

COMPARISON OF EVALUATION RESULTS OF PORCINE CARCASS MEATINESS OBTAINED WITH THE ASSISTANCE OF DIFFERENT METHODS OF FULL AND SIMPLIFIED DISSECTION

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Introduction

Full dissection, which can be defined as the mechanical separation of the basic tissue components of all half-carcass cuts - with the exception of its peripheral parts - is still considered as the most precise method of determination of the tissue composition of a porcine carcass. In Poland, detailed methodology of full dissection was first published in 1957 (Kielanowski *et al.*, 1957). The method came to be known as the SKURTCh method which is an acronym formed from the name - Stacja Kontroli Użytkowości Rzeźnej Trzody Chlewnej (Control Station of Swine Slaughter Performance) and is still used in experiments even today. In Germany, another method of detailed dissection was elaborated known as the DLG method. After some modifications introduced in 1980s, the above method was adopted as the procedure to be applied in all EU member states (Borzuta 1998). Due to the considerable labour investment as well as the high costs of the full dissection, several methods of simplified dissection were elaborated in which the content of meat or fat is assessed with the assistance of regression equations. These methods are also known as reference methods. Among the best known methods of this type worth mentioning here are the SKURTCh method (Różycki, 1996) and the Walstra and Merkus (1996) method which was adopted as the reference method in all EU countries (Commission Regulation EC No 3127/1994).

Materials and Methods

The experiment was carried out on 30 pork carcasses (15 gilts and 15 hogs) randomly selected on the slaughter line in different meat processing plants. The after slaughter processing of carcasses was carried out in accordance with the method adopted in the meat industry but the kidney fat was left with the carcasses. After chilling, each half carcass was weighed separately to within 100g accuracy. Then the left half-carcass was dissected following the DLG methodology (Borzuta, 1998), whereas the right half carcass - according to the SKURTCh method (Kielanowski *et al.*, 1957). In addition, the obtained results were also used to calculate the meat content in the carcass according to the equations designed for the simplified methods, *i.e.* the method of Walstra and Merkus (Walstra and Merkus 1996) as well as the SKURTCh method (Różycki, 1996). In the case of the first method, data from the dissection of the left half-carcass were used, while in the case of the second one - those obtained from the right half-carcass. The obtained research results were elaborated statistically, assessing the significance of differences with the aid of the correlated pair method (Snedecor, 1956).

Results and Discussion

It is evident from Table 1 that the content of meat obtained from the dissection by the SKURTCh method is smaller than when the DLG method was applied (47.32 and 48.60%, respectively). This fact can be explained by different lines of cutting the carcass into cuts, different number of cuts subjected to dissection (*e.g.* in the case of the Polish method, the head is not dissected), different treatment of the carcass before dissection (absence of kidney fat in the carcass in the DLG method) as well as different tissue components obtained from the dissections (in the SKURTCh method, membranes and tendons are not separated). Furthermore, the above-mentioned factors also contributed to significant differences in the content of skin and bones (in the SKURTCh method, the whole head is included in bones) between the compared methods of full dissection. On the other hand, no significant differences were found in the content of dissection fat. The performed investigations also showed that meatiness assessed using the two simplified methods did not differ significantly from the results obtained using the DLG full dissection and was significantly higher in comparison with the full SKURTCh dissection method.

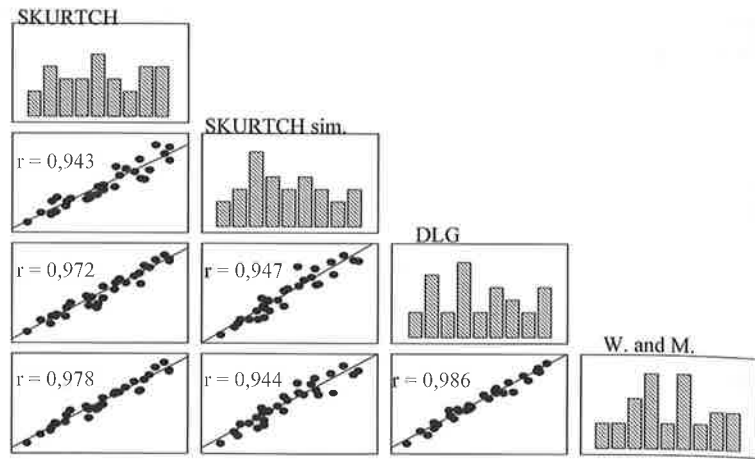


Figure 1: Correlations between the meat content in the carcass obtained using different dissection methods.

Table 1: Mean dissection results of carcasses obtained using different methods (%).

Tissue elements (%)	Full dissection		Full dissection SKURTCH		Simplified dissection SKURTCH		Simplified dissection of Walstra and Merkus	
	\bar{x}	sd	\bar{x}	sd	\bar{x}	SD	\bar{x}	sd
Meat	48.60 ^B	5.86	47.32 ^{ACD}	5.97	48.23 ^B	6.21	48.60 ^B	6.02
Fat	28.43	6.65	28.33	6.98	-	-	-	-
Bones	13.90 ^B	1.09	19.08 ^A	1.22	-	-	-	-
Skin	6.26 ^B	0.92	4.80 ^A	0.89	-	-	-	-
membranes and tendons	2.21	0.45	-	-	-	-	-	-

A – B – the difference is statistically significant at $P \leq 0.01$

The results of meatiness assessment determined with the assistance of the examined methods were characterised by a very high correlation coefficient (Figure 1). However, the highest correlation was observed between the DLG method and the simplified method of Walstra and Merkus with $r = 0.986$. In combination with the fact that the average meatiness determined using these two methods was identical, it points to a very precise match of the method currently in force in the EU to the full carcass dissection with the aid of the DLG method.

Conclusions

The content of meat determined on the basis of full dissection carried out according to the Polish SKURTCH method differed, on average, by approximately 1.28% when compared with the DLG method of dissection. The main cause of these differences was the inclusion, in the case of the SKURTCH method, of the kidney fat to the carcass weight and, at the same time, the exclusion of the head which was treated as part of bones. The performed investigations showed that, out of the examined methods of simplified dissection, the simplified method of Walstra and Merkus revealed higher compliance with the content of meat in the carcass determined using the full dissection method of DLG.

References

- Borzuta K. (1998). Studies on usefulness of different methods of meatiness evaluation for the classification of porcine carcasses in the Europ system. *Annals of the Meat and Fat Research Institute*, vol. XXXV/2, 1-84
- Kielanowski J., Osińska Z. and Chomyszyn W. (1957). *Sprawozdanie z działalności Stacji Kontroli Użytkowości Różnej Trzody Chlewnej za lata 1951 – 1954 i za rok 1955*, PWRiL Warszawa
- Różycki M. (1996). *Raport on pig breeding in Poland in 1995*, XVI, 69-82
- Snedecor G.W. (1956). *Statistical methods*. Er.5. The Iowa State Press.
- Walstra P. and Merkus G.S.M. (1996). Procedure for assessment of the lean meat percentage as a consequence of the new UE reference dissection method in pig carcass classification - Raport ID-DLO 96.014, 1-22 - Inst. for Animal Sci. and Health, Lelystad.