

International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
 ISSN Online: 2617-4707
 NAAS Rating (2026): 5.29
 IJABR 2026; 10(5): 622-627
www.biochemjournal.com
 Received: 14-02-2026
 Accepted: 16-03-2026

PR Munj

Postgraduate Student,
 Department of Livestock
 Production and Management,
 Mumbai Veterinary College,
 Maharashtra Animal and
 Fishery Sciences University,
 Nagpur, Maharashtra, India

PP Ghorpade

Associate Professor,
 Department of Livestock
 Production and Management,
 Mumbai Veterinary College,
 Maharashtra Animal and
 Fishery Sciences University,
 Nagpur, Maharashtra, India

ST Hande

Associate Professor,
 Department of Livestock
 Production and Management,
 Mumbai Veterinary College,
 Maharashtra Animal and
 Fishery Sciences University,
 Nagpur, Maharashtra, India

MN Sawant

Professor, Department of
 Veterinary & Animal
 Husbandry Extension,
 Mumbai Veterinary College,
 Maharashtra Animal and
 Fishery Sciences University,
 Nagpur, Maharashtra, India

SD Jagadale

Assistant Professor,
 Department of Animal
 Nutrition, Mumbai Veterinary
 College, Maharashtra Animal
 and Fishery Sciences
 University, Nagpur,
 Maharashtra, India

Corresponding Author:**PP Ghorpade**

Associate Professor,
 Department of Livestock
 Production and Management,
 Mumbai Veterinary College,
 Maharashtra Animal and
 Fishery Sciences University,
 Nagpur, Maharashtra, India

Assessment of production performance, profitability, and constraints of dairy farms in Thane district of Maharashtra

PR Munj, PP Ghorpade, ST Hande, MN Sawant and SD Jagadale

DOI: <https://www.doi.org/10.33545/26174693.2026.v10.i5h.8464>

Abstract

The present study was undertaken to evaluate the production performance, economic viability and major constraints of dairy farms in selected blocks of Thane district, Maharashtra. The study was conducted during September 2025 to March 2026 in four blocks, namely Bhiwandi, Kalyan, Ulhasnagar and Thane, using an ex-post facto research design. A total of 60 dairy farms, each maintaining at least 10 dairy animals, were selected through proportionate sampling. Data were collected through personal interview and on-farm observations using a pre-structured schedule. The parameters studied included production traits, economics of milk production and constraints faced by dairy farmers. The overall average total milk production was 198.57 ± 18.84 kg per farm per day, with an average lactation yield of 2053.48 ± 28.70 kg per animal and lactation length of 277.00 ± 1.38 days. The average annual total expenditure and total income per farm were ₹ 39,56,560.25 ± 3,96,259.73 and ₹ 56,42,778.42 ± 6,14,601.99, respectively, with an overall gross profit of ₹ 16,86,218.17 ± 2,72,369.54, indicating good economic returns from dairy farming. Feeding and labour costs constituted the major share of expenditure. Higher productivity and profitability were observed in Ulhasnagar and Kalyan blocks compared to Bhiwandi and Thane. The major constraints reported by dairy farmers included high cost of concentrate feed (27.78%), lack of technical knowledge (25.00%), competition from established dairy units (36.96%) and poor awareness regarding silage preparation (51.72%). The study concluded that dairy farming in Thane district is economically viable; however, reducing input costs and strengthening technical and extension support services are essential for improving sustainability and profitability.

Keywords: Urban dairy farms, lactation yield, milk marketing, stall-feeding system, technical constraints

Introduction

Dairying occupies a significant position in Indian agriculture and plays an important role in rural livelihoods, nutritional security, and economic development. Following the White Revolution, India emerged as the world's largest milk producer, contributing nearly 25% of global milk production. The dairy sector supports more than 70 million rural households, particularly small and marginal farmers, by providing regular income and employment opportunities (Shumway and Stoffer 2017; TAAS 2023) ^[19, 21]. Milk also serves as an important source of protein for the predominantly vegetarian population of the country (Lyngkhai *et al.* 2022) ^[12].

