

Characteristics of Goat Farmers in the Implementation of Good Farming Practices (GFP) in Dryland Areas

Veronika Yunerati Beyleto*, Maria Selfiana Pasi, and Nila Puspita Sari

Department of Animal Science, Faculty of Agriculture, Universitas Timor, East Nusa Tenggara, Indonesia

*Corresponding author email: veronikabeyleto@gmail.com

Abstract. This study aimed to examine the characteristics of goat farmers in the implementation of Good Farming Practices (GFP) in dryland areas. The study was conducted in the Biboki Anleu, North Bikomi, and North Insana sub-districts of North Central Timor Regency, East Nusa Tenggara Province, from June to August 2024. Data were collected from 318 goat farmers with at least two years of farming experience. The study locations were selected through purposive sampling based on accessibility, the highest goat population, and proximity to the border area. The survey method involved direct field interviews and observations of goat husbandry practices. Data were analyzed using descriptive statistics and frequency distributions. The results showed that the average age of the farmers was 47.74 years, and their primary occupation was farming. The majority were male, had completed only elementary school, and had received minimal training or extension services; their average farming experience was 9.69 years. The average herd size was 9.90 goats. However, the adoption of GFP among the farmers was notably low. In conclusion, the study indicated that the characteristics of goat farmers in the study area reflected limited resources and knowledge, which contributed to the inadequate adoption of GFP.

Keywords: Kacang goat, Good Farming Practices, dryland area, farmer characteristics

Abstrak. Penelitian ini bertujuan untuk mengidentifikasi karakteristik peternak kambing dalam penerapan cara beternak kambing yang baik di daerah lahan kering. Penelitian dilakukan di Kecamatan Biboki Anleu, Bikomi Utara, dan Insana Utara, Kabupaten Timor Tengah Utara, Provinsi Nusa Tenggara Timur, pada bulan Juni sampai Agustus 2024. Responden sebagai sumber data sebanyak 318 peternak kambing dengan syarat lama beternak minimal 2 tahun. Penentuan lokasi dilakukan dengan purposive sampling dengan pertimbangan mudah ditempuh dengan sarana transportasi, memiliki populasi kambing tertinggi, dan terletak di wilayah perbatasan. Metode penelitian menggunakan survei dengan melakukan wawancara langsung di lapangan dan pengamatan terhadap manajemen pemeliharaan kambing. Analisis data menggunakan analisis deskriptif dan distribusi frekuensi. Hasil penelitian menunjukkan bahwa rata-rata umur peternak 47,74 tahun, pekerjaan pokok petani, lebih didominasi oleh jenis kelamin laki-laki, tingkat pendidikan SD, kurang mengikuti pelatihan dan penyuluhan, lama beternak 9,69 tahun dan jumlah kepemilikan ternak 9,90 ekor, sedangkan penerapan GFP masih sangat rendah. Kesimpulan dari penelitian ini adalah bahwa karakteristik peternak masih sangat rendah dan penerapan GFP belum baik.

Kata kunci: Kambing kacang, *Good Farming Practices*, lahan kering, karakteristik peternak

Introduction

Kacang goats are a local Indonesian breed valued for their strong genetic traits, which include high adaptability to extreme feed and climate conditions as well as disease tolerance (Beyleto et al., 2022). The development of Kacang goats is therefore critical, and it aligns with national priorities focused on developing local livestock genetic resources. These goats are particularly suited to smallholder farming systems in East Nusa Tenggara (NTT), especially in North Central Timor (TTU), where community

interest in raising small ruminants tends to favor goats over sheep.

The success of a goat farming business relies heavily on effective husbandry practices guided by the principles of Good Farming Practices (GFP). GFP encompasses key aspects such as proper facilities, efficient production systems, environmental sustainability, and systematic supervision (Kepmentan, 2001; Lavino et al., 2024). Critical factors influencing livestock productivity include feed quality, housing systems, disease control, breeding stock

selection, and the adoption of environmentally friendly husbandry practices (Lubis et al., 2024).

North Central Timor is characterized by a predominantly dryland farming system, extensive grazing areas, and a significant goat population of 57,341 goats (BPS Kabupaten TTU, 2022). Goat farming in this region can be advanced through the adoption of modern goat farming technologies. Any such effort, however, must be preceded by a thorough understanding of farmer characteristics, because farmers are the primary stakeholders directly involved in the livestock business. The strategy for improving goat productivity lies in the hands of farmers (Mtshali et al., 2021), who serve as the key decision-makers in managing their livestock businesses (Lianou and Fthenakis, 2021). Behingan et al. (2023) emphasized that genetic improvement programs are essential for improving goat productivity. Such programs likewise depend on an understanding of farmer characteristics, including age, gender, primary occupation, farming experience, herd size, formal education level, and access to non-formal education or training. This study therefore aimed to examine the characteristics of goat farmers implementing Good Farming Practices (GFP) in dryland areas.

