GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

# *AGPAT6* polymorphism and its association with milk traits of dairy goats

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Genet. Mol. Res. 10 (4): 2747-2756 (2011)
Received January 4, 2011
Accepted August 15, 2011
Published November 4, 2011
DOI http://dx.doi.org/10.4238/2011.November.4.8

**ABSTRACT.** As one of the eight members in the 1-acylglycerol-3-phosphate-O-acyltransferase (AGPATs) family, *AGPAT6* is a crucial enzyme for the biosynthesis of glycerolipids and triacylglycerol in eukaryotes, as well as catalyzing the conversion from lysophosphatidic acid to phosphatidic acid. *AGPAT6* can be considered as a candidate gene for regulating milk composition. DNA sequencing and PCR-RFLP methods were applied to detect genetic variation in the *AGPAT6* gene in 549 Chinese dairy goats. Four polymorphisms (NC_007328.3:g.152G>C, 8124G>A, 9263C>G, 16436G>A) were detected in 5'UTR, intron 2, exon 4, and 3'UTR, respectively. For the *Kpn*I locus, the frequencies of the *AGPAT6*-G allele were 0.955 and 0.936 for SN (Xinong Sannen) and GZ (Guanzhong) dairy goat breeds, respectively. In the PCR-RFLP analysis for *Kpn*I, *Eco*RII, *Nco*I, and *Bgl*I, the frequencies of the G allele of *AGPAT6* were 0.955 and 0.936, 0.694 and 0.819, 0.206 and 0.254, 0.729 and 0.623 for SN and GZ dairy goat breeds, respectively. The 9263C>G mutation revealed a synonymous genetic code of Thr (threonine). Associations between the

 

four mutations and milk traits were analyzed in two dairy goat breeds. At the 9263C>G locus, genotype GG and CG individuals showed significantly better milk performance than genotype CC individuals ($P < 0.05$). Therefore, the G allele is suggested to be a molecular marker for milk production in dairy goats.

**Key words:** Dairy goat; *AGPAT6* gene; Polymorphism; PCR-RFLP; Milk traits

 