



**SIL TERMINOLOGY
DEFINITIONS**

Glossary: general terms, breeding values, indexes

General Terms	Description
Accuracy or reliability	A scale of relative accuracy for BVs and indexes. As more information is used in the prediction of the animals BV and Index, accuracy of the prediction increases. Traits or characteristics which are more heritable and more related to other predictor traits have higher accuracy.
Across flock analysis	A SIL evaluation that uses data from more than one flock. Use of 'link sires' (see definition) is needed to get 'genetic connectedness'. Connectedness is required to make comparisons of genetic merit between animals in different flocks.
Breeding Value	A measure of genetic merit for a particular trait (whether directly measurable or not), estimated from performance, pedigree and/or from DNA tests.
DNA Parentage	Flocks recording this are using DNA to assign both sire and dam of all lambs. This gives the most accurate (100%) pedigree compared to traditional methods (85-95%) so estimates of genetic merit are more accurate.
Dual Purpose Breed (DP)	Ewe breeds selected for lamb production and ewe maternal performance.
Genetic Connectedness	This is a measure of how well linked two flocks are genetically. Strong links are built by two flocks using the same sire in the same year. The progeny of such 'link sires' are used to benchmark genetic merit. Such connectedness is needed to validly compare the BVs or indexes for animals in different flocks.
Genetic Trends Graphs	SIL produced Genetic Trend Graphs show the genetic progress a flock is making. Accurate graphs require a flock to be using link sires between years i.e. the same sire is used in consecutive years to allow non-genetic effects to be removed and show how average genetic merit for a trait or index has changed.



General Terms	Description
Goal Trait Group	Breeding objectives are a combination of broad trait categories termed Goal Trait Groups. One or more breeding values contribute to a Goal Trait Group which has a corresponding sub-index. Combinations of relevant sub-indices comprise summary indexes of merit (see Index section).
Index	Net value of genetic merit across a range of traits that relate to the breeding objective. Higher values are better for all SIL indexes. SIL DP indexes have units of cents per ewe lambing, while SIL TS indexes have units of cents per lamb born. Indexes can be separated into sub-indices for general goal traits (see Goal Trait Group definition).
Link sires	Link sires have progeny in more than one flock in the genetic evaluation. This provides the essential benchmarking needed to allow us to compare genetic merit of animals from different flocks and from different years within flocks. Between year comparisons are used to produce Genetic Trend Graphs.
Maternal breed (DP)	Ewe breeds selected for lamb production and ewe maternal performance. (See Dual Purpose breed.)
Outside sires	Sires from outside the flock(s) in the evaluation. Outside sires will have estimates of genetic merit (BVs and indexes) close to zero until progeny in the evaluated flock(s) have performance data.
Terminal (Sire) breed (TS)	Sheep breeds selected for meat production including direct survival and growth.
Within flock analysis	The analysis or evaluation uses all the information from one flock. For sires from other flocks (outside sires), estimates of genetic merit (BVs and indexes) will be close to zero until their progeny in this flock have performance data.



Breeding Values		Description
Adult body weight	EWT	Liveweight of adult ewe
Adult dag score	ADAG	Adult dag score
Adult ewe fleece weight	EFW	Weight of ewe fleece
Adult faecal egg count	AFEC	Faecal egg count for adult ewes
Belly bareness score	BBELLY	Belly bareness score at weaning
Body Condition Score	BCS	Body Condition Score 1-5
Breech bareness score	BBREECH	Breech bareness score at weaning
Carcass weight	CW	Post-weaning growth rate, expressed in terms of carcass return
Eye muscle area	EMAc	Eye muscle area in 19kg carcass
Faecal egg count prior March	FEC1	Faecal egg count in lambs, late summer
Faecal egg count from March	FEC2	Faecal egg count in lamb, autumn
Fat yield of carcass	FATY	Fatness - above or below average for 19kg carcass
Fleece weight as a lamb	LFW	Weight of lamb fleece
Fleece weight at 12 months	FW12	Weight of hogget fleece
GGT at day 21 after dose	GGT21	Lamb GGT values 21 days after facial eczema challenge
Hind quarter lean yield	HQLY	Hind quarter lean yield in 19kg carcass
Hogget fertility	HFER	Ability of hogget to get pregnant
Hogget number of lambs born	HNLB	Hogget litter size
Lamb dag score	LDAG	Lamb dag score in summer or autumn



