

Diacylglycerol *o*- Acyltransferase 1(DGAT1) Polymorphism in Hardhenu Cross Bred Cattle (Holstein Friesian X Sahiwal X Haryana BREED)

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Abstract—DGAT enzyme catalyzes the final step of triglyceride biosynthesis in milk which accounts for about 97 percent of milk fat. Thus, DGAT1 has become a promising candidate gene for milk production traits and it could be used as a marker in selection programmes to enhance the production potential and to accelerate the rate of genetic gain. Therefore, as a first step to understand the molecular architecture of DGAT1 gene, PCR-RFLP was performed on 50 randomly selected Hardhenu cattle maintained at Animal farm of LUVAS, Hisar, Haryana to detect polymorphism in the 413 BP fragments of cattle. The PCR-RFLP studied on DGAT1 gene in Hardhenu cattle, using *EaeI* revealed two alleles, arbitrarily designated as K and A. An undigested fragment of 413 bp indicated the K allele whereas two co-migrated fragments of 210 and 203 bp length indicated the A allele. In Hardhenu cattle population genotype frequencies were 0.30 (KK) and 0.70 (AK). The frequency of K and A allele were 0.65 & 0.35. Over all 15 KK and 35 AK animals were recognised in Hardhenu cattle whereas no animal of AA genotype were observed. The overall DGAT1^K allele frequency in crossbred cattle was 0.65. Lysine variant was the likely ancestral form of DGAT1 gene and the presence of lysine allele in buffaloes and Indian zebu cattle breeds might be one of the factors for the high fat content of milk. As the frequency of almost fixed nature of K allele is very high in Sahiwal and other well defined Indian cattle breeds, DGAT1 K232A polymorphism may not be a suitable candidate for selection purpose. However, considering the increasing trends of crossbred cattle population in India, elimination of the K allele or selection against it may be suggested to increase milk and protein yield in crossbred, once association of K232A polymorphism with production traits is established.