

Breeding ewe replacements

Ewe productivity is the single most important factor influencing flock profitability. Today, the key challenge is to improve ewe productivity whilst at the same time reducing the need for human intervention. This is possible by adopting a targeted approach to stock selection using performance criteria. The following information details four key steps in the successful breeding of ewe replacements.

- Step 1. Select a breeding policy - Pure, Crossbred or Composite.
- Step 2. Divide the flock into two sub flocks, a replacement breeding flock and a slaughter lamb-producing flock.
- Step 3. Develop a breeding structure to minimise inbreeding and the need to purchase rams.
- Step 4. Select the correct genes irrespective of breed.

Step 1.

Select a breeding policy - Pure, Crossbred or Composite

Pure breeds are an important source of genetic material for the sheep industry. However a pure breeding flock is less productive than crossbred or composite flocks which exploit the benefits of hybrid vigour through crossbreeding. Research from the Agri-Food and Biosciences Institute (AFBI), Hillsborough indicates that hybrid vigour can boost the kilograms of lamb weaned per kg ewe lambed by up to 12%, especially when attention is focused on performance information rather than visual traits and perceptions. For example, many believe pure Blackface ewes to have better longevity than crossbreds, but recent findings from AFBI, Hillsborough indicate that 28% of the ewes in Blackface flocks are culled annually, compared with just 16% from Swaledale X Blackface flocks and 25% from Texel X Blackface flocks.

Crossbreeding has been crucial in exploiting efficiency gains within the sheep industry. However, with the influence of our stratified sheep breeding structure reducing, it is likely that composite ewes will become more common in the future. Composites contain a mixture of genes from different breeds. The genes, rather than breeds, are specially selected based on performance information. Producing composite ewes requires a large scale planned breeding structure, the correct use of performance information and the ability to source performance recorded rams, pure or crossbred. This can allow farmers to develop their own unique composite sheep, ideally suited to their farm.

Step 2.

Divide the flock into two sub flocks, a replacement breeding flock and a slaughter lamb producing flock.

There is considerable variation both between ewe breeds and within breeds. For example, research at AFBI Hillsborough indicates that a flock consisting of Mule ewes will produce on average 35% more kilograms of carcase gain per hectare than one comprising Suffolk Cheviot ewes. However, within both ewe types, there is widespread variation between individual ewes. It is important that the more efficient ewes are selected to form the replacement breeding flock. Ewes that are less desirable can be used to produce slaughter lambs. Performance information is critical to identify and select out the superior ewes. Three options are outlined below to obtain this information. Option 1 is the simplest but options 2 and 3 have the benefit that production traits such as weight are also being assessed. This information is very valuable, as it will ensure year on year productivity gains are achieved by the whole flock.

Option 1 - Produce a list of undesirable traits such as difficult to lamb, large pendulous teats, poor mothering instinct, mastitis, foot-rot, and poor fleshing ability at grass. Then simply tag any ewe that exhibits one of these traits with a black tag. At weaning time separate out the ewes with black tags from the others, physically examine them and decide whether they should be culled immediately or retained for slaughter lamb production. It is important that no ewe with a black tag and ideally any of her female offspring is ever allowed to enter or remain in your replacement breeding flock.

To successfully implement Options 2 and 3 each individual animal requires a unique management number for their lifetime. Ideally they should be tagged with this number at birth, but when starting to record it is best to tag ewes at tugging.

