SESSION VI

COURTES COMMUNICATIONS ET SÉANCE DE TRAVAIL

The genetic principles of the continuous hybridization programme

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In the beginning, in the 1950's and 1960's the tone ruling international literature was there are no possibilities for producing hybrids in swine breeding, in contrast to poultry breeding. Since that time more and more experience proved what we can lose by purebred breeding. This breeding method, the continuous pig hybridization shows the most economical way for the goal.

The basic principles of this kind of hybridization : the male line is bred by close inbreeding creating inbred lines, the sows are selected from the « hybrid end product » through a selection process conducted under high genetic pressure to form the next mother generation. In every single case they receive the most suitable male partner based on test mating.

Maternal and grand-maternal effects on litter size in pigs

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Two sets of data were available for an investigation of genetic parent-offspring relationships in pig fertility. These were the records of selected lines in a University farm and herdbook data in Baden-Württemberg. Regressions of daughters' litter sizes were calculated separately on their litter of origin and on independent litters of their dams. Furthermore, on a small number of records daughter-granddam regressions could be presented. A comparison of heritabilities derived from these different types of regression partly revealed some evidence of the existence of maternal effects on litter size as originally shown in mice by FALCONER (1965). The insufficiency of this type of analysis was discussed for the problem raised which is particularly relevant in herdbook data.

Heritability of litter size, phenotypic and genetic correlations between the four first litters of *Large White* sows

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Data from 76 purebred *Large White* herds from 1965 to 1979 were used to estimate genetic parameters of litter size characteristics (number of piglets born — NB —, born alive — NA — and weaned — NW —) using the daughter-dam regressions for the parities 1 to 4 (21 538 data). Heritabilities go from to 0.01 to 0.12. Genetic and phenotypic correlations

between NB, NA and NW within each parity are very high, from 0.7 to 1. Genetic correlations between data of consecutive parities seem to be high, excepting those including the first litter, which go from 0.7 with the second to 0 with the fourth (for NB and NA). So it appears that data of first parity are a poor enough information about the genetic value of sows ; on another hand, taking into account the genetic correlation between parities could improve the efficiency of selection on litter size.

Crossbreeding of pigs : effects on growth, feed conversion and carcass

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Heterosis and maternal effects on daily gain, feed conversion ratio and carcass traits were investigated in the pig crossbreeding experiment. Three breeds of pigs were used : *Large White, Dutch Landrace,* and *Swedish Landrace.* Nine genetically different pig groups of purebreds and crossbreds had been examined. General heterosis effects were small and nonsignificant. Comparisons between pure breeds show small differences with *Dutch Landrace* to some extent exceeded two other breeds. Significant specific heterosis effects were found for daily gain, feed conversion ratio and fat thickness at shoulder. Average difference in reciprocal crosses or general maternal effects were significant for daily gain and feed conversion. Specific maternal effects were significant for all characters studied, with exception for carcass length.

Use of micro-computers in the field for estimating breeding values : a system to automatically collect all data handled on a population in a computer compatible way for further processing

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Definition and development of breeding programs require data as a basis of analysis. A micro computer system is described which supports and carries out the routine calculations that have to be done in a breeding program. All data handled are stored on floppy discs or cassettes. Input is checked for plausibility. Data transmission to a central computer is via a direct link between the micro computer and the host. As a by-product of index calculation for auction boars in Northern Germany data on 23 000 boars have been collected in 1980, which comprises the total male population on sale in this region and 40 p. 100 of all boars sold in the Federal Republic of Germany.

What can be gained by the BLUP procedure under various circumstances ?

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In recent years the Blup procedure has replaced older procedures like the Contemporary Comparison method and the Herdmate method. The two main differences between Blup and the older methods are : all factors considered are estimated simultaneously and available