Comparison of the Reproductive Performance of Gayo and Thoroughbred Derivatives Horses in Gayo Lues Regency

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ABSTRACT
Analysis of the reproductive performance of Gayo horses and Thoroughbred derivatives breeds in the Gayo highlands is important to determine the strategy for developing Gayo horses in the future. The objective of this research was to compare the reproductive performance of Gayo and Thoroughbred horses in the Gayo Lues Regency. Survey research was applied in order to collect the primary data through direct interviews with horse owners based on questionnaires that have been prepared. A total of 49 horse owners were spread over four selected sub-districts (Blangkejeren, Blangjerango, Dabun Bracelet, and Kuta Panjang District) were involved as this research respondents. Meanwhile, the fourteen villages involved included Bustanussalam Village, Kutelintang, Blangkejeren City, Porang, Java Village, Peparik Dekat, Blangjerango, Penosan, Gegarang, Peparik Gaib, Badak, Rigeb, Rerebe, and Kuta Panjang. These research respondents were obtained by using the purposive sampling method in which the criteria are that the respondents should be breeders who maintain at least 2 mares who have given birth at least 2 times and has experience in raising horses for 4 years. The results revealed that the reproductive performance of Thoroughbred horses in Gayo Lues was better than Gayo horses'. The average age of the first mating of Gayo horses was 46.42±5.04 months, while Thoroughbred horses were 32.53±2.69 months. Furthermore, the gestational period of Gayo horses was 347.53±14.96 days, while the gestational period of Thoroughbred horses was 318.95 ±9.47 days. The average post-partum estrus of Gayo horses was 14.84±0.54 days, while Thoroughbred horses were 12.24±0.39 days. Last, the foaling interval of Gayo horses was 16.50±0.74 months, while the foaling interval of Thoroughbred breeds was 15.50±0.71 months.

Keywords: *Gayo Horses, Thoroughbred, Estrus, Reproductive.*

1. INTRODUCTION

The horse population has been occupying quite an interesting position in people's lives for a long time. However, as technology advances, the horse population has decreased since its role which is original as a means of transportation shifted and replaced by motorized vehicles. In addition, the high rate of horse slaughter in certain areas of Indonesia for food sources has caused the horse population to decrease. Based on the [1], the current horse population was ±392,000, far less than the horse population in the 1990s. Specifically for Aceh Province, the horse population in 2019 was 2,052 horses [2].

Horse livestock is one of the livestock that has special features compared to other livestock; one of them is the horses' relatively expensive price. When a horse is sold, it will produce higher money for each horse. The high selling price of horses makes Gayo people more often sell local horses, especially outside the area. Furthermore, the increase in equestrian sports activities that compete for prizes, it has encouraged people to improve the quality of their pet horses with more and more Gayo horses being bred through crosses with Thoroughbred horses, so that Gayo horses are increasingly difficult to ascertain their originality. This requires the attention of various parties to the

preservation of Gayo horses which currently are starting to decrease.

Based on the field observations that discover the decreased population of Gayo horses, in addition to the recognition of Indonesian racehorses that there must be blood (genetic material) of local horses until the fourth generation, the population of Gayo horses must be increased. However, to develop the population of Gayo horses, reproductive performance data is still very limited. Even the reproductive performance of Thoroughbred horses in Gayo Lues Regency has never been reported. The basic data on the reproductive performance of Gayo horses and their breeds include the horses' age at the first mating, gestational period, post-partum estrus, as well as the foaling interval need to be inventoried. Therefore, it is necessary to conduct a comparative study of the reproductive performance of Gayo and Thoroughbred breeds horses in Gayo Lues Regency.

