Australia's two breeding indices

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

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.

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

Australia's two breeding indices – BPI and HWI – 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.

Breed differences

The relative emphasis given to traits in the BPI and HWI is consistent across breeds, with one exception. The Jersey BPI excludes Feed Saved reflecting differences between breeding objectives (the breed is putting less emphasis on efficiency).

What animals get a BPI, HWI?

Dairy cows and bulls can receive a BPI and HWI if sufficient data is available in DataGene's genetic evaluation system.

Publishing the results

DataGene's genetic evaluation system calculates animals' BPI, HWI, 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.

They are updated regularly as more information becomes available. Bulls' BPI, HWI 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 5% of cows is published monthly.

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 the purebred cows of the same breed that were born between 2009 and 2013. It is updated periodically.

The breed average for BPI and HWI are set at zero. Animals with a negative BPI or HWI are below average for their breed.
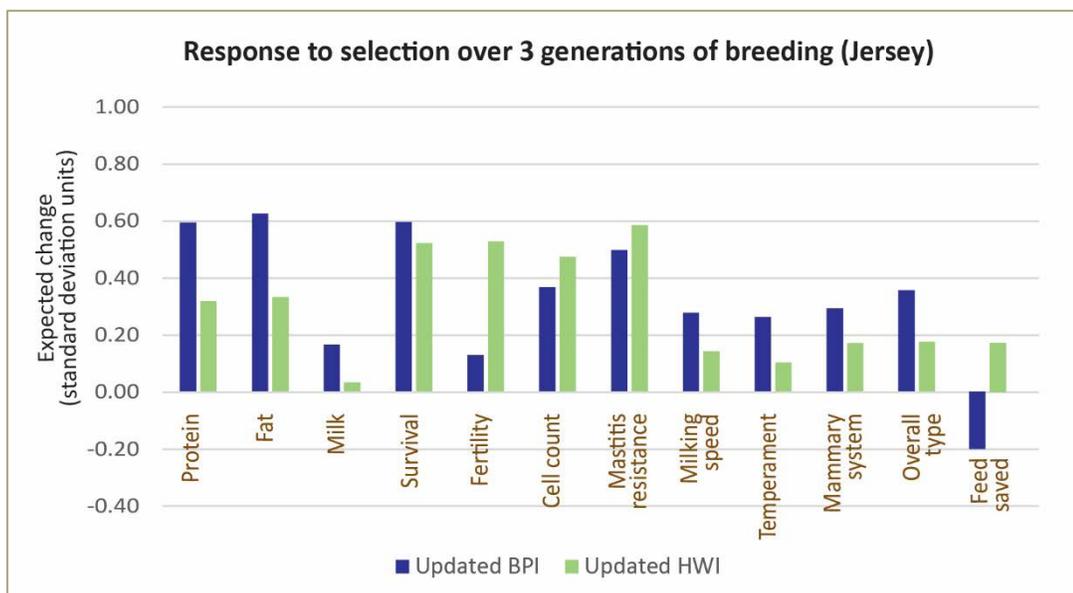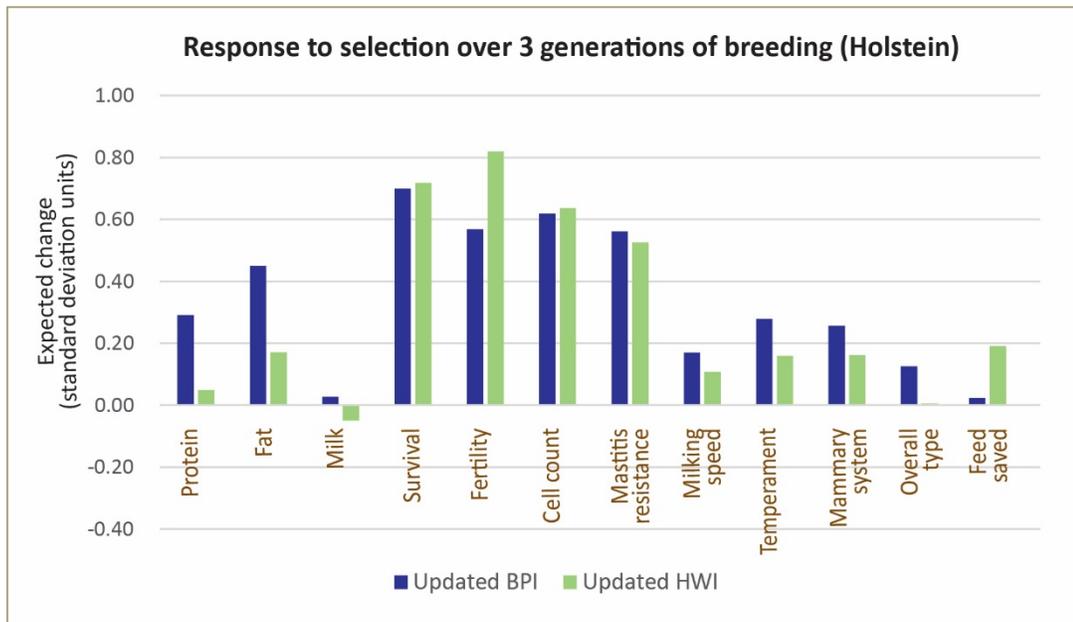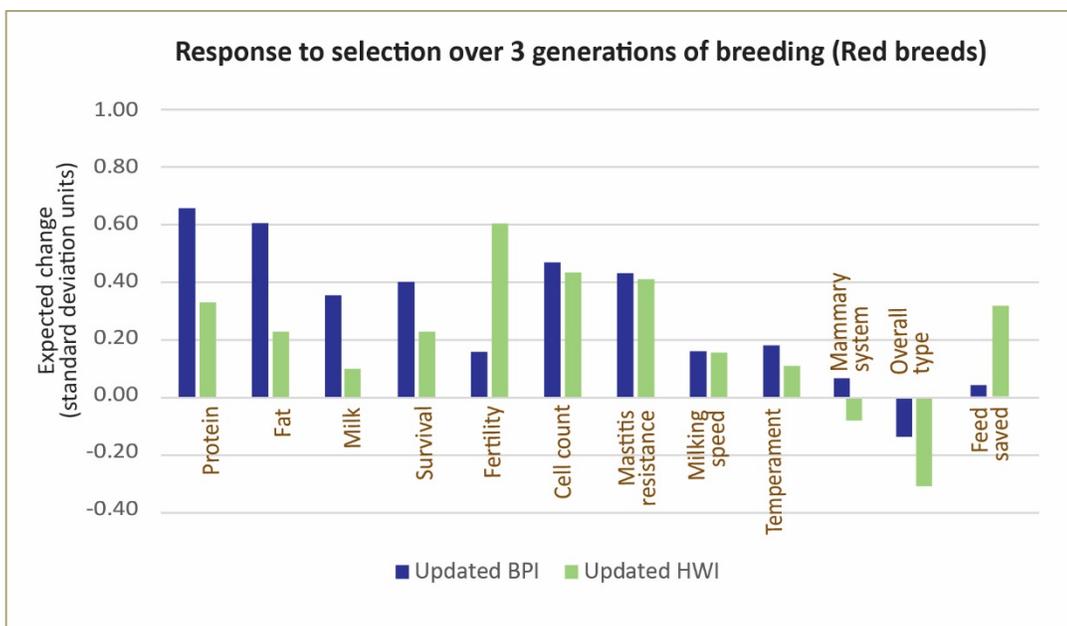
Don't compare breed BPI, HWI values

