



# General Management Practices and Socio-Economic Characteristics of Thanjavur Black Goat Farmers of Tamil Nadu

Nithiaselvi R. <sup>a++\*</sup>, Murali N. <sup>b#</sup>,  
Selvamesh A. S. <sup>c++</sup>, Clement Ebenezer Henry A. <sup>c++</sup>,  
Vijay Anand J. <sup>d++</sup> and Saravanan K. P. <sup>d++</sup>

<sup>a</sup> Livestock Farm Complex, Veterinary College and Research Institute, Orathanadu-614 625, Tamil Nadu, India.

<sup>b</sup> Department of Animal Genetics and Breeding, Veterinary College and Research Institute, Namakkal-637 002, India.

<sup>c</sup> Department of Livestock Production Management, Veterinary College and Research Institute, Tirunelveli - 627 358, India.

<sup>d</sup> Veterinary College and Research Institute, Orathanadu-614 625, India.

## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

## Article Information

DOI: 10.9734/AJAEES/2023/v41i41874

## Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/97645>

Original Research Article

Received: 09/01/2023

Accepted: 14/03/2023

Published: 16/03/2023

## ABSTRACT

**Aim:** The present study was carried with the objective to know the management practices and socio-economic characteristics of Thanjavur Black goat farmers.

<sup>++</sup> Assistant Professor;

<sup>#</sup> Professor and Head;

<sup>\*</sup>Corresponding author: E-mail: [nithisa121210@gmail.com](mailto:nithisa121210@gmail.com);

**Place and Duration of Study:** Thanjavur, Thiruvarur, Nagapattinam, Tiruchirappalli and Pudukkottai districts of Tamil Nadu from April to September 2022.

**Methodology:** Data was collected from 250 goat flocks in five districts of Tamil Nadu using stratified random sampling through a pretested interview schedule and analyzed by percentage, frequency and the Chi-square test.

**Results and Conclusion:** The study revealed that Thanjavur Black goats were compact and docile in nature, so 54.40 percent of small farmers (with up to 2.5 acres) preferred to rear this goat. The Thanjavur Black goat is a native goat and mainly reared for meat purposes; 72.80 percent of the goat flocks were small (1–15 goats). Further, 51.20 percent of farmers were male, the majority of whom were in their middle age (59.60%) and had less than 5 years of experience in goat farming (47.20%). Besides, about 40.40 percent of the farmers completed their primary education and farmers, who accounted for 69.60 percent of them, were the most backward community. The study found that the majority of the farmers engaged in small-scale goat rearing as an additional source of income. The study further shows that 85 percent of the goat shelters were half open without a side wall, 50.80 percent of the farmers followed grazing only with additional rice gruel, 86.80 percent of mating happened on grazing land with other herd mates. Foot and mouth disease, enterotoxaemia and *peste des petits ruminants* disease were major in Thanjavur Black goats. So far, no significant efforts have been attempted to register this indigenous germplasm. The current study was conducted to record the management practices and socio-economic profile of the farmers.

*Keywords: Management practices; Tamil Nadu; socio-economic; Thanjavur Black Goats.*

## 1. INTRODUCTION

Backyard goat farming is an integral part of the lives of landless, small, and marginal agricultural farmers. It helps generate income, create employment opportunities, and uplift the economic status of rural people in India. India has 148.88 million goats, with Tamil Nadu having a population of 9.9 million goats, which is higher than the previous [1] census, and most of goats were non-descript or a mixture of breeds. The goat population has increased by 10.14 percent over the previous census. The goat population has increased by 10.35 percent in rural areas and 5.78 percent in urban areas [2]. In India, the vast majority of goat breeds evolved naturally as a result of adaptation to agroecological conditions, with other breeds benefiting to a lesser extent from human selection for various purposes. Goat breeds were mainly defined by their geographical position, morphological characteristics, and production performance [3]. In India, 37 goat breeds were recognized by the National Bureau of Animal Genetic Resources [4], Karnal. In Tamil Nadu, three goat breeds are recognized, namely Kanni Adu, Kodi Adu, and Salem Black goats distributed in the state's southern and northern regions. However, undocumented livestock germplasm is present in the field. Among those is the Thanjavur Black Goat, an undocumented native germplasm. So far, no significant efforts have been attempted to register this indigenous germplasm. A previous study described the Thanjavur Black goat as a

smaller-sized black goat from Thanjavur district that is preferred for breeding by Kodi Adu goat farmers in Thanjavur and Pudukkottai districts [5]. Thanjavur Black Goat, a native medium-sized black goat widely distributed in the eastern region of Tamil Nadu, is mainly reared by farmers in their backyards with free-range grazing for meat purposes. The current studies aim to study the management practices followed and the socio-economic status of Thanjavur Black goat farmers in Tamil Nadu.

