DR-2154
[1-5]

RESEARCH ARTICLE Asian Journal of Dairy and Food Research

Study of Milk Cost Production in Buffaloes of Telangana State

Y. Shyam Babu[1], A. Sarat Chandra[2], R.M.V. Prasad[3], D. Nagalakshmi[4], M. Srinivas Reddy[5] 10.18805/ajdfr.DR-2154

ABSTRACT

Background: Telangana state stands 13th position in milk production with 5.61 MT of milk production during 2019-20 as compared to 4.2 MT in 2014-15. 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. So having adequate data on cost of milk production in different sized farms in buffaloes will enable policy makers to arrive at a minimum support price for milk, so that the farmer will not be put to loss.

Methods: An investigation was carried out to study the cost of milk production in buffaloes of dairy farmers in Karimnagar, Khammam and Rangareddy districts of Telangana. The data was collected from 240 farmers spread over 24 villages in 6 mandals in the selected districts. The 240 respondents were interviewed as per the questionnaire.

Result: Average milk production per day per animal, sale price of milk per kg per animal per day was 8.63 lit, Rs.35.42 respectively. Cost of milk production in large, medium and small herd size was found to be Rs.26.32, Rs.26.68, Rs.27.08, respectively. Average cost of milk production per animal per day was found to be Rs.26.49. The average net income from cow was Rs.77.03. The average profit/litre of milk was calculated as Rs.8.92/lit. The average benefit-cost ratio was found to be 1.33.

Key words: Buffaloes, Cost of milk production, Fixed cost, Gross cost, Net income, Variable cost.

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 68.00 per cent 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. Cattle and buffalo production systems are still largely traditional based and are giving way to the organized and commercial production systems wherein quality and profitability are given due importance. In spite of traditional based dairy farming, the dairy sector in India has grown substantially over the years with an annual growth rate of above 4.00 per cent.

India ranks first among the world's milk producing nations since 1998 and has the largest bovine population in the world. Milk production in India during the period 1950-51 to 2019-20, has increased from 17 million tons to 198.4 million tonnes as compared to 187.7 million tons during 2018-19 recording a growth rate of 5.70 per cent. The per capita availability of milk in the country which was 130 grams per day during 1950-51 has increased to 406 grams per day in 2019-20. This represents sustained growth in the availability of milk and milk products for growing population (DAHD and F, GoI, 2020).

Telangana, the youngest state in the country stands at 8th position in livestock population with a population of 34.18 lakh milch animals including exotic, crossbreed and indigenous cows and buffaloes compared to 28.97 lakhs in 2014-15. Telangana state stands 13th position in milk production with 5.61 MT of milk production during 2019-20 as compared to 4.2 MT in 2014-15. A majority of the milk produced in the state is being procured by the private dairies. As against the daily sale of milk to the tune of 22 lakh litres in the state, the four cooperative dairies under the Telangana State Dairy Development Cooperative Federation Limited.

So having adequate data on cost of milk production in different sized farms in cows and buffaloes will enable policy makers to arrive at a minimum support price for milk, so that the farmer will not be put to loss.

[1]Department of Livestock Production Management, P V Narsimha Rao Telangana Veterinary University, Hyderabad-500 030, Telangana, India.
[2]College of Diary Technology, Kamareddy, Nizamabad-503 111, Telangana, India.
[3]Department of Livestock Farm Complex, College of Veterinary Science, Hyderabad-500 030, Telangana, India.
[4]College of Fishery Sciences, Pebbair-509 104, Telangana, India.
[5]Department of Veterinary and Animal Husbandry Extension, College of Veterinary Science, Korutla-505 326, Telangana, India.

Corresponding Author: Y. Shyam Babu, Department of Livestock Production Management, P V Narsimha Rao Telangana Veterinary University, Hyderabad-500 030, Telangana, India.
Email: yeletishyambabu@gmail.com

How to cite this article: Shyambabu, Y., Saratchandra, A., Prasad, R.M.V., Nagalakshmi, D. and Reddy, M.S. (2024). Study of Milk Cost Production in Buffaloes of Telangana State. Asian Journal of Dairy and Food Research. DOI: 10.18805/ajdfr.DR-2154.