India's milk production has shown consistent growth, increasing from 239.30 million tonnes in 2023-24 to 247.87 million tonnes in 2024-25 (Press Information Bureau 2025) ^[15]. Maharashtra is one of the major milk-producing states and contributes substantially to national milk output. However, despite this progress, dairy farming continues to face several challenges affecting production efficiency and farm profitability. High feed and fodder costs, inadequate veterinary and breeding services, limited technical knowledge, and marketing difficulties are among the major constraints reported in dairy farming systems (Gamit *et al.* 2021; Shelar *et al.* 2022) ^[7, 18].

Thane district, due to its proximity to major urban markets, has considerable potential for dairy development and is characterized by intensive, market-oriented dairy farming systems. Most farms in the district follow stall-feeding practices and depend heavily on purchased fodder and concentrates, resulting in high production costs.

However, systematic studies focusing specifically on production performance, economics, and constraints of dairy farms in this region are limited.

Therefore, the present study was undertaken to evaluate the production performance, economic viability, and major constraints of dairy farms in selected blocks of Thane district, Maharashtra, with the objective of identifying factors affecting productivity and profitability and suggesting suitable measures for sustainable dairy development.

Materials and Methods

The present study was conducted in Thane district of Maharashtra state during September to December 2025. Four blocks, namely Bhiwandi, Kalyan, Ulhasnagar and Thane, were selected for the study. The ex-post facto experimental design served as the foundation for the present investigation. A total of 60 dairy farms were selected from the four blocks of Thane district. The selection process was based on selecting a minimum of 10 dairy farms from each block, ensuring that each selected farm housed at least 10 dairy animals. Proportionate sampling was carried out to ensure fair representation from each block considering the population of dairy animals. The data were collected through personal interview and observation using a pre-structured interview and assessment schedule. Information related to production parameters, economics of milk production and constraints faced by dairy farmers was collected from the respondents.

Production parameters included daily milk production, wet average, dry average, wet-to-dry ratio, average lactation yield, average lactation length and average dry period. These parameters were calculated based on farm records and information obtained from the respondents. The wet and dry averages were computed based on the number of lactating and dry animals, respectively, while lactation yield and lactation length were derived from individual animal performance records. Economic parameters such as feeding cost, labour cost, electricity cost, veterinary cost, total expenditure, cost of milk production per litre, income from milk sold, dung income, total income, gross profit and profit per animal were recorded and computed on an annual basis. Total expenditure was obtained by summing feeding, labour, electricity and veterinary costs. Cost of milk production per litre was calculated by dividing total expenditure by total milk production. Income from milk was estimated based on quantity of milk sold and prevailing market prices, while dung income was calculated based on farmer responses. Total income was derived by summing income from milk and dung. Gross profit was calculated as the difference between total income and total expenditure, and profit per animal was obtained by dividing gross profit by the number of milch animals. Constraints faced by dairy farmers were identified and categorised into economic, technical, marketing and general constraints. The frequency and percentage of responses were calculated to assess the severity of constraints.

The data generated were tabulated, computerised and subjected to frequencies and percentages using standard

procedures given by Snedecor and Cochran (1989) [20]. Statistical analysis of quantitative parameters, including calculation of mean values, standard error and comparison of means using one-way ANOVA, was performed using IBM SPSS Statistics 20.

Results and Discussion

Production performance: The production performance of dairy farms in the study area was evaluated using parameters such as total milk production per farm per day, wet and dry average milk yield, wet-to-dry ratio, lactation milk yield, lactation length and dry period. The data were presented in Table 1. The overall average total milk production was 198.57 ± 18.84 kg per farm per day, with higher production observed in Ulhasnagar (276.73 ± 42.92 kg) compared to Kalyan (240.60 ± 49.66 kg), Thane (149.00 ± 21.29 kg) and Bhiwandi (127.93 ± 11.14 kg). The differences were statistically significant ($p < 0.05$), with significantly higher production recorded in Ulhasnagar compared to all other blocks, while Kalyan also exhibited significantly higher production than Bhiwandi. The wet and dry average milk yields were 7.43 ± 0.08 kg/day and 6.36 ± 0.11 kg/day, respectively, with significant variation observed among the blocks. Higher wet and dry average yields were observed in Ulhasnagar and Kalyan, whereas comparatively lower values were recorded in Thane and Bhiwandi. The average wet-to-dry ratio was 9.24 ± 1.02 , indicating variation in herd composition without statistical significance. The average lactation milk yield was 2053.48 ± 28.70 kg/animal, while the average lactation length was 277.00 ± 1.38 days, both showing comparatively uniform performance across the study area. The average dry period was 84.50 ± 1.74 days, with no significant difference ($p > 0.05$) observed among the blocks, indicating uniformity in reproductive management practices.

