

eliminated and the sow can show its true genetic capacity in a better way. Avoiding the parity combination 1:1 the heritability estimates by regression are in line with the estimates of REVELLE *et al.* (1973), ALSING (1977), OLLIVIER (1973) and HANRAHAN *et al.* (1974) and worth while to be integrated into a breeding programme.

BENÜTZUNG DER INDEXZAHLEN, DIE BEI DER ZUCHTWERTSCHÄTZUNG  
DER SCHWEINE IN UNGARN VERWENDET WERDEN

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Der Verfasser stellt die Indexzahlen vor, die in der Schweinezucht in Ungarn benutzt werden. Er macht uns mit der Kennziffer der Exterieursbeurteilung bekannt. Der auf Grund der in der Leistungskontrolle erhaltenen Angaben der zukünftigen Zuchttiere (JUNGBER und JUNGSAU) bestimmter Index wird dargestellt.

Er orientiert über den Index, der auf den zentralen Teststationen bei der Beurteilung der Frohwüchsigkeit, Futtermittelverwertung und des Schlachtwertes der Jungeber verwendet wird.

Ausserdem wird die einheitliche Kennziffer, die aus den Daten der Mast- und Schlachtleistung auf den Teststationen gebildet wird, dargelegt. Der Verfasser zeigt an, dass die Zuchtpraxis diese Daten parallel und einander ergänzend benutzt und auf solcher Weise, dass die Nachteile der mechanischen Anwendung vermieden werden sollen.

**II. — Facteurs génétiques et de milieu  
influençant la résistance naturelle aux maladies**

GENETIC VARIATION IN MINERAL METABOLISM IN RELATION TO DISORDERS

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Evidence is reviewed of genetic variation in the incidence of disorders associated with the metabolism of minerals in general and trace elements in particular. Also reviewed is the evidence for genetic variation in the concentrations of various minerals and trace elements in blood and tissues of animals. Particular illustrations are given from work involving copper in sheep. The evidence suggests that breeds and strains of animals differ in their nutrient requirements for trace elements and probably other minerals, for the prevention of disorder and possibly for optimum performance.

AN ASSESSMENT OF GENETICAL METHODS IN THE CONTROL OF SCRAPIE

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Scrapie is caused by a virus-like agent which is transmitted to sheep by horizontal and vertical routes of infection. The disease can be controlled by selective culling of bloodline relatives of scrapie cases. However, this depends on accurate breeding records which are often not available. Two major studies, with *Cheviot* and with *Herdwick sheep*, have shown that "sus-

ceptibility" to experimental infection with one source of agent is controlled by a single gene and that the dominant allele confers "susceptibility". There is evidence that scrapie agent may replicate in some "resistant" sheep but at a slower rate than in "susceptible" sheep. For this reason, "resistance" is best regarded in terms of an extended incubation period. Also, "resistance" to one strain of agent does not mean "resistance" to all strains. A "resistant" flock of *Swaledale* sheep is being developed by experimentally infecting all animals and breeding from the survivors. There have been extensive outbreaks of natural scrapie in the "susceptible" flocks of *Cheviot* and *Herdwick* sheep.

Investigations of these outbreaks might be able to show whether or not sheep selected for "resistance" could be used to limit the spread of infection in flocks with a serious scrapie problem.

#### RESISTANCE OF CALVES TO GASTROINTESTINAL PARASITES

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Control of enzootic diseases is possible by hygienic measures and by increasing resistance of the animals. The resistance of calves to gastrointestinal nematodes is discussed as an example where the reaction of animals to a certain dose of infective larvae can be measured by serological as well as parasitological parameters. This resistance varies considerably in calves of the same age and feeding condition, and part of it is genetically determined. The question what this resistance means for the growth performance of the calf under various conditions of infection remains to be answered.

#### IMMUNOGENETICS STUDIES ON CATTLE TWINS

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Some components which are essential factors in the immune mechanism were quantified (titre tested) in the sera from cattle twins. It was found that in monozygous twins the kinetics of antibody formation against red cell antigens was under close genetic control. This phenomenon indicates that not only the amount but also the start, the rise and the persistence of antibody formation is genetically controlled. These results were obtained in twins which had never before been confronted with these antigens and where the dosage and route of injection was carefully controlled. When the contact with the antigen as in the case of the ubiquitously occurring J-substance could not be controlled genetic variation in the anti-I antibody titres was not demonstrable. The titre tests revealed considerable genetic variation also in the relative activity of complement (C<sub>1</sub> trough C<sub>3</sub>) and konglutinin in the twin sera.

#### GENETIC ANALYSIS OF HEALTH DISTURBANCES IN PIGS

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Since the beginning of 1973 every pig from the Swedish Pig progeny testing stations pass a special post-mortem examination where any disease in the thoracic cavity or in the snout is registered. The diseases which are thereby recorded are different kinds of pneumonia, pleurisy and atrophic rhinitis (AR).

Data from this post-mortem examination during 1973-1975 were merged with the ordinary progeny testing records. This merging could not be done for those animals or groups which for