



Adjusting the Calving Trait Component of the TPI® Formula

Accounting for the CDCB phenotypic base change

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The Council on Dairy Cattle Breeding (CDCB) will be changing the phenotypic base used in the expression of the PTAs for the calving traits in August 2020. This will result in a decrease in the mean and standard deviations, especially for Calving Ease. However, the ranking of the bulls will remain quite stable.

As, Daughter Calving Ease (DCE) and Daughter Stillbirth (DSB) are two components of the TPI formula, we will need to make an appropriate adjustment to the TPI formula. Only the Calving Traits will be adjusted, all other traits will be remaining unchanged.

The table below shows the average value for DCE and DSB for the April 2020 Top 100 TPI bulls, i.e., the daughter proven bulls. The lower average of 2.3% for Daughter Calving Ease, reflects the large improvement in genetics and management for calving difficulty in recent years. Daughter Stillbirth, will now average 5.3%, showing a more modest improvement. Weights on DCE and DSB in the TPI formula will be adjusted from 1:1 to 0.5:1.5.

Average Calving Traits of the April 2020 Top 100 TPI Bulls

	Currently in April	With New August Base
Daughter Calving Ease	7.2%	2.3%
Daughter Stillbirth	6.1%	5.3%

The standard deviations for these two traits, used in the TPI formula, will also be reduced to reflect the smaller spread in the proofs. Currently, amongst the Top 100 TPI bulls, the range in DCE is from a low of 4.0% to a high of 10.5%. The new DCE values have a range of 1.2% to 3.5%. The change for DSB is not as large. With a current range of a low of 4.0% to a high of 10.3%. The new DSB have a range of a low of 3.4% to a high of 9.3%.

TPI changes for August 2020

The Calving Traits in the current [April 2020] TPI formula are as follows:

$$\frac{-1 \times (\text{DCE})}{1.0} + \frac{-1 \times (\text{DSB})}{0.9}$$

In August 2020, the Calving Trait component of the TPI formula will change to:

$$\frac{-0.5 \times (\text{DCE})}{0.5} + \frac{-1.5 \times (\text{DSB})}{0.8}$$

The value 2370, which adjusts for our periodic base changes will be lowered to **2363**.

August 2020 TPI Formula

$$\left[\frac{19(\text{PTAP})}{17} + \frac{19(\text{PTAF})}{22} + \frac{8(\text{FE})}{45} + \frac{8(\text{PTAT})}{0.8} + \frac{11(\text{UDC})}{0.8} + \frac{6(\text{FLC})}{0.8} + \frac{5(\text{PL})}{1.6} + \frac{2(\text{HT})}{2.0} + \frac{3(\text{LIV})}{1.4} - \frac{4(\text{SCS})}{0.13} + \frac{13(\text{FI})}{1.3} - \frac{0.5(\text{DCE})}{0.5} - \frac{1.5(\text{DSB})}{0.8} \right] 3.8 + 2363$$

Examples

		Daughter Calving Ease		Daughter Stillbirth		TPI	
		April	New Base	April	New Base	April	August Formula
011HO11779	Altatopshot	6.9	2.0	4.6	3.6	2812	2817
001HO12786	Piledriver	6.8	2.2	6.0	4.9	2786	2787
029HO17553	Josuper	7.0	2.1	5.2	4.4	2760	2762
007HO13250	Jedi	5.7	1.6	5.2	4.3	2544	2544

Changing the weights of the Calving Trait component of the TPI formula allows the TPI rankings to remain fairly constant. In fact, there is no change in average TPI value of the Top 100 TPI bulls. For illustration, below are the top 10 TPI bulls with their April 2020 TPI value and their adjusted TPI value using the new calving traits and the adjusted TPI formula. The average change is less than 1 TPI point.

Rank	Bull Name	Bull NAAB	Current TPI	Adjusted TPI
1	HELIX	014HO07770	2997	3000
2	BURLEY	029HO18225	2922	2921
3	ROCKETFIRE	007HO13454	2893	2897
4	GRIFF	014HO07796	2876	2882
5	HOTLINE	097HO41774	2840	2837
6	ACHIEVER	029HO18296	2835	2837
7	DUKE	250HO13267	2825	2821
8	DYNAMO	551HO03416	2823	2820
9	NOBLE	551HO03412	2814	2810
10	ALTATOPSHOT	011HO11779	2812	2817