

Adjusting Records ...the American Way

In Canada, we express production records for milk, fat and protein in terms of projected or actual 305 day yields. For example, the ROLLING HERD AVERAGE on our DHI Monthly Herd Summary Report is the average of terminated 305 day records for individual cows over the previous 365 days. The methods used to calculate actual and projected 305 day records are described in the DHI infosheet entitled “**Breed Class Average**” available from the Western Canadian DHI Services office in Edmonton.

In the US, production records are also based on projected and actual 305 day records calculated in much the same way as they are in Canada. However, US DHI records are not reported as simple 305 day yields. Instead, they are ‘standardized’ to a mature equivalent (ME) basis before they are reported. How can we compare our 305 day records with standardized US records? The simple answer is: we can’t. But here’s an explanation of the way that ME records are calculated which should help you to do ‘ball park’ comparisons.

The new US system

Until the end of 1994, ME records were adjusted by breed for calving age and month using factors that were published in 1974 (1979 for protein production in Holsteins). The idea was similar to that behind our BCA index, developed over 20 years earlier. The difference is that we report the 305 day yield as an index, based on 1952 average production levels for each breed; in the US, the adjustment was applied directly to the 305 day record. An added complication is that we apply the same age and season adjustments across Canada while US factors were (and continue to be) derived and applied regionally. Regional state groupings for Holsteins are shown in figure 1.

Since January 1995, a new system of adjustments has been applied to US DHI records. Former age standardization factors did not consider the effect of parity (lactation number). For example, a 2nd lactation cow calving at 44 months got the same adjustment as a 3rd lactation cow calving at the same age. In the new system, calving age adjustments are applied within parity groups. The introduction of an adjustment for previous days open is also new. This recognizes the fact that cows calving at an early age within parity may be less productive due to fewer days open in the previous lactation.

Adjustments are used to calculate an adjustment factor, as follows:

$$\text{ADJUSTMENT FACTOR} = \frac{\text{BASE YIELD}}{\text{BASE YIELD} + \text{MOC} + \text{AGE} + \text{PDO}}$$

where:

- BASE YIELD = the average mature yield of cows in the same region;
- MOC = month of calving adjustment;
- AGE = age at calving adjustment;
- PDO = previous days open adjustment (= 0 for 1st lactation heifers).

Base (mature) yield for US Ayrshires, Brown Swiss, Guernseys and Holsteins is reached in 4th lactation at 72-77 months of age; for Jerseys in 4th lactation at 61-63 months, and for Shorthorns in 6th lactation at 76-86 months of age.

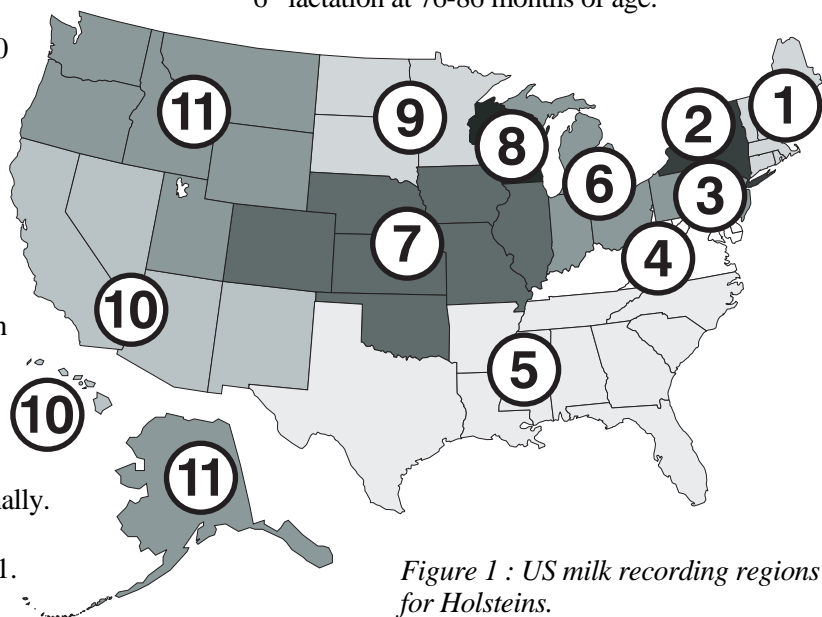


Figure 1 : US milk recording regions for Holsteins.

