



Display of Type Traits with an Intermediate Optimum

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- Conformation

Genetic evaluations for linear type traits are recognized as an important selection tool to ensure a well-balanced herd. However, not all genetic evaluations for these linear type traits are interpreted in the same way. For some traits, selecting towards one extreme is better, while others are considered to have an intermediate optimum score and evaluation. To improve the understanding of the mid-scoring nature of these type traits, the Genetic Evaluation Board (GEB) recommended that Lactanet update how type traits with an intermediate optimum value are displayed on its website. The website change outlined below has been implemented in advance of the December 2023 genetic evaluation release.

Type Traits Overview

Genetic evaluations for linear type traits are calculated using data from Holstein Canada's All-Breeds Classification program where they are scored on a linear scale from 1 to 9. The published genetic evaluations for these traits are standardized and expressed relative to the genetic base for each breed. For the Holstein breed, the average sire proof for the base group is set to zero and the standard deviation is 5 points creating an approximate range of proofs from -15 to +15. Some linear traits are considered to have an intermediate optimum score between 1 and 9 and the genetic evaluations are thus published with a letter code instead of a "+" or "-" sign. For example, a sire proof of 6T for Stature means that daughters are expected to be taller (T) than those of an average sire. For all type traits, a sire proof of zero is reflective of the average bull and the average sire may be different from the trait ideals defined by the classification program. As you may recall, [interpretation tables](#) are updated each year to demonstrate that a proof of zero isn't necessarily the breed ideal and to reflect how sire proofs for type traits relate to the expected average daughter classification scores in first lactation.

Website Display of Type Traits

The [Animal Query tool](#) on the [LactanetGen.ca](#) website is widely used to search animals and view their genetic data. The Genetic Evaluation Summary page for animals contains an overview of key genetic evaluations including the various type traits. On this page, all linear type traits are displayed together under the dropdown titled "Descriptive" within the Conformation section. Blue bars are used to show the magnitude and direction of the genetic evaluations away from zero as the breed average.

However, the perception of this display is that all bars to the right or evaluations with a positive value are always better, but this is not true for traits that have an intermediate optimum value. For these traits, an evaluation closer to the breed average of zero is better than a rating with

a high numerical value in the direction of one extreme or the other. For example, you don't want a cow with an udder depth that is too deep or too shallow. Depending on the cow, under corrective mating, a bull proof that is somewhat to the left or to the right may be a reasonable approach to achieve the desired mating objective.

A New Look for Type Traits with an Intermediate Optimum

Stemming from discussions during the March 2023 meeting of the Genetic Evaluation Board (GEB), Lactanet geneticists developed ideas and considerations around how best to display evaluations for linear type traits that have an intermediate optimum to improve the understanding of their mid-scoring nature. Two different display options were presented at Lactanet's October 2023 Open Industry Session for industry feedback, which were subsequently considered by the GEB.

After thorough discussion, the GEB recommended that linear type traits with intermediate optimum values be displayed on the Lactanet website in a separate block titled "Intermediate Optimum", immediately below the regular "Descriptive" traits section. In addition, the GEB recommended that a legend be added in the block for intermediate optimum traits to identify the breed "Average" evaluation in the centre and the "Extreme" values on each end (Figure 1). Everything else with respect to the blue bar display has remained unchanged. By adding this separate block of traits, users can clearly see which traits have intermediate optimum values and may need to be considered differently when making mating decisions.

Figure 1: Updated Lactanet Website Display for Linear Traits with an Intermediate Optimum

INTERMEDIATE OPTIMUM ?

	Rating	%RK	Extreme	Average	Extreme
Udder Floor	13 R		<i>Tilt</i>		<i>Reverse Tilt</i>
Udder Depth	2 S		<i>Deep</i>		<i>Shallow</i>
Front Teat Placement	0		<i>Wide</i>		<i>Close</i>
Rear Teat Placement	2 C		<i>Wide</i>		<i>Close</i>
Teat Length	4 L		<i>Short</i>		<i>Long</i>
Rear Legs Side View	13 S		<i>Straight</i>		<i>Curved</i>
Front Leg View	4 S		<i>Knock Kneed</i>		<i>Straight</i>
Stature	4 S		<i>Short</i>		<i>Tall</i>
Rump Angle	5 L		<i>High</i>		<i>Low</i>
Thurl Placement	9 A		<i>Back</i>		<i>Ahead</i>

In accordance with the GEB recommendations to improve the website display and assist in the understanding of type traits with an intermediate optimum evaluation, the Genetic Evaluation Summary page on the Lactanet website has now been changed, in preparation for the December 2023 genetic evaluation release. We trust this change will allow producers to consider these traits differentially when making their selection and mating decisions to ensure a well-balanced herd.



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