



# Breeding for improved fertility

## A tool for improving reproductive performance

### Key points

- Management practices have most impact on dairy herd reproductive performance but breeding for improved daughter fertility has long term benefits.
- The Daughter Fertility ABV identifies animals whose daughters are more likely to get in calf within six weeks of mating start date.
- It is available for all breeds, including young genomic bulls and heifers.



**To breed replacements with improved fertility, select high BPI animals with a Fertility ABV of greater than 100. For Holstein sires, choose Good Bulls with a Daughter Fertility ABV of greater than 105.**

While most improvement in herd reproductive performance comes through improved management, genetic variation for fertility does exist and some animals produce daughters that are more likely to become pregnant earlier.

### Daughter Fertility ABV

The Daughter Fertility ABV reflects the percentage of an animal's daughters pregnant by six weeks after mating start date, compared to the average. For year-round calving herds, this is equivalent to the percentage of daughters pregnant by 100 days after calving.

***Cows with a Daughter Fertility ABV of 110 had 10% more pregnancies after six weeks of joining compared to cows with an ABV of 100. (Source: Morton unpublished analysis for Dairy Australia)***

### Breeding for improved fertility

The Daughter Fertility ABV is expressed relative to an average of 100 with higher breeding values indicating more fertile daughters.

To breed for more fertile replacements, choose animals with a Daughter Fertility ABV above 100.

When selecting Holstein bulls, consider increasing the cut off to 105, as there is now a wide range of high BPI Holstein bulls available with Daughter Fertility ABVs of greater than 100.

### BPI, HWI

Fertility has a significant impact on a cow's lifetime contribution to the dairy business, so it is included in the two indices – Balanced Performance Index (BPI) and Health Weighted Index (HWI). Fertility is weighted at double its economic value in the Health Weighted Index as it is designed to fast track genetic gain for fertility (see table).

<b>Relative emphasis of fertility in BPI, HWI, Sustainability Index</b> (from December 2020)			
Breed	BPI	HWI	Sustainability Index
Holstein	13.2%	26.0%	6.94%
Jersey	9.9%	19.8%	6.94%
BPI: Balanced Performance Index; HWI: Health Weighted Index			

## Reliability

Reliability is a measure of confidence in an ABV. The reliability of an animal's breeding values improves with age as more information becomes available, for example genomics and daughters' fertility records and herd test results (see table).

Reliability of Daughter Fertility ABV (Aug 2023)				
Breed	Young genomic bull	Proven bull with genotype	Young genomic heifer	10-yo cow with genotype
Holstein	57%	87%	56%	66%
Jersey	50%	86%	49%	63%

## Heritability

Heritability is a measure of how much a trait is influenced by genetics. The heritability of fertility is low (5%), which is similar to the heritability of mastitis resistance. This means genetics plays a smaller role in the influencing a cow's fertility than factors such as environmental conditions and management.

However, genetic selection for fertility is still possible. It has a cumulative and long-term effect. Significant genetic variation exists within Holstein and Jersey breeds making it possible to identify animals with higher genetic merit for fertility.

## Genetically related traits

Some traits are genetically related, so selecting for one trait may have an impact on another. For example, placing a strong selection pressure on Daughter Fertility can have a negative impact on genetic merit for production traits. When selecting bulls for breeding replacements, look for Good Bulls. The Good Bulls icon gives breeders confidence the animal meets DataGene's minimum requirements for BPI, reliability and is available for purchase.



# Good Bulls

## 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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