



WAGYU BREEDOBJECT \$INDEXES - COMPARISON

- BreedObject \$Indexes can help you breed more profitable cattle. They help you target the type of commercial herd performance you need for a given production system by identifying appropriate seedstock.
- BreedObject \$Indexes draw together the BREEDPLAN estimated breeding value (EBV) figures of animals into a single EBV, the \$Index, which describes how the animals will influence the profitability of a particular production system.
- BreedObject \$Indexes are intended for use by both stud and commercial beef producers. If you are interested in more than one type of commercial production purpose, you will be interested in more than one \$Index

THE PROFIT TARGET FOR BREEDING

The beef producer who buys bulls will place greater emphasis on commercial production system profitability. Factors which affect commercial production system profitability will guide trait emphasis in bull choice. BreedObject \$Indexes consider profitability across the whole commercial production system. There are four types of \$Indexes used for Wagyu:

- Wagyu Breeder \$Index
- Self-replacing \$Index
- Fullblood Terminal \$Index
- F1 Terminal \$Index

The target use of these \$Indexes is compared in Table 1. For more detailed information on the Wagyu Breeder \$Index, Self-replacing \$Index, Fullblood Terminal \$Index and F1 Terminal \$Index, please refer to the relevant Fact Sheet on our website, www.wagyu.org.au

Table 1 Comparison of Wagyu Selection \$Indexes

Index Use	Wagyu Breeder Index	Self-replacing Index	Fullblood Terminal Index	F1 Terminal Index
Self-replacing herd	Y	Y		
Daughters retained for breeding	Y	Y		
Low input grass production base	Y			
Moderate input grass production base		Y	Y	Y
Average feedlot entry weight		Y	Y	Y
Above breed average feedlot entry weight	Y			
Average carcass weight		Y	Y	Y
Above breed average carcass weight	Y			
Average marbling score	Y			
Above breed average marbling score		Y	Y	Y

HOW BREEDOBJECT \$INDEXES WORK

\$Indexes, despite having market-oriented names, are just as much concerned with costs of production as they are with market returns. Both costs and returns are considered, as they need to be, when the focus is commercial production system profitability.

Differences in the \$Index values describe how animals are expected to benefit profitability in the described production system. The \$Index is an EBV for profit for the specified production system and ranking seedstock and their \$Index sorts them for their progeny's expected profitability for the targeted production system.

BreedObject \$Indexes assess genetic potential for progeny performance. They tell you what to expect from progeny on average. They don't describe how bulls themselves will perform, for example during joining. Issues of structural and reproductive soundness need to be considered by visually inspecting the animal.

There are four Wagyu BreedObject \$Indexes developed. Each \$Index is targeted specifically to an individual production scenario and members should identify and use the index that best describes their supply chain and use that \$Index. It is not appropriate to compare animals across different \$Indexes as each \$Index is based on different production models.

“It is not the \$Index with the highest \$ value that you should use, it is the \$Index that best reflects your production system.”

WAGYU BREEDER \$INDEX

The Wagyu Breeder Index (WBI) can be used to select Fullblood bulls that will produce females with high genetic merit for growth and breed average slaughter progeny for marbling. The WBI is 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 carcasses with breed average Marble Score.

SELF-REPLACING \$INDEX

The Self-replacing Index (SRI) Index can be 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). The SRI is suited to commercial producers who provide 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 carcasses with above average Marble Score – higher than 8.

FULLBLOOD TERMINAL \$INDEX

The Fullblood Terminal Index (FTI) has increased weighting on the Marble Score EBV and can be used to select bulls for the production of profitable slaughter animals where no progeny are retained for breeding. The FTI is suited to commercial producers of Fullblood cattle who provide supplementary feeding to grass-based production system before feedlot entry.

The FTI targets to produce steer and heifer progeny of average feedlot entry weight and Marble Score significantly higher than 8.

F1 TERMINAL \$INDEX

The F1 Terminal Index (F1 Index) has predominant weighting on the Marble Score EBV and can be used to select bulls for the production of profitable slaughter animals from cross-breeding where no progeny are retained for breeding. The F1 Index is suited to commercial producers of crossbred slaughter cattle using Fullblood bulls and non-Wagyu females. The F1 Index targets average carcase weight for steer progeny of 420kg and 387kg for heifers with above average F1 Marble Score (higher than 6) based on high marbling genetic merit of the sire.

INDICATIVE RESPONSES TO SELECTION

The relative emphasis on selection response for each of the \$Indexes is shown in Figure 1. This shows the likely change that will occur to each individual EBV is producers select for the average of high ranking animals (top 10%) in each \$Index.

