UNDERSTANDING THE TRANSTASMAN ANGUS CATTLE EVALUATION (TACE)

What is the TransTasman Angus Cattle Evaluation?

The TransTasman Angus Cattle Evaluation is the genetic evaluation program adopted by Angus Australia for Angus and Angus influenced beef cattle. The TransTasman Angus Cattle Evaluation uses Best Linear Unbiased Prediction (BLUP) technology to produce Estimated Breeding Values (EBVs) of recorded cattle for a range of important production traits (e.g. weight, carcase, fertility).

The TransTasman Angus Cattle Evaluation is an international genetic evaluation and includes pedigree, performance and genomic information from the Angus Australia and Angus New Zealand databases, along with selected information from the American and Canadian Angus Associations.

The TransTasman Angus Cattle Evaluation utilises a range of genetic evaluation software, including the internationally recognised BLUPF90 family of programs, and BREEDPLAN® beef genetic evaluation analytical software, as developed by the Animal Genetics and Breeding Unit (AGBU), a joint institute of NSW Agriculture and the University of New England, and Meat and Livestock Australia Limited (MLA).

What is an EBV?

An animal's breeding value can be defined as its genetic merit for each trait. While it is not possible to determine an animal's true breeding value, it is possible to estimate it. These estimates of an animal's true breeding value are called EBVs (Estimated Breeding Values).

EBVs are expressed as the difference between an individual animal's genetics and a historical genetic level (i.e. group of animals) within the TACE genetic evaluation, and are reported in the units in which the measurements are taken.

Using EBVs to Compare the Genetics of Two Animals

TACE EBVs can be used to estimate the expected difference in the genetics of two animals, with the expected difference equating to half the difference in the EBVs of the animals, all other things being equal (e.g. they are joined to the same animal/s).

For example, a bull with a 200 Day Growth EBV of +60 would be expected to produce progeny that are, on average, 10 kg heavier at 200 days of age than a bull with a 200 Day Growth EBV of +40 kg (i.e. 20 kg difference between the sire's EBVs, then halved as the sire only contributes half the genetics).

Or similarly, a bull with an IMF EBV of +3.0 would be expected to produce progeny with on average, 1% more intramuscular fat in a 400 kg carcase than a bull with a IMF EBV of +1.0 (i.e. 2% difference between the sire's EBVs, then halved as the sire only contributes half the genetics).

Using EBVs to Benchmark an Animal's Genetics with the Breed

EBVs can also be used to benchmark an animal's genetics relative to the genetics of other Angus or Angus infused animals recorded with Angus Australia.

To benchmark an animal's genetics relative to other Angus animals, an animal's EBV can be compared to the EBV reference tables, which provide:

- the breed average EBV
- the percentile bands table

The current breed average EBV is listed on the bottom of each page in this publication, while the current EBV reference tables are included at the end of these introductory notes. For easy reference, the percentile band in which an animal's EBV ranks is also published in association with the EBV.

Considering Accuracy

An accuracy value is published with each EBV, and is usually displayed as a percentage value immediately below the EBV.

The accuracy value provides an indication of the reliability of the EBV in estimating the animal's genetics (or true breeding value), and is an indication of the amount of information that has been used in the calculation of the EBV.

EBVs with accuracy values below 50% should be considered as preliminary or of low accuracy, 50-74% as of medium accuracy, 75-90% of medium to high accuracy, and 90% or greater as high accuracy.

Description of TACE EBVs

EBVs are calculated for a range of traits within TACE, covering calving ease, growth, fertility, maternal performance, carcase merit, feed efficiency and structural soundness. A description of each EBV included in this publication is provided on the following page.

