



ISSN (E): 2277-7695

ISSN (P): 2349-8242

TPI 2024; 13(6): 32-35

© 2024 TPI

www.thepharmajournal.com

Received: 05-04-2024

Accepted: 10-05-2024

E Sumer

Department of Livestock
Production Management, College
of Veterinary Science and A.H.,
Selesih, Aizawl, Mizoram, India

G Kalita

Department of Livestock
Production Management, College
of Veterinary Science and A.H.,
Selesih, Aizawl, Mizoram, India

R Goswami

Department of Livestock
Production Management, College
of Veterinary Science and A.H.,
Selesih, Aizawl, Mizoram, India

S Rahman

Department of Livestock
Production Management, College
of Veterinary Science and A.H.,
Selesih, Aizawl, Mizoram, India

FA Ahmed

Department of Livestock
Production Management, College
of Veterinary Science and A.H.,
Selesih, Aizawl, 796014,
Mizoram, India

JK Chaudhary

Department of Livestock
Production Management, College
of Veterinary Science and A.H.,
Selesih, Aizawl, 796014,
Mizoram, India

S Pakyntein

Department of Livestock
Production Management, College
of Veterinary Science and A.H.,
Selesih, Aizawl, 796014,
Mizoram, India

Corresponding Author:

Department of Livestock
Production Management, College
of Veterinary Science and A.H.,
Selesih, Aizawl, 796014,
Mizoram, India

Economics of dairy farming in Khasi and Jaintia Hill Districts of Meghalaya

**E Sumer, G Kalita, R Goswami, S Rahman, FA Ahmed, JK Chaudhary
and S Pakyntein**

Abstract

A study on the economics of dairy farming was conducted in Khasi and Jaintia hill districts of Meghalaya. The present study was attempted to record the economic status of the dairy farmers. Data was collected randomly from 120 dairy farmers from two districts, Khasi hill (60 farmers) and Jaintia hill (60 farmers) with the help of pre-developed interview schedule. The data collected were cost of milk production which include fixed cost, depreciation cost, variable cost, feed and fodder cost, veterinary and miscellaneous cost and the return of milk production like sale of milk, animal and dung. The annual overall total costs for all categories of farmers were ₹152867.70. The overall fixed cost per SAU per year was found to be 30.83 per cent of the gross cost and feed and fodder cost was found to be 48.83 per cent of the gross cost. The net return per litre of milk production has been worked out to be Rs 19.91, the highest was for medium herd farmers (Rs 21.20) and lowest for large herd farmers (Rs 14.27). The overall labour cost was 10.66 per cent of the total cost, per litre of milk cost was ₹62.50 and the total return for all categories of farmers per litre of milk was ₹19.91. The study concluded that medium herd dairy farmers have a better net returns compare to small and large hard dairy farmers.

Keywords: Dairy farmer, milk, feed and fodder, labour

Introduction

Livestock sector is a significant source of income that supports wellbeing through the provision of essential inputs, promotes health and household nutrition, supplements income, creates jobs and finally serves as a trustworthy "bank on hooves" in tough times. In rural areas, small households earned less from livestock (16.00%), in comparison with an average household (14.00%). Roughly, 8.80 per cent of the population of India works in rural areas, where cattle provide roughly two thirds of their income (BAHS, 2020). Their contribution to total GVA climbed from 23.12 per cent to 30.13 per cent (Annual Report, 2022-23). In Meghalaya, livestock sector is a vital source of income and food for people of the states.

Dairy is an important sub-sector of Indian agriculture, accounting for nearly 17.00 per cent of agricultural value and allied activity output. Sixty-six per cent of milk and milk products produced worldwide came from the livestock rearing business. (Ram *et al.*, 2018) [8]. Dairying sector in Meghalaya produced 89.14 thousand metric tonnes in 2020–21 which was 1.89 per cent higher than in year 2019-20 of 87.48 thousand metric tonnes (Annual Report, 2022-23). The availability of milk per capita in Meghalaya was 84 grams per head per day (20th Livestock Census, 2019) [1].

The overall fixed costs of dairy farmers in the tend to be higher in small herds than in others due to the lower number of animals. Dairy producers spend more money on dry fodder and concentrates but green fodder costs relatively very low because farmers collect their fodders from their village forest. In terms of labour costs, large herd farmers spend less per animal than small herd farmers because there are more cattle and fewer labourers. Miscellaneous cost of some farmers is very high due to poor management of the farm and animals and uses their expenses more on AI, medicine and veterinarian. The price of milk varies, in dairy cooperatives societies, the milk cost range between ₹47 - ₹50 per litre whereas when the farmers supply directly to the consumer the price range between ₹60 - ₹100. Maximum of the gross return came from milk, and some came from cow dung. Gross return is higher in the sale of milk when the number of milch animal are also more.

