

The estimation of dispersion parameters for body weight of rams at the end of performance test in Slovenia

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Objective

to estimate genetic and environmental dispersion parameters for body weight of rams at the end of the performance test in two Slovenian sheep breeds

Introduction



Foto: SimonKr

Jezerško-Solčava sheep (JS)

- Local breed
- Population size = 5,301 breeding animals
- Lamb and wool production

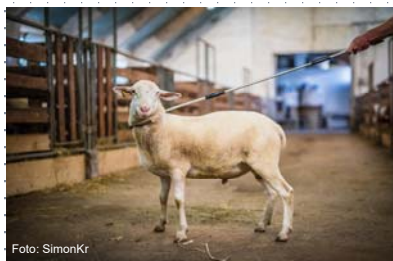


Foto: SimonKr

Improved Jezerško-Solčava sheep (JSR)

- Result of upgrading the Jezerško-Solčava sheep with the Romanov sheep
- Population size = 4,180 breeding animals
- Lamb production

Materials and methods

- Young male lambs are selected from different flocks
- Performance test:
 - 2 test stations with different conditions (Logatec, Jezersko)
 - 100 days, rams weighted 4 times
- Data collected from years 1996 to 2018
- 6,034 rams
- 18,752 body weight records
- Pedigree file = 12,092 animals
- Variance components estimated for the body weight at 270 days
- REML method
 - VCE-6 program (Groeneveld et al., 2010)

Statistical model:

$$y_{ijklmno} = \mu + b_I(x_{ijklmn} - \bar{x})B_i + b_{II}(x_{ijklmn} - \bar{x})^2B_j + C_j + D_k + F_l + hy_m + a_{ijklmn} + pe_{ijklmn} + e_{ijklmno}$$

$y_{ijklmno}$ = ram body weight at 270 days

μ = intercept

x_{ijklmn} = age of ram at weighing

\bar{x} = average age of ram at 270 days

b_I = linear regression coefficient for ram age

b_{II} = quadratic regression coefficient for ram age

B_i = breed-test station interaction (i = JS-Logatec, JSR-Logatec, JS-Jezersko)

C_j = litter size (j = 1, 2, 3+)

D_k = dam parity (k = 1, 2, 3, 4, 5, 6+)

F_l = season as day of weighing (l = 1, 2, 3, ..., 254)

hy_m = origin-year interaction (m = 1, 2, 3, ..., 890)

a_{ijklmn} = additive genetic effect

pe_{ijklmn} = permanent environment

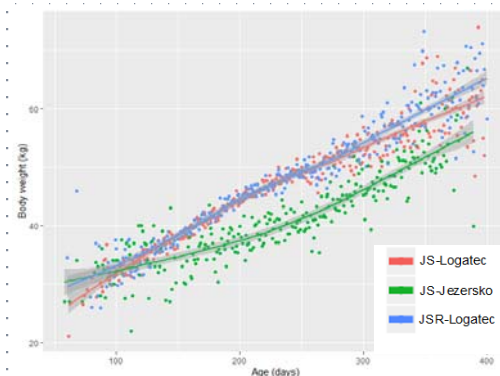
$e_{ijklmno}$ = residual

Conclusion

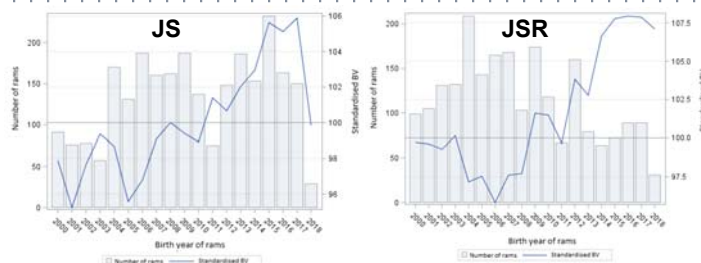
- Dispersion parameters are used in the breeding value (BV) prediction from the year 2019 onwards.

Results

Variance ratios	Estimate
Heritability (h^2)	0.28
Origin-year	0.29
Permanent environment	0.34
Residual	0.09



Quadratic regression of ram body weight according to the age



Genetic trend for BV of body weight at 270 days according to birth year of rams