Accuracy - amount of data from sib & daughter lambing

SIL Technical Note

Relates to: Depth of data behind Number of Lambs Born breeding value and Reproduction sub-index
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Summary

SIL estimates genetic merit for reproduction ($NLB_{BV}$and Reproduction sub-index) from all information available in a dataset taking account of pedigree relationships between animals. For most animals, actual lambing data are only available for relatives, and for many animals these are not descendants (including progeny).

When comparing animals for genetic merit in Reproduction, it can be useful to see how may female relatives are supplying lambing information to the calculation of merit. SIL has introduced variables to do this based on lambings of siblings (sibs) and progeny (daughters).

Background

Reproduction is a difficult trait to improve genetically since 1) it is lowly heritable, 2) rams do not manifest the trait and 3) usually selection decisions must be made before many close relatives supply actual lambing data to use in the calculation of genetic merit.

Accuracy is a simple concept to describe in general terms but it is fraught with difficulties with regard to calculation and with regard to making fair comparisons. However, simple tools can show the "depth and breadth" of data behind measures of genetic merit for Reproduction.

The importance of relatives

When traits are sex-limited (expressed in one sex only) or manifest later, relatives are very important for estimating merit in young animals of both sexes. Doubly so when the trait is of low heritability as is the case with Reproduction.

While sibling performance is very useful (they prove genetic merit of an animal's sire), progeny performance is the "gold standard" since it proves what is being passed on (provided there are sufficient numbers).

Information used to estimate breeding value for Number of Lambs Born (NLB_{BV})

SIL uses information from the animal itself and it's relatives to estimate genetic merit . For Reproduction, it uses autumn LW (LW6, LW8 or LW10) and the lambing information. Each lambing event is used as a separate piece of information. So if a ram has 3 daughters lambing, one as a hogget only and two at the ages of hogget, 2-tooth and 4-tooth, this are seven (7) measures of number of lambs born (NLB) i.e. seven lambing events or records.

In practice, NLB information has a greater impact on the NLB_{BV} than does LW information. But often NLB information is not available, or limited, for key, close relatives such as siblings and daughters.

Characterising how much data is available

SIL offers eight variables to characterise how much lambing information is available for an animal's relatives. These are combinations relative type (sib or progeny), ewe age (all ages or excluding hogget) and counting method (animals lambing or lambing events). The table below lists these with their trait abbreviations used on SIL reports.

Table of lambing information traits.

Counting method	Relative type	Ewe age	Trait name	Trait abbreviation
Lambing events	Sib	All	**Number of sib lambing records**	**SLR** ¶
Lambing events	Sib	2-tooth plus	Number of sib lambing records, 2-tooth and older	SLR2
Lambing events	Daughter	All	**Number of daughter lambing records**	**DLR** ¶
Lambing events	Daughter	2-tooth plus	Number of daughter lambing records, 2-tooth and older	DLR2
Ewes lambed	Sib	All	Number of sibs that have lambed	SL
Ewes lambed	Sib	2-tooth plus	Number of sibs that have lambed, 2-tooth and older	SL2
Ewes lambed	Daughter	All	Number of daughters that have lambed	DL
Ewes lambed	Daughter	2-tooth plus	Number of daughters that have lambed, 2-tooth and older	DL2

Using these variables

You only need to use one or two of these variables in most situations. Number of lambing records (or events) is generally more valuable than number of ewes lambing. The greatest benefits come from using these on Sire Summaries.

On a sire summary, not all animals have the same amount and type of data available for estimating NLB_{BV} (and hence the Reproduction sub-index). Older sires may have daughters lambing, while younger sires may have no sibs lambing if they are used as ram lambs and ewes are only mated as 2-tooths in the flock. So the NLB_{BV} is based on quite different information. It is VERY important to take this into consideration when assessing the merit of outside rams and performance information from the flock they were bred in is not being used.

On animal selection lists there may be a case for use of number of sibs. This tells you about data behind the NLB_{BV} of the sire. This can impact on the merit of these young animals where there are differences between sires in the data "behind" their BVs. For example, sons of bought-in sires will have limited performance data for reproduction in relatives through their dams and none through their sire until his daughters (their sibs) begin to lamb. Older sires have more robust estimates when their daughters supply lambing information.

SIL recommendations

- Use number of Sib Lambing Records (**SLR**) and number of Daughter Lambing Records (**DLR**) on Sire Summaries.
- Substitute SLR2 and DTR2 for these if you lamb hoggets but do not use hogget lambing information to estimate NLB_{BV}.

Interpretation

Younger sires or outside sires used in recent years will have less information from the important female relatives – sibs and daughters. Use the variables to flag this on your report and give them the benefit of the doubt for Reproduction until such data becomes available.

Need more information?

Contact your SIL bureau, local SIL adviser or call 0800-745-435 (0800-SIL-HELP).