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Business analysis of milk enterprises In Washim district

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Abstract

Dairy farming is more than a livelihood—it is a dynamic enterprise that underpins rural economies across India. In Washim district of Maharashtra, cow milk production significantly contributes to household income and nutritional security for agricultural families. This study is based on primary data collected from 15 dairy farmers representing varied enterprise scales, from small to large. Through direct engagement with these farmers, the research captures practical insights into the economics of milk production, covering input-output ratios, cost structures, milk yield efficiency, marketing practices, and by-product utilization such as cow dung and gaumutra. Unlike studies based on secondary data, this research is rooted in field-level realities and real-time observations. Each farmer's operational details were meticulously recorded and analyzed to evaluate production costs and income generation. This farmer-centric approach ensures the findings reflect authentic challenges and practices in rural dairy enterprises. The outcomes provide actionable insights for policymakers, dairy entrepreneurs, and researchers to enhance profitability, efficiency, and sustainability in the sector, offering a framework for data-driven decision-making in dairy farm management based on ground-level evidence.

Keywords: Dairy farming, Cow milk production, Farmer-centric approach, By-product utilization

Introduction

Dairy farming plays a vital role in India's rural economy by providing livelihood opportunities, nutritional support, and a steady income to millions of families. Among dairy animals, cows are particularly valued for their adaptability to rural conditions, religious significance, and consistent milk production. In many households, cow milk serves as a key source of daily nutrition and a dependable income stream that supports rural economic stability.

India is currently the world's leading milk producer, contributing over 24% to global milk output, with more than 230 million tonnes produced annually. Cow milk makes up a substantial portion of this total. The dairy sector contributes nearly 4.5% to the national GDP and over 25% to the agricultural GDP, underscoring its economic importance. While some states like Maharashtra have advanced in dairy development—especially districts like Pune and Kolhapur—other regions such as Vidarbha, including Washim district, are still in the early stages of dairy growth.

Washim district, largely dependent on monsoon-fed agriculture, is now seeing a gradual shift toward dairy farming, particularly among small and marginal farmers. For many of these farmers, cow milk production acts as a financial cushion against uncertain crop yields, offering a stable supplementary income. However, several challenges persist, including low milk productivity, inadequate veterinary services, high input costs, and limited access to reliable markets. Most dairy units in the region are small-scale and family-operated, often lacking professional management practices.

Despite these challenges, cow milk enterprises in Washim hold significant untapped potential. Enhancing breed quality, improving feed and healthcare, and establishing better market access could transform these enterprises into powerful drivers of rural development. Analyzing the economic structure and functioning of these units is essential for designing effective policies and support programs.

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This study focuses on evaluating the economic viability and operational practices of cow milk producers in Washim district. It examines key aspects such as cost components, income generation, marketing systems, and constraints faced by dairy farmers. Based on primary data collected from 15 local dairy farmers, the research provides practical insights relevant not only to Washim but also to similar rural settings across India. By addressing both production and marketing aspects, the study offers valuable recommendations for enhancing the profitability and sustainability of dairy enterprises. Additionally, it explores the socio-economic conditions of cattle owners, estimates the cost of production and returns from cow milk production, analyzes the marketing channels and practices involved in milk distribution, and identifies the key challenges faced in cattle rearing that hinder the growth and efficiency of the dairy sector.

Methodology

Area of Study

The research was carried out in Washim district of Maharashtra's Vidarbha region, chosen for its emerging yet under-explored role in cow milk production. Primary data was collected directly from milk producers through personal interviews using a structured questionnaire.

Analytical tools

Fixed cost

The fixed costs in the study comprise expenses related to capital investments in cow sheds, transport vehicles, wells or borewells, utensils, and storage containers.

Variable cost

Variable costs encompass recurring expenses such as feed, green and dry fodder, labour, veterinary charges, electricity, disinfectants, and medicines.

Total cost

The total processing cost was determined by combining both fixed and variable expenses.

Total cost = Fixed cost + Variable cost

Gross Returns

Gross returns include income generated from the sale of milk and by-products such as cow dung and gaumutra.

Gross return = Quantity of Milk Sold × Selling Price + Value of By-products

Net Returns: Net income represents the actual profit earned after deducting total costs from the gross returns.

Net Income = Gross Return – Total Cost

Benefit-cost Ratio

The benefit-cost ratio is a measure that evaluates the relationship between the total income generated (including milk and by-products) and the overall costs incurred, indicating the economic efficiency of the dairy enterprise.

