The estimation of variance components for litter size in two Slovenian sheep breeds

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Jezersko-Solčava sheep

Objective:

- To estimate variance components for ewe litter size;

Introduction:

- Two autochthonous Slovenian sheep breeds;
  - the Jezersko-Solčava sheep (**JS**) → Lamb and wool production
  - the Improved Jezersko-Solčava sheep (**JSR**) → Lamb production
    - Upgrading the JS sheep with Romanov sheep

Improved Jezersko-Solčava sheep

Materials and methods

- **17.071 ewes** (JS and JSR breed)
  - → **79.387 lambing's**: 40.172 JS / 39.215 JSR
- **2007 to 2023**
- + A **pedigree file** with 24.425 animals (central database for small Ruminants)
- SAS 9.4 – **MIXED procedure**
- Variance components estimated by using **REML** method implemented in **VCE-6** program

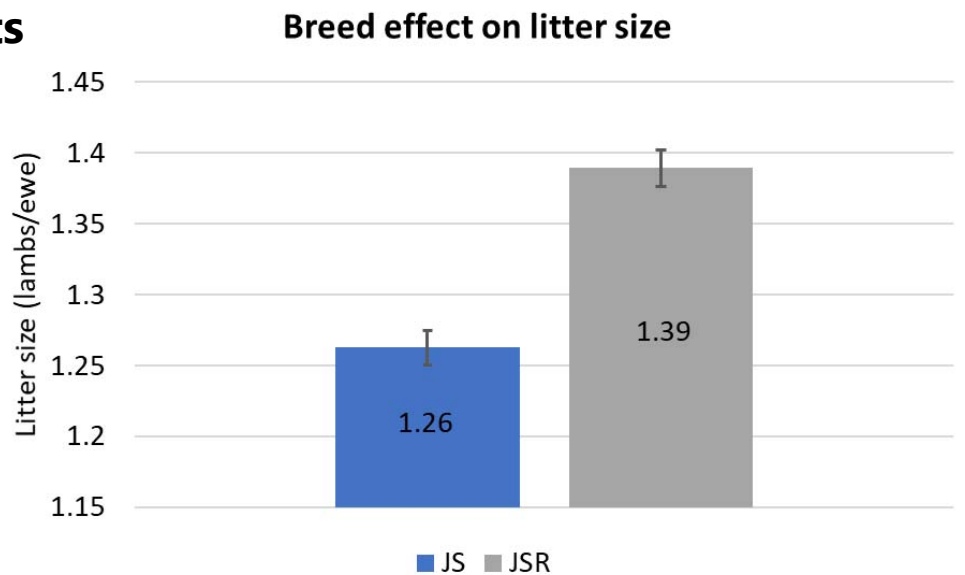
Statistical model

Fixed part:
- breed effect (JS, JSR)
- ewe parity (from 2 to 10)
- year-season interaction (1, 2, 3,..., 68)
- linear regression coefficient for lambing interval

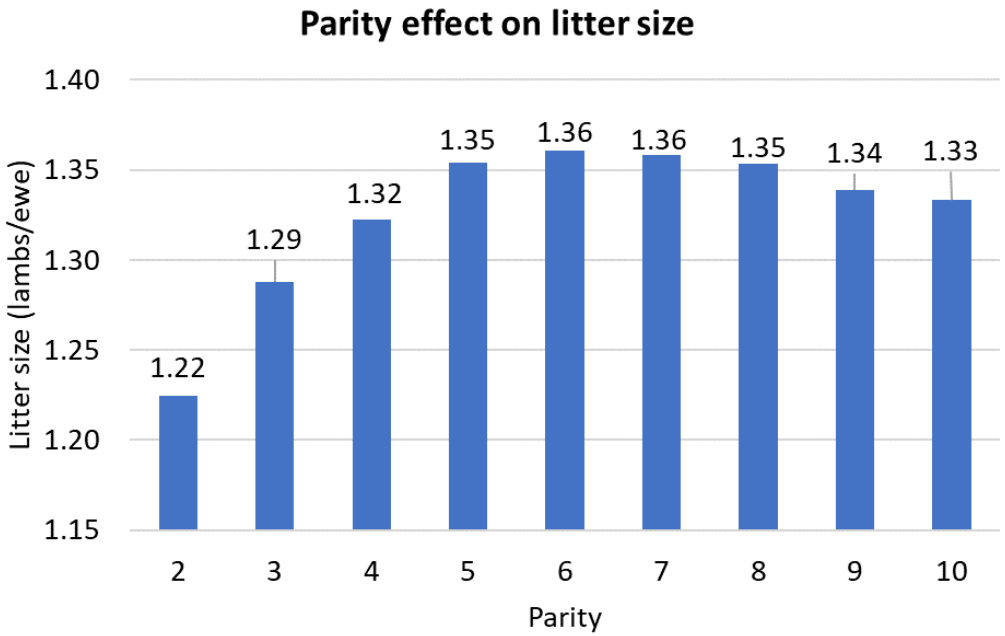
Random part:
- flock effect (1, 2, ..., 302)
- additive genetic effect
- permanent environment

Results

Effect	p - value
Breed effect	$p < 0.001$
Parity effect	$p < 0.001$
Year-season interaction	$p < 0.001$
Lambing interval	$p < 0.001$



Results



Variance ratios	Estimate
Heritability (h^2)	0.06
Permanent environment	0.02
Flock effect	0.11
Residual	0.81

Conclusion

•the variance components including estimated heritability for litter size were relatively low

•it is expected that **they could contribute to more effective selection in the future**, and for this reason **the estimated variance components will be used in predicting breeding values for ewe litter size from 2024 onwards**