

# Heritability of foot conformation and its relationship to sports performance in a Dutch Warmblood horse population

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## Results

The prevalence of uneven feet (UF) showed an increase with age, in both males and females (Table o1). Males received better scores for neck length (NL) than females, since in all of the age groups, the males had scores above -18.41, and the females had scores below -18.64 (Table o2). Similarly, males had better scores for forelimb conformation (FC), hoof shape (HS) and heel height (HH). In general, males had longer necks, a smaller hoof shape and higher heel depth than females.

With increasing age, the mean score for pastern angle (PA) became more negative both in males (from -19.86 in age group 3, to -21.22 in age group 5) and females (-19.98 to -20.77), therefore

as animals aged, the pasterns were more upright. Similarly, mean scores became more negative with increasing age in both sexes for the traits of neck length (NL) and limb quality (LQ).

Uneven feet were seen more frequently in older horses of both sexes (Table o2: M5 and F5). It is possible that the higher bodyweight of mature horses is likely to more severely load the lower angled, weaker developed foot, and this may be exacerbated by a longer shoeing interval (Moleman *et al.* 2006).

## Reference

Moleman, M., van Heel, M.C.V., van Weeren, P.R. and Back, W. (2006) Hoof growth between two shoeing sessions leads to a substantial increase of the moment about the distal, but not the proximal, interphalangeal joint. *Equine vet. J.* **38**, 170-174.

**TABLE o1: Least square means by year of traits scored at studbook entry (n = 44,480)**

	UF	HW	NL	FC	PA	HS	HH	LQ	CG <sup>a</sup>
1990	3.81	165.5	-17.36	-20.55	-20.48	-18.94	-19.86	-19.49	-
1991	4.47	164.9	-17.77	-20.06	-20.68	-19.09	-19.78	-20.08	-
1992	3.66	165.0	-18.25	-20.07	-20.64	-18.91	-20.09	-19.53	66.71
1993	5.02	164.9	-18.48	-20.18	-20.51	-18.71	-19.38	-19.39	66.19
1994	4.72	165.0	-18.65	-20.05	-20.28	-18.83	-19.55	-19.44	66.29
1995	5.53	164.9	-18.83	-19.87	-20.31	-19.08	-19.80	-19.33	65.62
1996	5.87	165.1	-18.74	-20.18	-20.19	-19.05	-19.60	-18.97	66.70
1997	7.20	165.1	-18.97	-19.97	-20.19	-19.35	-19.62	-19.54	63.66
1998	7.28	165.3	-19.52	-20.16	-20.44	-19.42	-19.75	-20.02	69.11
1999	7.48	165.5	-19.51	-19.84	-20.12	-19.39	-19.78	-20.23	68.34
2000	9.02	165.9	-19.56	-20.16	-20.48	-19.00	-19.87	-20.41	67.51
2001	8.05	166.1	-19.18	-20.54	-20.69	-19.15	-19.83	-20.52	67.36
2002	9.39	166.9	-19.15	-20.63	-20.67	-18.83	-20.46	-20.49	66.97
LSD	0.12	1.24	0.22	0.22	0.22	0.23	0.23	0.23	0.42

UF = Uneven feet (%); HW = Height at withers; NL = Neck length; FC = Forelimb conformation; PA = Pastern angle; HS = Hoof shape; HH = Heel height; LQ = Limb quality; CG = Conformation grade; LSD = Least significant difference; <sup>a</sup>Conformation was not recorded in 1990 or 1991.

**TABLE o2: Least square means of sex age groups of males (M) and females (F) at the age of 3, 4 and more than 4 years of age (M5, F5) for traits scored at studbook entry (n = 44,480)**

	UF	HW	NL	FC	PA	HS	HH	LQ	CG
M3	4.04	165.8	-18.29	-19.88	-19.86	-19.33	-19.56	-19.21	65.75
M4	6.85	166.8	-18.27	-19.92	-20.94	-18.74	-19.20	-20.17	67.50
M5	7.94	166.9	-18.41	-19.66	-21.22	-18.43	-19.17	-20.90	66.52
F3	5.32	164.9	-18.64	-20.52	-19.98	-19.43	-20.28	-18.79	68.90
F4	6.35	164.3	-19.27	-20.63	-20.17	-19.32	-20.51	-19.49	66.84
F5	8.04	164.3	-19.57	-20.44	-20.77	-19.28	-20.43	-20.25	65.09
LSD	0.16	1.42	0.29	0.28	0.28	0.29	0.29	0.29	0.56

UF = Uneven feet (%); HW = Height at withers; NL = Neck length; FC = Forelimb conformation; PA = Pastern angle; HS = Hoof shape; HH = Heel height; LQ = Limb quality; CG = Conformation grade; LSD = Least significant difference.