B:C ratio = Gross return / Total cost

Break-Even Point (in litres): The Break-Even Point (BEP) in cow milk production helps determine the volume of milk that must be sold to cover total costs (fixed + variable), after which the enterprise starts making a profit.

$$\text{BEP (litres)} = \frac{\text{Total Fixed Costs}}{\text{Selling Price Per Litre} - \text{Variable Cost Per Litre}}$$

Marketing Channels

The milk marketing channels observed in the study are:

Channel I: Producer → Retailer → Consumer

Channel II: Producer → Consumer

Marketing cost: The total cost includes the expenses incurred by the producer as well as those of intermediaries involved in the collection, transportation, and sale of milk until they reach the final consumer.

Market margin

Market margin denotes the gap between the final price paid by the consumer and the amount received by the producer, reflecting the income earned by intermediaries engaged in the marketing chain.

Market Margin = Selling price - (Purchase Price + Marketing Cost)

Result and Discussion

The results were systematically organized based on the specific objectives of the study.

Socio-economic characteristics of cattle owners

To fulfill this objective, key socio-economic variables such as age, education, cattle farming experience, family size, and landholding were analyzed to understand the profile and livelihood dynamics of cattle owners.

Table 1: Socio-economic characteristics of cattle owners.

Variable	Category	No. of Farmers	Percentage of Farmers (%)
Age	Up to 45	8	53
	46 – 55	4	27
	Above 55	3	20
Education	Up to Primary Education	5	34
	Secondary and Higher Secondary Education	2	13
	Graduate and above	8	53
Experience in Cattle Farming	Up to 10 years	4	27
	11 – 30 years	5	33
	Above 30 years	6	40
Family Size	Up to 4 members	4	27
	5 to 11 members	9	60
	More than 11 members	2	13
Land Holding	Small Farmer (Up to 2 ha)	5	33
	Medium Farmer (3 to 10 ha)	10	67
	Large Farmer (More than 10 ha)	0	0

The socio-economic profile of the selected 15 dairy farmers in Washim district reveals key insights relevant to the study. A majority of the farmers (53%) are aged up to 45 years, indicating active involvement of younger individuals in cow milk production. In terms of education, over half (53%) are graduates or above, while 34% have only primary education. The experience in cattle farming varies, with 40% having more than 30 years of experience, suggesting a strong

traditional knowledge base, while 27% are relatively new with up to 10 years of experience. Most farmers (60%) belong to medium-sized families with 5 to 11 members, and 67% are medium landholders owning between 3 to 10 hectares of land. This demographic and economic profile highlights the potential for professionalizing dairy farming among educated, experienced, and resource-accessible farmers in the region.

Table 2: Classification of farmers Based on No. of Cows Owned

Particulars	Small Farmers	Medium Farmers	Large Farmers
No. of Farmers	4	9	2
No. of Cows Owned	Up to 20 Cows	21–40 Cows	More than 40 Cows
No. of Average Milch Cows	15	30	60
Avg. Milk in lit/day	75	170	320
Annual income (₹)	Up to 1 lakh	1.01 to 5.5 lakh	Above 5.5 Lakh

The classification of farmers based on the number of cows owned shows distinct differences in herd size, milk production, and income levels. Small farmers (4 in number) typically own up to 20 cows with an average of 15 milch cows, producing around 75 litres of milk per day and earning up to ₹1 lakh annually. Medium farmers (9 in number) own 21–40 cows with an average of 30 milch cows, yielding approximately 170 litres of milk daily and earning between ₹1.01 to ₹5.5 lakh per year. Large farmers (2 in number) manage more than 40 cows with an average of 60 milch cows, producing 320 litres of milk per day and

generating an annual income above ₹5.5 lakh. This classification highlights the scale-wise variations in productivity and profitability among dairy farmers.

II. Cost and Returns of Cow Milk Production

The analysis of cost and returns in cow milk production provides insights into the economic viability of dairy farming. It includes detailed estimation of fixed and variable costs incurred by farmers and the income generated through milk sales and by-products. This helps assess profitability and efficiency across different farm sizes.

