

leneigenschaften von der Vorkommenshäufigkeit, dem Anteil der Tiere, die als Eltern verwendet werden und von der Zuverlässigkeit der Prüfung abhängt.

Ein numerisches Beispiel zum Gebrauch der Zahlen in den Tabellen wird ebenfalls angegeben.

### HOW TO HANDLE SAMPLING AND SELECTION FOR PRODUCTION AND MANAGEMENT TRAITS IN DAIRY CATTLE

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Sampling and selection for production and management traits in dairy cattle is a complex problem. In the scope of modern breeding plans (scheme 1) it is stated that only the best 25 p. 100 of the bulls tested on production (+++ 10 p. 100 and ++ 15 p. 100) are worthwhile to be ranked according to management traits. A uniform and clear presentation of progeny test results is proposed, namely the breeding value expressed as a deviation from the average (kg milk, 305 days, first lactation).

Management traits can be subdivided in categories like reproduction traits (stillbirth, fertility, and so on) milking traits (ease of milking, udder, mastitis) and conformation traits. Accurate sampling is necessary but also a clear and uniform system of handling and classification along the same lines as for production (scheme 2). A final ranking of the top classes (SS and SD) is necessary. A proposal of a sire summary (scheme 3) is given. It is worthwhile to study this subject more closely in collaboration with the *International Dairy Federation* (I.F.D.) to find some general guidelines for handling and selection of production and for management traits.

### MANAGEMENT TRAITS IN DAIRY CATTLE : DYSTOCIA, UDDER CHARACTERISTICS RELATED TO PRODUCTION, AND A REVIEW OF OTHER TRAITS

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Primary selection emphasis should be on milk production and milk constituents. Management traits contributing to ease or economy of production should be selected only if economic importance and phenotypic and genetic relationships to productive traits justify such selection.

Breeding efficiency is economically important but genetic improvement within breeds is difficult. Evidence indicates dystocia can be minimized by selecting sires for production, evaluating them for ease of calving, mating heifers to sires whose offspring are born easily without direct selection against dystocia. Selection against mastitis might be effective, but management practices can reduce the incidence of mastitis. Selection for udder and leg structure may be necessary in order to avoid problems concerning economical food production. Speed of milking has economic importance and it responds to selection. The amount of emphasis for the selection of milking speed and the most efficient way to apply this has not been clarified. Additional study of the genetics of body-weight change is necessary in order to maximize feed conversion. Genetic control of metabolic disorders is not now feasible; management control is necessary. Dairy men desire amenable cows, but heritability estimates for this trait are low. Measures of temperament need improvement. The economic worth of all management traits should be further quantified.

### A CHEAP METHOD OF PROGENY TESTING A.I. BULLS FOR MILK PROTEIN

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In order to develop a cheap method for progeny testing of bulls for milk protein content and yield, about 16 600 milk samples were collected of firstcalving daughters of bulls (1 sample-daughter) in 1971-1973. In 1971 the protein determinations were made with Promilk in one labo-