

# Variance components for semen production traits in Swiss pig breeds

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The objective of this study was to estimate variance components (VC) for the semen production traits ejaculate volume, sperm concentration and number of semen portions in the Swiss pig breeds Swiss Large White (SLW), Swiss Landrace (SLR), PREMIO® (PR) and Duroc (DU).

## Material and Methods

For this purpose, the semen production traits from 821 boars (SLW=243; SLR=49; PR=437; DU=92) with 48,175 records (SLW=6,804; SLR=1,880; PR=34,356; DU=5,135) were used. The data were collected in the years 2009-2016. Genetic and phenotypic variances and covariances were estimated by REML using the software ASReml 3.0. The following statistical model were used:

### Animal Model:

$$Y_{ijklmnopq} = u + \text{birthyear of boar}_i (\text{fix}) + \text{age of boar}_j (\text{fix}) \times \text{month of collection}_k (\text{fix}) + \text{year of collection}_l (\text{fix}) + \text{collection interval}_m (\text{fix}) + \text{breed}_n (\text{fix}) + \text{boar handler}_o (\text{fix}) + \text{additive genetic component}_p (\text{random}) + \text{permanent environmental effect}_q (\text{random}) + \text{residual effect}_{ijklmnopq} (\text{random})$$

The same model without a fixed breed effect was used to estimate VC separately for each of the breeds SLW, PR and DU.

