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Efficiency of measurements taken at the slaughter line for carcass classification by meat quality

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This study was carried out to evaluate the effectiveness of carcass classification by drip loss and marbling using measurements taken early post-mortem. A total of 747 pig carcasses from two slaughterhouses were evaluated. Carcasses were from seven genotypes and three genders (females, castrated males and immunocastrated males), originating from 27 pig farms. Sampling was defined to address major genotypes of pigs produced in the agricultural industry where the samples were collected. The classification variables for each meat quality attribute were generated, adopting arbitrary values for the definition of the categories for carcass classification: 1) Drip loss of loin: Normal if 0<drip loss≤6, Exudative if drip loss>6; 2) Drip loss of ham: Normal if 0<drip loss≤4, Exudative if drip loss>4; 3) Marbling: Undesirable if marbling≤1, Desirable if marbling>1. The variables used to build the discriminant functions and the regression equations for the classification of carcasses within each attribute were hot carcass weight (HCW), backfat thickness (BF), loin depth (LD), pH (pH45L) and temperature (Temp45L) 45 min from the loin and pH (pH45H) and temperature (Temp45H) 45 min from the ham. The following discriminant functions were obtained for carcass classification by drip loss: Normal = -714.067 + (0.428*HCW) + (0.406*BF) + (0.816*LD) + (194.621*pH45L) + (3.061*Temp45L); Exudative = -687.323 + (0.400*HCW) + (0.388*BF) + (0.906*LD) + (188.046*pH45L) + (3.507*Temp45L) for drip loss of loin and Normal = -596.614 + (0.357*HCW) + (0.485*BF) + (0.918*LD) + (162.634*pH45H) + (1.619*Temp45H); Exudative = -581.560 + (0.340*HCW) + (0.494*BF) + (0.954*LD) + (158.965*pH45H) + (1.882*Temp45H) for drip loss of ham. The estimates of the regression parameters for carcass classification by drip loss were: E(Y) = -54.644 – (0.019*HCW) – (0.730*BF) + (0.070*LD) + (7.629*pH45L) + (4.213*Temp45L) – (0.608*pH45L*Temp45L) + (0.116*BT*pH45L) with R^2 = 0.66, for drip loss of loin and E(Y) = -22.109 + (0.046*HCW) + (0.014*LD) + (2.368*pH45H) + (1.783*Temp45H) + (0.215*pH45H*Temp45H) – (0.002*HCW*Temp45H) with R^2 = 0.35 for drip loss of ham. It was not possible to adjust a regression equation for predicting marbling. For loin drip loss, the global concordance of carcasses reclassification at Normal and Exudative classes was 87.3% using the discriminant functions and 85.4% using the adjusted regression equations. For ham drip loss, the global concordance of carcasses reclassification at Normal and Exudative classes was 76.8% and 75.8% using discriminant functions and adjusted regression equations, respectively. For marbling, the global concordance for carcass reclassification at Desirable and Undesirable classes was 67.2% using discriminant functions. It was concluded that, it is possible to classify carcasses by meat quality using only measurements taken at the slaughter line. The attribute with better potential for carcass classification is drip loss of loin. The discriminant functions and the adjusted regression equations showed similar consistency for carcass classification in the category of drip loss of loin, but with the use of the regression equations it was possible to increase the degree of accuracy of carcass reclassification in the category of greatest interest, through the use of different thresholds for reclassification of carcasses.

Keywords: adding value, drip loss, marbling, pigs