

Abstract

Residual variance is one of the main sources of bias which affecting the accuracy and precision of genetic studies. The aim of the present research was determining the effect of heterogeneity of residual variance to genetic evaluation of production traits in Iranian dairy cattels. The registered records of National Livestock Breeding Center (1991 to 2011) were used in the current study. Data preparation was done using CFC and Foxpro softwares. Analysis of genetic parameters was done by ASReml 3.1 software, and statistical analysis done with PWR and Agricola packages (R.2.14 software). The studied production traits were the milk production, fat production and protein production in the three first parities. Factors influencing the heterogeneity of variance in the current study were calving year, herd size, mean of the milk production and mean of the fat production. Result of Bartlett test indicated that heterogeneity of variance significantly affects on production traits ($p < 0.001$). Log Likelihood ratio test used to determine the most appropriate model in the evaluations model included fat production were best fitted. Spearman correlation between heterogeneous models compared to the base model in most cases did not show a significant difference. In general we can say heterogeneous residual variance animals had little impact on rankings. Also, t-test statistics were used for access the accuracy of the breeding values. Considering model included fat production effect was significantly affected on mean standard error prediction of the accuracy of estimated breeding values. Considering the effect of fat production was not effecting on estimated genetic process, however.

Key Words: Genetic Evaluation, Heterogeneity of Residual Variance, Production traits, Holstein cattle.



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**The Thesis Submitted for the Degree of M.Sc
(in the field of Animal Science)**

Effects of heterogeneity of residual variance on genetic evaluation of production traits in Iranian Holstein cattle

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January 2015