

Using genetic tools for improved progeny and performance

Genetic selection improves animal production, performance and health to create a sustainable, high-performing industry at an overall lower cost to producers.

Genetic tools can assist you to improve the overall profitability of your business and the Australian red meat industry by:

- » better meeting the needs of consumers and participants across the value chain
- » breeding livestock that are more compliant with market requirements
- » producing livestock that meet on-farm productivity targets such as increased reproductive rate, improved turn-off time and healthier livestock
- » providing data to help meet environmental sustainability goals.

 ACCELERATE

YOUR PRODUCTIVITY WITH GENETICS

 genetics.mla.com.au

Genetic tools to accelerate productivity

The development of genomics means there is now a variety of tools available to help producers find and select the very best animals. These tools allow you to see ‘under the hood’ of an animal and accelerate your herd’s performance.

Which tools are right for me?

This depends on where your herd’s genetic performance currently sits and what you are trying to improve within your herd. The diagram below takes you on the journey of identifying where your herd and business are now and how genetics tools will support you to accelerate your productivity.

Do I have a breeding objective?



Setting a breeding objective is an important step as it helps describe what you’re trying to achieve with your herd. Once you’ve set a breeding objective, you can identify what tools are required to help get you there.

How do I buy the right bulls?



Estimated Breeding Values (EBVs)
How do you choose the right bulls with the right genetics for your business?

Bulls have the largest impact on genetic progress as they have more progeny throughout their lifetime.

BREEDPLAN EBVs are the most accurate way to select the bulls that suit your production system and meet your breeding objective.

How do I compare to the rest of the industry?



Herd profile

Now that you have a clear breeding objective, how does your herd compare against the rest of the commercial industry?

Herd profile is a mob-based benchmarking tool that is available to help you understand where your herd’s genetic performance currently sits.

This can inform decisions around which bulls to purchase to move your herd towards your breeding objective.

Can I select better females?



Genomic Breeding Values (GBVs)
So you have a clear breeding objective, identified your starting point with herd profiling, and identified the EBVs that will help you select the most appropriate bulls.

How do you identify replacement females?
GBVs can be used for large scale commercial production systems.

GBVs are available for both purebred and composite tropical breeds without EBVs. This tool has a smaller range of traits and lower accuracy compared to a full genetic evaluation.

Genetic tools to accelerate your productivity



Herd profile

If you have never done any form of genomic testing or used breeding values before, the herd profile tool will benchmark where your herd’s genetic performance currently sits. If you have a breed that has EBVs, you can do a herd profile which will identify the genetic merit of your female herd.



Genomic Breeding Values (GBVs)

