

Analysis of Gayo horse reproductive performance as a local livestock genetic resource in Aceh Province to characterize reproductive efficiency

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ARTICLE INFO

Received: 17 September 2025

Accepted: 22 October 2025

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Keywords:

Foaling interval, Gayo horse, Gestation period,
Reproduction, Postpartum mating

ABSTRACT

This study aimed to determine strategies for future Gayo horse development by examining the reproduction of the Gayo horse breed, which runs in the Gayo highland. The study was conducted in the regencies of Central Aceh, Bener Meriah, Gayo Lues, and Southeast Aceh in Aceh Province. A survey methodology was used. The study sites were selected due to the importance of the Gayo horse as a genetic resource, 112 Gayo horses were used as research samples. Some of the data required for this study were reproductive performance variables such as (1) age at first mating, (2) gestation period, (3) calving interval, and (4) postpartum mating. This study found that Gayo horses have a high reproductive rate. The average age of first mating ranged from 30 to 46 months, with a mean time span of 39.51 ± 84.49 months. Gestation averaged 339.38 ± 7.88 days, with a range of 333 to 347 days. The average calving interval was 425.78 ± 38.15 days, with a range of 370 to 495 days. The average postpartum mating interval was 134.74 ± 23.70 days, with a range of 123-150 days.

Introduction

In some wild populations, horses have been domesticated for 4,000 to 6,000 years (Outram *et al.*, 2009). Furthermore, after a long period of domestication, horses differentiated into various types (Jansen *et al.*, 2002). In contrast to other domesticated animals raised for sustenance, horses played a significant role in transportation and combat throughout history, transforming communities across the continent. One of the eight national native horses and a part of Indonesia's biodiversity is the Gayo horse (FAO, 2007).

This horse is found in Gayo Lues, Bener Meriah, Southeast Aceh, and Central Aceh in the central part of Aceh Province. The social and economic life of the Gayo highlands depends on domesticated Gayo horses. When crossbred horses are more economically profitable than Gayo horses, breeders will prefer to crossbreed Gayo horses with purebreds, leading to their extinction. To maintain the Gayo horse's existence, comprehensive reproductive statistics are needed to increase the population and reproductive efficiency of Gayo horses.

The population of Gayo horses needs to be raised based on field studies that reveal a decline in the number of these animals, as well as the understanding among Indonesian racehorses that local horses' blood (genetic material) must be present until the fourth generation. Nevertheless, there is currently very little information on reproductive performance to increase the Gayo horse population. It's crucial to remember some key information about the reproductive abilities of Gayo horses and their breed, including age at first mating, gestation period, postpartum estrus, and calving interval. Therefore, research is needed on the genetic abilities of Gayo horses in Aceh Province.

Materials and methods

The districts of Central Aceh, Bener Meriah, Gayo Lues, and Southeast

Aceh were the sites of this study. Direct interviews with horse owners were used to gather primary data, which were then applied to the survey. Open-ended, direct interviews with horse livestock owners were used to gather data. Purposive sampling, which selects breeders with mares who have given birth two or more times, was used to identify the breeders who participated in the survey. In this case, the sample consisted of 112 Gayo horses aged 3.5 to 6 years from 99 breeders.

The quantitative data used in this study included age at first mating, gestation period, age at postpartum mating, and calving interval, as well as breeders' knowledge of estrus indicators. The data obtained were further sorted and tabulated using quantitative analysis instruments and descriptive statistical methodology. Descriptive analysis of the reproductive performance of Gayo horses was conducted based on data collected from respondents.

Results

The reproductive characteristics observed were the age of first mating of Gayo horses, gestation period, postpartum mating age, and parturition interval. To achieve a high reproductive success rate, data on the reproductive performance of Gayo horses are required. The average age of first mating was 30-46 months, with a mean of 39.51 ± 8.49 months. The gestation period averaged 339.38 ± 7.88 days with a range of 333-347 days, the average birth interval was 425.78 ± 38.15 days with a range of 370-495 days, and the postpartum mating interval averaged 134.74 ± 23.70 days with a range of 123-150 days.

Discussion

Thoroughbred horses had an average first mating age of 32.53 ± 2.69 months, whereas Gayo horses had an average first mating age of 46.42 ± 5.04 months. A prior study (Imansyah, 2018) stated that it is pref-

erable to breed mares once they turn three years old. It is believed that inadequate upkeep and recording systems increase the variety of information on the age of first mating that has been gathered by earlier research (Heilder *et al.*, 2004). The age of first mating in Gayo horses ranges between 30 and 54 months (2.5 to 4.5 years), according to other research (Abdullah *et al.*, 2021). The formation of an embryonic vesicle in horses indicates pregnancy, which continues through fetal development (Amrozi and Tumbelaka, 2014). This study's findings contradict Dapawole (2014) assertion that the average gestational time of Thoroughbred horses and local horses in Payakumbuh City is 324.37 ± 14.185 days and 323.17 ± 8.55 days, respectively. In addition, Imansyah (2018) showed that the gestation period of Bima mares averaged 323.75 ± 7.97 days, with variations between 297 and 330 days. Mares who are pregnant may also have an expanded belly, a lustrous coat, a slow gait, unusually low activity levels, and restlessness. Pregnant horses should be fed no more or less as part of their treatment. Direct dosage is crucial for the child's growth and for improving the mother's body resistance. Natural grass and cereals such as maize and green beans are good horse staples. Vitamin must be given in accordance with the veterinarian's advice (Taveira and da Mota, 2007). One way to evaluate a mare's reproductive success is to determine the maximum birth spacing. Several factors, including postpartum heat, postpartum rebreeding, preconception care (S/C), and mating time, influence foal spacing (Salisbury and VanDemark, 1985).

The results of this study were relatively better than the Bantul working mare reported by Setyobudi *et al.* (2009) which has a foaling interval of 493.65 ± 43.01 days. Males with high-quality sperm are assumed to be the reason for the high foaling interval value. Normal horses have foaling intervals of roughly 15 months or 450 days (Setyobudi *et al.*, 2009). Mating after giving birth, postpartum estrus, the mating method, and a lack of technical knowledge about livestock breeding management can all have an impact on the delay in the foaling interval. The postpartum mating interval for gayo mares ranged from 123 to 150 days, with an average of 134.74 ± 23.70 days, according to studies on horses in Aceh province. Research on postpartum mating produced normal findings. According to Kings (2008), The mother's fertility is still very low during the first three to six weeks and will return to normal 40 to 60 days after giving birth. Up to 80% of horses can become pregnant if they are bred 40–60 days after giving birth. The findings differ from those of a prior study (Sari *et al.*, 2023) that found postpartum mortality in Gayo horses to be 136.63 ± 7.03 days. Another study (Setyobudi *et al.*, 2009) states that the sows' fertility is still extremely low during the first three to six weeks and will return to normal 40 to 60 days after giving birth.

Conclusion

Based on the research results, the reproductive performance of the

mare is within the normal range. Because the female Gayo horse is native to the area and has adapted well to its natural environment, this performance is possible. Therefore, this research can serve as a scientific basis for developing and conserving Gayo horses in the future.

Acknowledgments

Eka Meutia Sari was in charge of planning, execution, checking of result and writing. Asri Yoga, Hendra Koesmara was in charge to take a data in the field. Cut Intan Novita and Nabilah Putroe Agung assist in planning, execution, checking of result and writing. Mohd Agus Nashri Abdullah helps with checking results.

Conflict of interest

The authors have no conflict of interest to declare.

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