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Housing management practices followed by Indigenois Khillar cattle owners

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Abstract

India's agrarian economy relies heavily on agriculture and livestock for rural livelihoods, with cattle playing a vital role in agricultural sustainability. The indigenous Khillar cattle breed, valued for its draft power, remains significant in the western regions of Maharashtra despite mechanization challenges. This study examines housing management practices of Khillar cattle owners in selected tehsils of Solapur and Sangli districts. Data were collected from 160 respondents through structured interviews. Findings revealed that housing facilities were often basic, with 56.25 per cent using *kuccha* sheds, 68.12 per cent having *kuccha* floors, and 85.00 per cent keeping cattle in undersized shelters, while 94.37 per cent maintained drainage systems and 86.25 per cent ensured adequate sunlight and only 15.00 per cent provided bedding for pregnant cattle.

Keywords: Indigenous Khillar cattle owners, Housing management practices.

Introduction

India is predominantly an agricultural nation, with about 65.00 per cent of its population living in rural areas and relying on agriculture and allied activities, which are largely monsoon-dependent. Agriculture significantly contributes to the country's GDP and rural development, supported by sustainable practices, eco-friendly technologies, and effective natural resource management. Livestock has been integral to human society for centuries, providing economic, physical, and social benefits. India has a cattle population of 192.49 million (20th Livestock Census, 2019), including 142.11 million indigenous and 50.42 million exotic/crossbred cattle. Cattle play a crucial role in rural livelihoods, contributing to both agricultural productivity and household income. They are vital for poverty reduction and socio-economic development, especially for small and marginal farmers. The government promotes cattle conservation through initiatives such as the Rashtriya Gokul Mission, National Livestock Mission, and Livestock Health and Disease Control Programme. India's diverse indigenous breeds include the Khillar, a notable native breed with significant regional importance. The 20th livestock census indicated a 32.00 per cent decline in the number of Khillar bulls in the country, with a significant portion of this decline occurring in Maharashtra. Inspite of these challenges, the Khillar cattle breed is still popular amongst the farmers of Maharashtra and particularly farmers from western Maharashtra. A large number of farmers continue to rear this Khillar cattle breed, due to the emotional and prestige associated with the breed, regardless of the introduction of cross breed cattle for milk yield and reduction of demand of Khillar bullocks for agricultural operations and draft purpose on account of mechanization. Therefore, it is necessary to study farmers rearing the Khillar cattle breed and accordingly the present study on housing management practices followed by indigenous Khillar cattle owners was conducted.

Methodology

The study was conducted in Sangli and Solapur districts of Maharashtra, the native breeding tracts of Khillar cattle. These drought-prone, rain-shadow regions were selected due to their large Khillar population, traditional rearing practices, and the breed's draught power, heat tolerance and disease resistance. In Sangli district, Atpadi and Jath talukas were chosen for their reliance on Khillar cattle in agriculture and cultural activities, with open grazing and limited water sources. In Solapur district, Sangola and Pandharpur talukas were selected, representing diverse management systems, from semi-arid to irrigated areas, with both traditional and evolving practices. Purposive sampling was used to select study areas, followed by simple random sampling for respondents. From each of the four selected talukas, four villages were identified, and 10 Khillar cattle owners were randomly chosen per village, totaling 160 respondents. Care was taken to include variation in herd size, landholding, and

socio-economic background, ensuring findings reflect regional characteristics and indigenous management practices in Maharashtra's dry zones.

Results and Discussion

Housing management is an important aspect of cattle rearing, as it directly affects the health, comfort, and productivity of the animals. Proper housing provides protection from harsh weather, reduces disease incidence, and ensures better hygiene. In the case of indigenous Khillar cattle, housing practices vary based on the resources and awareness of the Khillar cattle owners. Studying the housing management practices followed by Khillar cattle owners helps in understanding the suitability and limitations of existing systems and provides a basis for recommending improvements to enhance animal welfare and farm efficiency.

The result of the housing management practices followed by Khillar cattle are presented below.

Table 1: Housing management practices followed by indigenous Khillar cattle owners

