AUSTRALIAN WAGYU ASSOCIATION™

WAGYU TECHNICAL UPDATE

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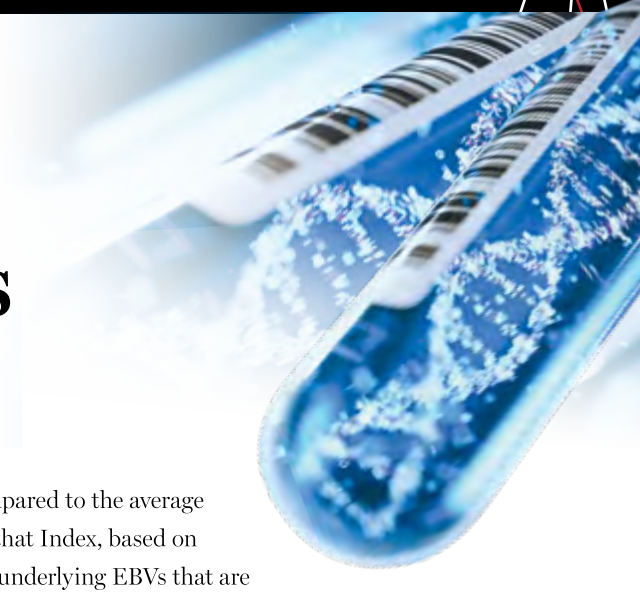


TRANSFORMING DATA INTO BREEDING DECISIONS WITH $INDEXES

THE TOOLS NEEDED TO DEVELOP A HERD

The tools needed to develop a herd that meets targeted production outcomes go beyond observation in the paddock and into analysis of data and turning it into information that can be used to improve breeding decisions.

The use of BREEDPLAN is common across many cattle breeds, and Wagyu BREEDPLAN provides data specific to our breed. The Estimated Breeding Values (EBVs) produced for a number of important animal traits allow for the transformation of raw data into genetic merit information for improving breeding decisions.

Taking it another step further, those EBVs can then be analysed to determine which animals have the best potential within a breeding herd to generate a more profitable outcome in targeted production systems. These are the BreedObject $Indexes.

Each Index is targeted to provide a performance outcome within a specific production system – the idea is to compare animals within the same Index, the index most related to your production system.

The value of each Index gives an indication of the likelihood of how profitable the animal performs compared to the average for that Index, based on the underlying EBVs that are best aligned with that production outcome.

> “Rather than fixate on the actual $Index values, breeders should look at how animals rank in comparison to each other within the $Index that best suits their production system. They should then look at the EBVs that make up the $Index to understand the composition of the total genetics package for that animal.

In 2018, three $Indexes were introduced for Wagyu – Self-replacing (SRI), Fullblood Terminal (FTI) and F1 Terminal $Indexes (F1I), that replaced the existing, temporary Terminal Carcase Index. These three Indexes have been widely accepted and utilised by breeders in making herd and production decisions and feature heavily in buying decisions in sales such as the Elite Wagyu Sale in conjunction with EBV figures.

