Summary

Since 2000, bulls from five beef cattle breeds Aberdeen Angus, Charolais, Hereford, Limousin and Simmental have been tested at the Norwegian performance test station and selected for AI or natural breeding based on their phenotypic test results. The main focus at the test station has been to select feed efficient bulls with high roughage consumption. The aim of this study was to estimate heritability and genetic correlations for five traits: average daily gain (ADG), feed conversion ratio (FCR), feed utilization potential (FUP), feed intake from roughage (RC), and feed intake from roughage and grain (FI). The traits ADG, FUP and RC are the ones currently used at the performance test, while FCR and FI are alternative traits more common in the literature. For this study, data from 1,070 bulls collected at the Norwegian performance test station for beef cattle from 2004 to 2016 was used, and the analyses was done using a multivariate linear animal model in DMU. Heritability estimates was 0.35 for ADG, 0.27 for FCR, 0.39 for FUP, 0.56 for RC and 0.61 for FI (SE=0.10 for all traits). This is in the range of previously published estimates. The genetic correlations between the traits ranged from -0.47 between ADG and FCR, to 0.92 between FCR and FUP. Growth was favorably correlated to both feed intake traits and to FCR, whereas the genetic correlation between growth and FUP was not significantly different from zero. Both feed efficiency traits, FCR and FUP, showed an unfavorable genetic correlation to the feed intake traits, RC and FI. The genetic correlations between FCR and FUP, and between RC and FI were strong (0.92 and 0.91, respectively). This indicates that these traits are genetically similar, however, different heritabilities and genetic correlations with the other traits showed some genetic differences. The results show that traits already used for phenotypic selection at the Norwegian performance test station for beef cattle are heritable, and can be used for breeding value estimation.

Keywords: concentrate, feed conversion, feed utilization, roughage