traits under study were much more affected by breed than by halothane phenotype. Regarding breed differences, the results may be summarized as follows :

1 — The LW breed, free from Halothane sensitivity, exhibits a relatively slow pH fall and gives meat with the most satisfying technological qualities.

2 — The P breed combines a low pH1 (due to the high incidence of HP animals) with a rather low ultimate pH (presumably due to a slightly higher muscle glycolytic potential). Since the post-mortem acidification of muscle tissue takes place at a fast rate and has a relatively large extent, the meat from P pigs presents the worst technological qualities.

3 — In the BL breed, the unfavorable effects of halothane sensitivity are counterbalanced to some extent by the maintaining of ultimate pH at a higher level than in the two other breeds in most muscles studied : BL pigs are consequently intermediate between LW and P in meat quality.

## Genetic parameters of some meat quality traits in the Large-White, French Landrace and Belgian Landrace pig breeds

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This analysis deals with data collected between 1974 and 1986 in central progeny-test stations on 8867 Large-White (LW), 4098 French Landrace (FL) and 2840 Belgian Landrace (BL) female pigs, slaughtered at 100 kg liveweight. The meat quality traits involved in this study are : subjective score (SS), ultimate pH of the *Adductor femoris* muscle (pHu), reflectance of the *Gluteus superficialis* muscle (Ref), water holding capacity (imbibition time) of the *Biceps femoris* muscle (WHC) and meat quality index (MQI) combining pHu, Ref and WHC and predicting the technological yield of cooked « Paris ham » processing. Meat quality traits are expressed as deviations from the « slaughter day » average whereas growth and body composition traits are expressed as deviations from the « batch » average. Heritabilities (h2) and genetic correlations (rA) are estimated from the sire variance and covariance components, separately for each breed (2483, 1123 and 493 sires in LW, FL and BL breeds, respectively). Genetic correlations between average daily gain (ADG) and meat quality traits are generally unfavorable in the LW breed (e.g. $rA = -0.27 \pm 0.09$ for SS and ADG, and $rA = -0.32 \pm 0.13$ for MQI and ADG), whereas they are of much lower magnitude in the FL and the BL breeds. Genetic correlations between estimated carcass lean content (ECLC) and meat quality traits are mostly unfavorable : the genetic antagonism between meat quantity and meat quality appears to be stronger in the BL than in the LW breed (e.g. $rA = -0.53 \pm 0.20$ vs $rA = -0.32 \pm 0.08$ for SS and ECLC, and $rA = -0.28 \pm 0.20$ vs $rA = -0.16 \pm 0.10$ for MQI and ECLC).

## Lipids and qualities of pork adipose and muscular tissues. Factors of variation. 1rst Part : Lipids and qualities of adipose tissue. Factors of variation

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The three main components of fatty tissues are : water, proteins and lipids. The latter, because of their effect on quality, are generally divided, into glycerol fatty acid esters and the unsaponifiable fraction with pigments and steroids.

Firmness of adipose tissues is of primary importance. During the last few years, several factors (selection, slaughter of light pigs, feeding) have led to a deterioration in this quality. Water and C18:2 contents on the one hand, protein and C18:0 contents on the other hand are respectively and positively correlated with firmness. Beside hem pigments, carotenoids are involved in the colour of these tissues. Flavour is affected by the presence of steroids and of 5α-androstenone, in particular. It is also affected by some fat-soluble components. The processing ability of adipose tissues into dry products requires a high firmness, i.e. tissues with a high protein and saturated fatty acid content and a low water content.

In animal production, two factors have a major influence on tissue composition : feeding, since the C18:2 content may vary from 8-32 p. 100 according to the nature of the diet and second, the breed, since adipose tissues issued from double-muscled breeds are characterized by a high water content (up to 30 p. 100 in backfat). Processed products include 20-50 p. 100 fatty tissues. The particle size of fat in ground meat products vary from several mm to some microns according as to whether there are adipocyte clusters or lipids liberated from their membrane. Their absorption in the digestive transit is thus more or less easy. Beside their high lipid content, meat products also contain cholesterol in rather large amounts.

## Lipids and qualities of pork adipose and muscular tissues. Factors of variation. 2nd Part : Lipids and qualities of muscle tissues. Factors of variation

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It has been established that lipids are involved in the determinism of meat quality. They have an effect on the aspect, colour, tenderness, juiciness and flavour of the meat.

As regards the latter quality, a basal quantity of lipids is required to the development of the species specific flavour. Lipids have also an effect on the processing ability. Processing of meat into high quality dry products require a higher lipid content of meat than for cooked products.

The breed seems to be the determining factor affecting the quantities and nature of lipids deposited in the muscle. At equal slaughter weights, the *Longissimus dorsi* from animals of the double-muscled breed contains more lipids than that of dual-purpose breeds (1.7 versus 1.2 g/ 100 g of meat). Red muscles have also a higher lipid content than white ones. The other factors of variation are less important.

From a nutritional point of view, pork is disregarded by most nutritionists. As a matter of fact, in most cases the lipid supply per 100 g of crude pork does not exceed 1.5 to 2.0 g, i.e. 1/50 of the daily amount recommended in most diets. The P/S ratio (polyunsaturated fatty acids to saturated fatty acids) ranges around 0.3 and 0.4 which ranks pork lipids after beef and poultry meat in terms of risk of atherosclerosis occurrence. Moreover, the cholesterol supply per 100 g of pork does not exceed 50 mg. By contrast, meat products have a high lipid content : fatty acids and cholesterol.