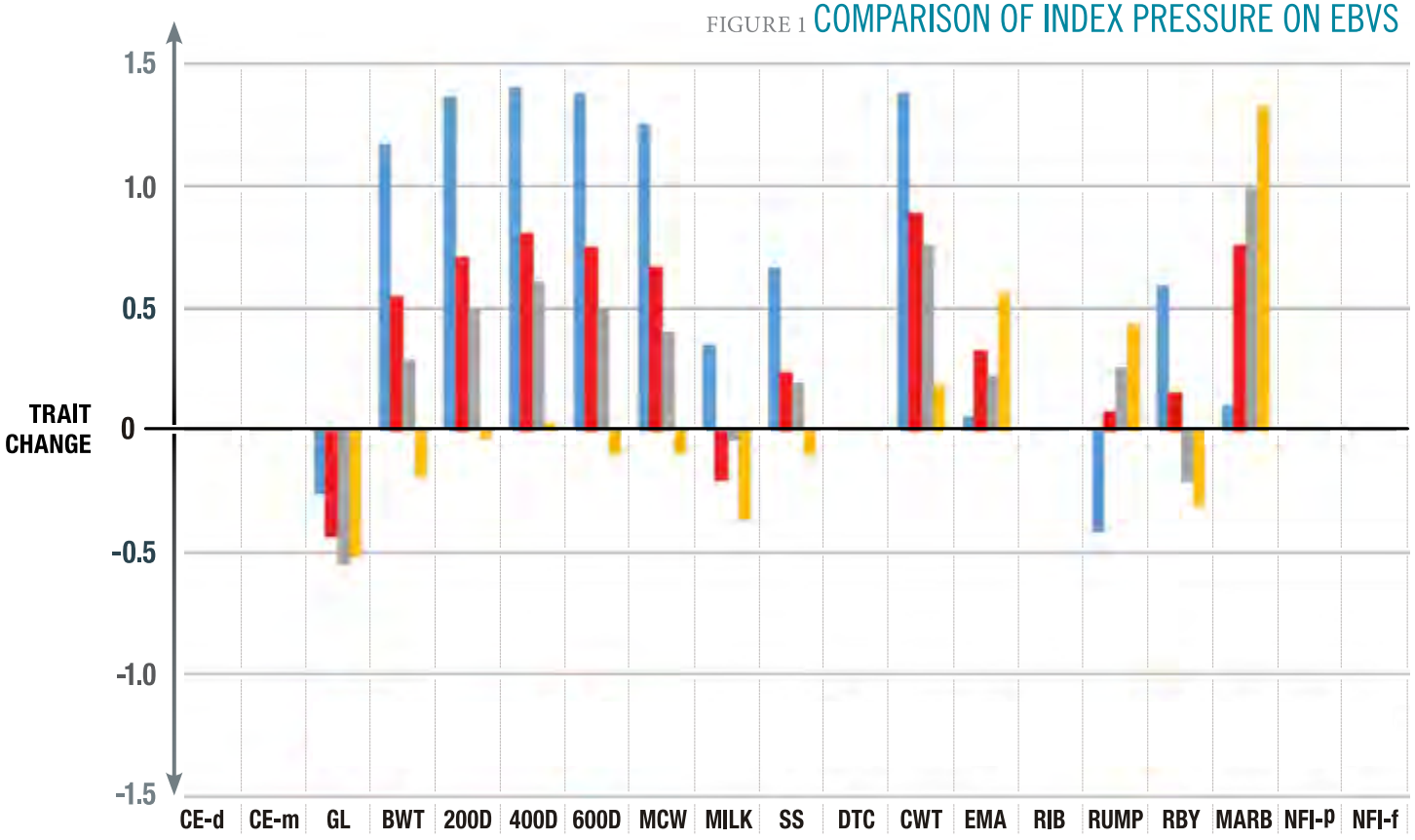
In June 2020, a fourth Index was introduced - the Wagyu Breeder Index – aimed at commercial producers with low-input, grass-based production systems to produce steers with high feedlot entry weight and high growth daughters with larger calves.

FULLBLOOD WAGYU SELF-REPLACING HERD PROFITABILITY $INDEXES

The AWA publishes two $Indexes focussed on developing profitability in self-replacing Fullblood herds.

The 2018 released SRI is designed for more temperate Fullblood Wagyu production systems where there are moderate to high levels of high-quality supplementary feeding, where females are retained for breeding and high marbling feeder steers are sold for feedlot finishing. The SRI can be used by breeders around the world who have moderate to high input production systems. It places balanced pressure on increasing growth, carcase weight and marble score.

FIGURE 1 COMPARISON OF INDEX PRESSURE ON EBVS



WBI
SRI
FB TERMINAL
F1 TERMINAL

Trait change is expressed in genetic standard deviations, with one standard deviation equivalent to approximately 30% of the available genetic gain within the breed.

The Wagyu Breeder Index (WBI) is designed for more extensive, low-input pastoral Fullblood Wagyu productions systems, where there is less opportunity to supplement stock with high quality feed. More emphasis is placed on fast-growing progeny and production of replacement females with improved maternal attributes to support finishing on pasture with low levels of supplementation. The WBI places higher emphasis on carcase weight for feeder steers whilst maintaining breed average Marble Score.

TERMINAL WAGYU PROFITABILITY $INDEXES

The AWA publishes two $Indexes focussed on terminal carcase production. The 2018 released FTI is a Fullblood terminal $Index designed for moderate to high levels of high-quality supplementary feeding to support production of Fullblood feeder animals where all progeny are slaughtered. The FTI targets increased growth and carcase weight with high marbling.

To support F1 crossbred feeder animals where all progeny are slaughtered, the F1I is a crossbred terminal $Index designed for moderate to high levels of high-quality supplementary feeding. The F1I solely targets improved carcase outcomes with significant pressure on increasing eye muscle area and very high marbling. No pressure is placed on improving live animal growth or maternal traits.

COMPARING WAGYU PROFITABILITY $INDEXES

The relative genetic selection pressure placed on EBVs for a range of production and carcase traits by each of the Wagyu $Indexes is shown in Figure 1.