The present findings were in agreement with Islam *et al.* (2020) [9], who reported stable milk production under smallholder conditions. The wet average yield observed in the present study was comparable with the findings of Rajpoot *et al.* (2019) [16] (7.50 ± 0.31 kg/day) and Khalangre and Suryawanshi *et al.* (2024) [10], indicating similar productivity under field conditions. However, the lactation yield (2053.48 kg/animal) was slightly higher than that reported by Chendge *et al.* (2022) [5] (2007.66 litres) and Khatke *et al.* (2023) [11] (1964.57 litres), which might be attributed to differences in feeding and concentrate supplementation practices. The shorter dry period compared to the upper recommended range indicated relatively efficient reproductive management in the study area. The non-significant differences in lactation length and dry period were in line with More *et al.* (2020) [13], suggesting consistent dairy management practices across the blocks. The dry average yield also aligned with Khalangre and Suryawanshi (2024) [10], indicating the predominance of small-to medium-scale dairy production systems. The higher production performance observed in Ulhasnagar and Kalyan may be attributed to better feeding, health care and overall herd management practices.

Table 1: Production parameters at Dairy Farms in Thane district

Block	Total Milk production, farm/day	Wet Average Milk Yield (kg/day)	Dry Average Milk Yield (kg/day)	Wet-to Dry Ratio	Lactation Milk Yield (kg/Animal)	Lactation Length (Days)	Dry Period (Days)
Thane	149.00 ^{ab} ±21.29	7.28 ^{ab} ±0.11	5.72 ^a ±0.13	6.68 ^a ±2.70	1990.37 ^a ±38.74	275.33 ^a ±2.46	86.00 ^a ±3.59
Bhiwandi	127.93 ^a ±11.14	7.01 ^a ±0.20	6.19 ^{ab} ±0.22	10.85 ^a ±1.95	1942.77 ^a ±58.43	277.33 ^a ±3.55	86.00 ^a ±3.56
Kalyan	240.60 ^b ±49.66	7.67 ^{bc} ±0.16	6.69 ^{bc} ±0.22	8.76 ^a ±1.30	2165.50 ^c ±75.16	281.00 ^a ±2.85	86.33 ^a ±3.14
Ulhasnagar	276.73 ^c ±42.92	7.74 ^c ±0.12	6.82 ^c ±0.14	10.67 ^a ±1.97	2115.27 ^{bc} ±31.45	274.33 ^a ±1.82	79.67 ^a ±3.63
Overall Average	198.57±18.84	7.43±0.08	6.36±0.11	9.24±1.02	2053.48±28.70	277.00±1.38	84.50±1.74

Means bearing different superscript (^{a,b,c}) within the column differs significantly ($p<0.05$)

Economic factors: The economic factors involved in milk production on dairy farms were analysed and were presented in Table 2A and 2B. The overall average herd size of milch animals was 26.20±2.33 animals, with the highest herd size recorded in Ulhasnagar (35.40±5.38), followed by Kalyan (30.67±6.09), Thane (20.40±2.89) and Bhiwandi (18.33±1.57). The overall average feeding cost was ₹ 347,594.67±34,679.81, with the highest feeding cost recorded in Ulhasnagar (₹ 524,053.00±83,069.44), followed by Kalyan (₹ 395,832.00±81,371.48), Thane (₹ 269,803.13±43,263.22) and Bhiwandi (₹ 200,338.33±22,378.66). The feeding cost in Ulhasnagar was significantly higher ($p<0.05$) than in Bhiwandi, while the other blocks remained at par with both.

