

ZUSAMMENHANG ZWISCHEN KÖRPERGEWICHTSENTWICKLUNG  
UND ALKALISCHER PHOSPHATASE-AKTIVITÄT IM BLUTPLASMA BEI DER MAUS,  
UNTER DEM EINFLUSS DER SELEKTION AUF PROTEINANSATZ

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Ziel dieser Arbeit war es, die Beziehungen zwischen Körpergewichtsentwicklung und alkalischer Phosphatase-Aktivität im Blutplasma zu untersuchen. Als Untersuchungsmaterial standen zwei Selektionslinien von Mäusen zur Verfügung, die über 22 Generationen auf hohen bzw. niederen Proteinansatz selektiert wurden.

Die Körpergewichtsentwicklung und die Enzymaktivität wurden am 20., 40. und 60. Lebenstag untersucht und folgende Ergebnisse wurden ermittelt :

- a) Die Aktivität der alkalischen Phosphatase nimmt im Blutplasma mit zunehmendem Alter ab.
- b) Es besteht bei der Maus eine enge Beziehung zwischen selektions- und geschlechtsbedingter Gewichtsentwicklung und alkalischen Phosphatase-Aktivität.
- c) Die Korrelationen zwischen Körpergewicht und alkalischer Phosphatase-Aktivität innerhalb der Geschlechter und Zuchtlinien sind gering und nicht eindeutig.

A SUBMETACENTRIC Y CHROMOSOME AND HAEMOGLOBIN I  
UNIQUE GENETIC MARKERS OF SOUTH AFRICAN BOS INDICUS CATTLE BREEDS

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Although the *Bos indicus* breeds of South Africa (like the *Afrikaner* and other *Sanga* types) are classified as such on account of their anatomy, physiology and adaptability, their Y chromosome is not acrocentric like that of the *Brahman* and related *indicus* breeds. They have the typical submetacentric Y chromosome found in *Bos taurus* breeds. A unique haemoglobin type, Hb I, has also been observed in the South African *Indicus* breeds, previously confounded with the Hb C occurring in the *Brahman*, *Santa Gertrudis* and their Asian ancestors.

RESULTS OF TWENTY YEARS OF BLOOD GROUP RESEARCH IN SOUTH AFRICA

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Blood groups and other genetic markers offer an efficient aid in the studies on breed structures, migration of genes and on phylogenetic relations between populations. Highlights of results obtained during twenty years of research are listed and discussed.

South Africa with its numerous breeds of livestock and many infectious diseases could prove to be an ideal outdoor laboratory to investigate the resistance to tropical diseases and to correlate this resistance to the ever increasing number of genetic markers.

ANALYSIS OF VETERINARY-RECORDED DISEASES IN FIRST LACTATION COWS

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Records on veterinary treatments of 11,797 first-lactation cows sired by 50 *Swedish Red and White* (SRB) and 34 *Swedish Friesian* (SLB) AI bulls were analysed. 22.9 and 28.7 p. 100 of the SRB and SLB cows respectively were treated some time during their first lactation. Udder problems were the most frequent disease for both breeds, though more frequent in the SLB.

In general, differences among herds appeared to be the most important source of variation. Significant effects of year, month, and age at calving were also found for several diseases.

Differences between daughter groups were significant for teat injuries, mastitis, any kind of teat or udder disease, foot, leg, or locomotory diseases, veterinary treatments whatever the origin, and culling rate in the SRB breed, while only teat injuries, foot, leg, or locomotory diseases, and the veterinary treatments whatever the origin, were significant in the SLB breed. Heritability estimates varied between zero and 4.6 p. 100. The highest value was obtained for udder or teat diseases in SRB.

A difference of 10 p. 100 in transmitting ability for veterinary treated daughters in first lactation was shown to exist between the extreme bulls within each breed, despite the fairly small number of bulls exceeding 100 daughters, which was chosen as a minimum.

#### CLASSIC VS. DESIRED GAIN INDEX

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Selection indices are among the most sophisticated tools of modern breeding theory. The optimal utilization of information leads to maximum gains in a given situation. However, extent and kind of information can be changed. The genetic change in milk and beef performance depends to a large extent on the resources allocated to estimate breeding values of the two respective trait complexes.

Desired gain index, suggested by Pezek and Baker, can take this problem into account and bring about changes in desired proportions. In view of the fact that agreement between supply and demand is of paramount importance to overall efficiency of the economy, it appears that application of such techniques to achieve gains of various traits in correct proportions, deserves attention.

#### NONLINEAR MODELS DESCRIBING THE DIFFERENCE IN GROWTH CURVES OF CATTLE STRAINS

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Five growth models fitted to the weight-age data of  $F_1$  bull calves from 10 different *Friesian* strains, were compared for their suitability to describe the shape of the growth curve. The most accurate model was Richards function followed by the von Bertalanffy, Gompertz, logistic and Brody functions. All models underestimated the 17-18 month weights. The only significant differences between strains in growth parameters were found with the von Bertalanffy model.

#### INVESTIGATIONS ON THE INDIVIDUAL AND MATERNAL COMPONENTS OF CALVING PERFORMANCE IN CATTLE

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The importance of the individual and maternal components of calving performance in a population of *German Simmental* cattle were to be studied and genetic parameters were to be estimated using the model of WILLHAM. Calving data of calves of testing bulls for analysis of the individual component were collected in the first phase by special recording. Frequencies for classes of calving performance were: 18 p. 100 without assistance, 35 p. 100 with little assistance, 44 p. 100 with considerable assistance and 3 p. 100 surgical assistance. Heritability for the individual component was  $h^2 = .14$  with a considerable standard error because of the relatively small data set ( $s^2h_1 = .14$ ). In the second phase, daughters of the same testing bulls were recorded at their first calving. From these 1,200 heifer calvings parameters for the maternal component will be estimated using also the data of the first phase. For the third phase, the interior pelvic measurements of the heifers are currently also recorded in order to study this component of the maternal effect in more detail.