

HEPATOCTYTE NUCLEAR FACTOR 4 GENE ASSOCIATED WITH BONE TRAITS AND BIRTH WEIGHT IN MALE CHICKENS

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Association of candidate genes with traits can help to understand their physiology, giving insights of possible pathways related to the expressed phenotype. The HNF4 α gene (hepatocyte nuclear factor 4, alpha) is a hepatic transcription factor normally related to the lipid and insulin metabolism in humans, being a potential candidate gene related to general metabolism in chickens. Interestingly, some genes previously associated with bone traits in chickens, such as Insulin-Like Growth Factor-I (*IGF1*) have higher affinity to insulin receptor, probably influencing in some level the insulin metabolism. This work aimed to establish relationship between a polymorphism in the HNF4 α gene (SNP A543G) with 23 broiler bone traits and 4 body weight traits (at 1, 21, 35 and 42 days of age). A total of 1380 chickens from the EMBRAPA TT Reference Population was genotyped by PCR-RFLP. Association analysis of the SNP with phenotypic traits was carried out with QxPak software. A mixed model with fixed effects of hatch, sex and SNP, and the infinitesimal and residual random effects was applied. The additive effect of the SNP was tested, including its interaction with sex. The additive effect of the marker was strongly influenced by sex, being significant only in males for the following traits: femur length after freezing period ($P < 0.01$), tibia weight after freezing period ($P < 0.006$), femur weight after slaughter ($P < 0.001$) and birth weight ($P < 0.05$). The effect of this SNP on birth weight might be explained by the higher percentage of bone tissue in newborn animals when compared with other tissues. The results indicate that selection favoring the A allele on males from this population could contribute to improve the general bone structure. Financial Support: CNPq Process nº 481755/2007-1 and Embrapa Project nº 02.10.06.003.00-04.