## Results

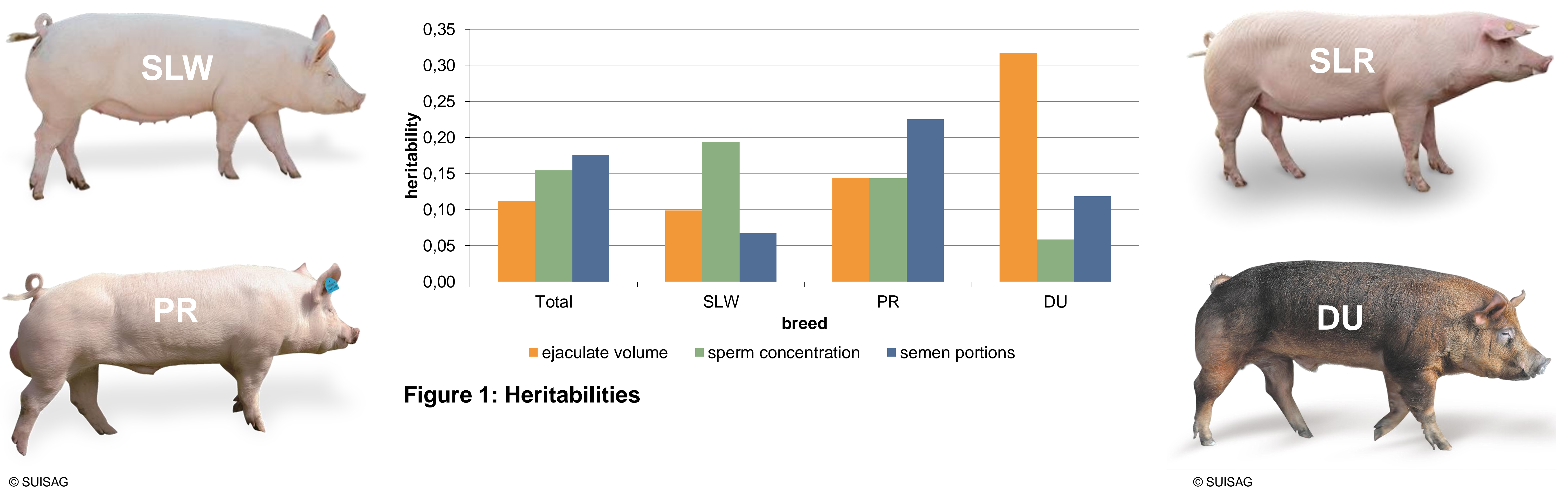


Figure 1: Heritabilities

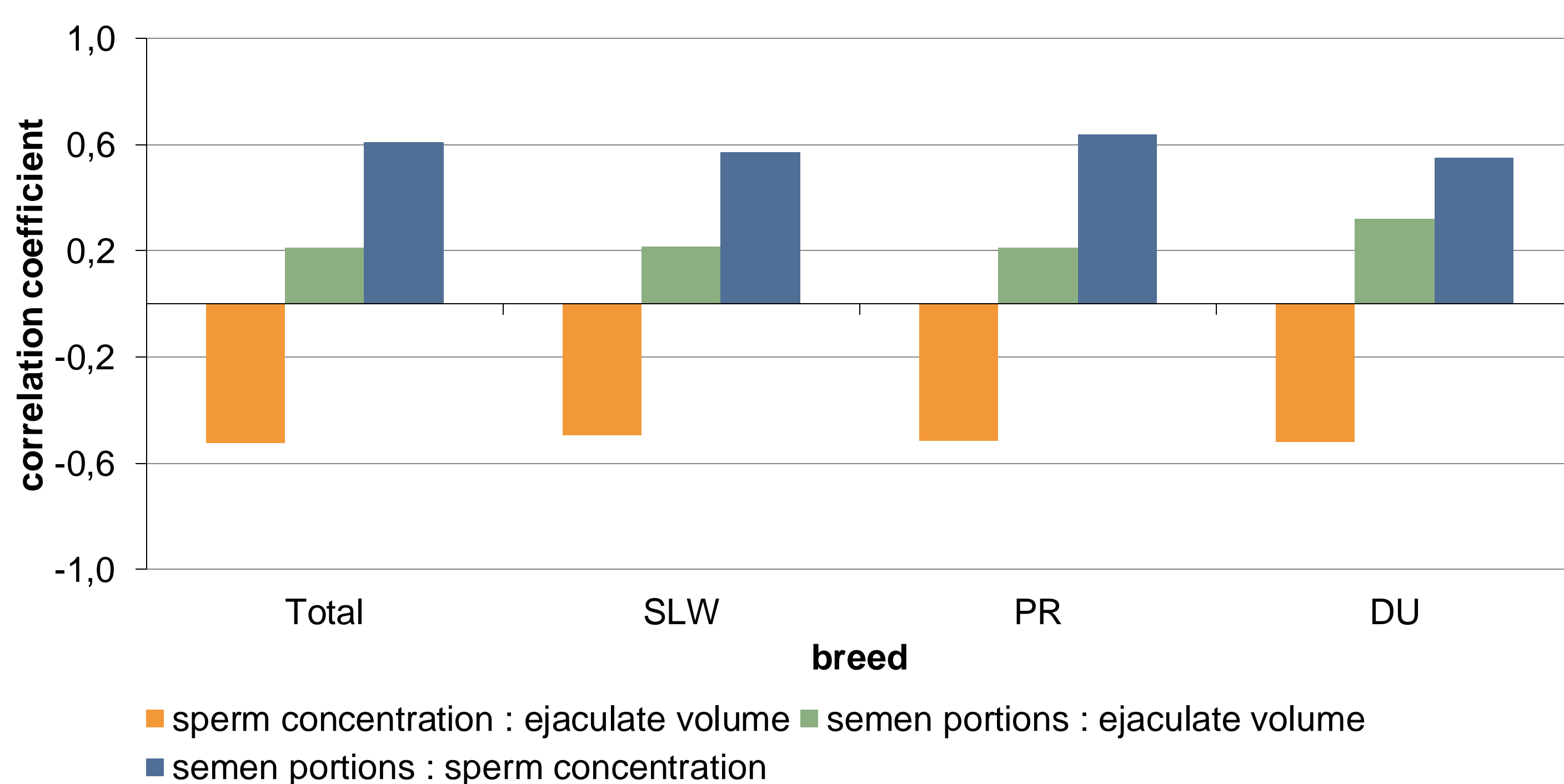


Figure 3: Phenotypic correlations

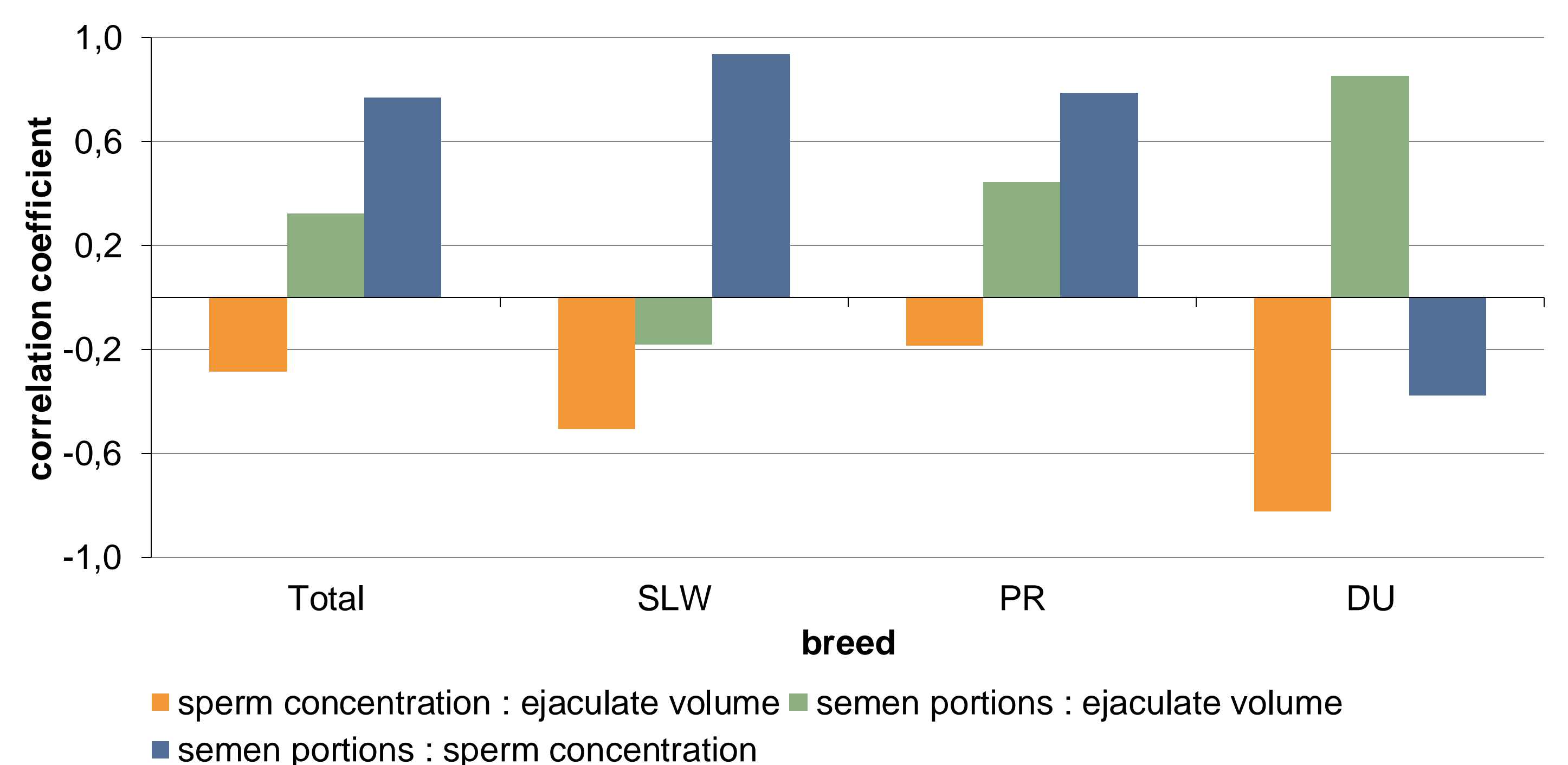


Figure 4: Genetic correlations

## Conclusion

The results seem to be plausible and show, that genetic improvement through selection would be possible in semen production traits.