Submitted: 10-08-2023 **Accepted:** 01-01-2024 **Online:** 17-01-2024

MATERIALS AND METHODS

Cost of milk production was estimated by taking the inputs and outputs into account. An investigation was carried out to study the cost of milk production in buffaloes of dairy farmers in Karimnagar, Khammam and Rangareddy districts of Telangana from June to August of 2022. The data was collected from 240 farmers spread over 24 villages in 6 mandals in the selected districts. The 240 respondents were interviewed as per the questionnaire. The information was elicited through interaction and by posing the questions present in the interview schedule and the information given by the farmer was taken into account for this purpose. The cost of inputs was taken by considering the fixed costs and variable costs involved.

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 lifetime. 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 included feed cost, labour cost and miscellaneous cost. The variable expenses on dry fodder, green fodder, on concentrate feed, labour and miscellaneous were collected per individual milch animal as per the information given by the famer and also by personal observation on the day of visit.

Feed and fodder cost

The information on the quantity of dry fodder, green fodder and concentrate fed to milch animals was recorded on the basis of farmer's input regarding the intake of individual animals. The jowar and maize varieties were fed to animals as a green fodder. The dry fodder available was paddy straw, jowar kutti, ground nut crop residue. Concentrates were fed to the dairy animals, being the major source of meeting the nutrient requirements and the concentrate mixture was prepared by the farmers themselves from the ingredients procured by themselves. The rates per kg of green, dry fodder and concentrates were arrived at as per the information given by the farmer and also by cross-checking with the local market through animal husbandry official.

Labour cost

It included 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 included the cost of breeding for AI or service charge of bullas 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 cost incurred_as informed by the famer was taken into consideration. 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, *i.e*;

Gross cost/Total cost =
Total variable cost + 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, *i.e*;

Net cost = Gross cost - 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, *i.e*;

Gross returns = Quantity of milk × Sale price of milk

Net income

Net income was calculated by subtracting net cost from gross returns, *i.e;*

Net Income = Gross returns - Net cost

Sale price of milk

The price of milk was taken as per the information given by the farmer.

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*.,

$$\text{Net cost} = X_1 + X_2 + X_3 + X_4 + X_5 - VD$$

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

Where,

X_1= Cost of green fodder per day per animal.
X_2= Cost of dry fodder per day per animal.
X_3= Cost of concentrates per day per animal.
X_4= Labour cost per day.
X_5= 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.

$$1 = \frac{R}{C}$$

Where,

R = Sale price of milk sold per litre.
C = Cost of milk production per litre.

RESULTS AND DISCUSSION

A perusal of the Table 1 revealed that the average depreciation cost and interest on fixed capital was Rs.14.71 (6.44%) and Rs.18.51 (8.41%) respectively. Comparing farms of different herd size categories, it was found that total fixed cost was highest in case of large farms (15.85%) followed by medium (14.22%) and small farms (13.44%). The reason for this may be due to more investment in building infrastructure like building sheds, purchase of animals and equipment in case of large farms. The average quantity of green, dry and concentrate fed per animal per day was 22.21, 9.43 and 3.43 kg, respectively and average cost of green, dry fodder and concentrates in the studied areas were Rs.1.32, Rs.3.92 and Rs.29.98 respectively. Regarding the costs, total fixed cost, average total feed cost, total variable cost per animal per day was found to be Rs.33.22, Rs.168.55 and Rs.194.95 respectively.

The study revealed that feed cost was the major cost components in total variable cost accounting 73.87 per cent followed by labour cost (8.83%) and miscellaneous cost (2.73%). Total feed cost (73.87%) was the major cost components in total variable cost which is mainly due to high cost of concentrates.

