



Estimation of Private Final Consumption Expenditure on Milk and Milk Products in Madhya Pradesh

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How to cite this paper:

Agrawal, A., & Raju, R. (2021). Estimation of Private Final Consumption Expenditure on Milk and Milk Products in Madhya Pradesh. *International Journal of Livestock Research*, 11(4), 50-55. <https://dx.doi.org/10.5455/ijlr.20210111024403>

Received : Jan 16, 2021
Accepted : Mar 09, 2021
Published : Apr 30, 2021

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Abstract

India is the world's largest milk producer, contributes 187.96 million tonnes (~22 per cent) to the total milk production in the world during 2018-19. The share of Madhya Pradesh in country's milk production is 15.91 million tonnes (8.46 per cent). The per capita availability of milk in the state is 538 gm/day as against 394 gm/day for India. In spite of highest availability of milk, the consumption is very low in Madhya Pradesh. The current study estimated the private final consumption expenditure on milk and milk products considering different milk consumer categories in Madhya Pradesh. The present study was carried out by collecting primary data from 140 rural and urban resident households along with 10 non-profit institutions serving households. The study revealed that the state's private final consumption expenditure on milk and milk products is around 9 per cent of country's PFCE on milk and milk products at current prices, which coincides with states contribution to country's milk production during 2019.

Keywords: Madhya Pradesh, Milk and Milk Products, Resident Households, NPISHs, PFCE

Introduction

The contribution of livestock sector in the country's gross domestic product (GDP) is continuously increasing and is one of the most significant changes found in the India's agricultural economy over the past few decades. The contribution of livestock sector to total gross value added at current prices during 2017-18 was 4.9 per cent (CSO, 2019) while the share of dairy industry in value of output from livestock sector in India is 67 per cent. Consumption is the largest component of demand generated within an economy. Two broad components of it are private consumption and government consumption. Private consumption is true reflection of demand generation in an economy compared to government consumption. To reflect the true economic growth, Private Final Consumption Expenditure (PFCE) is a latest methodology suggested by CSO to estimate GDP in India. PFCE is defined as the expenditure incurred by the resident households and non-profit institutions serving households (NPISHs) on final consumption of goods and services, whether made within or outside the economic territory.

Madhya Pradesh is one of the fastest growing states in the field of dairy industry and stands third in milk production in the country with 15.91 million tonnes (8.5 per cent of total) (NDDDB, 2019). The per capita milk availability in the state has increased from 278 gm/day in 2009-10 to 538 gm/day during 2018-19 (NDDDB, 2019). As the consumption pattern of consumers in the state have been undergoing significant shift towards high value commodities like fruits and vegetables, dairy products have also witnessed rising demand. Milk and milk products being rich in nutritional aspect made it necessary to assess the per capita consumption expenditure of households and NPISHs also called as PFCE on milk and milk products, as livestock sector contributes nearly 35 per cent to the state GDP (GOMP, 2019). There was no study available for estimation of PFCE on milk and milk products in the state. The current study has made an effort to estimate the PFCE on milk and milk products in Madhya Pradesh.

Materials and Methods

Selection of Resident Households

Multi-stage random sampling technique was used for selection of zones, districts, tehsils and villages for the current study. Madhya Pradesh consists of 11 Agro-Climatic Zones, out of which, two zones, namely, Malwa (Western) and Kymore (Eastern) were randomly selected for the study. One district from each zone and one block from each district along with two villages from each block were randomly selected. Resident households were further classified into rural and urban residents due to variation in their consumption pattern. About 70 rural households from four villages and 70 urban households were drawn randomly from each district in the study area. Overall, primary data on consumption of milk and milk products was collected from selected 140 consumers in Madhya Pradesh.

Selection of Non-Profit Institution Serving Households (NPISHs)

NPIs were classified according to the sectors they serve by CSO into three categories as: government, industries and household sectors.

a) Serving government: The societies which are mainly financing their activities through government aid/grants are classified as 'societies serving government'.

b) Serving industries: The societies created by farmers, manufacturers, traders, professionals like doctors, lawyers, auditors, etc. for the benefit of their respective businesses/industries are classified as 'societies serving industries'. They consist of chamber of commerce, trade associations, market associations, market federations, etc.

c) Serving households: The 'societies serving households' consist of societies which provide or sell goods or services to households and are not mainly financed by the Government. These societies include religious societies, social, cultural, recreational and sports clubs, trade unions, labour unions, consumers associations, resident welfare associations, parents-teachers associations. These also include charities, relief and aid organizations financed by voluntary donations and offerings, in cash or in kind.

A colossal look at the Table 1 shows the distribution of the societies by the sector they serve in Madhya Pradesh. About 82 per cent of the total societies traced in the state were serving households, while 11.4 and 6.7 per cent were serving government and industrial sectors, respectively.

