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## Envisioning entrepreneurial scope in the dairy sector through macroeconomic analysis

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### Abstract

The export of dairy products recorded a growth of 19.45% (\$471 Mn in FY 2022-23). According to Statista 2022 published report, the market size of packed dairy products is 968 Mill INR. Huge Market potential can be seen in the dairy sector for Entrepreneurial ventures and experimenting with PPP models even in Small scale farmers. The present study suggests that the return on investment is assured no matter whether the farm is organized or unorganized, Mechanization and Higher herd size holding resulted in better utilization of resources. ROI on Investment was found to be 1.45 across groups on average and B.C Ratio was high in small farm size holdings. Inputs were utilized better and converted into outputs to lucrative margins.

**Keywords:** Macroeconomics, dairy farm, NSS, input, output, market analysis

### Introduction

India contributing 24% of global milk production in the year 2021-22 is no wonder the highest Milk Producer in the world. A registered 51% increase during the last eight years (2014 to 2022) was observed indicating huge potential in the Market in the upcoming years. The export of dairy products recorded a growth of 19.45% (\$471 Mn in FY 2022-23). According to Statista 2022 published report, the market size of packed dairy products is 968 Mill INR.

The market growth in Dairy requires immense support of significant infrastructure investment across processing, chilling, logistics, cattle feed, etc. There are lucrative untapped opportunities for Private investors and seed funders in areas such as value-added dairy products, Marketing channelization, organic/ farm fresh milk, and exports, these are open opportunities for External investors in an area that largely depends on government assistance for sustainability. 65% of the Indian Population is directly or indirectly involved in Agriculture and Dairy sector proving it a Ginormous market to explore entrepreneurial opportunities The expected market size by 2026 as per Invest India is 314 Bn USD. <https://www.investindia.gov.in/sector/food-processing/dairy>. Having understood the potential of the market and its scope for investments an in-depth macroeconomic analysis to investigate the Input Utilization of regional areas will provide an insight into the ground realities of the Market and this has been the primary objective of the present study. Input-Output economic analysis is a largely significant market analysis that was developed by Wassily Leontief (1906–1999), which won him Nobel Memorial Prize in Economic Sciences.

### Research Methodology

The present study was conducted to understand the efficiency of input resource utilization in small and medium dairy farmers in the industry for an outlook to analyze outputs. Sri Venkateswara Veterinary University Andhra Pradesh under the NSS (National Service scheme) organized several developmental activities and adopted Villages for the holistic development of rural areas. A sample size of 75 respondents was selected in 5 Villages namely Sunnapurallapalle, Gopavaram, Chapadu, Devagudi, and Gandikota. The responding Farmers were categorized into marginal small, semi-medium, medium, and large farmers respectively as per the size of land holding derived from pilot data collected. The pilot data included general information about the Farmers, cropping pattern, and farm resource structure.

A structured Interview developed by experts after pre-testing and evaluation was used to know the socio-economic status of the Dairy farmers, family size, educational status, and utilization of social media and information and Communication Technologies. A basic background study was crucial to understanding the farmers and farming conditions in the sample.

For the study, the cost of cultivation classified as recommended by, the “Special expert committee on cost estimates, GOI, New Delhi”, was used in this study. Purposive sampling was used in the study and 15 Dairy farmers in each village were purposively selected and were approached through a designed questionnaire. Out of five selected villages Sunnapurallapalle village was taken as a model village where large-scale farmers were found to be practicing better farming methods and advanced mechanization was observed. The Four villages were categorized as NMV (Non-Model Village) where the cost incurred is calculated per animal and in the model village Herd is taken as a Unit for calculation for better understanding, both were compared and the difference in the organized and unorganized sectors was compared.

**Results and Discussion**

**Socio-economic characters**

The majority of the farmers were found to be falling under the mid-age group of about 35-40 years of age. Illiterate members were an average of 6.67 percent of total respondents indicating a maximum literacy rate in the respondents. The majority of the respondents (75.5%) utilized smartphone services and had knowledge of utilizing social media platforms. The majority of the farmers had small family sizes

and had average Extension contact (55%) the newly established RBK (*Raitu bharosa kendra/Farmers Credence Centers*) was approached for most of their information needs. All the farmers were also engaged in Agricultural production apart from dairy.

Women were the major workforce for small and medium-sized farms and family labor was utilized in both categories effectively. Large farm-size holders utilized minimal outside labor for defined farm operations like Milking and cleaning of the sheds apart from that family labor was functional in monitoring and feeding. Many of the farmers were interested in expanding their farms but due to a lack of access to credit facilities, they were forced to settle for small farm size.

The milk production function used in the present study for functional analysis is as follows:

$$Y = f (X_1, X_2, X_3, X_4, X_5)$$

Where per-day values are considered as

Y = Income from milk per animal (-)

X<sub>1</sub> = Expenditure on green fodder per animal per day (₹)

X<sub>2</sub> = Expenditure on dry fodder per animal (-)

X<sub>3</sub> = Expenditure on concentrates per animal (-)

X<sub>4</sub> = Value of labor used per animal per day (-)

X<sub>5</sub> = Miscellaneous expenses per animal (₹)

**Table 1:** Fixed cost incurred on each milch animal per Year in NMV

SN	Category of the Milch animal unit	Cost of sheds			Non-establishment cost					Average fixed cost per milch animal
		Present value of sheds	Total cost of shed per milch animal	Cost of Depr Citation (15%)	Feeding trough	Chaff cutters	Milking cans/Miscellaneous	Total cost per milch animal	Cost of depreciation per milch animal (20%)	
1	Small	17356	9289	1395	351	74	450	875	175	1568
2	Medium	19319	12888	1933	400	135	500	1035	207	2138
3	Large	25230	18925	2836	430	178	530	1135	227	3064

The results suggest that the average fixed cost incurred in establishing a large farm was 3064, whereas in small farms it was 1568, and medium farms incurred 2138.