Materials and methods

Study area

The research takes place in Meghalaya's Khasi and Jaintia hill districts.

Data Collection

The data for the present study was collected from primary source with the help of pre-tested interview schedule.

Methodology

Cost of milk production

Fixed cost

Fixed costs do not change over a brief period of time in response to the level of output. Two of the components of fixed costs were depreciation and interest on fixed capital investments. The capital recovery cost (CRC) method (Sirohi *et al.*, 2015) [11] was used to calculate fixed costs. The interest on fixed capital does not have to be separately accounted for when using the CRC method.

Depreciation

It was the declined in asset value brought on by everyday wear and tear as well as technical obsolescence. The CRC methods, used to calculate depreciation costs, was described as annual payment that will refund the fixed input cost throughout the input's useful life and give an economically viable rate of return on investment. The CRC was calculated using the following formula:

$$R = Z \left[\frac{(1+r)^n - 1}{(1+r)^n \times r} \right]$$

Where: R = Capital recovery cost (CRC)

Z = Initial value of the capital asset

r = Interest rate

n = useful life of the assets

The present worth of the asset was taken into consideration in the event that there were any kind of practical challenges in obtaining the data on initial outlay at the field level. When using owned funds, the interest on a 1-5 year term deposit was used (6.50%), whereas when using borrowed funds, actual interest rate paid by the bank was used ("r"). The useful life was estimated to be 50 years for pucca shed, 10 years for kutcha shed, 6 years for manual chaff cutter and 10 years for power driven chaff cutter. The lifespan of milch animals varies depending on the species (local and crossbred). According to subject matter experts, average number of calving per animal during their useful productive life, defined in terms of age (years) and order of lactation, is: Crossbred cow: 8 years, 5 calving, local cow: 10 years, 6 calving. Following that total CRC was then divided among each animal in line with Standard Animal Units (SAUs) listed by Sirohi *et al.* (2019) [10] in Table 1

Table 1: Standard Animal Units (SAUs) according to Sirohi *et al.* (2019)

Sl. No.	Type of animal	SAU
1	Adult crossbred female	1.20
2	Adult crossbred male	1.07
3	Adult local female	1.00
4	Adult local male	0.92
5	Crossbred heifer	0.71
6	Local heifer	0.64
7	Young stock crossbred female (<1 year)	0.24
8	Young stock crossbred male (<1 year)	0.25
9	Young stock local female (<1 year)	0.24
10	Young stock local male (<1 year)	0.27

Variable cost

Variable costs are costs that fluctuated in short term and dependent on volume of output. Included were feed costs, labor costs, veterinarian fees and other miscellaneous expenses.

Feed and fodder cost

The amount of feed and fodder consumed by the animals must be multiplied by corresponding current prices in research area in order to determine cost of green fodder, dry fodder and concentrate. However, because it was difficult to assess cost of grazing and cost associated with the farmer's cut and carry from grazing grounds, those expenses have not been accounted in.

Veterinary and miscellaneous cost

In contrast to miscellaneous costs, which include cost of repairs, energy, water fees, purchase of milk cans, buckets, rope, etc., veterinary expenditures included artificial insemination (A.I.) cost, immunization cost as well as

medicines cost administered to animal during a one-year period. Due to the fact that these costs were shared, they were allocated depending on Animal Care Units (ACUs).

Some of the various cost elements mentioned include costs that the entire herd as a whole endures. Like cattle shed, storage, mangers, water tub, buckets, etc., the entire herd makes use of fixed assets. Additionally, price of labor and other expenses was given for the herd as a whole rather than for each individual animal. In order to divide up these shared expenditures, total animal number was converted into standard animal units.

Total cost

It was calculated by combining all cost factors, including both variable and fixed expenses, i.e.

Total cost = Total variable cost + Total fixed cost

$$\text{Cost per litre} = \frac{\text{Maintenance cost per animal per year}}{\text{Total milk produced per animal (SAU)}}$$

Returns

Returns from sale of milk

It was estimated by multiplying each animal's milk production by applicable market rates in the research region, i.e.

Returns from milk production = Quantity of milk x Market price of milk

Returns from sale of animals

It was income made from animal's selling.

Value of dung

By counting the number of dung trolleys the farm produced each year, the amount of dung was estimated. The number of dung trolleys generated was multiplied by average number of dung trolleys in study area. As a result, SAUs were used to allocate manure value to milch animals in farmhouse of farmer.

Net cost

It refers to the cost that was determined by deducting the value of animal's feces and return from its sale from total cost, i.e.

Net cost = Total cost – Value of dung – Return from sale of animal

Net Return

When calculating net return, return from milk sales was subtracted from milk production net cost, i.e.