The overall average labour cost was ₹ 422,189.92±56,887.81, with the highest value in Ulhasnagar (₹ 671,613.00±91,793.37), followed by Kalyan (₹ 531,546.67±149,635.93), Thane (₹ 384,000.00±97,593.91)

and Bhiwandi (₹ 101,600.00±38,322.54). A significant difference ($p<0.05$) was observed between Bhiwandi and the higher-cost blocks of Kalyan and Ulhasnagar. The overall electricity cost was ₹ 34,376.67±2,249.36, with Ulhasnagar recording significantly higher ($p<0.05$) electricity cost (₹ 46,800.00±4,905.97) than Thane, Bhiwandi and Kalyan. The overall veterinary cost was ₹ 24,050.00±1,609.19, with the highest value in Kalyan (₹ 27,200.00±4,285.30) followed by Thane (₹ 26,200.00±4,170.42), Ulhasnagar (₹ 24,666.67±1,855.92) and Bhiwandi (₹ 18,133.33±940.45), showing non-significant differences.

The average total expenditure was ₹ 3,956,560.25±396,259.73, with Ulhasnagar recording significantly higher ($p<0.05$) expenditure (₹ 5,987,132.67±916,215.16) than Bhiwandi (₹ 2,154,031.67±228,457.26), while Kalyan and Thane remained at par.

Table 2A: Expenditure pattern of dairy farms in different blocks of Thane district (₹/year)

Parameters	Thane	Bhiwandi	Kalyan	Ulhasnagar	Total
No. of Milch Animals	20.40±2.89	18.33±1.57	30.67±6.09	35.40±5.38	26.20±2.33
Feeding Cost	269803.13 ^{ab} ±43263.22	200338.33 ^a ±22378.66	395832.00 ^{bc} ±81371.48	524053.00 ^c ±83069.44	347594.67±34679.81
Labour Cost	384,000.00 ^{ab} ±97,593.91	101,600.00 ^a ±38,322.54	531,546.67 ^b ±149,635.93	671,613.00 ^b ±91,793.37	422,189.92±56,887.81
Electricity Cost	27,186.67 ^a ±2,546.82	30,960.00 ^a ±2,377.61	32,560.00 ^a ±5,770.31	46,800.00 ^b ±4,905.97	34,376.67±2,249.36
Veterinary Cost	26,200.00 ^a ±4,170.42	18,133.33 ^a ±940.45	27,200.00 ^a ±4,285.30	24,666.67 ^a ±1,855.92	24,050.00±1,609.19
Total Expenditure	3,135,418.00 ^{ab} ±511,135.04	2,154,031.67 ^a ±228,457.26	5,549,658.67 ^{bc} ±945,596.45	5,987,132.67 ^c ±916,215.16	3,956,560.25±396,259.73

Means bearing different superscript (^{a,b,c}) within the same row differs significantly ($p<0.05$)

The average annual quantity of milk sold was 71,546.08±6,889.32 litres, with higher values in Ulhasnagar (100,034.33±15,682.73 litres) followed by Kalyan (87,186.33±18,176.12 litres), Thane (53,557.67±7,767.89 litres) and Bhiwandi (45,406.00±4,007.85 litres), with significant differences observed between Bhiwandi and Ulhasnagar. The overall sale rate of cow milk was ₹ 69.68±1.57 per litre, with Ulhasnagar (₹ 77.50±2.71) recording significantly higher ($p<0.05$) rate than Bhiwandi (₹ 66.11±5.05) and Kalyan (₹ 65.77±2.88). Similarly, buffalo milk sale rate differed significantly ($p<0.05$) among the blocks, with the highest in Ulhasnagar (₹ 84.64±1.33), followed by Thane (₹ 82.14±1.55), Kalyan (₹ 74.38±1.93) and Bhiwandi (₹ 71.54±1.31). The average production cost per litre was ₹ 54.29±1.49, with significant variation across

Ulhasnagar (₹ 60.03±1.64), Thane (₹ 57.33±2.58), Kalyan (₹ 51.32±2.69) and Bhiwandi (₹ 48.49±3.85).