Materials and Methods

This study was conducted in North Central Timor, specifically in the Biboki Anleu, Bikomi Utara, and Insana Utara sub-districts. The study locations were selected through purposive sampling based on three criteria: accessibility, the highest goat population, and proximity to

the border area. A total of 318 goat farmers participated in the study, all of whom had at least two years of experience in goat farming. The distribution of the farmers and the samples drawn from each sub-district is presented in Table 1.

The variables studied included farmer characteristics such as age, gender, primary occupation, farming experience, herd size, formal education level, and access to non-formal education or training. The GFP variable was assessed through four key aspects: proper facilities, efficient production systems, environmental sustainability, and systematic supervision. The study used a survey method involving direct field interviews with farmers based on structured questionnaires as well as observations of goat husbandry practices at the farmer level. Data were analyzed using descriptive statistics and frequency distributions, processed with SPSS software version 25.0.

Results and Discussion

Characteristics of farmers

The characteristics of farmers play an important role in ensuring the sustainability of livestock development efforts. Factors such as age, gender, primary occupation, farming experience, herd size, formal education level, and access to non-formal education or training significantly influence the growth and progress of livestock businesses (Sari dan Nanda, 2021; Syafira et al., 2023). The characteristics of goat farmers in North Central Timor are presented in Table 2.

Table 1. Number of goat farmers in each sub-district

Sub-district	Number of Farmers	Number of Samples
Biboki Anleu	475	142
North Insana	330	99
North Bikomi	254	77
Amount	1,059	318

Source: Survey results document for 2024

Table 2. Characteristics of goat farmers

Farmer Characteristics	Number of Farmers	Percentage (%)
Age (years)		
Productive (15-64 years)	286	89.9
Unproductive (>64 years)		
Average = 47.74 years	32	10.1
Gender		
Male	183	57.5
Female	135	42.5
Formal education		
No formal education	22	6.9
Elementary School	186	58.5
Junior High School	39	12.3
Senior High School	50	15.7
Diploma/ Bachelor's degree D3/S1	21	6.6
Non-formal education		
Never attended training	299	94.0
Animal Husbandry Training	19	6.0
Primary occupation		
Civil Servant/military/police	15	4.7
Farmer	167	52.5
Entrepreneur	29	9.1
Housemaid	94	29.6
Village official	13	4.1
Farming Experience (years)		
2-7		
8-12	175	55.0
13-17	58	18.2
17 years and above	32	10.1
	53	16.7
Herd Size (goats)		
2-7	205	64.5
8-12	58	18.2
13-17	17	5.3
18-22	9	2.8
>22	29	9.1

Source: Primary data (2024)

The age of farmers is a critical factor in goat farming because it determines the availability and capacity of the workforce. Age is often an indicator of a person's physical ability to perform labor-intensive tasks (Hasan et al., 2022). Goat farming in the study area is predominantly managed by family members without hired labor. The physical ability and energy of the farmer are therefore the only source of labor in managing the livestock business. The findings revealed that 89.9% of the farmers fell within the productive age range of 15–64 years, with an average age of 47.74 years. This productive age range, as defined by Halidu et al. (2021), is

characterized by physiological and physical capabilities that significantly improve productivity and foster self-development (Randu & Hartono, 2018). Notably, goat farming in the area is generally carried out by farmers over 40 years old, which aligns with the findings of Al-Barakeh et al. (2024).

Goat farming in the study area is typically integrated into the family structure, and the farmers themselves handle husbandry, supervision, and sales. The interviews showed that women, particularly housewives, play a supporting role in goat farming activities such as feeding and providing water. This role becomes

more prominent when the husband or head of the family is occupied with selling agricultural products in urban areas, attending customary events, or handling other responsibilities. Men primarily handle tasks such as sourcing feed, cleaning pens, and administering veterinary care.

