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## Production, marketed surplus and disposal pattern of milk in northern dry zone of Karnataka

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**Abstract**

The present study investigated production, marketed surplus, and disposal pattern of milk in Northern Dry Zone of Karnataka. The study covered 240 milk producers selected randomly from four districts which were post-stratified into landless, marginal, small, medium and large farmers. The study revealed that the overall average daily milk production per households per day was found to be 17.68 litre, which varied from 9.61 litre in the case of small farmers to 26.73 litre in the case of large farmers. The percentage of marketed surplus of milk was found to be highest in marginal farmers (81.82%) while, it was lowest in large farmers (74.41%). About 57.73 per cent of total marketed surplus of milk was disposed through un-organized sector; whereas 42.27 per cent of total marketed surplus was disposed through organized sector. Procurement price of milk had positive effect on marketed surplus of milk whereas family size was found to be negatively correlated (-0.052) with marketed surplus.

**Keywords:** marketed surplus, consumption, co-operative, milk, disposal.

**Introduction**

India is the largest milk producing country in the world with production of 165.40 million tonnes during the year 2017-18 and having a share of 16.56 per cent of world milk production. The per capita availability of milk increased from 112 gm per day in 1968-69 to 355 gm in 2017-18 (NDDB, 2018) [1]. Dairying has become an important source of income for millions of rural families and has assumed crucial role in providing employment and income. The country has to step up efforts for increasing milk production and other dairy products owing to growing demand for them.

It is estimated that 70 per cent of the total milk is produced by landless labourers, marginal and small farmers located in widely dispersed rural areas. The total quantity of milk production in households depends on types of milch animals, family size, price of milk *etc.* However, large quantity of milk production does not necessarily mean higher marketed surplus of milk. Thus, increasing in the milk production is more beneficial from both producers and consumer point of view, if it is followed by proportion increasing in the marketed surplus of milk.

Milk being the perishable commodity in nature, it requires quick disposal or conversion into milk products. Therefore, it is vital important to examine the production, marketed surplus and disposal pattern of milk on different categories of households. The examining this factors in not only important for producers but this are great importance to dairy plants and various marketing agencies which operating in the study area. And it also serves as important bases for planning and policy purposes with a view to generate economic information's useful for projecting development activities in the dairy sector. Keeping above facts in view, the present study has been undertaken Northern Dry Zone of Karnataka State.

**Materials and Methods**

The proposed study was undertaken in Vijayapur, Bagalakot, Ballary and Koppal districts of northern dry zone of Karnataka which would adequately represent the region. From each district, four villages were selected randomly based on the bovine density such that, two villages from high bovine density area and two villages from low bovine density area. In second stage random sampling technique were employed in selection of fifteen dairy farming households from each village, and the total sample size was 240 dairy farming households. The required information was recorded with the aid of pre tested & well-structured interview schedules. The total milk produced by all milch animals in households was reckoned as per day milk production for household. Marketed surplus is that part of production which actually brought to the sale. The disposal pattern of milk was analyzed through quantity of milk sold to

various milk marketing agencies like dairy co-operative societies, consumers, milk vendors, tea shops, *etc.* in the study area.

With view to identify the factors responsible for marketed surplus of milk, the marketed surplus function was fitted for total number of sample households.

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

- Y= Marketed surplus of milk/ household (Its)
- X<sub>1</sub>= Total milk production/ household (Its)
- X<sub>2</sub>= Family size (No.)
- X<sub>3</sub>= Weighted average Price of milk (per Its)
- X<sub>4</sub>= Educational score and
- X<sub>5</sub>= Age of head of the household

## Results and Discussion

### Production and Marketed Surplus

The overall average daily milk production per households per day was found to be 17.68 litre, which varied from 9.61 litre in the case of small farmers to 26.73 litre in the case of large farmers while it was 13.15 litre, 17.86 litre, 21.06 litre in the case of marginal, small and medium category farmers, respectively. It was found that the milk production had a direct relationship with land holding size of sample households (Table 1).

The percentage of marketed surplus of milk was observed to be highest in the case of marginal (81.82 %), followed by small (78.77 %), landless farmers (78.04 %), medium (76.92 %) and large (74.41 %) category farmers (Figure 1). The percentage of marketed surplus of milk increased with decrease in land holdings size, possibly could be the adjustment of their family budget of landless, small and marginal farmers by selling more milk for immediate need of money and lack of alternate regular source of income for daily household's expenditure.

