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Hitchhiking the primordial western Ghats cattle ecotype: Rearing practices and socio-economic status of cattle rearing farmers in Theni district, Tamil Nadu, India

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Abstract

The present study was conducted in a native tract of Theni Malaimadu cattle in the Theni district. Information collected from 96 rearers about history and origin, geographical distribution, housing system, feeding and watering system, breeding system, reproduction characteristics, milking practice, identification method, tracking system, selection of calves for breeding and sporting, disease occurrence, revenue generation, and socio-economic status of Theni Malaimadu cattle rearers were analysed using appropriate statistical techniques. Cent per cent of Theni Malaimadu cattle rearers belonged to the Hindu religion and 81.25 per cent of rearers rearing Theni Malaimadu cattle from their ancestry. A maximum number of rearers (63.54 per cent) using locally available wood materials for housing of Theni Malaimadu cattle. The majority (94.79 per cent) of rearers rearing Theni Malaimadu cattle under an extensive system of management in its breeding tract, mainly by a zero or low input system of management. Milking is done primarily for household needs (53.12 per cent). This study showed that the major source of income of Theni Malaimadu cattle rearers is the sale of manure (53.13 per cent), followed by the sale of male calves (32.29 per cent) and penning (14.58 per cent). Mostly Theni Malaimadu male calves were sold for sporting purpose. The data depicted that 83.33 per cent of rearers followed hot iron branding and ear clipping as identification methods in Theni Malaimadu cattle. This extensive survey provides a thorough understanding of the Theni Malaimadu cattle breed and the practices of the farmers, contributing valuable insights for conservation and sustainable development efforts.

Keywords: Theni Malaimadu, rearing practices, socio-economic status, housing, feeding, reproduction, revenue generation

Introduction

Theni district in Tamil Nadu is celebrated for its rich cultural diversity and deep agricultural roots, with the indigenous Theni Malaimadu (Theni Western Ghats cattle) playing a vital role in local farming practices. Synonyms of Malaimadu cattle are Theni Malaimadu, Theni Western Ghats cattle, Thozhu madu, and Theni Jallikattu madu (Jagatheesan *et al.*, 2024)^[6]. These cattle are prized for their robustness and ability to thrive in challenging terrains and climates, essential traits that support the agricultural livelihoods of communities like the *Kambalathu nayakkar*, *Raja kambalathar*, *Okkaliga goundar*, *Piramalai kallars*, *Vellalars*, and some other minority communities. Known for their strength and adaptability, Theni Malaimadu cattle are well-suited for ploughing, draught work, Rekla race (Bullock cart racing), Jallikattu (Bull taming) and hill climbing in the Western Ghats region. Their dung, highly valued as a potent bio-fertilizer rich in nitrogen, phosphorus, potassium, calcium, and magnesium, enhances soil structure, water retention, and microbial activity. This natural fertilization process not only boosts soil health

sustainably but also mitigates environmental impacts associated with synthetic fertilizers by releasing nutrients gradually.

Efforts led by the Veterinary College and Research Institute in Theni focus on conserving this breed through ex situ methods, ensuring the preservation of biodiversity and valuable genetic traits. The institute is also actively documenting the breed's characteristics for registration with the aim of officially recognizing the breed at NBAGR, Karnal. Despite challenges that have led to a decline in their population, Malaimadu cattle remain a cornerstone of Theni district's agricultural heritage. Their significance underscores a deep cultural connection with the *Kambalathu nayakkar*, *Raja kambalathar*, *Okkaliga goundar*, and other communities, emphasizing the importance of preserving indigenous cattle breeds and sustainable agricultural practices to safeguard Tamil Nadu's unique cultural heritage and ensure future agricultural resilience.

Materials and Methods

For the Theni Malaimadu cattle survey and documentation,

a detailed and methodological approach was undertaken to gather accurate and representative data. Faculty members from the Veterinary College and Research Institute (VC&RI) in Theni, from the Animal Genetics and Breeding Department, led the survey. The team directly visited 12 out of 42 selected villages Theni district, conducting personal interviews with approximately 96 farmers using a well-structured questionnaire method. Around 3707 numbers of Theni Malaimadu cattle were observed, with comprehensive data collected from owners on various aspects including History and origin, Geographical distribution, Topography, Housing system, Feeding and watering system, Breeding system, Reproduction characteristics, Milking practice, Identification method, Tracking system, Restraining

method, Selection of calves for breeding and sporting, Training methods for Rekla race and Jallikattu, Disease occurrence, Revenue generation and Socio-economic status of farmers. This extensive survey provides a thorough understanding of the Theni Malaimadu cattle breed and the practices of the farmers, contributing valuable insights for conservation and sustainable development efforts. All the collected information were computerized and analysed by using suitable statistical techniques.

