PHENOTYPIC AND GENETIC CORRELATIONS TO ASSES MORPHOLOGICAL PATTERNS FOR THE 'MENORCA DRESSAGE' IN MENORCA HORSES

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Which are the most correlated morphological traits with my aptitude for menorca dressage?
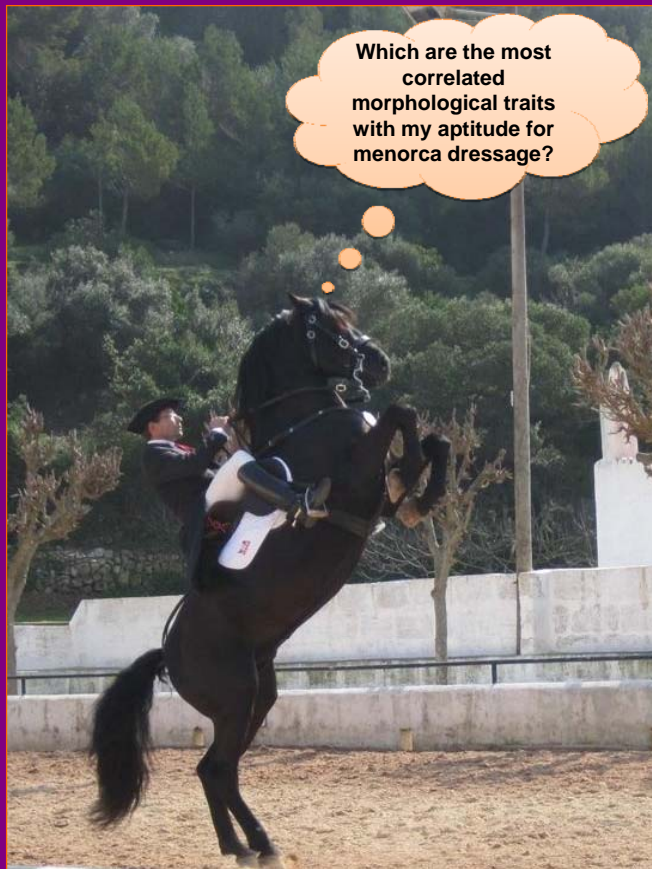
INTRODUCTION

The Menorca Pure Breed horses are selected by conformation traits and functional performance in Classic and Menorca Dressage (a special type of Dressage from Menorca).

MATERIALS AND METHODS

The data set consisted of 10 conformation traits for 342 Menorca Pure Breed horses (3-24 years old), collected between 2007 and 2011.

The performance data for Menorca dressage were obtained in the official competitions held in Menorca Island, between 2008 and 2010. A total of 611 records were available from 73 different horses (3-12 years old).

The genetic parameters of the variables: heigh at withers (HW), body length (BL), shoulder length (SL), croup length (CL), shoulder angle (SA), croup angle (CA), stifle angle (StA), hock angle (HA), hind legs side view (HV), hind legs hoofs (HH), score for menorca movements by judge (MM) and the final score by judge (FS) were estimated.

The genealogical information was obtained from the Studbook of the breed (provided by the Breeders Association). The relationship matrix contained a total of 3735 animals.

A multivariate REML animal model was designed to evaluate the different traits using VCE v.5.0 (Kovac, 2002). The models used in the genetic evaluation were:

$$\text{Conformation} = a^2_i + b_j + c_k + n_u + e_{ijku}$$

$$\text{Dressage} = a_i + d_j + f_k + g_l + n_u + e_{ijklu}$$

Where: a is age (c in conformation/f in dressage), b is sex (f), c is breeder (a), d is reprisse level (f), f is judge (f), g is rider (a), n is animal (a), and e is error (a); being f the fixed effects, a the random effects, and c the covariates in the model.

RESULTS AND DISCUSSION

Table 1. Genetic (G, above the diagonal) and phenotypic (P, below the diagonal) correlations, and heritability values of the conformation and dressage traits analysed in Menorca Pure Breed horses. **Significant with p<0.05**.

	HW	BL	SL	CL	SA	CA	StA	HA	HV	HH	MM	FS
HW	0.70	0.88	0.53	0.96	-0.63	-0.14	-0.51	0.10	0.08	-0.19	0.03	-0.03
BL	0.62	0.73	0.60	0.81	-0.68	-0.30	-0.56	0.18	-0.03	-0.12	-0.01	-0.22
SL	0.45	0.31	0.42	0.62	-0.62	-0.45	-0.47	-0.52	-0.36	-0.79	0.31	0.22
CL	0.43	0.33	0.25	0.38	-0.52	-0.06	-0.67	-0.18	-0.15	-0.33	0.07	-0.04
SA	0.09	-0.09	-0.06	-0.07	0.13	0.37	0.17	-0.18	-0.34	0.53	-0.60	-0.45
CA	0.34	0.21	0.13	-0.18	0.29	0.18	-0.28	-0.14	-0.15	0.19	0.10	0.16
StA	-0.1	-0.14	0.06	-0.26	-0.11	-0.19	0.17	0.47	0.70	0.26	-0.10	0.27
HA	0.14	0	0.06	0.13	-0.25	-0.14	0.24	0.20	0.74	0.68	-0.26	-0.20
HV	0.21	0.27	-0.11	0.25	0.22	0.22	-0.25	0.06	0.08	0.25	0.20	0.40
HH	0.11	0.14	-0.01	0.03	-0.35	-0.09	-0.09	-0.01	-0.09	0.07	-0.67	-0.65
MM	-0.03	0.07	0	-0.12	-0.17	0.01	0.02	-0.14	-0.05	0.08	0.34	0.79
FS	0.04	-0.03	0.03	-0.07	-0.07	0.00	0.15	-0.08	-0.01	-0.04	0.60	0.45

The heritability of conformation traits ranged between 0.07 (HH) and 0.73 (BL) (table 1). Whereas the heritability of performance traits was of medium level (0.34 for MM and 0.45 for FS). G correlations ranged between 0.01 (BL-MM) and 0.96 (HW-CL), in absolute value (table 1). The 56.06% of them were negatives. G correlations between conformation and performance traits ranged between 0.01 and 0.67 (HH-MM), in absolute value, and the 55% of them were negatives.

It is important to remark that most of the G correlations with angle traits were negative, as was found by Gómez et al. (2010) in the same breed. This fact is very important in the selection of traits to avoid negative indirect responses for performance ability. The high G correlations obtained between some conformation and performance traits, as SA-MM (-0.60), HH-MM (-0.67) and HH-FS (-0.65), are also very important in the selection process.

CONCLUSIONS:

✓The conformation of horses can influence their performance ability in the Menorca Dressage competitions.
✓The angles and the posterior aplomb have shown interesting results which could be taken into account in the breeding program of this breed to obtain an adecuate conformation for Menorca dressage ability.