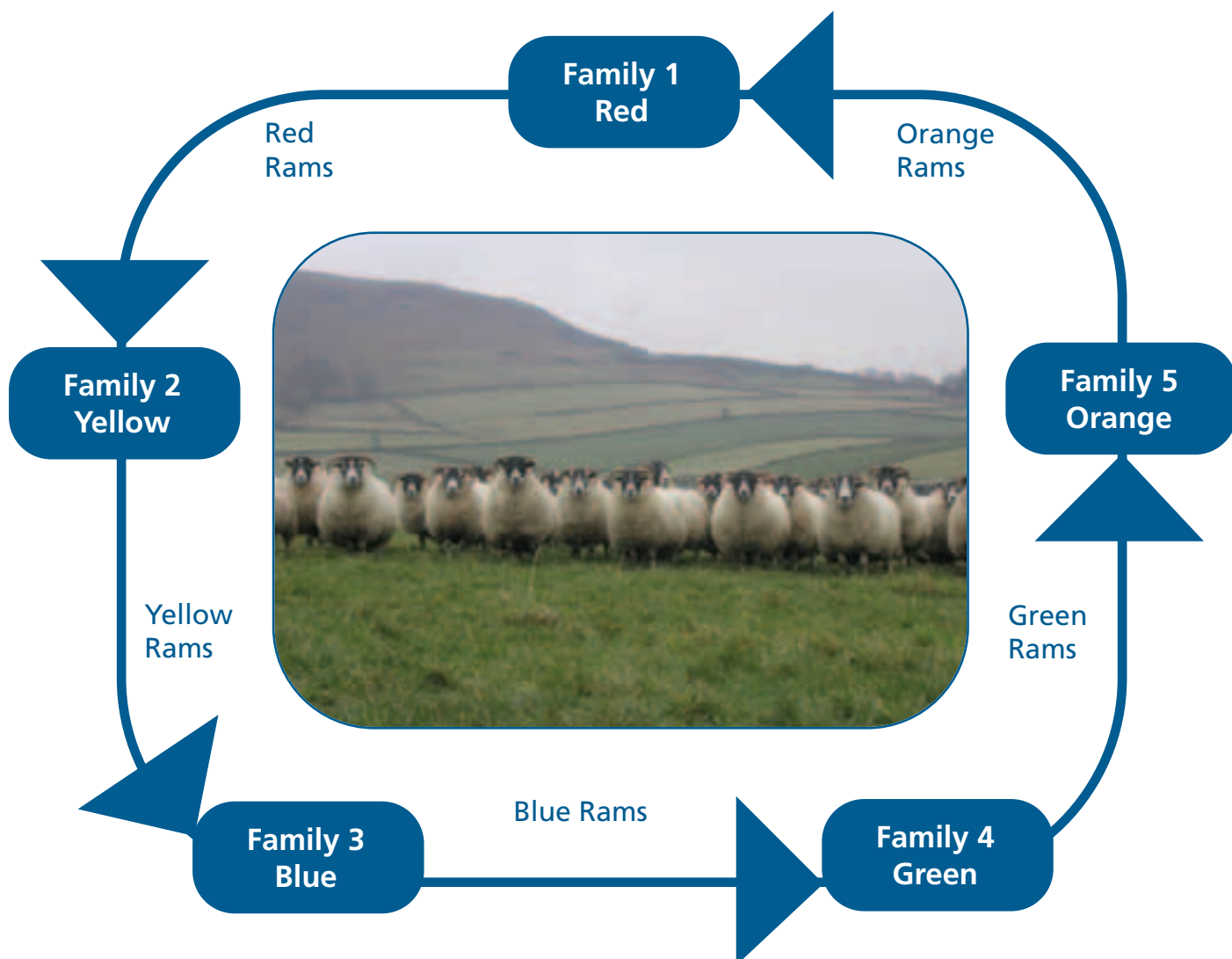
Option 2 - A system such as the

Hillsborough Management Recording Scheme (HMRS) can be used to record lambing difficulty, mothering ability, lamb vigour and lamb weight at weaning time. This information is used to compare the performance of individual ewes with the others in the flock. The high performance ewes and their daughters can then be retained within the replacement breeding flock, provided they are physically correct with regard to their udders, mouths and feet.

Option 3 - Utilising a genetic performance recording package. Such a package will use Best Linear Unbiased Prediction (BLUP) to separate out the

genetic factors influencing an animal's performance from the non-genetic 'or environmental' factors, (such as the way it is managed or fed). Genetic links between groups of animals are used by BLUP to compare each individual lamb against its companions. This information is combined with data from the animal's relatives to produce Estimated Breeding Value's (EBVs) for a selection of economically important traits. A Maternal Index is then calculated for each animal using the EBVs for litter size, lamb growth, maternal ability and mature size. Ewe lambs with the highest index or desired EBVs can be retained within the replacement breeding flock.

Fig. 1 Blackface breeding structure at Greenmount Hill farm



Step 3.

Develop a breeding structure to minimise inbreeding and the need to purchase rams

If the **replacement breeding section** of the flock is of sufficient scale (above 200 ewes) it can be subdivided into five families and placed in a rotational breeding structure. If less than 200 ewes it would be advantageous to build virtual scale through co-operating with others. The pure-breeding Blackface flock at Greenmount Hill Farm currently uses a five-family breeding structure. The flock is managed as one during the majority of the year, only being separated into the five families for the mating period. The female replacements are kept in the family in which they are born and the best rams are moved to the next family in the sequence each year. Figure 1 describes the breeding policy.

Step 4.

Select the correct genes irrespective of breed

There is as much variation in the performance of animals within a particular breed as there is in the performance of animals between different breeds. Therefore, all breeding decisions should be based on performance information. For example research work by SAC has shown that there are some Suffolk rams, which will

produce lambs with similar “get up and go” as Blackface rams. However performance information does not tell the full story. It is important to visit the flocks from which you are considering purchasing any replacement breeding rams to ensure the breeding and management policies mirror your own.

Experience at Greenmount Hill farm

By adopting a five family breeding policy, identifying and culling ewes with undesirable traits and selecting rams with the desired genes using Estimated breeding Values **the income generated per pure-breeding Blackface ewe has improved by £11.50* in 5 years.** There are 12 more lambs produced per 100 ewes to the ram, the entire male lambs have the potential to be taken to heavier weights (19.5kg compared with 18.1kg) or be castrated and achieve similar weights at much younger ages and 25% more of the lambs are grading in the desired R2, R3 and U3 grades.

*Calculations are based on a carcase price of £2.80/kg.

Technical note prepared by Dr Steven Johnston, Senior Sheep Technologist, Greenmount Campus with support from Dr Alistair Carson and Dr Ronald Annett, AFBI, Hillsborough.

For more information contact:

CAFRE
Greenmount Campus
Antrim BT41 4PU
Tel: 028 9442 6771
Email: technology.admin@dardni.gov.uk

Agri-Food and Biosciences Institute
Hillsborough
Co Down BT26 6DR
Tel: 028 9268 2484
Email: info@afbini.gov.uk