Lactation Curve of Sindi Cows (Bos taurus indicus) in a Tropical Environment of the Brazilian Cerrado

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The Sindi breed representes a strategic option for dairy production in tropical environments, due to its rusticity, adaptability, and efficiency under conditions of heat stress and feed restriction. However, genetic improvement programs targeting dairy performance remains incipient, and the lactation curve in this breed is still underexplored. This study aimed to describe the lactation profile of Sindi cows by fitting Wood's model to their milk yield data, generating precise parameter estimates relevant for management and selection. Daily milk production records from 30 Sindi cows were analyzed over a 25-month period, under pasture conditions, with an average lactation length of 219 days. Wood's model was fitted using the Nonlinear Mixed Model NLMIXED procedure in SAS, including a random cow effect associated with parameter A (initial production level). The estimated fixed parameters were A=5.56, B=0.206, and C=0.0059, all statistically significant ($p < 0.01$), demonstrating the model's ability to capture the typical lactation curve pattern. The variance of the random effect associated with parameter A (VARA=2.96) showed a tendency toward significance (p=0.068), suggesting individual variability in initial milk production potential. The residual variance was estimated as $S_2 = 5.40$. Based on the fitted parameters, peak milk yield was estimated at 9.42 kg/day (95% CI: 8.11–10.72), occurring early at 34.9 days in milk (95% CI: 20.7–49.1). Fitting Wood's model proved to be a robust and biologically coherent approach for describing the lactation profile of Sindi cows in Brazil. The results confirm a productive pattern characterized by an early peak, typical of Zebu and crossbred dairy animals, underscoring the need for future selection programs to target improving lactation persistency (parameters B and C). The precise quantification of these key parameters contributes to strengthening and promoting Sindi as a tropical dairy breed. Acknowledgments: FAP DF, CNPq, the Brazilian Sindi Breeders Association, the AgroIntegra Innovation Program.

Residual feed intake as a tool for efficiency in beef production systems in tropical regions

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The development of strategies designed to improve feed efficiency in beef cattle is essential for rational use of feed resources. Residual feed intake (RFI) is a measure of feed efficiency that permits to identify animals that consume less food and exhibit similar levels of production and lower enteric methane emission. However, the usefulness of RFI as an indicator of feed efficiency can be compromised by type of diet and age of evaluation. This study aimed to evaluate RFI variation throughout the growth of Nellore cattle fed different diets. Eighty-one Nellore bulls were submitted to a post-weaning feed efficiency test (PWT) and subsequently to another feed efficiency test at finishing (FT). In PWT, animals (265 ± 4.6 days; 235 ± 5.2 kg) were fed diet formulated to meet requirements of growing cattle, with 60% total digestible nutrients (TDN) and 12% crude protein (CP). In FT, animals (367 ± 4.6 days; 366 ± 4.6 kg) were fed diet formulated to meet requirements of cattle during carcass fattening phase, with 82% TDN and 14% CP. Animals were classified as negative or positive RFI in PWT and FT. Repeatability of RFI was determined based on data from each test. The change in ranking was evaluated by agreement analysis (Cohen's Kappa coefficient) using FREQ procedure and AGREE options of SAS. Forty-two of the 81 animals evaluated were classified as negative RFI in PWT. However, only 30 animals maintained this RFI class in FT, corresponding to 71.43%. Among the 39 animals classified as positive RFI in PWT, 26 maintained this RFI class in FT, representing agreement of 66.67%. Kappa coefficient of agreement in the ranking of negative and positive RFI animals was 0.3813, classified as fair or acceptable. Kappa coefficient also shows 30.86% of reranking of animals. Nellore cattle ranked for RFI in PWT may change their class at FT. However, most animals maintain the same RFI class, demonstrating that post-weaning assessment is reliable throughout the animal's life. Acknowledgments: FAPESP 2021/11922-2.