## 2. MATERIALS AND METHODS

### 2.1 Study Area and Data Collection

The present study was carried out in Thanjavur, Thiruvarur, Nagapattinam, Tiruchirappalli, and Pudukkottai districts of Tamil Nadu from April to September 2022. The breeding tract of the Thanjavur Black goat was situated in the Cauvery Delta region, which is located in the eastern part of Tamil Nadu. The study area has 60 percent cultivated land, and the main crop is paddy. The study region falls within the medium and high rainfall zones, and the climate is tropical. Alluvial soil in the Cauvery Delta and sandy soil in coastal areas are the predominant soil types. Data were collected from these five districts using stratified random sampling. Two hundred fifty households' data were collected on management practices and farmers socio-economic profiles using a pretested interview schedule as per the [6] guidelines. The interview

schedule was carefully prepared to cover all aspects of Thanjavur Black goat farming to collect the most first-hand information (primary data) from the farmers. Besides data pertaining to management practices, information on housing, feeding, breeding, and diseases was collected. The collected data were tabulated and statistically analyzed using frequency, percentage, and the Chi-square test.

### 3. RESULTS AND DISCUSSION

The study result gives information on management practices (Table 1) in first section and provides details about socio-economic characteristics (Table 2) in second section.

#### 3.1 Management Practices Followed by Thanjavur Black Goat Farmers

##### 3.1.1 Shelter management

All three housing systems were observed in the breeding tract of the Thanjavur Black goat. Large flocks (>30 goats) were housed away from the living area (17.20%), mostly on the goat farmer's farmland or in the backyard of the house. Small (1–15 goats) and medium-sized (16–30 goats) flocks were mostly housed adjacent to the owner's house or part of the house (82.30%). The goats spend most of their time on grazing land during the day; nearly 96.40 percent of farmers provide night shelter to the goats, and only 3.60 percent provide both day and night shelter (Table 1). According to [7], the majority of the Jakhrana goats were kept in open enclosures during the day and in closed housing at night. The percentages of closed, open, and half-open shelters provided to the goat were 5 %, 10 % and 15 % respectively.

Most of the Thanjavur Black Goat Shelter was built with no side walls, and 88.40 percent of them were *kutch*a houses, supported by four to six wooden poles and covered with plastic sheets to maintain the structure of the house. Only 11.60 percent of the houses were *pucca* structures (Table 1). After kidding, 59.20 percent of farmers provided kids with separate housing spaces to protect them from rain and sun. Most of the farmers offered a unique enclosure for kids called a "*kodappu*" or "*koodu*," built of bamboo stalks or Palmyra leaves, or a separate enclosure created by dividing the shed with small wooden sticks in one side of the corner of the shed. This result agrees with the [8] study in Kanni Adu, where kids were kept in a special

enclosure called "*koodu*." Cow dung was used to disinfect the floor and also to prevent cracking.

##### 3.1.2 Feeding practices

Thanjavur Black goats were taken for grazing from 9:00 a.m. to 6:00 p.m. on the common grazing lands, harvested paddy fields, fallow lands, and roadsides, which usually cover 2 to 3 kilometers per day. The grazing period and time vary depending on the season and flocks. In this breeding tract, community grazing was practiced by combining three to four flocks and moving them to a common grazing land. They are taken to a common water source around midday. Similarly, Berari goats are also reared through community grazing and go for pasture grazing in the morning and return in the evening [9].

