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Round Muscle Profiling: Management of Tenderness and Sensory Improvement of Specific Muscles with Aging

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Round Muscle Profiling: Influence of Aging on the Palatability of Specific Wholesale Round Cuts

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Summary and Implications

Sensory characteristics differed between the muscles of the round. Some of the muscles of the round had characteristics similar to the LD, which is generally accepted as a tender cut by consumers. The tenderness values of the GR, SAR, and VI were similar to or better than the LD at all aging periods. The juiciness values of the GR, SAR, and VI were similar to the LD at all times periods except 7 d postmortem where the SAR was less juicy than the LD. As a result of this the GR, SAR, and VI are all muscles that might be suitable to add value by marketing them as individual cuts. However, the tenderness and juiciness values of the AD, SM, and VL were generally lower than the LD and would not be good candidates to add value to by marketing as individual cuts.

Introduction

Consumers attach value to any perceived differences in beef palatability. Some of these differences are associated with quality grade or Warner-Bratzler shear force. Platter et al. in 2005 saw that consumers will attach value to any perceived or real differences in beef palatability. Two examples of the types of differences that are quality grade and Warner-Bratzler shear force. Differences in quality grade and Warner-Bratzler shear force will translate over into differences that can be perceived by the consumer as with juiciness tenderness beef flavor and other sensory characteristics. When we look at the muscles of the round, traditionally they all will receive the same treatment in regards to aging. However, there may be differences in tenderness and rate of tenderization in these muscles. Then we could add value to individual cuts by treating the individual muscles rather than a muscle group. So if one muscle could be removed or aged differently than the rest of the round muscles to form a product that will be accepted by consumers as a tender individual cut we could increase the value of the round. By looking for these differences in tenderness and rate of tenderization in muscles of the round may provide opportunity to add value by creating individual cuts.

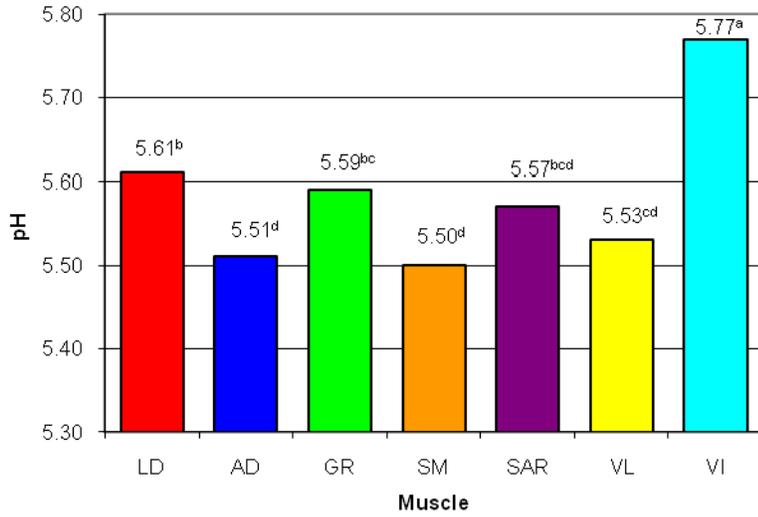
Materials and Methods

Ten market weight beef cattle were slaughtered at the ISU Meat Laboratory and the longissimus dorsi (LD) and the following six round muscles were removed at 24 hr postmortem: gracillus (GR), adductor (AD), sartorius (SAR), semimembranosus (SM), vastus lateralis (VL), and vastus intermedius (VI). Samples were aged to 1, 3, 7, or 14 d postmortem. Star probe, 24 hr pH, and sensory measurements (juiciness, tenderness, chewiness and beef flavor) were collected at each of the time periods.

