

Economic Analysis of Buffalo Milk Production in Different Seasons and its constraints in Faizabad District of Uttar Pradesh

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ABSTRACT

The livestock sector considered to be a major enterprise in agriculture sector. It plays a significant role in the welfare of India's rural population as it provides income and employment generation to a major section of the farming community. It is increasingly recognized that dairying could play a more constructive role in promoting rural welfare and reducing poverty. Keeping in view the importance of livestock among farming community a study was carried out in five villages of Faizabad district of Uttar Pradesh. For the study sixty buffalo milk producing households were selected randomly. The net maintenance cost of per milch buffalo per day was estimated by deducting the income from dung from the total maintenance cost. In winter, summer and rainy seasons, it was Rs. 101.85, 98.95 & 91.85 on marginal, Rs. 96.07, 92.94 & 86.60 on small and Rs. 88.14, 85.44 & 80.30, respectively on medium herd size groups. The net profit of milk production per milch buffalo per day was Rs. 70.28, 69.34 & 86.41 on marginal, Rs. 85.98, 83.84 & 104.24 on small, Rs. 105.77, 103.42 & 121.73 on medium herd size groups in summer, winter and rainy seasons respectively. The cost benefit ratio per milch buffalo per day was 1.63, 1.64 & 1.86 in winter, summer and rainy seasons, respectively on marginal herd size groups. The same trend was found in small and medium herd size groups. In this study the women participation in dairy farming was also work out. The results highlighted that the women participation in milk production was higher in feeding, compost making as compared to other practices. As constraints in dairying farming were studied, these were reported as low price of milk, inadequate knowledge about balanced feeding, lack of vaccination at appropriate time etc.

Keywords: Milk production, Cost, Income, Employment, Constraints.

INTRODUCTION

Animal husbandry & dairy play an important role in national economy and in socio-economic development of the country.

Livestock sector provides regular employment to 11 million in dairy and 9 million in subsidiary sector.

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Women constitute 70 per cent of the labour force in livestock sector as against 35 per cent in crop farming. The implementation of dairy development programmes and in adopting improved dairy farming technologies have increased milk production in India from 17 million tonnes in 1950-51 to 176.35 million tonnes in 2017-18 (Department of Animal Husbandry, Dairying & Fisheries, Govt. of India). India ranks first in milk production, accounting for 20.0 per cent of world production (National Action Plan for Dairy Development Vision- 2022). The per capita availability of milk in India has increased from 130 gm per day in 1950-51 to 375 gm per day in 2017-18, which is higher than the minimum nutritional requirement of 282 grams as recommended by the World Health Organization.

There are wide variations in per capita availability of milk in the country. The average per capita availability of milk during 2017-18 was highest in Punjab (1120 gm per day), followed by Haryana (1005 gm per day), Rajasthan (834 gm per day), Gujarat (592 gm per day) and Andhra Pradesh (574 gm per day). However, the per capita availability of milk in Uttar Pradesh was found to be only 359 gram per day against the national average of 375 gram per day. Uttar Pradesh was the largest milk producer in the country in 2017-18 by producing about 25.19 million tones of milk, followed by Rajasthan (16.93 MT), Gujarat (11.69 MT), Madya Pradesh (10.77 MT) and Punjab (10.35 MT).

The high income elasticity of demand for milk and milk products make the dairy sector vibrant and dynamic in nature. Consequently, the demand for milk is expected to increase to 191 million tonnes by 2020. The poor resource condition under small and landless dairy production system and poor nutrition management often results in deficiency of nutrition in high yielding dairy cow and buffaloes. Thereby, the milk producers unable to obtain potential milk yield. The livestock play important role in the economy of Indian agriculture. Under mixed farming system, the Indian farmers maintain a

large number of milch buffalo. Livestock raising is important for increasing the productivity of agriculture and provides food, fuel, fertilizer and draft a power to sustain our rural economy. It is increasingly recognized that dairying could play a more constructive role in improving rural income and reducing poverty. The livestock sector plays a major role in the growth of agriculture industry. Dung is an important input as organic manure for crop production and also widely used as fuel in rural areas. Diversification in crop based rural economy with animal husbandry mixed farming system must be encouraged for rapid economic development, generating equitable income and employment in the economy. The agriculture sector continues to dominate and contributes a large share in the state output. Agriculture is main source of livelihood in U.P and about 70 percent of populations directly or indirectly depend on agriculture and allied sectors. The total population of livestock was 68715147 in 2012 in Uttar Pradesh the population of buffaloes, cattle, goat, sheep was 44.57, 28.46, 22.68 and 1.97 percent respectively. Out of total population of bovines of 50182401 lakh in 2012 in U.P. buffaloes accounted for 61.03 and 38.97 percent of cattle.

