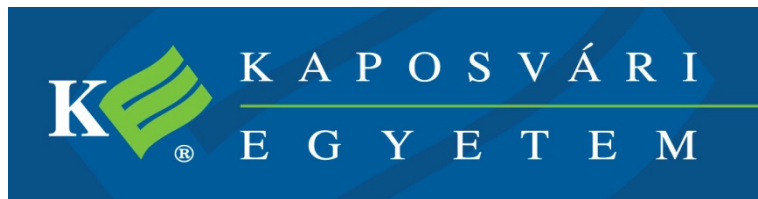


Estimating dominance effects and inbreeding depression of weaning weight in Pannon White rabbits

Nagy, Gorjanc, Čurik, Farkas, Szendrő



EAAP 2014, Copenhagen, Denmark

Introduction

- Genetic parameters
 - additive (included)
 - non-additive (ignored)
 - dominance
 - epistasis
- Consequence
 - Less accurate estimates



Material

- Synthetic Pannon White population (Hungary)
- Data from 1993 to 2013
 - pedigree 4,913
 - phenotype
 - dams 4,066
 - records 16,533
- Litter weight (35 d - kg)



Methods

- Linear model accounting for:
 - parity (factor)
 - year-month (factor)

 - inbreeding (F) (regression)
 - complete generation equivalents (CGE) (regression)
 - number of weaned kits (regression)
 - permanent environment (factor)

 - additive (factor)
 - dominance (factor)

Models

| Model | Inbreeding | A | D | N35 (C) |
|-------|------------|---|---|---------|
| I | X | X | - | - |
| II | X | X | X | - |
| III | X | X | - | X |
| IV | X | X | X | X |

Descriptive statistics

| Variable | Mean | SD |
|---------------|------|------|
| Litter weight | 6.80 | 2.22 |
| CGE | 6.37 | 4.36 |
| F | 2.72 | 3.25 |

Results – inbreeding depression (per 10% F)

| Variable | Model | Depression |
|---------------|-------|------------|
| Litter weight | I | -0.1614 |
| | II | -0.1609 |
| | III | -0.0009 |
| | IV | -0.0068 |

- Inbreeding depression practically disappeared when number of weaned kits was included in the model as a covariate

Results – variance components

| Variable | Model | Pe | h ² | d ² |
|---------------|-------|-------|----------------|----------------|
| Litter weight | I | 0.079 | 0.048 | - |
| | II | 0.079 | 0.048 | 0.00 |
| | III | 0.131 | 0.073 | - |
| | IV | 0.115 | 0.070 | 0.070 |

Results - Breeding value correlations

| Model | II | III | IV |
|-------|------|------|------|
| I | 1.00 | 0.69 | 0.68 |
| II | | 0.69 | 0.68 |
| III | | | 0.99 |

Results - Breeding value rank correlations

| Model | II | III | IV |
|-------|------|------|------|
| I | 1.00 | 0.68 | 0.68 |
| II | | 0.68 | 0.68 |
| III | | | 0.99 |

Conclusions

- Expected direction of inbreeding depression for models: I and II
- Sizeable dominance variation for litter weight for model: IV, but no effect and breeding value ranking
- Small confounding between permanent environmental and dominance effects for model: IV