Results and Discussion

Geographical distribution of Theni Malaimadu cattle in Theni district in Tamil Nadu

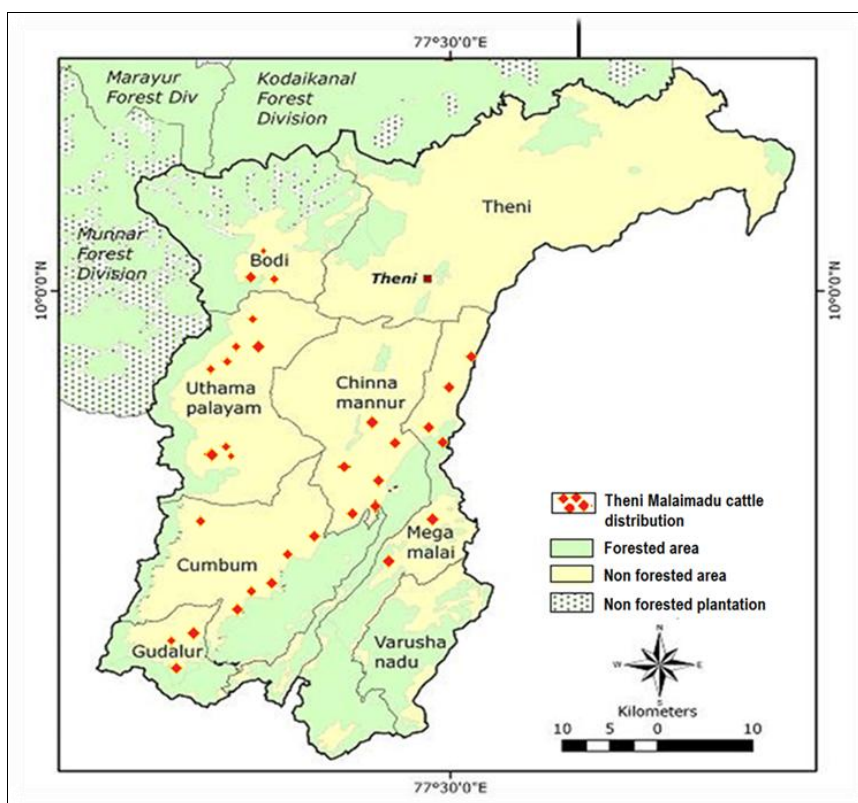


Fig 1: Geographical distribution of Theni Malaimadu cattle in Theni district

Socio-economic status of Theni Malaimadu cattle rearers

Socio-economic status of Theni Malaimadu cattle rearers depicted in Table 1. Majority (Cent per cent) of Theni Malaimadu cattle rearers belonged to Hindu religion. Among them, majority (79.17 per cent) belonged to backward community (Kambalathu Nayakkar, Rajakambalathar, Okaliga Goundar), remaining 20.83 per cent belonged to most backward community (Kallar, Maravar). Other minority communities also engaged as daily wagers, caring for the Theni Malaimadu cattle and guiding them into the Western Ghats for grazing. These findings have similarity with Thesinguraja *et al.*, 2017^[2], they reported that none of the minority community rear Pulikulam cattle. Most of them (87.50 per cent) males were engaged in rearing, in that 58.33 per cent of them belongs to 35 to 45 years of age. Majority of Malaimadu cattle owners were landless (73.96 per cent), while 18.75 per cent are small landholders and 5.21 per cent are large-scale farmers.

This was in agreement with Thesinguraja *et al.*, 2017^[2] who reported that majority of Pulikulam rearers were landless. About 81.25 per cent of these farmers rear Theni Malaimadu cattle due to ancestral traditions spanning 3 to 6 generations, with only 3.13 per cent being new to this practice. Educational levels among owners showed that 63.54 per cent have completed primary level of education, 20.83 per cent are illiterate, 10.42 per cent have completed higher secondary level of education, and 5.21 are graduates. It was found that majority of the rearers belonged to nuclear family. Similar findings documented by Kavithaa *et al.*, 2021^[4]. More than half of the rearers have experience in rearing of Theni Malaimadu cattle more than 10 to 20 years in that most of them reared from their ancestry. Among the 96 Theni Malaimadu cattle rearers, half of them (52.08 per cent) have annual income of 85,000 to 1,65,000 rupees. Each rearers have a herd average of 50 numbers of Theni Malaimadu cattle with a sex ratio of 1:40.

Table 1: Socio-economic status of Theni Malaimadu cattle rearers

Sl. No.	Variables	Categories	Frequency	Percentage
1	Age of the Theni Malaimadu cattle rearers	Less than 35 years	16	16.67
		35 - 45 years	56	58.33
		More than 45 years	24	25.00
2	Sex of the Theni Malaimadu cattle rearers	Male	84	87.50
		Female	12	12.50
3	Education status	Illiterate	20	20.83
		Primary level of education	61	63.54
		Secondary level of education	10	10.42
		Graduates	5	5.21
4	Community	Backward class	76	79.17
		Most backward class	20	20.83
		Scheduled caste	0	00.00
		Scheduled tribe	0	00.00
5	Religion	Hindu	96	100.00
		Christian	0	00.00
		Muslim	0	00.00
6	Annual income	Less than Rs.85,000/-	31	32.29
		Rs.85,000 – Rs.1,65,000/-	50	52.08
		More than Rs.1,65,000/-	15	15.63
7	Category of farmers based on land holdings	Landless	71	73.96
		Small landholders	18	18.75
		Medium- scale landholders	5	05.21
		Large-scale landholders	2	02.08
8	Number of Theni Malaimadu cattle reared / rearer	<50	50	52.08
		50-100	37	38.54
		>100	9	09.38
9	No. of individuals engaged in rearing of Theni Malaimadu cattle	One	12	12.50
		Two	71	73.96
		Three	12	12.50
		More than three	1	01.04
10	Reasons for rearing of Theni Malaimadu cattle	Ancestry	78	81.25
		From childhood	15	15.63
		Beginners	3	03.13
11	Experience in rearing of Theni Malaimadu cattle	Less than 10 years	21	21.88
		10 - 20 years	69	71.88
		More than 20 years	06	06.25
12	Family type	Joint family	38	39.98
		Nuclear family	58	60.42