The educational level of farmers significantly influences livestock husbandry practices, which in turn affect livestock productivity and production. In the study area, the majority of farmers (58.5%) were elementary school graduates. This low level of formal education limits their ability to manage goat farming operations effectively, as reflected in deficiencies in feed and reproduction management, pen systems (including pen sanitation), and the administration of vitamins and medications when livestock fall ill. Higher levels of education improve farmers' ability to manage their operations, adopt innovations, make informed decisions, adapt to new practices, and develop critical thinking skills (Pakpahan and Pane, 2019; Sow et al., 2021).

Non-formal education, such as training and extension services, provides farmers with opportunities to acquire practical skills outside the formal education system. In the study area, 94.0% of farmers had never participated in any form of non-formal education, such as goat farming training. Sari and Nanda (2021) emphasized that increasing the economic benefits of livestock farming can be achieved through outreach and extension programs that teach best practices in animal husbandry. The primary occupation of goat farmers in the study area was farming, with 52.5% identifying agriculture as their main source of income, while goat farming was primarily a supplementary activity. This finding aligns with the typical profile of traditional farmers in Indonesia, where agriculture serves as the primary occupation and livestock farming is integrated as a supplementary activity (Abd-Allah et al., 2019;

Indey et al., 2021). The interdependence between the agricultural and livestock subsectors demonstrates their mutual integration, as these two components of farming systems are inherently interconnected (Perwitasari et al., 2021).

Length of farming refers to the period a farmer has spent running a livestock business (Lutfi et al., 2020), and it shapes the farming experience that a farmer accumulates. Farming experience plays an important role in the adoption of new technologies and practices, and the level of experience and perseverance of a farmer in running a livestock business depends on it (Sari and Nanda, 2021).

In the study area, the average length of goat farming was 9.69 years, which falls in the high category. However, the low level of formal education, limited access to training and extension services, and insufficient supervision from relevant institutions meant that goat husbandry practices remained poor, which negatively influenced goat productivity. The study also revealed that the average herd size was 9.90 goats, which is categorized as low. Managing a larger herd requires greater farmer skill and commitment. While the length of farming experience was high, the low herd size reflected the status of goat farming as a supplementary activity for most farmers. Consequently, goat husbandry practices received less attention, further reducing productivity.

Implementation of Good Farming Practices (GFP)

The development of Kacang goats is critical for rural development and food security, particularly for meat production (Al-Barakeh et al., 2024). Good Farming Practices (GFP) establish minimum standards for a livestock business with respect to husbandry practices that improve livestock productivity.

Table 3. Implementation of GFP in the aspect of proper facilities

Indicator	Number of Farmers	Percentage (%)
Location		
Inattention to environmental and topographical considerations	318	100.00
Provision of water and lighting equipment		
Sourced from PAM (municipal water supply)	71	22.33
Sourced from wells	182	57.23
Sourced from irrigation channels	22	6.92
Sourced from rivers	43	13.52
Provides lighting equipment	2	0.63
Does not provide lighting equipment	316	99.37
Pen structure		
Roof made of zinc	14	4.40
Roof made of local materials	304	95.60
Pen constructed using wood or bamboo	318	100.00
Equipped with drainage/waste disposal channels	5	1.57
Pen has good air circulation	318	100.00
Livestock equipment and machinery		
Availability of feeding and drinking equipment	77	24.21
Sanitation equipment	5	1.57
Availability of other production support tools	0	0.00
Disease control and treatment	151	47.48

Source: Primary data (2024)

In the context of goat farming in dryland areas, GFP encompasses four main aspects: proper facilities, efficient production systems, environmental sustainability, and systematic supervision (Kepmentan, 2001). The implementation of GFP in the aspect of proper facilities is shown in Table 3.

Farmers in the study area generally do not consider environmental and topographical factors when establishing goat farming facilities. Sociocultural factors, vegetation, climate, and topography are nevertheless critical elements that significantly support goat farming development (Maesya & Rusdiana, 2018). The primary water source for goat farming in the area is wells, accounting for 57.23% of usage. Despite being located in a dryland region, farmers make consistent efforts to meet the water needs of their livestock. In agricultural and

livestock activities, water serves as a vital macronutrient essential for reproduction, growth rates, and milk production (Jain et al., 2023). The materials used for constructing goat pens are primarily sourced locally, resulting in basic and improvised structures. Most pens lack drainage systems for waste disposal but have adequate air circulation. Lighting in pens is typically absent, and many pens are not equipped with designated feeding or drinking areas. Instead, feeding is done freely, and water is provided in buckets that are also used by the farmers for household activities. Pen sanitation and disease control are not prioritized by farmers. Traditional medicines derived from local plants are commonly used for treating livestock illnesses, which reflects limited access to modern veterinary care.

