ESTIMATION OF GENETIC CONNECTEDNESS BETWEEN FLOCKS IN POPULATION OF ISTRIAN SHEEP

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Introduction

- Istrian sheep breed is Croatian indigenous breed under selection for dairy traits (milk, protein and fat).
- ISSUE → potential bias in ranking of BLUP estimated EBVs from different flocks due to low connectedness.
- **AIM:** To determine level of connectedness as an indirect measure of bias of comparison of e

Material & methods

- **Information:** 1895 performance tested animals belonging to 14 flocks (7208 animals in the pedigree)
- **Software:** R package *"GCA"*
- **Statistics:** $PEVD$ → prediction error variance of differences in EBVs between animals belonging to different flocks

Results

- $PEVD_{i'j'}$ from 0.752 to 0.824 (Figure 1.)
- The average $PEVD_{i'j'}$ ~ 0.78

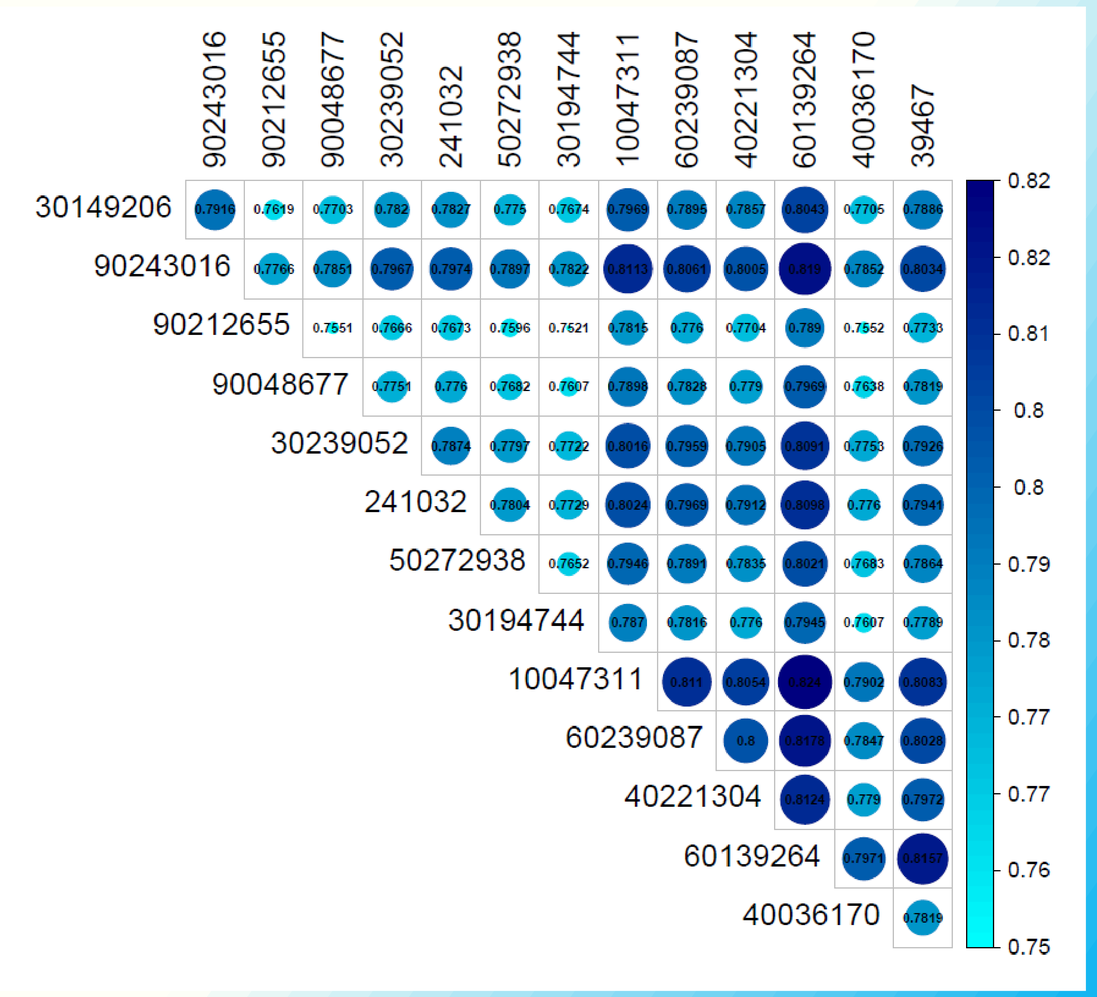

Figure 1. Estimates of connectedness between flocks

The PEV of the EBVs obtained from diagonal of the inverse of the coefficient matrix. Pairwise PEVDs were first computed at the individual level as follows: $PEVD(\hat{u}_i\text{-}\hat{u}_j) = [PEV(\hat{u}_i) + PEV(\hat{u}_j) - 2PEC(\hat{u}_i, \hat{u}_j)] = (C_{ii}^{22} - C_{ij}^{22} - C_{ji}^{22} - C_{jj}^{22}) * \sigma_e^2$ and thereafter summarized at management unit level as follows: $PEVD_{i'j'} = \frac{1}{n_{i'} * n_{j'}} \sum PEVD_{i'j'}$

Picture 1. Ewes of Istrian sheep breed

Conclusions

- Connectedness differed between the flocks, but results are inconclusive in term of bias in ranking EBVs from different flocks (no benchmark defined for PEVD statistics).
- Our previous work on this population suggests low level of connectedness between the flocks (insufficient for unbiased ranking of EBVs).
- Specially designed long-term breeding schemes should be established in order to strengthen connectedness between the flocks and make this population suitable for fair joint (between flock) genetic evaluation system

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