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Carcass measurements to body size traits in hanwoo beef (#508)

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Introduction

Beef carcass classification plays an important role as a marketing aid within and between countries, and as a means of increasing the precision of price reporting for administrative purposes (Fisher, 2007), beef carcasses are classified according to the official beef carcass classification scheme (Commission of the European Communities, 1982). It has been well documented that carcass composition varies among cows, bulls, and steers (Hinks, Hunter, Lowman, & Scott, 1999; Miller, Cross, & Crouse, 1987; Mukhoty & Berg, 1971). The objectives of the study were to determine the carcass body size of Hanwoo beef.

Methods

A total of 180 Hanwoo slaughtered were period at National institute of animal science meat processing plants. After chilling for 21 h at 1℃, the carcasses were weighted (CW) and carcasses were measured for side length (SL), forequarter length (FL), hindquarter length (HL), cervical vertebrae length (CVL), thoracic vertebrae length (TVL), lumbar vertebrae length (LVL), sacral vertebrae length (SVL), 6th lumbar vertebrae ~ heel length (LVHL), 7thcervical vertebrae carcass breadth (CVB), 5~6th thoracic vertebrae breadth (TVB), 4~5th lumbar vertebrae breadth (LVB), 5th sacral vertebrae breadth (SVB), 7~8th thoracic vertebrae girth (TVG), coxae girth (CG), 4~5th lumbar vertebrae thick (LVT), coxae thick (CT), 7~8th thoracic vertebrae thick (TVT) (Fig. 1).

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 Hanwoo beef for sex groups on body size. Average cold carcass weight 381.01 kg for the cow, 441.94 kg for the bulls and 467.60 kg for the steers.

The Hanwoo carcass body size was side length 248~263 cm, forequarter length 108.69~114.37 cm, hindquarter length 142.06~150.14 cm, cervical vertebrae length 43.48~45.49 cm, thoracic vertebrae length 76.80~81.84 cm, lumbar vertebrae length 40.05~42.73 cm, sacral vertebrae length 32.78~35.76 cm, 6th lumbar vertebrae ~ heel length 100.13~107.82 cm, 7thcervical vertebrae carcass breadth 74.61~81.62 cm, 5~6th thoracic vertebrae breadth 76.99~81.49 cm, 4~5th lumbar vertebrae breadth 41.00~44.94 cm, 5th sacral vertebrae breadth 44.90~49.93 cm, 7~8th thoracic vertebrae girth 169.05~179.30 cm, coxae girth 129.89~133.07 cm, 4~5th lumbar vertebrae thick 23.89~25.03 cm, coxae thick 21.46~22.45 cm, and 7~8th thoracic vertebrae thick 18.88~20.79 cm.

Side length, hindquarter length, cervical vertebrae length, lumbar vertebrae length, sacral vertebrae length, 6th lumbar vertebrae ~ heel length, 5~6th thoracic vertebrae breadth, 4~5th lumbar vertebrae breadth, 5th sacral vertebrae breadth, 7~8th thoracic vertebrae girth and 7~8th thoracic vertebrae thick was highest length in steer. There was no significant difference in coxae girth, 4~5th lumbar vertebrae thick and coxae thick between sex groups.

Conclusion

The results of bull and steer had showed that Hanwoo significantly higher side length, cervical vertebrae length, thoracic vertebrae length, lumbar vertebrae length, sacral vertebrae length, 6th lumbar vertebrae ~ heel length, 7thcervical vertebrae carcass breadth, 5~6th thoracic vertebrae breadth than cow.

