



Short Communication

Seasonal Changes in Body Condition of Przewalski's Horses in a Seminatural Habitat

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ABSTRACT

Identification of the normal fluctuations in body condition of equids is important for the monitoring and management of wild and feral equid populations. Knowledge of the causative factors and implications of body condition fluctuations may allow managers to better respond with interventions when body condition fluctuations are unseasonal or extreme. The body condition score (BCS) of 33 adult Przewalski's horses (22 mares and 12 harem stallions) roaming freely in a population in excess of 300 in the Hortobágy Pusztas in Hungary was assessed weekly for 12 months from January to December 2009. Mares had a higher mean BCS than stallions for each month of the year, and all horses maintained a moderate to fleshy condition score. There were two peaks and two troughs in BCS for both mares and stallions. It appears that an annual fluctuation of body condition of Przewalski's horses is normal for horses living in a semiwild habitat. This can be explained by seasonal variation in pasture quality, an energy cost to mares in late gestation and early lactation, and a large energy cost to mares and stallions in protecting new born offspring from aggressive attacks by rival stallions and the work of band stallions protecting against challenging stallions. Although there was a seasonal fluctuation in body condition, semiwild horses living in a former wild horse habitat were never in poor condition. Managers of domestic, feral, and wild horses may tolerate a small reduction in body condition of horses during the annual seasonal cycle.

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1. Introduction

The European wild horse, also known as Tarpan (*Equus ferus gmelini*), was hunted to extinction in the 19th century [1]. The Przewalski's horse (*Equus ferus przewalskii*), also known as Mongolian wild horse or Takhi, is the only surviving wild relative of the domestic horse. It can be regarded as a representative of a group of related species, which were once widely distributed over Europe and Asia and from which the domestic horse derived [2]. The

Przewalski's horse became extinct in the Gobi desert in the late 1960s, but the species has returned to its natural habitat and other areas in the range of Mongolia and China due to breeding and reintroduction programs [3–7]. Przewalski's horses have been roaming freely since 1997 in the Hortobágy Pusztas in Hungary which is part of the largest Central European steppe area. In Hungary, preserving open grassland with large herbivore species is no longer possible with the wild Tarpan, so Przewalski's horses were introduced for managing the landscape in the Pentezug area of the Hortobágy Pusztas [8]. This herd size now exceeds 300 head and presents a good opportunity to study wild horses in a semiwild habitat. In recent decades, feral horses (*Equus ferus caballus*) have been introduced into European ecosystems for rewilding [9] to assist in keeping landscapes

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open as was their role in former times. However, large herds of wild horses have never been studied in European ecosystems so there is limited knowledge of wild horse ecology in these habitats. The large herd of semiwild Przewalski's horses in the Hortobágy Puszta in Hungary represent the best opportunity available to study wild horse ecology. The goal of the present study was to investigate the body condition over a 12-month period of a large healthy group of adult mares and stallions living in a free-roaming European habitat. This data may then be used as a comparison to other feral and wild horse herds and to assist rangeland and wildlife managers to assess herd health throughout seasonal cycles. Identification of season patterns of body condition may also inform domestic horse (*Equus ferus caballus*) managers of important aspects of natural horse ecology.

2. Material and Methods

2.1. Study Area

The study was performed in the Pentezug, a steppe area which is now a biosphere reserve for wild horses. Its area is 2,388 ha (27 ha wood, 2,361 ha meadow) and is situated in the middle of the Hortobágy Puszta, Hungary. Pentezug is a former grass land that during summer is characterized by yellow meadow inula, and the blue thrift which is endemic for the Hungarian lowland plane. Like the rest of the Hortobágy steppe areas, Pentezug is characterized by a narrow mosaic of different plant communities. In addition to marsh plant communities which make about 10% of the area, at least three different grass communities occur in the drier areas. These can be roughly structurally divided into long grass and short grass steppe. The long grass or meadow covers about 15% of the area, 44% are covered with short grass steppe which is rich in *Fescue* species. About 30% is eroded area loosely covered with plants tolerant of salt. The climate is semiarid and is described as subcontinental wood and steppe climate [1]. The average temperature is 21°C (max 38°C) in July and –2.5°C (min –28°C) in January. The annual rainfall is 500 mm and snow falls on average 40–45 days per year (range, 2–10 cm).

2.2. Study Population

The study herd has a population of 310 horses and consists of approximately equal number of males and females, divided into approximately 25 of semistable social bands. The herd is relatively unmanaged, and breeding and social structures are natural processes. Thirty-three mature aged horses (21 mares and 12 harem stallions) were randomly selected for the study. Individual horses in this herd have been catalogued and can be identified by sex, color, and markings. All harem stallions belonged to separate harem bands, and all mares belonged to harem bands.

2.3. Body Condition Score

The body condition score (BCS) of each horse was assessed weekly by the author (K.B.) for a 12-month period

from January to December 2009 using a standardized 9-point scoring system [10]. Values of 1 to 9 corresponded to the following descriptions for body condition: poor, very thin, thin, moderately thin, moderate, moderate to fleshy, fleshy, fat, and extremely fat. The body condition scoring system is based on the prominence of the bones and the thickness of muscle and fat layer of the horse. In this study, only visual assessments could be conducted, similar to the scoring system described in Rudman and Keiper [11]. Data for mares and stallions were managed separately as these groups of horses have quite different roles in the herd structure which was thought likely to affect body condition.

The study was approved by Chief Veterinarian Dr Pál Póser of the Hajdú-Bihar County Agricultural Task Office—Directorate for Food chain Security and Animal Health Affairs according to Hungarian ethical restrictions.

2.4. Statistical Analyses

The significance of differences in body condition of mares and stallions over the whole study period, such as the differences of female body condition before and after foaling of the individuals, was tested with Mann–Whitney *U*-test, chi squared, with a *P* value <.01.

3. Results

The mean (\pm standard deviation [SD]) BCS for stallions for the 12-month period of the study was 7.3 (\pm 0.29) with a monthly mean range from 7.0 to 7.8. Stallions showed little variability among the group with the largest monthly SD of 0.3 scale points. The lowest BCS for stallions was 6 and the highest was 8. The mean (\pm SD) BCS for mares for the 12-month period was 7.9 (\pm 0.17) with a monthly mean range from 7.6 to 8.2. Mares showed similarly little variability among the group with the largest monthly SD of 0.4 scale points. The lowest BCS for mares was 7, and the highest was 9. The mean monthly BCS for stallions and mares is displayed in Fig. 1.

The body condition of mares and stallions differed significantly over the whole year with the stallion values being slightly lower than the mare values (Mann–Whitney *U*-test, chi squared = 349.3326; df = 1; *P* value < .0001).

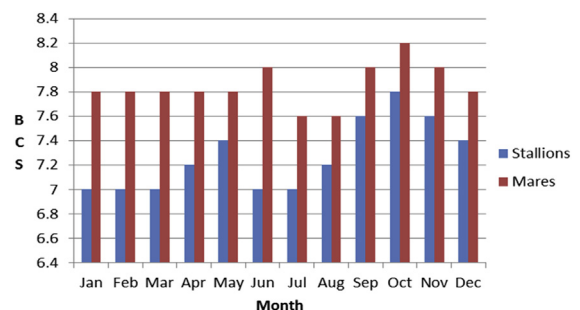


Fig. 1. The mean monthly BCS of 33 adult Przewalski's horses (22 mares and 12 stallions) roaming freely in a population in excess of 300 in the Hortobágy Puszta in Hungary assessed weekly for 12 months from January to December 2009 according to the Henneke BCS system.

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