Table 3: Total Annual Cost Per Category of Farmer (Cow/Year)

A. Variable Costs				
Sr. No.	Particulars	Small Farmer (₹)	Medium Farmer (₹)	Large Farmer (₹)
1	Dry Fodder	1266 (38.07%)	950 (26.75%)	1125 (31.91%)
2	Green Fodder	300 (9.02%)	430 (12.10%)	450 (12.76%)
3	Protein Concentrate	586 (17.62%)	671 (18.89%)	650 (18.43%)
4	Labour Charges	1200 (36.09%)	1500 (42.24%)	1300 (36.87%)
Total Variable Cost (₹)		3325	3551	3525
B. Fixed Costs				
Sr. No.	Particulars	Small Farmer (₹)	Medium Farmer (₹)	Large Farmer (₹)
1	Cow Shed	333.33 (18.70)	400 (20)	1008.33 (46.18)
2	Vehicle (Transport)	1093.33 (61.34)	1200 (60)	800 (36.64)
3	Well / Borewell	222.22 (12.46)	250 (12.5)	200 (9.16)
4	Utensils & Containers	133.4 (7.48)	150 (7.5)	175 (8.01)
Total Fixed Cost (₹)		1782.28	2000	2183.33

The above table presents a detailed comparison of the variable and fixed costs incurred by small, medium, and large cow milk producers. Among the variable costs, labor charges account for the highest share across all categories, with small farmers spending ₹1200, medium farmers ₹1500, and large farmers ₹1300. Dry fodder is another major component, especially for small farmers at ₹1266. Other recurring expenses include green fodder and protein

concentrate, with slight variations across farm sizes. In terms of fixed costs, the largest investment for small and medium farmers is in transport vehicles, whereas large farmers invest more in cow sheds. Total fixed costs range from ₹1782.28 for small farmers to ₹2183.33 for large farmers. This cost structure highlights how input allocation differs by scale and provides a foundation for analyzing the profitability of each farmer category.

Table 4: Seasonal Variation in Milk Yield and Farmer Income Across Categories (Cow/Rs) (FY 2024–25):

Sr. No.	Month	Season	Avg Yield Impact	Yearly Price Parity (Rs/Lit)	Small Farmer (₹)	Medium Farmer (₹)	Large Farmer (₹)
1	Apr–Jun 2024	Summer	↓15%	50	22,910	22,964	17,797
2	Jul–Sep 2024	Monsoon	Fluctuating	45	27,800	27,867	21,588
3	Oct-24	Transition	Normal	48	9,267	9,289	7,187
4	Nov–Jan 2025	Winter	↑20%	45	34,570	34,654	26,834
5	Feb-25	Transition	Normal	45	9,267	9,289	7,187
6	Mar-25	Summer	↓15%	50	7,637	7,655	5,932

The table illustrates seasonal variations in milk income for small, medium, and large farmers from April 2024 to March 2025, factoring in average yield impacts and yearly price parity. Summer months (Apr–Jun and Mar) show a 15% drop in yield but benefit from a higher selling price of ₹50/litre, resulting in moderate incomes. Monsoon season (Jul–Sep) has fluctuating yields and lower price parity at

₹45/litre. The winter season (Nov–Jan), with a 20% increase in yield, contributes the highest income despite a lower price parity, showing ₹34,570 for small farmers and ₹26,834 for large ones. Transitional periods (Oct and Feb) maintain normal yields and moderate incomes, emphasizing how both price and yield seasonality affect farmer earnings.

Table 5: Economics of Cow Milk Production (Cow/Year)

Sr. No.	Economic Indicator	Small Farmer (₹/cow/year)	Medium Farmer (₹/cow/year)	Large Farmer (₹/cow/year)
1	Milk Sales	1,08,000	1,08,000	81,000
2	By-product Income	3,200	3,466.66	5,350
3	Total Gross Return	1,11,200	1,11,466.66	86,350
4	Total Cost	80,000	75,000	70,000
5	Net Return	31,200	36,466.66	16,350
	B:C Ratio (per cow)	1.39	1.49	1.23
	Cost per litre (₹/litre)	44.44	41.67	38.89
	Break-Even Point (litres/year)	1,333.33	1,250	1,555.56
	Break-Even Price (₹/litre)	44.44	41.67	38.89

The table presents a comparative economic analysis of cow milk production across small, medium, and large farmers on a per cow per year basis. Medium farmers achieved the highest net return of ₹36,466.66, followed by small farmers at ₹31,200, and large farmers at ₹16,350. Although milk sales were consistent for small and medium farmers at ₹1,08,000, large farmers earned significantly less at ₹81,000. Medium farmers also maintained the highest benefit-cost (B:C) ratio of 1.49, indicating better profitability. Cost per litre of milk decreased with farm size—₹44.44 for small, ₹41.67 for medium, and ₹38.89 for large farmers. Break-even analysis revealed that large farmers required a higher annual milk output (1,555.56 litres) to break even, whereas medium farmers needed only 1,250 litres, highlighting better cost efficiency. These findings emphasize that medium-scale milk producers managed to strike an optimal balance between cost, production, and return, making their operations comparatively more viable.