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Table 1. The body size on the carcass characteristics of Hanwoo beef

	Market weight(kg)			
	Cow	Bull	Steer	Total
Number of heads	80	29	71	180
Cold carcass weight	381.01±55.73^{C}	441.94±80.78^{B}	467.60±45.66^{A}	424.98±69.55
Side length	248.14±9.42^{B}	261.40±16.33^{A}	263.72±9.56^{A}	256.42±13.13
Forequarter length	108.69±4.92^{C}	117.03±8.10^{A}	114.37±5.11^{B}	112.27±6.51
Hindquarter length	142.06±5.03^{C}	147.07±7.64^{B}	150.14±5.95^{A}	146.06±6.93
Cervical Vertebrae length	43.48±2.64^{B}	45.14±3.10^{A}	45.49±5.30^{A}	44.54±4.06
Thoracic Vertebrae length	76.80±3.47^{C}	81.84±6.22^{A}	79.83±3.83^{B}	78.81±4.56
Lumbar Vertebrae length	40.05±1.60^{B}	41.53±2.41^{A}	42.73±5.06^{A}	41.34±3.68
Sacral Vertebrae length	32.78±3.87^{B}	35.28±5.97^{A}	35.76±3.67^{A}	34.36±4.41
6th Lumbar Vertebrae - Heel length	100.13±12.21^{B}	105.67±5.31^{A}	107.82±7.05^{A}	104.05±10.13
7th Cervical Vertebrae carcass breadth	74.61±5.58^{B}	81.62±6.52^{A}	81.32±3.86^{A}	78.39±6.14
5~6th Thoracic Vertebrae breadth	76.99±5.44^{B}	79.64±5.86^{A}	81.49±3.29^{A}	79.19±5.19
4~5th Lumbar Vertebrae breadth	42.10±4.73^{B}	41.00±4.53^{B}	44.94±2.90^{A}	43.04±4.35
5th Sacral Vertebrae breadth	46.68±7.22^{B}	44.90±6.55^{B}	49.93±3.67^{A}	47.67±6.22
7~8th Thoracic Vertebrae girth	169.05±9.30^{B}	171.48±13.09^{B}	179.30±5.39^{A}	173.48±9.95
Coxae girth	129.89±8.50	130.69±13.32	133.07±5.14	131.27±8.49
4~5th Lumbar Vertebrae thick	23.89±2.68	24.48±4.86	25.03±3.31	24.43±3.38
Coxae thick	21.46±2.78	22.45±6.91	21.65±2.67	21.69±3.71
7~8th Thoracic Vertebrae thick	18.88±2.77^{B}	18.97±1.94^{B}	20.79±3.03^{A}	19.64±2.90

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

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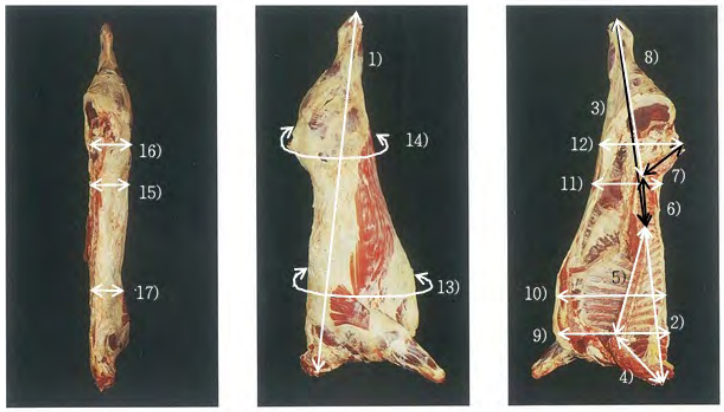

Fig. 1. Measurement of carcass size 1) Side length, 2) Forequarter length, 3) Hindquarter length, 4) Cervical Vertebrae length, 5) Thoracic Vertebrae length, 6) Lumbar Vertebrae length, 7) Sacral Vertebrae length, 8) 6th Lumbar Vertebrae ~ Heel length, 9) 7th Cervical Vertebrae carcass breadth, 10) 5~6th Thoracic Vertebrae breadth, 11) 4~5th Lumbar Vertebrae breadth, 12) 5th Sacral Vertebrae breadth, 13) 7~8th Thoracic Vertebrae girth, 14) Coxae girth, 15) 4~5th Lumbar Vertebrae thick, 16) Coxae thick, 17) 7~8th Thoracic Vertebrae thick.

Notes