

Genetic parameters for milk traits using fixed regression models for Istrian sheep in Croatia

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Abstract

Istrian sheep is a Croatian autochthonous breed originated from Istrian peninsula and neighbouring Karst plateau in Slovenia and Italy. The objective of this study was to estimate genetic parameters for daily milk, fat and protein yield and fat and protein content using test-day records of the Istrian sheep in Croatia. Data consisted of 13.101 test-day records for 2.320 ewes. Production data was recorded using the AT4 method and taken from the central database of the Croatian Agricultural Agency. The number of animals in pedigree was 3.588. A single-trait repeatability fixed regression test-day model was used to estimate genetic parameters. Fixed class effects in the model were: parity, litter size, lambing season, and flock. Days in milk and age at lambing were treated as covariates. For yield traits, the effect of days in milk was fitted using the Ali-Schaeffer lactation curve and nested within parity and litter size. Age at lambing was modelled as linear regression nested within parity. This effect was not included in the model for fat and protein content, while the effect of days in milk was nested within parity. Direct additive genetic effect, flock-test-day, and permanent environment effect over lactations were included in the model as random effects. Variance components were estimated using Residual Maximum Likelihood as implemented in the VCE-6 program. The estimated ratios for daily milk, fat and protein yields (kg), and fat and protein contents were: 0.15, 0.07, 0.013, 0.07, and 0.15 for additive genetic, 0.29, 0.31, 0.28, 0.34, and 0.18 for flock-test-day, and 0.21, 0.20, 0.21, and 0.05, and 0.07 for permanent environment effect over lactations. Results provide genetic parameters for the application of genetic evaluation for milk traits evaluation of the Istrian sheep in Croatia.