This finding is in consistent with the earlier studies carried out by (Sandeep, 2012; Manjunatha, 2014; Singh and Datta, 2016; Jadav *et al*., 2016; Vishwas, 2016; Kalyani, 2018 and Sandeep, 2020). Total feed cost was minimum in case of large farms (71.27%), followed by medium (74.22%) and small farms (76.46%). Among the feed costs concentrates was the major cost component constituting of about 44.89 per cent on an average followed by dry fodder and green fodder accounting 16.01 and 12.91 percentages respectively. Concentrate was having highest share of costs due to their higher market price. This is consistent with the earlier studies carried out by (Sharma, 2013; Singh and Datta, 2016; Jadav *et al*., 2016; Vishwas, 2016; Kalyani, 2018; Acharya and Malhotra, 2020 and Sandeep, 2020). Costs for green fodder were followed by dry fodder. The fixed costs and variable costs constituted 14.55 and 85.44 per cent, respectively.

Labour was hired in case of large and medium farms on monthly basis which was converted to per day per animal basis whereas small farms used family labour and it was worked out at prevailing hired labour cost. Labour cost was found to be highest in case of large farms (10.20%), followed by medium (8.80%) and small farms (7.20%). It was found that miscellaneous cost is very low in all herd size.

Perusal of Table 2, revealed that total net cost was found highest for large farms (Rs.237.46) followed by medium (Rs.220.92) and small (Rs. 207.10) farms. These findings were greater than findings of Sharma (2013) who reported that net cost was Rs. 197.90, Rs. 220.15, Rs. 226.85 in small, medium and large herd size respectively. Average net cost in the study area was found to be Rs. 221.84. This finding is greater than that reported by (Mankar, 2003; Das, 2004; Desai, 2005; Singh, 2006; Singh, 2008; Sharma, 2013 and Jadav *et al*., 2016). Due to higher fixed cost and total variable cost, large farms were having higher net costs. The income from dung was highest in large farms (Rs. 8), followed by medium (Rs. 6) and small (Rs. 5) farms. Average income from dung was Rs. 6.33.

Average net income from buffalo was Rs.55.31. Comparing across different herd size categories, it was observed that higher net income from buffalo was obtained in case of large farms (Rs.69.84), followed by medium (Rs.54.33) and small farms (Rs.42.35). In case of large farms higher milk productivity of the animals by performing better dairy management practices leads to higher net returns.

Average cost per litre of milk production was Rs.41.15/ lit. This finding was greater than the findings of (Singh, 2008; Thakur, 2010; Khoveio, 2012; Sharma, 2013; Manjunath, 2014; Sharif, 2014; Singh and Datta, 2016; Jadav *et al*., 2016; Kumawat *et al*., 2016; Kalyani, 2018; Manish, 2020 and Kumar, 2021). It was found that cost of milk production per litre was highest in case of small farms (Rs.42.20/lit) followed by medium farms (Rs.41.29/lit) and large farms (Rs.40.11/lit). This shows cost of milk production varied negatively with the herd size due to the economics of scale of dairying. The profit /litre of milk was highest in case of large farms (Rs.11.79), followed by medium (Rs.10.15) and small farms (Rs.8.84). These findings are greater than findings of (Sandeep, 2012 and Sharma, 2013) and less

than findings of (Manish, 2020). Considering this the average profit/ litre of milk was calculated as Rs.10.24/lit. This finding was greater than findings of (Singh, 2008; Manjunatha, 2014; Acharya and Malhotra, 2020) and less than the findings of (Sharma, 2013; Kumawat *et al*., 2016; Kalyani, 2018 and Sandeep, 2020). Average milk yield and milk price of the study area was 5.39 litres and Rs.51.42/lit.

The average Benefit-cost ratio was found to be 1.24. This finding was less than the findings of (Kumawat *et al*., 2016; Vishwas, 2016; Neelum and Khan, 2017; Kalyani, 2018; Sandeep, 2020 and Kumar, 2021) who found that the Benefit-cost ratio was 1.58, 1.52, 1.43, 1.47 and 1.97 at average level respectively. Comparing different herd size, it is found highest in case of large farms (1.29) followed by

Table 1: Fixed and variable costs of milk production pertaining to different production systems of buffalo (Rs. per animal/day).