Breeding Values		Description
Lamb survival, direct	SUR	Lamb vigour birth through to weaning
Lamb survival, maternal	SURM	Ewe mothering ability
Lean Yield	LEANY	Average lean yield across carcass region in 19kg carcass
Liveweight at 12 months	LW12	Liveweight of hogget (12mo)
Liveweight at 8 months	LW8	Autumn liveweight - post weaning growth
Loin lean yield	LNLY	Loin quarter lean yield in 19kg carcass
Number of lambs born	NLB	Litter size in adult ewes (2-tooth & older)
Resilience, age at first drench	DRAGE	Lamb age at first drench under worm challenge for resilience
Resilience, liveweight gain	RGAIN	Lamb liveweight gain under worm challenge for resilience
Saliva carbohydrate larval antigens	CARLA	Antigens in saliva indicate an immune response to a worm challenge. Animals with high levels of antibodies are better at preventing worms establishing in the gut and so considered more parasite resistant.
Shoulder lean yield	SHLY	Shoulder quarter lean yield in 19kg carcass
Stayability	STAY	Ewes ability to remain productive longer
Tail bare skin length	TSKIN	Length of bare skin area on the underside of the tail
Tail length score	TLENSC	Tail length score at tailing/docking
Twinning rate	TWIN	More twin and fewer single or triplet lambs at given lambing percentage
Weaning (body) weight	WWT	Pre-weaning growth rate
Weaning weight maternal	WWTM	Ewe milking ability contributing to lamb weaning weight



Indexes		Description
DP Adult Size	DPA	A function of the adult ewe liveweight BV (EWT)
DP Bareness	DPB	The genetic propensity to have clear points (no wool) around the belly and breech (rear end). Based on BBELLY & BBREECH BVs.
DP Dag Score	DPD	Propensity to carry dags – based on LDAG (lamb) & ADAG (adult) BVs.
DP Facial Eczema Tolerance	DPX	A rating of an animal's ability to tolerate an FE challenge, based on the RamGuard system. The level of challenge can differ between farm so this index is most accurate for comparisons within farm and birth year. Based on GGT21 BV.
DP Hogget lambing	DPH	A function of ewe lamb fertility (holding to the ram) and litter size as a 1-year old dam. Based on 3 BVs - HNLB, HFER, & NLB
DP Internal Parasite Resilience	DPZ	An animal's tolerance and ability to perform under a parasite challenge. Based on 2 BVs for rate of liveweight gain (RGAIN) and age when drenching is required (DRAGE). This differs to resistant animals that actively fight a parasite challenge resulting in a lower faecal egg count.
DP Internal Parasite Resistance	DPF	Predicted from faecal egg counts (FEC) using the WormFEC system. Based on 3 BVs - FEC 1 & FEC 2 for lambs & AFEC for ewes.
DP Lamb Growth	DPG	A function of 3 BVs – pre-weaning growth and ewe milking ability (WWT & WWTm), and carcass weight (CW)
DP Lamb Growth + Adult Size	DPG+A	A function of 4 BVs in DPG and DPA
DP Lamb Survival	DPS	A function of 2 BVs – lamb vigour (SUR) & ewe mothering ability (SURM)



Indexes		Description
DP Meat (Yield)	DPM	A function of carcass lean yields in 3 carcass regions – shoulder, loin and hindquarter (BVs SQLY, LQLY, & HQLY). Yields are deviation for kg of tissue at a standard carcass weight (19kg). Fat yield (FATY) is not addressed in this index but there is a degree of relationship between fat yield and lean yields (high FATY tends to be associated with low lean yield).
DP Reproduction	DPR	The economic value of more lambs per litter, per year, for 2-tooth and older ewes. Based on NLB BV.
DP Stayability	DPL	Ewe longevity based on how many years they are able to stay productive in the flock. STAY is the BV that informs this index and is currently being field tested by industry.
DP Twinning	DPT	The tendency to produce more litters of 2 and fewer of 1 or 3. Based on TWIN BV.
DP Wool production	DPW	A function of fleece weight BVs (LFW, FW12, EFW).
New Zealand Maternal Worth	NZDP	An industry standard index for dual purpose sheep based on Reproduction, Lamb Survival, Lamb Growth + Adult Size, and Wool production.



Indexes		Description
New Zealand Terminal Worth	NZTS	An industry standard index for terminal sire sheep based on Lamb Survival, Lamb Growth and carcass Meat Yield.
TS (Lamb) Growth	TSG	A function of 2 BVs – pre-weaning growth (WWT) and post-weaning growth (CW).
TS Meat (Yield)	TSM	A function of carcass lean yields in three carcass regions – shoulder, loin and hind quarter (BV's SQLY, LQLY, HQLY) and Fat Yield (FATY BV) Yields are deviations in kg fat or lean at a standard carcass weight (19kg).
TS (Lamb) Survival	TSS	A function of SUR (lamb vigour) BV.
TS Dag Score	TSD	Propensity to carry dags – based on LDAG BV.
TS Internal Parasite Resistance	TSF	Predicted from faecal egg counts (FEC) using the WormFEC system. Based on the FEC 1 & FEC 2 BVs for lambs.
TS Meat Quality	TSMQ	A function of carcass marbling (CMARB), redness (COLA24), pH (CPH) and tenderness/shear force (SHF) breeding.



