STAGE OF LACTATION PROFILE									
	1 st LACT	2 nd LACT	3 rd LACT	ALL LACTS	1 st LACT	2 nd LACT	3 rd LACT	ALL LACTS	TOTAL IN ANIMAL
NUMBER	8	4	19	11	6	4	4	36	48
AVG DAILY MILK PRODUCTION	57	58	64	42	35	35	35	55	55
FAT %	4.1	3.8	3.5	4.3	4.3	3.9	3.9	3.9	3.9
PROT %	3.1	2.9	3.3	3.8	3.6	3.4	3.4	3.4	3.4
SCC ACT	77	157	228	246	65	184	184	184	184
WEIGHTED SCC (NEAREST 1,000)	10	37	38	18	25	25	25	25	25

IDENTIFICATION AND GENETIC SUMMARY									
AGE GROUP	NUMBER ANIMALS	AVG AGE YR-MO	NUM IDENTIFIED BY	NUMBER OF ANIMALS	AVG MERIT 3	GENETIC PROFILE OF BREED			
0-12	80	0-07	80	58	38	+176 +374			
13+	85	1-09	66	70	41	+105 +261			
ALL LACTS	165	1-02	146	128	79	+139 +318			

PRODUCTION BY LACTATION SUMMARY									
NUMBER OF COWS	AVG MILK	PEAK MILK	SUMMIT MILK	PROJ ME 305 DAY MILK	DIFFERENCE FROM HERDMATES	WEIGHT	DIFFERENCE FROM HERDMATES	DIFFERENCE FROM HERDMATES	DIFFERENCE FROM HERDMATES
1 st LACT	68	25	64	60	20535	727	629	+2433	+29
2 nd LACT	49	41	81	78	20390	768	638	+1616	+47
3 rd LACT	43	57	79	76	19235	753	613	+359	+39
ALL LACTS	160	38	73	70	20151	747	628	+1623	+37

YEARLY PRODUCTION AND MASTITIS SUMMARY									
DATE OF TEST PERIOD	NUMBER COWS IN TEST	TEST DAY AVERAGES	STANDARD-150 DAY MILK	TEST PERIOD PERIOD-MILK	TEST DAY AVERAGES	ROLLING YEARLY HERD AVERAGE	TEST PERIOD PERIOD-MILK	TEST PERIOD PERIOD-MILK	TEST PERIOD PERIOD-MILK
1-27-11	29	159	140	57.2	62.1	101	46.2	4.1	3.3
2-23-11	27	181	147	56.7	59.5	93	49.6	4.3	3.3
3-29-11	34	159	156	61.0	61.7	105	53.5	4.4	3.3
4-29-11	31	163	178	60.2	62.7	103	58.8	3.5	3.1
5-31-11	32	166	189	53.9	58.3	94	50.4	3.2	3.1
6-28-11	28	168	196	49.3	55.6	87	42.8	3.4	3.1
7-27-11	29	173	195	44.1	52.0	84	37.2	3.3	3.0
8-24-11	28	166	180	49.8	57.1	87	43.0	3.4	3.2
9-29-11	36	159	178	49.0	56.6	99	43.7	3.7	3.2
10-25-11	26	157	157	43.8	42.3	77	43.8	4.2	3.4
11-23-11	29	156	156	41.2	43.3	79	41.2	4.3	3.4
12-27-11	34	160	160	44.9	3.9	3.3	44.9	3.9	3.3
AVERAGES	30	162	162	47.4	3.8	3.2	42.9	3.8	3.2

YEARLY SUMMARY OF COWS ENTERED AND LEFT THE HERD									
DATE	LOW PREG	REPR	MAST	LODER	FEET & OTHER	WALY ON OTHER	DIS-EASE	DIED	NOT RPTD
1 st LACT	70	43	32	20	16	10	1		
2 nd LACT	44	23	8	27	15	9			5
3 rd LACT	42	28	6	27	1	1	21	13	6
LACTATIONS	86	58	14	54	32	21	42	28	12

