**PE9.21 Effect of breed and diet on beef intramuscular fat fatty acid indices for enzyme activities 151.00**

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**Abstract— The effect of breed and diet on several indices of fatty acids involved in MUFA and PUFA metabolism in LD muscles for 144 Angus (A), Charolais x Angus (CHAxA) and Holando Argentino (HA) steers under four production systems, pasture exclusive (P), pasture and 0.7% corn grain (0.7%), pasture and 1.% corn grain (1%) and feedlot (F) were determined. The ratios MUFA/SFA, C16:1/C16:0 and C18:1/C18:0 were affected significantly by diet and breed. Feedlot LD had higher ratios than pasture LD. The ratio C18:1/C16:1 was only affected by breed. All ratios involved in PUFA metabolism, except the ratio C20:4/C20:3 were affected by the diet. The n-6/n-3 ratios considered here were lower in the pasture LD when compares to feedlot LD. All indices involved in MUFA and PUFA metabolism and some ratios of nutritional interest in Longissimus dorsi muscle intramuscular fat were affected, at some extent, by diet or breed.**

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**Index Terms—beef, fatty acids, Ä 9 desaturase , n-6/n-3**

## I. INTRODUCTION

Fatty acid (FA) composition of beef has received considerable interest due to its implications for human health and meat quality (1). It is well established that the FA composition of beef lipids is determined by genetic factors as breed, sex and genotype, and environmental factors of which diet is by far the most important one (2). In this study the effect of breed and diet on several indices involved in the metabolism of MUFA and PUFA fatty acid in LD intramuscular lipids was studied. .

## II. MATERIALS AND METHODS

LD muscles for 144 Angus (A), Charolais x Angus (CHAxA) and Holando Argentino (HA) steers under four production systems, pasture exclusive (P), pasture and 0.7% corn grain (0.7%), pasture and 1.% corn grain (1%) and feedlot (F) were the experimental samples. Samples of Longissimus dorsi were taken at the height of the 11th rib and stored at -20°C until analysis. Lipids were extracted using chloroform / methanol (2/1, v/v) adapted from the method of Folch et al. (1957). The FA methyl esters (FAME) were analysed on a Chrompack 900 gas chromatograph with a 100 m CP-Sil 88 capillary column. The indices for the activities of Ä desaturases as well as the elongase activity, were estimated by the ratios of product to precursor fatty acids. Treatments were compared by analysis of variance using the GML procedure (SAS 8.0 SAS Institute, Inc., Cary, NC). Mean values were compared using the Tukey test.

## III. RESULTS AND DISCUSSION

The effect of breed and diet on indices of Ä9 desaturase, MUFA/SFA, C16:1/C16:0 and C18:1/C18:0 are presented in Table 1. All ratios were affected significantly by diet and breed. Feedlot LD had higher ratios than pasture LD which indicate changes in Ä9 desaturase activity or reflect differences in the diet composition (3). The ratio C18:1/C16:1 was only affected by breed. In Table 2 are given several ratios involved in PUFA metabolism in LD muscle. All of them, except the ratio C20:4/C20:3 were affected by the diet. C20:4/C20:3, C20:4/C18:2, C20:5/C18:3 and C22:5/C18:3 were also significantly ($p<0.001$) affected by breed. In Table 3 are presented some ratios of nutritional interest. The ratios considered here, n-6/n-3, C18:2n-6/C18:3 n-3 and C20:4n-6/C20:5n-3 were lower in the pasture LD when compares to feedlot LD. These differences are very important from a nutritional point of view. The n-6/n-3 ratio is considered as a nutritional index for the healthiness of food for human consumption and it should not exceed a value of 4 in the human diet to prevent the occurrence of cardiovasculsar diseases (4)

## IV. CONCLUSION

Diet and breed affected several fatty acid indices of Ä9 desaturases and elongases involved in MUFA and PUFA metabolism and some ratios of nutritional interest in Longissimus dorsi muscle intramuscular fat.

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