

# EFFECT OF THE DIETARY POLYUNSATURATED FATTY ACIDS ON MEAT TENDERNESS OF BULLS FROM DIFFERENT GENETIC GROUPS

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**Abstract – This study aimed to evaluate the effects of dietary polyunsaturated fatty acid (PUFA) level on meat tenderness of bulls from different genetic groups. Thirty Nellore and thirty crossbred Angus x Nellore males were feedlot and fed diets containing low (LPF) or high (HPF) PUFA levels. Cooking loss (CL), shear force (SF) and sarcomere length (SL) were evaluated. There was a genetic group x diet interaction for SL, which crossbred animals fed LPF diet had higher SL than purebred animals fed LPF diet. A trend of purebred animals have higher CL than crossbred animals was observed. There was no difference between diets for CL and SF. Dietary PUFA levels has no effect on meat tenderness of *B. indicus* and crossbred animals.**

**Key Words – crossbred, Nellore, shear force, soybean oil**

## I. INTRODUCTION

Crosses between zebu and taurine breeds, which have been widely used in Brazil, have proven heterosis for overall meat quality [1]. Wheeler et al. [2] reported a decline in meat quality, especially meat tenderness, when *B. indicus* are compared with *B. Taurus*. In addition, *B. indicus* animals had a lower intramuscular fat content than *B. taurus*, which can affect the meat tenderness [3]. Because distinct genetic groups have different potentials for depositing intramuscular fat, feeding high levels of polyunsaturated FA can also affect differently the FA profile and therefore the meat quality. Therefore, this study was carried out to evaluate the effects of the dietary polyunsaturated FA levels on meat tenderness of bulls from different genetic groups.

## II. MATERIALS AND METHODS

Thirty Nellore and 30 crossbred Angus x Nellore ( $368 \pm 28$  kg bodyweight; 24 mo old) were feedlot and fed diets containing low (LPF) or high (HPF) levels of polyunsaturated FA. The LPF diet contained corn silage (10%), sugarcane bagasse (5%), corn grain (58%), citrus pulp (16%), soybean meal (9%), urea (1.2%), and mineral salt (0.8%). For the HPF diet, soybean oil (3.5%) was added in replacing of corn grain. After 133 days on feed, animals were harvested and samples of *Longissimus* muscle (12<sup>th</sup> rib level) were taken, vacuum packed and aged for 7 days. After that, samples were removed from the packages, weighed, and cooked, as recommended by AMSA [4]. Then, they were reweighed to determine the cooking loss (CL), wrapped in plastic wrap, and placed in a refrigerator (4 – 6 °C) for 12 hours. Afterward, shear force (SF) was determined according to AMSA [4]. Sarcomere length (SL) was evaluated according to Cross et al. [5]. Means were compared by Student's t test. Differences were considered statistically significant when  $P \leq 0.05$ .

## III. RESULTS AND DISCUSSION

*Genetic group x diet interaction.* A genetic group x diet interaction for SL was observed ( $P = 0.0392$ ; Fig. 1). Crossbred animals fed LPF diet had a higher SL than purebred animals fed LPF diet ( $P = 0.0307$ ); however, no difference was observed for SL between crossbred animals fed LPF and HPF diets ( $P = 0.5038$ ). Nevertheless, no genetic group x diet interaction for SF ( $P = 0.8904$ ) was observed.

*Genetic group.* A trend of purebred animals have higher CL than crossbred animals was observed ( $P = 0.0674$ ; Table 1). Nonetheless, there was no difference between genetic groups for SF. On the contrary, Koohmaraie et al. [6] stated sarcomere length has been positively correlated with tenderness.

*Diet.* No difference was observed between diets for CL ( $P = 0.8854$ ) and SF ( $P = 0.3997$ ), as reported by Oliveira et al. [7]. Nevertheless, animals fed HPF diet had mean value of SF (44.6 N) higher than the reduced threshold (42 N) indicated

by Huffman et al. [8] whereas animals fed LPF diet had mean value of SF (40.7) below that. Huffman et al. [8] noted a mean value of SF above 42 N could have a decrease in the score given in the sensory analysis.

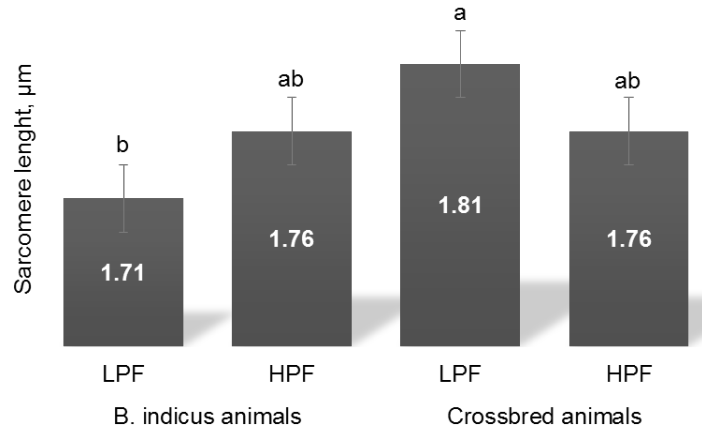


Figure 1. Genetic group x diet interaction on sarcomere length. LPF = low polyunsaturated fatty acid level; HPF = high polyunsaturated fatty acid level.

Table 1 Means, standard errors (SEM) and probabilities (*P*-value) of the meat quality according to the genetic group and diets.

Traits	Genetic group (GG)		Diet (DT) <sup>1</sup>		SEM	<i>P</i> -value		
	<i>B. indicus</i>	Crossbred	LPF	HPF		GG	DT	GG x DT
Cooking loss (%)	27.7	25.2	26.6	26.4	0.98	0.0674	0.8854	0.8525
Shear force (N)	41.8	43.5	40.7	44.6	3.27	0.7127	0.3997	0.8904

<sup>1</sup>LPF = low polyunsaturated fatty acid level; HPF = high polyunsaturated fatty acid level.

#### IV. CONCLUSION

The dietary PUFA levels has no effect on meat tenderness of *B. indicus* and crossbred animals.

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