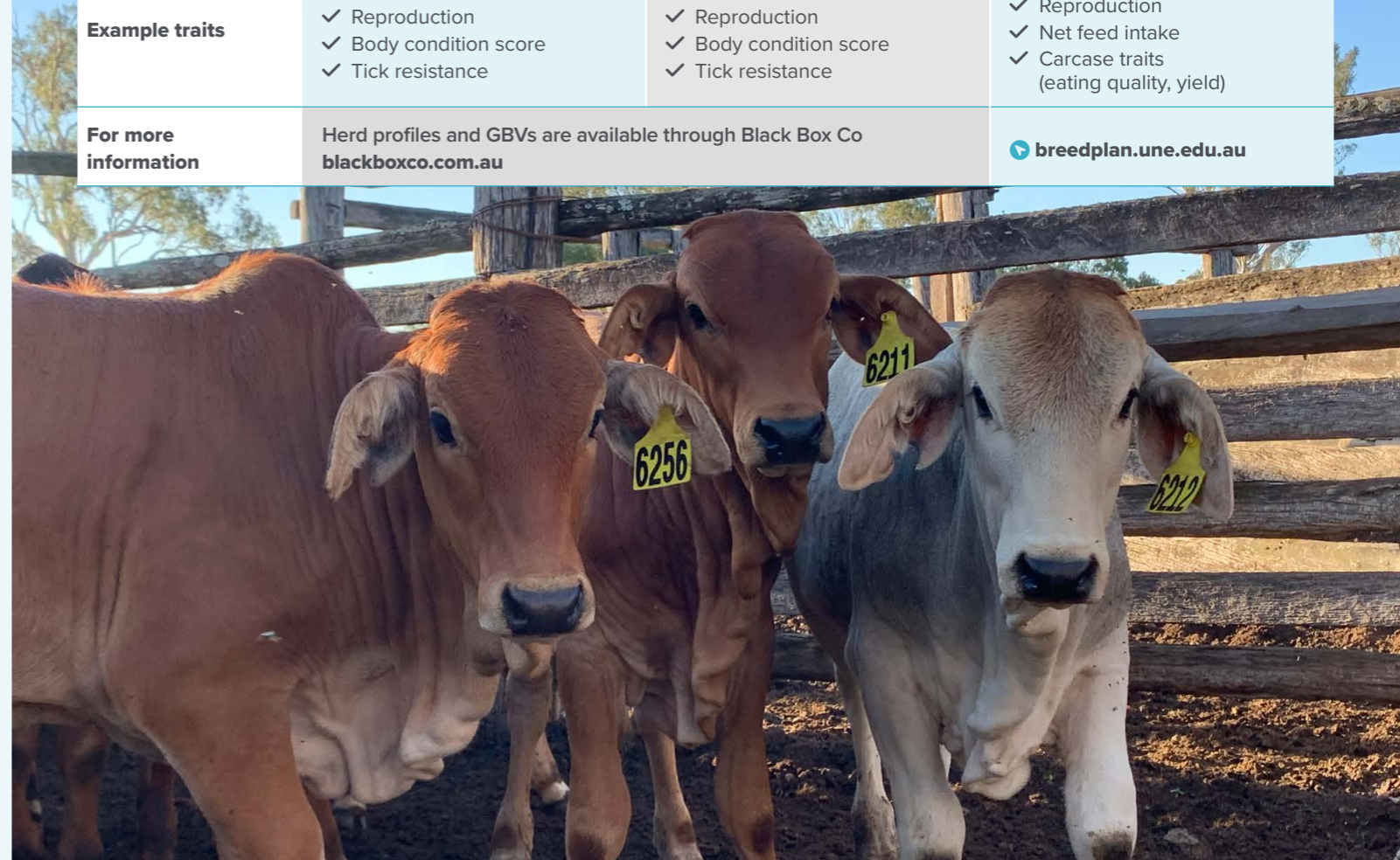
GBVs are based off a genomic prediction developed from a large commercial reference population. It allows you to select commercial females that are better for fertility and growth. GBVs can help producers select their highest performing heifers in a more objective way.



Estimated Breeding Values (EBVs)

EBVs are calculated from a range of information sources, including pedigree, performance and genomic information. They are the best estimate of an animal’s genetic merit for a particular trait and an indication of how an animal’s progeny will perform.

Used for	Benchmarking your herd – understand where your herd’s genetic performance currently sits and how you can move towards your breeding objective.	Selecting commercial replacement heifers	Selecting high value sires – choose bulls that best suit your production system and breeding objective.
Level of comparison	Average herd	Individual animal	Individual animal
Cattle type	Tropical purebred and composite	Tropical purebred and composite without access to EBVs	Purebred tropical and temperate cattle
Level of precision for selection	+	++	+++
Example traits	<ul style="list-style-type: none"> ✓ Growth ✓ Reproduction ✓ Body condition score ✓ Tick resistance 	<ul style="list-style-type: none"> ✓ Growth ✓ Reproduction ✓ Body condition score ✓ Tick resistance 	<ul style="list-style-type: none"> ✓ Growth ✓ Reproduction ✓ Net feed intake ✓ Carcase traits (eating quality, yield)
For more information	Herd profiles and GBVs are available through Black Box Co blackboxco.com.au		breedplan.une.edu.au





Fertility focus drives profits and productivity



Thomas, Marie, James, Josephine and Tom Copley

Tom and Marie Copley understand that to achieve their business goals and breeding objectives, functional analysed genetics are essential.

Fertility focus

'Fertility is a key determinant of profitability and productivity, which is why from the beginning our focus has been on developing a highly fertile and efficient cow herd', Tom said.

Because the Copleys value fertility, the Estimated Breeding Values (EBVs) they target are Days to Calving and Scrotal Circumference. They place additional emphasis on early puberty and evidence of generations of maternal success with a balanced approach to growth.

They also drive fertility in their females by joining all heifers and culling all non-pregnant females after a tight joining.

A long-term objective and persistence pay off

Copley heifers analysed in the 'Northern Genomics Project' reflect their breeding objectives and focus on fertility, with over 60% of the group in the top 20th percentile for Puberty and Body Condition Score whilst being moderately framed.

A long-term focus on their breeding objectives is illustrated by the comparison

of the key EBVs of Bull Teams from the first analysed team in 1985/86 to the 20/21 Bull Team. DTC has improved from 1986 as-1.6 to -15.8 in 2021.

The results of this careful selection and management are reflected in their herd being well above breed average for both Indices and Fertility EBVs.

