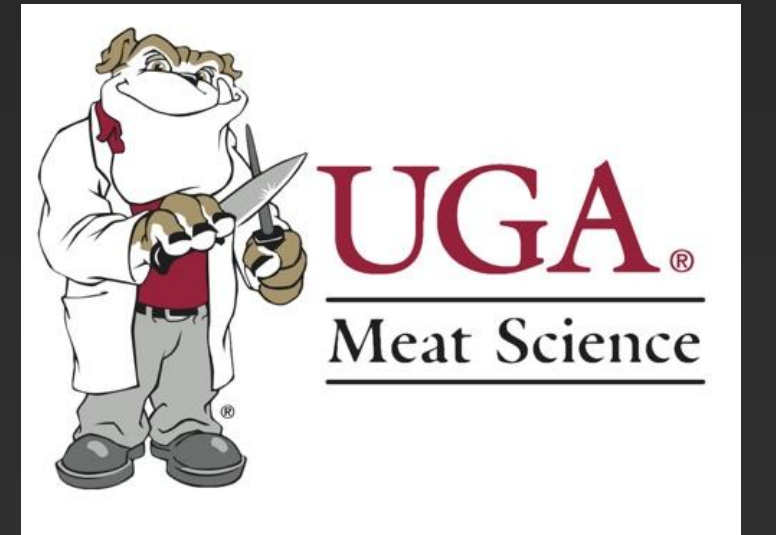




Effect of enhancement on shelf-life and quality attributes of the beef *biceps femoris* value cut

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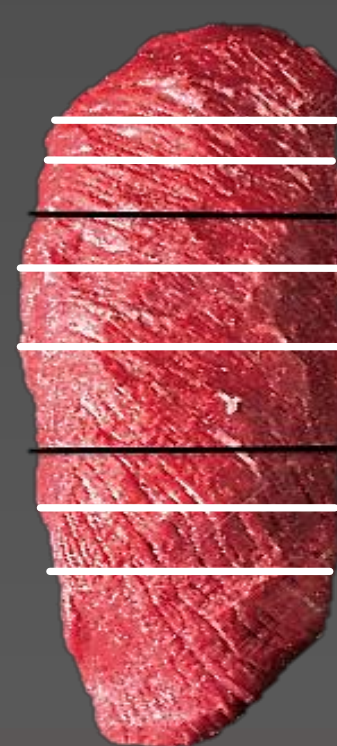
BACKGROUND

- Round cuts have been held back due to perception of tenderness and flavor
- Enhancing the bottom round with a mild acidic solution may improve the tenderness over cuts that are not enhanced or enhanced with a basic NaCl-STP solution
- Previous data (location poster) shows that location can have influence on quality traits of the bottom round
- No Enhancement x Location interactions, therefore only enhancement in this poster
- For location effects refer to Study 1 poster on location

OBJECTIVE

The objective of this research was to examine the effects of enhancement on the shelf-life and quality attributes of the beef *biceps femoris* (BF; IMPS 171B) when sectioned and portion cut perpendicular to the natural orientation of the muscle fibers.

Traditional Cuts



Value Cuts



MATERIALS AND METHODS

- Four days postmortem 36 Bottom Round IMPS 170A were removed, peeled, denuded and the Ishiatic Head was removed to make a 171D
- BF muscles were separated into thirds, Dorsal (Dor) Medial (Med) and Distal (Dis) based on fiber orientation
- Round Enhancement
 - NoE = no enhancement
 - STP = Enhanced to 110% with Salt 0.3% and Phosphate 0.35%
 - MLV = Enhanced to 110% with Mostatin LVX; buffered vinegar and lemon juice 2%
- Round samples were blocked by previous steer diet and location to ensure each location and diet were equally represented for each enhancement treatment
- Each section was cut into steaks (2.54 cm) perpendicular to fiber orientation
- One steak from each section was assigned to WBS and another steak to sensory, steaks were vacuumed packaged and aged 21 days (1 1 C)
- Four steaks were randomly assigned to shelf-life 1,3,5,7 d, packaged in PVC and displayed for 7 d (960 lux, 3 1 C) where objective L*,a*,b* color, hue, chroma, 630/580 nm, subjective color, purge, and lipid oxidation were measured on 1,3,5,7 d

- Data were analyzed using Proc Mixed SAS V 9.1
- Diet and 12th rib marbling score evaluated as covariates
- For shelf-life, enhancement and day of display were dependent variables
- If DOD by location interaction occurred data were reanalyzed by day
- Sensory and WBS—enhancement = dependent variable and sensory panelist was added as covariate