III. Marketing Channel Structures for Milk Sales

Table 6: Channel-wise Milk Marketing Performance – Small Farmers (Cow/Year)

Particulars	Channel I	Channel II
Milk Yield (L/year)	1,825	1,825
Selling Price (₹/L)	45	60
Cost of Production (₹/L)	44.44	44.44
Retailer Margin (₹/L)	12	0
Farmer Margin (₹/L)	3.22	15.56
Marketing Cost (₹/cow/year)	500	600
Total Farmer Income (₹/year)	5,883.50	28,909.00

Milk marketing analysis for small farmers shows clear profit differences between channels. In Channel I (via retailer), farmers earned ₹5,883.50 per cow annually with a low margin of ₹3.22/litre due to retailer deductions. In Channel II (direct to consumer), income rose significantly to

₹28,909.00 per cow, with a higher price of ₹60/litre and margin of ₹15.56/litre. Despite slightly higher marketing costs, direct sales proved far more profitable.

Table 7: Channel-wise Milk Marketing Performance – Medium Farmers (Cow/Year)

Particulars	Channel I	Channel II
Milk Yield (L/year)	1,950	1,950
Selling Price (₹/L)	45	60
Cost of Production (₹/L)	41.67	41.67
Retailer Margin (₹/L)	15	0
Farmer Margin (₹/L)	3.33	18.33
Marketing Cost (₹/cow/year)	350	500
Total Farmer Income (₹/year)	6,503.50	35,743.50

For medium farmers, direct-to-consumer milk sales offer a clear economic benefit. In Channel I (via retailer), income was ₹6,503.50 per cow/year with a low margin of ₹3.33/litre due to retailer cuts. In Channel II, income rose to ₹35,743.50 per cow/year with a higher margin of ₹18.33/litre. Though marketing costs were slightly higher, direct sales significantly boosted profitability.

Table 8: Milk Marketing Structure and Returns – Large Farmers (Cow/Year)

Particulars	Channel I
Milk Yield (L/year)	1,875
Selling Price (₹/L)	45
Cost of Production (₹/L)	38.89
Retailer Margin (₹/L)	15
Farmer Margin (₹/L)	15
Marketing Cost (₹/cow/year)	300
Total Farmer Income (₹/year)	28,875.00

Large farmers marketed milk solely through Channel I, earning ₹28,875 per cow annually. With a yield of 1,875 litres, a selling price of ₹45/litre, and low marketing cost (₹300), they maintained a high farmer margin of ₹15/litre, reflecting efficient and profitable operations.

Table 9: Constraints in Rearing of Cattle

Sr. No.	Constraint	No. of Farmers (Frequency)	Percentage (%)	Rank
1	High feed and fodder cost	12	80	1
2	Low milk selling price	11	73.33	2
3	Lack of veterinary services	9	60	3
4	Inadequate credit or loan facilities	8	53.33	4
5	Disease and health issues in cattle	7	46.67	5
6	Lack of proper housing and infrastructure	6	40	6
7	Labour shortage	5	33.33	7
8	Difficulty in marketing milk	4	26.67	8
9	Fluctuation in milk demand & prices	4	26.67	9

The major constraints faced by dairy farmers in the study were high feed and fodder costs (80%) and low milk selling prices (73.33%), ranking first and second, respectively. Other significant issues included lack of veterinary services (60%), limited access to credit (53.33%), and cattle health problems (46.67%). Challenges like poor housing, labour shortage, and marketing difficulties were also reported, indicating a need for improved support systems and infrastructure in dairy farming.

Conclusion

The study assessed the economic viability, marketing practices, and production constraints of cow milk enterprises in Washim district, focusing on per cow performance across small, medium, and large farmers. Most dairy farmers operate on small to medium landholdings and manage dairy as a supplementary activity to agriculture. Feed and fodder constituted the largest share of per cow annual expenditure, while medium and large farmers benefited from lower per-unit costs due to better resource management and economies of scale. Profitability analysis showed that cow milk production is financially viable, with medium and large farmers earning higher net returns per cow per year due to improved yields and efficiency, while small farmers reported modest profits due to higher costs and limited access to services.

Marketing analysis revealed that direct-to-consumer sales yielded the highest price per litre, though feasibility depended on location and infrastructure. Most farmers used a combination of channels to stabilize income. Key constraints included high input costs, inadequate veterinary care, lack of cold chain facilities, and market price fluctuations. These challenges were more pronounced for small farmers with weaker institutional support. The study concludes that while cow milk production is a sustainable rural enterprise, enhancing its performance requires improved farm management, input access, veterinary services, and stronger market linkages tailored to different farm sizes.

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