

EFFECT OF GENDER ON TEXTURE MEASUREMENTS OF HANWOO BEEF

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I. INTRODUCTION

Meat quality is influenced by pre-harvest factors such as breed and gender etc.. The animal gender has been recognized as one of the important factors affecting muscle chemical compositions of the carcass [1]. Moreover, castrating and spaying of animals are important husbandry techniques to prevent unwanted breeding in livestock. The castration or spaying of heifers improves carcass quality, may be marbled somewhat sooner and produce tender beef with higher quality grade. The objective of this study was to evaluate the effect of gender on the quality traits, textural measurements and collagen contents of *longissimus lumborum* muscle from Hanwoo beef.

II. MATERIALS AND METHODS

Longissimus lumborum (LL) muscles (n=20) from Hanwoo steers, bull, cow and spayed cow (30, 26, 46 and 30 months of age, respectively; n=5, each) were collected at a commercial meat processing plants in Korea. The muscles were aged for 3 days at 4 °C. Texture measurement, cooking loss, pH and color were evaluated by the methods of as described in previous study [2]. Textural and mechanical measurements were done by using Instron Universal Testing Machine (Model 3342, USA) with the software Instron Bluehill 2 (version 2.35). The WBSF evaluated on 6 pieces core samples with 0.5 inch diameter and sheared at a crosshead speed of 400 mm/min, using a 40 kgf load cell. Tensile testing was conducted on 6 strips with 70 x 10 x 10 mm thick per sample. Stretching was performed at 50 mm/min. Texture (hardness) was measured on 3 rectangular trapezoid shaped cuts with 0.5 x 1.5 x 70 x 60 cm per sample. Each sample underwent 2 cycles of 60% compression at constant speed 50 mm/min. The total and heat insoluble collagen was determined using colorimetric method of Kolar [3] and Hill [4]. Data were analyzed using the GLM procedure and Duncan's multiple range test of SAS Version 9.3 (SAS Institute, Cary, NC, USA).

III. RESULTS AND DISCUSSION

Gender had no effect on color parameters such as; CIE a* and CIE b*. However, lower CIE L* value (P<0.05) and higher pH values (P<0.01) were observed in the samples of bull compared with steer samples.

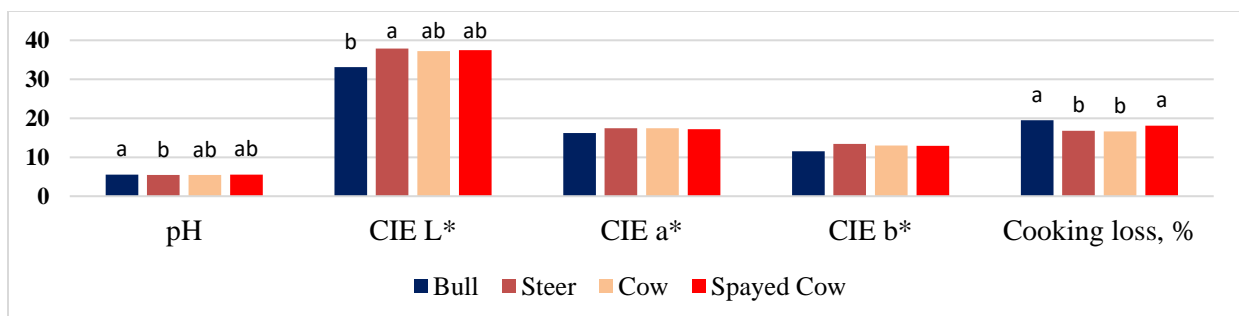


Fig. 1. Quality traits of Hanwoo beef subjected to different gender

Cooking loss of samples from bulls and spayed cows showed significantly higher values than those from steers and cows ($P < 0.05$). Compared with the samples from bulls, those from steers had lower ($P < 0.05$) shear force values. Bulls contained higher ($P < 0.001$) total collagen than those of steers and females.

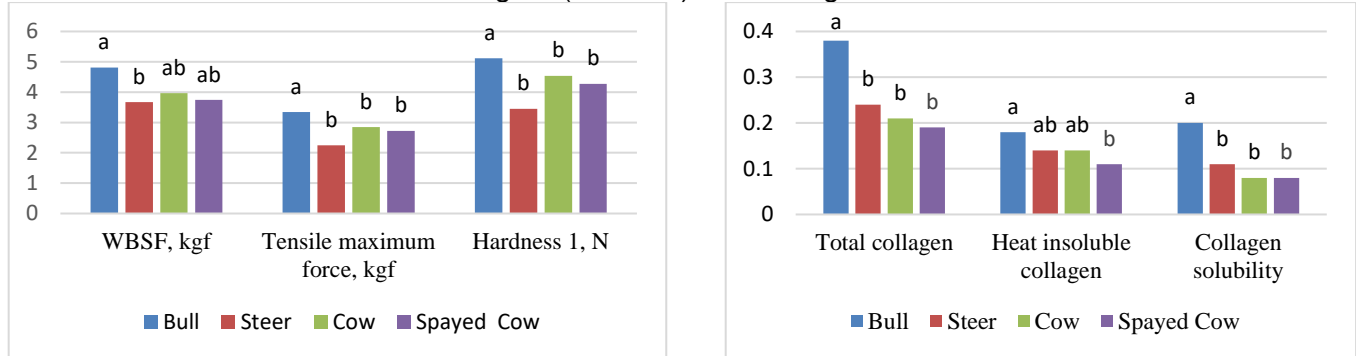


Fig. 2. Texture parameters and collagen content of LL muscle subjected to different gender

Numerous researchers have reported that higher collagen content was found in bulls compared to steers and cows, apparently due to the effect of different testosterone levels [5, 6]. The large differences in total collagen contents likely contributed to some of the texture parameters differences among genders. The tensile test parameters depend on the properties of both the connective tissue and muscle fibres. The maximum stress at a high strain can be related to collagen content, and number of links between collagen molecules, there could be a genetic influence in collagen composition.

IV. CONCLUSION

The results of study demonstrated that gender had a significant effect on the texture properties of meat. Bulls showed upwards value in texture parameters due to high connective tissue content than females and steers.

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