an index using the part yields (instead of the 305 day yield) can lead to a substantial increase in selection gain.

The statistical problems of cow evaluation are discussed from the point of view of cow selection for breeding bulls. There we have the problem that the average genetic values of the bulls used, and the applied selection intensities on the female side are very different from one herd to the next. It will be shown, how far these difficulties could, at least in theory, be successfully dealt with.

TEN YEARS EXPERIENCE WITH COW INDEXING (*)

S. TRODAHL (*), O. SYRSTAL (**)

(*) Norwegian Ministry of Agriculture, 1430 Ås, Norway
(**) Agricultural University of Norway, 1432 Ås NLH Norway

Cow indexing has been utilized in the Norwegian breeding scheme since 1967. The indexes are estimated relative breeding values for milk production, based on individual production, herd average, and indexes of sire and dam. The overall average of indexes computed is slightly above 100.

The standard deviation of the index is estimated at 4.5 units. Cows with indexes above 110 (i.e. > + 2 st. dev.) are recommended for planned matings with selected bull sires. The final selection of bull dams is carried out when bull calves are born from these matings. Besides the cow index, other traits like ease of milking, fertility and conformation are considered.

The average index of bull dams have in recent years been 114, about 2.7 standard deviations above the overall average, corresponding to the top 0.9 p. 100 from a normal distribution.

In intra herd selection a partial regression of daughters on dams of 17 kg FCM per index unit has been found. This in only about 70 p. 100 of what should theoretically be expected. This may be due to a number of causes.

The accuracy of cow indexes as a basis for bull dam selection can not be studied satisfactorily since only sons of cows with the highest indexes are entering A.I. service and subsequently progeny tested. However, positive correlations have been found, but these have not proved to be significant.

FACTORS AFFECTING THE ESTIMATION OF COW'S BREEDING VALUE IN THE GERMAN FRIESIAN POPULATION OF LOWER SAXONY

H. J. LANGHOLZ and H. KÖTHER

Institute of Animal Husbandry and Genetics
University of Göttingen, Albrecht-Thaer-Weg 1 D-3400 Göttingen /F.R.G.

All parameters relevant for the estimation of cow's breeding value int he German Friesian population of Lower Saxony were analysed on a sample of 13,063 cows with 3 complete lactations. Special attention was paid to systematic errors.

The investigation was based on a mixed model analysis of variance and least-squares techniques were applied. The following results were obtained:

1. All effects, obtainable through official milk recording, as region, calving season, age at calving, herd level and calving interval turned out to be significant and should be adjusted for when estimating cow's breeding value. Special attention should be paid to the fact that the effect of calving interval is more distinct on the current lactation (effect of pregnancy) than on the subsequent lactation. The influence of age at calving, however, might be neglected in the case of subsequent lactations.

2. Interactions are obvious between calving season and specific conditions in different regions and there are some indications of an interaction between calving season on production level of the year. However, due to the large variation in production conditions within regions only a limited advantage in adjusting for such interactions seems to be obtainable by applying correction factors within grassland and fodder cropping areas.

3. Regarding the differences in production potential, production systems and farm structures between regions and countries no general procedures for adjusting for systematic effects can be put forward. The main problem to be solved in each individual situation is to optimize the accuracy of environmental description and the validity of the contemporary mean.