**Table 2:** Labor and Miscellaneous costs per milch animal/year in NMV

S.N	Category of the Milch animal unit	Labor charge	Medical cost	Other costs	Total cost per milch animal
1.	Small	3275	40	35	3350
2	Medium	3250	45	17	3312
3	Large	2800	39	25	2864

Expenses incurred on Labor in Large farms were observed to be low when compared to small farms suggesting efficient

utilization of labor in large farms. Labor cost and farm size were indirectly proportional to each other

**Table 3:** Total cost per milch animal per year for milk production in NMV

SN	Category of the Milch animal unit	Average Fixed cost	Feed and fodder cost	Labor and Miscellaneous cost	Interest on Working capital	Average operation	Total cost
1	Small	1568	3348	3292	830	7470	9038
2	Medium	2138	3395	3212	826	7433	9571
3	Large	3064	3649	2864	814	7327	10391

The total cost incurred in large-scale farms was higher when compared to medium and small but the variation is not high between the categories.

**Table 4:** Economics of Dairy units/Year as categorized based on the size of the farm in Modal Village Sunnapurallapalle

	Small	%	Medium	%	Large	%
Proportion		45		30		25
Average herd size	2-3		4-5		>7	
<b>Variable cost</b>						
Cost of dry fodder	11,345	11.36	22,341	11.97	39,468	12.35
Cost of green fodder	15,546	15.56	25,432	13.63	44,576	13.95
Cost of concentrates	298,669	29.70	54,876	29.40	92,884	29.07
Labor cost	35,185	35.18	58,082	31.12	99,708	31.20
Veterinary cost	2,564	2.56	3,245	1.74	6,345	1.99
Miscellaneous cost	465	0.46	954	0.51	1,845	0.58
Interest on variable cost at 7%	6,134	6.14	1,154	6.19	19,938	6.24
Total variable cost	93,768	93.88	176,475	94.55	304,764	95.37
<b>Fixed cost</b>						
Amortized cost of animal	3,055	3.06	5,334	2.86	7,889	2.47
Amortized cost of building	2,154	2.16	3,122	1.67	4,221	1.32
Depreciation cost	345	0.35	788	0.42	1,342	0.42
Interest on fixed capital at 10%	555	0.56	924	0.50	1,345	0.42
Total fixed cost	6,109	6.12	10,168	5.45	14,797	4.63
Total cost	99,877	100.00	186,643	100.00	319,561	100.00
<b>Gross returns</b>						
Returns from milk	135,645	95.64	2,60,122	95.93	456,334	95.98
Returns from Manure	4,235	2.99	7,885	2.91	13,665	2.87
Returns from the sale of the male calf	1,955	1.38	3,150	1.16	5,432	1.14
Total gross returns	141,835	100.00	271,157	100.00	475,431	100.00
Total net returns	41,958		84,514		155,870	
Returns per cow	20,979		21,129		22,267	
Returns per rupee investment	1.42		1.45		1.49	

Standard Amortization expression was used for calculation and 10% Interest on fixed capital was considered. The gross cost was obtained by adding the total variable cost and total fixed cost. The results suggest an ROI of 1.42 in small farmers and 1.49 in large farm-size farmers. A negligible difference is seen between the categories, Case study results suggest a huge variation in the ROI as per the farm size, a herd size of more than 25 animals resulted in a solid ROI of Rs. 3.50 (Agrifarming-March-2022ed).

**Table 5:** Economics of milk production per animal per year NMV

SN	Category of the Milch animal unit	Total cost	Total milk production liters	Gross return	Net return	B.C. Ratio
1	Small	9038	1226	14712	5674	1.63
2	Medium	9571	1265	15180	5609	1.59
3	Large	10391	1325	15900	5509	1.58

Data on total cost and total return is the basis for economic evaluation and was found to be a lucrative business overall. Analysis of the benefit-cost ratio (B.C. Ratio) found to be decreasing with the increase in the size of the herd, The highest ratio of 1.63 with the Small category followed by the lowest 1.58 with the large category.

### Conclusion

An in-depth analysis and understanding of the study area revealed that no matter what the input sources are the output was lucrative in the dairy industry and there is a scope for encouraging entrepreneurial ventures through PPP models through support/funding the unorganized sectors. Small farmers are seen obtaining equal income per animal, on par with the organized sector due to the zero-labor cost involved due to the utilization of family labor and Unaccounted farm waste used to feed animals and Occasional natural grazing, Further studies suggested in the area with respect to Alternate

rations and output analysis, zero grazing cost analysis, Doubling farmers income implementation inputs and outputs proportions will give a clearer picture of the industry.

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