Results and Discussion

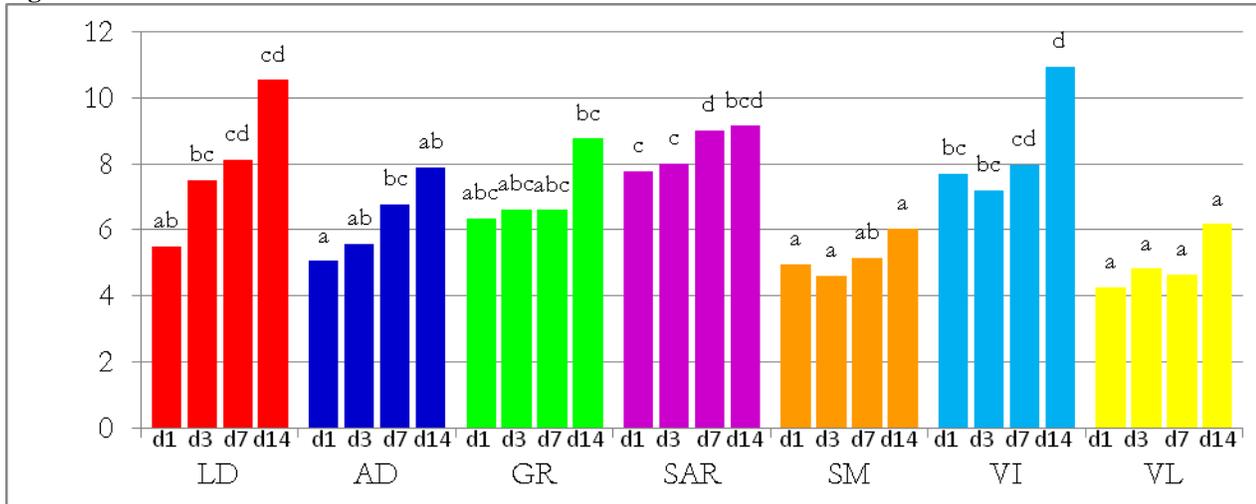
Definition of characteristics of individual muscles from the round will make it possible to identify appropriate strategies to consistently add value to underutilized cuts. Thus, the objective of this study was to determine palatability differences in specific muscles of the round to evaluate suitability for potential marketing of new cuts of beef. At 1 d postmortem VI had a significantly higher pH than all other muscles. LD, GR, SAR and VI had a lower percentage of cook loss ($P < 0.05$) than the AD on d 3 and 7. At 14 d LD, GR and SAR had a lower percentage of cook loss ($P < 0.05$) than the AD. Day 1 star probe values for the VI was lower ($P < 0.01$) than all other muscles. At 3 d and 14 GR, SAR, and VI had lower star probe values ($P < 0.01$) than the AD, SM, and VL. On d 7 GR, SAR, and VI had the lowest ($P < 0.01$) star probe values. Tenderness of these muscles was consistent with star probe values. At 1 d SAR and VI both had higher tenderness scores ($P < 0.05$) than the AD, SM, and VL. At 3 d the SAR continued to have higher tenderness scores ($P < 0.05$) than the AD, SM, and VL. On d 7 the SAR, LD, and VI had higher tenderness scores ($P < 0.01$) than the SM and VL. At 14 d LD, SAR, GR, and VI had higher tenderness scores ($P < 0.01$) than the SM and VL. Chewiness scores were consistent with tenderness results. At 1 d the SAR had lower chewiness scores ($P < 0.05$) than the AD, GR, LD, and VL. Day 3 chewiness was not significantly different between muscles. At 7 d SAR and VI had lower chewiness scores ($P < 0.01$) than the GR, SM, and VL. On d 14 SM and VL had higher chewiness scores ($P < 0.01$) than all other muscles. On d 1 and 3 AD juiciness score was lower ($P < 0.05$) than GR, LD, SM, and VI. On d 7 AD had the lowest juiciness scores ($P < 0.01$). At 14 d GR and VI had higher juiciness scores ($P < 0.01$) than AD, SAR, and SM. No differences in beef flavor were seen at any time period. Given that there were no differences in beef flavor, the GR, SAR, and VI displayed similar sensory characteristics as the LD in juiciness, tenderness, and chewiness. There is the potential to add value to GR, SAR and VI by merchandising them as individual cuts.

Figure 1. pH at 24 h postmortem.



