Daughter Pregnancy Rate (DPR)

Introduced in 2003, Daughter Pregnancy Rate PTA predicts the expected percentage of non-pregnant cows that will become pregnant in each 21-day period, relative to the breed base. DPR was updated for the August 2026 evaluation and beyond to include herd-level and lactation group voluntary waiting periods (VWP) rather than a fixed length. Genomic and genetic evaluations for DPR are provided for Ayrshire, Brown Swiss, Guernsey, Holstein, Jersey, and Milking Shorthorn (traditional only) males and females.

Benefits of Trait

- Improves reproductive efficiency by reducing days open
- Supports improved herd reproductive performance and sustainability
- Contributes to improved longevity and lifetime productivity
- Provides a standardized reproductive performance metric that can be used across herds and management systems

Heritability

DPR has a heritability of 2.9%. This level is typical for reproductive performance traits, indicating that genetic progress is gradual but cumulative over time.

Description of Trait

The number of days open (days from when a cow calves to when she becomes pregnant) is transformed into a non-linear pregnancy rate with variable VWP by herd-year and lactation group as:

$$DPR_{adj} = \frac{21}{\max\left(21,\ \max(DO,\ 71) - VWP_{herdyr-lactgrp}\right)} * 100,$$

DO = days open;
VWP = voluntary waiting period is calculated on herd-x-year and lactation group. Lactation group categories are "first lactation only" and "later lactations."

Inclusion in Selection Indexes

DPR has been included in the lifetime merit indexes since 2003. As of the April 2025 update to the indexes, DPR has the following relative emphasis in each:

- Net Merit $: 2.1%
- Fluid Merit $: 2.1%
- Cheese Merit $: 2.0%
- Grazing Merit $: 5.6%

These values represent DPR's economic importance to reproductive efficiency and herd profitability. The August 2026 modifications to DPR 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 DPR will be due to changes in PTA values because of the revisions, not the relative emphasis of the trait in the index.

How to Interpret the Trait

DPR is best for producers who use a VWP on a herd level and want cows to cycle, get bred, and become pregnant quickly, regardless of the number of services.

PTAs are interpreted based on the breed average and expressed as percentages. These averages are calculated during a test run and may vary slightly in August 2026 and beyond as additional phenotypic data becomes available.

HO Bull A
DPR PTA: 0.0 (%)
Expected daughter average: 32.19%

JE Bull A
DPR PTA: 0.0 (%)
Expected daughter average: 34.98%

HO Bull B
DPR PTA: +1.0 (%)
Expected daughter average: 33.19%

JE Bull B
DPR PTA: +1.0 (%)
Expected daughter average: 35.98%

Data Source

The data to calculate this trait is stored in the National Cooperator Database. DPR utilizes reproductive and calving records, including insemination, pregnancy diagnosis, and calving information 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

Correlations with Other Traits

Within the reproductive performance trait portfolio, DPR is strongly genetically correlated with Cow Conception Rate (+0.94) and First Service to Conception (+0.96) and moderately correlated with Heifer Conception Rate (+0.56). These correlations allow information from related reproductive performance traits to improve evaluation accuracy, particularly when data is limited.

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 positive values indicating higher-than-average genetic potential for pregnancy rate and negative values indicating lower-than-average genetic potential 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	-2.0 to +6.4	+1.28	2.24	-2.1 to +2.3	+0.23	1.05	-3.1 to +7.2	+1.01	1.88
Brown Swiss	-1.6 to +3.0	+0.47	1.40	-2.5 to +7.5	+1.37	1.92	-4.9 to +5.3	-0.08	1.66
Guernsey	-2.6 to +2.7	+0.49	1.47	-2.8 to +3.9	+0.57	1.60	-4.1 to +3.6	-0.66	1.62
Holstein	-5.3 to +5.7	+0.06	1.46	-3.8 to +6.1	+0.67	1.08	-7.9 to +9.5	-1.04	1.94
Jersey	-3.6 to +5.0	+0.13	1.65	-4.4 to +4.8	+0.62	1.38	-10.0 to +6.1	-0.82	1.82
Milking Shorthorn	-2.6 to +1.6	-0.08	1.95	---	---		-2.5 to +3.7	+0.76	1.49

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	-2.86	-1.40	+1.52	+2.98
Jersey	-3.16	-1.52	+1.78	+3.43

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	34% to 98%
Brown Swiss	63% to 99%
Guernsey	38.5% to 93%
Holstein	32.5% to 99%
Jersey	58.8% to 99%
Milking Shorthorn	52.9% to 89.8%

Frequently Asked Questions

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

Daughter Pregnancy Rate PTA continues to predict the expected percent of non-pregnant cows that become pregnant during each 21-day period, relative to the breed base. The model used to calculate DPR was revised to account for a herd-level and lactation group-specific voluntary waiting period.

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

The changes in PTA ranges, mean PTAs, and standard deviations between versions of DPR 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 DPR PTA ("G" Status Bulls)			Legacy DPR PTA ("G" Status Bulls)		
	PTA Range	Mean PTA	SD	PTA Range	Mean PTA	SD
Holstein	-3.80 to +6.10	+0.67	1.08	-6.30 to +6.60	-0.60	1.26
Jersey	-4.40 to +4.80	+0.62	1.38	-5.10 to +4.60	-0.16	1.51

Why was the genetic trend for DPR previously downward trending but now trending upward in the new model?

In the previous system, some long-term changes in herd management were not fully accounted for in the model. As a result, some of the effects of management choices could be incorrectly attributed to genetics, which made trends for traits like DPR and CCR appear flat or even declining. The updated model does a better job of separating genetic improvement from management effects and accounting for how on-farm practices have changed over the past 20–25 years. The change in trend does not mean biology has suddenly improved; it means we are now measuring genetic progress more accurately.

How should farmers use the updated DPR trait and the new First Service to Conception (FSC) trait?

DPR is best for producers who use a VWP on the herd level and want cows to cycle, get bred, and become pregnant quickly, regardless of the number of services. FSC is useful for producers who select VWPs on a cow basis and want cows to get pregnant as quickly as possible after the first breeding, without focusing on how many services it takes. It's important to remember that DPR is expressed as a percentage while FSC is expressed in days. For both DPR and FSC, a positive PTA is desirable.