

THE GENOTYPE FOR COAT COLOR GENES AS A CONSERVATION CRITERIA TO PRESERVE THE GENETIC DIVERSITY IN MENORCA HORSES



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INTRODUCTION

The Menorca Pure Breed Horse is a breed in danger of extinction. All the animals registered in its Studbook are black coated.

Is the level of variability affected when we take into account the genotypes for coat color?



MATERIALS & METHODS

A total of 1215 genotypes for 16 microsatellite markers were used to calculate the expected Heterozygosity (He), Polymorphic information content (PIC) and Effective allele size (EfAISize). Real-time PCR was used to genotype a total of 215 animals by the MC1R gene, responsible of the chestnut coat color. Molkin v3.0 was used to perform the analysis.

RESULTS

Table 1. Average number of alleles, Heterozygosity (He), Polymorphic information content (PIC) and Effective allele size (EfAISize) for the 1215 animals genotyped.

MARKER	ALLELES	He	PIC	EfAISize
AHT4	8	0.83	0.81	5.87
AHT5	7	0.76	0.72	4.12
ASB17	11	0.67	0.64	3.02
ASB2	9	0.70	0.64	3.29
ASB23	9	0.71	0.67	3.50
CA425	8	0.66	0.60	2.94
HMS1	8	0.73	0.68	3.68
HMS2	8	0.76	0.72	4.14
HMS3	7	0.75	0.70	3.93
HMS6	7	0.53	0.49	2.11
HMS7	7	0.80	0.77	4.94
HTG10	10	0.74	0.72	3.84
HTG4	7	0.72	0.68	3.59
HTG6	6	0.64	0.59	2.75
HTG7	5	0.56	0.50	2.29
VHL20	8	0.83	0.80	5.74
AVERAGE	7.81	0.71	0.67	3.73

Table 2. Average number of alleles, Expected Heterozygosity (He), Polymorphic information content (PIC) and Effective allele size (EfAISize) for the homozygous and heterozygous horses (215) and for homozygous horses genotyped for the MC1R gene (157), responsible of the chestnut coat color.

POPULATION	ALLELES	He	PIC	EfAISize
EE + Ee1	7.31	0.71	0.67	3.73
EE	7.19	0.70	0.66	3.65

Despite of being an endangered breed, the levels of genetic diversity were high (0.71, table 1). On the other hand, horses heterozygous for the MC1R gene should not be removed because it can affect the diversity of the breed as was shown in table 2.

CONCLUSIONS: We can't exclude heterozygous horses for MC1R gene (Ee), responsible of the chestnut coat color, because we losses genetic diversity in this endangered population.