Lamb survival

SIL Technical Note

Relates to: Selection to increase number of lambs sold
Date: Updated May 2017

Summary

- Record all dead lambs on SIL using lamb fate (BFATE) codes
- With regard to time of death, use the codes J, J3, K (born dead, dead within 3 days, died between 3 days of age and weaning)
- Record date of death where possible
- Avoid using code "M" (Died by Misadventure) unless accidental death
- Code lambs missing at weaning as dead – you are likely to be correct for most of these lambs

Background

The number of lambs sold can be increased in two ways. One is to increase number of lambs born, the other is to increase survival. Improvements are best obtained by selecting for both.

Increases in average lambing percentage lead to higher rates of multiple births in flocks. In some cases high proportions of ewes have triplets. These generally have lower rates of survival than twin or single born lambs. However lamb survival is important in litters of all sizes.

Survival depends on many factors including genetics, management and the environment (particularly weather conditions). Genetically, it is influenced by a combination of genes expressed by the ewe, as a mother, and by the lamb itself. SIL estimates genetic merit for both ewe and lamb effects.

Definition of survival

SIL measures survival in terms of lambs born that die before weaning. Currently, it does not consider how animals died or when they died. While lamb fate codes (BFATE) allow discrimination between deaths at different times, in practice SIL "groups" data to determine whether an animal survived to weaning or not.

Genetics of Survival

Survival is lowly heritable (<5%). This means many non-genetic effects have a large influence. We can split the small amount of variation due to genes into those acting in the lamb ("lamb vigour") and those acting in the ewe ("mothering ability"). SIL estimates genetic merit for survival as both effects.

Since the heritability is so low, family information is <u>VERY</u> important for estimating genetic merit for survival. A dead litter mate has some impact, but survival in the wider half-sib family is also important. This is why SIL needs comprehensive survival information for the whole flock.

<u>Selecting for Survival</u>

For maternal breeds there are two survival breeding values, SUReBV which reflects the lamb's direct genetic merit for survival and SURMeBV which reflects the ewe's genetic mothering ability which impacts on her lambs survival. The Dual Purpose Survival (DPS) index combines both aspects into a single score with the appropriate economic weightings.

For Terminal Sire sheep the Survival sub-index (TSS) is based only on the direct breeding value (SUReBV) since female progeny are not kept as replacements in most commercial situations.

SIL Lamb Birth Fate Codes (BFATE)

Abbreviation	Description	Effect on survival
E	ET Progeny	None
F	Fostered	Set to missing
H	Hand-reared	Set to missing
J	Born dead	Dead
J3	Died within 3 days of birth (autopsy)	Dead
K	Died between birth and weaning	Dead
L	AI Progeny	None
M	Died misadventure	Set to missing
P	Born dead – Premature	Dead
R	Born dead – Rotten	Dead
X	Multiplier lambs (usually DNA flocks)	Data excluded as whole birth cohort not recorded
1	Died between birth and weaning (missing at weaning)	Dead
4	Culled at birth (alive but not tagged)	Assumed would have lived

Note: An animal may have more than one BFATE e.g. LF – AI progeny, fostered.

If a lamb is fostered or hand-reared survival is set to missing as the intervention means as we do not know whether the lamb would actually have survived to weaning or not.

SIL assumes lambs are alive unless told otherwise. Lambs that have been Fated as dead and are subsequently found and recorded can be made "alive" easily. If an individual with a Dead fate code, subsequently has two or more records against its tag it is automatically made "alive" again.

<u>Best practice</u>

Currently animals with Fate codes of J, J3, K, P, R & 1 are all treated as dead prior to weaning and are used to estimate survival merit. However, in the future SIL may adopt a more comprehensive approach to the analysis of survival data. In order to "futureproof" your flock survival data, information on time of death is important. SIL suggests you record (approximate) date of death where known.

A problem can occur if there are a number of animals missing at weaning. If you are confident that all or most lambs were weighed, a fate of 1 can be entered against missing lambs. If some do turn up later, they can easily be made "alive" again by your bureau and survival adjusted.

Survival in flocks that are un-shepherded at lambing can be derived from pregnancy scanning data (litter size) and the number of live lambs attributed to ewes either by later matching or

DNA parentage.

<u>Why doesn't SIL currently use a more complex approach to analysis of Survival?</u>

Lamb deaths have many causes. The first step to improving it genetically is to collect information on survival for **all lambs born**. Since some historical data is incomplete, most breeders will get most benefit from working to collect complete information on lamb survival using standard SIL codes, as far as is practical on farm.

A standard post mortem procedure has been developed for attributing the main causes of lamb deaths in more detail. This information can be collected and stored on the SIL database so that it can be used in the future if more sophisticated genetic analysis of survival are developed.

<u>Survival filters</u>

SIL uses a number of filters to avoid common causes of bias in survival data. The average flock survival for all sires within a birth year is calculated and sires with values <u>very</u> different survival percentages (very high or low) are excluded. This commonly removes sire with small numbers of progeny (less than 10) where chance can result in very low or very high survival rates e.g. a sire with 6 progeny, 1 single, 1 set of twins and 1 set of triplets – triplets die due to birthing difficulty, survival is then 50%, if triplets had all survived then survival could be 100% but it is only three litters. It may also exclude back up sires whose progeny have not been fully recorded.

If survival within a flock is <u>very</u> high or low relative to normal, data for that year can be excluded. For example an average flock survival of 98% to 100% would suggest that dead lambs had not been fully recorded in that flock, as such high survival rates are unlikely to occur in practice. Or if the usual survival for a flock is around 85% and one year it is 55%, this year would be excluded from the survival estimate as it is unlikely to be a genetic effect (may have been extreme weather). Also some early DNA parentage flocks may have years excluded if pregnancy scan data was not available to calculate litter size for ewes, so appears as 100% lamb survival.

<u>Reporting Survival</u>

SIL recommends you report on the Survival sub-index only. However, if you want to look at maternal traits, the maternal breeding value could be included on a report. Your bureau can provide you with advice on this.

<u>Need more information?</u>

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