

Durability Component (DUR):

$$\text{DUR} = [2 \times (\text{HL} - 3.00)/0.20] + [4 \times \text{MS}/5] + [3 \times \text{F\&L}/5] + [1 \times \text{DS}/5]$$

Where HL = Herd Life, MS = Mammary System, F&L = Feet and Legs, DS = Dairy Strength and each trait is standardized using the appropriate averages and/or standard deviations and then multiplied by their respective relative weight, all of which are common to all breeds as outlined in the above formula.

Health & Fertility Component (H&F):

$$\text{H\&F} = [W_{\text{SCS}} \times (\text{SCS} - 3.00)/0.23] + [W_{\text{UD}} \times \text{UD}/5] + [W_{\text{MSP}} \times (\text{MSP} - 85)/4.8] + [W_{\text{DF}} \times (\text{DF} - \text{Avg})/3]$$

Where SCS = Somatic Cell Score, UD = Udder Depth, MSP = Milking Speed and DF = Daughter Fertility. The relative weights for each trait (i.e.: W_{SCS} , W_{UD} , W_{MSP} and W_{DF} respectively) as well as the EBV average (Avg) for Daughter Fertility, which is specific to each breed, are provided in the following table.

Parameter	Trait	Ayrshire	Brown Swiss	Canadienne	Guernsey	Holstein	Jersey	Milking Shorthorn
Relative Weights Within the Health & Fertility Component	Somatic Cell Score	3.0	3.0	3.0	3.0	3.0	4.8	4.8
	Udder Depth	1.5	1.5	1.5	1.5	1.5	2.4	2.4
	Milking Speed	0.5	0.5	0.5	0.5	0.5	0.8	0.8
	Daughter Fertility	5.0	5.0	5.0	5.0	5.0	2.0	2.0
EBV Average for Daughter Fertility		62	68	69	63	66	70	70

Application

The Lifetime Profit Index formula for each breed is applied to bulls and cows in Canada that have official genetic evaluations for production and type traits. In any case when an official genetic evaluation for a specific trait is not available, namely for Milking Speed or Daughter Fertility, the LPI is based on any preliminary genetic evaluation that is available or, otherwise, a value equal to breed average is used.

For foreign sires in the Holstein, Ayrshire, Jersey, Brown Swiss and Guernsey breeds that have MACE evaluations available for production and type traits, Somatic Cell Score and Direct Herd Life, the LPI formula for the respective breed is used to compute MACE LPI (MLPI) values. In these cases, the MACE evaluation for Direct Herd Life is combined with a predicted Herd Life value based on MACE proofs for various traits and fixed values for Milking Speed and Daughter Fertility are used for all foreign bulls of the same breed.