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EFFECTS OF MAJOR GENES ON ANIMAL BREEDING STRATEGIES

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of insemination of the controls. All returns to service were reinseminated at observed œstrus. Ovarian activity was initiated in 26 (70 p. 100) of 37 non-cyclical cows of which 12 (32 p. 100), conceived to the synchronised ovulation. Mean pregnancy rates were 44.8 and 47.4 p. 100 for treated and controls respectively. Mean calving to conception intervals were 70.9 days (treated) and 78.6 days (control).

III. — Effets de loci individuels sur des performances zootechniques : les conséquences pour les stratégies d'élevage

FRÉQUENCES DE GÈNES IMPORTANTS DANS LES POPULATIONS PORCINES

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Après une brève discussion des problèmes méthodologiques que soulève l'estimation des fréquences géniques, quelques résultats de la littérature concernant les populations porcines sont passés en revue. Parmi les gènes à effet visible, l'accent est mis sur le locus *Hal* de sensibilité à l'halothane. Parmi les polymorphismes biochimiques, sont considérés 3 enzymes du globule rouge, 2 protéines du sérum, 2 systèmes de groupe sanguin et le complexe d'histocompatibilité SLA. Les fréquences géniques, qui constituent une information utile en sélection dans le cas des gènes « majeurs » ou « marqueurs », servent également dans le contrôle des filiations et permettent d'estimer les distances génétiques entre races, ainsi que le degré d'hétérozygotie des populations.

THE EFFECT OF A SINGLE LOCUS (*HALOTHANE*) ON VARIANCES OF AND CORRELATIONS AMONG QUANTITATIVE PRODUCTION TRAITS

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The expression of quantitative production traits can be seen as the sum of genotypic and environmental effects. Genetic effects are the sum of effects of single genes and interactions among those genes. If genes on one locus affect various quantitative traits (pleiotropic) correlation arises. The *Hal*-locus seems to be a pleiotropic locus affecting several quantitative production traits. The effect of this locus on variances of production traits in *Dutch Landrace* pigs and correlations among those traits has been described in the present paper. It was concluded that the *Hal*-locus is a "major-locus" for meat quality, backfat thickness and ham per cent, accounting for about 60, 20 and 25 p. 100 of the respective additive genetic variances. Further that differences in variances and correlations between different genotypic groups could be explained satisfactory by the pleiotropic effect of the *Hal*-locus.

EFFECTS OF MAJOR GENES ON ANIMAL BREEDING STRATEGIES

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A segregating major gene can have important effects on genetic parameters and on selection responses, and may lead to anomalies in the estimates among breeds and also within breeds over time. However, proving the existence of a major gene may be difficult unless its effects are quite large. Fortunately selection will make use of such a gene even if its effects are not

detected, or the locus identified (usually a fortuitous event). A major gene can only be exploited if different phenotypes or genotypes can be identified, and if performance data for all relevant economic traits are available on all genotypes. Breeding strategies to make best use of the gene can then be evaluated, and compared with progress by conventional selection methods.

HALOTHANEMPFINDLICHKEIT UND BEZIEHUNGEN ZUR FLEISCHLEISTUNG
VON DEN VATERRASSEN PIÉTRAIN UND BELGISCHE LANDRASSE

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Der Halothantest wurde bisher an einem Gesamtmaterial von 715 weiblichen Reinzucht-tieren der Mastprüfungsanstalt Achterwehr durchgeführt.

Der Anteil Hal. (+)-Tiere (Reaktionsstufe 4 + 5) liegt bei 87.2 p. 100 in der Herdbuch-population *Piétrain* und bei 80.2 p. 100 in der *Belgischen Landrasse*. Diese Tiere haben eine signifikant bessere Handelsklasseneinstufung, eine größere Fleischfläche, ein besseres Fleisch : Fett-Verhältnis und einen höheren log. CK-Wert als die Tiere mit der Halothan-Reaktion 1 + 2. Bei direkten Kriterien der Streßanfälligkeit (Göfo-Wert, Mast- und Transportverluste) besteht keine Beziehung zur Halothan-Reaktion.

Insgesamt betrachtet haben sich vergleichsweise geringe Leistungsunterschiede zwischen Hal. (+)- und Hal. (—)-Tieren ergeben.

Im Hinblick auf die Frage des genetischen Modells der Halothanreaktion ist zu beachten, daß die Leistungsunterschiede zwischen den Reaktionsstufen 1 und 5 zumeist höher ausfielen als zwischen den Reaktionsstufen 2 und 4.

Das bisherige Datenmaterial läßt unseres Erachtens nach keine endgültige Aussage über die Eignung des Halothan-Tests zur Reduzierung der Streßanfälligkeit in den untersuchten Vater-populationen zu.

PHENOTYPIC CORRELATION AMONG FATTENING PERFORMANCES AND MEAT QUALITY
OF HALOTHANE POSITIVE AND NEGATIVE KA-HYB HYBRID SWINE POPULATIONS

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The determination of stress-sensitivity of swine have been conducted since 1978 on male—lines belonging to the hybrid combinations of KA-HYB production system. According to our breeding program the selection on carcass traits are mainly carried out in father—lines. Therefore it is of great importance to analyse comprehensively the possible consequences of the selection work.

The conclusions drawn from the results the following:

1. The coefficients of correlation between carcass traits and meat quality were low in both halothane positive and negative pigs.
2. In spite of the low value and non significance of the correlation coefficients the tendency that asserts itself in the difference between halothane positive and negative groups, is remarkable. The correlations of the traits investigated were ten times as close in the stress-susceptible population than in the stress-resistant group.
3. As a consequence of the selection intended for the further improvement of daily gain of weight and rate of high priced cuts, the meat quality of the halothane positive population presumably will decrease, while in the halothane negative population the meat quality deterioration may not take place.