Blocked by Location



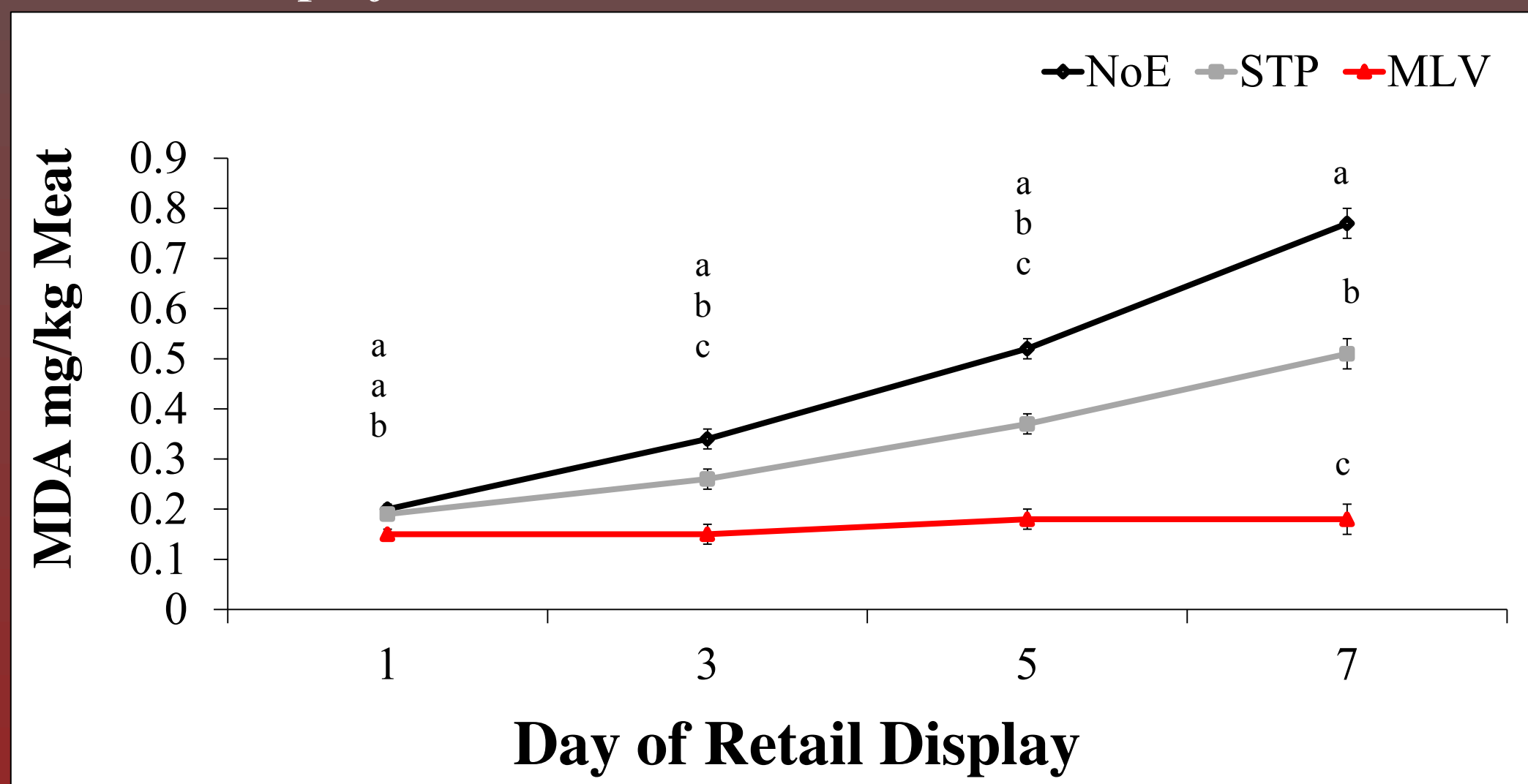
Dorsal – NoE
Medial – STP
Distal – MLV

Medial – NoE
Distal – STP
Dorsal – MLV

Distal – NoE
Dorsal – STP
Medial – MLV

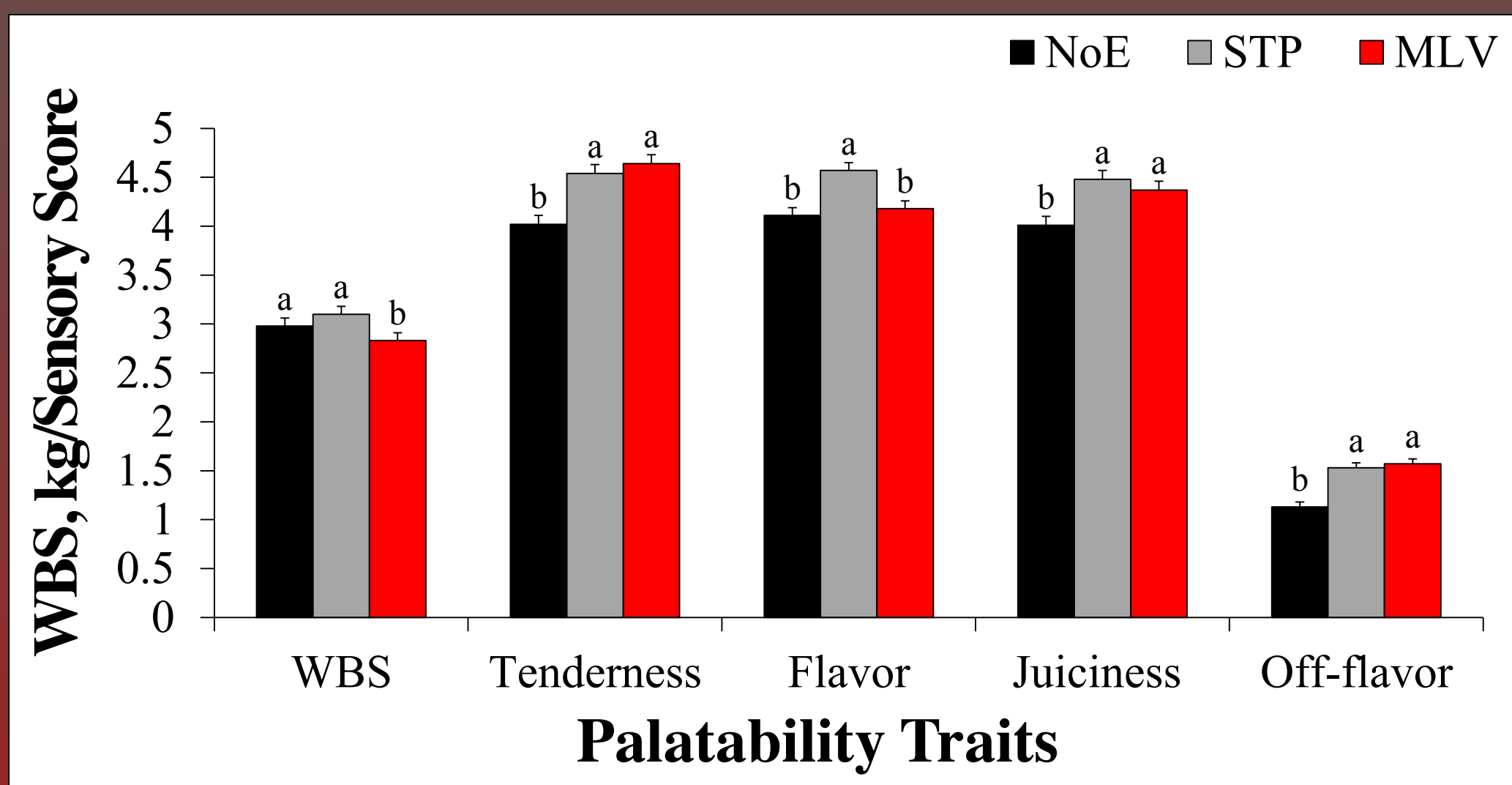
RESULTS

