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Polymorphism at 5′UTR region of *ACACB* gene and its association with body weight and HDL concentration in layer chickens

Shivaprasad Ch[1]*, Vinoo R[2], Chatterjee RN[5], Muralidhar M[6], Narendranath D[3] & Aswanikumar K[4]

[1]Livestock Farm Complex, College of Veterinary Science, P V Narasimha Rao Telangana Vetterinary University, Rajendranagar-500 030, Telangana, India

[2]Department of Animal Genetics and Breeding; [5]Department of Poultry Science; [6]Department of Veterinary Biochemistry, NTR College of Veterinary Science, Sri Venkateswara Veterinary University, Gannavaram-521 102, Andhra Pradesh, India

[5]ICAR-Directorate of Poultry Research, Rajendranagar, Hyderabad-500 030, Telangana, India

[6]Department of Animal Genetics and Breeding, College of Veterinary Science, Sri Venkateswara Veterinary University, Garividi-535 101 Andhra Pradesh, India

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Understanding genetic regulation of adipose tissue developmental genes would help in designing healthy chicken for human consumption. In the present study, we tried to identify the polymorphism at the 5′UTR region of the Acetyl-CoA Carboxylase Beta (*ACACB*) gene and its association with body weights and High-Density Lipoprotein (HDL) concentration in IWI and IWK lines of White Leghorn layer chicken breed. A total of 500 birds comprising of 250 IWI line and 250 IWK line were included in Single Stranded Conformation Polymorphism (SSCP) data analysis. Results revealed that in IWI lines within group there is a significant ($P \leq 0.05$) effect on body weights at 8th week and 16th week of age. Whereas, in IWK lines within group there is a significant ($P \leq 0.05$) effect on body weights at day old and 20th week of age was observed. In general, the h8h8 haplogroup showed the highest body weights in both the lines. The association analysis of serum concentration of HDL in IWI line revealed that h12h12 haplogroup birds was the highest (61.64±2.99) and in the h1h2 haplogroup it was found to be the lowest (42.72±7.23). In case of IWK, the h8h8 haplogroup birds were the highest (62.47±6.06) serum concentration of HDL and in the h7h7 haplogroup, it was found to be the lowest (44.85±2.64) serum concentration of HDL. In IWI lines within group, there is a non-significant ($P \leq 0.05$) effect on serum concentration of HDL and in IWK lines within group there is a significant ($P \leq 0.05$) effect on serum concentration of HDL was observed. It is concluded that promotor of the *ACACB* gene is highly polymorphic and have a significant effect on body weights and serum concentration of HDL in White Leghorn layer chicken.

Keywords: Genotyping, Haplogroup, High-Density Lipoprotein (HDL), Obesity, Single Stranded Conformation Polymorphism (SSCP), White Leghorn

The prevalence of accumulation of fat affects body syndrome, hypertension, and a few types of cancer[1-3]