The overall income from milk sold was ₹ 5,628,820.08±614,419.09, with Ulhasnagar recording significantly higher ($p<0.05$) income (₹ 8,419,578.67±1,457,539.23) than Bhiwandi, Kalyan and Thane. The average income from dung sold was ₹ 13,958.33±2,696.91, with significant differences among blocks, particularly no dung income reported in Ulhasnagar. The average total income was ₹ 5,642,778.42±614,601.99, with Ulhasnagar showing significantly higher ($p<0.05$) total income (₹ 8,419,578.67^b±1,457,539.23) than Kalyan, Bhiwandi and Thane. The overall gross profit was ₹ 1,686,218.17±272,369.54, and profit per milch animal was ₹ 60,633.31±3,856.39, with non-significant differences among blocks.

Table 2B: Milk sales, income and profitability of dairy farms in different blocks of Thane district (₹/year)

Parameters	Thane	Bhiwandi	Kalyan	Ulhasnagar	Total
Quantity of milk sold (L/yr)	53,557.67 ^{ab} ±7,767.89.	45,406.00 ^a ±4,007.85	87,186.33 ^{bc} ±18,176.12	100,034.33 ^a ±15,682.73	71,546.08±6,889.32
Cow Sale rate of milk per litre	70.00 ^{ab} ±1.69	66.11 ^a ±5.05	65.77 ^a ±2.88	77.50 ^b ±2.71	69.68±1.57
Buffalo Sale rate of milk per litre	82.14 ^b ±1.55	71.54 ^a ±1.31	74.38 ^a ±1.93	84.64 ^b ±1.33	78.37±1.05
Cost of milk production per litre	57.33 ^{bc} ±2.58	48.49 ^a ±3.85	51.32 ^{ab} ±2.69	60.03 ^a ±1.64	54.29±1.49
Income from milk sold	4,213,520.00 ^a ±605,567.20	3,279,320.67 ^a ±283,762.99	6,602,861.00 ^{ab} ±1,621,927.67	8,419,578.67 ^b ±1,457,539.23	5,628,820.08±614,419.09
Income from dung sold	16,000.00 ^b ±3,348.42	14,600.00 ^b ±4,646.35	25,233.33 ^b ±8,153.71	0.00 ^a ±0.00	13,958.33±2,696.91
Total Income	4,229,520.00 ^a ±604,088.84	3,293,920.67 ^a ±285,473.50	6,628,094.33 ^{ab} ±1,624,762.84	8,419,578.67 ^b ±1,457,539.23	5,642,778.42±614,601.99
Gross profit	1,094,102.00 ^a ±181,964.18	1,139,889.00 ^a ±169,685.75	2,078,435.67 ^a ±852,291.25	2,432,446.00 ^a ±604,250.82	1,686,218.17±272,369.54
Profit Per Animal	57,800.12 ^a ±5,973.03	62,250.18 ^a ±8,213.45	59,267.60 ^a ±8,775.03	63,215.32 ^a ±8,317.86	60,633.31±3,856.39

Means bearing different superscript (^{a,b,c}) within the same row differs significantly ($p < 0.05$)

The present findings were in agreement with Arti *et al.* (2024) ^[2] and Babu *et al.* (2023) ^[3], who reported superior economic performance in larger dairy units. The higher feeding and labour costs observed in the present study were comparable with the findings of Gulumbe and Bhat (2022) ^[8] and Gadhvi *et al.* (2021) ^[6], indicating that herd expansion substantially influences variable expenditure. However, the higher total income and gross profit recorded in Ulhasnagar and Kalyan may be attributed to larger herd size, better milk yield and favourable milk sale rates. The non-significant differences in gross profit and profit per milch animal suggest relatively uniform economic efficiency across the study area. Overall, the results indicate that dairy farming in Thane district is economically viable and sustainable, particularly in larger herd units.

Constraints faced by dairy farmers: The constraints faced by dairy farmers in dairy farming were analysed under economic, technical, marketing and general categories. The results are presented in Table 3.

Economic constraints: Among the economic constraints, high cost of concentrate was reported as the most important constraint by 27.78 percent of the respondents, followed by high cost of veterinary medicines (19.41%), high investment to start dairy farming (17.28%), and high cost of crossbred cow or improved buffalo (16.67%). A comparatively smaller proportion of farmers reported difficult loan procedure (11.11%) and inadequate finance by the bank for purchasing milch animals (8.02%) as major constraints.

