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Statistical comparisons of different models used in estimating population genetic parameters in dairy cattle

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Different models were used in estimating population genetic parameters. The objective of this research was to compare between two Statistical Models used in Estimation; Single-trait and Multi-traits Animal Models by Multi-trait Derivative Free Restricted Maximum Likelihood analysis. Traits under investigation were Total milk yield (TMY), Fat yield (FY), Protein yield (PY), Day in milk (DIM), Days open (DO), Services per conception (SC) and Days in milk to first heat (DIMFH). Data records (n=1668) of the first lactation of Holstein-Friesian cows were included in analysis. Accuracy of prediction was an important point of view used in statistical evaluations. Total milk yield was considered as control trait in multi-trait analysis. Heritability estimates from single trait model were 0.24, 0.26, 0.24, 0.18, 0.08, 0.46, and 0.11 for TMY, FY, PY, DIM, DO, SC and DIMFH, respectively. Heritability estimates from Multi-traits model were 0.24, 0.23, 0.18, 0.17, 0.45 and 0.08 for the same traits respectively except TMY. Using all animals in the pedigree, it was found that the accuracy of prediction (Rti) was higher in multi-trait than single–trait animal models for all studied traits. Accuracies were 0.48, 0.47, 0.42, 0.29, 0.61 and 0.34 from single-trait model and 0.49, 0.48, 0.45, 0.44, 0.61 and 0.37 from multi-traits models of the same traits respectively except TMY. Genetic correlations were positive between all traits except between Do with FY, PY, SC and DIM, between SC and both TMY and DIMFH and between DIM and DIMFH. Multi-trait model is best recommended in estimation of genetic parameters.

Biography

Sherif A Moawed is a PhD student at the Department of Animal Wealth Development, Biostatistics Division, College of Veterinary Medicine. Suez Canal University, Egypt. Currently, he is working as Assistant Lecturer of Biostatistics and Experimental Designs at the same Department. He has finished his Master thesis in 2008 and published papers on Multiple Regression and Time Series analysis by Modern Models. He attended many seminars and workshops related to Biostatistics as well as Diploma courses of Statistics at Institute of Statistical Studies and Research, Cairo University. His interests are in Statistical genetics, Regression analysis and Non-parametric tests.

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