

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

CASTRATION AND AGE EFFECTS ON GENE EXPRESSION OF COLLAGEN BIOMARKERS OF MUSCLE ON NELLORE CATTLE

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The collagen of the extracellular matrix (ECM) of the skeletal muscle interferes in the muscular structure altering the tenderness of the meat. The transforming growth factor beta (TGF- β), fundamental for fibrogenesis, is associated with the production of ECM by fibroblasts, while matrix metalloproteinases (MMPs) present collagenase activity, cleaving the ECM components. The activity of MMPs depends on their inhibitors (TIMPs), which also regulate ECM turnover and remodeling. The newly synthesized collagen fibers contains mostly divalent cross-links, and trivalent cross-links, are catalyzed by lysyl oxidase (LO). The objective of this study was to evaluate, through gene expression, the key molecular biomarkers related to intramuscular collagen metabolism, that affect the meat quality. Thirty-six male Nellore calves, with initial age and body weight of eight months and 250 kg, respectively, were used, and 18 were castrated before the experiment. The animals were kept in collective feedlot barns under the same experimental conditions, and received the same diet. Three slaughters of 12 animals (6 of each sexual class) were carried out when animals average ages were of 9, 12 or 15 months. During slaughter, samples of the Longissimus thoracic muscle were obtained on the 13th rib, immediately after bleeding. Gene expression of TGF β -1, MMP-2 genes and their tissue inhibitor (TIMP-2) was performed by real-time polymerase chain reaction (qRT-PCR). Statistical analyzes were performed assuming a 2x3 factorial scheme on %QPCR_MIXED macro in SAS, based on mixed linear models. The estimated contrast values of each gene and endogenous gene (18s) were used to evaluate the fold-change on gene expression using $2^{-\Delta\Delta Ct}$ method, and considering the significance level of $P < 0.05$. No differences ($P > 0.05$) were observed for any mRNA expression among the different ages (TGF β -1, $P = 0.8739$; TIMP-2, $P = 0.8378$; MMP, $P = 0.9282$ and LO, $P = 0.6328$), nor between the sex classes (TGF β -1, $P = 0.4913$; TIMP-2, $P = 0.7357$; MMP-2, $P = 0.5297$ and LO, $P = 0.5451$). Additionally, no interactions were found. The results indicate that the gene expression of the collagen metabolism biomarkers evaluated were constant over the age range evaluated and were not affected by sexual class. In conclusion, under the present study conditions, there is no difference between bulls and steers from 9-15 months of age, on gene expression of key genes associated with the fibrogenesis and intramuscular collagen turnover, nonetheless the post-translational control of collagen metabolism should be investigated.

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