

GROWTH OF CARCASS TRAITS OF BEEF CATTLE ON THE GRASSLAND IN ARGENTINE

J. J. Grigera Naon¹, S. Seneci¹, H. Harada², J. I. Utsumi Molle¹ and H.Yano³

¹ Dept. of Animal Science, University of Buenos Aires, Av. San Martin 4453, 1417 Buenos Aires, Argentina

² Dept. of Animal Science, Miyazaki University, Miyazaki 889-2192, Japan

³ Dept. of Animal Science, Kyoto University, Kyoto 606-8502, Japan

Background:

Animal Production in Argentina has long hold and dominant position in the world especially in beef production under favorable natural condition. Its production system is based on pastures, with a low-cost, feed as direct grazing use of sown pastures and crops as well as natural grassland. Occasionally, concentrated or processed grain feeds are used for a short period of time as a strategic use when animals require them nutritionally.

The animal production in Argentina has long been enjoying the advantage of its natural condition, however, it has become necessary to meet the requirements of the international market concerned for not only the competitive price but also a better quality of the products of animal husbandry.

Investigations from many approaches have been carried out and many reports have been produced about statistical genetic improvements of performance of meat production.

In order to get proved sires in Argentina, the bulls have been evaluated on their body weight gain, body conformations and circumference of scrotum related with the performance of fertilization but not on their carcass trait in live stage. There are not testing system for bulls here such as "performance testing" for evaluating the growth rate and feed efficiency of bulls and "progeny testing" for evaluating carcass traits of bulls genetically. It takes a long period of time, however, to get proved sires on meat quality and quantity by the performance and progeny testing. In order to solve the problem, carcass composition of live beef cattle has been measured by use of tentative techniques. These techniques, however, are not in wide use in South America.

Carcass traits such as fat thickness (SFT), rib thickness (RT), cross sectional area of M. longissimus thoracis (MLTA) and marbling score (MS) will be capable to judge without any injury to the body in a short time by use of ultrasonic equipment on live beef cattle. MS is one of the important carcass traits and affects to tenderness, juiciness and flavor of beef. Therefore estimating MS has been done not only in Japan but also the other countries. The composition of cross-sections between ribs of beef cattle is not simple and factors to influence ultrasonic estimating of carcass traits have not been fully discussed.

Objective:

The present study on ultrasonic technique for estimating carcass traits between ribs of live beef cattle by use of ultrasonic equipment, in which technique we are interested from the standpoint of its application to improvement of meat production performance of beef cattle in Argentina.

Methods:

Experiments will be done first to determine the most suitable conditions of ultrasonic equipment (Super-eye Meat 900SEM/ 2MHz, Fujihira-Kogyo Co. Ltd.) for estimating subcutaneous fat thickness (SFT/1:top edge, 2:middle, 3:bottom edge of M. longissimus thoracis), rib thickness (RT), cross sectional area of M. longissimus thoracis (MLTA) and marbling score (MS) at the last rib on the left side of live beef cows (181 heads) and steers (56 heads) which were Hereford and their crossbred with Angus. Then experiments will be tried to study the effects of several factors on ultrasonic measurements of these carcass traits and will be planned to clarify the growth rates of these carcass traits of grazing cows and fattening steers on the grassland for several months and also partial correlation coefficients based on live weight within carcass traits estimates. The main effects were different scanning stages and categories (combined age and sex) and linear regression effect was live weight for the least squares analysis of variance.

Results and Discussion:

Partial correlation coefficients based on live weight within carcass traits estimates were shown in Table 1 for cows and Table 2 for steers, respectively.

Table1. Partial correlation between carcass traits estimates of cows.

	MLTA	SFT1	SFT2	SFT3	RT
SFT1	0.329**				
SFT2	0.361**	0.736**			
SFT3	0.381**	0.508**	0.690**		
RT	0.121	0.153*	0.185**	-0.092	
MS	0.199**	0.172*	0.133*	0.156*	-0.012

MLTA:M.longissimus thoracis area RT:Rib thickness,
SFT:Subcutaneous fat thickness(1: top edge of rib eye,
2: middle og rib eye,3: bottom of rib eye)
MS:Marbling score

Table2. Partial correlation between carcass traits estimates of fattening steers.

