

CRITERIA OF CARCASS EVALUATION FROM DISSECTION OF CUTS
OR THEIR SPECIFIC GRAVITY DETERMINATION

B. DESMOULIN

Institut National de la Recherche Agronomique
C.N.R.Z. - Jouy-en-Josas - 78 FRANCE

Direct measurements define accuracy of the indirect Methods of estimating the tissue components of the carcass (HARRINGTON, 1958).

I) The significance of the weights of the carcass fractions, after cutting by the French method, was examined by dissecting the muscles, fats, bones and skin inside each cut. 40 half-carcasses of Large White pigs, slaughtered between 98 and 102 kg, were studied in this way. The following table gives the main results (DESMOULIN, 1969).

Correlation coefficients between the weights of cuts and their tissue characteristics or those of the whole carcass.

Weights	Ham	Loin	Breast	Fore-breast	Picnic	Backfat	Flare Fat	Backfat thickness
Muscle of cut	+ 0,75	+ 0,93	+ 0,26	+ 0,44	+ 0,80	-	-	-
fat of cut	- 0,20	- 0,15	+ 0,75	+ 0,51	+ 0,29	0,99	1,00	-
Whole muscle of 1/2 carcass	+ 0,59	+ 0,83	- 0,29	+ 0,23	+ 0,34	- 0,73	- 0,81	- 0,73
Whole fat of 1/2 carcass	- 0,40	- 0,77	+ 0,40	- 0,12	- 0,36	+ 0,82	- 0,82	+ 0,81

- by means of the LOIN and the HAM it is possible to estimate the total muscular mass of the carcass, with residual variation (1-r²) of 31 % and 65 % respectively. The weight of ham, which is one of the criteria for pig selection, thus accounts for variations in total muscle development (r = + 0,59) with as much lack of precision as it does for variations in the total fats (r = - 0,40). Only the weight of LOIN can be considered to be an important criterium of the lean body mass.

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- the backfat thickness, like the weights of the exclusively fatty cuts, backfat and flare-fat, allow the total mass of fat on the carcass to be estimated with residual variations about 33 %. In the present work, the amount of fat in the remaining fractions, breast and fore-breast is also closely linked to the total fat ($r = + 0,81$). Since the weights of these fractions does not give an exact indication of their composition, the best criterium explaining the total adiposity is concealed. The weight of backfat thus remains the best method for judging the total amount of fat on the carcass after cutting.

The separation of the LOIN and the backfat is the only useful operation for estimating the state of fattening of the pig carcass. The ratio of the grass weight of the loin to that of the backfat may represent the best synthesis for the estimation of the relationships between the lean and the fatty components in the breed of pig studied. These results have been confirmed by L. OLLIVIER (1970) according to the progeny-testing of 4172 Large White pigs between 1953 and 1966.

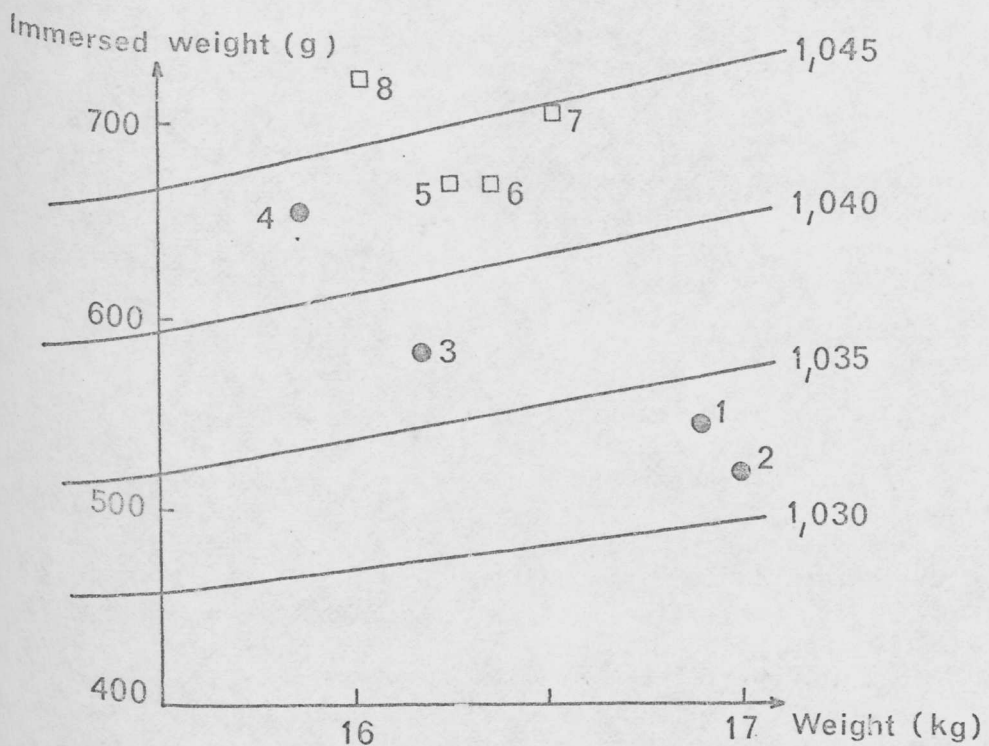
II) The determination of specific gravity has been used as an Indirect method for estimating the relationships between the lean body mass and the fat body mass inside the various cuts of the carcass (DESMOULIN, 1970).