2. MATERIALS AND METHODS

This research was carried out in four districts in Gayo Lues Regency, those are Blangkejeren, Blangjerango, Dabun Bracelet, and Kuta Panjang District. Meanwhile, the fourteen villages involved in this study include Bustanussalam Village, Kutelintang, Blangkejeren City, Porang, Java Village, Peparik Dekat, Blangjerango, Penosan, Gegarang, Peparik Gaib, Badak, Rigeb, Rerebe, and Kuta Panjang. This research was conducted from 30 April to 29 May 29, 2021. The Survey was applied to obtain primary data which were collected using direct interviews with horse owners based on questionnaires that have been prepared previously. A total of 49 horse owners who live in fourteen villages have been selected by purposive sampling technique, with the criteria that the horse owners must be a breeder who maintained at least 2 mares who have given birth at least 2 times and has experience of raising horses for 4 years. The variables observed in this study were the productivity of Gayo and Thoroughbred breeds mares by breeders in the Districts of Blangkejeren, Blangjerango, Dabun Bracelet, and Kuta Panjang District, Aceh Gayo Lues Regency, including: (a) signs of mating; (b) age at first mating; (c) gestational period; (d) postpartum estrus; and (e) foaling interval

3. RESULTS AND DISCUSSION

3.1. First Mating Age

The productivity performance of Gayo and Thoroughbred mares in the Districts of Blangkejeren, Blangjerango, Dabun Bracelet, and Kuta Panjang, Aceh Gayo Lues Regency is shown in the following Table 1.

The average first mating age of Gayo horses in the Districts of Blangkejeren, Blangjerango, Dabun Bracelet, and Kuta Panjang, Aceh Gayo Lues Regency was 46.42±5.04 months with a range of 30-54 months old, while the average first mating age of Thoroughbred horses was 32.53±2.69 months old with a range of 24-42 months (Table 1). When the Thoroughbred horses in Gayo Lues and Payakumbuih are compared, the first mating age of Thoroughbred Gayo Lues horses is faster. Furthermore, [3] reported that the average first mating age of Thoroughbred horses in Payakumbuh was 51.8 ± 14.5 months. Meanwhile, when the first mating age of Gayo horses and local horses in Payakumbuh, the first mating age for horses in Payakumbuh is faster, which is 26.2 ± 8.53 months.

The first mating age of Thoroughbred horses in Gayo Lues Regency was 14 months earlier than Gayo horses. The earliest first mating age for Thoroughbred horses was at 24 months by 10.53%, while the latest first mating occurred at 42 months by 5.26%. Meanwhile, regarding Gayo horses, generally the first mating age occurred at 54 months by 47.7%. There was a Gayo horse whose first mating occurred at the age of 30 months and the latest was at the age of 54 months by 5.26% respectively. The average first mating age for Gayo horses exceeds the first mating age of the reference horse, while the average first mating age for Thoroughbred horses is still in the reference standard category. According to [4], the average mating age of a mare is 2.5 years or 30 months. There is a difference in first mating age between Gayo horses and Thoroughbred horses which may be caused by factors of maintenance management and nutritional intake. Gayo horses are raised extensively, while Thoroughbred breeds are raised intensively. The maintenance of Gayo horses has not received good attention, such as being released wild in the savanna or mountains and plantations. Differences in the consumption and digestibility of feed substances from different feed sources can affect the performance of racehorses in Indonesia [5].

3.2. Gestation Period

Pregnancy in horses is indicated by the formation of embryonic vesicles which continues to the formation of a fetus [6]. The average gestational periods of Gayo horses and Thoroughbred horses in Gayo Lues Regency were 347.53±14.96 days and 318.95±9.47 days, respectively (Table 1). The results of this study are different from the opinion stated by [4] that the average gestational period of local horses and Thoroughbred horses in Payakumbuh City is not much different, which are 323.17±8.55 days and 324.37±14.185 days. In addition, [7] further revealed that the gestational period of Bima mares was at the average of 323.75 ± 7.97 days at the range of 297-330 days.

