



Which Index is Right for My Herd?

• March 27, 2025

As we prepare to launch the modernized LPI and an annual update to Pro\$ on April 1, 2025, it is a good time to re-acquaint yourself with the concept of expected responses resulting from index selection. When you select for LPI or Pro\$, you can expect a certain amount of genetic gain for a large group of traits. Simply put, the correlation between a given trait and the index, like LPI or Pro\$, provides an excellent indication of how much genetic gain you can achieve when using either national selection index. Lactanet uses proof correlations with each index as an important measure of their relationship to each trait and the LPI subindexes to estimate future expected responses, which can then help you identify the national selection index that is more geared towards your breeding goals.

Overview of LPI and Pro\$ Changes

The new LPI, first described in our previous [article](#), contains six subindexes for the Holstein breed, namely the Production Index (PI),

Longevity & Type Index (LTI), Health & Welfare Index (HWI), Reproduction Index (RI), Milkability Index (MI) and Environmental Impact Index (EI). Each subindex is published on their own and included in the LPI, allowing you to make selections for individual subindexes as needed.

For those who want to focus their selection on that revenue from milk sales, Pro\$ is geared towards maximizing genetic response for daughter lifetime profitability. First launched in August 2015, Pro\$ has seen annual updates to reflect the latest economic values. Fluctuations in economic values from year-to-year have, however, caused Pro\$ values of top animals to sometimes go up and down significantly in magnitude due only from changing profitability. For the April 2025 genetic evaluation release, Lactanet introduced a rolling average of economic values for the past five years to minimize the yearly changes and introduce updated economic values more gradually. Keep an eye out for our annual Pro\$ update article for more information.

