

Supplemental Effects of Ruminant Bypass Arginine and Lysine for Improving Meat Quality and Oxidative Stability of Aged Beef Loins

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ABSTRACT

Postmortem aging is widely practiced in the beef industry to improve eating quality characteristics. However, the oxidative stability of aged beef muscle could be negatively affected by extending aging period. The use of ruminant bypass amino acids allows levels of crude protein in the diet to be lowered and may also positively impact oxidative stability of aged beef muscle. This study was conducted to evaluate the effects of ruminant bypass arginine (Arg) and lysine (Lys) supplementation on meat quality and oxidative stability of beef loins (*M. longissimus lumborum*, LL) under two durations of postmortem aging (14 and 28 days). A total of forty cattle fed four different diets (control; regular diet; Arg, additional 6 g Arg per kg feed; Lys, additional 4 g Lys per kg feed; and ArgLys, additional Arg and Lys) were harvested. At 1-day postmortem, paired LL sections were separated, vacuum-packaged, and assigned to 14 and 28 days aging at 2 degrees C. The pH, water-holding capacity (WHC), shear force, color stability, and lipid oxidation of aged beef loins were measured. An increase in aging period decreased shear force ($P < 0.05$), but negatively impacted color stability as indicated by decreased lean color score and increased discoloration over display ($P < 0.05$). Arg supplementation reduced discoloration over display ($P < 0.05$), while Lys supplementation resulted in no positive impact on discoloration ($P > 0.05$). Dietary treatment had no significant effects on pH, WHC, and shear force ($P > 0.05$). These findings suggest that extended aging periods could decrease oxidative stability of beef loins, which may be mitigated by Arg supplementation.

KEYWORDS

Aging, Arginine, Beef, Lysine, Meat Quality, Oxidative Stability