### Disposal Pattern

It can be observed from Figure 2, that overall 57.73 per cent of total marketed surplus of milk was disposed through un-organized sector; whereas 42.27 per cent of total marketed surplus was disposed through organized sector. The share of un-organized sectors in total procurement of marketed surplus of milk was highest in the case of landless (78.37%) followed by marginal farmers (75.44%), small farmers (68.56%), medium farmers (39.38%) and large farmers (26.89%). The largest share of marketed surplus of milk on landless and marginal (more than 75%) went to un-organized sectors *i. e.*, consumers, milk vendors, tea shops and hotels. This may be due to fact that advances payment by the agencies (milk vendors & hotels) to the needy farmers, procurement at doorstep of farmers (Figure. 2).

In the case of unorganized sector the milk vendors had a largest share which varied from 39.76 per cent in the case of landless farmers to 100 per cent in case of large farmer. The share of milk vendors was found to be highest in the case of medium (79.72 %) and large farmers (100 %) this may be due the collection of milk at door step of farmers and unwillingness of large farmers to sale milk to individual consumers (Figure.3). Where as in the case of landless, marginal and small farmers more than 73 percentage of marketed surplus was disposed off to consumers, tea shops and hotels. The percentage share of marketed surplus covered by un-organized sector increased with the decrease in the land

household's size of households and quantity of milk production per day per households. While, it was reverse trend in case of medium and large farmer's *i.e.*, higher quantity of milk production (litre/day/households) lesser would be the supplies of milk to tea shops and directly to the consumers.

The direct sale of milk to consumers, milk vendors, hotel and tea were preferred by milk producers of landless, marginal and small category of farmers. The probable reason for preferences may be that milk vendors, consumers and hotels often advanced cash payments to needy milk producers at the time of emergency while dairy co-operative societies make payment on specified time only.

### Estimation of Marketed Function

Thee marketed surplus function revealed that the explanatory variables includes in the regression equation explained around 94.00 per cent of variation in the marketed surplus of milk showing the high degree of predictability of marketed surplus with variable included in the function. It was observed from the Table 2, that the effect of total milk production in the households had positive effect on marketed surplus milk. One per cent increases in the milk production would lead to 0.46 per cent increase in the marketed surplus. This clearly endorsed the hypothesis of direct relationship between milk production and marketed surplus. The family size had a negative influence on the marketed surplus of milk. The regression coefficient was found to be -0.052 and significant which indicated that one per cent increase in family size would lead to 0.052 per cent decrease in marketed surplus of milk. This is due to the fact that as family size increases, the quantity of milk retained at households level for consumption increases. Whereas price of milk was found to be positive and significant *i. e.*, one per cent increases in the price of milk led to 0.011 per cent increase in the marketed surplus. This finding was in agreement with Arun (2003) [2].

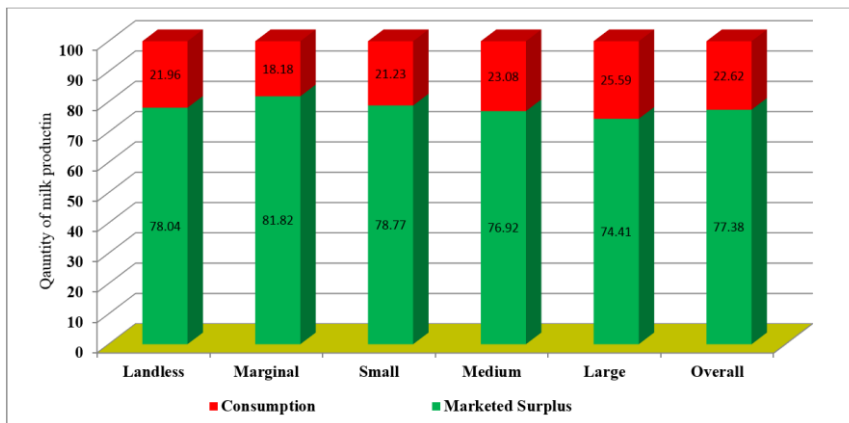
### Conclusion

It may be concluded from the above results that the average marketed surplus of milk as proportionate of total quantity of milk production was found to be in the range of 81.82 percentages in marginal farmers to 74.41 percentages in large farmers. Of the total quantity of marketed surplus of milk, 57.73 percentages was sold to un-organized sector and remaining quantity was sold to organized sector. The reasons for the preference to sell maximum quantity of milk to un-organized sector are that they pick up milk from doorstep of farmers and advancing the loan to needy farmers as and when required. Therefore, large scope existed for dairy co-operative societies to extract milk from un-organized sector. In order to improve the efficiency of cooperative and to compete with private sector an effort should made by cooperative for immediate cash payment, increasing number of cooperative societies in rural areas and providing incentives for milk producers. Analysis on factors affecting the marketed of milk revealed that the price of milk and total quantity of milk was found to be positively correlated with marketed surplus of milk while family size had a negative impact on marketed surplus of milk. In order to increase marketed surplus and safeguard the long term sustainability of smallholder dairy farmers; productivity of the milch animals has to be increased along with the strengthening dairy extension services in the study area.

