



Movements in Holstein BPIs

April 2019 ABV release

April 2019 is the first public ABV release with residual survival removed from Australia's three dairy breeding indices: BPI, Health Weighted Index (HWI) and Type Weighted Index (TWI).

April 2019 is also DataGene's first public ABV release to be done with a new genetic evaluation system. Extensive testing shows the new system is as good as, or better than, the old system at predicting future performance across traits.

However, this ABV release has seen some animals move for Balanced Performance Index (BPI).

DataGene has explored the largest movements and is comfortable they are consistent with model and data changes.

The movements are primarily the result of the removal of residual survival from the Balanced Performance Index, and refinements to the Fertility ABV. [Read more](#)

Investigating BPI movements

DataGene has investigated animal movements and is comfortable with their current BPIs and breeding values.

These investigations included looking at correlations between the December 2018 and April 2019 ABV run. Correlations help us understand how close the data is between two time periods. If it was the same data, the correlation would be 1. Correlations between December 2018 and April 2019 are consistent with the improvements implemented. For example, the correlation in production traits is between 0.97 and 0.99. However, the correlation of BPI is lower (0.91 to 0.97) due to changes to Residual Survival and the improved Fertility ABV model.

Blending genomic and conventional ABVs

Some of the animals that have extreme movements have a Direct Genomic Value (derived from genomic analysis) that is far higher or lower than the breeding value derived from on-farm performance information. In these cases, there are two estimates of genetic merit from two different sources that don't line up. In the new genetic evaluation system, the method of blending the Direct Genomic Value and conventional ABVs is subtly different which makes little difference in most animals but has a noticeable impact on these extreme animals.

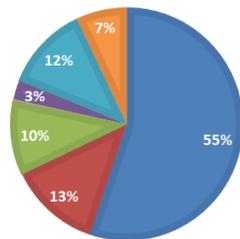
Female movements

In females, the correlations between December 2018 and April 2019 are strong and most females in the Holstein population have not moved significantly.

The average movement in Holstein genomically tested cows is +22 with most (66%) animals moving with a range of +/-33. However, there are some

RELATIVE EMPHASIS OF TRAITS IN THE BALANCED PERFORMANCE INDEX

■ ASI - Production ■ Fertility ■ Cell Count ■ Feed Saved ■ Type ■ Workability



Note: The three breeding indices – BPI, HWI and TWI – are not comparable across breeds. A BPI of say 200 in a Holstein is not comparable to a Jersey with a BPI of 200, as the measures are relative to their breed average.

noticeable movements in the top females. The following examples provide some insight into factors that contribute to female movements.

Gallrae Vosac Dora 829(g) has made a large move to the top of the Holstein list with a BPI of 385. In the old genetic evaluation system some of her data was excluded due to an anomaly in her herd identification. This issue was rectified in QA processes when moving data to the new genetic evaluation system so her current BPI is based on more complete data.

An example of a cow that dropped significantly is **Glomar Goldwyn Lucky 4319(g)**. Her BPI has dropped from 375 to 257, due mainly to drop in her production (ASI) and Daughter Fertility breeding values.

BPI – December 2018	382
ASI	-152
Daughter Fertility	-34
Removal Residual Survival	+32
Gain in SCC	+ 12
Gain in Overall Type	+ 7
Small movements in other traits	+ 10
BPI – April 2019	257

Bundalong Silver Waves 3521(g) made significant gains in BPI, mostly from improvements in production (ASI) and somatic cell count breeding values. This first-calver added data from three herd tests between December and April. As a result, her fat and protein PI went up by 5 points. Her conventional ABVs are now similar to her Direct Genomic Values (DVGs). In December her DVGs were higher.

BPI - December 2018	230
ASI	+85
SCC	+12
Fertility	-7
Remove Residual survival	+ 5
Feed Saved	- 5
Small changes in other traits	+ 4
BPI – April 2019	324

Herd movements

Despite individual movements in top animals, there is little change to the top 10 Holstein herds in Australia.

Bull movements

The amount of movement in animals between December 2018 and April 2019 varies between traits. For example, in production breeding values (ASI), Holstein proven bulls have an average movement of -2.3 with the difference in ASI for most bulls (66%) being +/- 5.7. The movement in BPI is much greater mainly due to residual survival and daughter fertility.

The difference in BPI for most bulls (66%) is within +/- 36 with an average movement of -2.3 BPI. However, most of the top bulls in December remain top bulls in April.

Correlation between December 2018 and April 2019 in Australian Breeding Values (Holsteins)

	Proven bulls	Genomic bulls	Genomic cows
Production (ASI)	0.99	0.98	0.97
Fertility	0.92	0.89	0.88
Survival (Longevity)	0.99	0.98	0.97
Overall Type	0.96	0.91	0.91
BPI	0.97	0.96	0.93

Testing the new system

DataGene has spent months testing the new system to ensure the breeding values predict the performance of animals as accurately as possible. A range of tests were performed, including passing Interbull tests for validation. Another key test was forward prediction, where a bull without daughters in 2012 was evaluated and then re-evaluated 5 years later with milking daughters in the national herd. The table shows the key results from this analysis

Forward prediction: traditional ABVs

	Average correlation improvement (predicted to actual)	Average reduction in bias	Biggest improvements
Holstein	↑ 8%	0.04	Fertility and Overall Type
Jersey	↑ 11%	0.00	Fertility and Survival
Aussie Reds	↑ 7%	0.10	Fertility and Likeability

Across all traits, there is an average 8% increase in the correlation between proofs before and after adding daughters in Holstein bulls. The traits that showed the biggest improvements were Fertility and Overall Type.

More information

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