Housing practices followed by Theni Malaimadu cattle rearers

Different aspects of housing practices followed by Theni Malaimadu cattle rearers under study are shown in Table 2. In Theni district, Malaimadu cattle rearers keep their animals on the outskirts of villages. Around 70 per cent of rearers rearing under foothills of mountains in the western ghats cattle. Majority (63.54 per cent) of rearers using locally available wood materials for housing. They do not tie the animals; instead, they are kept freely in open enclosures surrounded by walls made of bamboo sticks, black bamboo sticks, iron or diamond wire fencing and

other locally available tree wood materials. This loose open type housing practice is very economical, less investment and easy to maintain. Animals of all age groups are kept together in these enclosures during the night, and during the day, they are taken for grazing in the foothills of Western Ghats. In some villages, the practice of constructing separate enclosure for lactating cows is followed. During grazing (day) time, calves (up to 6 months of age) are kept in shelters which is made up of thatched roofs (71.88 per cent), asbestos sheets (17.71 per cent) and iron sheets (2.08 per cent). Here, they receive adequate feed and water.

Table 2: Management practices of Theni Malaimadu cattle rearers

Sl. No.	Variables	Categories	Frequency	Percentage
1.	Method of rearing of Theni Malaimadu cattle	Extensive	91	94.79
		Semi-intensive	5	05.21
		Intensive	0	00.00
2.	Location of Herd	Foothills of mountain	67	69.79
		Near cultivable land	17	17.71
		Away from cultivable land	12	12.50
3.	Pasture system	Mountain region	15	15.63
		Foothills of mountain region	68	70.83
		Near land	13	13.54
4.	Type of Enclosure	Locally available wood materials	61	63.54
		Wire mesh	19	19.79
		Bushes	16	16.67
5.	Type of housing for calf	Kutchra	67	69.79
		Pucca	11	11.46
		Tree shade	18	18.75
6.	Type of roofing materials used for calf shed	Open field	8	08.33
		Iron sheet	2	02.08
		Asbestos	17	17.71
		Thatched	69	71.88
		Tiled	0	00.00
7.	Tethering in shed	Free range	81	84.38
		Cement pole	2	02.08
		Ground peg	7	07.29
		Wooden log	6	06.25
8.	Integrated with other livestock species	Only Malaimadu cattle	61	63.54
		Goat	09	09.38
		Sheep	11	11.46
		Poultry	15	15.63
9.	Whether sporting ox allowed for grazing?	Yes	25	26.04
		No	71	73.96
10.	Special feeding for sporting ox	Yes	90	93.75
		No	6	06.25
11.	Frequency of watering	2 times per day	5	05.21
		3 times per day	91	94.79
12.	Outbreak of infectious diseases	Yes	65	67.71
		No	31	32.29
13.	Deworming	Yes	82	85.42
		No	14	14.58
14.	Vaccination	Yes	26	27.08
		No	70	72.92
15.	Identification method	Hot iron branding only	4	04.15
		Ear clipping only	3	03.13
		Both Hot iron branding and ear clipping	80	83.33
		Ear tagging only	09	09.38
16.	Tracking system	Copper bell	10	10.42
		Vocal sound	11	11.46
		Both	75	78.13

Feeding and watering practices followed by Theni Malaimadu cattle rearers

Majority (94.79 per cent) of rearers rearing Theni Malaimadu cattle under extensive system of management in its breeding tract, mainly by zero or low input system of management. Theni Malaimadu cattle are reared only on pasture basis. Maximum number of rearers (70.83 per cent) allowing cattle to graze on foothills of mountains. This might be due to restriction of grazing inside the mountains. Theni Malaimadu cattle grazing in the Western Ghats region which is rich in medicinal plants, where they get balanced nutrition, disease resistance capability and immunity. For calves which are kept in shelter, they are providing straws, green fodder, and low-cost concentrates such as paddy husk

and black gram husk (ulundu pottu) etc. The water from the Western Ghats Mountain is a source for Theni Malaimadu cattle and also it is stored in Mullai Periyar Dam, Sothuparai Dam and Vaigai Dam and used for irrigation in the villages around Theni district and as a source of water for Theni Malaimadu Cattle.

