

ASSOCIATIONS OF THE OSTEOPONTIN GENE WITH PERFORMANCE TRAITS IN A PATERNAL BROILER LINE

Ibelli, A.M.G.¹; Fornari, M.B.^{1,2}; Neis, K.L.^{3,4}; Zanella, R.^{1,5}; Tessmann, A.L.¹; Pandolfi, J.R.C.¹; Cantão, M.E.¹; Ledur, M.C.¹, Peixoto, J.O.¹

¹Embrapa Suínos e Aves, Concórdia, SC, Brasil; ²Universidade Federal do Paraná, Curitiba, PR, Brasil; ³PIBIC/CNPq fellow – Embrapa Suínos e Aves; ⁴Universidade do Contestado, UnC, Concórdia, SC, Brasil; ⁵BJT/CNPq fellow

adriana.ibelli@embrapa.br

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The osteopontin (*SPP1*) is a multifunctional gene involved with bone remodeling and mineralization. Furthermore, it is also expressed in many types of cells and tissues being involved in several biological processes. This gene has been associated with growth and performance traits in livestock species, like cattle, goats and swine. In chickens, this gene is located in chromosome 4 and harbors multiple QTLs, being a possible positional candidate gene associated with performance and bone related traits. Thus, the aim of this study was to identify SNPs in the *SPP1* gene and to test their associations with performance traits in a pure broiler line. DNA was extracted from whole blood using a standard protocol with DNAzol reagent®. For SNPs identification a 766bp fragment of *SPP1* was sequenced in 15 animals: 10 from a paternal broiler line TT and 5 from a layer line CC, both developed at the Embrapa Swine and Poultry National Research Center. The sequences were analyzed using Phred/Phrap/Consed/Polyphred softwares, and 11 SNPs were identified: 7 located in intron 6 and 4 in exon 7. Out of those, 10 have not been previously published in the dbSNP database. A SNP from intron 6 (A>T SNP) was selected to be genotyped in 1340 chickens from the TT line by PCR-RFLP technique, using the *XmnI* restriction enzyme. The performance traits analyzed were: birth weight, body weight at 21, 35, 41 and 42 days of age, and feed intake, weight gain and feed conversion from 35 to 41 days of age. SNP associations with performance traits were tested with QxPak program v4.0 using a mixed model including the fixed effects of sex, hatch and SNP, and the infinitesimal and residual random effects. The additive and additive + dominance effects of the SNP were tested including their interaction with sex. From 1340 chickens genotyped for the A>T SNP, 945 (70%) had AA genotype, 363 (27%) were heterozygous and 30 (2.32%) had TT genotype. The HWE hypothesis was rejected in this population ($p < 0.05$), indicating an indirect response to selection towards AA genotype. The additive model within sex had the best fit. The association between the A>T SNP and performance traits was significant for body weight at 21, 35, 41 and 42 days ($p < 0.05$) and feed intake from 35 to 41 days of age only in females. The results indicate a direct effect of the SNP on those traits, being a potential marker to improve female performance in chicken breeding programs. The next step is to evaluate the effect of this SNP in other group of traits, such as carcass, fatness and bone related traits. Financial Support: CNPq Process nº 481755/2007-1 and Embrapa Project nº 02.10.06.003.00-04.