# Calf Health: Resistance to Diarrhea (DIA) and Resistance to Respiratory Problems (RSP)

To be introduced on August 11, 2026, these two calf health traits start to address calf wellness through the U.S. national evaluation system. Genetic and genomic evaluations for calfhood Resistance to Respiratory Problems (RSP) and Resistance to Diarrhea (DIA) are now provided for Holstein and Jersey males and females. Evaluations are expressed in percentage points of resistance above or below the breed average.

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## Benefits of Traits:

- Raising replacement heifers is among the costliest aspects of dairy production, second only to feed expenses, and these costs are further increased by the occurrence of diarrhea and respiratory problems.
- Dairy producers now have a new genetic selection tool to improve resistance to the two most common health challenges affecting dairy heifers.
- Health challenges experienced early in life can have lasting effects on a dairy cow's productivity, livability, and health later in life.

## Trait Definitions

The RSP predicted transmitting ability (PTA) represents the expected resistance of an animal's offspring to calfhood respiratory problems in a herd with average management conditions. Likewise, the DIA PTA represents the expected resistance of an animal's offspring to calfhood diarrhea or scours in a herd with average management conditions. In both traits, larger, positive values are more favorable, indicating increased resistance.

## Unit of Measurement and Breeds

Evaluations are expressed in percentage points of resistance above or below the breed average. As of August 2026, genetic evaluations for Resistance to Respiratory Problems (RSP) and Resistance to Diarrhea (DIA) are provided for Holstein and Jersey males and females. As additional phenotypic data is collected, these evaluations will extend to additional breeds.

## Heritability

Estimated heritability is 2.6% for resistance to diarrhea and 2.2% for resistance to respiratory disease (observed scale).

## Data Source

CDCB calf health evaluations were developed using producer-recorded data available in the National Cooperator Database. Extensive data quality control measures, similar to those used for cow health traits, were developed and implemented to ensure only the most reliable data were included for evaluation. The edited pre-release testing data included a total of over 263,000 records for DIA and over 768,000 for RSP. The data to calculate these traits is stored in the National Cooperator Database.

Producers can help continue to improve calf health 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
- Utilize consistent disease recording practices

## Correlations with Other Traits

The PTA correlation between DIA and RSP was estimated to be 0.34. The correlation of DIA and RSP with Heifer Livability was found to be 0.23 and 0.38, respectively. PTA correlations of these two calf health traits with other traits currently under selection were negligible, with the exception of a small, favorable correlation between both calf health traits and Cow Livability.

## How to Interpret These Traits

PTAs should be interpreted based on the breed average for resistance of the measured trait. These averages are calculated during the test run and may vary slightly during the August run and beyond as additional phenotypic data becomes available.

### HO Bull A

DIA PTA: 0.0
*Expected average: 74.6% resistance to diarrhea*

RSP PTA: 0.0
*Expected average: 88.8% resistance to respiratory problems*

### HO Bull B

DIA PTA: +1.0
*Expected average: 75.6% resistance to diarrhea*

RSP PTA: +1.0
*Expected average: 89.8% resistance to respiratory problems*

### JE Bull A

DIA PTA: 0.0
*Expected average: 82.6% resistance to diarrhea*

RSP PTA: 0.0
*Expected average: 82.1% resistance to respiratory problems*

### JE Bull B

DIA PTA: +1.0
*Expected average: 83.6% resistance to diarrhea*

RSP PTA: +1.0
*Expected average: 83.1% resistance to respiratory problems*

# Resistance to Diarrhea (DIA)

## Range of Population

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 Code) | | | Bulls born since 2000 (≥ 80% reliability) | | |
|---|---|---|---|---|---|---|---|---|---|
| | PTA Range | Mean PTA | SD | PTA Range | Mean PTA | SD | PTA Range | Mean PTA | SD |
| Holstein | -5.3 to +2.4 | -0.19 | 1.04 | -4.1 to +3.1 | -0.19 | 0.82 | -4.4 to +3.0 | -0.18 | 1.35 |
| Jersey | -6.8 to +3.5 | -0.14 | 1.62 | -3.3 to +3.6 | -0.01 | 1.23 | -4.2 to +3.8 | -0.29 | 1.96 |

## Standard Deviations

One and two standard deviations normally include 68% and 95% of observations, respectively.

| | PTA Standard Deviations | | | |
|---|---|---|---|---|
| | -2 | -1 | +1 | +2 |
| Holstein | -2.6 | -1.3 | +1.3 | +2.6 |
| Jersey | -4.0 | -2.0 | +2.0 | 4.0 |

## Reliability Range

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. As additional data are accumulated to support this new trait, reliabilities will increase.

| | "A" Status Bulls |
|---|---|
| Holstein | 3 to 96% |
| Jersey | 17 to 95% |

# Resistance to Respiratory Problems (RSP)

## Range of Population

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 Code) | | | Bulls born since 2000 (≥ 80% reliability) | | |
|---|---|---|---|---|---|---|---|---|---|
| | PTA Range | Mean PTA | SD | PTA Range | Mean PTA | SD | PTA Range | Mean PTA | SD |
| Holstein | -6.9 to +3.5 | -0.36 | 1.36 | -7.0 to +4.8 | -0.69 | 1.18 | -8.0 to +6.8 | -0.33 | 1.78 |
| Jersey | -5.3 to +2.8 | -0.42 | 1.45 | -4.5 to +3.2 | 0.62 | 1.10 | -7.4 to +5.9 | -0.18 | 2.30 |

## Standard Deviations

One and two standard deviations normally include 68% and 95% of observations, respectively.

| | RSP PTA Standard Deviations | | | |
|---|---|---|---|---|
| | -2 | -1 | +1 | +2 |
| Holstein | -3.6 | -1.8 | +1.8 | +3.6 |
| Jersey | -4.6 | -2.3 | +2.3 | +4.6 |

## Reliability Range

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. As additional data are accumulated to support this new trait, reliabilities will increase.

| | "A" Status Bulls |
|---|---|
| Holstein | 3 to 97% |
| Jersey | 16 to 97% |

## Inclusion in Selection Indexes

As with all new traits published by CDCB, these traits will not be incorporated into lifetime merit indexes at launch. It is anticipated that these calf health traits will be incorporated with the next merit index revision.

## Future Developments

Future work will focus on evaluating the potential advantages of a multi-trait approach that jointly analyzes calf health-related traits. These two traits will also be made available for additional breeds as data needs are achieved.

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