

**Variance component and breeding value estimation for environmental sensitivity in dairy cattle**

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Animal robustness, or environmental sensitivity, may be studied through individual differences in residual variance. These differences appear to be heritable, and there is therefore a need to fit models to predict breeding values explaining differences in residual variance. The aim of this report is to study whether breeding values for environmental sensitivity (vEBV) can be predicted in a large dairy cattle data set having around 1.6 million records. Two traits recorded between 2002 and 2009 from Swedish Holstein dairy cattle were analyzed separately, somatic cell score and milk yield. Estimation of variance components, ordinary breeding values and vEBVs was performed using ASReml, applying the methodology for double hierarchical generalized linear models. Estimation using ASReml took less than 7 days on a Linux server. The genetic standard deviations for environmental variance were 0.21 and 0.22, for somatic cell score and milk yield, respectively, which indicate a moderate genetic variance for environmental variance. This study shows that estimation of variance components, EBVs and vEBVs, is feasible for large dairy cattle data sets using standard variance component estimation software. Especially for somatic cell score selection for lower vEBV seems economically attractive and therefore vEBV may be considered in a total merit index.