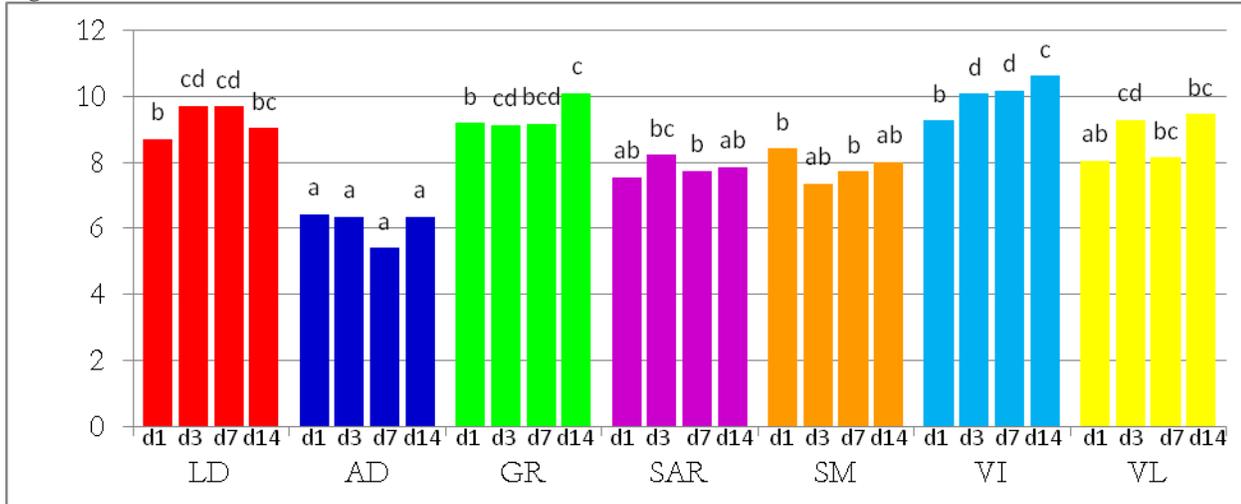
a,b,c,d means within a day with different superscripts differ ($P < 0.05$).

Figure 2. Tenderness scores of round muscles.



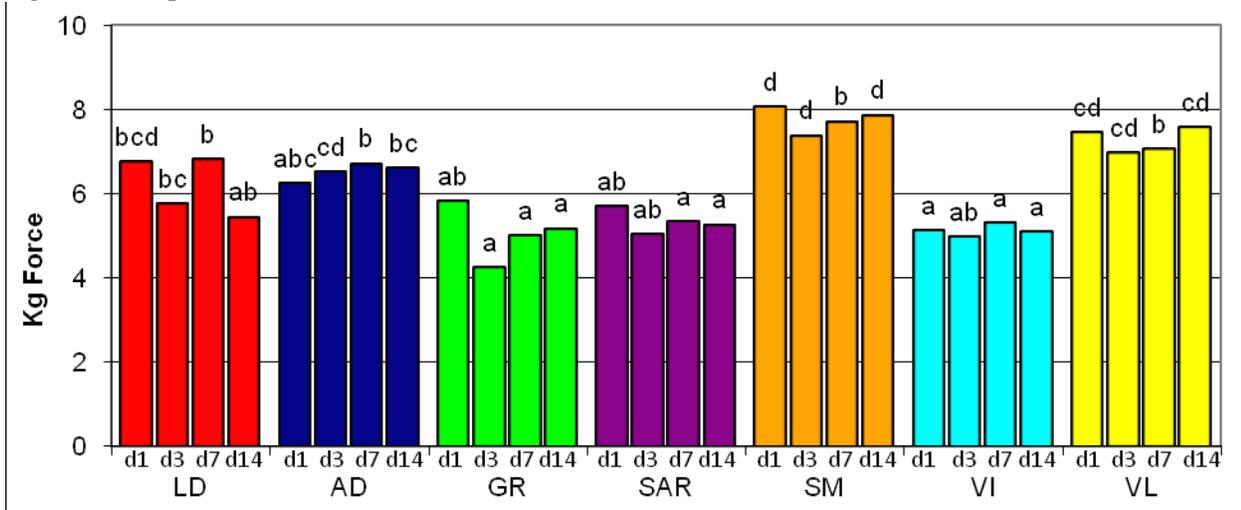
a,b,c,d means within a day with different superscripts differ ($P < 0.05$).

Figure 3. Juiciness scores of round muscles.



^{a,b,c,d} means within a day with different superscripts differ ($P < 0.05$).

Figure 4. Star probe values of round muscles.



^{a,b,c,d} means within a day with different superscripts differ ($P < 0.05$).

Acknowledgements

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