Longissimus muscle area in Simmental and Holstein veal calves and their crossbreeds

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Introduction

Ultrasound is a non-invasive method used for estimating fat and muscle accretion and body composition in live cattle. Ultrasound is mostly used for the estimation of bovine carcass characteristics including back fat thickness, longissimus muscle area (LMA), percent of intramuscular fat, rump fat, and gluteus medius depth. Longissimus muscle area is the most common estimator of total carcass muscle.

The object of this study was to determine LMA of different genotypes veal calves slaughter at different final weight (150-160 kg and 190-200 kg).

Material and methods

Research included 80 calves of different breeds (30 Holstein, 24 Simmental, 26 crossbreeds Simmental x Holstein). Calves were reared under identical feeding and handling conditions on the one farm.

Study included two finale weight group of calves (150-160 kg and 190-200 kg).

Day before slaughter LMA was measured using Aquila Vet (Pie Med.) placing meat probe between 12th and 13th rib on the right side of body. From each animal two ultrasound images were taken.

Carcass LMA was traced on transparent foil 24 hours *post mortem* and measured later with planimeter Robotron (Reiss Precision).

Data were analyzed by the GLM procedure of SAS (1999).

Fig. 1. Calves carcass

Fig. 2. Measured LMA using Aquila Vet

Fig. 3. Carcass LMA paint on folia

Results

Table 1. Longissimus muscle area of different genotypes measured by ultrasound and planimeter (LSM)

LMA (cm^2)	Genotypes		
	Simmental	Holstein	Crossbreeds
ULMA	36.51^a	32.16^b	33.51^a
CLMA	40.32^a	35.06^b	36.54^a

$^{a, b}$ Values marked with a common superscript within a row do not differ significantly at P<0.05.

ULMA = ultrasound longissimus muscle area;
CLMA = carcass longissimus muscle area.

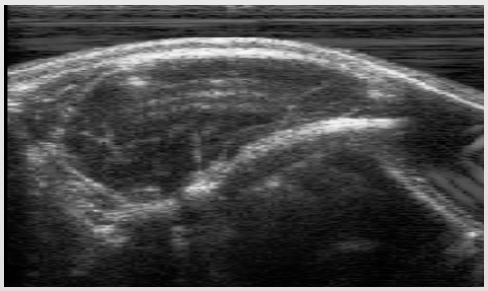

Fig. 4. Ultrasound LMA

Table 2. Effect of finale weight on LMA of different genotypes measured by ultrasound and planimeter (LSM)

FSW (kg)	LMA (cm^2)	Genotypes		
		Simmental	Holstein	Crossbreeds
150-160	ULMA	32.38	31.28	31.46
	CLMA	34.27	33.89	34.06
190-200	ULMA	40.09^a	33.50^b	35.64^a
	CLMA	44.43	36.70	39.02

$^{a, b}$ Values marked with a common superscript within a row do not differ significantly at P<0.05.

FSW = Finale slaughter weight

Pearson correlation coefficient between ULMA and CLMA was significant (P<0.001), Simmental calves were 0.95, Holstein 0.92 and crossbreeds 0.88.

Conclusion

Results of this study show significant influence of genotype and finale slaughter body weight on LMA (ULMA and CLMA). High pearsons correlation between ultrasound and planimeter measured LMA suggest that ultrasound is a valid tool for measuring LMA in live veal calves.