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THEME 4 | GENETICS, GENOMICS, ANIMAL BREEDING AND REPRODUCTION

Estimation of genetic parameters for weight at birth and 365 days in Nellore cattle reared in the north of Brazil

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The objective of this study was to estimate genetic parameters for weight at birth (BW) and 365 days of age (W365) standardized for birth weight and weight at 365 days of age, using multi-trait models. Herds of the Nellore breed belonging to the Program of weight gain of the Brazilian Association of Zebu Breeders (ABCZ), born between 1995 and 2010, and raised in grazing system were used. The standardization was based on one weighing before and one after the standard reference age, with deviation of 60 days. The herds used in this study are located in the seven states of the North region of Brazil, which has rain distribution throughout the year as a particularity. A total of 15,148 birth records of 3,115 individuals from Nellore breed were evaluated. Genetic parameters were obtained by restricted maximum likelihood (REML), using the WOMBAT program. The statistical models of analysis included additive genetic effects (direct and maternal) as random effects, contemporary groups (sex, birth year and month of animal, weighing year and month, herd, nursing or weaning categories) as fixed effects, and cow age at calving as covariate. The maternal effect was included only in BW, and contemporary groups were composed in such a way that was possible to properly identify the rearing environmental condition and to allow for better comparison between animals performances. The means for weight at birth and 365 days of age were 34.01 and 217.67kg, respectively. The high heritability estimates for direct genetic effects (0.48 for BW and 0.44 for W365) indicate that herds from the North region of Brazil have additive genetic variability for these traits with possibility of genetic gains by selection. The low magnitude of maternal heritability for BW (0.16) indicates that maternal additive genetic variance, as proportion of phenotypic variance, is present in the calf life since the first days. This result shows the dependence of calves on their dams, i.e., calves are still under dams care, despite the low magnitude of maternal heritability. Ignoring maternal effect at the initial phase of calf life could result in the overestimation of the animal direct heritability. The high magnitude of genetic correlation (0.86) estimated between BW and W365 indicates the possibility of selection, so that selection in one of these weights also could result in the increase of the other one, and could be a problem in herds with very high records of birth weights.

Keywords: Correlation, Genetic evaluation, Heritability, Zebu