

COMPARISON BETWEEN MULTITRAIT AND UNITRAIT ANALYSIS IN THE HERITABILITY ESTIMATE OF ELECTRICAL CONDUCTIVITY OF MILK¹

COMPARAÇÃO ENTRE AS ANÁLISES MULTICARACTERÍSTICA E UNICARACTERÍSTICA NA ESTIMATIVA DA HERDABILIDADE DA CONDUTIVIDADE ELÉTRICA DO LEITE

DANIELLA FLAVIA VILAS BOAS², DIEGO AUGUSTO CAMPOS DA CRUZ², ANÍBAL EUGÊNIO VERCESI FILHO³, RAUL LARA RESENDE DE CARNEIRO⁴, LENIRA EL FARO⁵

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²Instituto de Zootecnia. Rua Heitor Pentead, 56, Centro, CEP 13460-000, Nova Odessa - SP - Brazil. Capes scholarship. E-mail: daniellaflavia@hotmail.com

³Pólo Regional Nordeste Paulista/APTA. Avenida Presidente Castelo Branco, s/n (Final), CEP 13730-980, Mococa - SP - Brazil

⁴Gestor Leite, CRV Lagoa. Rodovia Paulo Donato Castellani, s/n, Sertãozinho - SP - Brazil

⁵Pólo Regional Centro Leste/APTA. Avenida Bandeirantes, 2419, Vila Virgínia, CEP 14030-670, Ribeirão Preto - SP - Brazil. CNPq scholarship

Electrical conductivity of milk is an indirect method for diagnosis of mastitis that can be used as criterion of selection in breeding programs, to obtain more resistant animals to infection. Data from 9,302 records of electrical conductivity from the morning milking (ECM), 13,070 milk yield records (MY) and 11,560 records of milking time (MT), of 1,129 first lactation Holstein cows, calving from 2001 to 2011, were used in statistical analysis. Data of eight herds of Southeast region of Brazil were obtained by the WESTFALIA® electronic milking machines, with "Dairyplan" management system. Two analysis were performed: a multitrait, including MY, MT and ECM, and an unitrait, considering only test-day morning electrical conductivity. The model included additive genetic, permanent environmental and residual effects as random. Additionally, contemporary groups (CG), the age of cow at calving (AGC) and days in milk (DIM) (linear and quadratic regression) were included as fixed effects. The CG was composed by herd, year and month of test. DIM classes were formed with weekly intervals, constituting a total of 42 classes. The variance components were estimated by Restricted Maximum Likelihood Method (REML), using the Wombat software. The average and standard deviation of ECM were 4.80 mS/cm and 0.54 mS/cm, respectively. The heritability estimates by multitrait model and their standard errors were 0.33 (0.05), 0.15 (0.03) and 0.22 (0.03) for ECM, MY and MT, respectively. Genetic correlation was 0.74 for MY and MT, 0.37 for MY and ECM and -0.09 for MY and ECM. In the unitrait analysis, the heritability estimate for ECM was 0.35 with a standard error of 0.05. These results agree with the literature that reported heritability estimates for electrical conductivity ranging from 0.26 to 0.39. Although the estimates were close, the heritability estimated by unitrait analysis was slightly higher that estimated by multitrait probably because the pedigree file was the same for both analysis. In general, multitrait analysis are more appropriated when the study involves correlated traits, because they use information more appropriately. Heritability estimates obtained in this study suggest the possibility of genetic gain through selection using ECM as selection criterion, aiming resistance to mastitis, since there is a reasonable additive genetic variance for this trait.

Key words: mastitis, milking time, milk yield