Reproduction characteristics of Theni Malaimadu cattle and breeding practices followed by Theni Malaimadu cattle rearers

Different aspects of breeding practices and reproduction characteristics of Theni Malaimadu cattle have been summarized in Table 3. Breeding method opted by the Theni Malaimadu cattle rearers is natural mating. In Theni

Malaimadu cattle herd, male and female were always kept together during day and night time and also during grazing. Bulls can detect the cows with heat by sniffs, nose licks and flehmen reflex. Unrestricted natural mating was practiced in the Theni Malaimadu Cattle herd. Due to non-selective unrestricted natural mating, the genetic diversity of Theni Malaimadu cattle has been preserved over many generations. On an average, Bulls attain sexual maturity at the age of 2.5 to 3 years. Bulls allowed to mate first time at the age of 3 to 3.5 years. This was in agreement with the findings of Singh *et al.*, 2012 ^[3] who reported that in Pulikulam herd. Natural mating system followed for Theni Malaimadu cattle by cent percent of rearers. Average reproductive life time of Theni Malaimadu cattle bull is 10 to 12 years. Average lifespan of Theni Malaimadu bull is 20 to 25 years. Male calves were castrated at the age of one to

one and half years for the purpose Rekla race (68.50 per cent) and draught (31.25 percent). Due to mechanization, usage of ox for farming operation is reduced (Figure 5). Similar findings were documented by Kannadhasan *et al.*, 2018 ^[5] in Umblachery breed of cattle.

Theni Malaimadu cow attain sexual maturity at the age of 3 to 3.5 years on an average. Average age at first calving of Theni Malaimadu cow is 4 to 4.5 years. Interval between two calvings of Theni Malaimadu cow is one to one and half years. The service period of Theni Malaimadu cow is about 3 to 9 months. Average reproductive life time of Theni Malaimadu cow is up to 8 to 10 calvings. Average lifespan of Theni Malaimadu cow is 15 to 20 years which is in agreement with Singh *et al.*, 2012 ^[3] who reported in Pulikulam herd.

Table 3: Reproduction characteristics of Theni Malaimadu cattle

Sl. No.	Variables	Categories	Frequency	Percentage
1.	Age at sexual maturity in cow	2.5 - 3 years	5	05.21
		3 - 3.5 years	65	67.71
		3.5 - 4 years	26	27.08
2.	Age at first calving	3.5 - 4 years	07	07.29
		4 - 4.5 years	72	75.00
		4.5 - 5 years	17	17.71
3.	Daily milk yield	Less than one litre per day	84	87.50
		1-2 litre per day	11	11.46
		More than 2 litres per day	1	01.04
4.	Inter-calving period	1 - 1.5 years	10	10.42
		1.5 - 2 years	79	82.29
		2.0 - 2.5 years	05	05.21
		2.5 - 3.0 years	02	02.08
5.	Practice of weaning	Yes	16	16.67
		No	80	83.33
6.	Age at sexual maturity in bull	2.5 - 3 years	72	75.00
		3 - 3.5 years	20	20.83
		3.5 - 4 years	04	04.17
7.	Age at first mating	2.5 - 3 years	09	09.38
		3 - 3.5 years	66	68.75
		3.5 - 4 years	21	21.88
8.	Reproductive life time of bull	6- 8 years	10	10.42
		8-10 years	25	26.04
		10-12 years	61	63.54
9.	Reproductive life time of cow	4 to 6 calvings	09	09.38
		6 to 8 calvings	21	21.88
		8 to 10 calvings	66	68.75
10.	Average life span of bull	15-20 years	10	10.42
		20-25 years	71	73.96
		25-30 years	15	15.63
11.	Average life span of cow	15-20 years	74	77.08
		20-25 years	10	10.42
		25-30 years	12	12.50
12.	Purpose of castration	Draught	30	31.25
		Rekla race (Bullock cart race)	66	68.50
13.	Mating system	Natural service	96	100.00
		Artificial insemination	0	00.00

Milking practices followed by Theni Malaimadu cattle rearers

Milking practices followed by Theni Malaimadu cattle rearers are shown in Table 4. Milking practices among Theni Malaimadu cattle rearers reflect their unique characteristics and traditional methods. Due to their low milk production, daily milking is not commonly practiced

by 67.71 per cent of rearers, and instead, most rearers allow the entire milk to be consumed by the calf to promote its growth. Consequently, weaning calves is not a standard practice among these cattle rearers (83.33 per cent). Naturally endowed with strong mothering abilities, Theni Malaimadu cows often nurse their calves for over a year. Milking done primarily for household needs (53.12 per cent)

(Figure 2). They do not sell the milk to the outsiders but they offer milk at free of cost to the close relatives for foster milk to new-born child, girl who attaining puberty and person who suffering ill conditions. The milking process involves hand milking, as these cattle are sensitive and only allow their owner, who cares for them, to touch their udders or teats. Mostly men involved in milking process. On an average, Theni Malaimadu cattle yield between 0.5 to 1.5 litre of milk per day per animal (87.50 per cent). This modest yield underscores their role primarily in cultural practices and occasional household dairy needs rather than commercial milk production.

