IGF-I gene polymorphism, but not its blood concentration, is associated with milk fat and protein in Holstein dairy cows

E. Bonakdar¹, H.R. Rahmani¹, M.A. Edriss¹ and B.E. Sayed Tabatabaei²

¹Department of Animal Science, College of Agriculture, Isfahan University of Technology, Isfahan, Iran
²Department of Biotechnology, College of Agriculture, Isfahan University of Technology, Isfahan, Iran

Corresponding author: H.R. Rahmani
E-mail: hrahmani@cc.iut.ac.ir

Received April 12, 2010
Accepted June 24, 2010
Published August 31, 2010
DOI 10.4238/vol9-3gmr874

ABSTRACT. We estimated the allele and genotype frequencies of IGF-I/SnaBI gene polymorphism and the concentration of this protein in Holstein dairy cows. We also examined the association with milk yield (305-day milk yield) and milk components (fat and protein percentage, and 305-day milk protein and fat yield). Blood IGF-I levels were measured and genotyping was performed on 250 Holstein cows of four different herds. In the association studies, traits of interest were analyzed using the GLM procedure of SAS; means of the IGF-I level among genotypes were compared by the LSMeans test. The AB and AA genotypes were the most (0.583-0.661) and least (0.083-0.192) frequent in the herds, respectively; the frequency of the BB genotype ranged from 0.201 to 0.333. The frequency of the A allele ranged from 0.375 to 0.495, while the frequency of the B allele ranged from 0.504 to 0.625, being the dominant allele. The mean level of IGF-I was 107 ± 22 ng/mL for all groups, without
any significant correlation with the production traits. Association of IGF-I/SnaBI genotypes with percentage of fat and protein in the milk was relatively high (P < 0.1 and P < 0.05, respectively); the AB genotype was superior to AA and BB genotypes. We concluded that this marker should be considered for milk component selection in Holstein dairy cattle.

**Key words:** Dairy Holstein; Gene polymorphism; Milk protein; Milk fat; IGF-I