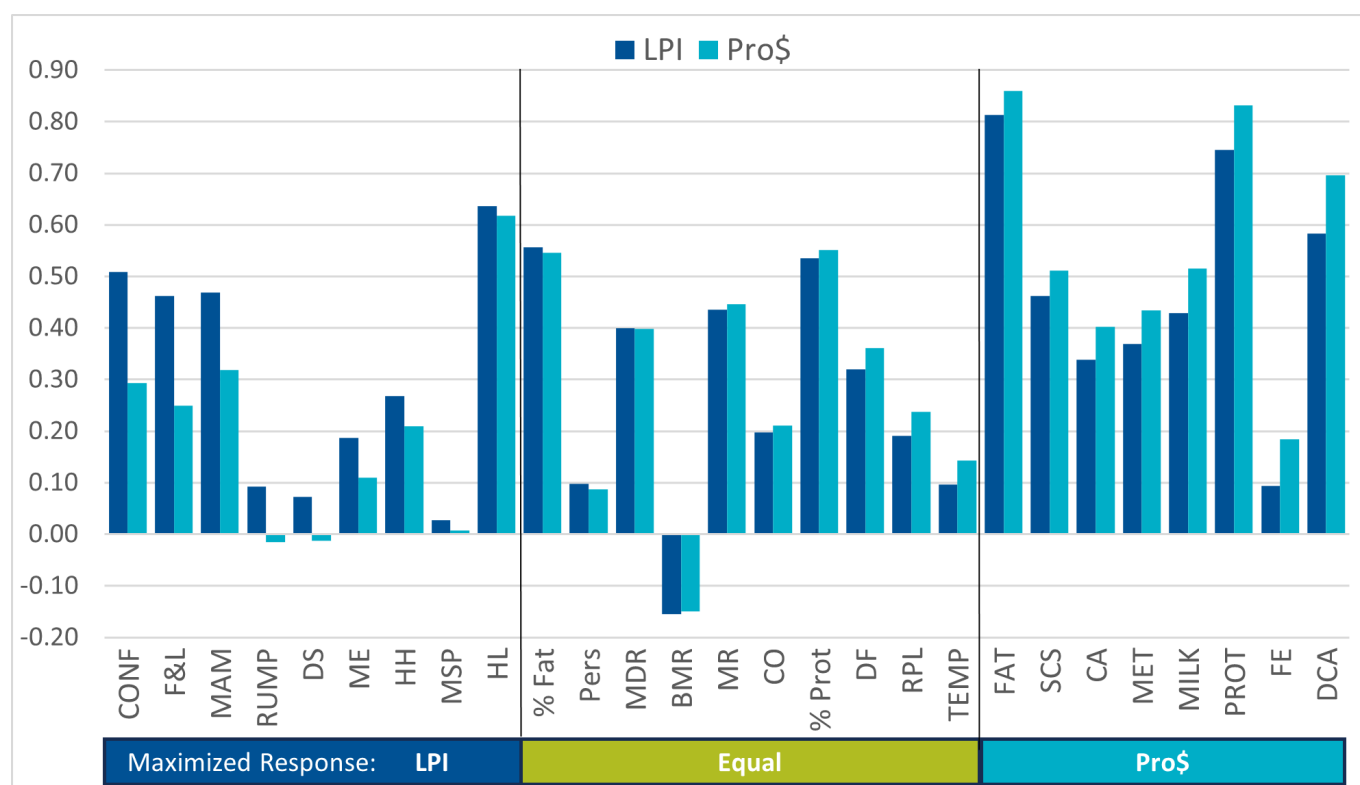
Expected Response: A Review

Regardless of which national selection index you choose, it is important to note that just because particular traits are not directly included in the formula, it doesn't mean you won't make progress for them when selecting for LPI or Pro\$. Such traits may be correlated to other traits in the formula such that when you select for LPI or Pro\$, the correlated trait will change as well. Genetic correlations range from -1.00 to +1.00 with values near zero meaning no genetic response should be expected. A correlation above zero indicates the trait and LPI or Pro\$ could be influenced by common genes and, as such, selection for the index will cause a genetic change for the trait. Thus, it is essential to take expected response or proof correlations between traits and the national indexes into account when making selection decisions.

LPI versus Pro\$

With a correlation between the new LPI and Pro\$ of 95%, animals may rank differently for each index, depending on the specific combination of traits. Figure 1 shows a comparison of expected response rates by trait for both LPI and Pro\$. Using LPI as your primary selection index, compared to Pro\$, will lead to a higher rate of genetic gain for conformation traits, Methane Efficiency, Hoof Health, and Herd Life. On the other hand, when focusing on Pro\$ as your selection criterion instead of LPI, you will achieve faster genetic progress for production yields, calving performance, udder health, and Feed Efficiency. Other traits, namely Fat and Protein Deviations, Daughter Fertility, Mastitis Resistance, Metabolic Disease Resistance, and other health traits will achieve similar rates of genetic gain when you select for either LPI or Pro\$. No matter which selection index you choose, each one is formulated using the most accurate Canadian data so you can be confident in your selection decisions.

