VIS-NIRS TO PREDICT MEAT QUALITY IS ANATOMICAL POINT SPECIFIC

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The Vis-NIRS is a non-destructive, simple, rapid, and safe method for evaluating meat quality. Studies using VIS/NIRS to predict the meat quality are based mainly in information collected on longissimus thoracis (LT), at 12th rib, which differs in quality from LT at 5th rib. Accordingly, the present study aimed to create VIS/NIRS calibrations models for LT at 5th (LT5) and 12th rib (LT12) and test their accuracy to predict meat quality of beef samples. A total of 1,508 steer and heifer carcasses, averaging 20 months (± 4.00) were used in this study. After slaughter, carcasses were chilled and then samples of LT5 and LT12 were taken for Warner Bratzler Shear Force (WBSF), color (L*a*b*), dripping losses (DL), cooking losses (CL) and spectroscopy analyses. VIS/NIRS spectra were collected in the chilling room, on the intact LT5 (NIRS5) and LT12 muscle (NIRS12), immediately after quartering the carcasses. The spectrophotometer used wavelength range from 400 to 1395 nm. Data were subjected to principal component analysis and partial least squares regression using The Unscrambler X v.10.3 software. Coefficients of determination were used to compare the predictive accuracy of the equations and were relatively low, ranging from $R^2 = 0.11$ to 0.67. Except for drip losses ($R^2 = 0.31$), the prediction equation from NIRS5 did not predict ($R^2 = 0.00$) meat quality of LT12. These results demonstrate the importance of create specific calibration curves of VIS-NIRS to predict meat quality of LT5, as that in Brazilian abattoirs systems, carcass are ribbed in this anatomical point. The R^2 of prediction models obtained from NIRS5 and NIRS12 to predict L*, a*, b*, DL, CL and WBSF at LT5 and LT12 was, respectively, 0.61 and 0.53, 0.57 and 0.15, 0.57 and 0.34, 0.41 and 0.63, 0.11 and 0.11. The VIS-NIRS could be an online technology to predict meat quality at chilling room, although calibration models have to be anatomical point specific.

Keywords: color, cooking loss, dripping loss, online evaluation, spectroscopy, tenderness