EXAMPLE:	1	2	3	4	5	6	7	8	9
Region	11	11	11	11	2	5	8	9	10
Parity	1	2	3	5	2	2	2	2	2
Calving Month	10	1	7	10	1	1	1	1	1
Age at Calving	26	43	50	78	43	43	43	43	43
Prev Days Open	0	90	1120	170	90	90	90	90	90
Base Yield	21475	21475	21475	21475	19307	18642	20089	19225	21696
Adjustments:									
Calving Month	-13641	-7307	-10200	-13923	-5756	-5498	-5424	-7248	-8198
Age at Calving	9740	6583	8837	14067	4794	4656	4344	6547	7625
Prev Days Open	0	-384	0	103	-339	-306	-371	-319	-384
Adjustment Factor	1.22	1.05	1.07	0.99	1.07	1.07	1.08	1.06	1.05
305-day 2x Yield	16000	20000	23000	25000	20000	20000	20000	20000	20000
Standardized Yield	19551	21088	24558	24716	21446	21313	21557	21120	20922

Table 1 : Examples of standardized milk yield calculations for Holsteins.

Standardized ME yields are projected by multiplying the calculated adjustment factor by the cow's actual or projected 305 day yield from 2X milking. Table 1 gives several examples of the calculation for milk yield. The same method is used to project standardized yields of fat and protein.

CALVING MONTH	LACTATION 1 CALVING AGE				
	22	24	26	28	30
January	1.29	1.26	1.23	1.21	1.19
April	1.30	1.26	1.23	1.21	1.19
July	1.32	1.28	1.25	1.23	1.21
October	1.28	1.25	1.22	1.20	1.18
CALVING MONTH	LACTATION 2 CALVING AGE				
	35	37	39	41	43
January	1.07	1.06	1.05	1.05	1.04
April	1.08	1.07	1.06	1.05	1.05
July	1.13	1.12	1.11	1.10	1.09
October	1.10	1.09	1.08	1.07	1.06
CALVING MONTH	LACTATION 3 CALVING AGE				
	48	50	52	54	56
January	1.02	1.01	1.01	1.00	1.00
April	1.03	1.03	1.02	1.01	1.01
July	1.08	1.07	1.07	1.06	1.06
October	1.03	1.03	1.02	1.02	1.01
CALVING MONTH	LACTATION 4 CALVING AGE				
	61	63	65	67	69
January	0.99	0.99	0.99	0.98	0.98
April	1.01	1.00	1.00	1.00	1.00
July	1.06	1.05	1.05	1.05	1.05
October	1.01	1.01	1.00	1.00	1.00

Table 2 : Examples of Holstein milk yield adjustment factors for region 11. Previous days open = 120 days for lactations 2, 3 and 4.

Notice that Base Yields and adjustments for Calving Month, Age at Calving and Previous Days Open are unique for each region. In spite of this, Adjustment Factors and Standardized Yields for 2nd parity cows calving at 43 months of age in January (examples 2 and 5-9) are not very different from region to region. For 2nd+ parity cows (examples 2-4), the Previous Days Open Adjustment is negative when Previous Days Open is less than 120 days; positive when greater than 120; 0 when 120. Because adjustments are in the denominator of the adjustment factor equation, a negative adjustment increases the adjustment factor; a positive adjustment decreases it.

Table 2 illustrates Holstein milk adjustment factors for region 11, showing the effects of parity, calving age and calving month assuming previous days open of 120 days. As you would expect, adjustment factors are large for 1st lactation heifers, decreasing as cows approach maturity. Within parity groups, adjustment factors are largest for the youngest cows and those calving in the summer months.

Understanding how US records are adjusted makes it possible to roughly estimate 305 day yields for comparison with Canadian values. For example, assuming an adjustment factor of about 1.25 would have been used to standardize her record, an American cow with a first lactation DHI milk record of 20,000 lbs would probably have produced about 7,300 kg in 305 days (20,000 lbs ÷ 2.2 lbs/kg ÷ 1.25).

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