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IMPACT OF MEASUREMENT ERRORS ON ALTERNATIVE PREDICTORS OF LEAN MEAT PROPORTION OF LAMB CARCASSES

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The objectives of this study were to evaluate the impact of measurement errors on alternative predictors of lean meat proportion (LMP) of lamb carcasses. Ninety eight lambs (72 males and 26 females) of Churra Galega Bragançana breed were slaughtered, and carcasses were weighed (HCW) approximately 30 min after exsanguination. During carcasses quartering a caliper was used to perform tissue depth measurements, over the maximum depth of longissimus muscle (LM), between the 12th and 13th ribs (C12), and between the 3rd and 4th lumbar vertebrae (C3). The C12 and C3 measurements were contaminated with simulated measurement errors, and three distributions for random error were simulated: 1) random error with mean 0 and variance of 0.25 mm ($\epsilon \sim N(0,0.25\text{mm})$), 2) random error with mean 0 and variance of 0.50 mm ($\epsilon \sim N(0,0.50\text{mm})$), and 3) random error with mean 0 and variance of 0.75 mm ($\epsilon \sim N(0,0.75\text{mm})$). Simple and multiple linear regression models were developed using as independent variables the measured (original) and the biased C12 and C3 measurements as predictors of LMP. The coefficient of determination and the residual standard deviation were computed. This work shows that measurement errors of subcutaneous fat can have a high impact on the stability of models to predict the carcasses LMP. The subcutaneous fat measurements of higher magnitude are less sensitive to measurement errors, and give rise to more stable prediction models.

Keywords: Classification, Lean meat, Subcutaneous fat, Simulation.