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CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

NON-LINEAR MODELS TO ESTIMATE THE CORPORAL DEVELOPMENT OF DOELING SAANEN GOATS: BREAST WIDTH

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Mathematical models can be an essential tool to support decisions in animal production systems. The objective of this research was to evaluate the use of non-linear statistical models to estimate the breast width (BstW) of Saanen doeling goats fed with four nutritional plans. A total of 40 Saanen goats aged 109 ± 21 days, weighing 12 ± 2 kg of body weight were monitored from weaning to 30 days of gestation. The research was conducted at the Federal University of Minas Gerais. The treatments consisted of four experimental diets to provide different weight gains: 90, 130, 170 and 210 g day^{-1}. The diets where formulated according to the 2007 National Research Council. The metabolizable energy of diets remained constant (2.8 Mcal kg^{-1} dry matter), and the forage:concentrate ratio was 30:70. The diets were composed of *Tifton* 85 hay, ground corn, soybean meal, limestone, sodium bicarbonate, dicalcium phosphate, vitamin and mineral premix. The feed was offered twice a day at 08 am and 04 pm. Fortnightly the BstW was measured by the distances between the cranial borders of the scapula, with a 0,5 cm scale hipometer. Three statistical models were used: Logistic, Gompertz and Generalized Michaelis-Menten. In order to model the variance, the functions of homoscedasticity (homogeneous) and staggered variance were used. Akaike method, Akaike minimums, likelihood ratio and evidence, was used to test the quality of the models. The R statistical program, free to use, was used. The best model to estimated BstW was the generalized Michaelis-Menten model, with a function of stepwise variance and an order one continuous auto-regressive variance structure. The highest BstW growth rate was provided by the 210 g day^{-1} body weight gain diet. It can be concluded that the breast width of doeling can be estimated by the Generalized Michaelis-Menten models with stepwise variance function.

Keywords: Biometry, Modeling, Nutrition.

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