GENETIC PARAMETERS AND BREEDING VALUES FOR LINEAR TYPE TRAITS IN THE CZECH SPORT HORSE POPULATION

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OBJECTIVE: Analyse the quality of input database, estimate for the first time the genetic parameters and predicted breeding values of linear profiling.
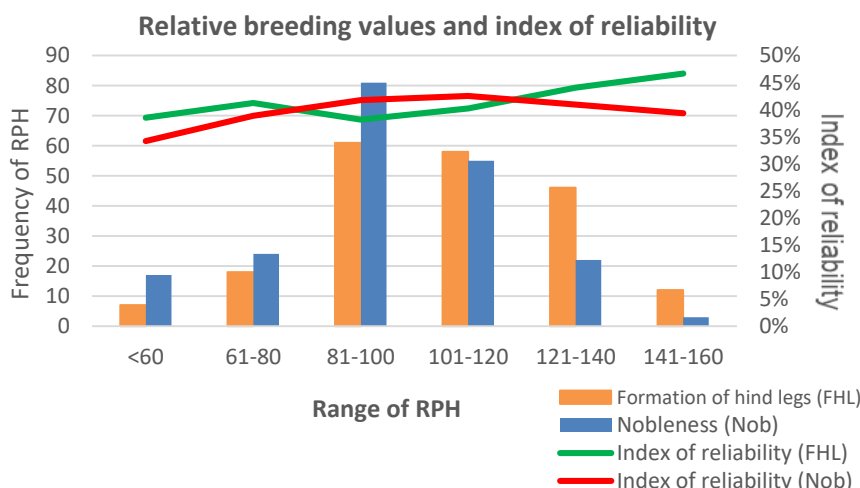
MATERIALS AND METHODS:

➢ Years 1997-2015.
➢ Totally 12455 observations , each horse had 1 evaluation.
➢ 22 linear type traits (scale 1-9), 3 measured traits in cm.
➢ Genetic parameters were estimated with AIREML.

➢ Fixed effects: gender, age, place, classiffier*year, and random effect: animal.
➢ Genetic correlations were estimated by two-trait analyses.
➢ Variance-covariance matrices were modified by the weighted bending method.
➢ Breeding values were predicted by a single-trait animal model.

RESULTS:

Estimates of heritability (diagonal) and genetic (above the diagonal) correlations for linear type traits

Trait	Ty	Fr	Nob	Nle	Npo	LeW	Ble	BSh	LeL	ShL	Cle	CSl	CSh	Sho	FP	HP	FH	HH	FHL	BW	SLeW	SLeT
Ty	**0.24**	-0.13	0.18	0.42	0.29	0.25	-0.10	0.32	0.06	0.26	0.31	-0.13	0.22	0.25	-0.10	-0.05	0.26	0.22	-0.12	0.30	0.51	0.67
Fr		**0.09**	-0.17	-0.05	-0.13	0.13	0.78	-0.16	0.85	0.00	0.41	-0.32	0.26	0.62	-0.09	0.05	0.14	0.22	-0.03	0.44	0.41	0.07
Nob			**0.31**	0.34	-0.14	0.25	-0.06	-0.17	-0.05	-0.19	0.14	0.14	-0.19	0.20	-0.07	0.09	0.19	0.02	-0.15	-0.17	0.22	0.18
Nle				**0.10**	0.25	0.31	0.12	-0.18	0.00	-0.22	0.24	-0.27	-0.07	0.26	0.08	0.15	-0.06	0.02	0.00	-0.08	0.20	0.32
Npo					**0.10**	-0.50	0.15	-0.32	0.17	0.04	0.00	-0.41	0.44	-0.37	0.00	0.04	0.11	0.27	0.02	0.04	-0.13	0.04
LeW						**0.09**	-0.14	0.20	0.06	0.31	-0.03	0.24	-0.27	0.51	-0.06	-0.17	-0.04	-0.14	0.01	-0.05	0.41	0.51
Ble							**0.14**	-0.25	0.93	-0.03	-0.09	-0.07	-0.10	-0.04	0.07	0.05	-0.02	0.37	-0.12	-0.02	-0.12	-0.26
BSh								**0.08**	-0.14	0.67	-0.22	0.11	-0.26	0.22	0.18	-0.12	-0.08	-0.27	-0.05	-0.24	0.12	0.16
LeL									**0.11**	0.15	-0.07	-0.12	-0.10	0.39	0.01	0.05	0.13	0.41	-0.08	0.15	-0.04	-0.08
ShL										**0.07**	0.01	-0.05	0.00	0.13	0.29	0.11	0.00	-0.04	-0.01	0.02	0.19	0.22
Cle											**0.10**	-0.40	0.43	0.47	-0.25	-0.06	0.00	0.05	0.07	0.40	0.26	0.41
CSl												**0.16**	-0.26	0.25	-0.18	-0.22	-0.18	-0.33	0.22	-0.12	0.12	-0.05
CSh													**0.18**	0.06	-0.04	0.00	-0.03	0.14	-0.06	0.64	0.11	0.12
Sho														**0.05**	-0.46	-0.38	-0.29	-0.28	0.22	0.37	0.29	0.17
FP															**0.09**	0.62	0.19	0.16	-0.06	-0.31	-0.31	-0.22
HP																**0.06**	0.01	0.29	-0.09	0.01	-0.36	-0.21
FH																	**0.09**	0.81	-0.12	0.08	0.16	-0.01
HH																		**0.08**	-0.15	0.02	-0.15	-0.04
FHL																			**0.14**	-0.28	-0.05	-0.02
BW																				**0.18**	0.26	0.23
SLeW																					**0.18**	0.77
SLeT																						**0.20**

Czech warmblood horse

Relative breeding values and index of reliability

Range of RPH: <60, 61-80, 81-100, 101-120, 121-140, 141-160

- Formation of hind legs (FHL)
- Nobleness (Nob)
- Index of reliability (FHL)
- Index of reliability (Nob)

CONCLUSION: This study provides essential information for development of a routine genetic evaluation. Estimated heritabilities and breeding values suggest that selection program can be based on the genetic evaluation of linear profiling.