



Original Article

Goat Feed and Reproduction Management at Jariah Agrofarm, Sungai Kandis Shah Alam, Selangor, Malaysia

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Received: 10-12-2024 | Accepted: 14-12-2024 | Published: 14-12-2024



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Abstract

The expansion of goat farming in Malaysia has been driven by the increasing demand for goat-derived products such as meat and milk. Despite government efforts to reduce reliance on imports, local goat populations remain insufficient to meet domestic needs. This study, conducted at Jariah Agrofarm in Selangor, aimed to explore feed management and reproductive practices, with a focus on standardizing the estrus cycle in goats. The research was carried out from April 16 to May 8, 2019, involving detailed observations and data collection on feeding strategies and estrus synchronization. The findings underscored the importance of balanced nutrition, with the farm utilizing locally available forage and agro-industrial by-products, such as soybean waste, to supplement goat diets. Additionally, estrus synchronization protocols, including the use of medroxyprogesterone sponges and GnRH injections, were successfully implemented, with all goats exhibiting clear signs of estrus within one day of synchronization. This study provides valuable insights into effective goat farming practices, which are crucial for enhancing productivity in Malaysia's goat industry.

Keywords: Goat farming, Feed management, Estrus synchronization, Reproduction, Agro-products

INTRODUCTION

The expansion of the human population has resulted in an increased demand for food, particularly animal-derived products (Fukase and Martin 2020). Consequently, the number of goat farms has surged to meet the growing demand for products such as goat meat and milk (Derks *et al.* 2013). Over the past two decades, heightened market interest in goat milk has facilitated the establishment of commercial dairy goat farms across various Southeast Asian countries (Liang and Devendra 2014).

The goat population in Malaysia remains comparatively low relative to other developing nations such as India, China, Thailand, and Indonesia. By 2015, the population of goats in Malaysia had reached 439,667. Despite a 2.7% increase, this growth proved inadequate to meet local demand (Shahudin *et al.* 2018). To mitigate this gap, the government encouraged the importation of live goats, leading to the arrival of 102,445 goats in the country in 2007 (Shahudin *et al.* 2018). Moreover, to address these challenges, the government implemented a policy aimed at encouraging smallholder participation in goat farming, with the goal of reducing reliance on imports and bridging the gap in domestic production. A notable contributor to the supply of goat meat and milk is Jariah Agrofarm, operated by Jariah Enterprise, which was officially registered on June 18, 2007, under registration number SA0059396-W. The farm commenced operations on January 1, 2009, with an initial herd of 36 goats on a 1.3-hectare plot located in Kampung Sungai Kandis, Shah Alam, Selangor. Jariah Agrofarm houses several goat breeds, including Saanen, Boer, and Peranakan Etawa. This study focuses on feed management and reproductive practices, with a particular emphasis on standardizing the goat estrus cycle at Jariah Agrofarm. The findings aim to deepen the understanding of goat farming practices, ultimately contributing to enhanced productivity in the future.

MATERIAL AND METHODS

The study was conducted at Jariah Agrofarm in Sungai Kandis, Shah Alam, Selangor, Malaysia, from April 16, 2019, to May 8, 2019. Research activities were carried out according to a pre-established schedule, coordinated with the daily operations of the farm.

Prior to the commencement of practical activities, an orientation session was held to outline the tasks to be performed during the study. This session provided guidance and an overview of the planned activities, which included goat and sheep care, such as pen cleaning, feeding, providing drinking water, waste management, and other tasks related to livestock maintenance.

All activities were meticulously documented and cross-referenced with credible sources. Searches were conducted on platforms such as Google Scholar, PubMed, and ScienceDirect using keywords including "goat farming in Malaysia," "goat farming management," "goat feed management," and "goat reproductive management." The objective was to evaluate the relationship between feed management practices and the reproductive cycle in goats.

RESULTS AND DISCUSSION

Selangor, Malaysia, possesses considerable potential for the development of livestock farming, particularly in goats and sheep. The success of livestock enterprises is largely contingent upon meeting growth requirements, including sufficient feed for tissue development, weight gain, reproduction (pregnancy), and milk production. However, inadequate rearing practices have been associated with poor growth performance, inefficient feed utilization, low disease resistance, and reduced milk production in dairy goats (Shahudin *et al.* 2018).

Feed Management in Goats

Balanced nutrition is essential for maintaining animal health and optimizing productivity, forming the cornerstone of any successful

production system. Even a well-structured preventive health program cannot compensate for problems arising from inadequate nutrition (Dey *et al.* 2018). Furthermore, nutrition plays a pivotal role in overall production and profitability, representing one of the most manageable aspects of farm operations for farmers (Morand-Fehr 2005). Therefore, proper goat nutrition is crucial for achieving efficient and effective goat production (Abubakr *et al.* 2015).

In Malaysia, smallholders typically rely on locally available forage and commercial concentrate feed as the primary feeding strategy. Common forages include Guinea grass, Napier grass, and *Brachiaria* species, while leguminous plants such as *Leucaena* spp., *Gliricidia* spp., and *Mulberry* spp. are frequently fed to goats (Shahudin *et al.* 2018).

