COMPARATIVE INVESTIGATION OF PIG CARCASS MEATNESS ASESSMENT WITH DLG AND WALSTRA & MERKUS METHOD

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Introduction

Investigations on the morphological composition of pig carcasses have already been conducted for over 140 years. First results from this field were published in 1859 (Osińska 1971, McMeekan 1941), while objective classification of pig carcasses dates back to 1940 and is associated with the evaluation of bacon (Borzuta 1998). The most accurate method of determination of tissue composition is full dissection, i.e. their physical isolation and weighing. That is why the Council of the European Union developed a common classification scale, which is based on the assessment of musculature by means of a special apparatus modelled according to the full dissection by the DLG method (2967/85/EEC). However, because this procedure is very time-consuming, in 1994 a simplified method of Walstra and Merkus was allowed to be used (3127/EEC). The accuracy of this method is often questioned as it can be affected by the type of the examined carcasses, especially by their genetic origin.

Objective

The objective of this study was to determine the assessment accuracy of meat content using the method of Walstra and Merkus in pig carcasses selected on slaughter lines in Polish slaughterhouses.

Methods

Investigations were carried out on 30 pig carcasses derived mainly from fatteners of large white and landrace breeds and their crosses. Half of the experimental material came from sows and the other half - from hogs.

After chilling, left half-carcasses were divided and dissected according to DLG methodology (Walstra and Merkus 1996, Borzuta and Pospiech 1997) obtaining 21 cuts. Next all parts (with the exception of the front and hind leg) were subjected to dissection isolating: meat, fat, bones, tendons and glands. Meat content in half carcasses was determined on the basis of measurement of weight of pure meat obtained from the full DLG dissection and using the method of Walstra and Merkus (1996) based on dissection of 5 cuts, i.e. leg, shoulder, belly, loin and tenderloin. In the two methods applied here, different lines of separation of the leg from the carcass were used (in the Walstra and Merkus method, the leg is shorter by one lumbar vertebra).

The obtained material was subjected to statistical analysis allowing to establish: correlation coefficient, estimation error and significance of differences between means.

Results and discussion

Dissection results of half-carcasses obtained using the two compared methods are presented in Table 1 and in Figures 1 and 2.

Table 1. Results of measurements of meat content in pig half-carcasses of individual dissections

Statistical trait	DLG method	Walstra & Merkus method	Difference	RSD
Mean, %	48,70	48,6	0,10	-
Standard deviation	5,85	6,01	0,16	1,01
Minimum, %	37,04	38,23	1,19	-
Maximum, %	59,61	58,91	0,70	-

The difference in meat content in the examined half-carcasses of domestic pigs determined by means of the two compared m amounted to only 0.10% and turned out to be statistically non-significant (P = 0.947). The obtained estimation error of meatiness by Wal Merkus method was low (RSD = 1.01) and differences between minimal and maximal values were also relatively small (approximat meatiness). The correlation coefficient between meat content determined using the two methods turned out to be very high r = 0.986 ($P \leq 0.$ evident from Fig.2, the obtained regression equation for the examined correlation is characterised by a high accuracy (R^2 = 0.972). Th tangent of the trend line turned out to be close to one (0.958), which means that the increment of both variables derived from the ex measurement methods is uniform.

Similar results of investigations are quoted by Blicharski et al. (2000) who measured 29 meat half-carcasses and obtained the fo comparative data: DLG method - 51.9% meat, Walstra and Merkus method - 51.6% meat (minimal content - 40.1% and 39.8%, respec maximal content - 60.4% and 61.1%, respectively).

Conclusions

1. A high correlation was found between results of determination of carcass meatiness between the DLG dissection method and the sim method of Walstra and Merkus (r=0,986).
2. The method of Walstra and Merkus is a good simplified method to be used for calibration of classification equipment of pig carca Polish conditions.

Fig. 1. Graphic description of pig carcass meatness determined occording to different methods of dissection

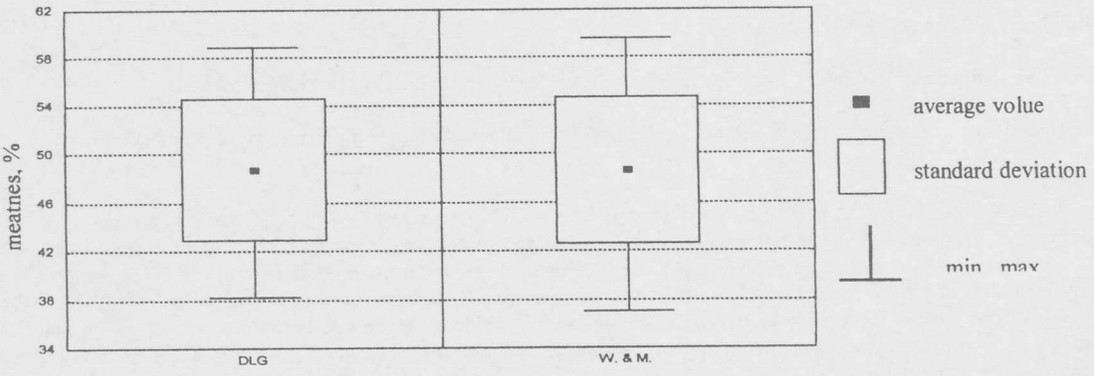
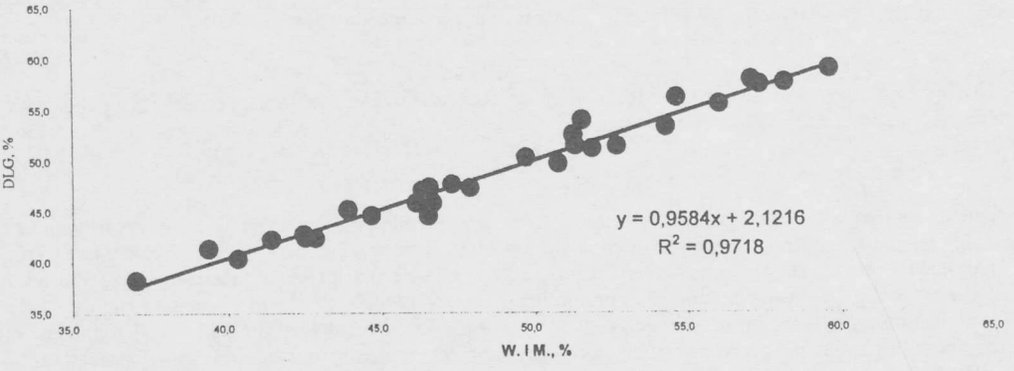


Fig. 2. Relationship betwen carcass meatnes determined occording to DLG and Walstra & Merkus methods



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