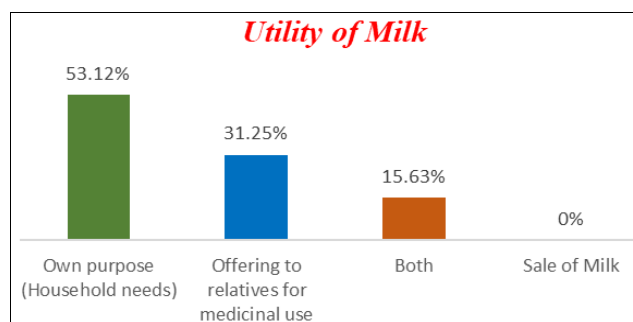


Fig 2: Utility of Theni Malaimadu cattle milk

Table 4: Milking practices followed by Theni Malaimadu cattle rearers.

Sl. No.	Variables	Categories	Frequency	Percentage
1.	Milking practice	Yes	31	32.29
		No	65	67.71
2.	Milking method (Hand milking)	Full hand milking	70	72.92
		Knuckling	11	11.46
		Stripping	15	15.63
3.	Frequency of milking	Once per day	41	42.71
		Twice per day	55	57.29
4.	Gender of milking person	Male	61	63.54
		Female	10	10.42
		Both	25	26.04
5.	Practice of let-down of milk	Allow calf to suck	91	94.79
		Feeding concentrates and udder massage	5	05.21
6.	Washing of hand before milking	Yes	91	94.79
		No	5	05.21
7.	Utility of milk	Own purpose (Household needs)	51	53.12
		Offering to relatives for medicinal use	30	31.25
		Both	15	15.63
		Sale of milk	0	00.00

Revenue generation by Theni Malaimadu cattle rearers:

Revenue generation from Theni Malaimadu cattle are represented in Table 5. It could be inferred that, major source of income of Theni Malaimadu cattle rearer is sale of manure (53.13 per cent), followed by sale of male calves (32.29 per cent) and penning (14.58 per cent) (Figure 3). The cost of manure is Rs. 5000 to 6000/ load of tractor or one basket of manure holding 25 to 35 kg weight costs around Rs. 50/-. Similar findings have been reported by Satheeshkumar *et al.*, 2024 [7]. The cost of male calves differs according to their age. Mostly calves around 6 to 10 months, 10 months to 1 year and 1 to 2-year-old sold at Rs. 8000 to 10000, 10000 to 15000 and 15000 to 20000 respectively. Major purpose of sale of male calves is mainly for Jallikattu and Rekla race (Figure 4). Farmers from Dindigul, Madurai, Virudhunagar, Pudukottai, Tiruchirappalli were preferring to purchase male calves for Jallikattu purpose. Farmers from Theni, Pazhani, Tirupur, Udumalaipet, Erode, Coimbatore were preferring to purchase male calves for the purpose of Rekla race. Penning also practiced by Theni Malaimadu cattle farmers for income generation. Theni Malaimadu cattle were housed in agricultural fields overnight. The cost of penning is based on total number of animals housed in the field per night. It costs around Rs. 5/animal/night.

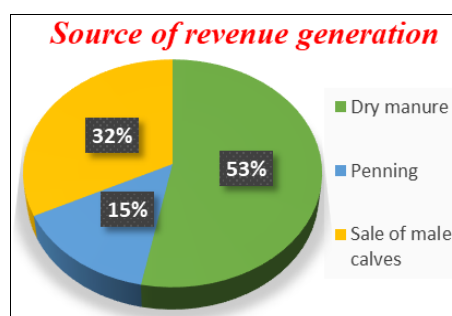


Fig 3: Source of revenue generation

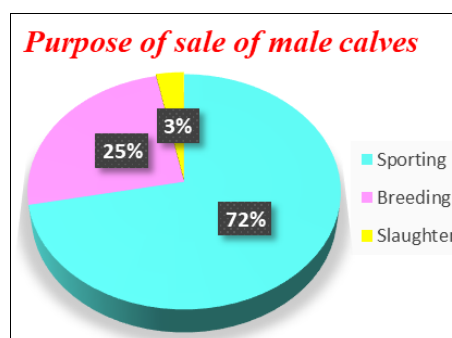


Fig 4: Purpose of sale of male calves

Table 5: Revenue generation from Theni Malaimadu cattle

Sl. No.	Variables	Categories	Frequency	Percentage
1.	Source of revenue generation	Sale of dry manure	51	53.13
		Penning	14	14.58
		Sale of male calves	31	32.29
2.	Price of dry manure	5000 / per load of tractor	20	20.83
		6000 / per load of tractor	74	77.08
		7000 / per load of tractor	2	02.08
3.	Sale of calves	Male calves	81	84.38
		Female calves	15	15.63
4.	Purpose of sale of male calves	Sporting	69	71.88
		Breeding	24	25.00
		Slaughter	03	03.13

Selection and training of Theni Malaimadu bull for Jallikattu (Bull taming)

Information about Theni Malaimadu sporting bulls is given in Table 6. Theni Malaimadu calves selected for Jallikattu based on age, alertness, vigour and exuberance, whirls, colour, strength of legs and history. These observations were agreed with the report of Priyadharsini *et al.*, 2019 ^[1] who stated that selection criterion for sporting bulls is based on vigour, alertness, body conformation and whirls. Selected animals were trained for walking, swimming, jumping, sideward horn swinging, and entering into the mock vadivasal. For Jallikattu games, spotted type calves (Sempor, Karumpor, Puliyampor, Thavuttupor, Athikapor) were mostly chosen. Special feeding like cotton seeds, oil cakes, groundnut chocolate cake, rice bran, egg and chicken soup were offered to sporting bulls. Utility of sporting bull after sporting life is they will keep up to natural death.

