

Research Breeding Values for Yield and Eating Quality

The following traits have been identified by the Sheep CRC and the Sheep Genetics Technical committee as potentially impacting on either carcass dimensions, yield or the eating quality of Australian lamb.

At this stage, none of these traits are included in any of the standard LAMBPLAN or MERINOSELECT indexes. Over the coming months, we will be trialling some ways of doing that, and will be involving you in discussing the potential new indexes.

Carcass weight (HCWT - kg)

This trait is a measure of hot carcass weight of the animal and reported in kilograms. HCWT is a function of live weight and the dressing percentage. HCWT is the primary character in payment of lambs that are sold over the hooks. The RBVs range around 0, with higher values indicating genetic makeup for increased carcass weight.

Carcass EMD (CEMD - mm)

This trait is a measure of the eye muscle depth of the loin taken from a quartered carcass and reported in millimetres. It is adjusted to a constant weight – in this case carcass weight – in the same way that the PEMD breeding value is adjusted to constant live weight. This trait has been shown to influence lean meat yield and the weights of key muscle particularly the loin muscle. CEMD is correlated with the ultrasonic measure of eye muscle (PEMD) taken on a live animal. The mean CEMD measurement from the Information Nucleus flock is currently 30mm, with a range of 17 - 45mm. The RBVs range around 0, with higher values indicating genetic makeup for increased carcass muscling.

Carcass fat (CFAT - mm)

This trait is a measure of the depth of fat taken at the C site in a quartered carcass and reported in millimetres. It is adjusted to a constant weight – in this case carcass weight – in the same way that the PFAT breeding value is adjusted to constant live weight. This trait has been shown to influence lean meat yield and the GR tissue depth. The trait is correlated with the ultrasonic measure of C fat (PFAT) in the live animal, though it is not as strong as the relationship between muscle traits. The mean CFAT measurement from the Information Nucleus flock is currently 4mm, with a range of 0.2 - 24mm. The RBVs range around 0, with lower values indicating genetic makeup for reduced carcass fat cover.

Lean Meat Yield (LMY - %)

This trait is a measure of the commercial yield of lean meat as a percentage of hot carcass weight. Lean meat yield is estimated from a combination of weight, muscle and fat dimensions and has been validated by either CT-scanning or through direct commercial bone-outs. LMY has a moderate heritability, with the normal range in lamb between 51 and 58%. The RBVs range around 0, with higher values indicating genetic makeup for higher LMY.

Intramuscular Fat (IMF - %)

This trait is a measure of the chemical fat percentage in the loin muscle of a lamb, and is often referred to as marbling. The preferred range in lamb is between 4 and 6%, with a current industry mean value of 4.3%. IMF has been shown to have a significant impact on the flavour, juiciness, tenderness and overall likeability of lamb. IMF has a moderate to high heritability and high negative correlation with shear force – how hard it is to cut through the meat (see below) - as IMF increases, so does tenderness. The measured range in Information Nucleus flock lambs is 2-7%. The RBVs range around 0, with higher values indicating genetic makeup for higher IMF%.

Shear Force (SHEARF5 - kg)

This trait is a measure of the force or energy required to cut through the loin muscle of lamb after 5 days of ageing, and is reported in kilograms of force. The trait has a moderate/high heritability, and a moderate correlation with tenderness in lamb. The preferred value for lamb is 3kg or less. The mean SF5 from the Information Nucleus lambs is currently 2.4kg with a range from 1.1 - 7.7 kg. The RBVs for this trait range around 0 – with lower values indicating genetic makeup for lower shear force, or more tender meat.