The Terminal $Indexes place the highest emphasis on Marbling (MARB), with the F1I (yellow bars) placing very high pressure on marble score and eye muscle area (EMA), with negligible pressure on other EBVs. Within the F1I, attributes related to growth and maternal support are provided by the non-Wagyu cow. The FTI (grey bars) also places high pressure on marble score, but because growth and development within a Fullblood terminal system are driven solely by Wagyu genetics, moderate pressure is placed on growth and carcase weight.

The Self-replacing Fullblood herd $Indexes place greater pressure on growth and live-animal performance traits, as female progeny are retained within the herd for future breeding and herd development. The SRI (**red bars**) places even greater pressure across growth and carcase traits, although due to relatively high input costs to support early life production, it places no significant pressure on maternal and fertility through Milk or Scrotal Circumference.

The WBI (**blue bars**) places the greatest pressure on growth, Milk and fertility as it assumes low levels of management inputs to support early life production in more extensive pastoral production systems. Correlated with high selection pressure for growth, the WBI also places the highest pressure on carcase weight whilst maintaining breed average marble score.

A key strategy to using the Index tools in breeding decisions is to recognise that each one is designed to apply to one particular production system.

SUMMARY OF **AWA SELECTION $INDEXES**

WAGYU BREEDER $INDEX

Used to **select Fullblood bulls** that will produce females with high genetic merit for growth and breed average slaughter progeny for marbling.

Suited to commercial producers who rely on low input, grass-based production systems to produce steer progeny for high feedlot entry weight and high growth daughters.

Heifers are retained for breeding and therefore maternal traits are of importance.

Steers are assumed to be slaughtered at 32 months after 550 days of feedlot finishing targeting 460kg carcases with breed average marble score.

SELF-REPLACING $INDEX

Used to **select Fullblood bulls** that will produce females with moderate genetic merit for growth and above breed average slaughter progeny for marbling (targeting marble score higher than 8).

Suited to commercial producers who provide high quality supplementary feeding on grass-based production systems to produce steer progeny of average feedlot entry weight and moderate growth daughters.

Heifers are retained for breeding and therefore maternal traits are of importance.

Steers are assumed to be slaughtered at 32 months after 550 days of feedlot finishing targeting 435kg carcases with above average marble scores (above 8).

FULLBLOOD TERMINAL $INDEX

Select bulls for the production of profitable slaughter animals where no progeny are retained for breeding.

Suited to commercial producers of Fullblood cattle who provide supplementary feeding to grass-based production system before feedlot entry.

Production of **steer** and **heifer progeny** of average feedlot entry weight and marble score significantly higher than 8.

F1 TERMINAL $INDEX

Select bulls for with higher marble score EBV for the production of profitable slaughter animals from cross-breeding where no progeny are retained for breeding.

Suited to commercial producers of crossbred slaughter cattle using Fullblood bulls and non-Wagyu females.

Targets average carcase weight for steer progeny of 420kg and 387kg for heifers with above average F1 marble score (significantly higher than 6) based on high marbling genetic merit of the sire.

TABLE ONE COMPARISON OF WAGYU SELECTION $INDEXES

INDEX USE	WAGYU BREEDER INDEX	SELF-REPLACING INDEX	FULLBLOOD TERMINAL INDEX	F1 TERMINAL INDEX
Self-replacing herd	✓	✓		
Daughters retained for breeding	✓	✓		
Low-input grass production base	✓			
Moderate-input grass production base		✓	✓	✓
Ave. feedlot entry weight		✓	✓	✓
Above breed ave. feedlot entry weight	✓			
Ave. carcase weight		✓	✓	✓
Above breed ave. carcase weight	✓			
Ave. marble score	✓			
Above breed ave. marble score		✓	✓	✓

> “If animals rank similarly for an $Index and have similar EBVs in the core areas of interest to a breeder, the animal with the higher EBV accuracy should be considered favourably.

It is important to note that the $Indexes values for animals are based on that animal’s EBVs for each trait. Members using the $Indexes should use the index that best suits their production system. The relative ranking of animals is important along with understanding of the individual EBVs of a potential sire and their accuracy. If animals rank similarly for an $Index and have similar EBVs in the core areas of interest to a breeder, the animal with the higher EBV accuracy should be considered favourably.

The $Indexes also do not account for the structural and conformation attributes of animals. It is always advisable to visually inspect animals for structural and reproductive soundness along with obtaining semen morphology tests for sires.

MORE INFORMATION
Contact the Australian Wagyu Association for further information or if you wish to republish any part of this article
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