At Jariah Agrofarm, the feed provided is sourced from abundant materials available around the farm. The goats are primarily fed grass (*Cenchrus purpureus*) and leaves from leguminous plants (Leguminosae). For supplementary feed, the farm uses a mixture of concentrate feed and soy waste. Feeding occurs twice daily, in the morning and evening, with water provided *ad libitum*. The livestock feed is categorized into two types: dairy and fattening. Dairy goats are given 5 kg of concentrate feed daily, 5 kg of soy waste, and 100 kg of grass.

In recent years, various agro-industrial by-products, such as oil palm fronds, rice straw, and soybean waste, have been utilized as animal feed. Malaysia produces approximately 2 million tons of agro-industrial by-products annually (Shahudin *et al.* 2018). Soybean waste, in particular, is rich in protein content (Canaan *et al.* 2022). By incorporating soybean waste into goat feed, it not only helps in reducing waste but also contributes to lowering feed costs for goat farming.

On the other hand, fattening goats are typically fed a single type of feed, such as silage, throughout the fattening period, or occasionally ammoniated coffee skin waste. This approach helps prevent acidosis. Although the feed may be of high quality, sudden changes in diet can disrupt rumen microbial

activity, impairing proper digestion and hindering the fattening process.

Reproductive Management in Goats

The presence of goats of varying ages within a herd can complicate the management of younger animals, leading to reduced reproductive rates and inconsistent milk production during lactation (Habeeb and Kutzler 2021). To address this issue, the use of estrus induction and synchronization protocols provides several advantages (Petrusha *et al.* 2022). Firstly, it eliminates the need to wait for spontaneous estrus cycles. Secondly, synchronization allows for better control over the number of animals in heat on any given day, making artificial insemination more predictable. Following synchronization, sexual receptivity occurs in 90–100% of animals within 36–48 hours. Although fertility rates in synchronized goats may be slightly lower than those in naturally mated goats (by 10.0–13.3%), the multiple fertility rates in synchronized goats are higher by 14.5–25.0% (Petrusha *et al.* 2022).

Induction and synchronization protocols in goats typically involve the use of hormones such as melatonin, gonadotropins, gonadotropin-releasing hormone (GnRH) or its agonists, progestogens, and prostaglandins, either individually or in combination. These hormones are administered through various methods, including oral, injection, or intravaginal devices (Wondim *et al.* 2022). The key to hormonal stimulation for estrus induction lies in the artificial simulation of the luteal phase of the sexual cycle, which is achieved by administering progesterone or other progestagen-based drugs. The subsequent introduction of gonadotropic hormones stimulates follicle development in the ovaries, triggering the natural sexual cycle processes—estrus, sexual heat, and ovulation (Petrusha *et al.* 2022). Once hormonal treatment is effective, goats and ewes will exhibit estrus symptoms and can be mated immediately. For farms with large numbers of livestock, estrus

synchronization becomes a crucial management tool. At Jariah Agrofarm, we implement estrus synchronization using a method that involves inserting a sponge containing 0.5 mg of medroxyprogesterone, in combination with an intra-vulva (IV) injection of GnRH at a dose of 0.5 ml. Prior to initiating the program, we prepare by selecting the ideal breeding stock and setting up a mating pen with a ratio of 1 male to 5 females. The sponge is inserted into the female for 10 days, after which it is removed

on the 11th day, and GnRH is injected intra-vulva at a dose of 0.5 ml. On the 12th day, the male is placed in a teaser cage. On the 13th day, the male is introduced to the female's pen. After monitoring for 3 days, the male is removed from the female's pen on the 16th day. Before mating, it is recommended to inject the animals with Vitamins A, D, and E to support the reproductive tract. The results from the synchronization program are as follows (Table 1 and 2):

Table 1. Condition of Goats in Pen A.

Ear tag	Estrus	Estrus duration (days)	Time interval between synchronization and estrus (days)
A7	√	2	1
A4	√	2	1
A6	√	3	1
A5	√	3	1
A12	√	3	1

Table 2. Condition of Goats in Pen B.

Ear tag	Estrus	Estrus duration (days)	Time interval between synchronization and estrus (days)
A33	√	2	1
A17	√	2	1
A28	√	2	1
A18	√	3	1
A23	√	3	1
A20	√	3	1
A27	√	2	1
A26	√	2	1
A15	√	3	1
A25	√	2	1

Out of the fifteen goats involved in the study, the duration of estrus ranged from 2 to 3 days, with a 1-day interval between synchronization and the onset of estrus. All the goats displayed clear signs of estrus, including a reddened vulva, restlessness, and mucus discharge from the vulva. Based on these observations, it can be concluded that the estrus synchronization program in this experiment was successful.

CONCLUSION

The study conducted at Jariah Agrofarm has demonstrated that effective feed management

and reproductive practices are essential for improving goat farming productivity. The use of locally available forage and agro-industrial by-products, such as soybean waste, proved beneficial for the goats' nutrition and contributed to reducing feed costs. The estrus synchronization program, utilizing medroxyprogesterone sponges and GnRH injections, was successful, with all goats displaying clear signs of estrus within one day of synchronization. These findings enhance the understanding of goat farming practices in Malaysia and provide valuable insights for

improving productivity and reducing dependence on imports within the local goat farming industry. It is anticipated that the results of this study will serve as an important reference for refining feed and reproductive management practices in goat farming in Malaysia, particularly in efforts to meet the growing domestic demand.

ACKNOWLEDGEMENTS

This study supported by Faculty of Vocational Studies Airlangga University and Jariah Agro Farm

CONFLICTS OF INTEREST

There is not conflict of interest in this study

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