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ABSTRACT

Comparison of Marbling Fleck Characteristics and Objective Tenderness Parameters with Different Marbling Coarseness within Longissimus thoracis Muscle of High-marbled Hanwoo Steer.

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It is important to understand how marbling traits and tenderness differ among beef steaks from the carcass grading site and other regions within the *longissimus thoracis* (LT) muscle, as these characteristics are closely associated with consumer acceptability and willingness to purchase. Thus, the aim of this study was to compare the marbling fleck traits and objective tenderness parameters in the groups classified by the coarseness index (CI) of marbling fleck (high and low groups) at the carcass grading site (13th thoracic vertebra; 13T) and three different locations (13T, 9T, and 6T) within the LT muscle from well-marbled (marbling score 7 to 9) Hanwoo steer. Image analysis showed that the longitudinal locations had a significant effect on marbling fleck traits. The total area of large marbling fleck divided by the total marbling area (coarseness) was higher at the central region (13T to 12T) compared to the front thoracic region (6T to 5T) in the high CI group (0.23 vs. 0.17, $p<0.05$), whereas no significant differences were observed in the total number of marbling fleck within the LT muscle in the high or low CI groups ($p>0.05$). Location effect on objective tenderness parameters within the LT muscle was somewhat limited, although the high CI group had a lower Warner-Bratzler shear force (WBS) value than did the low group ($p<0.05$). Taken together, the degree of coarseness of marbling fleck decreased from the carcass grading site to the front thoracic site, whereas the objective tenderness parameters, including WBS and hardness, of the grading site did not differ from the other regions within the LT muscle.

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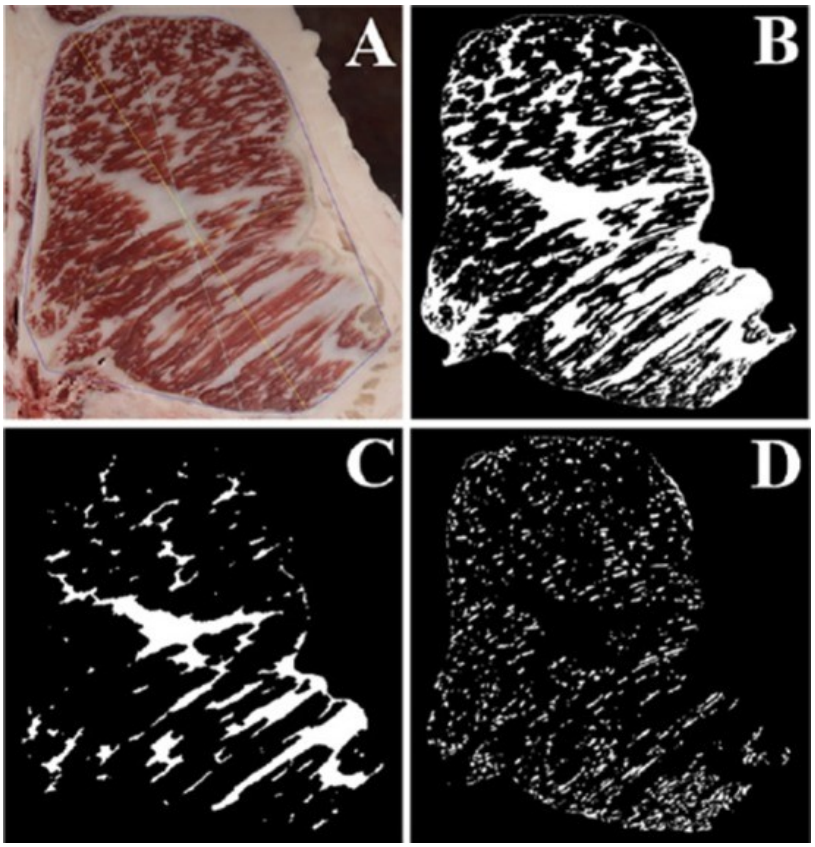
Fig. 1



Details of image analysis to calculate the characteristics of marbling fleck.

Digital color image (A) of the longissimus thoracis muscle cross-section was binarized into muscle and marbling flecks (B) using the image analysis program. The binarized image was separated into two images of bigger (C) and smaller (D) marbling flecks. The fineness was calculated from the number of smaller marbling flecks (0.01 to 0.5 cm2) per loin-eye area, and the coarseness was calculated by division of the total area of bigger marbling flecks (above 0.5 cm2) by the total marbling area measured.

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