INBREEDING EFFECTS ON MORPHOLOGICAL AND MANAGEMENT TRAITS IN GYR DAIRY CATTLE

EFEITO DA ENDOGAMIA SOBRE CARACTERÍSTICAS MORFOLÓGICAS E DE MANEJO NA RAÇA GIR LEITEIRO

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Bovine populations under genetic evaluation based on the BLUP method, as is the case of Gyr dairy cattle, tend to progressively use less breeding bulls, which can lead to increased relationship between individuals. It is known that morphological traits are genetically correlated with milk production, longevity and animal health, and that these are affected by the increase in homozygosity, justifying assessment of the effects of inbreeding. The main objective of this study was to estimate the effect of an increase in the inbreeding coefficient (F) on morphological and management traits in Gyr dairy cattle. A database was analyzed with a total of 2,979 animals, containing observations for 17 conformation and management traits: rump height (RH), hoof angle (HA), rump angle (RA), rump length (RL), rear teat length (RTL), milking ease (ME), rump width (RW), legs side view (LSV), udder depth (UD), temperament (TP), body length (BL), front teat length (FTL), navel length (NL), rear udder width (RUW), ischia width (IW), thoracic perimeter (TP), and legs rear view (LRV). The pedigree file used to calculate F-values for each individual contained a total of 79,538 animals. A univariate animal model was used with the Bayesian approach, considering the fixed effects of herd-year of birth of the animal, classifier, cow age (covariate); and the value of F (covariable; ranging from 0 to 100) of the animals; and random animal and residual effects. A Markov chain containing 850,000 samples was created, with *burn-in* of 250,000 samples and storing only 100 sample intervals (thinning), resulting in posterior distributions of 6,000 samples. The averages (and confidence intervals; 0.05 - 0.95) of posterior inbreeding effect on the traits studied were: RH= -0.08 (-0.14/-0.02), HA= -0.02 (-0.08/0.04), RA= -0.06 (-0.17/0.03), RL= -0.02 (-0.05/0.01), RTL= -0.01 (-0.03/0.01), ME= 0.003 (-0.01/0.01), RW= -0.05 (-0.10/-0.07), LSV= 0.01 (-0.01/0.03), UD= -0.02 (-0.09/0.04), TP= 0.01 (-0.009/0.02), BL= -0.07 (-0.16/0.00), FTL= -0.004 (-0,02/0.01), NL= -0.01 (-0.06/0.05), RUW= 0.002 (-0.03/0.03), IW= -0.01 (-0.04/0.01), TP= -0.11 (-0.24/0.00), LRV= 0.005 (-0.01/0.02). For most of the traits analyzed, an unfavorable effect was found with increase of F. However, in only four cases (RH, LIL, TP and BL) did the estimated confidence interval not include zero (0), thus being considered significant. Negative effects of inbreeding on morphological characteristics have also been reported by authors in the Holstein and other taurine breeds. The reduced number of animals with F-value higher than 10%, together with some probable selective phenotyping, may have caused a uncertainty in the parameter estimation.

Keywords: Bayesian inference, coefficient of inbreeding, zebu.

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