Peak Milk by lactation

Summit Milk by lactation

Importance of Peak Milk

From records of 7 Western Canadian herds (14,000 records in the data set), mature cows peaked around 8 weeks into milk and first-calf heifers peaked within 14 weeks. For every pound of milk higher a cow peaks, she produces 200 to 250 lbs more milk over the entire lactation. For example, if we can improve Peak Milk production by 4 lbs, these cows could produce 800 to 1000 lbs more milk over this lactation. Lactation curves for heifers are more persistent, in other words they hold their peak production longer than mature cows. Values for Peak Milk by lactation number and Rolling Herd Average are shown in the table for Holstein herds in Kentucky enrolled on DHI averaging over 20,000 lbs rolling herd average for milk production (data from 2012).

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	Rolling Herd Average (KY Holstein DHI herds)	
	20,000 to 22,000 lb RHA	Over 22,000 lbs RHA
Number of herds	37	25
<u>Peak Milk</u>		
First Lactation	72.1	79.6
Second Lactation	90.1	96.7
Mature Cows	94.6	102.4
<u>Summit Milk</u>		
First Lactation	68.0	74.8
Second Lactation	84.9	91.9
Mature Cows	89.1	96.2
Insufficient Jersey herds were available on DHI test for calculating comparable values-2012 data		

Calculate Peak Ratios

Using your own records, a peak ratio can be calculated. Peak ratio is calculated by:

$$\frac{\text{Peak Milk for first lactation cows}}{\text{Peak Milk for mature cows}} \times 100$$

Generally, first-calf heifers peak 75 to 80% of mature cows peak production.

If your herd has a lower peak ratio than 75%, your heifers may not be peaking as well as expected. Areas that should be reviewed include (1) are heifers calving at the expected size and weight, (2) are freshening heifers having problems transitioning into the herd, (3) are there numerous heifers that are just "poor doers" and are candidates for culling (may reflect genetics, high somatic cell counts, or heifer feeding and management programs).

If the peak ratio is higher than expected, mature cows are not peaking in milk production. Possible areas to investigated include (1) are cows calving with the appropriate amount of body condition, (2) are transition programs around calving working properly so that cows are eating well at and after calving to prevent large losses in body condition (i.e. preventing milk fever, ketosis, metritis, and displaced abomasums in pre-fresh and fresh cows), (3) are high quality forages provided after calving, and (4) do diets fed pre-fresh and after calving contain the appropriate amount of energy.

If the Peak Milk for second lactation cows is lower than expected but mature cows are peaking appropriately, these younger cows may be experiencing sophomore slump. During their first lactation, first-calf heifers need adequate amounts of energy and protein for milk production, growth, and during mid to later lactation to replace used body stores (also known as body condition). If they are not provided adequate amounts of energy during mid to later lactation, they will use available nutrients for milk production and growth and will not regain adequate amounts of body condition. Body fat stores are necessary during early lactation since cows cannot eat enough to support their energy needs and rely on these stores to provide energy for milk production. Thus, these cows do not peak as high and hold that peak as well as if they had the appropriate amount of body condition at calving which they can use during early lactation. Another possibility is that these cows have clinical or subclinical metabolic related disorders (i.e. ketosis, metritis, and displaced abomasums) which limit intake and increase use of body condition for purposes other than milk production.

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Using Peak and Summit Milk to Evaluate Your Dairy's Management Programs

What is Summit Milk?

Summit Milk is calculated by averaging the two highest milk weights for a cow for the first three test days in a cow's lactation. For each age group, the values are averaged for all cows that meet these criteria. This value is closely correlated to overall lactation production. Therefore, as Summit Milk increases, overall lactation milk production increases.

Any decreases seen in Summit Milk could reflect (1) changes needed in feeding and management programs to increase energy, protein, or water intakes, (2) effects of heat stress, (3) poor cow comfort, (4) disease issues such as clinical and subclinical mastitis, or (5) in first-calf heifers, problems associated with heifer-raising programs.