As per 19th Livestock census, 2012 (GOI) India's livestock sector is one of the largest in the world with a holding of 11.6% of total world livestock population and it consists of buffaloes (57.83%), cattle (15.06%), sheep (7.14%), goats (17.93%), camel (2.18%), equine (1.3%), pigs (1.2%), chickens (4.72%) and ducks (1.94%). India has huge livestock population of 512 million numbers which mainly includes cattle, buffaloes, goats, sheep and pigs. Livestock has been an important source of livelihood for small farmers. Livestock contributes about 16 per cent to the income of small farm households. Livestock provides livelihood to two- third of rural community. The present study was undertaken with the following specific objectives:

(i) to estimate the cost of buffalo milk production in different seasons. (ii) to work out the economics of buffalo milk production

in different seasons. (iii) to work out the women participation in dairy farming and (iv) to identify the constraints in dairying farming.

MATERIALS AND METHODS

The present study was conducted in Faizabad district of Uttar Pradesh. For collection of data the selection of ultimate unit of the sample was selected purposively. For this study the Bikapur block of Faizabad district was selected. The list of all villages was prepared and arranged in ascending order on the basis of availability of number of milch animals. The five villages were randomly selected for this purpose from selected villages. The total households of the selected village were post-stratified according to the number of animals into marginal (one milch animals), small (two milch animals) and medium (three & above milch animals) with the view to study various economic aspects of dairy farming in different socio economic strata. From the villages, sixty dairy households were selected through simple random sampling without replacement each category. The information on various aspects of dairy farming was collected such as green fodder, dry fodder, concentrates and their prices, labour charges, veterinary and breeding expenses, labour requirement and their constraint. The primary data on various aspects of dairy farming was collected from the dairy households through detailed questionnaire.

RESULTS & DISCUSSION

Cost of Milk production:

The data in table 1 to 3 resulted that the cost of green fodder per milch buffalo per day was Rs 31.50, 26.56 and 24.12 in winter, summer and rainy seasons, respectively on marginal herd size groups. In case of small herd size groups, it was Rs. 29.62, 26.17 and 23.78 in winter, summer and rainy seasons, respectively. While the cost of green fodder per buffalo per day in winter, summer and rainy seasons was Rs. 28.23, 25.09 and 22.27 respectively on medium herd size groups. The results show that the cost of green fodder per milch buffalo per day was higher in winter seasons followed

by summer and rainy seasons on all the herd size groups. The cost of dry fodder per milch buffalo per day was much lower in rainy seasons as compared to summer and winter seasons on all the herd size groups. It was due to the reasons that the lower quantity of dry fodder was fed to milch buffalo in rainy seasons due to the higher availability of green fodder in this seasons on all the herd size groups. The total feeding cost of green fodder, dry fodder and concentrates (including minerals) constituted the most important items of the total maintenance cost accounting for 52.53 to 62.38 per cent of the total cost. The total feeding cost per milch buffalo per day was highest in winter seasons followed by summer and rainy seasons on all the herd size groups. In winter, summer and rainy seasons, it was Rs. 64.70, 63.96 and 50.32 respectively on marginal; Rs. 60.13, 58.74 and 47.46, respectively on small and Rs.55.82, 54.88 and 44.58 respectively on medium herd size groups. The results of this study are in line with the findings given by Kaur et al. (2013), Jaiswal et al. (2015) and Singh et al. (2017).

The cost of human labour per milch buffalo per day was comparatively higher in rainy seasons as compared to winter and summer seasons on all the herd size groups. This may be attributed to the fact that the actual time spent by farmers of all the herd size groups was higher in rainy seasons due to animal grazing in field. The human labour in winter, summer and rainy seasons was Rs. 23.40, 21.24 and 27.78 respectively on marginal; Rs. 22.72, 20.98 and 25.92 respectively on small and Rs. 20.44, 18.68 and 23.84 respectively on medium herd size groups. This shows that the cost of human labour decreased with increased in herd size groups. The results of this study in line with the findings of Kaur et al. (2013), Jaiswal et al. (2015) and Singh et al. (2017).

The interest on animal value per milch buffalo per day was higher on marginal and lower on medium herd size groups. The interest on animal value on different seasons on all the herd size groups accounted for 11.97 to 13.69 per cent of the total maintenance cost.

The housing expenditure (include depreciation) on per milch animal per day was accounting for 2.15 to 3.47 per cent of the total maintenance cost on all the seasons. The miscellaneous expenses accounted for 1.24 to 1.80 per cent of the total maintenance cost in all seasons. The total maintenance cost per milch Buffalo per day was higher in winter season as compared to summer and rainy season on all the herd size groups. In winter, summer and rainy seasons, it was Rs. 105.80, 102.90 & 95.80 respectively on marginal, Rs. 99.22, 96.09 & 89.75 respectively on small and Rs. 90.67, 87.97 & 82.83 respectively on medium herd size groups. The results of this study in line with the findings given by Kaur et al. (2013), Jaiswal et al. (2015) and Singh et al. (2017).

