

USE OF GENETIC DIFFERENCES BETWEEN GROUPS IN
DAIRY CATTLE BREEDING

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The development of BLUP (Best Linear Unbiased Predictor) has enabled us to estimate more accurately the breeding values of animals available for selection. Its main advantage over Regressed Contemporary Comparison are that it enables us to compare bulls from progeny test teams of different years or regions, and makes efficient use of information on relatives of test bulls.

The accuracy of a comparison of bulls from different teams depends on the number of links between the groups. The simplest way to provide links is to use reference sire(s) in each team. The reference sires provide an estimate of the difference between group means. It is important that reference sires are mated at random in the herds. This is not always possible if proven bulls are used as reference sires.

Tong et al (1980) showed that the estimates of group effects may have large standard errors unless there is substantial exchange of semen between groups.

An alternative to reliance on BLUP is the parent selection method of Hopkins and James (1977). In this approach, group means are predicted from the selection history of the group. The approach takes account of likely time trends in the breeding program, but will be of less use in comparing groups from different regions.

The essential difference between the use of parent selection and the use of BLUP is that parent selection uses predicted group means, while BLUP uses estimates from the data. While the use of estimates from real data has appeal, such estimates may be inaccurate. The consequences of errors of prediction will be discussed.

Allowance for the errors in estimating group effects can be made by treating group effects as random in a BLUP estimation. This would ensure that excessive weight is not given to inaccurate estimates of group means.

There is scope for the use of both parent selection and BLUP. The main value with either approach is that the breeding program is committed to the goal of continued response.

REFERENCE

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