Selection and training of Theni Malaimadu ox for Rekla race (Bullock cart race)

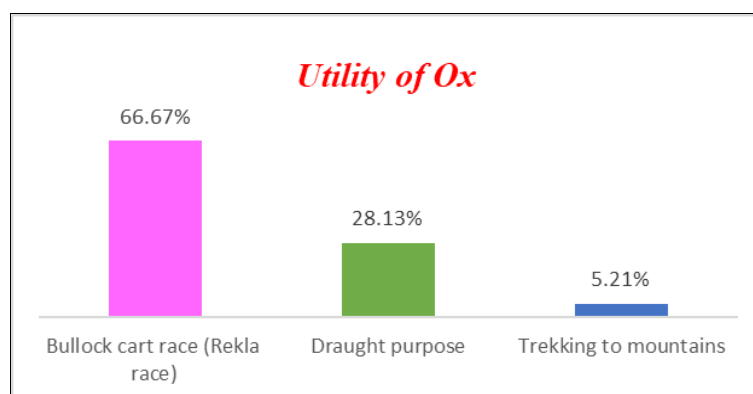
Information about Theni Malaimadu sporting ox is given in Table 6. Theni Malaimadu calves selected for Rekla race based on age, alertness, whirls, colour, strength of legs, growth and history. For Rekla races, plain-colored types (Greyish white, White, grey, dark grey, black, fawn, and brown) are preferred. Mostly male calves selected for Rekla race (Bullock cart) were castrated one to one and half year of age. Calves are selected for rekla race starts to give training at a very young age. Calves are started to train

gradually from 1 year onwards after castration. During the training period, based on their age and height from calf to ox, they are classified ox into different categories and given different names: Ilamchettu (6 months to 1 year), Poonchettu (1 to 2 years), Muyalchettu (1st pair – 2 to 2 and half years), Thattanchettu (2nd pair – 3 to 3 and half years), Karichan (3rd pair – 4 to 4 and half years), Nadumadu (4th pair – 5 to 5 and half years) and Periyamadu (Full mouth). Based upon the category of ox, they are allowed to participate into different distance races. For example, Periyamadu, Nadumadu, Karichan and Thattanchettu category allowed to participate to cover 15-, 12-, 10- and 7-kilometre Rekla races respectively. Selected animals were trained for long walking, running, swimming and racing for a small distance. Trial is given ox during training, allow to race for a small distance called “out savari”. The person who running behind bullock cart to speed up ox is called “pinnoti”. Special feeding like cotton seeds, oil cakes, groundnut chocolate cake, dates, rice bran, egg and chicken soup were offered to training animals. One week before racing, ginger, onion, palm jaggery mixed paste given to ox for better digestion and strength. Ox pair those who won the Rekla race were sold from 1,00,000 to Rs.5,00,000 lakhs. Highest winning Rekla race ox pair sold upto Rs. 17,00,000 lakhs. As there is dearth of literature about profile of Rekla race rearers in India and particularly in Tamil Nadu, the information obtained in the current study could not be compared.

Table 6: Information about Theni Malaimadu sporting bulls and ox

Sl. No.	Variables	Categories	Frequency	Percentage
	Source of purchase	Traditional rearing	69	71.87
		From other rearers	10	10.42
		Herd	09	09.38
		Livestock market	8	08.33
	Preferred age to purchase the bull calf	6 months to 1 year	20	20.83
		1 to 2 years	58	60.42
		2 to 3 years	11	11.46
		3 to 4 years	5	05.21
		> 4 years	2	02.08
	Optimum age for selection of Theni Malaimadu calf for Jallikattu	6 months to 1 year	50	52.08
		1 year to 2 years	37	38.54
		>2 years	9	09.38
	Optimum age for selection of Theni Malaimadu calf for Rekla race	6 months to 1 year	49	51.04
		1 year to 2 years	39	40.63
		>2 years	8	08.33
	Training is essential for sporting event	Yes	90	93.75
		No	6	06.25
	Optimum age to start training for Jallikattu	6 months to 1 year	20	20.83