UNDERSTANDING ESTIMATED BREEDING VALUES (EBVS)

Calving Ease	**CEDir**	%	Genetic differences in the ability of a sire's calves to be born unassisted from 2 year old heifers.	Higher EBVs indicate fewer calving difficulties in 2 year old heifers.
	CEDtrs	%	Genetic differences in the ability of a sire's daughters to calve unassisted at 2 years of age.	Higher EBVs indicate fewer calving difficulties in 2 year old heifers.
	GL	days	Genetic differences between animals in the length of time from the date of conception to the birth of the calf.	Lower EBVs indicate shorter gestation length.
	BW	kg	Genetic differences between animals in calf weight at birth.	Lower EBVs indicate lighter birth weight.
Growth	**200 Day**	kg	Genetic differences between animals in live weight at 200 days of age due to genetics for growth.	Higher EBVs indicate heavier live weight.
	400 Day	kg	Genetic differences between animals in live weight at 400 days of age.	Higher EBVs indicate heavier live weight.
	600 Day	kg	Genetic differences between animals in live weight at 600 days of age.	Higher EBVs indicate heavier live weight.
	MCW	kg	Genetic differences between animals in live weight of cows at 5 years of age.	Higher EBVs indicate heavier mature weight.
	Milk	kg	Genetic differences between animals in live weight at 200 days of age due to the maternal contribution of its dam.	Higher EBVs indicate heavier live weight.
Fertility	**DtC**	days	Genetic differences between animals in the time from the start of the joining period (i.e. when the female is introduced to a bull) until subsequent calving.	Lower EBVs indicate shorter time to calving.
	SS	cm	Genetic differences between animals in scrotal circumference at 400 days of age.	Higher EBVs indicate larger scrotal circumference.
Carcase	**CWT**	kg	Genetic differences between animals in hot standard carcase weight at 750 days of age.	Higher EBVs indicate heavier carcase weight.
	EMA	cm^2	Genetic differences between animals in eye muscle area at the 12/13th rib site in a 400 kg carcase.	Higher EBVs indicate larger eye muscle area.
	Rib Fat	mm	Genetic differences between animals in fat depth at the 12/13th rib site in a 400 kg carcase.	Higher EBVs indicate more fat.
	P8 Fat	mm	Genetic differences between animals in fat depth at the P8 rump site in a 400 kg carcase.	Higher EBVs indicate more fat.
	RBY	%	Genetic differences between animals in boned out saleable meat from a 400 kg carcase.	Higher EBVs indicate higher yield.
	IMF	%	Genetic differences between animals in intramuscular fat (marbling) at the 12/13th rib site in a 400 kg carcase.	Higher EBVs indicate more intramuscular fat.
Feed/ Temp.	**NFI-F**	kg/ day	Genetic differences between animals in feed intake at a standard weight and rate of weight gain when animals are in a feedlot finishing phase.	Lower EBVs indicate more feed efficiency.
	Doc	%	Genetic differences between animals in temperament.	Higher EBVs indicate better temperament.
Structure	**Foot Angle**	score	Genetic differences in foot angle (strength of pastern, depth of heel).	Lower EBVs indicate more desirable foot angle.
	Claw Set	score	Genetic differences in claw set structure (shape and evenness of claws).	Lower EBVs indicate more desirable claw structure.
Selection Index	**$A**	$	Genetic differences between animals in net profitability per cow joined in a typical commercial self replacing herd using Angus bulls. This selection index is not specific to a particular market end-point, but identifies animals that will improve overall net profitability in the majority of commercial, self replacing, grass and grain finishing beef production systems.	Higher selection indexes indicate greater profitability.
	$A-L	$	Genetic differences between animals in net profitability per cow joined in a typical commercial self replacing herd using Angus bulls. This selection index is not specific to a particular market end-point, but identifies animals that will improve overall net profitability in the majority of commercial, self replacing, grass and grain finishing beef production systems. The $A-L index is similar to the $A index but is modelled on a production system where feed is surplus to requirements for the majority of the year, or the cost of supplying additional feed when animal feed requirements increase is low. While the $A aims to maintain mature cow weight, the $A-L does not aim to limit the increase in mature cow weight as there is minimal cost incurred if the feed maintenance requirements of the female breeding herd increase as a result of selection decisions.	Higher selection indexes indicate greater profitability.