

III. — CARCASS AND MEAT QUALITY

Change in the anatomical composition of female pigs of the breeds: *Landrace Français, Landrace Belge* and *Pietrain*. Consequences on the choice of the production methods

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Change in the anatomical composition of female pigs of 3 genetic types : *Landrace Français*, *Landrace Belge* and *Pietrain* was studied by successive slaughterings at 40, 60, 80 and 100 kg live weight. The parameters for the estimation of fatness or leanness of the carcasses were examined at different growth stages (42 pigs dissected) and furthermore defined more accurately at the commercial stage of 95 kg (48 pigs dissected). Change in the anatomical character of the dorso-lombar section (13th, 14th rib) was examined more particularly.

The first series of results deals with the tissular growth characteristics of the 3 breeds and the eventual incidence upon the choice of production methods.

— In *common breeds*, as the type *Landrace Français*, the degree of fatness increases at two stages, on the one hand before 60 kg (+ 100 p. 100) when muscular growth is intense, and on the other, after 80 kg (+ 45 p. 100) when muscular growth slows down. The latter is maximum between 60 and 80 kg, whereafter it noticeably decreases. It is therefore important to reduce the excessive fatness at the beginning of growth by early and progressive restricted feeding (DESMOULIN *and al.*, 1971-1973) to prevent the restrictions from being too severe during the finishing period. At 60 kg live weight, the « pre-fattening » of the animal is definitive and severe restriction may limit the development of lean masses.

— In *hypermuscled breeds*, the initial period before 60 kg corresponds to an important differentiation of the phases of muscular growth : isometric as compared to the carcass weight in *Belgian Landrace* pigs and « explosive » in the *Pietrain* pig when the relative increase exceeds that of the carcass weight. At 60 kg, the mean value per muscle content represents 63 p. 100 in the *Belgian Landrace* pig and reaches 70 p. 100 in the *Pietrain* pig. Thereafter, the muscular development remains isometric up to 100 kg in the *Belgian Landrace*, whereas it undergoes two successive reductions in the *Pietrain* pig after 60 kg and after 80 kg live weight.

The fatness of the carcasses highly increases between 60 and 80 kg live weight ; after 80 kg, the development of fat is more limited in the *Belgian Landrace* pig than in the *Pietrain* pig. *Ad libitum* feeding of these two types of pigs remains compatible with obtention of excellent and even exceptional carcass qualities, although final fatness results from very distinct phases of

depositions. However, the quality defects of the hypertrophied musculature, more marked in the *Pietrain* than in the *Belgian Landrace* (DUMONT, 1974) might necessitate a particular study of the nutritional conditions during the very early differentiation of the 2 types of musculatures.

— The parameters for the estimation of the degrees of fatness or leanness during growth are variable according to breeds when considering the thicknesses and areas of fat and muscle measured on the dorso-lumbar cutting (13th and 14th rib). *Checking of fatness at 60 kg and of eye muscle areas at 80 kg* would give optimum estimations of the anatomical composition according to breeds. On the other hand, at slaughter, the loin eye area represents a poor estimation of the degree of leanness in the breeds : *Landrace Français* (+ 0.54) or *Landrace Belge* (+ 0.69), whereas this estimation is accurate in the *Pietrain* breed (+ 0.99). The loin eye thickness represents a measure of the varying degree of compactness of the lean mass.

At the commercial stage of 95 kg, classification criteria might be based on the provisional value of the ratio $\frac{\text{loin}}{\text{backfat}}$ for the estimation of the ratio $\frac{\text{muscle}}{\text{fat}}$ in the different breeds ($r = 0.93$ to 0.95). Forecasting of the lean content of the carcass by this criterion $\left(\frac{\text{loin}}{\text{backfat}}\right)$, as in the case of the densimetric classification, however leads to consideration of the grades related to $\frac{\text{the muscle}}{\text{bone}}$ ratios of the different breeds. *A special codification of carcasses from hypermuscled breeds* appears to be necessary for objectively estimating the lean percentage by conformation scores (grading of the E. E. C.).

Comparative studies of ham characteristics in *Landrace Français*, *Landrace Belge* and *Pietrain* pigs

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Anatomical composition of ham (percentages of muscle, fat, bone and skin ; distribution of different muscles) has been studied in 16 females of the following breeds : *Landrace Français* (*LF*), *Landrace Belge* (*LB*) and *Pietrain* (*P*). The average weight of ham in each breed was 8 169 g for *LF*, 8 754 g for *LB* and 8 815 g for *P*. A significant effect of the breed was found for percentage of muscle, bone, external fat. The commercially edible part of the ham was 69,08 p. 100 in *LF*, 74,62 p. 100 in *P* and 74,82 p. 100 in *LB*. The percentage of the most interesting muscles (adductor, semitendinosus, semimembranosus, biceps femoris) was higher in *LB* and *P* than *LF*. Meat characteristics (color, pH, water holding capacity) were measured in 8 locations throughout the ham. *Pietrain* pigs had lower pH values and water holding capacities than *LF* and *LB*. Within each breed a rather large variation was found for all characteristics studied. Shear forces of semimembranosus and biceps femoris were not different between the three breeds.

Landrace Belge seemed to be the best breed of the 3 for ham processing. It is also suggested that muscular hypertrophy does not affect in the same way the *Landrace Belge* and the *Pietrain* breed, which could support the hypothesis that muscular hypertrophy is not governed by the same genetic factors in both breeds.