Figure 1. Effect of Enhancement on Lipid Oxidation of the *biceps femoris*



^{abc} Denotes differences within day for enhanced steaks ($P < 0.05$)

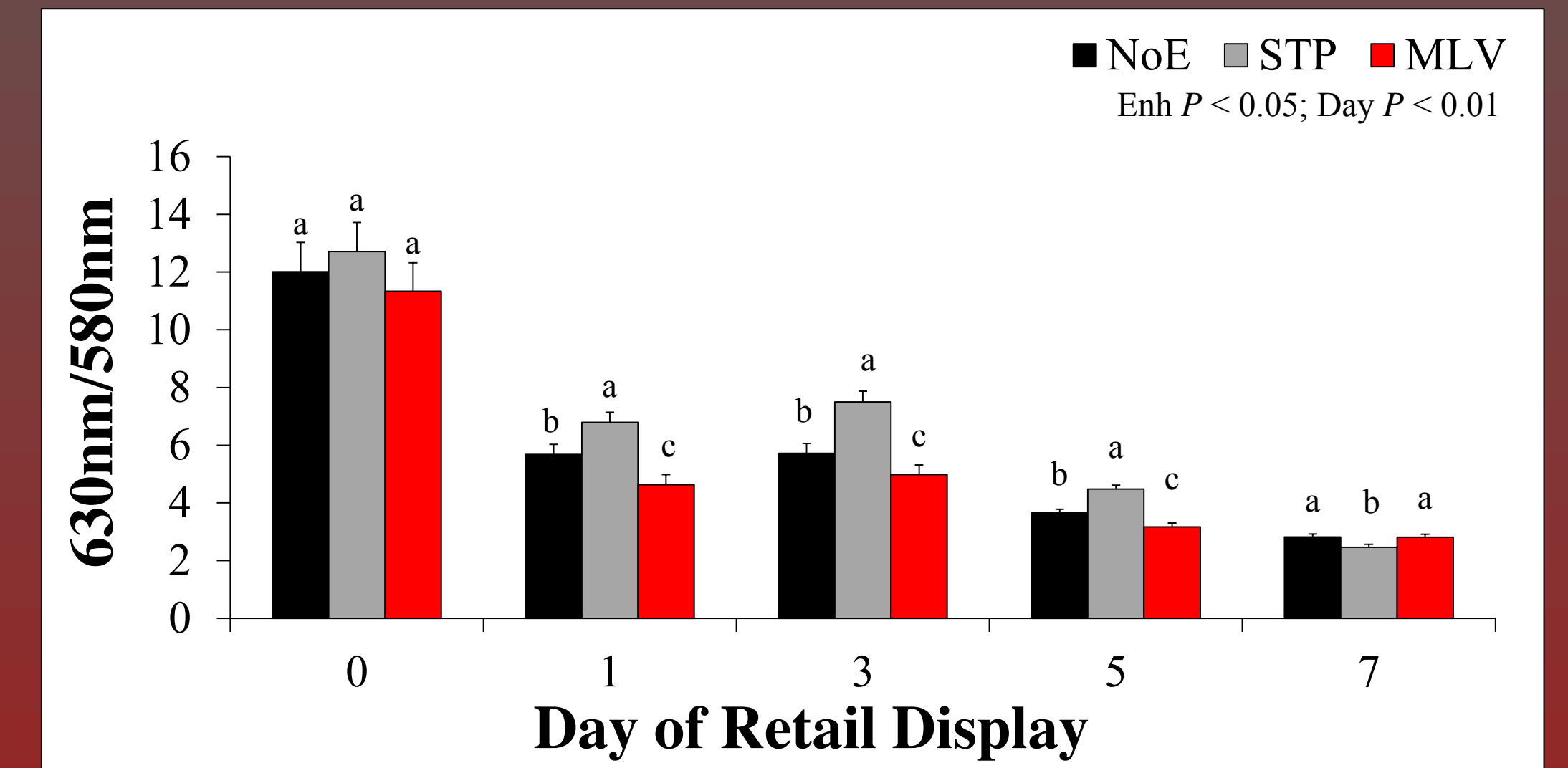
Figure 2. Effect of Enhancement on WBS¹ and Sensory Traits² of the *biceps femoris*



