

Appendix A

Sheep traits affecting costs and returns for a speciality wool producing enterprise

<i>Product</i>	<i>Traits affecting returns</i>
Wool	Fleece weight clean greasy yield Fibre diameter length strength colour
Excess young stock	Reproductive weight ewe fertility prolificacy lamb survival body weight
Cast-for-age	Survival at older ages Body Weight
<i>Cost</i>	<i>Traits affecting costs</i>
Feed	Mature body sizes
Health products Labour costs	Mature body sizes Ease of care - adaptability to environment - disease resistance

Sheep traits affecting costs and returns for a meat producing enterprise

<i>Product</i>	<i>Traits affecting returns</i>
Prime lamb hogget	Liveweight and carcass characteristics of lamb/hogget at sale growth rate rate of maturity feed conversion efficiency maternal ability of dam Number of lambs/hoggets for sale reproductive rate fertility - seasonality of the ewe prolificacy - ovulation rate - embryo survival
	lamb survival - maternal performance - milk production - mothering ability - lamb growth - lamb birthweight
Mutton	Liveweight and condition of animals at sale mature size Number of ewes for sale reproductive wastage survival rate of mature animals
<i>Cost</i>	<i>Traits affecting costs</i>
<i>Slaughter Stock</i>	
Feed	Food consumption Rate of maturity
Health products	Resistance/resilience to internal parasites Disease resistance
<i>Breeding stock</i>	
Feed	Mature size
Health products	Resistance/resilience to internal parasites
Management	Ease of lambing Maternal ability

Source: Australian Sheep & Wool Handbook
 Edited by D.J Cottle
 Published by Inkata Press Melbourne 1991.

Appendix B

Heritability ranges

Heritability is the extent to which a trait is passed on from one generation to the next. It is generally higher for production traits like live weight and fleece characteristics than reproductive traits like number of lambs weaned. Below are listed ranges of heritability estimates for some selected traits. This is also be expressed as a % for example greasy fleece weight 0.3 - 0.4 equals 30 - 40%. The higher the heritability the more that genes will determine the offsprings production capability.

Number of lambs born		0.05-0.20
Number of lambs weaned		0.05-0.15
Weaning weight		0.10-0.35
10-month (hogget) weight		0.20-0.50
Hogget fertility		0.05-0.15
Greasy fleece weight		0.3-0.4
Staple length		0.35-0.45
Mean fibre diameter		0.40-0.65
Crimps per cm		0.30-0.50
Medullation		0.40-0.70
Greasy colour		0.10-0.30
Face-cover score		0.20-0.40
Live animal scans		
EMD	<i>(eye muscle depth)</i>	0.15-0.35
EMW	<i>(eye msucle width)</i>	0.10-0.35
FDM	<i>(fat depth over eye muscle)</i>	0.10-0.35
Carcass traits		
Fat depth	<i>(over eye muscle)</i>	0.25-0.40
EMA	<i>(eye muscle area)</i>	0.25-0.60
Lean wt		0.20-0.40
Fat wt		0.20-0.40

Glossary

Generation Interval (GI) - The average age of the parents when the offspring are born.

For example if ewes are joined at 2.5 and then kept for 5 lambings they will be 3, 4, 5, 6, 7 when their lambs are born. This would equate to a generation interval of 5. The same can be calculated for rams so using the same example if they were joined for 4 years they will be 3, 4, 5, & 6 when their lambs are born equalling a generation interval of 4.5. Overall the flock GI is the average of the rams and ewes and would equal 4.75. If the rams and ewes were joined at 18 months and kept for mating for the same amount of time the GI would be reduced to 3.75. This will have a major effect on the genetic response of economically important traits.

If the rams and ewes were kept for mating at older ages then the GI will go up and therefore decrease the rate of genetic response to breeding objectives.

Source: A guide to genetic improvement in sheep.

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