



Effect of Location and Postmortem Aging on Tenderness and Sarcomere Length of Beef Longissimus Lumborum and Semitendinosus Steaks

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Keywords: aging, beef, location, shear force, tenderness
Meat and Muscle Biology 1(3):152

doi:10.221751/rmc2017.145

Objectives

The purpose of this study was to determine the effect of steak location and postmortem aging on cooked meat tenderness and sarcomere length of steaks from the *Semitendinosus* (ST) and *Longissimus lumborum* (LL).

Materials and Methods

Forty crossbred steers were processed at a commercial facility, and from 1 side of each carcass, the ST and LL subprimal were collected. Each ST was divided into 5 locations (LOC) with LOC 1 being the most proximal and LOC 5 the most distal. Similarly, each LL was divided into 3 LOC with LOC 1 starting within the middle of the subprimal and LOC 3 being the most posterior. Within each subprimal location a 2.54-cm thick steak was fabricated for Warner-Bratzler shear force (WBSF) and sarcomere length analyses. Steaks from each LOC within the ST were randomly assigned to 7, 14, 28, 56, or 112 d of aging (DOA) and steaks from each LL LOC were randomly assigned to 7, 28, or 112 d of aging. After the appropriate aging period, WBSF and sarcomere steaks were cooked to 71°C and chilled overnight. Six cores were removed parallel to muscle fibers and were sheared perpendicular to the muscle fibers. Sheared cores were frozen and powdered for sarcomere length. The Z- and M-Lines were marked under a laser beam, and the equation established by Cross et al. (1981) was utilized to quantify sarcomere length. Data were analyzed as a randomized complete block design with repeated measures.

Results

There were no LOC × day of aging interactions for ST or LL steaks for WBSF or sarcomere length ($P > 0.25$). Steaks from the ST had reduced WBSF values in LOC 4 compared to other LOC ($P < 0.05$). The ST steaks for LOC 1 and 2 had the greatest WBSF values compared to the more distal LOC ($P < 0.05$). Sarcomere length was shorter for ST steaks from LOC 1 and 2, compared to LOC 4 and 5 ($P < 0.05$). Longer sarcomere lengths were found in the more distal LOC for ST steaks than in the proximal LOC ($P < 0.05$). The LL steaks were not different in WBSF values across LOC ($P > 0.05$). Additionally, sarcomere length of LL steaks was not different across LOC ($P > 0.05$). As day of aging increased, WBSF values decreased in ST steaks ($P < 0.05$). However, no differences ($P > 0.05$) were detected for sarcomere length in ST steaks as day of aging increased. In LL steaks, WBSF values decreased and sarcomere length increased ($P < 0.05$) as day of aging increased.

Conclusion

Semitendinosus steaks from the center portion of the subprimal were instrumentally tenderer than proximal steaks, but LOC had no effect on instrumental tenderness for LL steaks. Increased day of aging resulted in more tender ST and LL steaks. To provide the highest eating satisfaction to consumers on a budget, extended aging and steak location should become most valued when selecting ST steaks. While loin steaks can be more consistent in tenderness, consumers can value quality over steak location.