		1 year to 2 years	64	66.67
		>2 years	12	12.50
	Optimum age to start training for Rekla race	6 months to 1 year	31	32.29
		1 year to 2 years	56	58.33
		>2 years	9	09.38
	Duration of training per day	15 minutes	31	32.29
		30 minutes	56	58.33
		No specific timings	9	09.38
	Response to training	Good	87	90.63
		Poor	9	09.38
	Frequency of training	Weekly once	52	54.16
		Monthly once	22	22.92
		Monthly twice	12	12.50
		No specific frequency	10	10.42
	Difficulties during training	Yes	22	22.92
		No	74	77.08
	Age at first participation in the sporting event	Less than 2.5 years	10	10.42
		2.5-3.5 years	67	69.79
		3.5-4.5 years	17	17.71
		More than 4.5 years	02	02.08
	Utility of ox	Bullock cart race (Rekla race)	64	66.67
		Draught purpose	27	28.13
		Trekking to mountains	5	05.21
	Type of sporting event participated by Theni Malaimadu cattle bulls	Jallikattu	82	85.42
		Vaadi virattu	4	04.17
		Manju virattu	10	10.42
	Type of sporting event participated by Theni Malaimadu cattle ox	Rekla race	78	81.25
		Draught purpose	18	18.75
	Accidents during sporting event	Yes	18	18.75
		No	78	81.25
	Sporting life of Theni Malaimadu cattle bull	Less than 8 years	65	67.71
		8 -10 years	26	27.08
		More than 10 years	5	05.21
	Sporting life of Theni Malaimadu cattle ox	Less than 8 years	61	63.54
		8 -10 years	32	33.33
		More than 10 years	3	03.13
	Utility of bull after sporting life	Keeping up to death	72	75.00
		Natural service	24	25.00
		Slaughter	0	00.00
	Utility of ox after sporting life	Keeping up to death	75	78.13
		Draught	20	20.83
		Slaughter	01	01.04
	Disposal of losing bulls and ox	Keeping up to death	84	87.50
		Sold to others	12	12.50
		Slaughter	0	00.00
	Constraints in rearing of sporting bulls and ox	Yes	17	17.71
		No	79	82.29
	Insurance to bulls	Yes	09	09.37
		No	87	90.63
	Insurance to ox	Yes	12	12.50
		No	84	87.50

**Fig 5:** Utility of ox of Theni Malaimadu cattle

Identification methods followed by Theni Malaimadu cattle rearers:

This study showed that 83.33 per cent of Theni Malaimadu cattle rearers following both hot iron branding and ear clipping as identification methods (Figure 6). Hot branding marks are typically applied to the face of Malaimadu cattle, each group within a community creating unique branding patterns for herd differentiation which is in agreement with the findings of Singh *et al.*, (2012) ^[3] who reported in Pulikulam cattle. Despite for identification, branding also done in the inflamed area, it is believed that the localized inflammation may provide relief, and there is also a traditional belief that branding confers immunity, protecting the cattle from various disease outbreaks. In addition to branding, ear clipping is also done as another method of identification. Branding and ear clipping done particularly during the "Mattu Pongal" celebration. Additionally, ear tags administered by the Animal Husbandry Department of Tamil Nadu are widely observed among herds for identifying individual Malaimadu cattle. These tags are usually applied post-vaccination, serving as a reliable method for tracking and managing the health and vaccination history of each animal within the herd. This practice not only helps in monitoring health and vaccination records but also facilitates effective herd management.

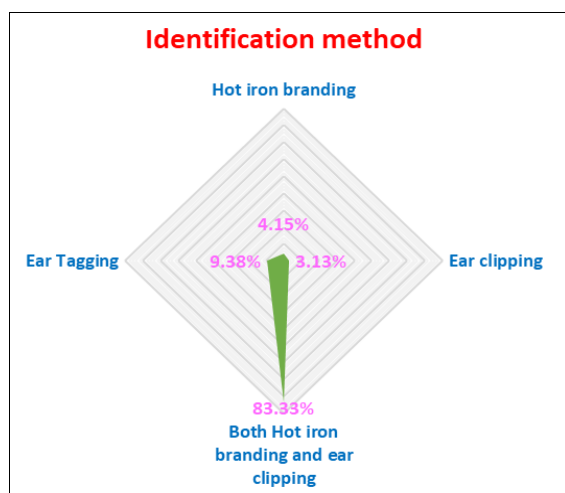


Fig 6: Identification method followed by Theni Malaimadu cattle rearers

Tracking methods followed by Theni Malaimadu cattle rearers

A Copper bells tied around the necks of the cattle, serve as a method of tracking and identification, aiding herders in locating their animals amidst dense vegetation or during night time. Beyond their functional purpose, the practice holds deep cultural significance, symbolizing the heritage and pride associated with these indigenous breeds. The melodious chime of the bells not only helps in managing the herd but also adds to the aesthetic appeal of the cattle, reflecting the intertwined relationship between practicality, tradition, and cultural expression in the lives of those who raise and care for Theni Malaimadu cattle.

Traditional practices followed by Theni Malaimadu cattle rearers

In certain villages, a specific family maintains a temple

herd, adhering to traditions passed down through many generations. In temple herd, they do not sell animals; the cattle are kept in the herd until their natural death, followed by ritualistic burials similar to human ceremonies. And also, they do not allow slippers and also outsiders inside the herd. Identification methods like Branding and ear clipping done particularly during the "Mattu Pongal" celebration.

