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FEED EFFICIENCY OF LACTATING NELLORE COWS: 2. CORRELATION AMONG PHASES AND BETWEEN MODELS

EFICIÊNCIA ALIMENTAR DE VACAS NELORE LACTANTES: 2. CORRELAÇÕES ENTRE TESTES DE DESEMPENHO E ENTRE MODELOS

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The objective of the study was to examine the classification of cows based on residual feed intake (RFI) obtained during the first, second and total lactation phase, fitting models which included or not fat thickness and milk production. Twenty-seven lactating Nellore cows, 38 ± 0.83 months of age and 509 ± 32 kg of body weight, were evaluated 22 ± 5 days after calving in a collective pen equipped with GrowSafe® Systems during 75 ± 12 days (phase 1) and 77 ± 6 days (phase 2). The forage-based diet (dry matter basis) consisted of 90% corn silage, 8.5% soybean meal and 1.5% mineral salt plus urea. Dry matter intake (DMI) was obtained as the mean of all valid days of feed intake during the test period (12.7 ± 1.2 kg DM for phase 1; 13.0 ± 1.4 kg DM for phase 2; and 12.9 ± 1.25 kg DM for the total phase), and average daily gain (ADG) was obtained as a regression of body weights on days on test (0.359 ± 0.242 kg day^{-1} for phase 1; 0.716 ± 0.263 kg day^{-1} for phase 2; and 0.591 ± 0.148 kg day^{-1} for the total phase). Ultrasonic fat thickness was evaluated in five anatomic sites, and the average of fat thickness (FT) was obtained (7.81 ± 1.45 mm for phase 1; 12.68 ± 2.03 mm for phase 2, and 10.24 ± 1.64 mm for the total phase). Cows were machine milked three times after calving (63 ± 5 days in milk; 85 ± 5 dim; and 151 ± 6 dim), after intravenous injection of 20 Ul of oxytocin, quantifying the 6 h milk production to estimate 24 h milk production. The 24 h energy-corrected milk production (24hMP) was obtained by 24hMP = (0.327 x kg milk production) + (12.95 x kg fat) + (7.20 x kg protein), using fat and protein percentage of milk. The 24hMP values of cows were 10.1 ± 2.85 kg day^{-1}, 10.7 ± 2.68 kg day^{-1} and 10.27 ± 2.80 kg day^{-1} in phase 1, phase 2 and total phase. Two models were tested for RFI calculation: model 1 - DMI = ADG + metabolic body weight ($BW^{0.75}$) + error; and model 2 - DMI = ADG + $PV^{0.75}$ + FT + 24hMP + error. The RFI values obtained were: phase 1 (RFI1 and RFI1fm: 0 ± 1.05 kg day^{-1} and R^2 = 0.17; 0 ± 1.01 kg day^{-1} and R^2 = 0.22); phase 2 (RFI2 and RFI2fm: 0 ± 1.06 kg day^{-1} and R^2 = 0.46; 0 ± 1.02 kg day^{-1} and R^2 = 0.45); and total phase (RFIt and RFItfm: 0 ± 1.05 kg day^{-1} and R^2 = 0.29; 0 ± 0.92 kg day^{-1} and R^2 = 0.45). Analyses of ranking correlation were conducted using PROC CORR by SAS®. For the phases, RFI correlations were positive and ranged from moderate to high (0.59 to 0.91). The smallest correlation was 0.59 between RFI1fm and RFI2fm and the largest was 0.91 between RFI2 and RFIt. The correlation between RFI1 and RFI2 was moderate (0.74). The models to calculate RFI, correlations between RFI adjusted or not for FT and 24hMP were 0.96, 0.96 and 0.88 for phase 1, phase 2 and total phase, suggesting little importance of FT and 24hMP variables to explain the DMI variation of these lactating cows. These results showed that the classification of primiparous lactating Nellore cows for RFI differs between the first and second lactation phases. An unexpected result was the low coefficient of determination of the RFI models for phase 1, in which no effect was significant to explain the DMI variation. As expected, cow metabolic body weight was the main effect of RFI models for phase 2 and the total phase. The average fat thickness was not relevant to explain the DMI variation of primiparous lactating Nellore cows.

Keywords: Beef cattle, feed conversion, residual feed intake.

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