Extreme storm conditions & coding of lamb losses
SIL Guidelines

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<u>SUMMARY POINTS</u>

- In severe storms where a high proportion of lambs die you can code lambs lost as "M" (misadventure) for lamb fate (BFATE).

- From late November 2010, SIL will treat M codes as "missing data". Up to that time they will continue to be treated as "live lambs" for the genetic evaluation of lamb survival data.

- Alternatively you can code the dead lambs using the standard codes for lamb deaths (1, J & K).

- SIL has a Data Exclusion tool which can exclude groups of data from genetic evaluations. This is used to exclude extreme Lamb Survival data from SIL-ACE genetic evaluations. Whole flock-year groups are excluded.

- Your bureau can exclude lamb survival data for a whole lamb birth cohort (all lambs in a flock in one year) from Lamb Survival evaluations if you request this.

- How to best to treat high lamb losses is a matter for the flock owner to decide in consultation with their bureau. SIL has provided these guidelines to help this process.

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<u>Coding strategy & consequences</u>

- Where severe storm conditions result in very high lamb losses, you can code lamb deaths due to these extreme conditions as M (misadventure) for lamb fate (BFATE). Typically this would be used where the majority of lambs born during the period of a storm die.

- Alternatively, all lamb losses can be coded with standard fate codes for lamb deaths. This will yield a low average survival figure which impacts on criteria used to exclude data (see below).

- **SIL will permanently change the way the M code is used in the genetic evaluation of Lamb Survival late in November 2010 so that all M codes are treated as "missing information" rather than assume the lambs would have survived as is presently the case (8-nov-2010). Animal breeding experts agree this change is a better strategy for the genetic evaluation.**

- Using the M code in the new way may mean that average Lamb Survival percentage for the ram mob data, based on all animals without an M code, does not give a good picture of Lamb Survival. SIL recommends that whole flock-birth year cohorts (groups) be excluded from future Lamb Survival evaluations where average lamb survival is either too low or too high. Critical thresholds to apply when judging such cases are described below for the SIL-ACE evaluation.

- <u>SIL will exclude from the SIL-ACE analyses</u> of Lamb Survival whole flock-birth year cohorts for a flock based on TWO criteria:
  - **1st criterion** – where average lamb survival (excluding M coded lambs) over the entire lambing period is less than a critical threshold e.g. this could be 50% survival. <u>The exact value for this threshold remains to be determined</u>.
  - **2nd criterion** – where average lamb survival (excluding M coded lambs) over the entire lambing period, is greater than 93%.

- Currently SIL routinely uses this 2nd criterion to exclude lamb survival data from SIL-ACE.

- Working with data from flocks severely affected by the storms in 2010, SIL will examine the effect of differing thresholds for the 1st criterion to derive the value it will apply for SIL-ACE. Bureaus will be informed of this threshold.

- Flock owners can request their data not be excluded from SIL-ACE on the basis of the 1st and/or 2nd criteria described, if they consider the remaining lamb survival data is informative. SIL will have final say in what is excluded or included for the SIL-ACE evaluation of Lamb Survival.

- Flock owners can ask their bureau service provider to use the SIL-ACE exclusion set for Lamb Survival in genetic evaluations they conduct for their flock(s). Alternatively they can ask their bureau to construct an exclusion set specifically for their flock(s) to be used in such evaluations.
- SIL does not currently have a way to exclude subsets of lamb survival data within a lambing season based on date of birth and a specified period for a storm.

WARNING

Storms can seriously bias Lamb Survival eBVs and across flock benchmarking if progeny of AI or link sires are hit more severely or less severely by a storm than the progeny of other sires. To minimize the risk this will occur, mating dates for AI sires should coincide as close as possible to the main lambing period or natural mating should occur for link sires at the same time as other sires. SIL realizes this is often not possible but it is important to know the risks and the consequences.

Useful ideas to consider when deciding on how to code your lambs

- If a typical lambing has 85% lambs surviving, what happened when a severe storm reduces this to 60% survival in one year? i.e. lamb losses are at 40% compared to the 15% expected.
    - Since 60% of lambs survive, this should still give a good indication of those sires with good progeny survival compared to those lambs that do not i.e. it is still a pretty good test of lamb survival genes. If you agree, code dead lambs using the 1, J or K code.
- Where survival is extremely low (<30%) it is so much lower than the normal figure that it can be argued the conditions are so severe we would not see the effect of the genes that help lambs survive under more typical challenges.
- Some people argue that challenging conditions will always discriminate genes that help lambs survive. The sterner test of the severe storm will highlight the extreme survival genes that a typical lambing will not show up. And that sires whose progeny survive under severe conditions are the ones we need to identify. Coding lambs as M will mean it is harder to identify such extreme genetic merit for lamb survival.
- SIL's 1st criteria on the preceding page is used to estimate whether the remaining data will be sufficiently informative to be worth using.
- Where survival is very high (>93%) we don't expect to get good estimates of between sire variation in progeny survival because so few lambs are contributing useful information (only 7 out of 100 are lost).

The key decision to make is where you draw the line between extreme and "normal" challenges. You may say that lambs that would have been expected to survive under better conditions but did not, should be coded as M. However, if this is related to lamb size or "robustness" it is very likely that smaller or less robust looking lambs may have survived showing that this is not completely reliable.

A test for your logic when deciding on the coding criteria best for your situation is whether you are more likely to falsely excuse lambs that would have died under less severe conditions or falsely penalize tough lambs that succumbed to the extreme conditions. You should aim to reduce the number of false classifications of both types.

Coding as 1/J/K a "good sized" dead lamb found in good conditions is attempting to minimize the risk of the first situation (falsely over-rating a "poor lamb" and its relatives) whereas using M codes for lambs that are lost in very severe storms is minimizing the risk of the second situation (falsely under-rating a good lamb that dies through no fault of its own, and its relatives).

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