



Balanced
Performance Index



Health
Weighted Index



Sustainability
Index

Australia's three breeding indices

Balanced Performance Index (BPI), Health Weighted Index (HWI) and Sustainability Index

Key points

- Breeding indices take the hard work out of breeding for more than one trait at once.
- Choose the index that best matches your breeding priorities.
- Use BPI for a balance of the traits that affect dairy business performance.
- Use HWI to fast-track fertility, mastitis resistance and feed efficiency.
- Use the Sustainability Index to fast-track genetic gain for reduced emissions intensity.
- The Sustainability Index was introduced in August 2022.



Bulls that carry the Good Bulls logo meet DataGene's minimum criteria for BPI and reliability and are available for purchase.

Australia's three breeding indices – BPI, HWI and Sustainability Index – account for the traits that affect a cow's lifetime contribution to the dairy business: production, health and fertility, longevity, workability, type and feed efficiency. The difference is in the amount of emphasis given to specific traits.

Why use an index?

Most dairy farmers want to breed to improve more than one trait at once. Breeding Indices take the hard work out of breeding for multiple traits by combining them in a single value.

They are based on rigorous scientific analysis and industry priorities.

Balanced Performance Index (BPI)

The Balanced Performance Index (BPI) is an economic index that drives improvements in the traits that affect lifetime contribution to the farm business: production, health, fertility, longevity, workability, feed efficiency and type. It reflects most farmers' preferences. The BPI is measured in \$, compared with the breed average (or 'base') which is set at zero.

Health Weighted Index (HWI)

The Health Weighted Index allows farmers to fast-track genetic gain for traits such as fertility, mastitis resistance and feed saved. The HWI places greater weighting on these traits than the BPI. Breeding for HWI is expected to reduce cow size and show little improvement in production. This is

because it places less emphasis on milk yield per cow. The HWI is modelled on a strictly seasonal calving system.

Sustainability Index

The Sustainability Index enables farmers to fast-track breeding for reduced greenhouse gas emissions intensity by placing greater emphasis on the traits that contribute to reducing emissions intensity (production, survival and feed saved).

The Sustainability Index is a relative ranking of animals expressed as a unit against a base of 0.

The higher the Sustainability Index number, the more efficient the animal for emissions intensity.

The unit of emissions intensity used in the Sustainability Index is kilograms of carbon dioxide equivalent per kilogram of protein equivalent produced (kg CO₂-eq/ kg protein-eq).

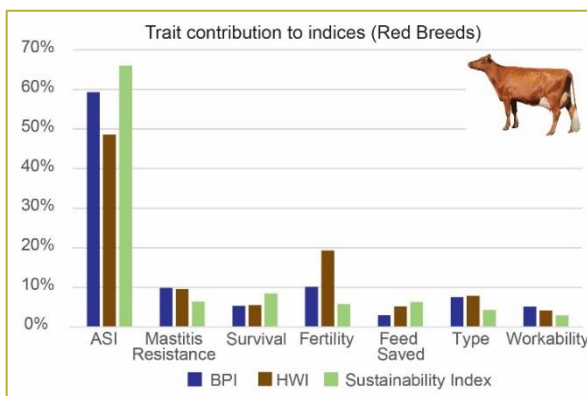
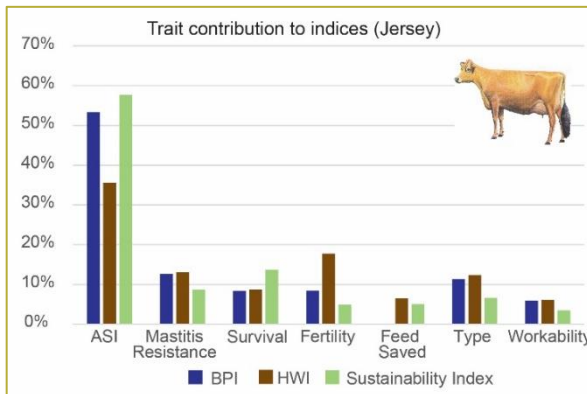
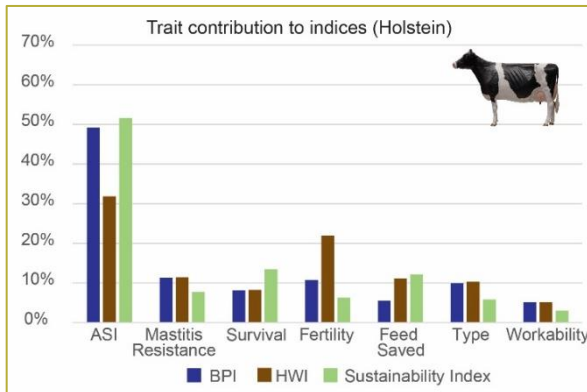
The Sustainability Index is a desired gains index and cannot be directly compared to the BPI or HWI.

What animals get a BPI, HWI and Sustainability Index?

Genomically tested animals, dairy cows and bulls can receive a BPI, HWI and Sustainability Index if sufficient data is available in DataGene's genetic evaluation system.

Breed differences

The relative emphasis given to traits in the BPI, HWI and Sustainability Index varies slightly across breeds. For example, the Jersey BPI excludes Feed Saved reflecting differences between breeding objectives (the breed is putting less emphasis on efficiency). The following bar charts show the relative trait weightings in the indices for each breed.



Publishing the results

DataGene's genetic evaluation system calculates animals' BPI, HWI, Sustainability Index, Australian Selection Index (ASI) and Australian Breeding Values (ABVs) for individual traits. They are calculated from available information such as genomic results, herd test data, records from on-farm software, classification results and workability reports.



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They are updated regularly as more information becomes available. Bulls' BPI, HWI, Sustainability Index and ABVs are published every April, August and December.

Bull results are published on DataVat.com.au, in the Good Bulls App and the Good Bulls Guide.

Cow results are reported directly to herd owners via their login to DataVat.com.au. The top 2% of cows is published three times a year at public ABV releases.

Breed average (the 'base')

Breeding values and indices are relative measures meaning they make more sense when compared to each other or to an average. The average, also known as the 'base' is a clearly defined group of animals to which all others are compared.

In Australia, the average is defined as cows of the same breed that were born between 2009 and 2013. It is updated periodically.

The breed average for BPI, HWI and Sustainability Index are set at zero. Animals with a negative index value are below average for their breed.

Don't compare breed BPI, HWI, Sustainability Index values

It is not valid to compare BPI, HWI or Sustainability Index values between breeds. A Holstein animal with a BPI of say 150 is not comparable to a Jersey animal with a BPI of 150.

This is because the BPI and HWI values are relative to their breed average (the base).

Good Bulls

An easy way to select bulls is to look for bulls that carry the Good Bulls icon and that meet your breeding priorities. Bulls that carry the Good Bulls logo meet DataGene's minimum criteria for BPI and reliability and are available for purchase.



Acknowledgement

DataGene is an initiative of Dairy Australia and the herd improvement industry. DairyBio provides the research pipeline to develop and maintain Australian Breeding Values.

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