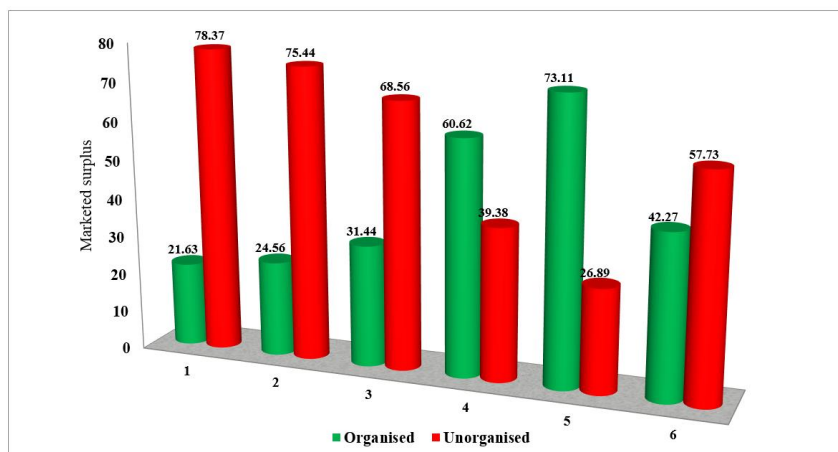
**Table 1:** Average Daily Milk Production and Marketed Surplus of Milk

Particulars	Average Milk Production (litre)	Average Family Size	Consumption/ Retained (litre)	Marketed Surplus (litre)	Proportion of Marketed surplus in per households milk production (%)
Landless	9.61	5.84	2.11	7.50	78.04
Marginal	13.15	5.11	2.39	10.76	81.82
Small	17.86	6.27	3.79	14.07	78.77
Medium	21.06	7.61	4.86	16.2	76.92
Large	26.73	9.17	6.84	19.89	74.41
Overall	17.68	6.80	3.99	13.68	77.38

Figure in *parentheses* indicate percentage to total

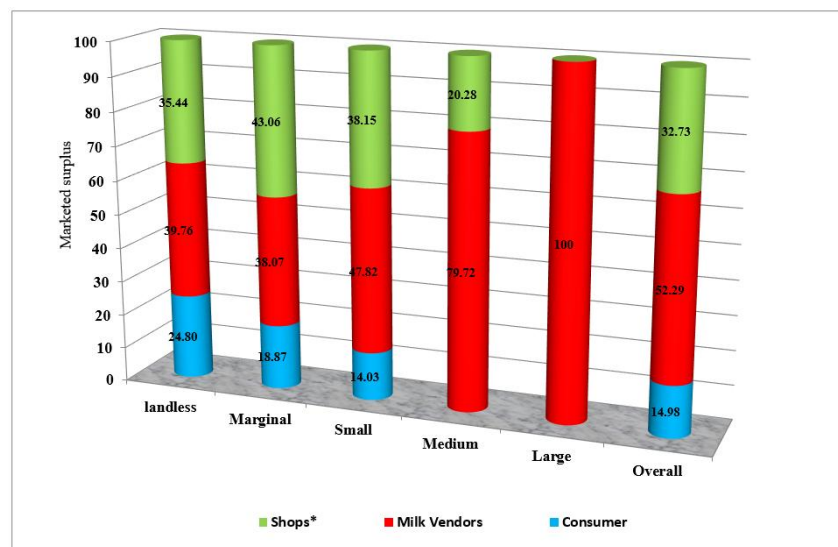


**Fig 1:** Production and marketed surplus of milk across different categories of households



1. Landless, 2. Marginal, 3. Small, 4. Medium, 5. Large farmers 6. Overall

**Fig 2:** Disposal pattern of milk to organized and un-organized sector (in %)



**Fig 3:** Disposal pattern of milk to different agency in un-organized sector (in %)

**Table 2:** Estimation of Marketed surplus Function of Milk

Particulars	Variables	Coefficients	R <sup>2</sup>
1	Constant	0.816	0.94
2	Total Milk Production	0.462*** (0.121)	
3	Family Size	-0.052*** (0.247)	
4	Education level of households	-0.014 (0.025)	
5	Age of the Head of Households	0.024 (0.138)	
6	Price of Milk	0.011** (0.052)	

\*\*\* Significant at 1 per cent level

\*\* Significant at 5 per cent level

Figure in parentheses indicate the standard error

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