



A Monthly e Magazine  
ISSN:2583-2212

Sept, 2023; 3(09), 2292-2295

Popular Article

## Methodology To Analyze Cost of Milk Production in India

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<https://doi.org/10.5281/zenodo.8349650>

### Introduction

Dairying in India is closely knitted as an integral part of agriculture, playing an indispensable role in the upliftment of rural poor. Indian livestock production systems are characterized by low inputs and low yields. Landless, marginal and small farmers own about 68 percent of livestock and contribute largely to the livestock economy. Apart from ensuring nutrient supplies to the families owning dairy animals, dairy sector also offers promising employment opportunities and economic returns on a regular basis. Dairy sector is an important source of secondary income for over 80-90 million milk producers in the country.

The profitability of dairy enterprise is determined by sale price of milk and of late there is lot of uproar from farming community on lack of proper support price for milk. Having adequate data on cost of milk production will enable policy makers to arrive at a minimum support price for milk, so that the farmer will not be put to loss.

### Methodology

The cost of inputs was taken by considering the fixed costs and variable costs involved. The total costs involved in dairy farm operations consisted of depreciation on different components such as shed, animals, equipment, interest on fixed capital and imputed values for family labour, sale price of milk, value of dung etc. For the estimation and calculation of various costs, the following methodology was used.

**Fixed cost:** Fixed cost was taken as the expenditure which was incurred whether or not the production was carried out. It included interest on fixed capital and depreciation value. The components of fixed

cost were as following

**Interest on fixed capital:** The interest on fixed capital was worked out at the prevailing rate. This amount was taken into consideration by calculating the total interest to be paid divided by 365 to arrive at the interest per day.

**Depreciation on fixed capital:** Depreciation was taken as the loss in the value of an asset as a result of the use, wear and tear, accidental damage and time obsolete. It was worked out for milch animals (10%), animal shed (2.5%), machinery and equipment (2.5%) keeping in view the present value and life time. This amount was arrived at by dividing the total amount of depreciation per annum by 365 to arrive at the depreciation amount per day.

**Variable cost:** Variable costs were taken as those costs which were incurred on the variable factors of production and which varied on day-to-day basis. It includes feed cost, labour cost, and miscellaneous cost. The variable expenses on dry fodder, green fodder, concentrate feed and labour were calculated per individual milch animal. Per day expenditure on miscellaneous items per milch animal were worked out on the basis of daily and annual expenditure on these items.

**Feed and fodder cost:** The information on the quantity of dry fodder, green fodder and concentrate fed to individual milch animal need to be recorded. The jowar and maize varieties were fed to animals as a green fodder. The dry fodder available was paddy straw, jowar kutti, groundnut crop residue. Concentrates were fed to the dairy animals, being the major source of meeting the nutrient requirements, and the concentrate mixture was prepared from the ingredients procured by dairy farm owners. The major ingredients used for making concentrate mixture were cotton seed cake, ground nut cake, maize, jowar, etc. The rates per kg of green, dry fodder and concentrates were to be recorded.

**Labour cost:** It includes cost of family as well as paid labour (hired labour). The cost of hired labour was calculated considering type of work allotted and wages paid whereas, family labour costs were determined on the basis of existing market rate of farm labour. The number of man hours of labour engaged per day was converted into monetary terms by multiplying with the corresponding wage rate.

**Miscellaneous cost:** Miscellaneous cost includes the cost of breeding for AI or service charge of bull as well as cost of vaccination and medicines. They were calculated on the basis of per milch animal per day for different milch animals kept by the household. The amount was arrived on per animal basis.

#### **Other cost concepts used**

**Gross cost:** It was obtained by adding all the cost components including fixed and variable costs,

$$\text{i.e., Gross Cost/Total cost} = \text{Total Variable Cost} + \text{Total Fixed Cost}$$

**Income from dung:** For value of dung, rough estimate of dung voided by animal per day was taken as 30 kg fresh and calculated per year and finally divided by 365 to arrive at the per day value after removal of 60% of moisture. The total income from dung of all the milch animals was taken to arrive at the average value.



**Net cost:** The net cost was worked out by deducting the imputed income earned through sale of dung, from the gross cost,

$$\text{i.e., Net Cost} = \text{Gross Cost} - \text{Income from dung (Kumawat et al.2016)}$$

**Gross returns:** Gross returns were obtained by multiplying milk yield of an individual milch animal with respective prevailing sale prices in the study area,

$$\text{i.e., Gross returns} = \text{Quantity of milk} \times \text{Sale price of milk}$$

**Net income:** Net income was calculated by subtracting net cost from gross returns,

$$\text{i.e., Net Income} = \text{Gross returns} - \text{Net cost}$$

**Sale price of milk:** The price of milk was taken as per the market rate and as per informed by dairy farm owners.

### Cost of milk production

In order to estimate the cost of milk production, the average net cost per animal per day was divided by average milk yield of animal per day, i.e.,

$$\text{Net cost} = X1 + X2 + X3 + X4 + X5 - VD$$

$$\text{Cost of milk production per day per kg (C)} = \frac{\text{TNMC}}{\text{TM}}$$

Where,

X1= Cost of green fodder per day per animal

X2= Cost of dry fodder per day per animal

X3= Cost of concentrates per day per animal

X4= Labour cost per day

X5= Miscellaneous cost per day per animal

VD= Income from dung (Arrived figure per day per animal)

TNMC = Total Net Maintenance Cost or Net Cost

TM= Average quantity of milk produced per day per animal in litre

**Benefit-cost ratio:** In order to look from the angle of input and output the following formulae was used to calculate the Benefit-cost ratio.

$$1 = R / C$$

Where,

R= Sale price of milk sold per litre

C= Cost of milk production per litre



## Conclusion

By this methodology the actual cost dairy owners are investing in maintaining their animals and the cost they spend for production of one litre milk is calculated. It also makes a conclusion to dairy farm owners whether the dairy farm is profitable or in loss. This methodology will enable policy makers to arrive at a minimum support price for milk, so that the farmer will not be put to loss.

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