Summary of Indexes

Sub-index average, top and bottom values can be found in the Percentile Band tables at www.sil.co.nz/tools/nzge/percentile-bands.

Percentile bands tables are updated every 2 months and provide a useful benchmarking resource for indexes and breeding values for connected flocks within the New Zealand Genetic Evaluation (NZGE).

Summary of SIL Indexes and weighting of the components they summarise (REVs updated Aug 2022)

Note: TS Index values are calculated in cents per lamb born. DP Index values are calculated in cents per ewe lambbed

SIL Index	Equation
Terminal Worth	TSG + TSM + TSS
TS Lamb Growth	(TSG) $\phi = 87 \times \text{WWTgBV} + 275 \times \text{CWgBV}$
TS Meat Quality	(TSMQ) $\phi = -1153 \times \text{CPHgBV} - 29 \times \text{SHFgBV} + 310 \times \text{CMARBgBV} + 28 \times \text{COLA24gBV}$
TS Survival	(TSS) $\phi = 8385 \times \text{SURgBV}$
TS Carla	(TSC) $\phi = 1.10 \times \text{CARLAgBV}$
TS Dag Score	(TSD) $\phi = -25 \times \text{LDAGgBV}$
TS Meat Yield	(TSM) $\phi = 415 \times \text{LNLYgBV} - 119 \times \text{FATYgBV} + 332 \times \text{HQLYgBV} + 249 \times \text{SHLYgBV} + 275 \times \text{CWYgBV}$
TS WormFEC	(TSF) $\phi = -3.20 \times \text{FEC1gBV} - 3.20 \times \text{FEC2gBV}$
Maternal Worth	DPA + DPCR + DPG + DPS
DP Adult Size	(DPA) $\phi = -158 \times \text{EWTgBV}$
DP Capped Reproduction	(DPCR) $\phi = \text{non-linear index}$
DP Lamb Growth	(DPG) $\phi = 153 \times \text{WWTgBV} + 145 \times \text{WWTMgBV} + 480 \times \text{CWgBV}$
DP Survival	(DPS) $\phi = 16049 \times \text{SURgBV} + 15008 \times \text{SURMgBV}$
DP Bare Points	(DPBP) $\phi = 46 \times \text{BBELLYrBV} + 35 \times \text{BBREECHrBV}$
DP Body Condition Score	(DPBC) $\phi = 3292 \times \text{BCSgBV}$
DP Carla	(DPC) $\phi = 2.27 \times \text{CARLAgBV}$
DP Dag Score	(DPD) $\phi = -64 \times \text{LDAGgBV} - 64 \times \text{ADAGgBV}$
DP Facial Eczema	(DPX) $\phi = -2228 \times \text{GGT21gBV}$
DP Hogget Lambing	(DPH) $\phi = 621 \times \text{HNLBgBV} + 1067 \times \text{HFERgBV}$
DP Meat Yield	(DPM) $\phi = 724 \times \text{LNLYgBV} + 579 \times \text{HQLYgBV} + 435 \times \text{SHLYgBV} + 480 \times \text{CWYgBV}$
DP Reproduction	(DPR) $\phi = 3367 \times \text{NLBgBV}$
DP Resilience	(DPZ) $\phi = 2.26 \times \text{DRAGEgBV} + 16.65 \times \text{RGAINgBV}$
DP Twinning Rate	(DPT) $\phi = 6097 \times \text{TWINgBV}$
DP Wool	(DPW) $\phi = 82 \times \text{FW12gBV} + 190 \times \text{LFWgBV} + 246 \times \text{EFWgBV}$
DP WormFEC	(DPF) $\phi = -6.80 \times \text{FEC1gBV} - 6.80 \times \text{FEC2gBV} - 5.20 \times \text{AFECgBV}$
DP Wool Quality Colour	(DPWQC) $\phi = -73 \times \text{COLSCgBV}$
DP Wool Quality Fineness	(DPWQF) $\phi = \text{non-linear index}$



How on-farm measurements relate to the sub-indexes

Recorded on farm	The sub-indexes (goal trait groups) these on-farm measurements go into
Weaning weight	Growth, Meat, Survival, Parasite Resistance,
Lamb fate code	Survival
Autumn liveweight	Growth, Meat, Wool, Reproduction, Parasite Resistance
Hogget liveweight	Growth, Wool, Parasite Resistance
2-tooth liveweight	Growth
Meat scanning	Meat
Wool measurements	Wool, Parasite Resistance
Pregnancy scanning	Reproduction, (Survival)*
Hogget lambing	Growth, Reproduction
WormFEC™	Parasite Resistance
Dag score	Dag Score
FE (RamGuard)	Facial Eczema

* Pregnancy scanning results only used when bureau flags them to be used after breeder instruction