Cost of components		Large	Medium	Small	Average
			Fixed costs		
Depreciation cost		17.48	13.93	12.72	14.71
		(7.12)	(6.13)	(5.99)	(6.44)
Interest on fixed capital		21.44	18.35	15.76	18.51
		(8.73)	(8.08)	(7.43)	(8.11)
Total fixed cost		38.92	32.28	28.48	33.22
		(15.85)	(14.22)	(13.42)	(14.55)
Feed cost/animal	Quantity of green fodder offered (kg)	23.61	22.53	20.50	22.21
	Rate/kg	1.26	1.30	1.42	1.32
	Total cost F_1	29.74	29.36	29.11	29.46
		(12.11)	(12.93)	(13.72)	(12.91)
	Quantity of dry fodder offered (kg)	9.43	9.32	9.20	9.31
	Rate/kg	3.98	3.89	3.91	3.92
	Total cost F_2	37.55	36.25	35.99	36.55
		(15.29)	(15.97)	(16.96)	(16.01)
	Quantity of conc. offered (kg)	3.61	3.43	3.22	3.42
	Rate/kg	29.82	29.98	30.15	29.98
	Total cost F_3	107.67	102.83	97.08	102.54
		(43.86)	(45.34)	(45.77)	(44.81)
Total feed cost (F_1+F_2+F_3)		174.96	168.44	162.18	168.55
		(71.27)	(74.22)	(76.46)	(73.87)
Labour cost		25.19	19.97	15.29	20.15
		(10.20)	(8.80)	(7.20)	(8.83)
Miscellaneous charges		6.39	6.23	6.15	6.25
		(2.60)	(2.74)	(2.89)	(2.73)
Total variable cost		206.54	194.64	183.62	194.95
		(84.14)	(85.77)	(86.57)	(85.44)
Gross cost		245.46	226.92	212.10	228.17

Table 2: Economics of milk production pertaining to different production systems of buffalo (Rs. per animal/day).

Particulars	Large	Medium	Small	Average
Gross cost	245.46	226.92	212.10	228.17
Income from dung/day	8.00	6.00	5.00	6.33
Net cost/day/animal	237.46	220.92	207.10	221.84
Average milk yield (lit/day)	5.92	5.35	4.90	5.39
Sale price of milk/lit	51.91	51.45	50.91	51.42
Gross returns/day	307.30	275.25	249.45	277.15
Net income/animal	69.84	54.33	42.35	55.31
Cost of milk production/lit	40.11	41.29	42.26	41.15
Profit per lit milk produced	11.79	10.15	8.64	10.24
Benefit-cost ratio	1.29	1.24	1.20	1.24

medium farms (1.24) and small farms (1.20). This finding was lower than the findings of (Manish, 2020). Analysing the Benefit-cost ratio indicates that large farms are profitable than medium and small farms.

CONCLUSION

It is concluded that the average gross cost and average net cost was found to be Rs.228.17 and Rs.221.84 respectively. Average milk production per day per animal, sale price of milk per litre was 5.39 lit, Rs.51.42 respectively. Average cost of milk production per animal per day was Rs.41.15. It was found that cost of milk production per litre was highest in case of small farms (Rs.42.26/lit), followed by medium farms (Rs.41.29/lit) and large farms (Rs.40.11/lit). Average net income from buffalo was Rs.55.31. Comparing across different herd size categories, it was observed that higher net income from buffalo was obtained in case of large farms (Rs.69.84) followed by medium (Rs.54.33) and small farms (Rs.42.35). Profit /litre of milk was highest in case of large farms (Rs.11.79), followed by medium (Rs.10.15) and small farms (Rs.8.64). Average profit/litre milk produced was found to be Rs.10.24. Benefit-cost ratio found highest in case of large farms (1.29) followed by medium farms (1.24) and small farms (1.20). Average Benefit-cost ratio was found to be 1.24.

REFERENCES

Acharya, K.K. and Malhotra, R. (2020). Economic analysis of milk production in peri-urban dairy farms of Odisha. Indian Journal of Dairy Science. 73(2): 155-159.