This study deals with male castrated pigs submitted to severe nutritional restrictions (1 2 3 4) and female pigs submitted to less strict nutritional limitations (5 6 7 8) whose weight at slaughter was the same (98-102 kg). The immersed weights of the "rein du porc" i.e. LOIN + BACKFAT, were determined (± 1 g) in water maintained at a constant temperature of 4 to 6°C. The following table (DESMOULIN et BOURDON, 1971) gives the mean of the results obtained on groups of 7 pigs per treatment. The composition of the "rein du porc" after separation of the LOIN and Backfat is compared with backfat thickness or the immersed weights. (DIAGRAMS)

SEX	CASTRATED MALES				FEMALES				SIGN.
	1	2	3	4	5	6	7	8	
Nutritional level									CV
1/2 carcass (kg)	37,0	36,9	35,8	36,0	36,3	36,9	36,5	36,1	
Backfat thickness (mm)	31,1 _a	29,2 _{ab}	25,1 _{bc}	22,6 _c	24,6 _{bc}	25,8 _{bc}	24,5 _{bc}	21,8 _c	13,8
Weights LOIN (g)	10.688 _b	10.673 _b	10.697 _b	10.957 _{ab}	11.186 _{ab}	11.094 _{ab}	11.501 _a	11.501 _a	3,9
BACKFAT (g)	6.221 _a	6.236 _a	5.473 _b	4.906 _b	5.066 _b	5.215 _b	5.003 _b	4.553 _b	11,2
P ⁱ : immersed weight of "rein"	545 _{cd}	521 _d	591 _{dbc}	658 _{abc}	668 _{ab}	668 _{ab}	705 _a	726 _a	11,8
Class of density	1,030 - 1,035		1,035-1,040		1,040 - 1,045		1,045 - 1,050		

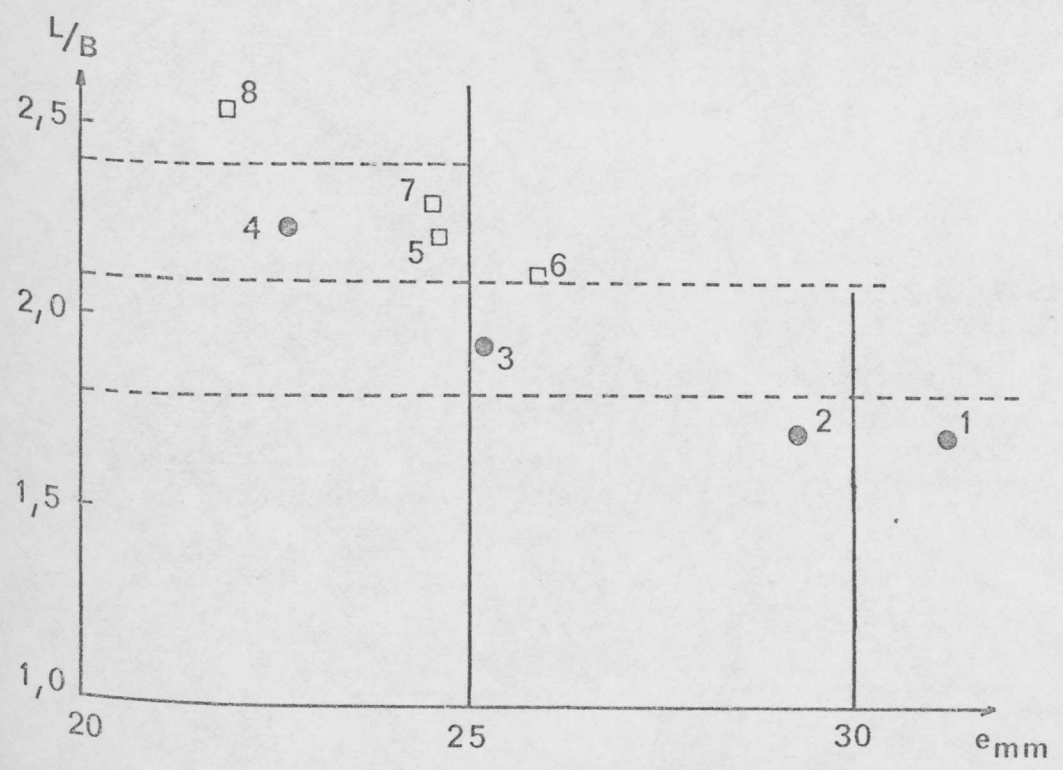
The values given with the same index letter do not differ significantly at the threshold $P < 0,05$

SPECIFIC GRAVITY OF "LOIN + BACKFAT"
(56 PIGS 100 kg)



LOIN / BACK FAT AND BACKFAT THICKNESS

Sex	Feeding Level			
	1	2	3	4
♂	1	2	3	4
♀	5	6	7	8



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- in the treatment 8 compared with treatment 1, the immersed weight of the "rein" increased by 33 % while the weight of loin increased by 8 % and that of the backfat decreased by 27 %. The selection influence of sex on the development of the lean body mass is combined into the variation of the immersed weights, while neither the backfat thickness nor the weight of these fats give an accurate estimation of the lean body mass just under the adipose masses.

Therefore, densimetry is also a method for studying the total allometry of tissue composition, and not only an indirect method for estimating variations in the adiposity of carcasses. The classification of carcasses only on the criteria of adiposity should be completed with criteria taking into account simultaneously the development of lean body mass.

CONCLUSION

The dissection of the different fractions of the pig's carcass, after cutting by the French method gives a precise indication of the significance of the gross weight of the various cuts as an indirect criteria of the state of fattening of the whole carcass.

The ratio of the gross weight of the loin to that of the backfat may represent the best useful criterium after the cutting process.

The specific gravity determination defines the variation in composition of LOIN + BACKFAT before the separation of the lean and the fat body masses and allows a critical study of the only criteria of adiposity.

These various methods of analysis (and synthesis) should make the choice of criteria for pig selection more accurate; the application concerns in particular the checking of the carcasse for progeny-testing.

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