Technical constraints: With respect to technical constraints, lack of technical knowledge for managing the dairy enterprise was reported as the major constraint by 25.00 percent of the respondents. This was followed by high cost of consultancy services from private practitioners (22.58%), inadequate veterinary facilities in the village (20.97%), and

limited availability of veterinary literature (16.94%). Poor conception rate in dairy animals was reported by 14.52 percent of the respondents as an additional technical problem.

Marketing constraints: Among the marketing constraints, competition from well-established and large dairy units was reported as the major constraint by 36.96 percent of the respondents. This was followed by non-remunerative milk prices (28.26%), difficulty in storing milk during summer season (18.48%), and inadequate marketing outlets for milk (16.30%).

General constraints: Among the general constraints, lack of knowledge regarding silage preparation was reported as the most important problem by 51.72 percent of the respondents. This was followed by animal susceptibility to diseases (22.41%), distant location of A.I. centres (15.52%), non-availability of improved fodder seeds (6.90%), and poor irrigation facilities for fodder cultivation (3.45%).

The constraints faced by dairy farmers in the present study were largely similar to those reported in earlier investigations. The high cost of concentrate feed, veterinary medicines, and initial investment emerged as major economic constraints, which aligns with the findings of Barman *et al.* (2024) ^[4] and Paradkar *et al.* (2025) ^[14]. Difficult loan procedures and inadequate credit facilities were also comparable with the observations of Reddy *et al.* (2024) ^[17]. Technical problems such as lack of knowledge, insufficient veterinary facilities, and poor conception rates correspond with the reports of Barman *et al.* (2024) ^[4]. Marketing challenges, particularly non-remunerative milk prices, were consistent with the findings of Reddy *et al.* (2024) ^[17]. Additionally, general issues related to fodder management and limited access to A.I. services were in agreement with Paradkar *et al.* (2025) ^[14].

Table 3: Constraints faced by dairy farmers in the Thane district

Constraints/blocks	Overall	
	f	%
Economics		
High cost of concentrate	45	27.78
High cost of crossbred cow/improved buffalo	27	16.67
High cost of veterinary medicines	31	19.41
High investment	28	17.28
Difficult loan procedure	18	11.11
Inadequate finance by the bank for purchasing milch animals	13	8.02
Overall	162	100.0
Technical		
Lack of veterinary facilities in the village	26	20.97
Highly expensive consultancy service of private practitioner	28	22.58
Lack of availability of veterinary literature in the village	21	16.94
Lack of technical knowledge to manage the dairy enterprise	31	25.00
Poor conception rate in dairy animals	18	14.52
Overall	124	100.0
Marketing		
Non-ruminative price for milk	26	28.26
Poor marketing outlet for milk	15	16.30
Difficulty to store milk in summer season	17	18.48
Competition from established & large units	34	36.96
Overall	92	100.0
General		
Distant locations of A.I centres	18	15.52
Poor irrigation facilities for growing fodder crops	4	3.45
Lack of knowledge about silage preparation	60	51.72
Non-availability of improved fodder seeds	8	6.90
Susceptibility of animals for diseases	26	22.41
Overall	116	100.0

The present study indicated that dairy farms in Thane district exhibited comparatively better production performance, with significant variation among blocks in total milk production, wet and dry average yield, and lactation milk yield, while lactation length and dry period remained largely uniform. Economic analysis revealed that feeding and labour costs constituted the major share of total expenditure and significantly influenced the cost of milk production, whereas higher herd size and milk sale rates contributed to improved income and profitability in Ulhasnagar and Kalyan blocks. Although variations were observed among blocks in expenditure, milk sales, and total income, the overall gross profit and profit per milch animal remained comparable, indicating uniform economic efficiency. The study further identified major constraints affecting dairy farming, including high cost of concentrate, lack of technical knowledge, competition from established dairy units, and poor awareness regarding silage preparation. Overall, the findings suggest that dairy farming in the study area is economically viable and productive, but reduction in input costs and strengthening of technical and extension support services are essential for improving sustainability and profitability.

