FEED EFFICIENCY OF LACTATING NELLORE COWS: 1. CORRELATION OF COMPONENT TRAITS BETWEEN TWO THE LACTATION PHASES

EFICIÊNCIA ALIMENTAR DE VACAS NELORE LACTANTES: 1. CORRELAÇÃO DAS CARACTERÍSTICAS COMPONENTES NAS DUAS FASES DA LACTAÇÃO

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The objective of the study was to evaluate the correlations of dry matter intake (DMI), average daily gain (ADG), metabolic weight ($BW^{0.75}$), fat thickness and corrected milk production obtained between the two lactation phases. 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), 77 ± 6 days (phase 2) and 152 ± 6 days (total phase). The forage-based diet (dry matter basis) consisted of 90% corn silage, 8.5% soybean meal and 1.5% mineral salt plus urea. 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 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). $BW^{0.75}$ was obtained by the equation: $[\alpha + (ADG\ test \times 0.5 \times days)]^{0.75}$ (110 ± 5 kg for phase 1, 108 ± 6 kg for phase 2, and 113 ± 5 kg for the total phase), where α is the intercept of the regression equation and represents the initial weight. Ultrasonic fat thickness was evaluated in five anatomic sites, and 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. All variables were obtained for phase 1 (DMI1, ADG1, $BW^{0.75}1$, FT1 and 24hMP1), phase 2 (DMI2, ADG2, $BW^{0.75}2$, FT2 and 24hMP2) and for the total phase (DMIt, ADGt, $BW^{0.75}t$, FTt and 24hMPt). Analyses of ranking correlation were conducted using PROC CORR by SAS®. The DMI correlations ranged from moderate to high: DMI1 and DMI2 (0.69), DMI1 and DMIt (0.88), and DMI2 and DMIt (0.95). High correlations were observed between $BW^{0.75}1$ and $BW^{0.75}2$ (0.86); $BW^{0.75}1$ and $BW^{0.75}t$ (0.98); and $BW^{0.75}2$ and $BW^{0.75}t$ (0.85). Among ADG, correlations were low and non-significant, except for the correlation between ADG2 and ADGt (0.64), suggesting that phase 1 is different from phase 2. In phase 1, lactating cows have higher energy expenditure with milk production for the suckling calves, in addition to energy expenditure for maintenance. High correlations of fat thickness between the lactation phases were observed: FT1 and FT2 (0.77), FT1 and FTt (0.92), and FT2 and FTt (0.96). The correlations between 24hMP varied from low to high: 0.21 between 24hMP1 and 24hMP2; 0.88 between 24hMP1 and 24hMPt; and 0.65 between 24hMP2 and 24hMPt. These results indicate that reranking exists in Nellore cows between the two lactation phases.

Keywords: Average daily gain, beef cattle, dry matter intake.

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