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Economic evaluation of Osmanabadi goats under different rearing systems in the plain region of Chhattisgarh

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Abstract

The present study was conducted to evaluate the economics of Osmanabadi goats reared under extensive (T_1), semi-intensive (T_2) and intensive (T_3) management systems in the plain region of Chhattisgarh. A total of 45 adult Osmanabadi goats were randomly allocated to three treatment groups comprising 15 animals each and maintained for 120 days at the Osmanabadi Goat Seed Centre, Directorate of Research Services (DRS), Anjora, Durg, Chhattisgarh. Economic parameters including feed cost, labour cost, total expenditure, gross income and net cost were assessed. The intensive system recorded the highest total expenditure (₹ 46,489) as well as the highest gross income (₹ 19,330.80) owing to greater kid production and total kid weight. However, the semi-intensive system recorded the lowest net cost (₹ 25,638), indicating superior economic efficiency compared to the intensive (₹ 27,158.20) and extensive (₹ 34,192.00) systems. The findings revealed that while intensive management improved productive performance and gross returns, semi-intensive rearing provided a more favourable balance between production costs and economic returns. Therefore, semi-intensive rearing may be considered a practical, sustainable and economically viable management strategy for Osmanabadi goat production under the agro-climatic conditions of the plain region of Chhattisgarh.

Keywords: Osmanabadi goat, economics, rearing system, semi-intensive management, profitability, gross income, net cost, Chhattisgarh

Introduction

Goat farming plays an important role in the livelihood security and economic upliftment of rural households in India. Owing to their high productivity, low capital requirement and minimal financial risk, goats are often referred to as the “poor man’s cow”. Their adaptability to diverse agro-climatic conditions enables them to contribute significantly to the income and employment of small and marginal farmers, particularly those living below the poverty line (Maske and Phule, 2011) [6]. In India, goat production is predominantly meat-oriented and chevon is widely preferred by consumers among all categories of meat. Furthermore, goats possess the ability to utilize tannin-rich browse species efficiently, making them well suited to resource-poor production systems (Basha *et al.*, 2012) [1].

Small ruminants contribute substantially to the food, nutritional and economic security of rural communities by providing meat, milk, fibre, skin and manure. They are well adapted to harsh climatic conditions and can efficiently utilize marginal lands where cultivation of crops is often difficult (Sahoo, 2016) [9]. Despite their recognized importance, the productivity of goats under traditional production systems remains relatively low due to dependence on degraded grazing lands and poor-quality feed resources (Singh and Kumar, 2007) [7].

India currently faces substantial shortages of green fodder, dry crop residues and concentrate feeds, which pose major constraints to livestock production. Feed deficits of green fodder, dry fodder and concentrate feeds have been widely reported in India (IGFRI, 2013) [5]. Moreover, the livestock population has increased considerably in recent years (DAHDF, 2019), further aggravating pressure on available feed resources. India supports nearly 10.71% of the world’s livestock population despite having only 2.4% of the world’s land area (Mitra *et al.*, 2025) [7]. Therefore, adoption of semi-intensive and intensive rearing systems has become necessary to improve productivity and profitability.

The Osmanabadi goat is one of the recognized indigenous goat breeds of India and is primarily reared for meat production. The breed is known for its adaptability, hardiness, early maturity, high twinning ability and suitability to arid and semi-arid environments (ICAR-NBAGR, 2020) [4]. Studies have indicated that the performance of Osmanabadi goats is greatly influenced by the management system adopted, and semi-intensive rearing often results in superior productivity compared to extensive and intensive systems (Devi *et al.*, 2020) [3].

Recently, Osmanabadi goats have been introduced into Chhattisgarh through various development programmes. The state possesses abundant natural grazing resources and has witnessed a substantial increase in goat population. Goat farming is generally considered more economical than cattle and sheep rearing under natural grazing conditions, and semi-intensive management has been reported to provide better economic returns (Sharma and Jindal, 2008) [10]. However, information regarding the comparative economics of extensive, semi-intensive and intensive rearing systems for Osmanabadi goats under the agro-climatic conditions of Chhattisgarh remains limited.

Therefore, the present study was undertaken to evaluate and compare the economics of Osmanabadi goats reared under extensive, semi-intensive and intensive management systems in the plain region of Chhattisgarh. The study aimed to assess the expenditure incurred, returns obtained and overall profitability associated with different rearing systems in order to identify a sustainable and economically viable management strategy for goat production.

Materials and Methods

Experimental location

The present study was conducted at the Osmanabadi Goat Seed Centre, Directorate of Research Services (DRS-FARM), Anjora, Durg, Chhattisgarh, under Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya. The experimental trial was carried out for 120 days from 15 August 2025 to 15 December 2025.

