

Factors influencing gestation length of Thoroughbred mares in India

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Received: 21 July 2009; Accepted: 30 September 2009

Key words: Foal gender, Gestation length, Mare, Thoroughbred

Gestation length in the mare is highly variable, and the variability in physical signs of imminent parturition makes predicting foaling particularly difficult. To date, any detailed reference on the gestation length of Thoroughbred mares in India is obscure. Additionally, the gestation length is also reported to be influenced by climate (Astudillo *et al.* 1960) and management therefore the reported findings from other countries might not hold true for Indian Thoroughbreds. Therefore this study aims to assess the effect of various factors on gestation length of Thoroughbred mares in India.

Reproductive records for 422 Thoroughbred mares those were foaled (1998-2005) at 8 stud farms of Punjab were analysed. On all the surveyed stud farms ultrasonographic examination and/or transrectal palpation of ovaries were performed daily or every other day to confirm ovulation (day 0). The mares were grouped according to their age (3-7, 8-12, 13-17, ≥ 18 years) and reproductive status, viz. maiden, barren, lactating, rested and aborted (Sharma *et al.* 2009). Univariate analysis of variance was used to examine the effect of age of mare, reproductive status, foal gender, stud farm, year and month of foaling on gestation length, using statistical

software (SPSS 12.00). Results were expressed as mean $\pm$ sem. Chi squared test was used to analyse the ratio of colt to filly foals. Statistical significance was considered at $P < 0.05$.

The mean gestation length for 422 Thoroughbred foals was 343.13 ± 0.39 days with a range of 319–378 days. The mean gestation length obtained in this study is consistent with the observation (344.1 ± 0.49 days) of Davis Morel *et al.* (2002) but comparatively longer than recorded (335.15 days) by Singhvi (1987) in Thoroughbreds. The mean gestational length for all foals falls within previously reported ranges of 310-388 days (Immegart 1997, Davies Morel *et al.* 2002). The calculation of gestation length (ovulation to foaling) plus the use of large number of single breed pregnancies, allows this work to be considered more accurate and reliable than previous work.

There was a nonsignificant ($P > 0.05$) difference in the percentage of colt (46.92%) and filly (53.08%) foals born. Further, year of foaling and reproductive status of dam did not significantly affect gestation length. No effect of mare age on gestation length in all the stud farms surveyed may

Table 1. Gestation length of Thoroughbred foals in different months of foaling

Month of foaling	Mean gestation length, all pregnancies (days) $\pm$ s.e.m.	n	Mean gestation length, filly pregnancies (days) $\pm$ s.e.m.	n	Mean gestation length, colt pregnancies (days) $\pm$ s.e.m.	n
January	$335.79^a \pm 1.29$	29	334.60 ± 1.73	15	337.07 ± 1.95	14
February	$340.21^b \pm 0.81$	80	338.79 ± 0.99	42	341.79 ± 1.27	38
March	$344.02^c \pm 0.57$	141	342.55 ± 0.80	75	345.70 ± 0.78	66
April	$346.08^c \pm 0.77$	124	344.27 ± 0.80	67	348.21 ± 1.33	57
May	$342.75^{bc} \pm 1.33$	36	341.16 ± 1.80	19	344.53 ± 1.95	17
June	$340.33^b \pm 1.37$	12	339.17 ± 1.54	6	341.50 ± 2.32	6
Total	343.13 ± 0.39	422	341.62 ± 0.48	224	344.83 ± 0.61	198

Within column mean gestation lengths with different superscripts differ significantly ($P < 0.05$)

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well be accounted for by the close proximity of the stud farms and their similar management regimes.

Pregnancy was significantly longer when mares gave birth to colts rather than fillies (344.83 ± 0.61 vs. 341.62 ± 0.48 days,

$P < 0.001$; Table 1), consistent with Pe'rez *et al.* (2003). This may be due to difference to androgen action and to sex-chromosome-linked effects (Monteiro *et al.* 1998).

The shortest gestation lengths were in January (335.79 ± 1.29) and longest (346.08 ± 0.77) in April, is in accordance with Davies morel *et al.* (2002). As climate in particular the photoperiod is thought to affect the foaling time (Astudillo *et al.* 1960) therefore, significant difference in gestation length was expected between the months in this study (Table 1). It has previously been suggested that nature attempts to bring the timing of parturition back to the ideal, early spring and that this may be achieved by shorter or longer gestation lengths in late born and early born foals, respectively (Evans and Torbeck 1998). Previous work, therefore, agrees with the decline in gestation length in later months as seen in the current study, but not the short gestation lengths in January. No ready explanation for this difference is found.

In conclusion, true gestation length for Thoroughbred foals born in India is 343.13 ± 0.39 days. The mares carrying colt foals due to be born in mid season are likely to have the longer gestation lengths.

SUMMARY

Factors affecting gestation length of thoroughbred mares in India, were studied. Reproductive records of 422 mares that foaled in 8 stud farms of Punjab were collected. True gestation length for mare was 343.13 ± 0.38 days in India. The mares carrying colt foal due to born in mid season are likely to have longer gestation length.

REFERENCES

- Astudillo C R, Hajek G E and Diaz O H. 1960. Influencia de algunos factores climaticos sobre la duracion de la gestacion de carrera: estudio preliminar (the influence of some climatic factors on pregnancy duration in Thoroughbred mares: preliminary account). *Zoolatria* **2** (35): 37–38 (Animal Breeding Abstracts **30**, 2348).
- Davies Morel M C G, Newcombe J R and Holland S J. 2002. Factors affecting gestation length in the Thoroughbred mare. *Animal Reproduction Science* **74**: 175–85.
- Evans W J and Torbeck R L. 1998. *Breeding Management and Foal Development*. Equine Research Incorporated Texas, pp. 700.
- Immegart H M. 1997. Abnormalities of pregnancy. *Current Therapy in Large Animal Theriogenology*. (Ed.) Yougquist R S, pp. 113–129, Saunders, Philadelphia, USA.
- Monteiro V, Derom C, Vlietinck R, Kohn N, Lesser M and Gregerson P K. 1998. Commitment to X-inactivation precedes the twinning event in monochorionic MZ twins. *American Journal of Human Genetics* **63**: 339–46.
- Pe'rez C C, Rod'riguez I, Mota J, Dorado J, Hidalgo M, Felipe M and Sanz J. 2003. Gestation length in Carthusian Spanishbred mares. *Livestock Production Science* **82**: 181–87.
- Sharma S, Davies Morel M C G, Dhaliwal G S and Dadarwal D. 2009. The pattern of embryonic fixation and its relationship to pregnancy loss in Thoroughbred mares. *Reproduction in Domestic Animals* (doi: 10.1111/j. 1439-0531.2009.01523.x.)
- Singhvi N M. 1987. Gestation in equines and factors affecting it. *Journal of Remount Veterinary Corps* **26**: 6–11.
- Winter G H Z, Rubin M I B, De La Corte F D and Silva C A M. 2007. Gestational length and first postpartum ovulation of Criollo mares on a stud farm in Southern Brazil. *Journal of Equine Veterinary Science* **27**: 53–34.