Table 1: Distribution of societies by the sectors they serve in Madhya Pradesh

Sl. No.	Type of Societies	Number	Per cent
1	Serving Government	3,121	11.4
2	Serving Industries	1,830	6.7
3	Serving Households	22,521	82
	Total	27,472	100

Source: CSO, 2012

Work-Force Distribution in the Societies

Societies consists of both the paid workers and volunteer workers. As paid workers are already paid the salary for providing their service in the societies so they will be accounted under resident households rather than NPISHs. Whereas, volunteer labour constitutes a significant input to NPOs. Volunteer labour is so critical to the output of the NPIs that employ it and to their ability, to produce the level and quality of services that they provide, it becomes important to capture their activity in the NPIs account. This will give a more complete picture of service actually produced and consumed in the economy and in particular fields. The distribution of work-force in the societies in Madhya Pradesh reveals that 75.2 per cent of the work-force employed in the societies were voluntary in service, while only 24.8 per cent were paid employees (Table 2). The study has taken into account paid employees under resident household category as per CSO, so expenditure of volunteer labour on goods and services provided by society at minimal or no price has been considered for computation of final consumption expenditure of NPISHs to be included in estimation of PFCE.

Table 2: Distribution of work-force in NPISHs in Madhya Pradesh

S. No.	Type of Workers	Number	Per cent
1	Paid workers	73.4	24.8
2	Volunteer workers	222.9	75.2
	Total	296.3	100

Source: CSO, 2012

A pre-determined sample of 10 NPISHs were randomly drawn from the study area and the necessary information was collected on consumption pattern of milk and milk products by the members of those societies.

Analytical Framework

Steps involved in estimation of PFCE are as follows:

1. Per capita per day milk consumption (both fluid as well as product form) was worked out as quantity of milk retained at home divided by the family size.

$$\text{Per Capita per day milk consumption} = \frac{\text{Quantity of milk retained at home}}{\text{Family size}}$$

2. Per day milk consumption for the rural, urban and NPISHs consumers was obtained by multiplying the per capita per day milk consumption with their respective population.

$$\text{Per day milk consumption} = \text{per capita per day milk consumption} \times \text{respective population}$$

3. Respective quantity of milk and milk products was multiplied by their prices to know the final consumption expenditure for different category of population.

$$\text{Final consumption expenditure} = \text{quantity of product consumed} \times \text{retail price of product}$$

4. Final consumption expenditure of all the households was added together to calculate the PFCE on milk and milk

products for Madhya Pradesh state using the methodology suggested by CSO (2015):

PFCE on milk and milk products = Final consumption expenditure on milk and milk products by resident households + final consumption expenditure on milk and milk products by NPISHs

Results and Discussion

Table 3 shows the consumption of milk by various categories of consumers in Madhya Pradesh. The study revealed that per capita milk consumption was highest in case of urban consumers (0.47 lit/day) followed by rural (0.37 lit/day) and NPISHs (0.27 lit/day). Similar findings has been reported for variation in rural and urban consumption by Bhattacharjee & Patel (2016). The study indicates that rural consumers consumed highest proportion of the total milk in the state (67.25 per cent) followed by urban (32.54 per cent) and NPISHs (0.21 per cent) consumers. Total milk consumption per day in the state was worked out to be 0.029 million tonnes. However, annual total milk consumption in the state by both the residents as well as NPISHs together was 10.68 million tonnes which is 67.17 per cent of state's total milk production.

Table 3: Milk consumption per day across various categories of consumers in Madhya Pradesh

Particulars	Type of population			
	Rural	Urban	NPISHs	Total
Total annual milk production (million tonnes)	-	-	-	15.91
Milk consumption (lit/household/day)	2.48	2.92	6.64	
Family size (No.)	6.72	6.22	24.33	
Milk consumption (lit/cap/day)	0.37	0.47	0.27	
Population (No.)	5,25,57,404*	2,00,69,405*	2,22,900**	7,28,49,709
Total milk consumption (lit/day)	19689179 (67.25)	9529682 (32.54)	60833 (0.21)	29279693 (100)
Total annual milk consumption (million tonnes)	7.19	3.48	0.02	10.69 (67.17)

Figures in parentheses indicates percentage to total milk consumption; Source: *Census, 2011, ** CSO, 2012

Table 4 represents the utilization pattern of milk across various categories of households. As milk is consumed in both fluid as well as in processed form, it is important to assess the proportion of milk intake by consumers in various forms. Out of the total milk utilized by rural households, 53.78 per cent is being consumed in liquid form while 46.22 per cent of their total milk is consumed in processed form. Urban consumers consumed major proportion of their total milk in processed form i.e., 53.46 per cent while in case of NPISHs, 65.42 per cent of their total milk is consumed as liquid milk and 34.58 per cent in processed form. Among the milk products, curd had major share of processed milk in case of rural and NPISHs consumers, while in case of urban households, ghee captures the major proportion of processed milk. Proportion of processed milk utilized for making paneer is comparatively low, especially in rural area.

