Original Research Article

THE ECONOMIC EVALUATION OF MARKETED SURPLUS, AND FACTORS AFFECTING IT AND MARKETING EFFICIENCY OF MILK AND MILK PRODUCTS

ABSTRACT:

Milk is perishable in nature and its shelf-life is very short in unprocessed form. This must therefore be disposed of or converted as soon as possible into different milk products. Marketed surplus is the total quantity of milk delivered for sale into the market. Estimation of marketed surplus is quantity of produce brought to the market for sale would be Marketed surplus. The quantity of milk sold by the producer after meeting family requirements, farm needs and other payments would be marketed surplus. Therefore, farmers of various herd size categories need to identify the contribution and the maximum share in the marketed surplus of milk. For the present study, consideration was given to the number of milk animal assets, family size, land holding, milk production per day, milk price and net return obtained from milk production among various factors influencing the marketed milk surplus. Overall marketed surplus of milk was highest for large herd size category households (84.15 per cent) followed by medium (82.63 per cent) and small category households (80.76 per cent). Producer's share in consumer's rupee was observed 100 per cent in case of Channel because no milk marketing agencies were present in this channel. The value of the coefficient of multiple determination (R^2) was 0.722 which means only 72.20 per cent of the total variation in marketed surplus of milk was explained by the variables included in the regression model. Due to increase in family size, the family consumption requirement of milk increases which negatively affects the marketed surplus of milk.

Keywords: Marketed surplus, marketing efficiency, producers share in consumers rupee.

INTRODUCTION:

India has always been the largest producer (580 million litres per day currently) and consumer of milk in the world. But the per capita consumption was low and most of the milk was consumed in its basic, liquid form, curd or at best as ghee and some butter. Over the past few years, Indian consumption is going up. India's per capita consumption of milk at 97 litres a year is way below that of western countries like the US, which boasts per capita consumption of 285 litres per annum, or the EU, which consumes 281 litres per capita per

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annum. But while Indian per capita demand is going up 4.5 per cent year-on-year, global per capita consumption is growing at 1.5 per cent.

The changing income demographics, age profile and macro - environment are visible in the growth in consumption of products. Customers, themselves are changing, customer loyalty is a thing of past. Higher business risk owing to dynamism in customer's expectation, innovative strategies by the competitors and other macro level changes demand the contemporary managers to be strategic with regard to maintaining profitable customer relationship through product and process design, pricing, product mix and distribution decisions. It becomes very important for the marketing managers to study the behaviour of the target customers in a systematic way.

It is really a matter of concern that unorganized sector in our country handled about 80 per cent of the total milk collection. Organized sector needs a large number of farmers' membership to support them for increased milk productivity and fair price for their produce. This would be possible by strong linkages with the hard efforts of extension services in our country. Milk disposal method is the selling of liquid milk through various organized and unorganized sectors after meeting the requirements of household consumption. Successful milk disposal depends on the efficiency of various marketing networks that are involved in the milk marketing network.

This section provides information on household consumption and the marketing surplus of milk, various factors affecting the marketing surplus, the disposal pattern of milk through various marketing channels, as well as the marketing efficiency of traditional channels involved in the disposal of milk to end users. The success of dairy enterprises demands estimation of the input-output relationship efficiently. It is well known fact that shelf life of milk is very low especially under rural set-up, like other horticultural products. It forces the farmer to ensure early dispose of milk within a short period of time to prevent losses. Most of the small dairy farmers compelled for distress sales of milk to protect their minimum price. Large variation has been observed in production and consumption of milk & products from one state to state as well as from one region to another region.

It is really matter of concern that unorganized sector in our country handled about 80 percent of the total milk collection. Organized sector needs large number of farmers membership to support them for increased milk productivity and fair price of their produce. This would be possible by strong linkages with the hard efforts of extension services in our country. The present study would be of help to understand how to make the dairy sector more competitive as well as profitable particularly to dairy farmers with increased productivity of livestock by better management practices.

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MATERIALS AND METHODS:

Estimation of marketed surplus is Quantity of produce brought to the market for sale would be Marketed surplus. The quantity of milk sold by the producer after meeting family requirements, farm needs and other payments would be marketed surplus.

Marketed Surplus of Milk = Total Milk Production – Total Milk Consumption

Total milk production of the household is the total milk produced by all the milch animals per day. The quantity of milk retained at home for consumption or converting into other dairy products is the total milk consumption.

