VARIANCE COMPONENTS AND GENETIC PARAMETERS ESTIMATED FOR DAILY MILK YIELD IN INDIVIDUAL MONTHS OF LACTATION: THE CASE OF TSIGAI SHEEP

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Abstract. The objective of this study was to assess variance components and genetic parameters for daily milk yield of Tsigai sheep based on test day records. First, heritability estimates and genetic correlations were estimated using multivariate animal models in which milk yield in individual months of lactation was treated as a different trait. For comparison purposes, univariate animal models with milk yield treated as repeated measures of the same trait were employed. In both analyses, test day records between the second and the seventh month of lactation were considered. The fixed effects were lactation number, litter size and days in milk. All these effects were modelled as linear regressions. The random effects were animal genetic effect and permanent environmental effect of ewe. The effect of flock-year-month of test day measurement was fitted either as a fixed (FYM) or random (*fym*) effect. The number of test day records in the second, third, fourth, fifth, sixth and the seventh month of lactation was 9,943, 40,422, 43,982, 41,687, 32,158 and 3,878, respectively. In total, 172,070 test day records were included. Milk yield heritabilities in individual months of lactation were estimated between 0.11 and 0.14 when FYM was fitted and between 0.08 and 0.12 when *fym* was fitted. Variance ratios of permanent environmental effect of ewe were estimated between 0.17 and 0.22 when FYM was fitted and between 0.10 and 0.14 when *fym* was fitted. The proportion of phenotypic variance explained by *fym* fitted as a random effect ranged from 0.25 to 0.35. Genetic correlations between test day records of daily milk yield ranged from 0.58 to 0.98 and were higher between adjacent months of lactation. Daily milk yield heritabilities estimated with univariate animal models roughly corresponded with heritability estimates from multivariate models: 0.13 when FYM was fitted and 0.09 when *fym* was fitted. As a general pattern, phenotypic variances were slightly higher with a random effect of flock-year-month.

Keywords: sheep milk, test day, heritability, genetic correlations, variance ratios