Technical Information Note II/1997

Data Needed for Multibreed EBVs

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Introduction

In the 1980s BREEDPLAN moved from within-herd EBVs to GROUP BREEDPLAN across-herd EBVs. The advantages were great. Bull buyers could compare EBVs from all recorded bulls within a breed. Participating stud breeders could see how their cattle compared in breeding value with those of other studs and identify bulls which would improve their own herds. In addition cattle which had relatives in more than one herd received one accurate EBV instead of multiple less accurate within-herd EBVs.

BREEDPLAN is now planning to produce multibreed EBVs. The benefits are of a similar nature to those obtained from the introduction of across-herd EBVs. Bull buyers will be able to compare bulls of different breeds and crosses. Breeders of bulls will be able to compare different grades of cattle and composite breeders will be able to compare cattle from different crosses or generations of the composite breed.

However the full introduction of multibreed EBVs will take some years for two reasons. Firstly, the BREEDPLAN databases are predominantly owned by breed societies and they will need to decide how they will use the opportunity to produce multibreed EBVs. Secondly, the existing BREEDPLAN databases have insufficient data which links breeds. To produce across-herd EBVs it was necessary to create genetic links between herds by using some bulls in more than one herd. Now it is necessary to link breeds if we want the benefits of multibreed EBVs. The purpose of this note is to set out the data which is necessary to create links across breeds.

Linking breeds

To link breeds A and B we need a direct comparison between calves from breed A bulls and calves from breed B bulls when all bulls have been mated to the same group of cows and the calves reared together. To make the comparison fair you must follow the same rules as for a progeny test. (See Technical Information Note IV/97 'Conducting a Progeny Test'.) In brief this means that there should be no differences between the calves from one sire and those from another, except their sires. Therefore the calves should have similar dams, be the same age, be reared together from birth, be measured on the same days and, in all respects, treated alike.

A link between breeds could also be made by directly comparing purebreds of the two breeds provided both sires and dams have been recorded and are of known pedigree. However it is rare that calves such as these from two different breeds are reared together.

Which bulls to use

The linkage between breeds will only be successful if the sires used have been accurately evaluated within their own breeds. Therefore the bulls used must have highly accurate GROUP BREEDPLAN EBVs for the traits we wish to compare across breeds. Provided this is so, the number of bulls is not critical but should be at least 5 per breed.

Because there are likely to be some new or existing traits for which not all bulls will have highly accurate EBVs, the number of bulls per breed should ideally be increased to about 15.

How many calves

Regardless of the number of sires used, you should have at least 100 calves per sire breed, measured for each trait.

Carcase traits

Carcase traits follow the same rules as other traits but may present extra problems. Ultrasound scanning can be used to measure fat depth and eye muscle area in bulls, steers and heifers but if some measurements are to be made only on slaughtered steers then the total number of calves bred must be increased accordingly.

Sometimes cattle are slaughtered in groups, with the heaviest or fattest slaughtered first, then other groups as they are ready. This severely biases comparisons between sires and breeds. It is essential that all of a group are slaughtered at the same time. Alternatively they can be randomly allocated to slaughter groups so that each sire is equally represented in each group. A less desirable design, but one which is still useful, is to slaughter the cattle in groups according to when they are ready but to have the same proportions of calves from each sire in every group.

If cattle are to be finished in a feedlot it is best if all cattle are kept in one pen. If this is not possible, they should be randomly allocated to pens so that each sire is equally represented in each pen.

How many herds

It is possible to split the sire breed comparisons over many herds. Where practical it is best to have all sire breeds and all sires represented in each herd. However herds with only two sire breeds still add useful information. Very small herds are not very useful because there are too few calves born and reared at the same time and therefore genuine contemporaries.

Maternal traits

To link breeds for maternal traits such as milk yield or fertility, the best method is to retain the heifers born in the sire breed comparison described above.

They are then kept together as a herd and mated to the same bulls. Purebred cows purchased from different properties do not make a very good breed comparison because their past environment can have a long term effect on their growth, fertility and milk yield.

Splitting management groups

If a head-to-head comparison between bulls of different breeds has been carried out, it is important that calves from different crosses are analysed in the same management groups. For instance, if the data on calves by breed A bulls is sent to the breed A database and the data on calves from breed B bulls is sent to the breed B database then the comparison between breeds will be lost.

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