

- a selection pressure (selection intensity/generation interval ratio) of 35-45 points on the boars according to the magnitude of the line ;
- correct economic management depending on production of at least 100 litters per year ;
- less than 1 p. 100 increase in the inbreeding coefficient per generation.

**Utilization of a control herd
to estimate genetic change of fattening and carcass traits
in the *Large White* breed in France from 1965 to 1973.
A preliminary note**

Y. HOUIX, P. DANDO* and P. SELLIER

*Station de Génétique quantitative et appliquée, I. N. R. A., C. N. R. Z.,
78350 Jouy en Josas*

* *Domaines Expérimentaux de la Sapinière et de Galle,
Avord, 18800 Baugy*

No real control herd presently exists in France, but it seemed to be possible to consider as such an experimental herd kept at the « domaine de Galle » (I. N. R. A.) for another purpose. This *Large White* herd, established in 1965 with 10 boars and 120 sows, was primarily used for a selection experiment on litter size at birth. Being not subjected to any selection on growth and carcass traits, the Galle herd could be considered as a control for these production traits, supposed to be genetically independent of the litter size. Available data consisted of measurements on 60 gilts from the Galle herd, tested in competition with 112 contemporary gilts from 26 selection herds of the *Large White* breed. Comparisons were made within-testing period for 14 traits. Results definitely show a favourable genetic trend of *Large White* breed since 1965, both for rate and economy of gain and for most of body-composition traits. The estimated genetic gain is around 7.5 F per year. Another point of concern is the unfavourable evolution of meat quality, particularly of ultimate pH of muscle. The genetic assumptions underlying the validity of this estimation of genetic change are discussed. A statistical analysis of a larger number of data is now in progress.

**A comparison of the crossbred progeny
of *French Landrace* and *Pietrain* boars**

P. SELLIER

*Station de Génétique quantitative et appliquée, I. N. R. A., C. N. R. Z.,
78350 Jouy en Josas*

Both *French Landrace* and *Pietrain* boars were randomly used (by A. I.) on *Landrace* × *Large White* sows of commercial farms. Gilts and barrows sampled in resultant litters were sent to an experimental station where they were fed *ad libitum* (test started at 30 kg) and slaughtered at

around 100 kg. Complete data were recorded in 108 pigs from 28 litters sired by 8 *Landrace* boars (XL group) and 122 pigs from 30 litters sired by 7 *Pietrain* boars (XP group). A least-squares analysis was performed to obtain an estimate of the « breed of boar » effect for 24 traits. XL pigs prevailed over XP pigs in an average daily gain (821 vs 787 g; $P < 0.01$) but food conversion ratio, measured between 30 and 90 kg, was quite similar in the two groups (3.15 vs 3.16); average daily food consumption was lower by 6 p. 100 ($P < 0.01$) in *Pietrain* crosses. A highly significant difference (XL-XP) was found for dressing out percentage (-0.7 ± 0.2) carcass length ($+50 \pm 4$ mm), weight of ham (-0.12 ± 0.04 kg), weight of loin (-0.30 ± 0.08 kg). No difference between breeding groups was found in weight of backfat and average backfat thickness, but weight of leaf was much lower (-15 p. 100) in XP pigs. With respect to meat quality, assessed 24 hours *post mortem*, a general superiority of XL pigs as compared to XP pigs was evidenced, especially for water binding capacity and color of two muscles; XL pigs presented an advantage in pH of muscle *L. dorsi* (5.95 vs 5.39, $P < 0.05$) but there was no significant difference in pH of 3 muscles of the ham. Despite a higher fattening cost (+ 4F/pig) and because of a greater commercial value of the carcass (+ 8F/pig), the 3-way cross with *Pietrain* showed an advantage of about 4 F per pig as compared to the back cross with *French Landrace* in overall economic merit. The genetic signification of these differences between crossbreds is discussed in relation to an earlier comparison between pure *Landrace* and *Pietrain* gilts.

The improvement of pig meat quality through selection

L. OLLIVIER and D. POTIER

*Station de Génétique quantitative et appliquée, I. N. R. A., C. N. R. Z.,
78350 Jouy en Josas*

This paper discusses the choice and combination of selection criteria in order to improve meat quality in pigs. Several measurements on the live animal have been studied recently and have been shown to be more or less closely associated with meat quality. From a genetic point of view, a high selection intensity on such criteria can make for their low precision. The efficiency of individual selection depends on the product rh' , h' being the heritability of a live measurement and r being its genetic correlation with meat quality. Thus, with equal selection intensities, rh' must at least be equal to 0.35 in order that individual selection be as efficient as a 2 sib-test (on meat quality with 0.30 as heritability and 0.25 as phenotypic correlation between full-sibs). But, when selection is 6 times as intense on individual performance as with sib or combined selection (which is the present situation in France), the lower limit of rh' , which makes individual selection as efficient as the other 2 methods, becomes 0.06.

When the aim is simultaneously to improve feed efficiency, carcass and meat quality, the relative weight of each of these characters must be established. In French conditions of 1974, a standard-deviation of meat quality is worth 10 F., through its incidence on fattening and transport losses and on the yield of industrial transformations. For fattening cost and carcass value, the standard-deviations are both worth around 20 F. With those economic weights, selection indices for combined testing (with 2 sibs) are 20 p. 100 more efficient than individual selection indices, in terms of correlation between index and aggregate genetic value. The relative values of these correlations are practically independant of the genetic parameters of the live measurement predicting