Experimental design

A total of 45 adult Osmanabadi goats (10 females and 5 males per treatment group) with an average body weight of 23 kg were selected for the study. The animals were equally

distributed into three treatment groups representing extensive (T₁), semi-intensive (T₂) and intensive (T₃) rearing systems, with 15 animals in each group. The age of the goats ranged from 9 months to 2.5 years.

The animals were maintained under standard management practices throughout the experimental period. Prior to the commencement of the experiment, all goats were dewormed and vaccinated against Peste des Petits Ruminants (PPR) and enterotoxaemia. Clean drinking water was provided *ad libitum*.

Under the extensive system (T₁), goats were allowed to graze on natural pasture for 8 h daily without concentrate supplementation. In the semi-intensive system (T₂), goats were allowed 4 h grazing daily and supplemented with 100 g concentrate feed per animal per day. Under the intensive system (T₃), goats were maintained under stall-feeding conditions without grazing and were provided 150 g concentrate feed per animal per day. In addition, Stylo (*Stylosanthes hamata*) and gram straw were offered *ad libitum* to the intensive group throughout the experimental period.

Economic analysis was carried out to evaluate the profitability of different rearing systems. The expenditure incurred under each system was calculated based on concentrate feed, green fodder, dry fodder and labour costs. The cost of concentrate feed, green fodder and dry fodder was calculated at the prevailing market rates of ₹ 41.50/kg, ₹ 4.00/kg and ₹ 11.50/kg, respectively. Labour charges were calculated at the rate of ₹ 46 per hour. Total expenditure was obtained by summing all input costs. Gross income was estimated based on a prevailing live body weight market price of ₹ 356/kg. Net cost was calculated as the difference between total expenditure and gross income [Net cost (₹) = Total expenditure (₹) – Gross income (₹)].

Results

Economics of Osmanabadi goats under different rearing systems

The economics of Osmanabadi goats reared under extensive (T₁), semi-intensive (T₂) and intensive (T₃) systems over a 120-day experimental period are presented in Table 1. The comparison includes feed cost, labour cost, total expenditure, gross income and net cost under different rearing systems.

Table 1: Economics of Osmanabadi goats under different rearing systems during a 120-day experimental period.

Particulars	T ₁ (Extensive)	T ₂ (Semi intensive)	T ₃ (Intensive)
Total concentrate (kg/120 d)	-	180	270
Concentrate cost (₹)	-	7470	11205
Total green fodder (kg/120 d)	-	-	3255
Green fodder cost (₹)	-	-	13020
Total dry fodder (kg/120 d)	-	-	496
Dry fodder cost (₹)	-	-	5704
Labour requirement (h/day)	8	6	3
Labour cost (₹/120 d)	44160	33120	16560
Total expenditure (₹)	44160	40590	46489
Number of kids born	4	6	7
Total weight of kids born (kg)	28.0	42.0	54.3
Gross income (₹)	9968	14952	19330.8
Net cost (₹)	34192	25638	27158.2

Discussion

The expenditure incurred under the extensive, semi-intensive and intensive systems was ₹ 44,160, ₹ 40,590 and ₹ 46,489, respectively. The intensive system incurred the

highest feed cost due to complete dependence on concentrate feed, green fodder and dry fodder, whereas the extensive system relied entirely on natural grazing. The number of kids born and total kid weight were highest under

the intensive system, resulting in greater gross income (₹ 19,330.80) compared to the semi-intensive (₹ 14,952.00) and extensive (₹ 9,968.00) systems. However, net cost varied among the rearing systems due to differences in feed and labour expenditure. The semi-intensive system recorded the lowest net cost (₹ 25,638), followed by the intensive (₹ 27,158.20) and extensive (₹ 34,192.00) systems, indicating better economic efficiency under semi-intensive management. The results indicated that improved feeding and management practices enhanced productive performance and economic returns. Similar observations regarding the influence of rearing systems on the economics of goat production were reported by Shivakumara and Kiran (2019) ^[11]. However, Devi *et al.* (2020) ^[3] and Patil *et al.* (2014) ^[8] reported greater profitability under intensive or stall-feeding systems. The variation among studies may be attributed to differences in feed cost, labour charges, herd size and management practices under different production environments.

Conclusion

The present study demonstrated that the rearing system had a marked influence on the economics of Osmanabadi goat production. The intensive system resulted in the highest kid production, total kid weight and gross income due to improved feeding and management practices. However, the higher expenditure incurred on concentrate feed, green fodder and dry fodder increased the overall cost of production. The semi-intensive system required lower expenditure than the intensive system while maintaining satisfactory productive performance, indicating its suitability as an economically viable management strategy. Therefore, semi-intensive rearing may be considered as practical and sustainable management strategy for Osmanabadi goat farming in the plain region of Chhattisgarh.

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