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Association of the *Adiponectin receptor 1* gene with bone integrity traits in a paternal broiler line

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The Adiponectin protein plays fundamental role in several basal metabolic pathways expressed in various tissues and have been associated with growth at different ages, obesity and bone formation. A study on the association of a single nucleotide polymorphism (SNP) SNPg.729*C>T* in the *Adiponectin receptor1* gene (*AdipoR1*) with 17 bone integrity-related traits was conducted in 1,454 chickens of a paternal broiler line developed by Embrapa. Genotyping was obtained by PCR-RFLP using the *HhaI* restriction enzyme. The association analysis was carried out with the QxPak software using the maximum likelihood method. The statistical model included the fixed effects of sex, hatch and SNP, and the animal polygenic additive genetic and residual random effects. Significant associations of the SNP with tibia and femur breaking strength and femur width were found. The additive effect (a) of the SNP was 0.96 kgf/mm^2 for tibia breaking strength, 1.16 kgf/mm^2 for femur breaking strength, and 0.14 cm for femur width. Despite of the fact that this gene was previously reported as a candidate for fat deposition, consistent associations were found with bone integrity traits. The adiponectin (*ADIPOR*) gene, however, has recently emerged as an important element in the regulation of bone metabolism, although its functional mechanism has not been completely elucidated. Our findings indicate a possible direct effect of the *AdipoR1* on the bone integrity traits evaluated in this study.

Keywords: *ADIPOR1*, broiler, femur, SNP, tibia

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