Table 4: Utilization pattern of milk across various households

Sl. No.	Particulars	Resident Households		
		Rural (%)	Urban (%)	NPISHs (%)
1	Milk consumed in liquid form	53.78	46.54	65.42
2	Milk consumed in processed form	46.22	53.46	34.58
2a.	Processed milk utilized for ghee	41.3	47.1	28.49
2b.	Processed milk utilized for curd	53.13	39.23	63.99
2c.	Processed milk utilized for khoa	5.18	9.22	2.96
2d.	Processed milk utilized for paneer	0.38	4.45	4.56

Source: Author's estimation

A bird eye view of Table 5 shows the annual final consumption expenditure on milk and milk products across resident households and NPISHs. Liquid milk captured the highest proportion of total expenditure on milk and milk

products across both resident households and NPISHs. Among milk products, expenditure on curd was highest among all the households followed by ghee, while khoa and paneer got the least share in total expenditure on milk and milk products in the study area.

Annual final consumption expenditure on milk and milk products was highest in rural area (₹361.62 billion) due to 72 per cent of the states' population reside in rural areas in the state, followed by urban (₹168.68 billion) and NPISHs (₹1.14 billion). Annual per capita final consumption expenditure on milk and milk products was highest for urban consumers (₹8,404) followed by rural consumers and NPISHs. This gives the ratio of urban to rural monthly per capita expenditure on milk and milk products to be 1.2. These variations in rural and urban consumption expenditure were found to be consistent with household consumer expenditure survey estimates (2011-12) organized by National Sample Survey which shows that per capita consumption expenditure on milk and milk products is more in urban area as compared to rural area in state. Similar result was reported by authors in other states (Bhattacharjee & Patel, 2016; Krishnadas *et al.*, 2015).

Table 5: Annual final consumption expenditure on milk and milk products

Particulars	Price (₹/t)	Resident Households				NPISHs	
		Rural		Urban		Quantity (million tonnes)	Value (₹ million)
		Quantity (million tonnes)	Value (₹ million)	Quantity (million tonnes)	Value (₹ million)		
Milk	48,000	3.86493	1,85,516	1.61882	77,703	0.01453	697
Ghee	4,80,000	0.08069	38,733	0.05152	24,730	0.00013	62
Curd	80,000	1.60437	1,28,350	0.6631	53,048	0.00447	357
Khoa	2,45,000	0.03441	8,430	0.03811	9,336	0.00005	12
Paneer	2,80,000	0.00211	591	0.0138	3,863	0.00006	16
Annual final consumption expenditure		3,61,620		1,68,680		1,144	
Annual per capita consumption expenditure (₹/cap/year)		6,880		8,404		5,132	

Source: Author's estimation

Table 6 presents the PFCE on milk and milk products for Madhya Pradesh state. The study revealed that total quantity of liquid milk consumed in the state was 5.50 million tonnes, which is 34.57 per cent of state's total milk production (15.91 million tonnes). The PFCE incurred on milk and milk products in the state by all resident households and NPISHs together is ₹528.90 billion, which is about 9 per cent of country's PFCE on milk and milk products at current prices in 2018-19. Out of total PFCE, highest PFCE was being incurred on fluid milk consumption (49.90 per cent) followed by curd (34.36 per cent), ghee (12.01 per cent) while very less expenditure was made in case of khoa (2.88 per cent) and paneer (0.84 per cent). This study revealed that almost equal proportion of total PFCE was being incurred on liquid milk and milk products in the state. Overall annual per capita PFCE on milk and milk products in the state was ₹7,882.

Table 6: PFCE on milk and milk products in Madhya Pradesh

S. No.	Milk and Milk Products	Quantity	Price	Value
		(million tonnes)	(₹/tonnes)	(₹ in million)
1	Milk	5.5	48,000	2,63,917 (49.90)
2	Milk Products			
2a.	Ghee	0.13	4,80,000	63,524 (12.01)
2b.	Curd	2.27	80,000	1,81,755 (34.36)
2c.	Khoa	0.07	2,10,000	15,238 (2.88)
2d.	Paneer	0.02	2,80,000	4,471 (0.84)
	Total PFCE			5,28,905 (100.00)
	Annual per capita PFCE (₹/cap/year)			7,882

Figures in the parentheses indicates percentage of column total; Source: Author's estimation.

Conclusion

The PFCE on milk and milk products in Madhya Pradesh revealed to an extent of ₹5,28,905 millions per year, which is nearly 9 per cent of country's PFCE on milk and milk products at current prices. It coincides with the contribution of state to the country's total milk production. The ratio of urban to rural monthly per capita final consumption expenditure on milk and milk products was 1.2 which depicts that the per capita consumption expenditure on milk and milk products is lower in rural areas of state. Rural population consumes major proportion of total state milk production as 72 per cent of states' population reside in rural area but per capita milk consumption was low in rural areas (370 g/cap/day) as compared to urban areas (470 g/cap/day). The study indicates that to increase per capita milk consumption in rural areas, efforts should be made to create awareness on the nutritional benefits of milk and milk products.

Acknowledgement

The authors express their heartfelt thanks to the Director, ICAR-National Dairy Research Institute, for providing financial assistance and infrastructure to carry out the research work during the M.Sc. study period.

Conflict of Interests

There is no conflict of interest.

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