P-06-23

Carcass measurements to retail product weight in hanwoo beef (#502)

Hyun Woo Seo[1], Van Ba Hoa[1], Pil Nam Seong[1], Sun Moon Kang[1], Yun Seok Kim[1], Kuk Wan Seol[1], Jin Hyoung Kim[1], Sung Sil Moon[2], Yong Min Choi[3], Soo Hyun Cho[1]

[1] National Institute of Animal Science, Rural Development Administration, Wanju, South Korea; [2] Sunjin Meat Research Center, Ansung, South Korea; [3] National Institute of Agricultural Sciences, Wanju, South Korea

Introduction

The best practice to estimate yield of cattle is to first break down the whole carcass. However, prediction equations estimated using carcass traits have been adopted by the beef industry because of their practicability (Johnson, Taylor, & Priyanto, 1995; Murphey, Johnson, Smith, Abraham, & Cross, 1985). Previous studies implied that the prediction equation of beef yield, estimated from a biased group of cattle, could be a poor estimator for industrial population. This is the case of the Korean beef industry.

This study, therefore, was conducted to Hanwoo yield by using a mixture group of cows, steers, and bulls.

Methods

A total of 180 Hanwoo (80 cows, 29 bulls, and 71 steers) slaughtered were period at National institute of animal science meat processing plants. After chilling for 21 h at 1 , the carcasses were weighted, primal cuts weight and primal cuts percentage.

The data were subjected to statistical analysis using the Statistic Analysis System (SAS) package (SAS Institute, USA, 2014). All data were analyzed by the General Linear Model procedure considering treatment and storage time as the main effects. Means were compared using Duncan's Multiple Range Test. Significant differences ($p<0.05$) between carcass body size were determined.

Results

Table 1 presents the number of animals and their carcass characteristics which were used for estimating equation coefficients of carcass yield. Average arrival weight 649.68 kg for the cow, 739.93 kg for the bulls and 768.97 kg for the steers. Average cold carcass weight 381.01 kg for the cow, 441.94 kg for the bulls and 467.60 kg for the steers. The primal cuts lean meat weight rate and sub-primal cuts lean meat weight rate were higher for the bull (70.45 and 62.77%, respectively) than for the cow (63.39 and 54.86%, respectively) and steer (63.01 and 55.09%, respectively). Fat weight rate of bulls was lower than that of cows and steers. The diversity in carcass traits between sex groups were expected because carcass composition varies between sex groups during the course of growth (Steen & Kilpatrick, 1995).

Table 2, 3 presents Hanwoo beef for sex groups on primal cuts weight and primal cuts percentage. The primal cuts weight was tenderloin 6.72~8.09 kg, loin 30.23~40.88 kg, strip lion 9.14~10.42 kg, chuck roll 16.68~30.84 kg, clod 22.66~31.25 kg, top round 22.06~27.13 kg, bottom round 33.83~41.53 kg, brisket 35.67~46.38 kg, shank 14.36~18.22 kg and ribs 49.45~59.04 kg. Carcass characteristics and meat composition data are similar to those found in previous studies (Lee et al., 2008; Lee et al., 2013). Loin, chuck roll, clod, top round, bottom round, brisket, shank weight rate of bulls was higher than that of cows and steers. There was no significant difference in tenderloin and ribs weight rate between sex groups.

Conclusion

Development of a new prediction equation for Hanwoo yield was required because of changes in the Korean beef industry, where the proportion of steers has dramatically increased, and the slaughter weight ranges to 768 kg. These results show that other variables could in combination with carcass length or primal cuts weight, be used to achieve a more accurate estimation of fat and carcass yield. Weight or variables derived from it, such as carcass compactness should be in the carcass grading system for predicting kilograms of meat of the different primal.

ACKNOWLEDGEMENTS

This study was supported by 2019 year Postdoctoral Fellowship Program (Project No. PJ01212501) of National Institute of Animal Science, Rural Development Administration, Republic of Korea.

1. Lee, J. M., Hah, K. H., Kim, J. H., Cho, S. H., Seong, P. N., Jung, M. O., Cho, Y. M., Park, B. Y., Kim, D. H., & Ahn, C. N. (2008). Study on the carcass yield grade traits and prediction of retail product weight in hanwoo beef. Korean Journal for Food Science Animal Resources 28: 604-609.
2. Lee, J. G., Lee, S. S., Cho, K. H., Cho, C. I., Choy, Y. H., Choi J. G., Park, B. Y., Na, C. S., & Choi, T. J. (2013). Correlation analysis on body size traits, carcass traits and primal cuts in Hanwoo steers. Journal of Animal Science and Technology 55: 351-358.
3. Johnson, E. R., Taylor, D. G., & Priyanto, R. (1995). The estimation of beef carcass muscle using cross-sectional area of M. longissimus dorsi at the fifth rib. Meat Science, 40: 13-19.
4. Murphey, C. E., Johnson, D. D., Smith, G. C., Abraham, H. C., & Cross, H. R. (1985). Effects of sex-related differences in external fat deposition

Notes

1. on subjective carcass fatness evaluations-steer versus heifer. Journal of Animal Science, 60: 666-67
2. SAS. (2014). SAS/STAT Software for PC. Release 9.4, SAS Institute Inc., Cary, NC, USA.

Steen, R. W. J., & Kilpatrick, D. J. (1995). Effects of plane of nutrition and slaughter weight on the carcass composition of serially slaughtered bulls, steers, and heifers of three breed crosses. Livestock Production Science, 43, 205-213.

Table 3. The 10 primal cuts weight rate (%) on the carcass characteristics of Hanwoo beef

	Market weight(kg)			
	Cow	Bull	Steer	Total
Number of heads	80	29	71	180
Cold carcass weight (kg)	381.01±55.73^{C}	441.94±80.78^{B}	467.60±45.66^{A}	424.98±69.55
Primal cuts lean meat weight (kg)	240.79±32.11^{C}	310.36±53.02^{A}	294.47±30.76^{B}	273.17±46.23
Tenderloin	1.78±0.16	1.77±0.11	1.73±0.14	1.76±0.14
Loin	7.96±0.58^{B}	9.31±0.86^{A}	8.15±0.57^{B}	8.25±0.79
Strip lion	2.40±0.16^{A}	2.20±0.15^{B}	2.23±0.19^{B}	2.30±0.19
Chuck roll	4.38±0.47^{B}	6.98±1.35^{A}	4.66±0.57^{B}	4.91±1.16
Clod	5.98±0.50^{C}	7.10±0.58^{A}	6.26±0.53^{B}	6.27±0.65
Top round	5.83±0.56^{B}	6.19±0.56^{A}	5.49±0.40^{C}	5.75±0.56
Bottom round	8.93±0.74^{B}	9.45±0.62^{A}	8.67±0.62^{B}	8.91±0.72
Brisket	9.38±0.59^{B}	10.46±0.73^{A}	9.44±0.69^{B}	9.58±0.76
Shank	3.79±0.34^{B}	4.15±0.33^{A}	3.74±0.32^{B}	3.83±0.36
Ribs	12.98±1.41	12.83±0.68	12.64±1.25	12.82±1.26

$^{A-C}$ Means with different superscript in the same row significantly differ at $p<0.05$.

Table

Notes