Purchasing and applying genetics

When purchasing genetics, the Copleys seek out a Seedstock Producer who can provide a comprehensive EBV profile from a herd, raised and managed with a 'fertility first' focus.

'I use the sporting metaphor of 'training how you want to play' when it comes to buying genetics,' Tom said.

The Copleys encourage the use of the \$ indices.

'Looking through pages of EBVs can be a bit daunting, but the dollar indices draw from each bull's data to give a ranking of the value of that bull to your business in economic terms,' said Marie.

TOM AND MARIE COPLEY – COPLEY GENETICS
'Salty', Anduramba, Queensland

AREA
4,000ha

ENTERPRISE
Seedstock producers

LIVESTOCK
1,000 Brahman breeders

PASTURES
Forest grazing

Seedstock enterprise

'We have taken the next logical step to seedstock production. To support and enhance the accuracy of the EBVs, we utilise genomic analysis of the entire herd and enter their phenotypical data to Brahman BREEDPLAN,' Tom explained.



Watch a video of the Copleys as they share their genetics approach.



Pathway to progress

There's no doubt that a high-performing sire must be structurally sound, have good temperament and be reproductively fit, but what you can't see is just as important.

MLA's livestock genetics tools will help you decide if he's the right fit, to help you progress with your enterprise goals. This pathway demonstrates exactly how genetic tools are delivered.

Data collection

Genetic tools are underpinned by extensive and accurate data collection of:

- » phenotypes: observable traits
- » genotypes: to understand the DNA make up of animals and its genetic relationships with other animals (through pedigree or genomics)

MLA invests in the collection of data in reference populations to drive genetic improvement, particularly for hard to measure and new traits that are of economical importance currently and in the future (e.g. eating quality, methane emissions and feed intake).



1

Are the studs you're buying from collecting data for traits of importance to you?

Are you making the most accurate selection decisions to help you progress with your enterprise goals?

2

Analysis

Genetic evaluation systems analyse phenotypes and genotypes (along with data on non-genetic factors) to get an estimate of an animal's genetic merit. These large-scale analyses are able to compare animals within and across herds.

MLA invests in the analysis behind BREEDPLAN and the scientifically rigorous process for this analysis ensures our world-leading systems deliver highly accurate and simple to use genetic tools for industry.



Tools

An important first step to using genetic tools is to set a breeding objective, as it helps describe what you're trying to achieve with your herd. Once you've set a breeding objective, you can identify what tools are required to help get you there.

Estimated Breeding Values (EBVs)

BREEDPLAN EBVs are the best estimate of an animal's genetic merit for a particular trait, and an indication of how an animal's progeny will perform.

These can be used to select the bulls that suit your production system and meet your breeding objective.

Selection Indexes

Indexes combine a range of traits into a single ranking value. This helps you balance and prioritise traits that drive the most profit for the production system and market you're targeting.

Breed-specific indexes are available.

3

Are you buying bulls with EBVs?



4

How do other producers use the genetics tools?

On-farm outcomes through genetics

Minimal herd inputs during dry season

Faced with a challenging climate and the myriad of variables involved in breeding cattle, Queensland seedstock producers Tom and Marie Copley are leveraging genetics to map out a productive path for their herd.



Improved calving and efficiency

NSW beef producer, Chris Main, switched to breeding with the goal to produce cattle which perform for his environment and management system.



Genetics resources and training programs

Visit MLA's Genetics hub



No jargon. No complexity. MLA's Genetics hub provides a clear look at how better breeding values can help you accelerate your herd's or flock's productivity.

genetics.mla.com.au

Programs for herds

A modern genetic evaluation system for beef cattle breeders, offering the potential to accelerate genetic progress in their herds, and to provide objective information on stock they sell to commercial breeders.



breedplan.une.edu.au

ABRI Extension Services provides technical support and extension initiatives supporting the use and understanding of BREEDPLAN and related genetic technologies including BreedObject, MateSel, Completeness of Performance and GeneProb.



breedplan.une.edu.au/extension-services/about

Workshops and training

A practical, one-day workshop on how productivity and profitability can be improved through good breeding and feeding over the livestock production cycle with a specific focus on profit drivers.



**BredWell
FedWell**

mla.com.au/bredwellfedwell

Breeding EDGE is a three-day workshop



designed to help you evaluate how your breeding program is currently performing and to consider opportunities for improvement.

mla.com.au/edgenetwork

Takes small groups of like-minded producers who want to improve their whole-farm performance and matches them with a deliverer who builds their knowledge, skills and experience through hands-on training.



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