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

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Introduction

- Istrian sheep is a Croatian autochthonous breed originated from Istrian peninsula
- The selection emphasis has been on milk traits that result in more efficient milk production
- The objective of this study was to estimate genetic parameters for milk traits using test-day records

Material and method

Traits

- Daily milk (DMY), fat (DFY), protein yield (DPY), fat (FC), and protein content (PC)
- Number of test-day records: 13,101 for 2,320 ewes
- Number of animals in pedigree: 3,588
- Residual Maximum Likelihood method

Conclusions

- Estimated heritabilities for milk traits are in agreement to the estimates reported in the studies using the same type of the test-day model
- Results provide genetic parameters for the application of genetic evaluation for milk traits in Istrian sheep

Results

Estimated ratios for milk traits

Trait	h^2	c^2	p^2
DMY (kg)	0.15±0.02	0.29±0.02	0.21±0.01
DFY (kg)	0.07±0.02	0.31±0.02	0.20±0.01
DPY (kg)	0.13±0.02	0.28±0.02	0.21±0.01
FC (%)	0.07±0.01	0.34±0.02	0.05±0.01
PC (%)	0.15±0.02	0.18±0.01	0.07±0.01

h^2 - heritability, c^2 - ratio for common flock-test-day environment, p^2 - ratio for permanent environment

Model

- Single-trait repeatability fixed regression test-day model

$$y = Xb + Z_c c + Z_a a + Z_p p + e$$

Trait

- Parity
- Litter size
- Lambing season
- Flock
- Days in milk (Ali-Schaeffer reg. nested within parity and litter size)
- Age at first calving (linear regression nested within litter size)

- Flock-test-day
- Direct additive genetic effect
- Permanent environmental effect of cow within parity

Residual