

December 2020

## Annual Enhancements to TransTasman Angus Cattle Evaluation

A number of enhancements have been implemented within the mid December 2020 TransTasman Angus Cattle Evaluation

These changes are part of the ongoing maintenance and improvement to the genetic evaluation, and have resulted in the calculation of EBVs that better predict the genetic merit of Australian Angus animals.

### 1. Improvements to Handling of Genomic Information

Improvements have been implemented to the manner in which genomic information is incorporated in the calculation of EBVs

- **Transition from GBLUP to TBLUP software:** Updates have been made to the single step analytical software to accommodate the large number of genotypes now being included in the TransTasman Angus Cattle Evaluation. The new TBLUP version of single step analytical software has not resulted in any noticeable change to the EBVs that are published, but will ensure that the software can accommodate a far larger number of genotypes in the future than what would be possible using the current GBLUP version.
- **Transition from V6.0 to V8.0 genomic pipeline:** The pipeline used to incorporate genomic information into the genetic evaluation has been updated. Most notably, the new pipeline includes an updated strategy for applying quality assurance checks to genomic information and will address some of the issues currently being encountered with the unnecessary exclusion of genotypes from the genetic evaluation.
- **Incorporation of additional SNPs:** The single nucleotide polymorphisms (SNPs) that are used in the genetic evaluation have been updated to include additional SNPs from the latest genotyping platforms (i.e. HD50K for Angus, Angus GS).
- **Updating of haplotype library:** The reference haplotype library that is used when converting (imputing) the raw genotypes from different genotyping platforms into a standard set of SNPs for use in the genetic evaluation has been updated. Some changes in EBVs may be observed for animals with low density genotypes (i.e. <20K) or their close relatives as a result of this enhancement.

### 2. Updated Selection Indexes

Considerable modifications have been implemented to the calculation of the Angus Breeding Index, Domestic Index, Heavy Grain Index and Heavy Grass Index.

- **Updating of economic and production parameters:** All economic and production parameters used in the calculation of the selection indexes have been updated to reflect current production systems and markets, replacing the current parameters that were last updated in December 2014.
- **Updated analytical software:** The selection indexes published within the TransTasman Angus Cattle Evaluation are calculated using software called BreedObject. A new version of the software, referred to as BreedObject version 6, has been implemented.

By comparison to the previous software, the new version includes a number of new features, such as:

- » Improved modelling of young animal growth
- » Improved modelling of cow weight and condition score throughout the year
- » Enhanced modelling of carcase market specifications

Of particular note, the enhanced modelling of cow weight better accounts for the impact that an increase in cow weight has on feed costs, resulting in greater emphasis being given to Mature Cow Weight EBVs in the calculation of the selection indexes.

The modifications to the calculation of selection indexes have resulted in considerable changes to the selection indexes values that are published for animals. In addition to the re-ranking of animals, there is also a considerable increase in the standard deviation, or spread of selection index values.

### 3. Improvements to Structural Soundness EBVs

Resulting from concerns raised by the Genetic Evaluation Consultative Committee and wider Angus Australia membership, considerable modifications have been implemented to the Structural Soundness EBVs that are published.

- **Consolidation of traits:** The five EBVs previously published have been replaced with two EBVs, being Front Foot Angle and Claw Set. EBVs for rear leg hind view and side view will still be calculated and available upon request, however they will not be routinely published.

Structural				
Front Feet Angle	Front Feet Claw Set	Rear Feet Angle	Rear Leg Hind View	Rear Leg Side View
+14	+25	+3	+1.8	+0.1
89%	90%	84%	65%	79%



Structural	
Foot Angle	Claw Set
+0.82	+0.46
98%	98%

- **Change in EBV units:** The new Foot Angle and Claw Set EBVs are expressed as expected differences in the score units, rather than the percentage of progeny with acceptable structure. Lower Foot Angle and Claw Set EBVs are more favourable and identify animals that will produce progeny with more desirable structure (i.e. a score closer to 5).
- **Updated analytical software:** The analytical software used to calculate the EBVs now includes a number of improvements, including:
  - » Adoption of a liner analytical model (by comparison to the threshold model that was previously used)
  - » Facility to incorporate multiple scores per animal
  - » Facility to incorporate scores on mature females
  - » Facility to incorporation genomic information into the calculation of EBVs

- **Incorporation of North American data:** The analysis is now conducted in association with the American Angus Association and Canadian Angus Association. In this manner, scores collected on animals in Australia, the United States and Canada have been combined for analysis, with the resultant EBVs calculated for Angus animals in Australia and North America now being directly comparable.

- **Acceptance of breeder collected scores:** In addition to the scores collected by independent accredited assessors, breeder collected scores are now also accepted for analysis. It is suggested that members continue to use an independent assessor for the collection of scores on sale animals, or if they feel uncomfortable with scoring their animals, with the acceptance of breeder collected scores specifically aiming to facilitate an increase in the recording of scores on replacement heifers and mature females.

The modifications to the manner in which Structural Soundness EBVs are calculated has resulted in considerable changes to the EBVs that are published for animals, and in particular, to the ranking of animals for foot angle and claw set.

#### 4. Improvements to Publication of Research Breeding Values

Considerable improvements have been implemented to the Research Breeding Values that are calculated for Mature Cow Body Condition (MBC) and Mature Cow Height (MCH).

- **Routine updating of RBVs:** MBC & MCH RBVs will now be routinely updated at each bi-monthly evaluation, with updated RBVs published on the Angus Database Search.
- **Publication of RBVs for additional animals:** The animals for which MBC & MCH RBVs are published has been expanded. Rather than RBVs only being available for sires, RBVs will now be published for any female with that has a performance measurement and an RBV accuracy of >25%.

#### Further Information

To further discuss any of the enhancements that have been implemented in the mid December 2020 TransTasman Angus Cattle Evaluation, please contact Andrew Byrne, Angus Australia's Breed Development & Extension Manager, on (02) 6773 4618 or [andrew@angusaustralia.com.au](mailto:andrew@angusaustralia.com.au).

