



Heritability and genetic correlations for scrotal circumference at different ages in Brahman bulls raised under tropical conditions

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Beef herds in the tropics are based on the utilization of *Bos indicus* and its crosses bred naturally. Genetic progress has been traditionally restrained by many factors including social, climatic, nutritional and management, among others. Besides, there is little selection of sires through variables correlated to their profitability, such as scrotal circumference (SC). This fact justifies attention to and research on those valuable characteristics as selection criterion to benefit genetic improvement in those systems. This paper aimed to determine the heritability index and genetic correlations for SC at different ages in Brahman bulls, to establish its use as a robust selection criterion at early ages in sires raised under tropical conditions. Heritability index (h^2) and genetic correlations (r^g) for SC at different ages were determined in 485 full blood Brahman bulls distributed in 8 herds from the North dry Pacific region of Costa Rica. Monthly SC measurements were performed by the same operator from 7 to 24 months of age. The genetic estimates were determined with a bivariate random regression animal model (SAS, ver 9.3, 2010). The model considered the fixed effects of herd, year and season of birth, nutritional plane, body weight, age at weaning and calving number of the mother. In addition, the random permanent effect of environment and animal additive genetic effect were considered. The genealogy data base included 3000 animals distributed in 7 ancestors' generations. The average h^2 index for SC was 0.58 (range 0.48-0.72), being highest at 20 months of age. In addition, SC h^2 was higher in the period comprising 14 to 20 months of age compared to younger ages. The h^2 index found in this study in Brahman bulls is higher than previous reports in crossbred zebu sires in Australia (Brahman and Sahiwal x Shorthorn; $h^2=0.40$ and 0.45 at 18 and 24 months respectively; Fordyce et al., 1996. Aust J Exp Agric, 36:9-17). In contrast, they are lower than those published for most *Bos taurus* breeds raised under sub-tropical climate. Coulter for instance (Coulter et al., 1976. J Anim Sci, 43:9-12), reported average $h^2=0.68$ in Holstein bulls under conditions of an experimental station. The SC r^g coefficients obtained in this study in Brahmans aged 7 to 24 months ranged from 0.43 to 1. Furthermore, r^g among yearling and bulls 18, 20, 22 and 24 months of age were higher (0.95, 0.92, 0.89 and 0.84 respectively) than those obtained among 7 months-old bulls and the same age range (0.43, 0.43, 0.44 and 0.45). These findings indicate that selection of Brahman sires by their SC can be performed as early as 12 months of age with high confidence (>80%) of their SC when adults (24 months). In addition, the lower h^2 and r^g for SC obtained among bulls <11 months and older ages (20-24 months), suggest that the initial post weaning is a stressful and adaptation period in Brahman steers. This fact should be considered by breeders and practitioners when choosing the right age for selection of prospective Brahman sires. This study was funded by the Andrology Section-UNA.