Table 4. Implementation of GFP in the aspect of efficient production systems

Indicator	Number of Farmers	Percentage (%)
Breeding stock selection		
Lacks general knowledge of livestock selection	318	100.00
Has general knowledge of livestock selection	0	0.00
Reproduction		
Animals are mated upon reaching sexual maturity	0	0.00
Identifies signs of estrus in goats	53	16.67
Understands that goat estrus lasts 25–40 hours	5	1.57
Is aware of the estrus cycle occurring every 17–21 days	4	1.26
Is aware that goats give birth every 8 months	53	16.67
Feeding		
Feeding is done twice daily	33	10.38
Uses green fodder	80	25.16
Incorporates silage into feeding practices	0	0.00
Differentiates feed for nursing and pregnant does	0	0.00
Differentiates feed for weaned and post-weaning goats	0	0.00
Provides supplementary feed	142	44.65
Animal health		
Livestock experience health issues	223	70.13
Implements disease prevention measures	25	7.86

Source: Primary data (2024)

The selection of quality breeding stock is essential for improving the productivity and development of goat farming. However, farmers in the study area exhibited limited knowledge regarding livestock selection. When acquiring new livestock to expand their herds, their decisions were primarily based on the sex of the animals. The implementation of GFP in the production aspect, including reproduction, feeding systems, and livestock health management, is shown in Table 4.

The ability of farmers to manage goat reproduction was significantly limited by a lack of knowledge about the reproductive phases and activities of their livestock. This is evident from the low proportion of farmers who understood key aspects such as the estrus cycle, signs of estrus, duration of estrus, optimal timing for mating, and kidding intervals. Goat feeding management in the study area was also suboptimal in terms of both quality and quantity.

Additional feed was primarily available to farmers in lowland or coastal areas, such as the Insana Utara and Biboki Anleu sub-districts, where sago trees (a source of supplementary feed) were abundant. Most farmers provided feed only once a day, typically in the morning or evening, and feeding practices did not account for the reproductive status of the livestock. Health management practices were also poorly implemented, which contributed to high livestock mortality rates. The overall low implementation of GFP in the production aspect is attributed to the farmers' low level of formal education and the lack of training in goat farming. Furthermore, the greatest challenges faced by farmers in improving their livestock operations include financial constraints and limited resources (Zaw Win et al., 2019).

The implementation of GFP in the aspect of environmental sustainability is presented in Table 5.

Table 5. Implementation of GFP in the aspect of environmental sustainability

Indicator	Number of Farmers	Percentage (%)
Waste disposal facility		
Does not have a waste disposal facility	265	83.33
Has a waste disposal facility (waste container)	53	16.67
Waste processing		
Does not carry out waste processing	316	99.37
Carries out waste processing	2	0.63

Source: Primary data (2024)

Table 6. Implementation of GFP in the aspect of systematic supervision

Indicator	Number of Farmers	Percentage (%)
Supervision system from relevant agencies/services		
Monitoring and evaluation	0	0.00
Recording	0	0.00
Reporting	0	0.00

Source: Primary data (2024)

Table 5 summarizes the implementation of GFP in the environmental sustainability aspect of goat farming in North Central Timor. Among the respondents, 53 farmers reported having a designated waste disposal facility; however, only two actively processed livestock waste. The majority of farmers left livestock waste piled around the pens to dry before spreading it on rice fields or gardens. This lack of proper waste management poses a risk of environmental pollution. Livestock waste, particularly from goat farming, can release compounds such as NH_3 and other gases that contribute to environmental degradation if not managed effectively (Mangalisu et al., 2022). The implementation of GFP in the aspect of systematic supervision for goat farming in North Central Timor is detailed in Table 6.

Based on interviews with goat farmers in the study area, no monitoring or evaluation was conducted by relevant agencies. Farmers also did not maintain production or reproduction records, nor did they prepare monthly or annual reports. The goat farming activities in the study area were not part of any livestock assistance program initiated by the government or private sector. Consequently, the implementation of

GFP in terms of supervision was found to be extremely poor.

Conclusions

The characteristics of goat farmers in the dryland areas of North Central Timor indicate that the farmers are predominantly of productive age, male, and elementary school graduates, and that they have received minimal training or extension services. Their primary occupation is farming, with an average farming experience of 9.69 years and an average herd size of 9.90 goats. The implementation of Good Farming Practices (GFP) in goat farming, covering the aspects of facilities, production, environmental conservation, and supervision, remains suboptimal.

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