Housing management practices followed by indigenous Khillar cattle owners				
Sr. No.	**Practices**		**Frequency (N=160)**	**Percentage**
1	House available	Available	160	100.00
		Unavailable	00	00.00
2	Type of house	Open paddock	19	11.88
		Kuccha house	90	56.25
		Pucca house	51	31.87
3	Location of shed	Attached to house	56	35.00
		Near the house	78	48.75
		At field of Khillar cattle owner	26	16.25
4	Direction of shelter	East-West	63	39.37
		North-South	97	60.63
5	Type of housing system	Loose housing system	19	11.88
		One/single row housing system	94	58.75
		Tail to tail	17	10.62
		Head to head	30	18.75
6	Type of the floor	*Kuccha*	109	68.12
		Dung plastered	00	00.00
		Brick paved	13	8.13
		Stone paved	00	00.00
		Pucca	38	23.75
7	Presence of slope	Present	151	94.37
		Not present	9	5.63
8	Use of rubber mat	Used	24	15.00
		Not used	136	85.00
9	Type of roof	Grass	19	11.88
		Galvanized iron sheet	65	40.63
		Clay tile	48	30.00
		Asbestos sheet	21	13.12
		RCC	7	4.37
10	Slope of roof of the housing	Single slope	72	45.00
		Double slope	88	55.00
11	Material used in the wall	No wall	19	11.88
		Grass	26	16.25
		Brick and mud	64	40.00
		Brick and cement	41	25.62
		RCC	10	6.25
12	Painting of the wall	No painting	30	18.75
		Cow dung plastering	11	6.87
		Lime	85	53.13
		Orch	34	21.25
13	Type of pole use in the shelter	Wooden	90	56.25
		Iron	37	23.12
		Cement	21	13.13
		RCC	12	7.50
14	Floor space for animal	3.5 sq.m.	13	8.12
		7 sq.m.	11	6.88
		Less space than recommended	136	85.00
15	Type of Manger	*Kuccha*	89	55.63
		Pucca	64	40.00
		Cement pipe manger	7	4.37
16	Provision of urine drain	*Kuccha* drain /Swiped from floor	109	68.12
		Pucca drain	51	31.87

17	Uses of foggers	Used	8	5.00
		Not used	152	95.00
18	Utilization of dung	Dung cake	16	10.00
		FYM	160	100.00
		Biogas	19	11.88
		Other	15	9.37
19	Provision of place for composting	No Place for composting	00	00.00
		Adjacent	117	73.12
		Distance	43	26.87
20	Measures to control ectoparasites	Controlled	160	100
		Not controlled	0	0
21	Provision of bedding material for pregnant animal	Provided	24	15.00
		Not provided	136	85.00
22	Provision of adequate sunlight	Adequate	138	86.25
		Not Adequate	22	13.75
23	Ventilation	Good	135	84.37
		Poor	25	15.63

1.1 House availability

From table 1, it was revealed that all respondents (100.00 per cent) had a house or shelter available for their Khillar cattle. This shows that Khillar cattle owners are fully awere of the importance of providing shelter to protect animals from harsh weather and ensure their wellbeing.

1.2 Type of cattle shed / house:

From table 1, it was revealed that more than half of the Khillar cattle owners (56.25 per cent) had housed their cattle in *kuccha* (temporary or semi-permanent) structures, while 31.87 per cent, had kept them in *pucca* (permanent) houses. Only 11.88 per cent owners had open paddocks. This indicates that, while basic housing is common, a large number still rely on simple, low-cost construction, likely due to limited resources.

1.3 Location of shed

From above the table 1, it was revealed that nearly half of the sheds (48.75 per cent) were built near the house, while 35.00 per cent were attached to the house, and 16.25 per cent were located in the field. This shows a preference for keeping cattle close for easier supervision, safety, and convenience.

1.4 Direction of shelter

From table 1, it was observed that about 60.63 per cent of cattle sheds were oriented north-south, which is preferred for the better air flow and less direct sunlight during peak hours. This shows good awareness of animal comfort among Khillar cattle owners.

1.5 Type of housing system

It was observed that most common system was the *one/single row* housing system (58.75 per cent), which can be attributed to its simplicity, cost-effectiveness, and ease of daily operations such as feeding, cleaning, and milking. This layout is particularly suitable for small to medium-scale farmers who have limited space and resources, as it allows for efficient use of available land and infrastructure, followed by *head-to-head* (18.75 per cent) and *tail-to-tail* (10.62 per cent) layouts. A small group (11.88 per cent) followed the *loose housing* system, which allows more animal movement. On the other hand, this system usually requires more land, higher initial investment, and increased labor for cleaning and management**,** which may not be feasible for all farmers, especially in resource-constrained settings. Most Khillar cattle owners preferred structured housing for space and management efficiency.

1.6 Type of the floor

From table 1, it was revealed that majority of the Khillar cattle owners (68.12 per cent) had *kuccha* floors, indicating low-cost or traditional flooring. About 23.75 per cent had *pucca* floors, and 8.13 per cent had brick paving. No one used dung plaster or stone paving, showing limited use of more hygienic or durable flooring.

1.7 Presence of Slope

From table 1 it was revealed that most shelters (94.37 per cent) had sloped floors to facilitate easy drainage of urine and water, reducing disease risk. This is a positive sign of good hygiene practices. This finding is consistent with the findings of Kumar *et al*. (2017).

1.8. Use of rubber mats:

From the table 1, it was found that only 15.00 per cent indigenous Khillar cattle owners used rubber mats for cattle, showing low adoption of comfort-enhancing tools. The high cost or lack of awareness may be limiting their use.

1.9 Type of roof

Galvanized iron sheets (40.63 per cent) and clay tiles (30.00 per cent) were the most common roofing materials, followed by asbestos (13.12 per cent) and grass (11.88 per cent). Only 4.37 per cent had RCC roofs, suggesting limited investment in permanent structures.

1.10 Slope of roof

From the table 1 it is clear that more than half (55.00 per cent) had double-sloped roofs, which are better for rainwater runoff and ventilation. The rest (45.00 per cent) used single slope, likely due to structural or cost considerations.