It is not valid to compare BPI or HWI 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).

Response to selection

A good way to compare the impact of the BPI and HWI is to look at the response to selection using an index over time. Response to selection is breed specific and shown in the following bar charts.

Response to selection over 3 generations of breeding (Holstein)

Response to selection over 3 generations of breeding (Jersey)

Response to selection over 3 generations of breeding (Red breeds)

Chart: Expected change (standard deviation units) comparing Updated BPI (dark blue) and Updated HWI (green) across the following traits: Protein, Fat, Milk, Survival, Fertility, Cell count, Mastitis resistance, Milking speed, Temperament, Mammary system, Overall type, Feed saved.

Legend: ■ Updated BPI   ■ Updated HWI

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.

Good Bulls
Bull choices made easy

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.

More information

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November 2020 updates

This fact sheet reflects refinements made to the breeding indices in November 2020. These refinements were made to reflect the industry's evolving breeding priorities which were reviewed in 2019/20. The key refinements were:

1. **Balanced Performance Index (BPI)**
   - updated with current economic values for fat, protein, feed and labour.
   - greater emphasis on health traits and less emphasis on production traits, compared with 2019 BPI.
   - Jersey BPI excludes Feed Saved, reflecting differences between breed objectives and differences in the evaluation of the Feed Saved ABV.
2. **Health Weighted Index (HWI)**
   - updated with current values for fat, protein, feed and labour.
   - double weighting on Daughter Fertility.
3. **Type Weighted Index (TWI)**
   - replaced by Good Bulls Guide tables that rank bulls by Overall Type and Mammary System.
4. **The base (used to compare animals)**
   - unchanged but with a breed purity filter added so it is a truer reflection of the breed.

More info

Dairy Australia

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