Net returns = Return from sale of milk – net cost of milk production

Net return per litre of milk production

To calculate net returns per litre of milk or SAU, average net returns per animal (SAU) for the year were divided by average lactation production per animal.

$$\text{Net return per litre} = \frac{\text{Net returns per animal (SAU) per year}}{\text{Total milk produced per animal (SAU)}}$$

Data analysis

To produce meaningful results and logical conclusions, the acquired data were scored, organized, tabulated and exposed to several suitable statistical tests. Software, specifically MS Excel and SPSS, was used to do statistical analysis.

Results and Discussion

The results of the economics of milk production of the dairy

cattle are being presented in the table 2 and are discussed in the followings

The study revealed that the annual total costs for small, medium and large herds farmers were ₹167771.99, ₹151771.20 and ₹149876.40 respectively and the overall total cost was ₹152867.70. It was observed that total cost of small herd dairy farmers was higher than that of medium and large herd farmers. The reason might be large herd sizes required less average maintenance cost per animal than small and medium herd sizes farmer. On the contrary, the results of the present study were greater than those of Deb (2022) [5], who reported that overall total fixed costs were ₹54540.93 in Tripura.

The total fixed costs of small, medium and large herds farmers were 33.00, 30.54 and 31.07 per cent of their total costs respectively and the overall total fixed costs accounted for 30.83 per cent of the total cost. It was observed that small herd farmers has less animals and the average total fixed cost per animal was more when compared to the medium and large herd size. On the contrary, the finding of Deb (2022) [5] was found to be lower than the results of the present study who reported that the total fixed cost was 19.60 per cent of the total cost in Tripura.

The yearly cost of feed and fodder for small, medium and large herd dairy farmers were 49.37, 48.78 and 48.77 per cent respectively of the total cost and the overall yearly cost of feed and fodder was found to be 48.83 per cent per SAU of the total cost. It was observed that in the study area, the small herd farmers had varying costs from the medium and large herd. This may be due to the increase in the amount of feed and fodder spend per cattle in small herd as compared to the medium and large herd size. This shows that the percentage of feed and fodder cost decreased as the herd size increased. On the contrary, the results of the present study are less than those of Deb (2022) [5] in Tripura which showed that feed and fodder costs make up about 60.38 per cent of overall fixed costs.

The labour costs for small, medium and large herds dairy farmers were 10.46, 11.04 and 8.35 per cent of the total cost respectively and the overall labour cost was 10.66 per cent of the total cost. It was observed that the large herd dairy farmers (8.35%) per SAU per year was lower than for small (10.46%) and medium (11.04%) herd dairy producers. This is because larger herd farmers utilized less labour per animal as compared to small and medium herd size farmer therefore, the labour cost share decreased as the herd size increased. The results of the present study were consistent with Vishnoi (2014) in Rajasthan, Lal (2016) in Haryana and Singh *et al.* (2019) in Manipur, who reported that that labour costs decreased as the herd size increased.

Table 2: Cost of milk production and returns at farms of various categories of dairy farmers (Rs/SAU/year)

Component	Small herds farmers	Medium herd farmers	Large herd farmers	Overall
Total fixed cost (TFC)	55358.28 (33.00)	46354.03 (30.54)	46567.59 (31.07)	47131.08 (30.83)
Green fodder (F1)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Dry fodder (F2)	19432.30 (11.58)	17132.48 (11.29)	17029.92 (11.36)	17311.31 (11.32)
Concentrate (F3)	63401.04 (37.79)	56895.36 (37.49)	56069.45 (37.41)	57334.26 (37.51)
Feed and fodder cost (V1=F1+F2+F3)	82833.34 (49.37)	74027.84 (48.78)	73099.37 (48.77)	74645.57 (48.83)
Labour cost (V2)	17547.38 (10.46)	16752.54 (11.04)	12509.34 (8.35)	16288.38 (10.66)
Miscellaneous cost (V3)	12032.99 (7.17)	14636.76 (9.64)	17700.10 (11.81)	14802.68 (9.68)
Total variable cost (TVC=V1+V2+V3)	112413.71 (67.00)	105417.14 (69.46)	103308.80 (68.93)	105736.65 (69.17)
Total Cost (A=TFC+TVC)	167771.99 (100.00)	151771.20 (100.00)	149876.40 (100.00)	152867.70 (100.00)
Value of dung (B)	2751.16	2825.06	2399.67	2765.72

Return from sale of animal (C)	12242.88	10897.61	9003.30	10772.93
Net cost (I=A-B-C)	152777.95	138048.50	138473.40	139329.08
Price of milk (D)	65.50	67.39	63.00	66.52
Average milk production (litres/animal) (E)	2902.30	2691.68	2607.73	2698.74
Return from sale of milk (F=D*E)	184296.05	181392.32	164286.99	179520.18
Total return (G=B+C+F)	199290.09	195114.99	175689.96	193058.83
Net return (H=G-A)	46512.14	57066.49	37216.53	53729.75
Cost of milk production/litre (A/E) (Rs/litre)	57.81	56.39	57.47	56.64
Gross return (G/E) (Rs/litre)	68.67	72.49	67.37	71.54
Return/litre (H/E) (Rs/litre)	16.03	21.20	14.27	19.91

Figures in parentheses indicate percentage to the column's total cost.

