

PE9.13 Effect of breed and diet on the cholesterol content of intramuscular beef fat 92.00

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Abstract— Intramuscular fat and cholesterol were determined in Longissimus dorsi 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). No significant differences were detected for cholesterol content expressed as mg/100 g of beef. Specific cholesterol (mg/g intramuscular fat) was negative related to the amounts of IMF. A clear dilution effect of cholesterol in the intramuscular fat seems to be evident. The specific cholesterol values were higher in pasture beef in the three breeds compared with the supplemented and feedlot beef.

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Index Terms—Cholesterol, beef, intramuscular fat, production systems.

I. INTRODUCTION

Public concern over the effects of dietary cholesterol on heart disease is more specifically related to meat products, especially red meat (1). Several researches reported the lower cholesterol content (45.7-45.8mg/100g) in LM of bulls and steers finishing in pasture systems as opposed to traditional finishing. They found no difference in cholesterol content among animals despite the variation in fatness (2). Others (3) considered that breed, nutrition and gender do not affect cholesterol concentrations of bovine skeletal muscle. The results from these studies previously mentioned indicated an unpredictable relationship between fatness and cholesterol (5). The present study was undertaken to evaluate the relationship between the intramuscular fat and the cholesterol content of

Longissimus dorsi muscles in steers from three breeds and four dietary production systems.

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 LD at the 11th rib were were extracted with chloroform : methanol (2:1, v/v) according to an adaptation of Folch et al. (1957) method. One aliquot sample of the chloroform extract was saponified with ethanol absolute 50% OHK, extracted and the total cholesterol determined by a colorimetric enzymatic method (BioSystem S.A.) In other chloroform aliquot sample total intramuscular fat was determined. Data were compared by analysis of variance using the GLM procedure (SAS Institute, Inc., Cary, NC). Mean values were compared using the Tukey test. The Pearson correlation coefficients were used in order to determine the relationship existing between the total intramuscular fat and the specific cholesterol content. A linear regression was applied to model the relationship between IMF and specific cholesterol.

III. RESULTS AND DISCUSSION

The effects of breed and diet on total intramuscular fat, cholesterol mg/100g meat and the specific cholesterol content (mg/g IMF) are given in Table 1. As expected the IMF content was lower in the pasture beef compared with the other groups. No differences were detected for cholesterol mg/100 g of meat. Many authors consider that muscle cholesterol concentrations do not vary in response to the differences in breed type, sex class or diet (4). They also suggested that changes in cholesterol content in muscle might require marked changes in structure of muscle cells associated with a marked redistribution of membrane fatty acids. On the contrary specific cholesterol was negative related to the amounts of IMF. A clear dilution effect of cholesterol in the intramuscular fat seems to be evident. The

specific cholesterol values were higher in pasture beef in three breed compared with the supplemented and feedlot beef.

IV. CONCLUSION

The specific cholesterol content seems to be more sensible to animal dietary changes than the total beef cholesterol. The relation between beef intramuscular fat and specific cholesterol could contribute to understand the erratic results related to cholesterol content in beef under different production systems.

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