	MLTA	SFT1	SFT2	SFT3
SFT1	0.167			
SFT2	0.085	0.581**		
SFT3	0.344**	0.228*	0.408**	
RT	-0.140	0.128	0.034	-0.234*
MS	0.324**	0.066	0.102	0.148

MLTA:M.longissimus thoracis area RT:Rib thickness,
SFT:Subcutaneous fat thickness(1: top edge of rib eye,
2: middle og rib eye,3: bottom of rib eye)
MS:Marbling score

Partial correlation coefficients between SFT2 and SFT1 (0.736 for cows, 0.581 for steers) or SFT3 (0.690, 0.408) were relatively high ($P<0.01$) and showed that SFT2 was better indicator than SFT1 and SFT3 for evaluating fat thickness of beef cows and also steers. Partial correlation coefficients between MLTA and MS were 0.199 for cows and 0.324 for steers. The results of least squares analysis of variance showed that all carcass traits estimates were significantly ($P<0.01$) influenced from the effects of categories of animals. Least squares means of them were shown in Fig.1 and Fig. 2. Steers had highest values of least squares mean for all traits. Scanning stage effect was significant for MLTA ($P<0.05$) and SFT ($P<0.01$) at all locations, while was not significant for MS and RT.

Conclusion:

Ultrasonic equipment (Super-eye Meat 900SEM/ 2MHz, Fujihira-Kogyo Co. Ltd.) for estimating carcass traits of live animals would be effectively used for improving carcass traits of beef cattle. SFT2 was good indicator for evaluating fat thickness of beef cattle. It is necessary to select good marbled cows for producing good quality beef not only MS but also tenderness and juiciness.

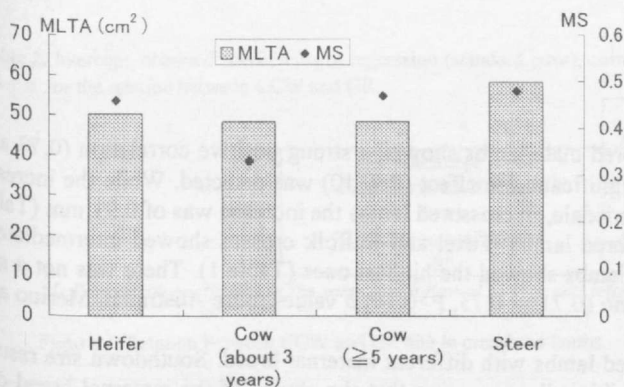


Fig1. Least Squares Means of ultrasonic estimates of MLTA and MS within some category of cattle.

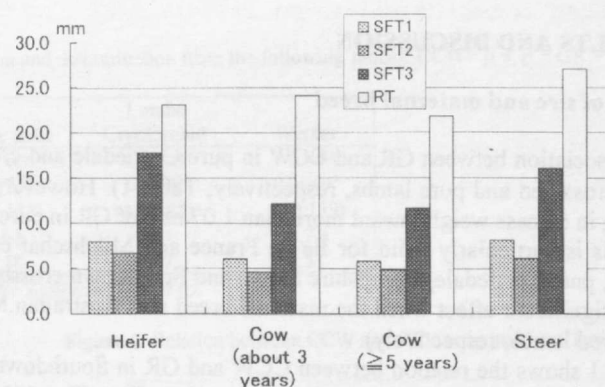


Fig2. Least Squares Means of ultrasonic estimates of SFT and RT within some category of cattle.

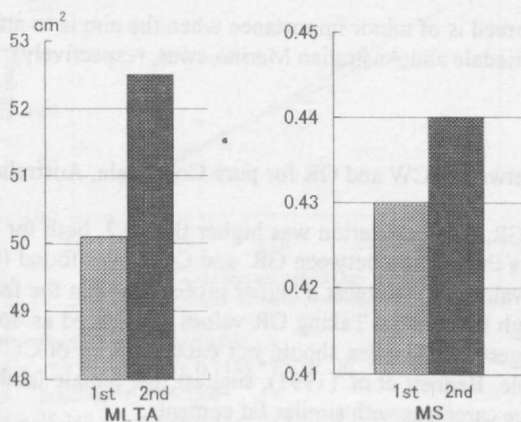


Fig3. Least Squares Means of ultrasonic estimates of carcass traits within scanning stages.