^{abc} Denotes differences for enhanced steaks ($P < 0.05$)

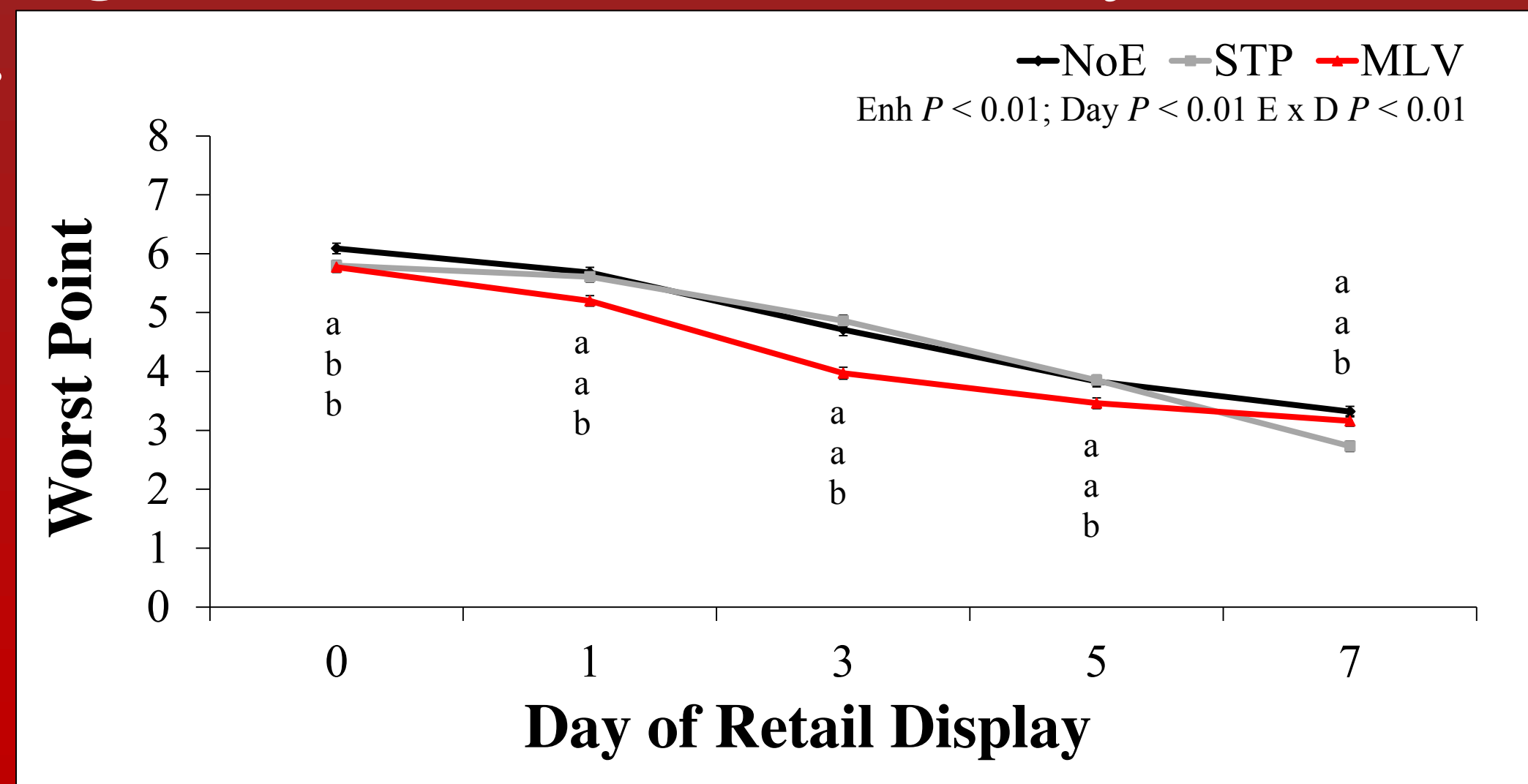
¹WBS—kilograms of force required to shear meat core
²Sensory tenderness, flavor, & juiciness—1=extremely tough, bland, dry; 8=extremely tender, intense, juicy
Sensory off-flavor—1=none detected, 6=extreme off-flavor