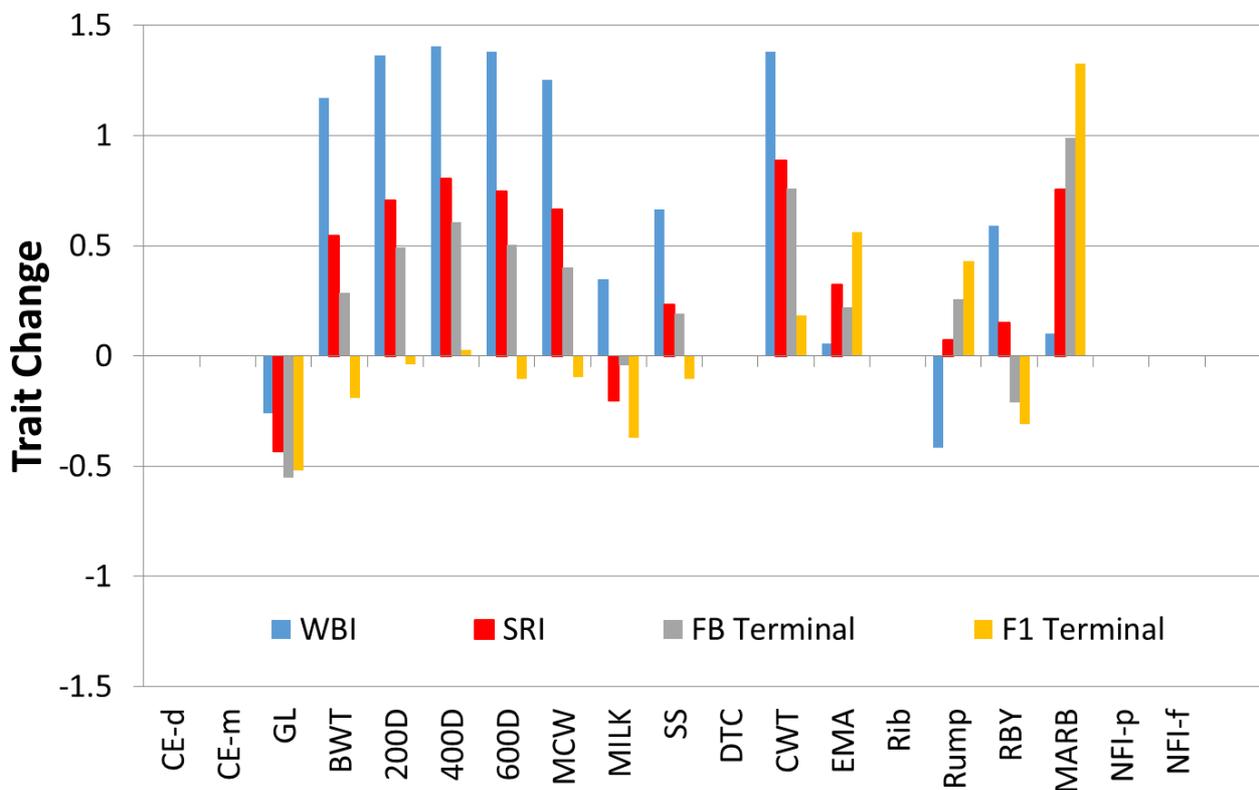


Figure 1. Indicative response to genetic selection expressed in genetic standard deviations. This shows the relative selection pressure placed on each EBV by the four Wagyu selection \$Indexes.

Comparing the \$Indexes in Figure 1.

1. The F1 Index (Yellow Bars) places the highest pressure on Marble Score (greater than 1 genetic standard deviation) and less pressure on other EBVs.
2. The Wagyu Breeder Index (Blue Bars) places the highest pressure on growth and carcass weight (greater than 1 genetic standard deviation), with moderate pressure on milk, scrotal circumference and retail beef yield.
3. The Self-replacing Index (Red Bars) places balanced pressure on Marble Score, carcass weight and growth traits, with negligible pressure on milk, scrotal circumference and retail beef yield
4. The Fullblood Terminal Index (Grey Bars) places slightly less emphasis on growth than the SRI, but places more pressure on Marble Score.

The relative change that could be expected in each individual trait by selecting animals in the top 10% of each index is shown in Table 2.

Table 2 Indicative response to selection of EBV trends shown in Figure 1

Trait	WBI	SRI	FTI	F1TI
Gestation Length	-0.4 days	-0.6 days	-0.7 days	-0.7 days
Birth Weight	+2.5 kg	+1.1 kg	+0.6 kg	-0.5 kg
200 Day Weight	+12 kg	+6 kg	+4 kg	-1 kg
400 Day Weight	+21 kg	+11 kg	+9 kg	0 kg
600 Day Weight	+33 kg	+17 kg	+11 kg	-3 kg
Mature Cow Weight	+29 kg	+15 kg	+9 kg	-3 kg
Milk	+1.7 kg	-1.1 kg	-0.3 kg	-1.8 kg
Scrotal Size	+0.8 cm	+0.3 cm	+0.2 cm	-0.1 cm
Carcass Weight	+26 kg	+16 kg	+14 kg	+3 kg
Eye Muscle Area	+0.1 cm ²	+0.9 cm ²	+0.7 cm ²	+1.5 cm ²
Rump Fat	-0.9 mm	+0.3 mm	+0.6 mm	+0.9 mm
Retail Beef Yield	+0.54 %	+0.12 %	-0.2 %	-0.28 %
Marble Score	+0.09 MS	+0.58 MS	+0.73 MS	+0.99 MS

DEVELOPMENT OF BREEDOBJECT

The BreedObject technology was developed by the Animal Genetics & Breeding Unit (AGBU), a joint venture of NSW Agriculture and the University of New England, with financial assistance from Meat and Livestock Australia.

'BreedObject on the web' is an AGBU-led project backed by a consortium that includes the Agricultural Business Research Institute, breed societies through the Performance Beef Breeders' Association, Meat and Livestock Australia and NSW Agriculture.