

Investigation of the LEPR1 A>G polymorphism in the leptin receptor gene in a commercial broiler population

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The leptin receptor gene (RLEP) plays an important role in growth and fat metabolism in domestic animals. Previous studies in an experimental F2 chicken population identified a polymorphism (LEPR1 A> G) associated with performance and carcass traits. Furthermore, this polymorphism was validated in a paternal broiler line (TT) from Embrapa, being associated with body weight at 35, 41 and 42 days and carcass weight. The aim of this study was to check if the SNP LEPR1 A> G was also associated in a commercial broiler line. For this, an experiment was conducted with male broilers from the commercial line COBB500®. At 45 days, the chickens were slaughtered and blood samples were collected. The traits evaluated were: body weight at 45 days of age, eviscerated carcass weight, the weights of breast, thighs, drumsticks, wings, back, neck, head, feet, gizzard, liver, heart, lungs and abdominal fat, and their yields in relation to body weight. The DNA was extracted from 463 blood samples using DNAzol® (Invitrogen) following the manufacturer's protocol and was quantified by agarose gel electrophoresis. The primers for amplification of a fragment of 754 bp of LEPR were designed based on the sequence of this gene available in GenBank (AF222783). The fragment analyzed corresponds to an intronic region between exons eight and nine. The SNP was studied based on the exchange of the A to G at position 754, identified by restriction enzyme cleavage (*HhaI*) by PCR-RFLP. The genotype frequencies observed were 0.44, 0.44 and 0.12, respectively, for AA, AG and GG. The allele's frequency A and G were 0.66 and 0.34, respectively. For association analysis between genotypes and phenotypes, an ANOVA in a split-plot was used. A significant association was found for neck yield ($p < 0.04$), and suggestive association for feet ($p < 0.06$) and wings (0.07) yield. The GG genotype had lower yields compared to the others. Although the polymorphism is segregating in the studied broiler population, the association results did not confirm the observations made in the F2 and TT populations. This is possibly due to the large effect of complementarity derived from the crosses used in the formation of the broiler, that is a double hybrid. This structure of the commercial population may have diluted the SNP effect, being difficult to detect associations of small effect. Financial Support: Embrapa Swine and Poultry Research Center – Brazil