Figure 1: Expected Response by Trait for LPI and Pro\$

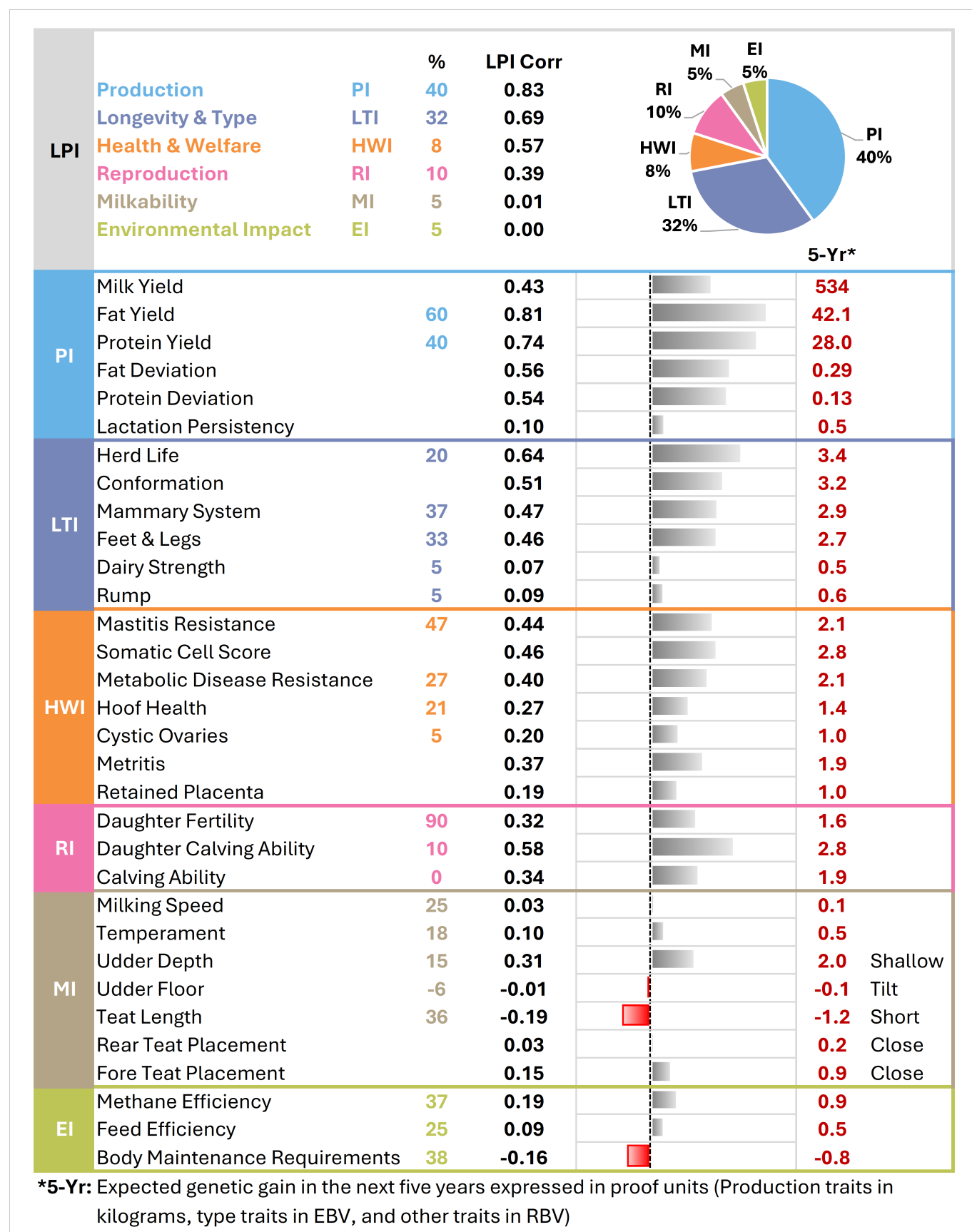


LPI Subindexes Trait Correlations

We can also take a closer look into the six LPI subindexes for the Holstein breed to identify the correlations and expected response for traits included in each subindex as well as the other correlated traits (Figure 2). For example, if we look to the Production Index (PI), a 60:40 ratio on Fat Yield and Protein Yield results in a correlation with LPI of 0.81 and 0.74, respectively. In other words, every 1 standard deviation gain from selection for LPI will result in a correlated response of a 0.81 standard deviation gain for Fat Yield and 0.74 for Protein Yield. In addition to these traits, a correlation with LPI also exists for Milk Yield, Fat Deviation, Protein Deviation, and Lactation Persistency despite them not being directly included in the PI subindex.

To further assist producer understanding with the concept of trait correlations and the expected response from index selection, Lactanet has also converted the LPI correlation value for each trait into the expected genetic gain in the next 5-year period expressed in proof units. As a reminder, production traits are published in kilograms, type traits are published as Estimated Breed Values (EBV), and all other traits are published as Relative Breeding Values (RBV). For LPI selection in the Holstein breed, the expected genetic progress in the average herd over the next five years can be found in Figure 1 in the column titled “5-Yr”. For example, a 60:40 ratio on Fat Yield and Protein Yield in the Holstein PI translates to a 5-year genetic gain of 534 kg for Milk, 42 kg for Fat and 28 kg for Protein in the average Canadian herd. As another example, selection for LPI is expected to give 3.4 RBV points genetic gain for Herd Life over the next five years as well as approximately three EBV points progress for each of Conformation, Mammary System and Feet & Legs. These expected responses are a quick and easy way to identify which traits will be impacted with selection for the LPI and its subindexes introduced in April 2025.

Figure 2: Holstein LPI Correlations and 5-year Expected Response by Subindex



Summary

The modernized LPI and its subindexes, as well as the annual Pro\$ update, coincide with the April 2025 genetic evaluations. With these changes, it is important to reflect on whether your breeding goals align more with LPI or Pro\$. While both national selection indexes are excellent tools, the expected response is different for some traits. With the publication of 5-year expected response values on a trait-by-trait basis, you are better positioned to determine if LPI or Pro\$ best helps you achieve the breeding objectives of your herd.

[Click here](#) to download LPI correlations and expected response charts for other breeds.

Partager



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