Disease occurrences in Theni Malaimadu cattle

Vaccination and deworming were not commonly practiced in Theni Malaimadu cattle. Due to better disease resistance and adaptability to harsh climatic conditions infrequently diseases occurred. Occasionally affected with Foot and Mouth disease, Lumpy skin disease, Black quarter, Ephemeral fever, Cow pox and Parasitic infection. This finding is in line with Singh *et al.*, 2012 ^[3]. Other minor health issues like plant poisoning, fracture, fight wound, tick bite, flea bite, snake bite, dog bite and wild animal attack. Ethno-veterinary medicines were commonly used to treat their diseases.

Constraints in rearing of Theni Malaimadu cattle

Restraining of Theni Malaimadu cattle poses challenges due to their strong build and occasionally unpredictable behavior. Their muscular physique and agility require careful handling during veterinary procedures and other tasks. Handlers often use ropes to safely manage them. Experienced caretakers can control the Theni Malaimadu cattle with minimal stress, ensuring the well-being of both cattle and handlers.

Theni district's Malaimadu cattle rearers are organized under the Colonel John Pennycuick Malaimadu Rearers Association, Theni District (Reg.No:54/2018), which addresses legal issues faced by cattle rearers. Surveys and documentation are permitted only with references from this association, as farmers typically consider their cattle herds to be sacred and restrict unauthorized access.

Conclusion and summary

Malaimadu cattle provide a reliable source of income through various channels. Beyond direct agricultural activities, farmers benefit from the sale of male calves for Rekla racing and Jallikattu sports, as well as the sale of surplus organic manure produced by these animals. On average, 50% of a family's total annual income is derived from rearing Theni Malaimadu cattle. Despite economic challenges, Malaimadu cattle rearing remains culturally integral to farming communities in Theni. It preserves traditional practices, supports biodiversity conservation, and maintains the ecological balance of the Western Ghats.

Theni Malaimadu cattle are highly valued for their resilience and suitability for various agricultural tasks, including ploughing, draught work, Rekla race, Jallikattu, and hill climbing. Their significant contribution to farm labour reduces dependency on mechanized equipment, thereby lowering operational costs and enhancing farm profitability. Adapted to the local terrain and climate, Malaimadu cattle require minimal external inputs for their upkeep, contributing to the ecological balance of the Western Ghats ecosystem, where they graze throughout the year. The dung of Malaimadu cattle serves as a potent bio-fertilizer, naturally enriching soil fertility without the

harmful environmental impacts associated with chemical fertilizers. This promotes sustainable agricultural practices and supports biodiversity conservation in the region.

Keeping in view the declining population status of the Theni Malaimadu cattle, there is a need to take up sustainable measures for the enhancement and preservation of this breed. This cattle population ought to be registered and included in the recognized list of livestock breeds. A nucleus herd may be formed to produce bull calves, and research on the breed's traits—particularly its ability to withstand hot, humid climates in an open-housing system—may be started. Farmers may be made aware of the importance of collecting milk from every cow and selling it to make money. This will increase the breed's profitability. Lack of sufficient drinking water and shrinking grazing field area are two significant obstacles that are negatively impacting the breed's population status. The Tamil Nadu government's departments of forestry and animal husbandry ought to adequately handle these issues. It is also possible to create a breed society to safeguard the interests of this breed's owners.

References

1. Priyadharsini R, Gopinathan A, Karthickeyan SMK, Jagatheesan PN. Demographic and social status of sporting bull rearers and rearing of Jallikattu bulls. *Int J Curr Microbiol App Sci*. 2019;8(8):2799-2806.
2. Thesinguraja S, Mathialagan P, Thilakar P, Devendran P, Palanichamy V. Socio-economic profile of Pulikulam cattle rearers in Madurai and Sivagangai districts of Tamil Nadu, India. *Int J Curr Microbiol App Sci*. 2017;6(12):424-429.
3. Singh PK, Pundir RK, Kumarasamy P, Vivekanandan P. Management and physical features of migratory Pulikulam cattle of Tamil Nadu. *Indian J Anim Sci*. 2012;82(12):1587-1590.
4. Kavithaa NV, Manivannan C, Vimal Rajkumar N, Kumarasamy P, Manokaran S. Socio-economic profile of Kangayam cattle farmers of Tamil Nadu. *The Pharma Innovation Journal*. 2021; SP-10(9):147-150.
5. Kannadhasan MS, Kathirchelvan M, Rajendran R. Identification and prioritization of constraints in Umblachery breed cattle farming through participatory approach. *Int J Curr Microbiol App Sci*. 2018;7(11):1100-1110.
6. Jagatheesan PN, Gnanaraj PT, Satheeshkumar P, Priyadharsini R, Gokulakrishnan P, Selvam R. Monograph on Theni Malaimadu cattle; c2024.
7. Satheeshkumar P, Priyadharsini R, Jagatheesan PN, Gnanaraj PT, Gokulakrishnan P. The decline of bull population in India: Economic, ecological, and health impacts based on a study of Theni Malaimadu cattle. *Int J Agric Ext Soc Dev*. 2024;7(11):180-183.