



COLLABORATIVE GENETIC RESEARCH PROJECT

WHAT IS THE COLLABORATIVE GENETIC RESEARCH PROJECT?

A project co-funded with Meat & Livestock Australia in 2014, the Australian Wagyu Association sought to improve the genetic gain of Australian fullblood and purebred Wagyu by developing a low cost, whole of industry Wagyu genetic advancement model. The result is a suite of carcase estimated breeding values (EBVs) capable of predicting the genetic merit of a wide range of Wagyu sires and dams and an overall ranking of animals.

Delivered in two stages, the aim was to gather phenotype data from large cohorts of fullblood and crossbred Wagyu progeny from larger commercial Wagyu producers. With more than 2,000 carcasses analysed using the MIJ objective carcase camera and AusMeat data, correlations and heritability were determined between carcase traits such as marbling, fineness, carcase weight and rib eye area.

The analysis was conducted by the Animal Genetics and Breeding Unit (AGBU) with the following outcomes:

- Carcase data including carcase weight, AusMeat marble score, P8 rump fat depth, and up to 11 Camera marbling traits was collected on 2,215 carcasses.
- The data was analysed by the Animal Genetics and Breeding Unit (AGBU) with heritabilities and genetic correlations calculated.
- The heritability of key traits was generally high such as carcase weight (0.47), AusMeat Marble Score (0.52), Camera Marbling Percentage (0.35), Camera Fineness Index (0.50) and Camera Eye Muscle Area (0.62).
- The genetic correlation between these traits is high.
- All carcase weight, P8 fat and Rib Eye Area Measurements are now incorporated in the standard Wagyu analysis increasing the accuracy of the EBVs for these traits.
- New EBVs for Marble Score, Camera Marbling Percentage and Camera Fineness Index are now calculated by the Animal Genetics and Breeding Unit in a multi-trait model.

Two of these EBVs, Marbling Score and Marbling Fineness are calculated for all animals in the analysis. The EBV for Camera Marbling Percentage (CCMP) is not published but contributes to the Marble Score EBV. Although independent scientific studies have established that current AusMeat marble score assessment is unable to measure the highest levels of Fullblood Wagyu marbling, these CCMP adjustments are the first step to overcoming this difficulty.

In the October 2015 carcase analysis, AGBU included all Wagyu animals which resulted in carcase EBVs being calculated for all Wagyu animals. Early identification of young animals as the next generation of parents was shown to be a very important factor influencing genetic gain. To facilitate the identification and use of younger animals as parents, the Australian Wagyu Association Board published the EBVs of all animals for those traits with an accuracy of 30% or higher, known as the Wagyu Breeding Guide and is updated monthly.

The second phase of the project was to incorporate the analysis into BREEDPLAN and to develop a new business model for the AWA to enable rapid genetic improvement in the Wagyu breed. Further, the Wagyu BREEDPLAN was to be tailored to best meet the needs of Australian producers and to increase the accuracy of Wagyu EBVs.

As a consequence of the increased data in BREEDPLAN, higher accuracies can be given for EBVs, particularly with the

introduction of the Wagyu-specific Single-Step BREEDPLAN, production Indexes have been developed. The first Index developed, the Terminal Carcase Index (TCI), was introduced as an interim step while advances were made in BREEDPLAN technology upgrades to Single-Step.

In 2018, three BreedObject \$Indexes were introduced to replace the TCI, and designed to reflect the production outcomes of the Wagyu producer, namely:

- Self-replacing Breeding \$Index
- Fullblood Terminal \$Index
- F1 Terminal \$Index

The Self-replacing Breeding Index can be used to select bulls that will produce more profitable females for retention in Fullblood or Purebred herds. The Fullblood Terminal and F1 Terminal Indexes can be used to select bulls that will produce more profitable slaughter progeny.