About 50.80 percent of the Thanjavur Black goat farmers were grazing only and 49.20 percent were grazing with concentrated feed like soaked oil cake water and rice gruel (Table 1). Few farmers were feeding extra concentrate to bucks and pregnant does. This result agrees with [10] feeding extra concentrate to the buck (60%) in Sirohi districts. The main grazing sources were grasses, herbs, weeds, and tree fodder. In Salem Black goats [11] 33 percent of farmers fed concentrate and allowed them to graze 3–4 kilometers for 6-7 hours per day. On the grazing land, approximately 85 percent of the farmers were lopping the tree leaves during the day with sickle hooks. After grazing, the goats were tied inside the shed, and then they were fed with dry fodder or tree leaves of Neem (*Azadirachta indica*) and Selanthalai (*Delonix elata*).

##### 3.1.3 Breeding practices

Most of the small flocks were without breeding bucks; however, 86.80 percent of mating happens on grazing land with other herd mates and farmers unaware of conception details. This suggests that breeding management could be improved to increase the availability of breeding bucks in small flocks and that there may be a need for better communication between farmers to track breeding and conception details. Thanjavur Black Goat farmers did not exchange the male for breeding. Instead, 56.80 percent of farmers retained the best male for breeding, 37.20 percent never changed their breeding buck and kept it for more than 5 years, 4.40 percent were interested in replacing the male and purchased a new buck every 2 years, and 1.60 percent purchased a buck each year from a local market (Table 1). Kidding occurs throughout the

year; there is no seasonality; however, peaks were noted between January and March and October and December. This present finding agrees with [12] report in Kanni Adu that kidding peaks in January and March, October and December. This indicates that Thanjavur Black goat farmers do not practice flock rotation and tend to keep the same breeding bucks for several years. The lack of flock rotation and repeated use of breeding bucks could lead to inbreeding and decreased genetic diversity within the Thanjavur Black goat population. Farmers need to implement proper breeding management practices to ensure the long-term sustainability of the breed.

### 3.1.4 Disease prevalence and management

Based on the present survey, foot and mouth disease (FMD), enterotoxaemia, and *peste des petits ruminants (PPR)* diseases were majorly affecting the Thanjavur Black goats. These results were similar to Malabari and Berari goats' management practices [13,9]. Vaccination of the animals against the diseases was practiced by 39.60 percent of the farmers, and 60.40 percent farmers were not practicing vaccination. The percentage of farmers who routinely dewormed the goats was 70.40 percent and 29.60 percent of farmers were not doing deworming (Table 1). The most common endoparasitic infections in Thanjavur Black goats were *Amphistomes* and *Strongyle*. Ectoparasitic infestation was common

in Thanjavur Black goats infested with *Haemophilus* ticks, and 96 percent of farmers washed their animals with ectoparasiticides. Chillness induced mortality in kids during rainy season is the common problem faced by farmers. By implementing scientific management techniques and routine flock replacement stock, which tend to boost business profitability, the mortality of young ones can be decreased [14].

### 3.2 Socio-Economic Profile of the Thanjavur Black Goat Farmers

The socio-economic profile of the 250 Thanjavur Black goat farmers is depicted in Table 2. Most of goat farmers (51.20%) were male, with nearly equal numbers of female farmers (48.80%) observed, indicating that women were also actively involved in goat farming. These observations were in agreement with [15]. Further, most goat owners (59.20%) were between the ages of 30 and 50, with those over 50 years accounting for 28.40 percent and those under 30 years accounting for 12.40 percent. This finding was similar to that of [16], who stated that the majority of goat owners were in middle age (72.50%) followed by old age. The findings were consistent with those of [15], who discovered that 65.55 percent of goat farmers in the Marwar region were in middle age.

