

Gender discrimination and multivariate analysis using deboning data

Joon-Yong Shim Ha-Yeong Kim Byoung-Kwan Cho Wang-Hee Lee*

Department of Biosystems Machinery Engineering, Chungnam National University, Daejeon, 305-764, Korea

Abstract

Recent favor on high quality food and concern on food safety have demonstrated the superiority of Hanwoo (Korean native cattle). In general, the price of cow is higher than those of steer and bull, causing cheating issues in the market. Hence, this study is to discriminate genders of Hanwoo with identification of factors which highly influence gender discrimination based on the big-size deboning data. Totally, there were 31 variables in the deboning data, and we divided into them two categories: data obtained before and after deboning. Discriminant function analysis was then applied into the data to determined the accuracy of gender discrimination in Hanwoo. The result showed that Hanwoo could be classified by gender with 99.2% of accuracy when using all 31 variables. In detail, it was possible to identify 93 of 94 bulls (98.9%), 96 of 96 cows (100%) and 74 of 75 steers (98.7%). The most significant variables was chuck, sirloin, armbone shin, plates, retail and cuts percentage, sequentially. With variables obtainable before deboning, accuracies of classification were 91.5% for bulls, 92.7% for cows, and 89.3% for steers. The most significant variables was water, cold carcass weight and back-fat thickness. The discrimination accuracy was higher with data obtainable after deboning: bulls (98.9%), cows (99.0%) and steers (98.7%). In this case, chuck, sirloin and armbone shin were the factors determined the classification ability. This study showed that Hanwoo can be classified based on deboning data with appropriate statistics, further suggesting weight of cut of beef might be the standard for gender classification.

Keywords

deboning data, discriminant function analysis, gender discrimination, Hanwoo

Acknowledgement

This research was supported by a grant from the collaborative research project Program (No. PJ011815), Rural Development Administration, Republic of Korea.

* 교신저자 : 이왕희(wanghee@cnu.ac.kr)