Effect of specialization on genetic parameters in sport horses

Rovere, G.[1,2], Ducro, B.J.[1], Madsen, P.[2], Norberg, E.[2], Van Arendonk, J.A.M[1]

Introduction

- During the last decades the breeding practice has resulted in an increasing specialization of horses into dressage (DH) and show jumping (JH).
- The increasing specialization could lead to differences in genetic parameters and makes joint evaluation suboptimal.

Aim

Has the specialization led to differences in genetic parameters of traits in DH and JH subpopulations?

Materials & Methods

- The material comprised 38,142 first inspections from 1998 through 2010.
- Bi-variate animal model analysis were used to estimate heritability and genetic correlation between each trait expressed in DH and JH.

Results

Table 1. Phenotypic means and standard deviations of movement traits and evaluation traits for DH and JH subpopulations.

		Dressage Mean (S.D.)	Jumpers Mean (S.D.)
Walk	Length of stride	18.32 (5.51)	19.58 (6.04)
	Correctness	19.29 (6.04)	19.05 (6.15)
Trot	Length of stride	16.60 (6.35)	19.47 (6.14)
	Elasticity	19.22 (6.76)	21.11 (7.26)
	Impulsion	19.59 (6.69)	21.28 (7.25)
	Balance	21.17 (6.14)	23.39 (7.06)
Canter	Length of stride	19.83 (6.21)	19.61 (6.44)
	Impulsion	20.12 (6.20)	19.45 (6.62)
	Balance	22.28 (6.19)	21.63 (6.75)
Evaluation Traits	Conformation	67.09 (6.14)	66.95 (6.66)
	Walk	68.36 (5.89)	65.65 (6.77)
	Trot	69.54 (6.83)	65.36 (7.71)
	Canter	67.63 (6.66)	68.21 (7.23)

Table 2. Heritabilities of movement and evaluation traits in DH and JH subpopulations and corresponding genetic correlation.

		h^2_{DH*}	h^2_{JH*}	r_a (s.e.)
Walk	Length of stride	0.188	0.197	0.938 (0.027)
	Correctness	0.274	0.326	0.997 (0.009)
Trot	Length of stride	0.317	0.311	0.967 (0.015)
	Elasticity	0.288	0.282	0.941 (0.020)
	Impulsion	0.284	0.245	0.951 (0.019)
	Balance	0.265	0.248	0.965 (0.019)
Canter	Length of stride	0.347	0.273	0.992 (0.017)
	Impulsion	0.265	0.234	0.962 (0.028)
	Balance	0.237	0.194	0.971 (0.029)
Evaluation Traits	Conformation	0.333	0.290	0.934 (0.022)
	Walk	0.330	0.240	**0.857** (0.065)
	Trot	0.387	0.390	0.942 (0.040)
	Canter	0.343	0.340	0.970 (0.037)

* Standard errors were from 0.01 through 0.03

Conclusions

1. Specialization until now has not led to changes in genetic parameters that seriously affect the current genetic evaluations.
2. Similar analyses might be extended to all traits.

1 WAGENINGEN UNIVERSITY WAGENINGEN UR

2 AARHUS UNIVERSITY

Email: gabriel.rovere@agsci.dk

benefited from a grant from KWPN, within the framework of the Erasmus-Mundus joint doctorate "EGS-ABG"

KWPN Royal Dutch Sport Horse

EGS ABG European Commission ERASMUS MUNDUS