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EVALUATION AND PERFORMANCE TESTED BEEF BULLS BY BLUP

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2. — Sélection pour la viande bovine

SELECTING "FRIESIANS" FOR MILK AND BEEF

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The *Friesian* breed makes a substantial contribution to beef production in Great Britain. The value of selection for beefing characteristics has been studied based on the discounted gene flow technique (MCCLINTOCK and CUNNINGHAM). The technique has been adapted to consider the use of crossbred females as beef suckler cows. The selection for beef can rarely be justified at a level greater than 1 in 4 — the use of suckler cows making little difference. The parameter under selection and economic values have a large effect. As an initial step visual assessments of beef shape are being recorded and will be reported for progeny tested milk bulls.

APPLICATION OF BLUP IN PERFORMANCE TESTING OF DAIRY BULLS

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The method used in Sweden for performance testing of dual purpose bulls has, especially during recent years, shown some limitations due to many and small testing stations and an intense use of sires over a short time period. To overcome these problems, at least partly, and to get a more efficient estimate of the breeding value for growth rate an application of best linear unbiased prediction (BLUP) in performance testing has been made.

In this procedure the daily gain of a bull on test is corrected for the effect of test station, year and season and the sire effect (the sire's predicted difference) and bull effect are estimated by BLUP. The bull's estimated breeding value is then calculated as the sum of these two effects and finally expressed as a relative breeding value.

The advantages of the BLUP procedure in comparison with the officially used method can be summarized as follows,

1. Bulls can be compared across test stations and across years and season, which means a more efficient utilization of data available.
2. Information on half-sibs of the same sire is used to obtain estimated breeding values of bulls.
3. Sire and station effects are independent of one another.

EVALUATION AND PERFORMANCE TESTED BEEF BULLS BY BLUP

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The heritability of growth rate at station between 180-365 days of age has been computed by maximum likelihood procedure for *Charolais* and *Hereford*. The estimates were 0.48 and 0.43 respectively. The variance components differed and the phenotypic standard deviations were 123 and 96 g per day for *Charolais* and *Hereford* respectively.

BLUP procedure for evaluation of breeding values of bulls was applied to the same data as was used for variance component estimation, namely 272 *Charolais* and 805 *Hereford* bulls by 100 and 276 sires, respectively. The BLUP procedure was compared to two simplified proce-

dures of estimation of contemporary average, namely one where number of bulls per sire was considered and one where this was not done. The correlations in breeding values between the procedures was quite high.

However, because correlations were less than one and of anticipated increased genetic trends the model which should be used for evaluation of performance tested bulls, should take into consideration the genetic trend in both sires and dams and should include information on half-sibs.

SCHÄTZUNG PHÄNOTYPISCHER PARAMETER BEI ZENTRAL, EIGENLEISTUNGSGEPRÜFTEN FLEISCHBULLEN

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Zwischen dem Alter bei Beginn der Prüfung und dem Gewicht bei bestimmtem Alter wurden geringe negative Korrelationen gefunden. Die Zunahme während der Prüfung war hiervon unabhängig. Zwischen den Zunahmen vor der Prüfung und den Zunahmen während des Tests bestanden keine Beziehungen. Es trat jedoch eine signifikant negative Korrelation auf, wenn der Einfluss der täglichen Futteraufnahme ausgeschaltet wurde.

Die Beziehungen zwischen der Zunahme während der Prüfung bzw. dem 400 Tage-Gewicht einerseits und der Futtermittelverwertung andererseits stiegen an, wenn die Appetiteinflüsse ausgeschaltet wurden. Der Einfluss des Appetits muss berücksichtigt werden, wenn die Futtermittelverwertung ein Selektionsmerkmal darstellt.

Die Analyse deutet darauf hin, dass die Ergebnisse der Eigenleistungsprüfungen korrigiert werden müssen, wenn entweder ein Merkmal der Verfettung oder die Futtermittelverwertung bei der Selektion berücksichtigt werden.

Der Test weist eine erhebliche relative Variabilität für Verfettung und Futtermittelverwertung im Vergleich zur Variabilität bei einem Gewicht im Alter von 400 Tagen auf.

SELECTION INDEXES FOR BEEF CATTLE

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The first phase of developing selection indexes for beef cattle is described. This phase involve the theoretical consideration of the factors that must be considered in development.

Six factors are discussed. First, the definition of the goal of selection is discussed. A monetary goal at the farm level appears suitable. Second, the goals must be expressed in such a way that selection indexes can be derived. The association between profit equations, models of aggregate genotype and selection indexes are described, including considerations of non-linearity. Third, the association between selection goals and both commercial production programs and crossbreeding programs are discussed. Fourth, the sources of genetic parameters are briefly discussed. Fifth, the sources of economic parameters and their prediction for the future are briefly discussed. Sixth, the association between selection indexes and times of selection for both males and females are discussed.

EXPRESSION OF DIFFERENT TRAITS IN BEEF CROSSBREEDING PROGRAMS

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The total and relative number of discounted expressions for various traits in beef production differed between rotational and terminal crossing and between sexes within terminal crossing. Differences between relative number of expressions of traits were most evident within nucleus