Figure 3. Enhancement Effect on Metmyoglobin



^{abc} Denotes differences within day for enhanced steaks ($P < 0.05$)

Figure 4. Effect of Enhancement on Subjective Shelf-life¹



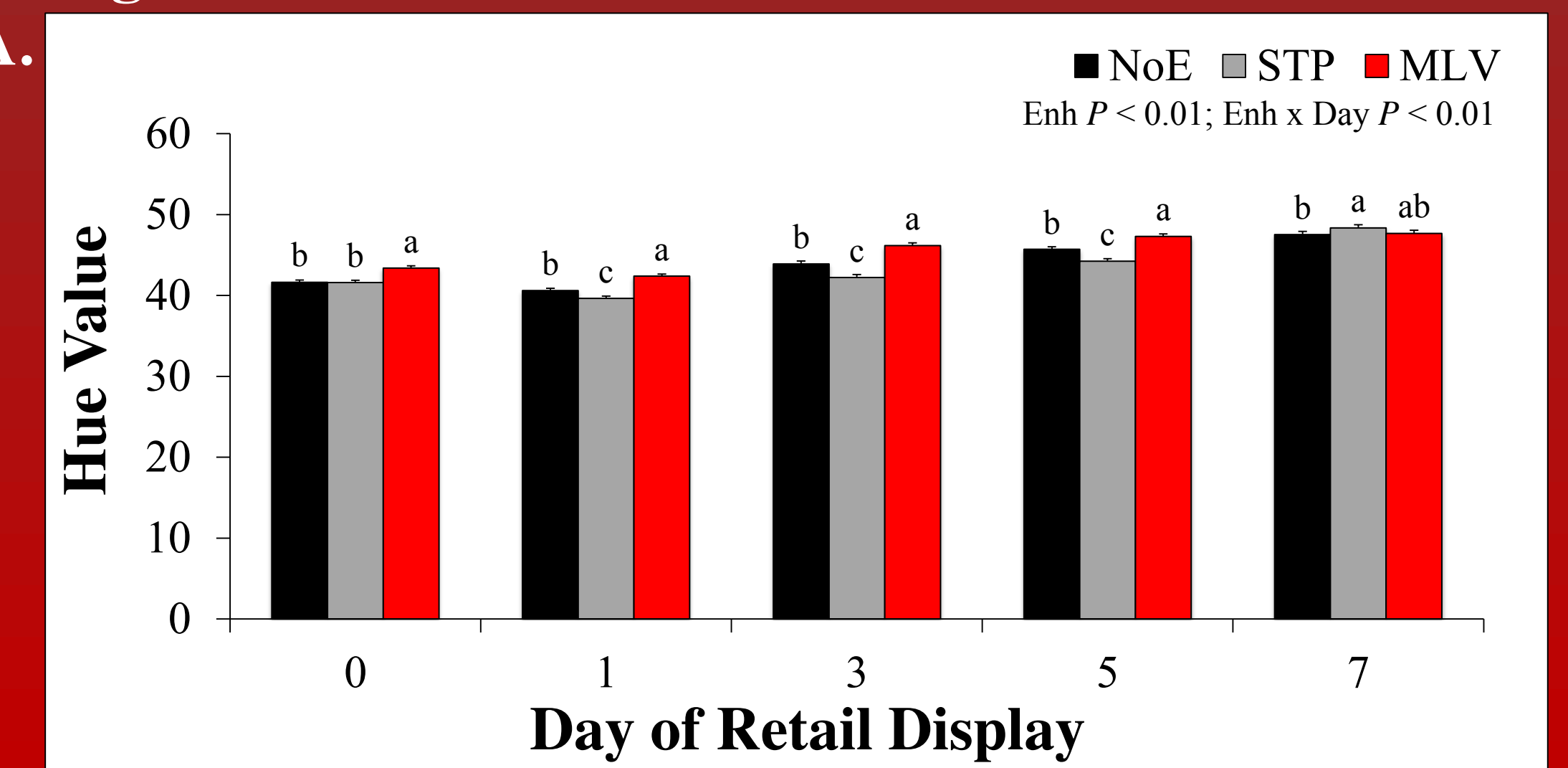
^{abc} Denotes differences within day for enhanced steaks ($P < 0.05$)

