

Determination of allelic and genotypic frequencies of kappa-casein and beta-lactoglobulin genes on Girolando cattle

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Animal breeding on dairy cattle is performed with the aim of improving quality and earnings on dairy chain. Among many genes already correlated with functional and constitutive milk characteristics, kappa-casein gene (*CSN3*) and beta-lactoglobulin gene (*LGB*) were widely studied and seems to play a role in such items. *CSN3* gene has 11 variants identified, being A and B variants the most frequent on cattle, where B variant is correlated with a positive effect on milk proteins percentage, in addition of being correlated with thermal resistance, short curd formation time, harder curds and different sizes of micelles, which is favorable on cheese-making properties. *LGB* gene has 12 described variants, being A and B widely studied and of main interest. A variant seems to play a role on milk productivity and B seems to be correlated with higher fat and protein percentage, thus being favorable for dairy products manufacturing. Present work aim was to estimate allelic and genotypic frequencies of *CSN3* and *LGB* genes of cows and bulls participants on Girolando Progeny Test. DNA was extracted from blood and semen samples using DNeasy Blood and Tissue Kit (QIAGEN), and quantified by spectrophotometry. The animals were genotyped by PCR-RFLP technique. The amplified fragments were digested with the restriction enzymes *Hinf* I (*CSN3*), and *Hae* III (*LGB*). AA genotype for *CSN3* gene was characterized by the presence of three restriction fragments of 326, 100 and 27 bp. BB genotype showed two fragments of 426 and 27 bp, and heterozygous individuals (AB) were characterized by the presence of four fragments (426, 326, 100 and 27 bp). For *LGB* gene the pattern of fragments was 153 and 109 bp for AA genotype, 109, 79 and 74 bp for BB genotype, and 153, 109, 79 and 74 bp for heterozygous individuals (AB). Allelic and genotypic frequencies were estimated using GENETPOP software web version 3.4, developed by Raymond and Rousset. The genotypic frequencies were 72.5% AA, 2.5% BB and 25% AB for *CSN3* gene, and 25% AA, 25% BB and 50% AB for *LGB* gene, thus being the population under Hardy-Weinberg equilibrium ($p < 0.05$). Allelic frequencies found were 85% A and 15% B for *CSN3* gene and 50% A and 50% B for *LGB* gene. That being so, genotyping of dairy cattle seems to be a valuable tool by improving earnings on dairy chain, once it allows breeders to properly manage the production focusing on either milk productivity or dairy products manufacturing. Financial Support: CNPq, FAPEMIG, CAPES and EMBRAPA/AGROFUTURO