FACTORS AFFECTING MARKETED SURPLUS:

The marketed surplus of milk-producing household influenced by number of factors. The marketed surplus function was fitted to test the significance of the responsible factors. Marketed surplus of milk was considered as the dependent variable and factors like family size, price of milk, milch animal holding, operational land holding, experience of household heads, and education level of household heads were considered as the explanatory variables in multiple regression analysis.

I. Family size: The family size and composition determine the consumption of milk. Larger family size consumption would be more, hence, lower will be the marketed surplus. Family size was considered as one of the independent variables in the marketed surplus function that would negatively affecting the marketed surplus.

II. Education of the household heads: Education of the household heads considered as an important factor influencing marketed surplus of milk in positive direction.

III. Milch animal holding: The total daily milk production from bovines in the milk producing household was considered as an explanatory variable.

IV. Price of milk: Weighted average of milk price was taken as an explanatory variable in the marketed surplus function and calculated for each household as follows:

Weighted Average Price= $\sum P_i W_i / \sum W_i$

Per litre price of the ith type of milk : P_i

Total quantity of ith type of milk sold by the household : W_i

V. Land Holding: Total operational land holding was considered as an explanatory variable positively influencing the marketed surplus of milk in the model.

VI. Experience of household heads: The farmer have more experience in dairying it will helpful to increase the milk production by adopting scientific dairy farming practices.

Specification of Marketed Surplus Function:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6)$$

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X1= Average milch animal holding (Number)

X2= Family size (Number)

X3= Price of milk (Rs/litre)

X4= Operational Land holding (ha)

X5=Experience of household heads(years)

X6= Education level of household heads(ranks)

RESULTS AND DISCUSSION

Table 1: Average daily milk production, consumption and marketed surplus

(Litre/household/day)

Particulars	**Average milk production (litre)**	**Consumption/ Retained (litre)**	**Marketed surplus (litre)**	**Proportion of marketed surplus in per household's milk production (%)**
Small (2-11)	33.8	6.5	27.3	80.76
Medium (12-15)	45.18	7.85	37.33	82.63
Large (16-27)	66.26	10.5	55.76	84.15
Overall	48.41	8.28	40.13	82.89

Table 1 represented the average daily milk production, family consumption and marketed surplus of milk of across different categories of the farmer households. It was evident from the table that the average milk production was estimated to be 33.8, 45.18 and 66.26 litre/household/day for small, medium and large herd size categories and overall average milk production was 48.41 litre. Overall family consumption of milk was worked out to be 8.28 litre per day which varied from 6.5 litre/day in case of small farmers up to 10.5 litre/day for large farmers. As shown in the table, family size had a positive relationship with the average family consumption. The overall average marketed surplus was estimated to be 40.13 litre which varied from 27.3 litre in case of small farmers up to 55.76 in case of large farmers. The overall share of marketed surplus of milk was found to be 82.89 per cent of the total milk production. The share of marketed surplus in total milk production showed an increasing trend with the

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herd size which was lowest for small herd size category (80.76 per cent) and highest in case of large herd size category (84.15 per cent). Therefore, it is quite evident that the farmers of all the categories consume a little quantity of milk and they dispose of most part of the milk produced.

