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Genotypic and Allelic Frequencies of DGAT1 gene on Girolando

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The acyl-CoA:diacylglycerol acyltransferase1 gene (DGAT1) was identified as one underlying the quantitative trait locus (QTL) for milk production traits in the centromeric region of the bovine chromosome 14 (BTA14). Acyl-CoA:diacylglycerol acyltransferase regulates the rate of triglycerides in adipocytes, and it is also associated with energetic homeostasis. A polymorphism occurs on exon VIII in which there is a substitution from a lysine for an alanine (K232A) resulting in the substitution of two nucleotides (AA/GC). Such polymorphism is associated with fat deposition. Allele A is associated with the increase on milk and protein production while allele K is associated with decrease on protein production and increase of fat on milk. The objective of the present work is to estimate the genotypic and allelic frequencies of DGAT1 gene on Girolando breed cattle and verify if the population is under Hardy-Weinberg equilibrium (EHW). DNA was extracted from blood samples using DNeasy Blood & Tissue Kit (Qiagen, Hilden, Germany), quantified by spectrophotometry (Nanodrop®, Wilmington, DE, USA). The genotypes were established using PCR-RFLP, with primers already described. The conditions were optimized regarding the concentration of reagents and temperature of annealing using model 9700 thermocycler (Applied Biosystems, Foster City, CA, USA). Digestion was made using *EaeI* enzyme (Biolabs, New England, USA) and restriction fragments were observed on 1,5% agarose gel dyed with Ethidium bromide. Allelic and genotypic frequencies and Hardy-Weinberg equilibrium were established using POPGENE software (v 1.32) and the probability of Hardy-Weinberg equilibrium was tested using χ^2 ($p < 0,05$). The frequency of allele A was 0,2644 and variant K was 0,7356. The genotypic frequencies were 0,0250; 0,4790 and 0,4960 for genotypes AA, AK and KK respectively. Such population does not find itself on Hardy-Weinberg equilibrium for alleles A and K at 5% of probability as the frequencies observed differs from the expected frequency meaning that such population could be undergoing selection for allele K. Breeders interested in increase milk and protein production should chose animals with AA genotype, however, like in this case, if breeders need milk with low protein and more fat they should choose animals with KK genotype. Financial Support: CNPq, FAPEMIG, CAPES and EMBRAPA/AGROFUTURO

SP 5301 P. 167