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RELATIONSHIP BETWEEN PITUITARY SPECIFIC TRANSCRIPTION FACTOR-1 (PIT-1) GENOTYPIC VARIANTS AND NON-LINEAR GROWTH CURVE PARAMETERS IN FUNAAB ALPHA CHICKENS

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ABSTRACT

This research was designed to identify genotypic variants in pituitary specific transcription factor-1 (PIT-1) gene and determine the relationship between PIT-1 genotypic variants and growth rate indices, with non-linear growth model parameters in FUNAAB Alpha chickens. Four non-linear growth models (Brody, Gompertz, Logistic and Bertalanffy) were fitted to measure the body weight of FUNAAB alpha chickens at 8 weeks of age. This analysis was conducted using the NLIN procedure of the SAS software (Version 9.2). The Akaike information criteria (AIC), Bayesian information criteria (BIC), Means Squared Error (MSE) and Root Mean Squared Error (RMSE) were used to determine the most appropriate model. Polymerase Chain Reaction-Restriction Fragment Length Polymorphism (PCR-RFLP) analysis was used to identify PIT-1 genotypic variants. The results revealed a significant effect of the PIT-1 genotypic variant on the relative growth rate (RGR). BB allele had the highest value (54.00), while AA and AB alleles had values of 44.13 and 52.11, respectively. A significant effect of chicken genotype was observed on body weight (BW), absolute growth rate (AGR) and RGR (relative growth rate). The mean values obtained for normal feather growth rate indices were higher than the mean values for frizzle feather (FF) and naked neck (NK). There was a high negative correlation between mature weight (A) and maturing index (k) in all the models for genotypic variants AA, AB and BB. AIC and BIC estimates were lowest in Gompertz for FF genotype and male sex of FUNAAB alpha chickens. This study found an association between PIT-1 genotypic variants and growth curve parameters; the Gompertz model was found to be the most appropriate non-linear model for describing growth in FUNAAB alpha chickens.

Key words: genotypic variants; pit-1; growth model; PCR-RFLP; FUNAAB alpha

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