A Linear mixed-effects model (LME) is one of the possible tools for longitudinal or group--dependent data. This thesis deals with evaluating of prediction error in LME. Firstly, it is derived the mean square error of prediction (MSEP) by direct calculation. Then the covariance penalty method and crossvalidation is presented for evaluation of MSEP in LME. Further, it is shown how Akaike information criterion (AIC) can be used in mixed-effects models. Because of the model's properties two types of AIC are distinguished – marginal and conditional one. Subsequently, the procedures of AIC's calculation and its basic asymptotic properties are described. Finally, the thesis contains simulation study of behaviour of marginal and conditional AIC with the goal to choose the right variance structure of random effects. It turns out that the marginal criterion tends to select models with smaller number of random effects than conditional criterion.