1.11 Wall material

It was observed that most walls were made of brick and mud (40.00 per cent) and brick and cement (25.62 per cent). Some used grass (16.25 per cent) or had no wall (11.88 per cent), reflecting varied construction quality based on affordability and housing system followed.

1.12 Painting of the wall
From data it was found that lime was the most common wall treatment (53.13 per cent), as it is cost-effective and has disinfectant properties. About 21.25 per cent used orch (traditional clay mix), while a few used cow dung plasters (6.87 per cent). A Notable 18.75 per cent had No painting, possibly due to financial constraints.

1.13 Type of pole used in shelter
From table 1, it was observed that wooden poles were most used (56.25 per cent) due to easy availability. Iron (23.12 per cent), cement (13.13 per cent), and RCC (7.50 per cent) poles were used by those with more durable structures.

1.14 Floor space for animal
In the study, it was found that a concerning 85.00 per cent Khillar cattle owners provided less space than recommended, which could affect animal comfort, health, and productivity. Only 13 Khillar cattle owners (8.12 per cent) provided 3.5 sq.m, and 11 Khillar cattle owners (6.88 per cent) provided 7 sq.m, which is ideal.

1.15 Type of manger
From table 1, it was observed that *kuccha* mangers (55.63 per cent) were most common, followed by *pucca* (40 per cent). Only a few (4.37 per cent) used cement pipe mangers, indicating preference for lowcost options over durable infrastructure.

1.16 Provision of urine drain
From table 1, it was revealed that majority of the indigenous Khillar cattle owners (68.12 per cent) had a *kuccha* drain or were swiping urine from floor for urine disposal. Only 31.87 per cent had *pucca* drains, suggesting room for improvement in hygiene infrastructure.

1.17 Use of foggers
In the study, it was revealed that only 5.00 per cent of the indigenous Khillar cattle owners used foggers, which help control temperature and flies. This very low usage shows poor adoption of modern practices, possibly due to cost or lack of awareness.

1.18 Utilization of dung
From the study, it was observed that all Khillar cattle owners (100.00 per cent) used dung as farmyard manure (FYM), showing excellent recycling practices. Some also used it for biogas (11.88 per cent), dung cake (10.00 per cent), or other purposes (9.37 per cent), reflecting multifunctional uses of dung.

1.19 Composting area
From the study, it was revealed that most Khillar cattle owners (73.12 per cent) had a composting site adjacent to the cattle shed, while 26.87 per cent had it at some distance. No respondent lacked a composting area, indicating awareness of nutrient recycling.

1.20 Ectoparasite control
From the study, it was observed that all Khillar cattle owners (100.00 per cent) took measures to control ectoparasites, showing strong awareness of animal health and cleanliness.

1.21 Bedding for pregnant animals
From table 1, it was observed that only 15.00 per cent Khillar cattle owners provided bedding materials for pregnant cattle. The remaining 85.00 per cent did not, which may affect animal comfort during a crucial period. More awareness is needed here.

1.22 Provision of sunlight
A majority of indigenous Khillar cattle owners (86.25 per cent) provided adequate sunlight in their sheds, recognizing its importance for animal health, hygiene, and overall well-being. This is often achieved by constructing sheds in a north-south direction and ensuring an open area**,** both of which help maximize sunlight exposure and reduce moisture buildup. However, 13.75per cent lacked sufficient sunlight, likely due to poor shed design, inadequate open space, which can negatively impact cattle comfort and health.

1.23 Ventilation
From the table 1, it was observed that most Khillar cattle owners (84.37 per cent) had good ventilation in their cattle sheds, while a small portion (15.63 per cent) faced issues, possibly due to improper construction or overcrowding.

Conclusion
The study revealed that all Khillar cattle owners provided shelter for their animals, reflecting strong awareness of housing importance. However, the majority relied on *kuccha* structures (56.25 per cent) and *kuccha* floors (68.12 per cent), indicating resource constraints and low investment in durable infrastructure. While most sheds were located near or attached to homes for ease of management, nearly half followed the north–south orientation, ensuring better airflow and sunlight. Hygiene practices were commendable, with 94.37 per cent providing floor slopes and 100 per cent controlling ectoparasites. Adequate ventilation (84.37 per cent) and sunlight (86.25 per cent) were common, though bedding for pregnant cattle (15.00 per cent) and use of rubber mats (15.00 per cent) were limited. Roofing was dominated by galvanized iron sheets and clay tiles, and wall materials varied based on affordability. Space allocation for cattle was often below recommended standards, potentially impacting animal welfare. Waste management was effective, with all owners utilizing dung, mostly for farmyard manure, and 73.12 per cent maintaining composting areas near sheds. Modern amenities like foggers were rarely used (5.00 per cent), showing scope for technological adoption. Overall, Khillar cattle owners demonstrated strong traditional management knowledge and hygiene practices, but there remains significant potential for improving housing quality, comfort provisions, and adoption of modern facilities to enhance productivity and animal welfare.

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