***Original Research Article***

**Utilization and Consumption pattern of milk and milk products in Andhra Pradesh**

**ABSTRACT**

Milk and dairy products are vital for a balanced diet and play important roles in the economy and culture. India is the world's largest producer and consumer of milk. This study examines milk consumption and use in Andhra Pradesh, gathering data from 80 farmers and 50 consumer households. Findings indicate that small farmers consume 11.83% of their total milk production, while large farmers consume only 5.23%. Among the milk retained in households, the majority was utilized as liquid milk (61.72%), followed by curd (25.40%) and ghee (12. 88%).On average, daily liquid milk consumption is 1.24 liters, higher than that of milk products across both rural and urban areas. Rural areas consume slightly more liquid milk, while urban areas prefer curd. Ghee consumption is similar in both regions, with rural areas showing a marginally higher intake.

**Keywords**: Milk, Ghee, Curd, Utilization, Consumption

**INTRODUCTION**

Livestock is crucial to the Indian economy, and dairy development is significant for creating income and jobs in rural areas. Dairy production boosts rural livelihoods by increasing per capita income (Squicciarini et al., 2017), enhancing food security, and providing a viable way out of poverty for smallholders (Randolph et al., 2007). The dairy sector is vital to India's agricultural economy, generating income and creating jobs that support rural communities (Naresha and Dixit, 2023). The dairy sector is a crucial resource for small and marginal producers, offering benefits like draught power and organic fertilizers that improve crop production. Milk is highly nutritious and plays a vital role in the diets of infants and lactating mothers. As the population grows and the economy develops, the demand for dairy products is set to increase significantly (Ohlan,2016).

 India is the world's largest producer and consumer of milk, with a production of 230.6 million tonnes and a per capita availability of 459 grams per day, accounting for 25% of the global output (GoI 2024). Milk production has significantly increased due to dairy development programs and higher consumer demand for value-added products. (Naresha et al.,2023; Sunil et al., 2016). Due to economic growth, a rising population, and increased health awareness, the demand for milk and dairy products is expected to rise, leading to a larger share of household income spent on these items (Krishnadas et al., 2016). Andhra Pradesh is the world’s largest milk producer, with a production of 15.45 million tonnes (MT) in 2022-23 and a per capita availability of 799 grams per day (GoI 2024). Dairy farmers reserve some liquid milk for their households and sell the rest through various channels. The amount set aside varies by state. Owning cows or buffaloes is believed to increase household milk consumption, especially among children (Bhagowalia et al., 2012). However, significant differences in milk consumption exist across states in India. Dairy consumption trends show that rural and urban areas are increasing their milk intake, but spending remains lower in rural areas than in urban ones(Ohlan,2016). Research comparing milk consumption in households with milch animals (producers) and those that purchase milk (non-producers) is limited. Additionally, understanding how much liquid milk households buy is important for milk marketing insights. While there is data on state milk production, there is little research on state-level consumption patterns. (Bhattacharjee & Patel, 2016). Thus this paper analyses the consumption and utilization of milk and milk products in both rural and urban households.

**METHODOLOGY**

The consumption pattern of milk refers to how different stakeholders utilize liquid milk and its various dairy products. While milk producers retain a portion for personal consumption, either as liquid milk or processed into other dairy products, non-producer consumers differ in their milk consumption levels and preferences. To analyze milk and milk product utilization, primary data was collected through personal interviews with 80 producer-consumer households and 50 non-producer-consumer households. Based on information gathered from milk producers, they were categorized into three herd size groups using the cumulative square root frequency method:

* Small (1-5 Standard Animal Units - SAUs)
* Medium (6-9 SAUs)
* Large (>9 SAUs)

Additionally, 50 consumer households were surveyed—25 from rural areas and 25 from urban areas neighboring the selected villages—to further examine milk and dairy product utilization patterns.

**RESULTS AND DISCUSSION**

 Milk produced by the dairy farmers was observed to be utilized as liquid milk or converted into milk products such as curd and ghee. The milk products produced by the farmers were found to meet the family consumption requirements only.

Table 1 represents the average daily milk production, family consumption, and marketed surplus of milk across different categories of farmer households. It is evident from the table that the average milk production was to the tune of 21.56, 48.13, and 61.77 liter/farm/day for small, medium, and large herd size categories, respectively and overall average milk production was 39.07 liter/farm/day. Overall average family consumption of milk was worked out to be 2.73 liters per day which varied from 2.55 liters/day in the case of small farmers up to 3.23 liters/day for large farmers. The results depict that milk consumption per household has a positive relationship with the average family size. The proportion of milk used for family consumption relative to average milk production was found to be highest among small farmers (11.83%), as they primarily focus on meeting their household’s daily milk needs (Naresha and Dixit, 2024). In contrast, medium and large farmers consume 5.46% and 5.23%, respectively, since larger herd sizes allow them to sell more surplus milk. Studies support these trends, with Singh (2006) reporting that 91% of total milk production is sold, leaving only 9% for household consumption. Similarly, Ghosh et al. (2023) found that smaller dairy farms retain more milk for personal use, whereas larger farms prioritize selling surplus milk. These observations align with Singh et al. (2023) and Patel et al. (2022), who noted that large-scale farmers are more likely to market excess milk. Dairy farmers utilize milk either as liquid milk or by converting it into dairy products such as curd and ghee, primarily to meet household consumption needs.