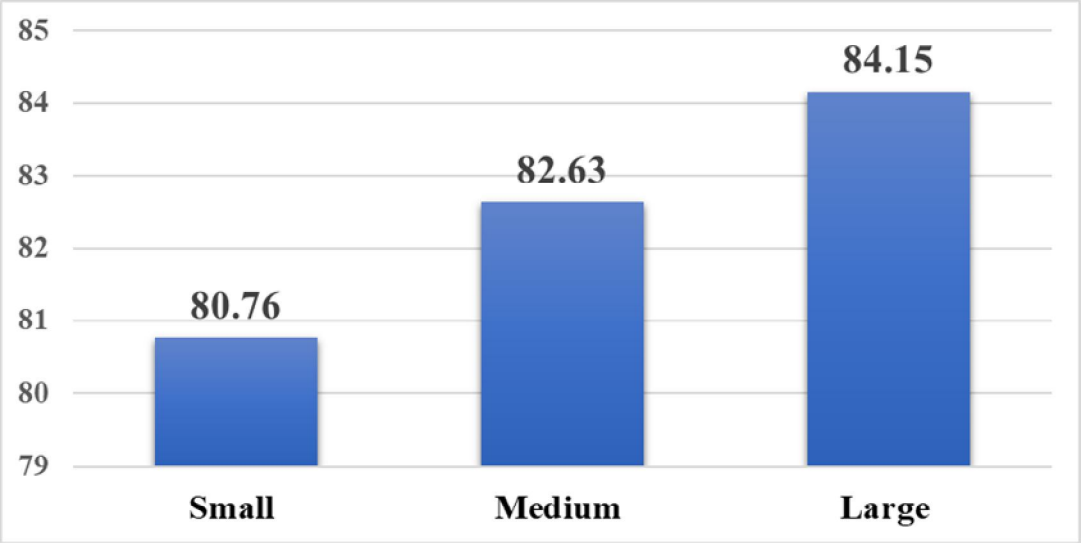

Fig.1 .Proportion of marketed surplus in per households' milk production (%)

Factors affecting marketed surplus of milk at farmers' level

A number of factors influencing the marketed surplus of milk across different herd size categories of farmers were identified and fitted into different regression models like linear, log linear and Cobb-Douglas. Linear regression model was found to be the best fit considering the value of coefficient of determination (R^2).

Table 2: Regression analysis of marketed surplus.

Variables	**Regression coefficient**
Constant	-41.56 (70.58)
Family size (numbers)	-0.103* (0.323)
Operational land holding (hectare)	1.273* (0.906)
Herd size (numbers)	1.64* (0.511)
Price of milk received by farmer (₹/lit)	0.98

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	(2.15)
Education level of household heads (scores)	0.06 (1.41)
Experience of the farmer in dairying (years)	0.22 (0.44)
Milk production per day (litre)	2.30 (1.23)
Income of the farmer (thousands)	-0.04 (0.03)
R^2	0.722

(Figure in parenthesis indicate the standard error of regression coefficient)

* Significant (p<0.05); ** Significant (p<0.01).

From the Table 2, it understood that value of the coefficient of multiple determination (R^2) was 0.722 which means only 72.20 per cent of the total variation in marketed surplus of milk was explained by the variables included in the regression model.

The herd size was found to be statistically most significant factor (p<0.05) influencing the marketed surplus of milk. One number of animal increase in the herd size resulted in an increase in marketed surplus of milk by 1.64 litre. This is due to the fact that farmers of all the categories mainly concerned to sale a major portion of the total milk produced.

It was also found that the regression coefficient of price per litre of milk was found to be significant (p<0.05). One per cent changes in the price of milk resulted in a change in the marketed surplus by 0.98 per cent, for which farmers tend to spare more milk for sale in order to obtain higher income from the dairy enterprise. In the study area, it was observed that the large farmers were having highest share of marketed surplus of milk in total quantity of milk production (84.15%) as they were gaining highest net return per litre of milk marketed.

The size of operational land holding was reported to show a positive and significant influence (p<0.05) on the marketed surplus of milk. One hectare increases in the area of land holding increased the marketed surplus of milk by 1.273 litre. It is due to the fact that if more area will put under fodder cultivation, then the marketed surplus will be enhanced through improvement in milk production. Family size of the farmer was found to be a significant determinant (p<0.05), negatively influencing the marketed surplus. The regression coefficient was found to be -0.103 which means the marketed surplus declined by -0.103 litre upon addition of one member to the family. Due to increase in family size, the family consumption requirement of milk increases which negatively affects the marketed surplus of milk. However, four other

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determinants *i.e*. education, milk production per day, income of the farmer and experience of the farmer were found to non-significant influence on marketed surplus of milk.

CONCLUSION

The share of marketed surplus in total milk production showed an increasing trend with the herd size which was lowest for small herd size category (80.76 per cent) and highest in case of large herd size category (84.15 per cent). Therefore, it is quite evident that the farmers of all the categories consume a little quantity of milk and they dispose of most part of the milk produced. The large farmers were having highest share of marketed surplus of milk in total quantity of milk production (84.15%) as they were gaining highest net return per litre of milk marketed. Due to increase in family size, the family consumption requirement of milk increases which negatively affects the marketed surplus of milk. However, four other determinants *i.e*. education, milk production per day, income of the farmer and experience of the farmer were found to non-significant influence on marketed surplus of milk.

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