Early First Calving (EFC)

Introduced in 2019, Early First Calving PTA predicts an animal's genetic ability to influence the age at which a female offspring has her first calving, expressed in days relative to the breed base. Already handled as an uncorrelated trait, EFC was updated for the August 2026 evaluation and beyond to be calculated in a single-trait model. Genomic and genetic evaluations for EFC are provided for Ayrshire, Brown Swiss, Guernsey, Holstein, Jersey, and Milking Shorthorn (traditional only) males and females.

Benefits of Trait

- Supports earlier reproductive maturity in replacement heifers
- Contributes to improved lifetime productivity and herd efficiency
- Reduces non-productive days prior to first lactation
- Complements conception-based reproductive performance traits by capturing timing of reproductive onset

Heritability

EFC has a heritability of 6.0%. This is higher than the other reproductive performance traits, indicating meaningful genetic variation for age at first calving.

Description of Trait

EFC is the number of days from birth to a cow's first calving. Fewer days are desirable, so the number of days is multiplied by -1 to make a positive PTA desirable.

Inclusion in Selection Indexes

EFC has been included in the lifetime merit indexes since 2021. As of the April 2025 update to the indexes, EFC has the following relative emphasis in each:

- Net Merit $: 1.0%
- Fluid Merit $: 1.0%
- Cheese Merit $: 1.0%
- Grazing Merit $: 0.8%

These values represent EFC's economic importance to reproductive efficiency and herd profitability. The August 2026 modifications to EFC do not affect these emphases because the weights on traits in the lifetime merit indexes are based on economic values that are not being updated. Animal variations in NM$, CM$, FM$, and GM$ that are expected with the updates to EFC will be due to changes in PTA values because of the revisions, not the relative emphasis of the trait in the index.

Correlations with Other Traits

EFC is treated as uncorrelated with the other reproductive performance traits. This reflects that EFC captures age-related reproductive timing rather than insemination success.

How to Interpret the Trait

PTAs are interpreted based on the breed average and expressed as days. These averages are calculated during a test run and may vary slightly in August and beyond as additional phenotypic data becomes available.

Positive PTA values indicate days fewer than the breed average. Negative PTA values indicate additional days compared to the breed average.

HO Bull A
EFC PTA: 0.0 (days)
Expected daughter average: 723.47 days

JE Bull A
EFC PTA: 0.0 (days)
Expected daughter average: 693.39 days

HO Bull B
EFC PTA: +3.0 (days)
Expected daughter average: 720.47 days

JE Bull B
EFC PTA: +3.0 (days)
Expected daughter average: 690.39 days

Data Source

The data to calculate this trait is stored in the National Cooperator Database. EFC utilizes calving records, including birth dates and first calving dates reported through U.S. dairy records programs.

Producers can help continue to improve reproductive performance traits by recording key information in on-farm software.

- Ensure animal ID is unique and recorded correctly
- Confirm each animal has sire, dam, and date of birth
- Properly record service sire with the NAAB code or bull ID for each reproductive event
- Record ET births

Resources and Research

Published research supporting this trait and the 2026 reproductive revisions is available by scanning this QR code.

Listen to The CDCB CowCast for a conversation with lead researcher Dr. Taylor McWhorter about the 2026 revisions to reproductive traits. Available on YouTube and podcast platforms on May 12.

Range of Population

Most animals fall within a relatively narrow range around zero, with more positive values indicating earlier-than-average age at first calving and more negative values indicating later-than-average age at first calving, relative to the breed base. These PTA values are calculated during a pre-release analysis. Some variation is expected in the August 2026 evaluation.

	Active A.I. Bulls ("A" Status Bulls)			Genomic Bulls ("G" Status Bulls)			Bulls born since 2000 (≥ 90% reliability)		
	PTA Range	Mean PTA	SD	PTA Range	Mean PTA	SD	PTA Range	Mean PTA	SD
Ayrshire	-3.3 to +33.6	+13.94	14.38	-6.0 to +14.4	+3.73	5.22	-3.2 to +31.7	+21.50	9.56
Brown Swiss	-9.4 to +8.9	+0.70	4.88	-6.4 to +10.6	+3.95	3.55	-14.5 to +19.5	+0.94	6.87
Guernsey	-7.7 to +17.9	+0.87	6.05	-9.0 to +10.5	-0.36	4.46	-7.1 to +5.2	+0.48	5.46
Holstein	-16.9 to +8.4	+0.74	3.46	-10.5 to +8.5	+2.10	2.40	-24.2 to +17.1	-0.26	3.24
Jersey	-13.1 to +10.1	+0.67	3.12	-7.7 to +7.6	+0.78	2.57	-12.5 to +16.0	-0.37	3.22
Milking Shorthorn	-1.7 to +7.9	+3.48	3.91	---	---	---	***	***	***

*** – Insufficient number of bulls to calculate statistics.

Approximately 68% and 95% of observations fall within one and two standard deviations (SD) of the mean, respectively. The following example demonstrates how these proportions apply to active Holstein and Jersey bulls.

	PTA Standard Deviations ("A" Status Bulls)			
	-2	-1	+1	+2
Holstein	-6.19	-2.72	+4.21	+7.67
Jersey	-5.57	-2.45	+3.80	+6.92

Reliability Ranges

Reliability varies by animal and is influenced by the amount of available information. Young animals typically have lower reliability, while proven sires with extensive daughter records have higher reliability.

	"A" Status Bulls
Ayrshire	27% to 94.8%
Brown Swiss	33% to 97%
Guernsey	24% to 77%
Holstein	24.3% to 99%
Jersey	43.7% to 99%
Milking Shorthorn	29.1% to 69.7%

Frequently Asked Questions

How does the revised version of EFC compare to the legacy version?

Early First Calving PTA continues to predict days above or before the breed average that a female offspring will have her first calf. The primary change for this trait in the 2026 revisions is a move to a single-trait model for computational efficiency.

How do the PTA values of the revised EFC compare to the legacy values?

The changes in PTA ranges, mean PTA, and standard deviations between versions of EFC are due to the updated model and variance components. These differences reflect rescaling of the traits, rather than a true increase or decrease in underlying genetic variation.

	Revised EFC PTA ("G" Status Bulls)			Legacy EFC PTA ("G" Status Bulls)		
	PTA Range	Mean PTA	SD	PTA Range	Mean PTA	SD
Holstein	-10.50 to +8.50	+2.10	2.40	-10.90 to +9.50	+2.18	2.50
Jersey	-7.70 to +7.60	+0.78	2.57	-6.70 to +6.00	+0.34	1.99