43 The impact of acidic marination on sensory and instrumental cooked color characteristics of dark-cutting beef. J. T. Sawyer*, J. K. Apple, and Z. B. Johnson, *Department of Animal Science, University of Arkansas*, *Fayetteville*.

The objectives of this study were to evaluate the effect of enhancement at varying levels of lactic acid (LA) with or without sodium chloride (NaCl), on muscle pH, percent denatured myoglobin (PDMb), and cooked color (instrumental and sensory) of dark-cutting beef. Dark-cutting (DC; mean pH = 6.64) and normal pH (NDC; mean pH = 5.43) beef strip loins (IMPS #180; n = 52) were selected and purchased from a commercial beef packing plant, and subsequently sectioned into thirds. The DC sections were injected to 110% of raw product weight with solutions containing 0.5, 1.0, 1.5, or 2.0% LA and 0.0 or 0.5% NaCl, and 2.54-cm-thick steaks were cut from all strip loin sections. Steaks were cooked to an internal temperature of 71 ºC and evaluated for degree of doneness (1 = very rare to 6 = very well done), internal cooked color (1 = very red to 7 = brown), instrumental cooked color (L*, a*, and b*), and the reflectance ratio of 630nm/580nm (measure of cooked color change from red to brown). Data were analyzed as a completely randomized design with four replications using the mixed procedure of SAS (SAS Inc., Cary, NC) with fixed effects of treatment, and the random effect of replicate. Muscle sections served as the experimental unit of analysis for all effects (pH, instrumental color, sensory color, expressible moisture, and myoglobin). Session was included in the model and fit with all main effects and main effects interactions for sensory cooked color variables, whereas panelists was included in the model as a random effect for all sensory variables to account for panelist variation. For all variables, least squares means were generated, and when significant ($P < 0.05$) F-values were observed, least squares means were separated with pair-wise t-test (PDIFF option). Post-enhancement pH values were reduced ($P < 0.05$) with the addition of LA. Sensory panelists recorded an improvement in the degree of doneness of treated DC steaks ($P < 0.05$). Most notably, internal cooked color was improved ($P < 0.05$) when DC sections were enhanced with LA., and DC steaks enhanced with lower levels of LA had a* values similar ($P > 0.05$) to NDC steaks. Conversely, L* values appeared to decrease ($P < 0.05$) with increasing levels of LA in the enhancement solution. The 630nm/580nm reflectance ratio indicated that LA was able to impact ($P < 0.05$) cooked beef color, as DC steaks enhanced with the lower levels of LA were similar in internal cooked color to NDC steaks. More importantly, LA-enhancement of DC beef increased PDMb ($P < 0.05$) levels, regardless of LA concentration in the enhancement solution. Results of this experiment suggest that LA enhancement can reduce muscle pH and improve the cooked beef color/degree of doneness of DC beef; thereby leading to improved marketability of beef from DC beef carcasses.

Keywords: beef, dark-cutters, lactic acid enhancement