

What you need to know about the April 2020 US Genetic Base Change

A genetic base change is an adjustment of predicted transmitting abilities (PTAs) for all animals in a given breed. This change resets the average PTAs for each trait within a new reference population back to zero.

With the April 2020 US genetic base change in mind, here are five key points to remember.

1. THE BASE CHANGE HAPPENS EVERY 5 YEARS.

It happens this frequently to ensure that the values for traits and indexes don't grow to unrealistically high levels. The last base change took place in December 2014, and the next one will be in 2025.

2. THIS BASE CHANGE ACCOUNTS FOR THE AMOUNT OF GENETIC PROGRESS WE'VE MADE SINCE THE LAST BASE CHANGE.

Dairy cattle genetics are continually improving, and the base change is the way to quantify the actual amount of progress that we've made for each trait within each breed.

For example, the base change for PTA Milk in the Holstein breed is 492. That means that the average genetic level for pounds of milk in the Holstein breed has increased by 492 pounds over the past five years. To account for this progress, the PTA Milk value for *all* Holsteins will automatically decrease by 492 pounds with April 2020 proofs.

3. THE NEW REFERENCE POPULATION WAS BORN IN 2015.

The base change means resetting the average PTAs for the reference population to zero. The previous reference population was made up of the sire-identified animals born in 2010. Since the new reference population is animals born in 2015, that means this current base change will now set the average PTA of cows born in 2015 back to zero.

4. DOWNWARD ADJUSTMENTS ARE ACTUALLY A GOOD THING!

In general, a downward adjustment for a trait is the amount of genetic progress we've made for that trait. So a larger downward adjustment is actually a good thing – it just means we've made that much more genetic progress for that given trait!

Because of the downward adjustments, we'll need to get used to new, generally lower reference levels for the traits and indexes that we affect our genetic selection decisions.

5. THE BASE CHANGE DOES NOT AFFECT THE RELATIVE RANK OF ANIMALS.

Even though the base change will cause PTA values for bulls and cows to appear lower for most traits, it is the same adjustment for *all* animals. That means individual rankings will not be impacted.

WHAT ARE THE ACTUAL CHANGES?

Wondering what the actual changes will be? Table 1 below lays it all out.

Because a positive value is the amount of progress we've made, it also means the PTA for that trait will decrease by this amount. Conversely, negative values mean the PTA for that trait will actually increase by that amount.

To clearly assess the overall picture of genetic progress, trait changes shown in black show positive progress. Traits shown in red have made negative progress over the past five years.

Please note that the CDCB will recalculate these values with April 2020 proofs using more complete and current data. So there may be slight changes between now and then.

Table 1. PTA difference of cows born in 2015 compared to those born in 2010. PTAs will decrease by these amounts in April 2020.

Table 1	TRAIT	UNITS	ADJUSTMENT WE'LL SEE PER BREED		
			HOLSTEIN	JERSEY	BROWN SWISS
PRODUCTION TRAITS	Milk	Pounds	492	524	214
	Fat	Pounds	24	25	8
	Protein	Pounds	18	20	8
HEALTH TRAITS	Productive life PL	Months	1.86	1.54	0.24
	Daughter pregnancy rate DPR	%	0.24	-0.99	-0.62
	Somatic cell score SCS	Log base 2 units	-0.08	0	0
	Heifer conception rate HCR	%	0.5	0.44	-0.24
	Cow conception rate CCR	%	0.38	-0.9	-0.74
	Cow livability LIV	%	0.74	0.08	-0.28
	Displaced abomasum DA	%	0.21	-	-
	Ketosis KET	%	0.2	-	-
	Mastitis MAST	%	0.6	-	-
	Metritis MET	%	0.34	-	-
	Milk fever MFEV	%	-0.06	-	-
	Retained Placenta RP	%	0.05	-	-
	Early first calving EFC	Days	1.5	1.4	0.5
	Gestation length GL	Days	-0.35	0.3	-0.03
CALVING TRAITS	Sire Calving Ease SCE	%	-0.4	-	-0.3
	Daughter Calving Ease DCE	%	-1.9	-	-0.6
	Sire Stillbirth SSB	%	-0.3	-	-
	Daughter Stillbirth DSB	%	-1.6	-	-
CONFORMATION TRAITS	Final Score (PTAT)	Points	0.76	0.7	0.4
	Udder composite UDC / JUI		0.85	-	-
	Feet and leg composite FLC		0.49	-	-
INDEXES	Lifetime Net Merit NM\$	Dollars	231	191	60
	Lifetime Cheese Merit CM\$	Dollars	239	196	63
	Lifetime Fluid Merit FM\$	Dollars	219	179	56
	Lifetime Grazing Merit GM\$	Dollars	207	142	38

ADDITIONAL TRAITS & LINEARS	Stature	Points	0.47	0.5	0.6
	Strength	Points	0.2	0	0.2
	Dairy form	Points	0.38	0.4	0.3
	Foot angle	Points	0.5	0.1	0.1
	Feet and leg score		0.54		
	Rear legs - side view	Points	-0.02	0	0.1
	Rear legs - rear view		0.49		
	Body depth		0.14		
	Rump angle	Points	-0.02	0.4	0
	Rump width	Points	0.36	0.1	0.1
	Fore udder attachment	Points	1.01	0.7	0.3
	Rear udder height	Points	1.2	0.6	0.3
	Rear udder width	Points	1.16	0.2	0.3
	Udder depth	Points	0.84	0.9	0.2
	Udder cleft	Points	0.54	0.1	0.1
	Front teat placement	Points	0.52	0.3	0.3
	Rear teat placement		0.49		
	Teat length	Points	-0.27	0	-0.2
	Body weight composite		0.15		

HOW DOES THIS COMPARE?

Are you curious how the amount of progress over the past five years compares to the progress we made before that? The tables below lay it all out for the Holstein and Jersey breeds.

HOLSTEIN BASE CHANGE COMPARISON	Milk	Fat	Prot	PL	DPR	NM\$
2020 Changes <i>progress made from 2015-2020</i>	492	24	18	1.9	0.24	231
2015 Changes <i>progress made from 2010-2015</i>	382	17	12	1.0	0.2	184

JERSEY BASE CHANGE COMPARISON	Milk	Fat	Prot	PL	DPR	SCS	NM\$
2020 Changes <i>progress made from 2015-2020</i>	524	25	20	1.54	-0.99	0.00	191
2015 Changes <i>progress made from 2010-2015</i>	382	19	12	0.8	0.0	0.04	124

You'll see that for the production traits, both Holsteins and Jerseys made significantly more progress in the past five years, than in the five years preceding. That means, as an industry, we're making huge strides. Have confidence that the bulls you use now will deliver profitable results through their offspring.