According to the data, the per litre cost of milk for small, medium and large herds categories of farmers were ₹65.50, ₹67.39 and ₹63.00 respectively and the overall per litre of milk cost was ₹62.50. Majority of the milk was sold directly to the consumer rather than to the dairy cooperative societies. It was observed that the medium dairy herd farmers had the highest per litre costs (Rs 67.39) because of their relatively lower average milk output. It was found that dairy farms grew both the cost per litre and milk yield rose. On the contrary, the results of the present study were reported to be higher than that of Kaur *et al.* (2016) in Punjab and Chale *et al.* (2018)^[4] in Nagaland who found that the overall per litre cost of milk was ₹18.01 and ₹44.05 respectively.

The total return per litre of milk for small, medium and large herds dairy farmer was ₹16.03, ₹21.20 and ₹14.27 respectively and the overall total return per litre of milk was ₹19.91. It was observed that the medium sized dairy farmers were found to have the highest total return per litre of milk because the price per litre of milk was highest and cost of milk production/litre is lowest in medium size farmer when compared to the small and large size herd farmer. Deb (2022)^[5] reported that the overall total return per litre of milk was ₹9.50/litre in Tripura which were contradicted with the result of the present study.

Conclusion

The study concluded that the net returns per litre of milk production of dairy farmers was highest at medium dairy farmer (21.20 Rs/litre) as compared to small (16.03 Rs/litre) and large (14.27 Rs/litre) dairy farmer in Khasi and Jaintia hill districts of Meghalaya. The study reported that the medium herd category of farmers has better economic status compare to the other two categories of farmers.

Acknowledgement

Professors of Livestock Production and Management, College of Veterinary Science and A.H Selesih, Aizawl, Mizoram.

References

1. 20th Livestock census (2019). Government of India, Ministry of Agriculture Department of Animal Husbandry, Dairying and Fisheries, Krishi Bhawan, New Delhi.
2. Annual Report (2022-23). Department of Animal Husbandry and Dairying. Available from: <https://dahd.nic.in/sites/default/files/FINALREPORT2023ENGLISH.pdf>. Accessed on 11 August 2023.
3. BAHS (Basic Animal Husbandry Statistics) 2020. Department of Animal Husbandry and Dairying. Available from: <https://dahd.nic.in/sites/default/files/BookBAHS2020Final.pdf>. Accessed on 13 August 2023.

4. Chale S, Choudhury A, Datta KK, Devarani L, Hemochandra L. Economic analysis of milk production in Kohima district of Nagaland. *Int J Agric Sci.* 2018;19:7339-41.
5. Deb. Study on management practices, performance and welfare status of dairy cattle reared under dairy cooperative societies in Tripura. M.V.Sc. thesis, submitted to CAU (Deemed University), Imphal, Manipur, India; c2022.
6. Kaur I, Singh VP, Kaur H, Singh P. Cost of milk production in Punjab: A pre-requisite for pricing policy. *Indian J Ext Educ.* 2016;12:313-21.
7. Lal P. An analysis of productivity and efficiency of milk production among dairy farmers in Sirsa cooperative milk shed, Haryana. M.Sc. thesis submitted to NDRI, Karnal, Haryana, India; c2016.
8. Ram DH, Kumar R, Chaudhari GM, Vekariya SJ, Savsani HH. A socio-economic profile of the unorganized dairy farmers. *Int J Agric Sci.* 2018;8:49-54.
9. Singh OK, Singh YC, Singh KR, Singh NO. Economics of milk production and marketing in Thoubal district of Manipur, India. *Int J Curr Microbiol App Sci.* 2019;8:1397-1407.
10. Sirohi S, Chand P, Sharma D, Saxena R. Estimation of bovine equalizing units in India: A regional perspective. *Indian J Anim Sci.* 2019;89:1009-13.
11. Sirohi S, Saxena R, Chauhan AK, Dhaka JP, Sirohi SK, Kumar N. Costs and returns in milk production: Developing standardized methodology and estimates for various dairy production systems. Project report submitted to Department of Animal Husbandry, Dairying and Fisheries, Krishi Bhawan, New Delhi; c2015.
12. Vishnoi S. Economics of milk production and optimization of hero size of commercial dairy farm Jaipur district (Rajasthan). PhD Thesis, NDRI, Karnal, Haryana, India; c2014.