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Determination of seasonal variation of ovarian activity and sexual hormones in Caspian horse

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Abstract

The Caspian horses are among the genetic resources of the country because of their unique characteristics. The Caspian horse has been considered one of the oldest domestic horses in the world for more than 5,000 years. It is considered as one of the endangered genetic resources of the country.In order to determine the beginning and end of Caspian horse sexual activity by measuring progesterone, the present study was performed on 10 Caspian mares in Guilan for one year. The reproductive cycle for all mares was recorded in the breeding season one year before sampling. These ten mares were divided into three age groups: 3 to 5 years (young), 6 to 7 years (middle age) and 14 to 19 years (old). Young and middle age groups did not have any mating in life history. The last mating of the older group was two years ago. In during 52 weeks (one year), blood samples were taken from the jugular vein at 11 am weekly. The blood serum was then separated and its progesterone concentration was measued. An ELISA device was used to measure the serum progesterone concentration of mares. Changes in serum progesterone concentration were considered to determine ovarian activity.For two consecutive weeks, ovarian cessation and the end of the mare breeding season were found, with a progesterone concentration of less than 1 ng / ml. The time of onset of the reproductive season was determined by increasing the concentration of progesterone to 1 ng / ml. According to the results, the effect of different levels of mares' age and month of mare blood sampling on their serum progesterone concentration (ovarian activity) was significant ($P < 0.05$). The highest concentration of progesterone (ovarian activity) with a value of 6.28± 0.30 ng/ml was observed in older mares.Different age and month levels on serum progesterone concentration of Caspian mares were significant. The highest concentration of progesterone was present in older mares ($P < 0.05$). Progesterone concentration in middle-aged mares was higher than young mares but lower than older ones ($P < 0.05$). Regardless of the age of the mares, the mean serum progesterone concentration in June (9.54 ±0.72) was not significantly different from July (8.83 ±0.72) and August (8.83 ±0.72). But it was more than other months of the year ($P < 0.05$). Also, the mean serum progesterone concentration in December (1.4 ± 0.72) with January (0.14

±0.72), February (0.08 ±0.72) and March (1.76 ±0.64) was not significantly different but was less than the other months of the year.The mean serum progesterone concentration of Caspian mares did not show a significant difference in all age groups in May, June, July and December and January. In March, the highest concentration of progesterone (4.93 ± 1.15) was observed in young mares .In April, the lowest serum progesterone concentration was related to older mares (0.60 ± 1.1). The lowest serum progesterone concentrations in August and September were 3.08 ± 1.30 and 0.22 ±1.14 and belonged to young mares, respectively .In older mares, the highest concentration of progesterone was in October, November and December (respectively 8.82 ±1.13 , 9.30 ± 1.14, 3.66 ± 1.13) ($P < 0.05$). In general, the onset of sexual activity and the cessation of ovarian activity in mares in the young age group in March and September, in the middle age group in April, which lasted until October, and in the older age group, began in May and continued until December respectively. Based on the results, the effect of age can affect the onset and end of ovarian activity in Caspian mares.

Key words: Caspian, Horse, Seasonal Variation, Reproduction, Sex Hormones