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Czech Journal of Animal Science

Analysis of Czech cold-blooded horses: genetic parameters, breeding value and the influence of inbreeding depression on linear description of conformation and type characters

Vostrý L., Čapková Z., Příbyl J., Mach K.:

Czech J. Anim. Sci., 56 (2011): 217-230

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Genetic parameters, breeding values and inbreeding depression for 22 linear type description of conformation and type characters and 4 body measurements were evaluated in a group of 1744 horses

of three original cold-blooded breeds in the Czech Republic in a long period of 18 years (1990–2007). Based on the values of Akaike's information criterion, residual variance and heritability coefficient, a model with fixed effects (sex, year of description, breed, and classifier) and with a random effect (animal) was selected. Heritability coefficients for the particular traits were in the range of 0.11 to 0.55 and genetic correlations ranged from -0.63 to 0.97 . Inbreeding depression, expressed as coefficients of regression on one percent of inbreeding, was in the range of -0.0992 to 0.0242 points for the particular traits. The inclusion of inbreeding depression in the model resulted in a moderate change in h^2 in one-third of the traits. In two-thirds of traits, the value of r_G increased or decreased by 0.01 . Standard deviations of the breeding values for linear type description of conformation and type characters were in the range of 0.30 to 0.72 and 0.62 to 6.18 for body measurement traits. Among breeding values estimated by a model without inbreeding depression and a model with inbreeding depression, Spearman's rank

correlation coefficient values for the particular traits were 0.916–0.999 (sample of all horses), 0.710–0.992 (10% of the best horses) and 0.827–0.998 (10% of the worst horses). If the average value of the inbreeding coefficient is low (0.03), then it is not necessary to include the influence of inbreeding depression in the model for the genetic evaluation of individuals of original cold-blooded horses kept in the Czech Republic.

Keywords:

breeding value; inbreeding depression; linear description of conformation; cold-blooded horses

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