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Influence of Muscle Source on Color Stability of Fresh Beef from Purebred *Bos Indicus* Cattle

A. C. V. C. S. Canto[1,2], B. R. C. Costa-Lima[1,2]*, M. N. Nair[1], S. P. Suman[1], M. L. G. Monteiro[2], F. M. Viana[3], A. P. A. A. Salim[3], T. J. P. Silva[2], and C. A. Conte-Junior[2,3]

[1]University of Kentucky, Lexington, KY, USA; [2]Universidade Federal Fluminense, Niteroi, Rio de Janeiro; [3]Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

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Objectives

Brazil is a major beef producer and exporter, with a beef herd composed primarily of *Bos indicus* animals, mainly Nellore breed. Meat color is critical to consumer acceptance of retail fresh beef, and brown discoloration can cause consumer rejection leading to economic loss. Muscle source and cattle genetics are important intrinsic factors influencing beef color stability. Previous studies in *Bos taurus* cattle reported that longissimus lumborum (LL) is a color-stable muscle, whereas psoas major (PM) is a color-labile one. Nonetheless, the influence of muscle source on color stability in *Bos indicus* beef is yet to be examined. Therefore, our objective was to examine the influence of muscle source on color stability of beef from *Bos indicus* (Nellore) animals during storage at 4°C under aerobic conditions.

Materials and Methods

The LL and PM muscles were removed from 12 (n = 12) *Bos indicus* (purebred Nellore) bull carcasses and fabricated into 2.5-cm steaks. The steaks were individually packaged in polystyrene trays with soaker pads, overwrapped with oxygen-permeable polyvinyl chloride film, and stored at 4°C for 9 d. Myoglobin content was analyzed on d 0. Lightness (L*), redness (a*), yellowness (b*), color stability (R630/580; ratio of reflectance at 630 nm and at 580 nm) and metmyoglobin reducing activity (MRA) were evaluated on d 0, 3, 6, and 9. The effects of muscle source, storage, and their interaction were analyzed using the PROC MIXED procedure of SAS (SAS Inst. Inc., Cary, NC) with the repeated measure option. The differences among means were detected using the least significant difference (LSD) at a 5% level.

Results

LL steaks exhibited lower ($P < 0.05$) myoglobin concentration than their PM counterparts. The muscle source also influenced ($P < 0.05$) the instrumental color and MRA. LL steaks demonstrated greater ($P < 0.05$) L* values than PM counterparts on d 0 and 6 of storage. In addition, LL steaks demonstrated consistently greater ($P < 0.05$) a*, b*, R630/580, and MRA than PM steaks throughout the storage. While both muscles exhibited a decrease ($P < 0.05$) in a* values, R630/580, and MRA during storage, PM steaks demonstrated a more pronounced decline in redness than the LL ones.

Conclusion

These findings indicate that the muscle source influenced the color stability of fresh beef from purebred Nellore bulls. Brazilian beef industry may employ muscle-specific processing strategies to improve color stability of whole-muscle cuts from *Bos indicus* cattle.