Table 1. Characteristics of Gayo and Thoroughbred Mares

Characteristics of Reproduction	Average ± SD	
	Gayo Horse	Thoroughbred Horse
First mating age (months)	46.42±5.04	32.53±2.69
Gestational Period (days)	347.53±14.96	318.95±9.47
Post-partum estrus (days)	14.84±0.54	12.24±0.39
Foaling Interval (days)	16.50±0.74	15.50±0.71

In addition to being affected by the maintaining system, the differences in the gestational period between Gayo and Thoroughbred horses may be affected by the gender of the foal conceived. According to [8], the normal gestational period in horses ranges from 335 to 345 days with an average of 340 days. However, a horse's gestational period is often longer by up to ten days if the pregnant mother gives birth at the beginning of the year which is in January-March. In addition, mares conceiving a male foal will give birth 2-3 days longer than mares conceiving a female foal. The results of research previously conducted by [9] revealed that female horses which mated with Thoroughbred males in West Sumatra showed an average gestational period of 329.27±9.71 days consisting of 325.55±8.25 days for mares and 355.65 ± 10.65 days for a stallion.

The gestational period is determined genetically, even though it can be modified by the internal factors of the fetus and the environment [7]. The Gestational period in horses is relatively longer compared to other livestock. Furthermore, gestational age can be also be affected by good nutritional conditions, environmental factors, endocrine system balance, and genetic factors [10]. Furthermore, [11] claimed that if an early pregnancy examination will be carried out on Gayo horses, it can be done 14 days after the last mating and the concentration of steroid hormones can be used as a technique for monitoring the gestational period and parturition in Gayo horses.

3.3. Post-Partum Estrus

Post-partum estrus in Gayo horses and Thoroughbred horses was at 14.84±0.54 days and 12.24±0.39 days, respectively (Table 1). The results obtained are not much different from the opinion stated by [3] that the post-partum estrus of local horses and Thoroughbred horses in Payakumbuh City, was16.37±9.37 days and 10.9±6.64 days, respectively. The average post-partum estrus in Gayo horses is longer than the post-partum estrus of Thoroughbred horses. This may be caused by several factors, including the age of the mares, body condition, and nutrition given to livestock.

Thoroughbred horses experienced normal postpartum estrus at 17.24 days [12]. However, there are less than 18% of the horse population whose estrus after giving birth is undetectable due to the silent heat.

3.4. Foaling Interval (FI)

Research data showed that the foaling interval of Gayo horses and Thoroughbred horses in Gayo Lues Regency was 16.50 ± 0.74 months or about 495 days and 15.50 ± 0.71 months or about 465 days (Table 1). The results of this study are not much different from the foaling interval in working horses in Bantul Regency as reported by [13] with an average of 493.65 ± 43.01 days or 16.45 ± 1.43 months. Furthermore, [7] added that the foaling interval for Bima mares ranged from 360-540 days with an average of 380±57.64 days or 12.66±1.92 months. Foaling intervals for normal horses range from approximately 15 months or 450 days [14] in [13]. The delay in foaling interval may be affected by the post-partum estrus, mating after giving birth, as well as the mating system and lack of technical knowledge of livestock breeding management.

4. CONCLUSION

It is summed up that the reproductive performance of Thoroughbred horses in Gayo Lues is better than Gayo horses'. The average first mating age for Gayo horses was 46.42±5.04 months, while the average first mating age for Thoroughbred horses was 32.53±2.69 months. Furthermore, the gestational period for Gayo horses was 347.53±14.96 days, while for Thoroughbred horses was 318.95±9.47 days. The average post-partum estrus of Gayo horses was 14.84±0.54 days, while Thoroughbred horses were 12.24±0.39 days. Last, the foaling interval of Gayo horses was 16.50±0.74 months, while the Thoroughbred horses were 15.50±0.71 months.

AUTHORS' CONTRIBUTIONS

Abdullah MAN was in charge of planning, execution, checking of results and writing. Sulaiman M assists in planning, execution, checking of results and writing. Sari EM helps with checking results.

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