

Corriedale eating quality genomics trial 2017-2020

Results from the trial are now available to breeders and their clients through Sheep Genetics as ASBVs with links to all data as well as being provided from this trial specifically.



The Performance Corriedale Group have been focussed on ASBV's for profit traits, but there was one piece of the puzzle missing. As a group of likeminded breeders, the Group initiated the trial to find out the quality of Corriedale lamb being produced by member's flocks and the broader Corriedale breeders. What started as an idea to benchmark the breed against other breeds, led to a major genomic effort to describe variation within the breed.



Performance Corriedale Group link sires are included in Meat and Livestock Australia Resource Flock breeding programs to achieve benchmarking with other breeds. The trial was funded by breeders, University of Adelaide's Davies Livestock Research Centre and the Meat and Livestock Australia Donor Company. Breeder involvement and mix of funding provides a model for involvement of smaller breeds in speeding genetic progress using genomics.



Over 3 years, the group artificially inseminated (and naturally mated in 2019) Corriedale ewes to 44 Sires at Cressy Tasmania. Sire were submitted from studs outside as well as within the Group. Lambs were weighed at birth and mothered up by Claire

Blackwood and Victoria Archer, Quamby Plains and 764 were raised to slaughter by Claire and Peter Blackwood.

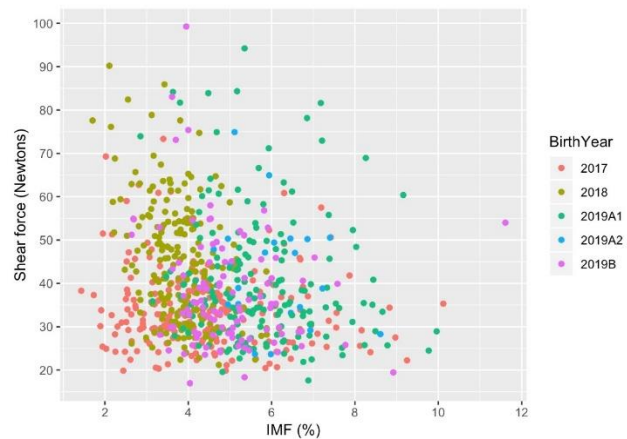


The measurements started from this point, and went on to weaning weights, muscle and fat scanning, wool traits measured at shearing, and physical recording of body types and fleece characteristics scored by multiple breeders. Slaughter of lambs followed with DNA samples collected and genotyped, and meat samples collected to analyse the two key traits affecting eating quality: tenderness measured as shear force (Newtons) of cooked meat and marbling measured as intramuscular fat content (IMF, %) of individual lambs.



Lambs were slaughtered at an average carcass weight of 21kg. When processing meat, it is important to maximise meat quality both in terms of meat safety and eating quality. Thus, carcasses are rapidly cooled to maximise shelf life. Sometimes, especially for lean carcasses, they cooled too fast termed cold-

shortening resulting in tough meat. This is prevented by using electrical stimulation and by ensuring carcasses have sufficient fat cover. This is likely the cause of some high shear force values shown. In addition to this processing effect, there is also some (albeit small) genetic variation in tenderness.



Relationship between eating quality measures tenderness (SF) and marbling (IMF) showing typical distribution of shear force and some excellent high levels of IMF with cohorts colour coded

Heritability is a measure of the proportion of variation in a trait within a group of lambs that have been born and raised together that is genetic after adjustment for factors like twin vs single and ewe vs wether. Some traits like fleece weight (GFW) and fibre diameter are highly heritable, whereas IMF was moderately heritable and shear force lowly heritable.



High levels of IMF are associated with less likelihood of being tough as well as having direct benefits to eating quality. The high variation in IMF demonstrates some excellent performance and ample opportunity for ongoing improvement.

Gundagai Meat Processors are now objectively measuring IMF using the MEQ meat probe which was initially developed at the University of Adelaide. They are currently paying a 50c/kg premium for carcasses with IMF greater than 5%. The group are delighted that 34% of the trial carcasses would have attracted this premium.

