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## Czech Journal of Animal Science

Estimation of additive and dominance variance for litter size components in rabbits

Nagy I., Farkas J., Curik I., Gorjanc G., Gyovai P., Szendrő Zs.:

Czech J. Anim. Sci., 59 (2014): 182-189

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Additive, dominance, and permanent environmental variance components were estimated for the number of kits born alive, number of kits born dead, and total number of kits born of a synthetic rabbit

consisted of 11 582 kindling records of 2620 does collected between the years 1996–2013. The total number of animals in the pedigree files was 4012. The examined traits were evaluated using single-trait and two-trait (number of kits born alive-dead) animal models containing all or part of the following effects: additive genetic effects, permanent environmental effects, dominance effects. Heritability estimates calculated using the basic single-trait and two-trait models were  $0.094 \pm 0.018$  and  $0.090 \pm 0.016$  for number of kits born alive,  $0.037 \pm 0.010$  and  $0.041 \pm 0.012$  for number of kits born dead, and  $0.117 \pm 0.018$  for total number of kits born, respectively. The relative significance of permanent environmental effects was  $0.069 \pm 0.014$  and  $0.069 \pm 0.012$  for number of kits born alive,  $0.025 \pm 0.011$  and  $0.023 \pm 0.010$  for number of kits born dead, and  $0.060 \pm 0.013$  for total number of kits born, respectively. Using the extended single-trait and two-trait models, the ratios of the dominance components compared to the phenotypic variances were  $0.048 \pm 0.008$  and  $0.046 \pm 0.007$  for number of kits born alive,  $0.068 \pm 0.006$

and  $0.065 \pm 0.006$  for number of kits born dead, and  $0.005 \pm 0.0073$  for total number of kits born, respectively. Genetic correlation coefficients between number of kits born alive and number of kits born dead were  $0.401 \pm 0.171$  and  $0.521 \pm 0.182$ , respectively. Spearman's rank correlations between the breeding values of the different single-trait models were close to unity in all traits (0.992–0.990). Much lower breeding value stability was found for two-trait models (0.384–0.898), especially for number of kits born dead. Results showed that the dominance components for number of kits born alive and number of kits born dead were not zero and affected the ranking of the animals (based on the breeding values).

### **Keywords:**

REML analysis; dominance effects; family class effect; genetic parameters

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