

# Predicting heifer performance with genomic testing

## What is genomic testing?

Genomic testing analyses an animal's DNA from a sample such as ear tissue or a tail hair, to predict future performance. Heifers can be tested as young calves, so farmers can make early decisions about their future in their herd. Samples are easy to collect and can be taken at the same time as routine husbandry procedures such as ear tagging or disbudding.

**Figure 1** Collecting an ear tissue sample (a. side view, b. front view) for genomic testing using a Tissue Sampling Unit (TSU) (Image credit: Zoetis)



## How is genomic testing used?

Genomic testing allows farmers to:

- save money on rearing costs by not rearing heifers that are unlikely to perform
- make more informed decisions on which heifers to sell, use of sexed or beef semen and/or purchasing of females
- significantly fast-track genetic improvement in the herd for traits of importance such as fertility, heat tolerance or type.



The typical cost of rearing a heifer to two years of age is between  
**\$1,300-\$2,500**

In herds where no surplus heifers are available, farmers may also consider selling less desirable heifers and replacing them with higher quality, genotyped heifers. If doing so, it is important to consider biosecurity.

Genomic testing accurately determines animal identification and parentage and reduces pedigree errors. Pedigree errors occur in about 15 per cent of Australian dairy calves. Testing is also a straight forward way to establish pedigrees in herds that do not have adequate records or do not have time to construct pedigrees.

**DataGene estimates that around 15% of calves are incorrectly identified at birth.**

## Reliability

The reliability of genomic breeding values is more than double those based on pedigree alone.

Dairy genomic technology was developed by world class Australian scientists from DairyBio utilising data from more than 30,000 genotyped animals, 30 years of progeny testing, herd recording, type classification and genetic evaluation programs.

**The reliability of genomic testing of young heifers is the equivalent of having seven lactations of data.**

## KEY MESSAGES

Genomic test results predict a heifer's future performance

Save money on rearing costs and make more informed mating decisions

Samples are easy to collect at the same time as other routine husbandry procedures (e.g. disbudding)

Genomic testing of dairy females is increasing rapidly

## Results

Genomic testing using the Australian genetic evaluation system, produces a Balanced Performance Index (BPI) and Australian Breeding Values (ABVs) for each animal. The ImProving herds project found that on average, high BPI cows produced more milk solids and last as long or longer (Table 1) than their low BPI herd-mates.

### Compared to their lower BPI herd mates, high BPI cows

<b>Milk (L)</b>	Produced 649 L/cow/year more
<b>Fat (kg)</b>	Produced 50 kg/cow/year more
<b>Protein (kg)</b>	Produced 38 kg/cow/year more
<b>Fat (%)</b>	Produced 0.29% higher fat percentage
<b>Protein (%)</b>	Produced 0.19% higher protein percentage
<b>Productive life (months)</b>	Lasted 8 months longer

**Table 1** Average difference between high and low BPI cows for milk production in 27 Australian farms (ImProving Herds, 2018)



Since we have been [genomic] testing and having a bit more of a focus on the calves and their quality, it has meant we have put more effort into growing them well and feeding them well."

**Huw Evans,**  
Gippsland, 350 cows

Genomic testing is available for Holstein, Jersey and Holstein-Jersey crossbred cattle.

### Which animals can I test?

Currently, genomic testing can be done for any Holstein, Jersey, or Holstein-Jersey cross animal whose sire has an Australian Breeding Value (ABV).

Farmers do not need to be herd recording, but genomic test results are more reliable if they do.

### Genomic testing in Australia

The use of genomic testing of dairy heifers is rapidly increasing in Australia. The most recent data shows that over the past 12 months, commercial genotyping of females in Australia rose by more than 60 per cent compared to the total number in 2018/19.

To get started, contact a genomic service provider. Genomic service providers currently operating in Australia include:

- ABS Global Australia
- Holstein Australia
- Jersey Australia
- Neogen
- Semex
- ST Genetics Australia
- Total Livestock Genetics (TLG)
- Weatherbys Scientific Australia
- Zoetis ■■■

More information on genomic testing can be found at

**dairyaustralia.com.au**