**Table 1. Management practices followed by the Thanjavur Black goat farmers**

Sl. No.	Parameters	Number	Percentage (%)
<b>Housed</b>			
1.	Night only	241	96.40
2.	Day and night	9	3.60
<b>Type of shelter</b>			
1.	Kutchra	221	88.40
2.	Pucca	29	11.60
<b>Feeding practices</b>			
1.	Grazing only	127	50.80
2.	Grazing + concentrate feed	123	49.20
<b>Frequency of buck changed for breeding</b>			
1.	1 year once	4	1.60
2.	2 years once	11	4.40
3.	Replaced within the flock	142	56.80
4.	Never changed	93	37.20
<b>Deworming the animal</b>			
1.	Provided	176	70.40
2.	Not- provided	74	29.60
<b>Vaccination of animal</b>			
1.	Provided	99	39.60
2.	Not- provided	151	60.40

**Table 2. Socio-economic profile of the Thanjavur Black goat farmers (n=250)**

Sl. No.	Parameters	Number of farmers			Overall (250)	Chi-square
		Small (n=182)	Medium (n=59)	Large (n=9)		
<b>Gender</b>						
1	Male	94 (51.60)	29 (49.20)	5 (55.60)	128 (51.20)	0.18 <sup>NS</sup>
2	Female	88 (48.40)	30 (50.80)	4 (44.40)	122 (48.80)	
<b>Age</b>						
1	Below 30 years	26 (14.30)	5 (8.50)	0	31 (12.40)	7.28 <sup>NS</sup>
2	30-50 year	112 (61.5)	31 (52.50)	5 (55.60)	148 (59.20)	
3	Above 50 years	44 (24.20)	23 (39.00)	4 (44.40)	71 (28.40)	
<b>Educational status</b>						
1.	Illiterate	67 (36.80)	19 (32.20)	3 (33.30)	89 (35.60)	11.68 <sup>NS</sup>
2.	Primary (up to V standard)	68 (37.40)	29 (49.20)	4 (44.40)	101 (40.40)	
3.	Secondary (VI to X)	8 (4.40)	6 (10.20)	1 (11.10)	15 (6.00)	
4.	Higher secondary (XI-XII)	26 (14.30)	1 (1.70)	1 (11.10)	28 (11.20)	
5	College / Professionals	13 (7.10)	4 (6.80)	0	17 (6.80)	
<b>Occupation</b>						
1.	Goat Farming only	61 (33.50)	24 (40.70)	3 (33.30)	88 (35.20)	12.28 <sup>**</sup>
2.	Agriculture + Goat farming	66 (36.30)	25 (42.40)	1 (11.10)	92 (36.80)	
3.	Integrated Farming system	15 (8.20)	1 (1.70)	0	16 (6.40)	
4.	Secondary	40 (22.00)	9 (15.30)	5 (55.60)	54 (21.60)	
<b>Family Type</b>						
1.	Nuclear Family	164 (90.10)	46 (78.00)	8 (88.90)	218 (87.20)	5.91 <sup>**</sup>
2.	Joint Family	18 (9.90)	13 (22.00)	1 (11.10)	32 (12.80)	
<b>Income</b>						
1.	<10,000 .00	178 (97.80)	33 (55.93)	1 (11.11)	212 (84.80)	99.93 <sup>**</sup>
2.	>10,000.00	4 (2.19)	26 (44.06)	8 (88.88)	38 (15.20)	
<b>Social status</b>						
1.	OC	2 (1.10)	0	1 (11.10)	3 (1.20)	16.17 <sup>**</sup>
2.	BC	28 (15.40)	4 (6.80)	0	32 (12.80)	
3.	MBC	128 (70.30)	40 (67.80)	6 (66.70)	174 (69.60)	
4.	SCST	24 (13.20)	15 (25.40)	2 (22.20)	41 (16.40)	

Sl. No.	Parameters	Number of farmers			Overall (250)	Chi-square
		Small (n=182)	Medium (n=59)	Large (n=9)		
<b>Land holding</b>						
1.	Landless	67 (36.80)	20 (33.90)	2 (22.20)	89 (35.60)	4.70 <sup>NS</sup>
2.	Small Farmers (up to 2.5 acres)	100 (54.90)	30 (50.80)	6 (66.70)	136 (54.40)	
3.	Marginal Farmers (up to 5 acres)	7 (3.80)	4 (6.80)	0	11 (4.40)	
4.	Large Farmers (>5 acres)	7 (3.80)	5 (8.50)	1 (11.10)	13 (5.20)	
<b>Goat Farming Experience</b>						
1.	< 5years	96 (52.70)	20 (33.90)	2 (22.20)	118 (47.20)	20.09 <sup>**</sup>
2.	5-10 years	41 (22.50)	11 (18.6)	2 (22.20)	54 (21.60)	
3.	10-15 years	19 (10.40)	5 (8.50)	2 (22.20)	26 (10.40)	
4.	> 15 years	26 (14.30)	23 (39.00)	3 (33.30)	52 (20.80)	

