

# ASSESSMENT OF INBREEDING DEPRESSION ON LINEAR DESCRIBED TRAITS BY THE CZECH COLD-BLOODED BREEDS OF HORSES

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**The aim of this analysis was to determinate the influence of inbreeding depression on the formation of linear described traits in cold-blooded breeds of horses in CR.**



Foto: Ivana Gardiánová

## RESULTS

Characteristic	Mean	SD	without Fx		with Fx		b.Fx
			$\sigma_a^2$	$h^2$	$\sigma_a^2$	$h^2$	
<b>Body measures</b>							
							cm
withers height - stick	159.88	3.70	7.62	0.55	7.63	0.55	-0.0250
withers height - tape	171.63	4.26	9.96	0.54	10.06	0.55	-0.0992
chest circumference	204.53	10.43	37.74	0.36	37.87	0.36	-0.0255
cannon bone circum.	23.17	0.96	0.44	0.55	0.44	0.55	-0.0044
<b>Comprehensive character</b>							
							Points
Type	6.17	1.15	0.26	0.21	0.27	0.21	0.0008
Range	5.77	0.88	0.17	0.23	0.17	0.24	0.0232
Nobility	5.26	1.01	0.22	0.23	0.22	0.23	-0.0219
<b>Front</b>							
neck length	4.64	0.85	0.12	0.18	0.12	0.18	0.0063
neck tethering	5.90	0.98	0.30	0.36	0.30	0.36	0.0004
withers length	4.69	0.93	0.18	0.24	0.17	0.24	0.0134
shoulder-blade	5.35	1.11	0.41	0.36	0.41	0.37	0.0036
<b>Body and rear</b>							
topline length	5.63	0.78	0.11	0.19	0.11	0.19	0.0032
topline form	4.54	0.65	0.06	0.14	0.05	0.13	0.0030
loin length	5.45	0.66	0.07	0.16	0.07	0.16	-0.0018
loin form	4.89	0.49	0.03	0.14	0.03	0.14	-0.0035
body width	6.19	1.05	0.30	0.28	0.29	0.27	-0.0191
croup length	5.29	0.94	0.29	0.35	0.30	0.37	-0.0340
croup slope	6.01	0.86	0.21	0.29	0.21	0.29	0.0175
shape of croup	6.67	0.86	0.13	0.18	0.12	0.17	-0.0193
<b>Legs</b>							
Foretoes	5.19	0.73	0.06	0.11	0.06	0.11	-0.0050
Forehoof	4.85	0.60	0.03	0.10	0.03	0.10	-0.0029
hind-limbs posture	5.45	0.95	0.32	0.37	0.33	0.37	0.0242
Fetlock	5.17	0.62	0.06	0.16	0.06	0.16	0.0133
back hoof	4.97	0.47	0.04	0.19	0.04	0.19	-0.0083
<b>Movement</b>							
spaciousness of pace	6.19	1.12	0.31	0.28	0.31	0.28	-0.0226
spaciousness of gallop	6.15	1.09	0.30	0.27	0.30	0.28	-0.0313

## MATERIAL AND METHODS

Genetic parameters, breeding values and inbreeding depression for 22 traits of linear described traits and of 4 body measurements were evaluated in 1,744 horses of three original Czech draft breeds (373 Silesian Norikers, 574 Norikers and 794 Czech-Moravian Belgian horses) in a period of 18 years (1990–2007).

The following linear models were used:

$$y = \mu + \text{Sex}_i + \text{Year}D_j + \text{Age}D_k + \text{Breed}_l + \text{Clas}_m + b.Fx + a_n + e_{ijklmn}$$

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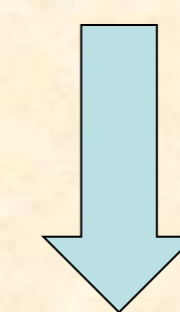
where:  $\mu$  – general mean,  $\text{Sex}_i$  – fixed effect of the  $i$ -th sex,  $\text{Year}D_j$  – fixed effect of the  $j$ -th year of description,  $\text{Age}D_k$  – fixed effect of the  $k$ -th age at description,  $\text{Breed}_l$  – fixed effect of the  $l$ -th breed,  $\text{Clas}_m$  – fixed effect of the  $m$ -th classifier,  $b$  – fixed regression coefficient,  $Fx$  – effect of inbreeding coefficient of the  $n$ -th horse,  $a_n$  – random effect of a horse,  $e$  – residual error.



## CONCLUSION

□ Inbreeding depression does not influence the morphological features of the body of cold-blooded horses.

□ The inclusion of inbreeding coefficient in the model did not contribute to any significant changes in the values of genetic parameters.



**It is not necessary to include the influence of inbreeding depression in the model for genetic evaluation of horses of original cold-blooded breeds kept in the Czech Republic.**