GROWTH CURVE MODELING IN THORACIC PERIMETER OF MANGALARGA MARCHADOR HORSES

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Mangalarga Marchador (MM) breed originated in Minas Gerais, southeastern Brazil and has been used for leisure, sport and farm work. Animal growth curve studies based on non-linear methods have been applied on the growth analysis of several species; nevertheless, there is no report concerning studies on thoracic perimeter growth curve modeling. The aim of this work was to assess Brody, Gompertz, Logistic and Von Bertalanffy non-linear models fit to thoracic perimeter (TP) data obtained through the cross-sectional data collection method in MM equines in order to select the best model and make predictions regarding the growth and maturity of males and females. Two hundred MM animals (75 males and 125 non-pregnant females) with ages ranging between six and 153 months old were tape-measured. The non-linear models used were: Brody, Gompertz, Logistic and Von Bertalanffy. Model parameters estimate was achieved by the least square method, through the Gauss-Newton numerical algorithm based on R software routine. Data normality was checked by the Shapiro-wilk test. The comparison and selection of the most adequate model to describe the growth curve were performed by the coefficient of determination (R²); residual standard deviation (RSD) and the corrected Akaike information criterion (cAIC). The statistical models were efficient in the prediction female thoracic perimeter, with R² values ranging from 85.6 to 86.2%, where Brody being the most fit model. Adult male TP data did not present normality, which impaired the use of non-linear model. Adult female TP varied between 179.07 and 182.88 cm. A greater growth intensity and homogeneity occurred for animals with ages between six and 24 months old; moreover, thoracic perimeter variability increased after 24 months. Growth curve stability was observed at age 60. Brody was the most appropriate non-linear model used to describe thoracic perimeter for females.

Keywords: age, cross-data collection method, fit quality, non-linear models