Table 1. Effect of Enhancement on Moisture Loss of the *biceps femoris*

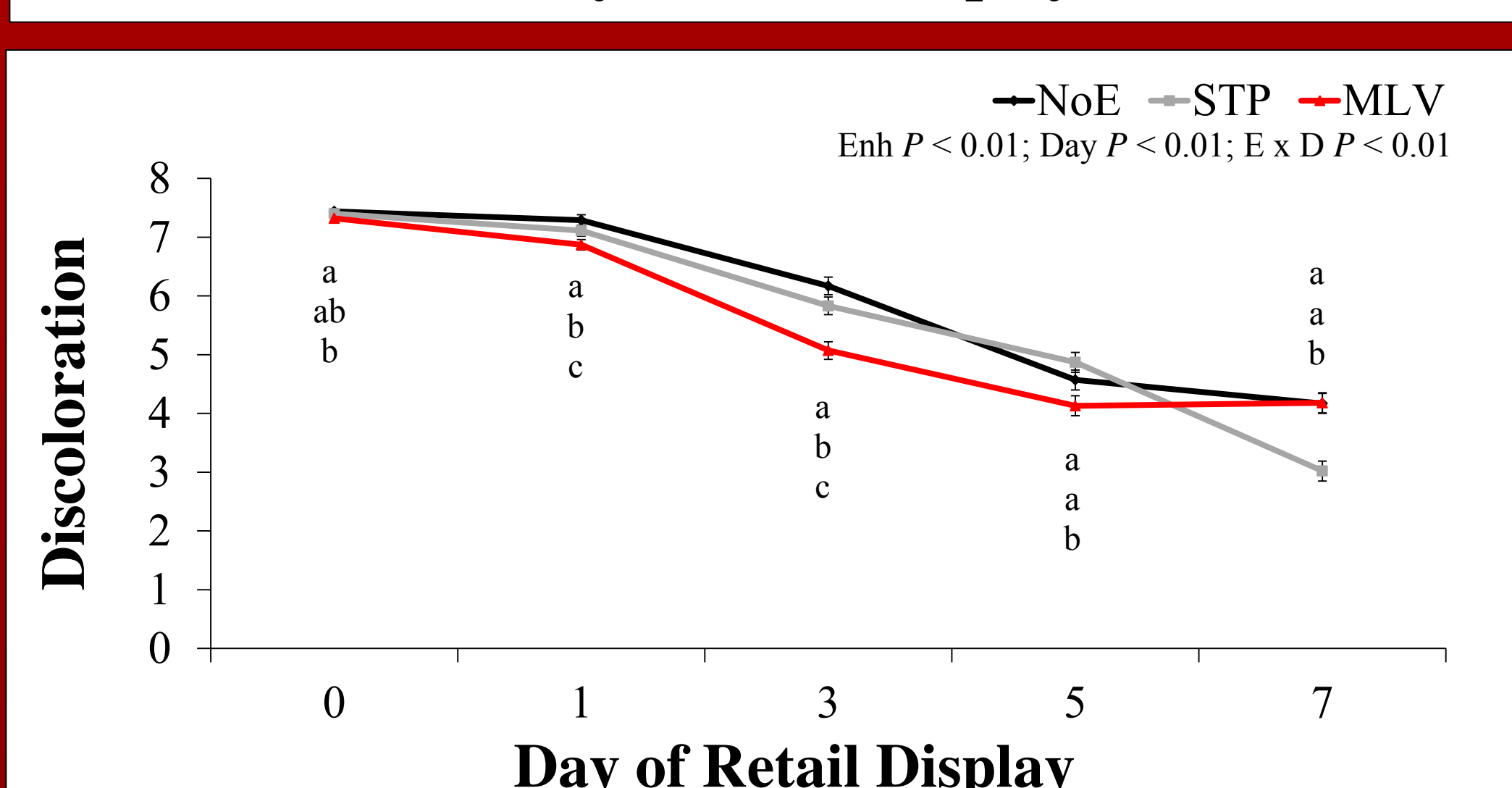
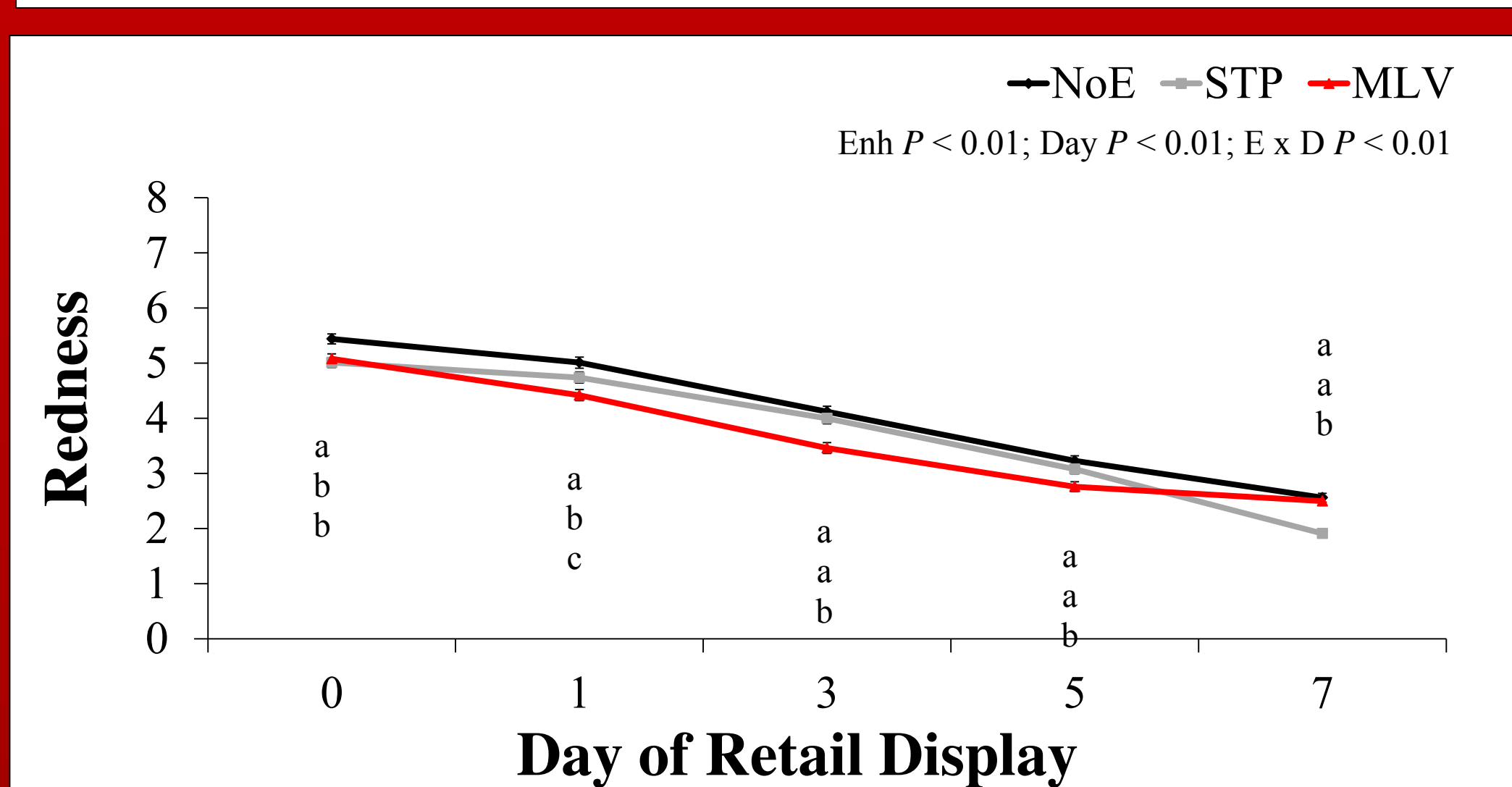
Trait	Enhancement			SEM
	NoE	STP	MLV	
Thaw loss, %	2.66 ^b	4.00 ^a	3.76 ^a	0.26
Cook loss, %	25.55 ^a	28.80 ^a	25.75 ^b	0.78

