

Resistance to Retained Placenta (RETP)

INTRODUCTION DATE

April 3, 2018, and then in all subsequent weekly, monthly and tri-annual evaluations.

DESCRIPTION OF TRAIT

Genetic and genomic evaluations for resistance to retained placenta (RETP) are provided for Holstein males and females. Evaluations are expressed in percentage points of resistance above or below the breed average.

Trait definition

The RETP predicted transmitting ability (PTA) represents the expected resistance of an animal's offspring to retained placenta in a herd with average management conditions. Larger, positive values are more favorable.

Unit of measurement: Percentage points

The average resistance rate is equal to 96.4% in U.S. Holsteins. The resistance rate is equivalent to the incidence rate subtracted from 100.

Daughters of a Holstein bull with a RETP PTA of +2.0% are expected to have an average resistance rate to retained placenta of 98% (assuming the breed average resistance is approximately 96%). Daughters of a Holstein bull with a RETP PTA of -2.0% are expected to have an average resistance to retained placenta of 94%. Daughters from the bull with PTA of -2.0% are expected to have three times the number of cases of retained placenta as daughters from the bull with PTA of +2.0%.

Benefits of trait:

- Retained placenta is a common risk factor of subsequent metritis.¹ Selecting for improved resistance to retained placenta will also improve resistance to metritis.
- The direct cost of retained placenta is \$68 per case. This does not include any associated costs such as decreases in production and fertility^{2,3} already accounted for in Net Merit.
- Producers now have an indication of an animal's genetic resistance to developing retained placenta compared to the breed average.

Breeds: Initially, the evaluations will be available only for Holstein animals. As more health data become available, evaluations can be provided for additional breeds.

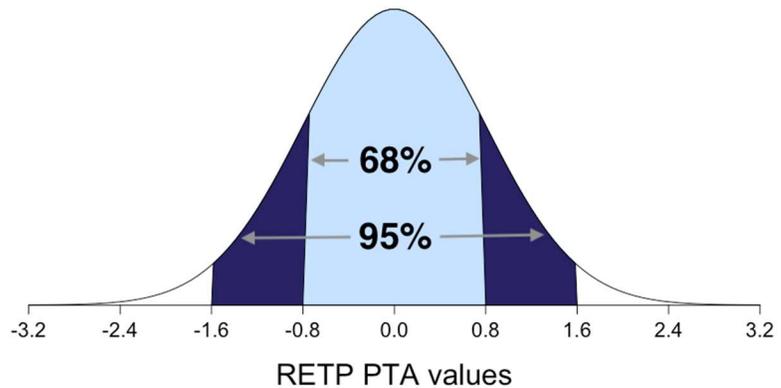
Data source: CDCB RETP evaluations were developed using producer-recorded data collected through Dairy Herd Information (DHI) affiliates from herds across the U.S. Strict editing was applied to ensure only the most reliable data was included for the development of genetic evaluations. The edited data included a total of more than 2 million RETP records from over 1.1 million cows. These health records are used in conjunction with lactation data available in the CDCB cooperator database.



Photo source: Pixabay

Range of population:

The standard deviation (variation) for RETP PTA is 0.8%. Because one and two standard deviations normally include 68% and 95% of observations, respectively, we assume about 68% of bulls will have a RETP PTA between -0.8 and +0.8 percentage points while 95% of the bulls will range from -1.6 to +1.6 percentage points.



RETP PTAs range from 2.7 percentage points below to 2.1 percentage points

above average in evaluated Holstein bulls born since 1990 with reliabilities $\geq 75\%$ (December 2017).

Pre-release testing indicates the active AI Holstein sires in December 2017 (614 bulls) range from -2.1 percentage points to +1.3 percentage points, with the average at approximately -0.3 percentage points.

Reliability range: Young genomic bulls are expected to have reliabilities averaging 42% for resistance to retained placenta, and progeny tested bulls are expected to have genomic reliabilities averaging 47%. As additional data are accumulated, reliabilities will increase.

Heritability: Estimated heritability is 1.0% for resistance to retained placenta (observed scale).

Use in net merit indices: The trait will not be incorporated into net merit indices at launch; inclusion of resistance to retained placenta is expected in the future (date to be determined).

It is suggested that producers continue to rely primarily on a composite economic index with the specific choice dependent on the farm's milk payment situation and management system. In the meantime, producers might consider avoiding those service bulls having low predictions for resistance to retained placenta.

PTA Correlations: The largest significant ($P < 0.05$) correlation with PTA for resistance to retained placenta was with productive life PTA at 0.17. Additional significant correlations were 0.14 with daughter pregnancy rate PTA, 0.13 with livability PTA, 0.13 with cow conception rate PTA, and 0.12 with heifer conception rate PTA.

Future developments:

In the future, further model improvements and development will be researched and tested. This may include the development of a multi-trait model that incorporates multiple reproductive disorders and/or measures of fertility.

RESEARCH REFERENCES

¹Parker Gaddis, K.L., J.B. Cole, J.S. Clay, and C. Maltecca. 2012. Incidence validation and relationship analysis of producer-recorded health event data from on-farm computer systems in the United States. *J. Dairy Sci.* 95:5422–5435. doi:10.3168/jds.2012-5572.

²Donnelly, M. R., A. R. Hazel, B. J. Heins, & L. B. Hansen, 2018. Health treatment cost of Holsteins in 8 high-performance herds. *J. Dairy Sci.* (in preparation).

³Liang, D., L.M. Arnold, C.J. Stowe, R.J. Harmon, & J.M. Bewley, 2017. Estimating US dairy clinical disease costs with a stochastic simulation model. *J. Dairy Sci.* 100(2): 1472–1486.