

Adiponectin receptor 2 gene associated with bone traits in broiler chickens

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Candidate genes studies are important to identify mutations that can be associated with variation in the phenotypic trait of interest. The adiponectin receptor 2 gene (*ADIPOR2*) is a receptor of the adiponectin, a protein hormone that suppresses glucose production and increases lipid oxidation. Recently, the adiponectin has emerged as an important element in the regulation of bone metabolism in humans. Hence, this work aimed to establish relationship between a polymorphism in the *ADIPOR2* gene (SNP C242T) with 23 broiler bone traits. A total of 1440 chickens from the EMBRAPA TT Reference Population was genotyped by PCR-RFLP. Association analysis of the SNP with traits was performed with QxPak.v4 software. A mixed model was applied with fixed effects of sex, SNP and hatch, and the infinitesimal and residual as random effects. The additive effect and the additive plus dominant effects of the SNP were tested. The frequencies of genotypes (CC, CT and TT) were 58.36%, 37.65% and 3.99%, respectively. The additive effect of the marker was significant ($P < 0.05$) for the following tibia traits: fresh weight, width, ash content and yield). The additive plus dominant effect was significant ($P < 0.05$) for femur width and femur ash content. Although this gene is related to fat metabolism, it was significantly associated with important bone traits. This might indicate a possible influence of this gene on chicken bone metabolism. The observed associations are interesting because chickens are selected for rapid growth and greater muscle development, while the bone tissue does not follow these physiological processes, increasing the incidence of leg problems and bone weaknesses. Therefore, the *ADIPOR2* gene is a potential marker to improve bone traits in broilers.

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