**Table 1 Milk production and family consumption across different herd size categories (liter/day)**

|  |  |  |  |
| --- | --- | --- | --- |
| Herd Size | Average Milk Production | Family Consumption | Percentage of Consumption to Production |
| Small  | 21.56 | 2.55 | 11.83 |
| Medium  | 48.13 | 2.63 | 5.46 |
| Large  | 61.77 | 3.23 | 5.23 |
| Overall | 39.07 | 2.73 | 6.99 |

**Fig.1 Utilization pattern of milk and milk products (liters/day)**

 Table 2 represents the average on-farm utilization pattern of milk and the proportions of milk and milk products in total family consumption requirements. Overall farm utilization of milk was found to be highest in the form of liquid milk (61.72%), followed by curd (25.40%), and ghee (12.88%), respectively. The utilization of milk as liquid milk was found to be increasing with the herd size varying from 1.55 liter in the case of small farmers up to 1.85 liter in the case of large farmers due to an increase in average family size across the herd size. Utilization of milk for curd preparation was found to be highest in the case of large farmers (0.75 liters), followed by medium (0.67 liters) and small farmers (0.65 liters). Utilization of milk for ghee preparation was found to be highest in the case of large farmers (0.42 liter), followed by medium (0.33 liter) and small farmers (0.30 liter). Reddy (2005) found that about 71% of total rural milk consumption was in the form of liquid milk, while the remaining portion was processed into butter (70%), ghee (17%), and buttermilk (13%). Meena and Bhavendra (2015) reported that 40% of milk intended for domestic use was consumed as liquid, whereas 60% was converted into dairy products. Similarly, Jaiswal (2016) observed that in Raipur, Chhattisgarh, 63.41% of total milk production was sold as surplus, with the rest retained for household consumption. Gule (2010) found that the marketed surplus accounted for 94.48%, 94.81%, and 96.96% of total milk production on small, medium, and large farms, respectively. Studies by Gangwar et al. (1989), Gupta (1992), and Inamke (1998), along with Patel et al. (2022), also support this trend, indicating that larger farms tend to process more milk into products like curd and ghee, while smaller farms primarily focus on liquid milk consumption.

**Table 2: Utilization pattern of milk by producer households**

 **(liter/household/day)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Particulars  | Small | Medium | Large | Overall |
| Total milk retained at household | 2.50 | 2.63 | 3.02 | 2.72 |
| Liquid milk consumed | 1.55(62.00) | 1.63(61.98) | 1.85(61.26) | 1.68(61.72) |
| Milk converted into products. |
| 1. Curd  | 0.65(26.00) | 0.67(25.48) | 0.75(24.83) | 0.69(25.40) |
| 2. Ghee  | 0.30( 12.00) | 0.33( 12.55) | 0.42( 13.91) | 0.35(12.88) |

*Figures in parentheses indicate the percent of the row's total.*

**Consumption pattern of milk and milk products (MMPs) by consumer households**

Consumers were found to be the end users of the milk and milk products.   Fifty consumers were selected, 25 each from both rural and urban communities to analyze their consumption patterns of milk and milk products (MMPs). The average quantity of milk and milk products consumed by the consumers on per per-day basis were analysed and represented in Table 3.

**Table 3: Consumption pattern of MMPs by consumer households**

 **(liter or kg/day)**

|  |  |
| --- | --- |
| Milk products | Categories of consumer households |
| Rural | Urban |
| Liquid milk | 1.24 | 1.21 |
| Curd | 0.32 | 0.50 |
| Ghee | 0.07 | 0.06 |

 The results depict that consumption of liquid milk (1.24 lit/day) was higher than milk products in both rural and urban areas. Results were found to be aligned with findings from Subramanian et al (2019), who reported thatOver the years, households in both rural and urban regions have preferred liquid milk over other forms of milk products. Milk consumption was higher in rural areas (1.24 lit/day) than the urban areas (1.21 lit/day). However, the quantity of curd consumed was higher in urban areas (0.50 lit/day) than the rural areas (0.32 lit/day). Average consumption of ghee was estimated to be 0.07kg and 0.06 kg in rural and urban areas, respectively. Das et al. (2011) found that in North Tripura District, 66% of rural households consumed liquid milk, while 34% consumed curd and 36% used ghee. In urban areas, the consumption rates were slightly higher, with 70% consuming liquid milk, 40% consuming curd, and 42% using ghee. Similarly, Krishnadas et al. (2015) reported that urban consumers in Kerala spent more on dairy products compared to their rural counterparts. Urban consumers spent 14.46% more on liquid milk and 33.13% more on curd and buttermilk than rural consumers.

Agrawal and Kumar (2021) analyzed milk production and utilization patterns in Madhya Pradesh, finding that overall per capita milk availability was 1.49 liters per day, while per capita consumption stood at 0.37 liters per day. Among milk products, a nearly equal proportion of milk was used for curd (22.57%) and ghee (22.41%).

**CONCLUSION**

The study found that small farmers have the highest average family milk consumption, followed by medium and large farmers. This is because small farmers prioritize meeting their household’s daily milk needs over marketing, ensuring a steady supply of liquid milk for family consumption. As herd size increases, a larger proportion of milk is allocated for sale rather than home use, leading to relatively lower household consumption among medium and large farmers. Liquid milk remains the primary form of on-farm milk utilization across all herd sizes. However, the extent to which milk is processed into curd and ghee varies, with larger farmers using more milk for these products. This trend is driven by both higher milk production and greater family consumption in households with larger herds. Small farmers, on the other hand, retain more milk in its liquid form for direct consumption. In terms of regional consumption patterns, rural households consume slightly more liquid milk compared to urban households, reflecting the direct availability of fresh milk in villages. Urban areas, however, show a higher preference for curd, possibly due to changing dietary habits and increased demand for fermented dairy products. Ghee consumption is relatively similar across both regions, with rural households displaying a marginally higher intake, likely due to traditional cooking practices and greater availability of home-produced ghee.

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