

# Nix Pro 2, a novel technology for instrumental colour analysis on Canadian veal

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**Objectives:** In Canada, veal carcasses are segregated into four colour classifications according to apparent brightness ( $Y^*$ ) which can be calculated using  $L^*$  values, measured on brisket muscle, from conventional colour measurement spectrophotometers (CBGA 2022). Nix sensors are becoming more competitive devices for colour value assessments due to their improved software, ergonomic features and a more compact size for use in the meat production line. In this preliminary study, the feasibility of implementing a commercial Nix colour sensor device for the measurement of the  $L^*$  variable, on both brisket and ribeye muscle, and its relationship with  $Y^*$  on Canadian veal were evaluated.

**Materials and Methods:** A total of 315 veal carcasses, representative of the different veal production systems in Canada, milk-fed ( $n=158$ ) and grain-fed ( $n=157$ ), were used in this study. After chilling at 2 °C for 24 h post-mortem in a cooler from a federally inspected abattoir, carcass sides were weighed. Then, carcasses were knife-ribbed between the 11<sup>th</sup> and 12<sup>th</sup> ribs and brisket muscle surfaced and pH was measured in the brisket muscle (Hanna Instruments Woonsocket RI, USA). After 20 min of atmospheric exposure, colour measurements were carried out on both brisket and ribeye, using both a HunterLab MiniScan XE Plus spectrophotometer and the Nix Pro 2 colour sensor device (Nix Pro 2 Color Sensor™), both set to illuminant D65 and 10° standard observer. Statistical analyses were performed using SAS 9.4 (2014). PROC REG regression model procedures were used to evaluate the relationship among the different equipment models to evaluate potential improvements that might increase the accuracy of the final estimation. The accuracy of prediction was evaluated using the coefficient of determination ( $R^2$ ) and root mean square error (RMSE).

**Results and Discussion:** Veal carcass weights were on average  $155.3 \pm 52.61$  kg, and pH and backfat values averaged  $5.77 \pm 0.187$  and  $0.92 \pm 1.692$  mm, respectively. Some colour attributes in the present study, namely  $L^*$  and  $a^*$ , were significantly different between the HunterLab colourimeter and the Nix Pro 2 equipment ( $P < 0.05$ ). In this sense,  $L^*$ ,  $a^*$  and  $b^*$  values when measured using HunterLab colourimeter averaged 43.2, 10.6 and 10.4 but when measured using Nix Pro 2 equipment, the values were 29.1, 11.3 and 4.4, respectively. Calibration is not an applicable option for Nix Pro 2 device that also had a flat adapter to protect the unit from contaminants. With the flat adapter attached, colour values may have been lower than those seen without the flat adapter due to light geometry. However, high  $R^2$  value (0.91) was shown when comparing  $L^*$  values from Nix Pro 2 and Hunter Lab Colour Sensors for both brisket and ribeye muscles. This relationship between both technologies suggests that  $Y^*$  value colour value descriptor used on veal carcasses, can be accurately predicted by using Nix Pro 2 technologies at the brisket carcass location. Comparable colour measurements to HunterLab colorimeter for fresh beef by Nix Pro colour sensor were described by Schelkopf et al. (2021) and by Holman & Hopkins (2019) in beef.

**Conclusions:** Preliminary results of this study suggest the potential of using Nix Pro 2 for veal colour assessments at the brisket. Further studies comparing brisket and ribeye measurements and the reliability considering different production systems are currently underway.

## References:

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**Key words:** Veal, colour, Nix Pro 2, Hunter Lab