^{abc} Denotes differences within day for enhanced steaks ($P < 0.05$)

Figure 6. Effect of Enhancement on Hue and Chroma



^{abc} Denotes differences within day for enhanced steaks ($P < 0.05$)

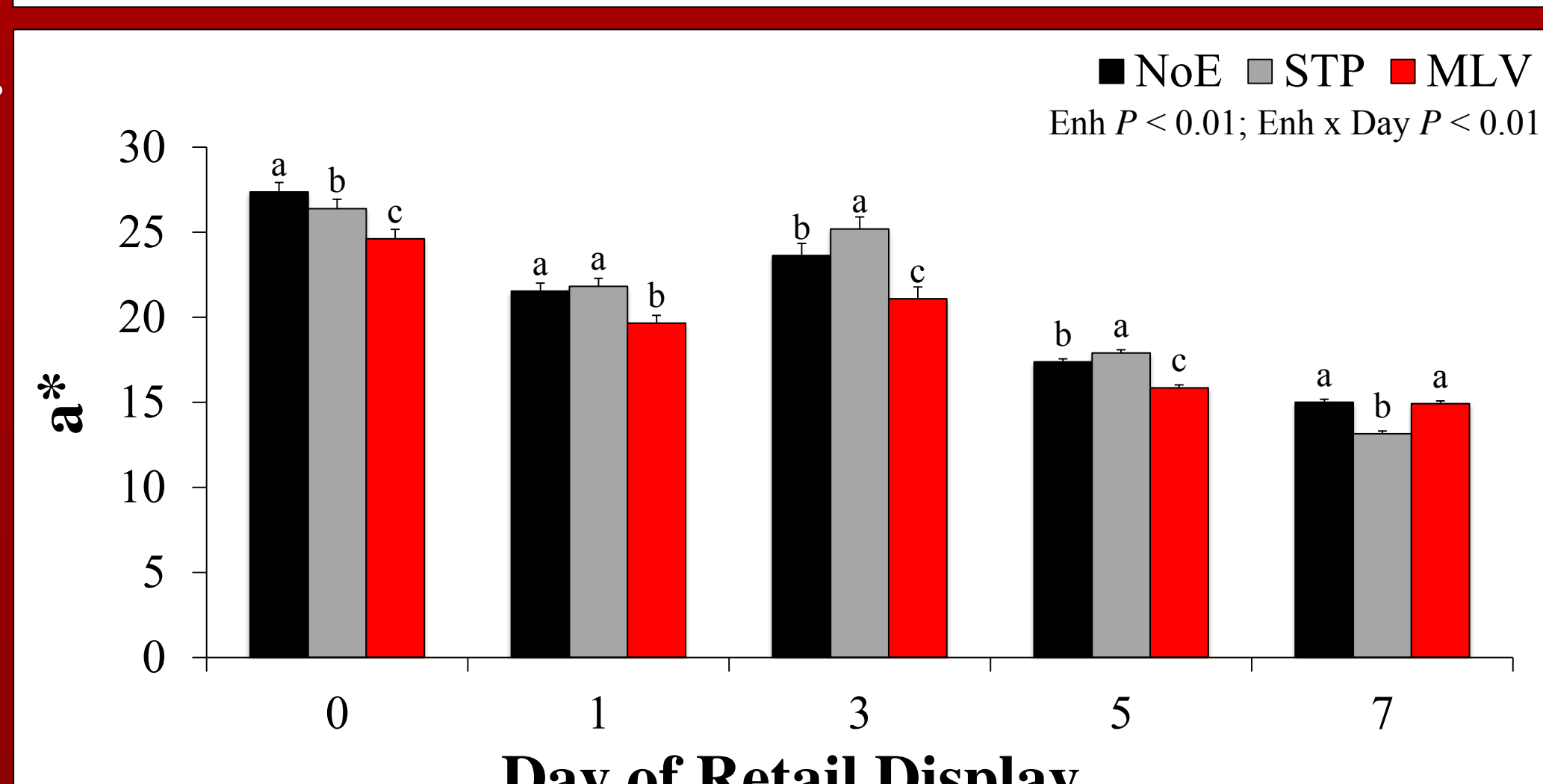
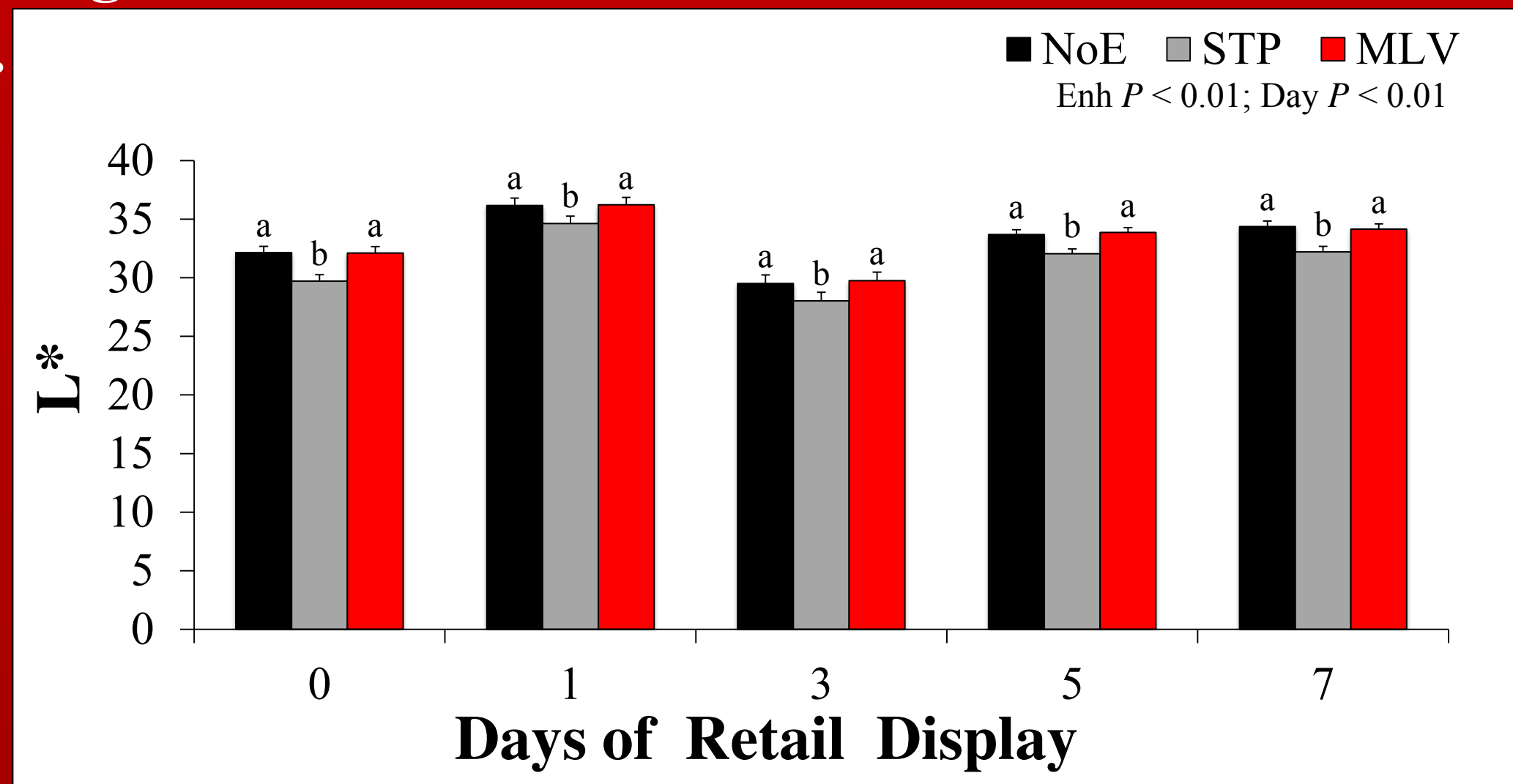


^{abc} Denotes differences within day for enhanced steaks ($P < 0.05$)

¹AB: 8-Extremely bright cherry red; 1-Extremely dark red

¹C: 8-No discoloration; 1-91% to 100%

Figure 5. Effect Enhancement on L* and a*



^{abc} Denotes differences within day for enhanced steaks ($P < 0.05$)

CONCLUSION

Enhancement of the *biceps femoris* value cut can increase tenderness and juiciness, but may impact color during retail display and increase off-flavor detection.

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For a copy of this poster visit www.StelzLab.org or scan using smart phone:

