

## II. — CARCASS AND MEAT QUALITY

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### Comparison between three methods for measurement of the back fat thickness in the pig

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Three methods used for measuring backfat thickness were compared: ultra-sound measurement on the live animal, endoscopic measurement and measurement on the split of the carcasses. The results showed a good correlation between the figures obtained with the different techniques: the correlation coefficients were between 0.64 and 0.81. However, the values obtained depended on the method used. The ultra-sound measurement seems to underestimate the back fat thickness and a new standardization of the apparatus has to be considered.

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### Meat production by entire or castrated male pigs of the Pietrain or Belgian Landrace types

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Seventy two entire or castrated male pigs (Pietrain or Belgian Landrace) were produced and compared in order to show the decrease of the lean meat yield in castrated males and that of the meat quality in entire males. The main results were the following:

— The castrated males fed *ad libitum* consumed 25-40 kg food more than the entire males for a similar growth. Hyperphagia was more marked in the Pietrain castrates (+ 18 p. 100) and the feed efficiency was lower (— 17 p. 100) in the castrates of the Belgian Landrace. At a weight of 90 kg the muscle content of the carcass was reduced by 7 p. 100. At the heavy stage (100-110 kg), the increase of fatness in the Pietrain castrated males (+ 15 p. 100) was much higher than in the Belgian Landrace (+ 6,8 p. 100). In consequence, the differences due to selection between the male lines are counterbalanced after castration.

The meat quality of the entire or castrated males was estimated at two levels. The very pronounced muscle defects in the Pietrain breed were characterized by the lower pH-values ( $\leq 5.5$ ) reached within 45 mn *post mortem*. These within breed defects also affected the castrated males. The boar taint defects due to storage of androstenone in the fat of the entire males were very frequent in the Pietrain animals from the weight of 90 kg (28 to 59 p. 100 of the judgments according to tests). In the Belgian Landrace only a minority (4 to 10 p. 100 of the judgments) was involved at the light stage (90 kg). However the frequency of defects increased very significantly at the heavy stage (10 to 35 p. 100 of the judgments).

The risks of boar taint in fresh pork being very high in the Pietrain, castration should be maintained in this breed. As the optimal slaughter weight may be related to differences in the precocity of tissue development, the application of castration or not depends essentially on the possibilities of using male pig meat.

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### **Influence of hypermuscularity and castration on the anatomical composition of ham in male pigs**

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The influence of both the genetic type (hypermuscularity) and castration on the anatomical composition of the hind limbs of male pigs was studied in Pietrain and Belgian Landrace breeds by considering 17 Pietrain (10 entire males and 7 castrated) and 16 Belgian Landrace pigs (8 entire males and 8 castrated). Statistical analysis of results was entirely based on multivariate analysis; two types of analysis were performed, the analysis of centred data and the  $D^2$  of Mahalanobis.

Both types of analysis gave concordant informations and showed a significant effect of breed and sex.

As regards the overall tissue composition the castrated males were characterized by a higher covering fat percentage. Differences in muscle distribution were small and concerned mainly the anterior crural part.

Within each sexual type there were differences between breeds as for the muscle/bone ratio (higher in Pietrain and thus the most hypermuscled of both types) and the muscle distribution (smaller development of *Rectus femoris* and *Gastrocnemius pars externa* muscles, higher development of *Adductor* muscle in Pietrain).

In male pigs, the muscular hypertrophy did not affect in the same way the Pietrain and Belgian Landrace breeds each one showing different muscle distributions.

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### **Distribution of the Longissimus dorsi muscle in the dorso-lumbar area of the pig**

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The distribution of the mass of Longissimus dorsi muscle (LD) along the backbone was studied in pigs of normal (Large-White and Danish type) and hypertrophied conformation (Pietrain breed). In each conformation group animals with different numbers of thoracic and lumbar vertebrae were considered, i.e. 20 ( $N = 6$ ) and 21 ( $N = 7$ ) vertebrae in hypertrophied animals and 21 ( $N = 9$ ) and 22 ( $N = 10$ ) vertebrae in normal animals.

At the same carcass weight (half carcass of 35-36 kg) there were highly significant differences in the average linear load of the backbone with LD muscle.

The load was higher in hypertrophied pigs ( $35.5 \text{ g}\cdot\text{cm}^{-1}$ ) than in normal ones ( $26.3 \text{ g}\cdot\text{cm}^{-1}$ ).