Brazilian-International Congress of Genetics

Genotyping of Girolando bulls for the β-casein gene

RA

Pereira, HP[1]; Nascimento, RIC[1]; Oliveira, FR[2]; Reis, DRL[2]; Silva, MVGB[2]; Machado, MA[2]; Martins, MF[2]

[1] Centro de Ensino Superior de Juiz de Fora, Juiz de Fora, MG; [2] Embrapa Gado de Leite, Juiz de Fora, MG

hyago_passe@hotmail.com

Palavras-chave: Keywords: β-casein, AS-PCR, BCM-7, Real-Time PCR, genotyping

Milk is a widely traded commodity and is a common source of animal protein of great importance in human nutrition, with two large main groups of proteins: caseins and whey proteins. The caseins are the most plentiful in milk, corresponding to about 80% of the total. They are divided into four groups: alpha S1, alpha S2, β e kappa-casein. Among the caseins, β-caseins account for about 25-35% of the total, the A1 and A2 variants are the most common in bovine milk. These variants differ by one nucleotide change at position 67 of the chain, in which the proline at A2 is replaced by a histidine at A1. The digestion of the β-casein A1 in the human gastrointestinal tract has the bioactive peptide β-casomorphin 7 (BCM -7) as one of its final products, which has been linked to several human diseases, such as coronary problems, allergy and diabetes mellitus type 1. The objective of this study is to estimate the genotypic and allelic frequencies of the β-casein gene in Girolando breed cattle and verify if the population is under Hardy-Weinberg equilibrium (HWE). Two hundred and eighty participants bulls of Progeny Test - Girolando, coordinated by Embrapa Dairy Cattle and Brazilian Association of Breeders, were genotyped for the β-casein gene. The DNA was extracted from blood and semen samples using DNeasy Blood and Tissue kit (Qiagen, Hilden, Germany), quantified and assessed by spectrophotometry (Nanodrop®, Wilmington, DE, USA). The identification of alleles was performed by AS-PCR in Real-Time PCR. The amplified products were evaluated in the 7300 System SDS software Core Application Version 1.3.1 (Applied Biosystems) in Real-Time PCR equipment (ABI Prism 7300 Sequence Detection Systems, Applied Biosystems). Allelic and genotypic frequencies and HWE were established using POPGENE software (v 1.32) and the probability of HWE was tested using $\chi2$ (p<0.05). The frequency of bulls have the A1A1 genotype was 5%, 60 % A2A2 and 35% A1A2 genotype. The allele frequencies were 23% for the A1 allele and 77% allele A2. The results shows that Girolando not have high frequency of allele A1 and may decrease the frequency of this unfavorable allele in cattle through breeding strategies. The observed frequencies are close to the expected indicating that the population is in HWE.

SP 7203