



## **Genetic effects on preweaning growth traits in beef cattle of different breed composition in Southeastern Brazil**

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Crossbreeding is a strategy that can be used to increase beef production in Brazil. The objectives of this study were to evaluate preweaning performance, and to estimate direct additive breed effects and individual heterotic effects for birth weight (BW), standardized 240 days weaning weight (WW), and daily weight gain from birth to weaning (ADG), of calves of several breed compositions. The calves were sired by Nellore (Ne), Angus (An), Bonsmara (Bo), beef type Brown Swiss (Bs), Brangus (5/8 An + 3/8 Zebu), Charolais (Ch), Canchim (5/8 Ch + 3/8 Zebu), Hereford (He), Limousin (Li), Senepol (Se), or Simmental (Si) bulls, and were out of commercial Nellore, 1/2 An + 1/2 Ne, 5/16 Ch + 11/16 Ne, 1/2 Se + 1/2 Ne, or 1/2 Si + 1/2 Ne cows. Genetic groups (22) of calves were classified according to their taurine adapted (Ta; Bo and Se), taurine British (Tb; An and He), taurine continental (Tc; Bs, Ch, Li, and Si), and indicine (Zb; Ne) composition. Data from 6,192 (BW), 5,760 (WW), and 5,760 (ADG) animals, born from 1998 to 2014, were used. Calves of different genetic groups were born in different years and seasons, but there was no complete confounding of genetic group (GG) with year and season of birth. The data were analyzed by the restricted maximum likelihood method, with a statistical model that included the fixed effects of year and season of birth, sex of calf, intensification level of production (intensive and not intensive), age of cow at calving, class of genetic group (GG), and the covariate age at weaning for WW and ADG. In a second analysis, GG was substituted by the covariates proportion of Ta, Tb, and Tc in the calf, and proportion of loci heterozygous for Ta-Zb, Tb-Zb, Tc-Zb, Ta-Tb, Ta-Tc, and Tb-Tc. In this second analysis, intensification level was not included in the model since it was not significant in the first analysis. The results showed that GG had a significant effect on all traits studied, and that, in general, the crossbred calves were heavier and gained more weight than the Nellore ones, mainly the crossbred with Tc and the offspring of F<sub>1</sub> cows. The direct additive effects for Ta, Tb, and Tc were, in general, positive and significantly different from zero, mainly for WW and ADG, and the heterotic effects, both between taurine and indicine as between taurine and taurine, were also positive and significantly different from zero. These results indicate that crossbreeding Nellore with taurine (adapted, British, and continental) breeds can be used to produce heavier calves at weaning in Southeastern Brazil, under pasture condition.

**Keywords:** additive direct effects, body weights, crossbreeding, indicine, individual heterotic effects, taurine

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