Figures in parentheses indicate respective proportions in percentage

NS - Non significant \*\* - Significant (P < 0.01)

According to the findings (Table 2), 40.40 percent of Thanjavur black goat farmers had primary education, 35.60 percent were illiterate, and the remaining 24 percent had secondary education or higher. In the southern region [12] stated that 39.40 percent farmers were illiterate, while 38.38 percent completed primary school; this finding is consistent with the current study. Concerning to occupation, one-third of the farmers (36.80%) had agriculture along with goat rearing, followed by goat rearing as the primary occupation (35.20%), goat rearing for extra income as an additional occupation (21.60%) and integrated farming systems (6.40%). The present result was closer to [17] study on goat farmers in the Gujarat region, with 38.67 percent engaged in agriculture with animal husbandry and 57.99 percent animal husbandry sector solely. In the southern region [12] observed that 80 percent of farmers were involved in goat farming as a major enterprise, and 15 percent followed agriculture along with goat farming.

Most of goat farmers (87.20%) were from nuclear families, with joint families coming in second (12.80%). This finding is similar to that of [16], who discovered that 55 percent of farmers lived in nuclear families and 45 percent in joint families. According to [12], 78.33 percent of goat farmers in Tamil Nadu's southern region prefer to live in nuclear families, while 21.67 percent prefer to live in joint families. The small flock owners (97.80%) have an annual income below Rs. 10,000, followed by the medium owners (55.93%) and large flock owners (11.11%). Large flock (88.88%) owners had an annual income above Rs. 10,000, followed by medium (44.06%) and small flock (2.19%). Hence, providing regular technical input to the farmers would positively impact the flock size and income of the small farmers.

Further analysis of Table 2 revealed that farming experience was distributed as follows: 47.20 percent farmers had less than 5 years of experience in goat farming, 21.60 percent had 5–10 years of experience, 10.40 percent had 10–15 years of experience, and 20.80 percent had more than 15 years of experience. This finding is consistent with the [16] study, which found that 50 percent of goat farmers in Jabalpur had less than 5 years of experience, with 30 percent and 20 percent having 10–15 years and more than 10 years of experience, respectively.

Over half of the (54.40%) of respondents were small farmers (up to 2.5 acres), followed by

35.60 percent of landless people, 5.20 percent of large farmers, and 4.40 percent of marginal farmers. These results differed from other earlier studies by [18,19] stating that 51.90 percent and 53.04 percent of farmers were landless, respectively. The percentage of a farmer's class belonging from highest to lowest was most backward (69.60%), scheduled caste (16.40%), backward (12.80%) and other communities (1.20%). The result shows that no specific community is rearing this goat. The results were in accordance with [19]. It differs from [9] findings that 90 percent of the Berari goat keepers were from backward communities.

#### 4. CONCLUSION

This study provides a comprehensive insight into the Thanjavur Black goat management practices followed and the socio-economic profile of farmers. It found that Thanjavur Black goats were housed in the owner's house, grazed with concentrated feed, mated on grazing land, and dewormed and vaccinated. Small farmers and landless people make up the majority of the farming population in this area; with a significant proportion belonging to the most backward farmer's class. The data collected from this pilot study will help in the development of breeding programmes and improve the overall productivity of the breed.

#### ACKNOWLEDGEMENT

The authors wish to express their sincere thanks to the honorable Vice-chancellor of Tamil Nadu Veterinary and Animal Sciences University for allowing them to carry out this part-time Ph.D. research work. They also extend their appreciation to the advisory committee for their valuable insights and suggestions.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

#### REFERENCES

1. Arjun Lal Kakraliya, Ramesh Pandey, Jhabar Mal Tatarwal, Goutam Chopra, Serawat Rohan. Production and management practices of goat farming in Sirohi District, India. Asian Journal of Agricultural Extension Economics & Sociology. 2022;40(2):76-81.

