

Breeding Maternal Rams

Summary :

Maternal traits can only be measured on breeding females. However, performance data from all female relatives of rams can be used in a genetic evaluation to select rams that will produce offspring with superior maternal characteristics. Using a multi-trait selection index which includes both maternal and lamb performance traits will help to improve overall economic profitability of the flock. Such an index has been developed at SAC for hill sheep. Selection using this index has resulted in ewes with improved maternal performance (more lambs and heavier litters weaned), as well as improving lamb performance (increased weaning weights without corresponding increases in fatness). Selection by these means will result in more efficient production, greater economic gains and increased sustainability of hill sheep farming.

Breeding goal traits in the index:

(weightings on each depend on economic value)

Ewe traits

mature size
longevity
lambs lost
lambs reared
maternal wean wt
Fleece weight

Lamb traits

weaning weight
carcass fat class
carcass conformation
carcass weight

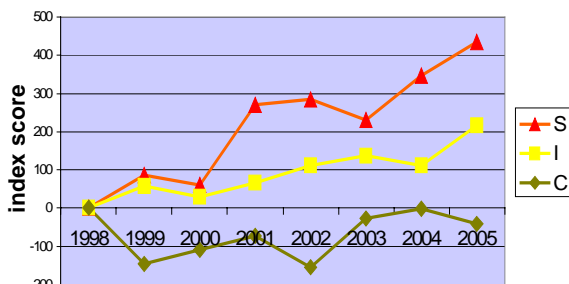


Figure 1: Average index scores at Castlelaw

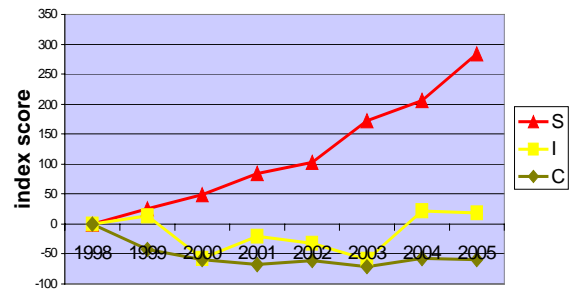


Figure 2: Average index scores at Kirkton

The index is being tested on two farms: Castlelaw in the Pentland hills; Kirkton in West Perthshire. Three genetic lines are run in each flock: **S**election (animals with the highest index scores chosen for breeding); **C**ontrol (animals with average index scores chosen for breeding); **I**ndustry (breeding animals chosen by eye). Trends in overall index scores (combining maternal and carcass traits) are shown in Figures 1 and 2.

Genetic line differences in individual traits:

Differences between lines on each farm have also been identified in the individual traits that contribute to the index. For example, there are significant differences in lamb numbers born to ewes in each genetic line. An example from ewes born into each line in 2001 is shown in Figure 3. The average difference between the Selection and Control line in the cumulative number of lambs produced in their first three lambings was 0.41 lambs per ewe. Assuming a value of £40/lamb, before costs, this would result in a difference of around £16.40/ ewe or £4,920 for a 300-ewe flock.

Success through **K**nowledge



SCOTTISH EXECUTIVE

This project is funded by SEERAD



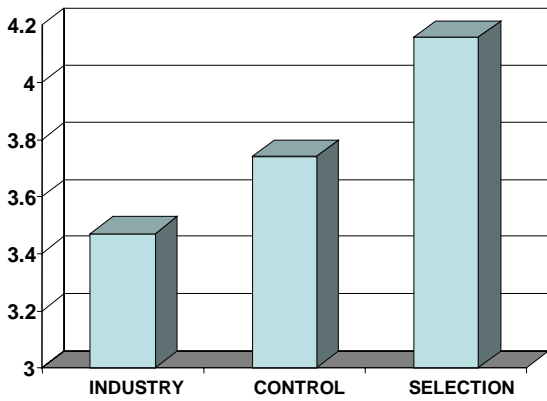


Figure 3: Average no. lambs born over first 3 lambings

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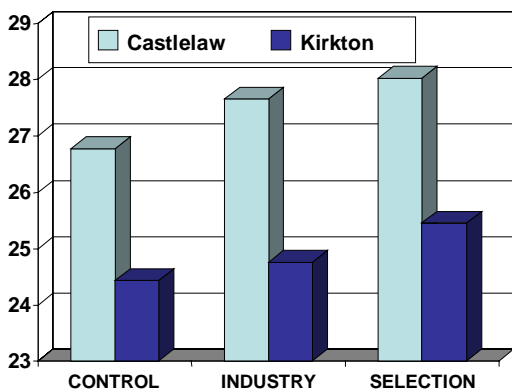


Figure 4: Average weaning weights

At the same time, progress is being made in lamb growth by selection using the index. Figure 4 shows the average weaning weights of lambs from each of the lines in 2001. On both farms the Selection line weights are significantly higher than the Control line. These line differences continue to increase over the years, but with no corresponding increase in carcass fatness.

Conclusions:

Using a multi-trait selection index that includes both maternal and lamb performance traits allows breeders to select rams that will produce offspring with superior maternal characteristics, as well as improved growth. Selection on the index at SAC has resulted in more lambs, heavier lambs, more productive ewes and better flock efficiency. This index is already being commercially implemented in part by the Blackface and other hill breeds in the UK.