

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

## **BAYESIAN ANALYSIS OF RANDOM REGRESSION MODEL USING SPLINE FUNCTION FOR GROWTH OF BEEF CATTLE**

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Random regression models are an alternative for genetic evaluation of growth traits in beef cattle because use all weights available in a single analysis. Therefore, the objective of the present study was to estimate genetic parameters for weights from birth to 700 days of age by random regression model using spline function and Bayesian inference. Phenotypic records of Nelore cattle from the National Association of Breeders and Researchers (ANCP, Brazil) were used. The contemporary groups were formed by farm, year and season of birth, sex, age group at recording (every 30 days of age), and management group. After data consistency, 90,710 body weight measures from 16,524 animals were used in the analysis. The average growth curve of the population was modeled with a fourth-order orthogonal Legendre polynomial. Segmented polynomials (linear splines) with knots positioned at 1, 205, 450, and 700 days of age were considered to adjust the direct and maternal additive genetic, animal and maternal permanent environmental random effects, assuming no correlation between the random regression coefficients for these effects. Residual variances were modeled using 15 age classes. The Bayesian inference, using GIBBS3F90 program, consisted of 600,000 cycles, with a conservative burn-in period of 100,000 cycles, and a thinning interval of 20 iterations. Direct heritability for weights ranged from 0.12 (65 days of age) to 0.33 (645 to 700 days of age). In the opposite way, maternal heritability estimates ranged from 0.05 to 0.11, with the highest values for weights occurring up to weaning. Positive and high genetic correlations were estimated between weight at 205 days of age with weights at 365 and 630 days of age (0.90 and 0.81, respectively). However, genetic correlations above 0.90 were estimated when the weights were measured at 365 days of age and closer to slaughter. A strong maternal genetic correlation (0.99) was estimated between weights at 120 and 205 days of age. Thus, the selection of Nelore sires with higher breeding values for weights at weaning and at 365 days of age can improve maternal ability and body weight at slaughter in the next generations.

**Keywords:** Genetic evaluation, genetic parameters, Nelore cattle, weights

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