2. Deshpande SB, Sabapara GP, Malik PK, Sadana DK, Singh PK, Gurmej Singh, Joshi BK. Morphometric characteristics of Surti goats and socio-economic status of Surti goat keepers. *Indian Journal of Animal Sciences*. 2010;80(6):575-577.
3. ICAR-NBAGR. Guidelines for Management of Animal Genetic Resources of India. ICAR-NBAGR, Karnal, Haryana; 2016.
4. ICAR-NBAGR. Guidelines for management of animal genetic resources of India. ICAR-NBAGR, Karnal, Haryana; 2022.
5. Jain A, Sahana G, Kandasamy N, Nivsarkar AE. Kodi Adu- a new goat breed of Tamil Nadu. *Indian J Anim Sci*. 2000;70:649-651.
6. Kumar SV, Ramesh Saravana Kumar V, Muralidharan J, Murali N, Vasanthakumar P. Socio-economic status of goat farmers in southern agro-climatic region of Tamil Nadu. *Indian Journal of Veterinary Sciences & Biotechnology*. 2014;9(4):89-91.
7. Manadal A, Karunakaran M, Rout PK, Roy R. Conservation of threatened goat breeds in India. *Animal Genetic Resources/ Resources Génétiques Animales/ Recursos Genéticos Animales*. 2014;55: 47-55.
8. Mohan B, Khushyal Singh, Dixit AK. Socio-economic status of goat farmers in semi-arid zone of Uttar Pradesh. *Indian Research Journal of Extension Education*. 2012;12(2):128-131.
9. Pulla Sireesha, Nithiaselvi R, Mathialagan P, Thilakar P. Training Needs of Goat Entrepreneurs in Tamil Nadu. *Int J Curr Microbiol App Sci*. 2020;9(1):1736-1741.
10. Report. 19th Livestock Census - 2012, All India Report. Ministry of Agriculture, Dept. of Animal Husbandry, Dairying and Fisheries, New Delhi; 2014.
11. Report. 20th Livestock Census - 2019, All India Report. Ministry of Agriculture, Dept. of Animal Husbandry, Dairying and Fisheries, New Delhi; 2019.
12. Singh SK, Singh R, Mandal MK, Pandey G. Socio-economic profile and existing flock structure of goat farmers in villages of Jabalpur District. *Journal of Pharmacognosy and Phytochemistry*. 2018;7(1):1080-1083.
13. Singh VP, Singh RP, Avanish Singh, Singh RK, Upadhyay SP, Srivastava AK. Socio-economic status of farmers in Gorakhpur district of Uttar Pradesh. *Indian Journal of Animal Sciences*. 2021;91(4): 318-320.
14. Siyak S. Gurjar M, Sharma MC, Rohitash Kumar, Dushyant Dev Bhal. Socio-economic characteristic of goat keepers in Marwar region of Rajasthan state, India. *Int J Curr Microbiol App Sci*. 2020;9(6):2795-2803.
15. Thiruvankadan AK. Kodi adu goat – A monograph. Tamil Nadu Veterinary and Animal Sciences University and International Foundation for Science, Sweden; 2012.
16. Thiruvankadan AK, Karunanithi K. Characterisation of Salem Black goats in their home tract. *Animal Genetic Resources/ Resources génétiques animales/ Recursos genéticos animales*. 2006;38:67-75.
17. Verma NK, Dixit SP, Dinesh Kumar, Aggarwal RAK, Sharma R, Ahlawat SPS. Jakhrana – A high potential milch gat breeds of semi-arid region. Monograph, 12. National Bureau of Animal Genetics Resources. Karnal; 2005.
18. Verma NK, Dixit SP, Dangi PS, Aggarwal RAK, Kumar S, Joshi BK. Malabari goats: Characterization, management, performance and genetic variability. *Indian J Anim Sci*. 2009;79(8):813-818.
19. Verma NK, Kuralkar SV, Aggarwal RAK, Dixit SP, Priyanka Mishra, Kuralkar P, Dangi PS, Joshi BK. Berari – An important goat germplasm of Vidarbha. Monograph, 76. National Bureau of Animal Genetics Resources. Karnal; 2012.

© 2023 Nithiaselvi et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:

<https://www.sdiarticle5.com/review-history/97645>