Das, S. (2004). Economic Efficiency of Milk Production and Marketed Surplus in Rural Area of Burdwan District (W. Bengal). M. Sc. Thesis, NDRI (Deemed University), Karnal, Haryana.

Desai, V. (2005). An Economic Analysis of Milk Production and Disposal Pattern of Milk in Rural Area of Bidar District (Karnataka). M. Sc. Thesis, NDRI (Deemed University), Karnal, Haryana.

DAHD and F, GoI, (2020). https://dahd.nic.in. as of 2021-2022 Financial Year.

Jadav, J.V., Dhandhalya, M.G., Swaminathan, B. (2016). An economic analysis of milk production on different farm sizes in Junagadh District of Gujarat. International Journal of Agriculture Sciences. 8(25): 1516-1518.

Kalyani, K. (2018). Study of management practices followed by rural milk producers of Telangana state. M.V. Sc. Thesis, P.V. Narsimha Rao Telangana Veterinary University Hyderabad.

Khoveio, L.L.M, Jain, D.K., Chauhan, A.K. (2012). Economics of milk production and its constraints in Nagaland. Indian Journal of Dairy Science. 65(6): 520-526.

Kumar, K. (2021). A study on Economic analysis of milk production and adoption of improved animal husbandry practices by dairy farmers. M. Sc (Agri) thesis Junagadh Agricultural University.

Kumawat, R., Singh, N.K.P. (2016). Analysis of cost and returns of milk production in Rajasthan. Economic Affairs. 61(1): 71-74.

Manish, (2020). An Economic Analysis on Production and Distribution of Buffalo Milk in Khandwa District of Madhya Pradesh. M. Sc. (Agri) thesis submitted to Banaras Hindu University, Varanasi (U.P).

Manjunatha, G. (2014). An economic study of milk supply chain in Kolar milk union (Komul), Karnataka. Ph.D. Thesis submitted to Division of Dairy Economics, Statistics and Management, I.C.A.R. National Dairy Research Institute, Karnal.

Mankar, G.M. (2003). Economics of Milk Production and Disposal Pattern in Wardha District of Maharastra. M.Sc. Thesis, NDRI (Deemed University), Karnal, Haryana.

Neelum, A. and Khan, M. (2017). Economics of milk production in District Mardan, Khyber Pakhtunkhwa (KP), Pakistan. Sarhad J. Agric. 33(1): 42-46.

Sandeep, (2012). Economics of Milk Production and Utilization Pattern in Malwa Plateau of Madhya Pradesh. M. V. Sc. thesis submitted to the National Dairy Research Institute, Karnal.

Sandeep, (2020). An economic analysis of costs and returns of buffalo milk production in Gwalior District of Madhya Pradesh. M. Sc., Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior.

Sharif, M. (2014). An economic study of milk production under different levels of ground water exploitation in Southern Karnataka. Ph. D. Thesis submitted to Division of Dairy Economics, Statistics and Management National Dairy Research Institute (I.C.A.R) Karnal.

Sharma, A. (2013). Economic viability of Commercial Dairy Farms in Jabalpur District of Madhya Pradesh, M. V. Sc. Thesis, NDRI, Karnal.

Singh, K.R. (2006). Economics of Milk Production and Marketed Surplus in Imphal West district of Manipur (Doctoral dissertation), NDRI Karnal.

Singh, P. and Datta, K.K. (2016). Economic analysis of traditional milk supply chain in Ranchi district of Jharkhand. Indian Journal of Economics and Development. 12(3): 495-502.

Singh, S. (2008). Economic Analysis of Milk Production in Varanasi District of Uttar Pradesh. M. Sc. Thesis, NDRI (Deemed University), Karnal, Haryana.

Thakur, M.K. (2010). Economics of production and marketing of milk in Samastipur district of Bihar (Doctoral dissertation), NDRI, Karnal.

Vishwas, (2016). Production and Marketing of indigenous cow and buffalo milk in Dharwad district of Karnataka-an economic analysis. M. Sc. (Agri) Thesis submitted to University of Agricultural Sciences, Dharwad.