

GENETIC AND PHENOTYPIC CORRELATIONS OF FEED EFFICIENCY WITH GROWTH TRAITS IN NELLORE CATTLE

CORRELAÇÕES GENÉTICA E FENOTÍPICA ENTRE CARACTERÍSTICAS DE EFICIÊNCIA ALIMENTAR E CARACTERÍSTICAS DE CRESCIMENTO EM BOVINOS NELORE

THAÍS MATOS CEACERO^{1*}, JOSLAINE NOELY DOS SANTOS GONÇALVES CYRILLO¹, ROBERTA CARRILHO CANESIN¹, MARCELA MORELLI¹, LÚCIA GALVÃO DE ALBUQUERQUE², MARIA EUGÊNIA ZERLOTTI MERCADANTE¹

¹Instituto de Zootecnia (IZ), Centro APTA Bovinos de Corte, Sertãozinho, SP, Brazil.

²Universidade Estadual Paulista "Júlio de Mesquita Filho" (UNESP), Faculdade de Ciências Agrárias e Veterinária, Jaboticabal, SP, Brazil.

*e-mail: thais.zootecnia@yahoo.com.br

Feed efficiency is difficult to evaluate because individual feeding are required. An alternative is selecting animals based on traits easier to obtain and genetically favorably correlated with feed efficiency traits. This study aimed to estimate genetic and phenotypic correlations between feed efficiency traits (residual feed intake - RFI, feed efficiency - FE and residual BW gain - RG) with yearling weight (YW), hip height (HH) and girth circumference (GC) in Nellore cattle. Feed efficiency data set consisted of 887 records of DMI, ADG and $BW^{0.75}$ obtained during performance tests (83 ± 15 d) to calculate RFI (0.005 ± 0.58 kg DM/d), FE (0.14 ± 0.03) and RG (0.00 ± 0.11 kg/d). FE was calculated as ADG and DMI ratio, RFI was estimated as the error of multiple regression of DMI on ADG and $BW^{0.75}$, and RG was estimated as the error of multiple regression of ADG on DMI and $BW^{0.75}$. The YW data set consisted of 7,948 records of males (314.45 ± 45.85 kg) and females (282.68 ± 48.19 kg) adjusted to 378 and 550 d of age, respectively. The HH consisted of 6,418 records of males (131.80 ± 5.40 cm) and females (132.51 ± 5.38 cm), and 3,745 records of GC of males (162.56 ± 8.48 cm) and females (167.72 ± 8.08 cm). Pedigree file contained 9,830 animals. Growth traits were analyzed as unit standard deviation of each sex/age. (Co)variance components were estimated through two-trait animal models by restricted maximum likelihood method using MTDFREML software. For RFI, FE and RG traits, models included fixed effect of test group (year-sex-facility), linear effect of animal age in the middle of performance test, linear and quadratic effects of dam age, and random effects of direct additive genetic and error. For growth traits models included the fixed effects of contemporary group (year-herd-sex) and month of birth, linear effect of animal age, linear and quadratic effects of dam age, and random effects of direct additive genetic and error. For YW model also included the permanent environmental effects of dam. RFI showed null genetic and phenotypic correlations with growth traits, however, low and favorable genetic correlation between RFI and HH was observed. Genetic correlation of FE (low and positive) and RG (high and positive) with growth traits were favorable to select animals with efficiency of growth and feed. Moreover, phenotypic correlation between EF and GR and HH were negative (Table 1). Growth traits can be used as indicators of feed efficiency traits in beef cattle.

Table 1. Heritability estimates \pm SE (diagonal), phenotypic (below diagonal) and genetic (above diagonal) correlations among feed efficiency and growth traits in Nellore cattle

	RFI	FE	RG	YW	HH	GC
RFI	0.20 (0.067)	-0.54	-0.11	0.01	-0.12	-0.03
FE	-0.65	0.15 (0.063)	0.67	0.07	0.09	0.15
RG	-0.47	0.85	0.20 (0.065)	0.52	0.45	0.60
YW	-0.04	0.10	0.20	0.38 (0.031)	0.75	0.86
HH	0.0	-0.11	-0.10	0.65	0.61 (0.027)	0.63
GC	-0.02	0.03	0.02	0.67	0.61	0.30 (0.039)

Keywords: hip height, girth circumference, residual feed intake.

Acknowledgments: CAPES, CNPq and FAPESP for scholarships and financial support.