References

1. Animal Husbandry Statistics Division. Livestock Integrated Sample Survey (LISS) 2024-25 brochure. New Delhi: Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India; 2025.
2. Arti, Chauhan AK, Dixit AK, Rai CK, Mondal B. Profitability and economic viability of commercial dairy farms in trans-Gangetic plains of India. *Indian J Dairy Sci.* 2024;77(3):275-281.
3. Babu YS, Saratchandra A, Prasad RMV, Nagalakshmi D, Reddy MS. A study on socio-economic characteristics of dairy farmers in Telangana State. *Indian J Vet Anim Sci Res.* 2023;52(5):42-55.
4. Barman B, Mohammad A, Kisku U, Lepcha CY. Exploring dairy farming practices and perceived constraints: A study of Rajbanshi farmers in Coochbehar. *Indian Res J Ext Educ.* 2024;24(1):44-52.
5. Chendge PD, Waghmare SU, Harane SP, Khatke SL, Bhagat DJ, Hanmante AA. Milk production and reproduction performance of non-descript buffaloes in Konkan region. *Asian J Dairy Food Res.* 2022;41(1):33-37.
6. Gadhvi DN, Sorathiya LM, Rathva AL. Comparative profitability analysis of specialized cattle and buffalo farms. *Agric Sci Dig.* 2024;44(4):774-778.
7. Gamit V, Odedra M, Ahlawat A, Prajapati V, Patel H, Gamit K. Constraints faced by dairy farmers in different states of India: An overview. *J Entomol Zool Stud.* 2021;9(1):1901-1906.
8. Gulumbe TA, Bhat V. Comparative study of economic diversification of dairy farmers with special reference to Pune, Maharashtra. *Cardiometry.* 2022;24:498-509.
9. Islam MA, Sharma A, Ahsan S, Mazumdar S, Rudra KC, Phillips CJC. Welfare assessment of dairy cows in small farms in Bangladesh. *Animals.* 2020;10(3):394.
10. Khalangre KD, Suryawanshi MV. Socio-economic profile of dairy farmers in Maharashtra: A case study of Latur district. *ICRRD J.* 2024;5(1):109-115.
11. Khatke SL, Mayekar AJ, Kadam NP, Desai BG, Gavitt MS. Reproduction performance of non-descript buffalo in Konkan region of Maharashtra state. 2023.
12. Lyngkhohi DR, Singh SB, Singh RM, Tyngkan H. Trend analysis of milk production in India. *J Dairying Foods Home Sci.* 2022. doi:10.18805/ajdfr.dr-1789.
13. More NM, Thombre BM, Patil RA. Feeding practices of dairy animals in Latur district of Marathwada region. *J Entomol Zool Stud.* 2020;8(6):446-448.
14. Paradkar S, Gupta S, Namdeo S, Jatav DK, Khan A. Constraints faced by livestock owners regarding livestock farming in Jabalpur division of Madhya Pradesh, India. *Asian J Agric Ext Econ Sociol.* 2025;43(1):84-89.
15. Press Information Bureau. National Milk Day: Honouring the White Revolution. New Delhi: Ministry of Fisheries, Animal Husbandry and Dairying, Government of India; 2025 Nov 25.
16. Rajpoot V. Studies on Management Practices, Performance and Welfare Status of Dairy Animals in Muzaffarnagar District of Uttar Pradesh [PhD thesis]. Karnal: National Dairy Research Institute; 2019.
17. Reddy GSM, Deva S, Sahadevareddy B, Srinivasulu DV. Constraints perceived by dairy farmers in Anantapuramu district of Andhra Pradesh. *Int J Vet Sci Anim Husb.* 2024;9(3):489-494.
18. Shelar R, Singh AK, Maji S. Constraints in adapting to climate change in Konkan region of Maharashtra. *Indian J Ext Educ.* 2022;58(1):169-171.

19. Shumway RH, Stoffer DS. Time Series Analysis and Its Applications: With R Examples. 4th ed. New York: Springer; 2017.
20. Snedecor GW, Cochran WG. Statistical Methods. 8th ed. Ames: Iowa State University Press; 1989. p. 289-290.
21. TAAS. National Dialogue on Sustainable Growth and Development of Indian Dairy Sector: Proceedings and Recommendations. New Delhi: The Animal Agriculture Society; 2023.