Economics of milk production:

The data in table 4 to 6 resulted that the net maintenance cost of per milch buffalo per day was estimated by deducting the income from dung from the total maintenance cost. The net maintenance cost per milch buffalo per day was higher in winter season as compared to summer and rainy season on all the herd size groups. In winter, summer and rainy seasons, it was Rs. 101.85, 98.95 & 91.85 respectively on marginal, Rs. 96.07, 92.94 & 86.60 respectively on small and Rs. 88.14, 85.44 & 80.30 respectively on medium herd size groups. The daily milk yield per milch buffalo per day was higher in rainy season i.e. 6.31 litre as compared to winter (5.64 litre) and summer (5.38 litre) season on marginal herd size group. Similarly, the daily milk yield was higher in rainy as compared to other seasons on all herd size groups. The price of milk per litre received by the producer was highest in summer followed by winter and rainy seasons in all the herd size groups. The average milk price per litre in summer, winter and rainy it was Rs. 30.52, 31.28 & 28.25 on marginal; Rs. 33.65, 34.46 & 30.78 on small, Rs. 36.45, 38.78 & 33.12 on medium herd size groups respectively. The gross return from the sale of milk per milch buffalo per day was highest in rainy seasons followed by winter and summer seasons in all the herd size

groups. The net profit in milk production per milch buffalo per day in summer, winter and rainy was Rs. 70.28, 69.34 & 86.41 on marginal, Rs. 85.98, 83.84 & 104.24 on small, Rs. 105.77, 103.42 & 121.73 on medium herd size groups respectively. The net profit of milk production per milch buffalo per day was highest in rainy season followed by winter and summer seasons on all the herd size groups. The cost of milk production is an indicator of profitability of the enterprise. The per litre cost of milk production was highest in summer seasons followed by winter and rainy seasons on all the herd size groups. In summer, winter and rainy seasons, it was Rs. 18.06, 18.39 & 14.56 respectively on marginal, Rs. 17.76, 18.12 & 13.97, respectively on small and Rs. 16.57, 17.54 & 13.16 respectively on medium herd size groups. The cost benefit ratio per milch buffalo per day was 1.63, 1.64 & 1.86 in winter, summer and rainy seasons, respectively on marginal herd size groups. The same trend was found in small and medium herd size groups. The results of this study in line with the findings given by Kaur et al. (2013), Kumar et al. (2015), Anbukani P. (2016) and Suvashree et al. (2016).

Employment of women:

The data in table 7 resulted that the women actively involved in most of the animal farming activities. Dairy farming is a labour intensive enterprise and labour requirement for different activities are met out by the family members and hired labour. The study showed that the participation of women in different activities in milk production was 93.33, 91.67, 86.67, 78.33, 73.33, 46.67, 41.67, 18.33 and 15.00 per cent of the total (60) respondents on feeding, compost making, milking, drinking, arrangement of ration, supervision, bathing, maintenance of cattle shed and grazing, respectively (Table 7). The results of this study in line with the findings given by Chauhan et al. (2013).

Constraints faced by milk producers:

The data in table 8 shows that the low productivity and income level in livestock production system arise from financial, feed and fodder, veterinary, marketing and others

constraints faced by the livestock farmers. The most important constraints recorded in the study for dairy farming are viz. low price of milk, high price of feed and fodder, inadequate knowledge about balanced feeding, high cost of concentrate feed, lack of vaccination at appropriate time, unavailability of AI facility

on time, lack of dairy processing unit, untimely payments of milk, unavailability of risk cover and lack of knowledge on disease faced by dairy farmers in the study area. The results of this study in line with the findings given by Sarker et al. (2010) and Lalrinsangpuii et al. (2016).

Table 1: Season wise maintenance cost of buffalo milk production in marginal herd size groups. (Rs. per milch animals per day)

Items of cost	Marginal (one milch animal)			
	Winter	Summer	Rainy	Overall
Green fodder	31.50 (29.77)	26.56 (25.81)	24.12 (25.18)	27.39 (26.99)
Dry fodder	15.45 (14.60)	17.65 (17.15)	13.84 (14.45)	15.65 (15.42)
Concentrate	17.75 (16.78)	19.75 (19.19)	12.36 (12.90)	16.62 (16.37)
Total feeding cost	64.70 (61.15)	63.96 (62.16)	50.32 (52.53)	59.66 (58.78)
Human labour	23.40 (22.12)	21.24 (20.64)	27.78 (29.00)	24.14 (23.78)
Interest on animal value	12.66 (11.97)	12.66 (12.30)	12.66 (13.22)	12.66 (12.47)
Housing expenditure	3.32 (3.14)	3.32 (3.23)	3.32 (3.47)	3.32 (3.27)
Miscellaneous	1.72 (1.63)	1.72 (1.67)	1.72 (1.80)	1.72 (1.69)
Total cost	105.80 (100.00)	102.90 (100.00)	95.80 (100.00)	101.50 (100.00)

Figures in parenthesis indicate percentage to total cost.

Table 2: Season wise maintenance cost of buffalo milk production in small herd size groups. (Rs. per milch animals per day)

Items of cost	Small (two milch animals)			
	Winter	Summer	Rainy	Overall
Green fodder	29.62 (29.85)	26.17 (27.23)	23.78 (26.50)	26.52 (27.91)
Dry fodder	14.25 (14.36)	15.32 (15.94)	12.45 (13.87)	14.01 (14.74)
Concentrate	16.26 (16.39)	17.25 (17.95)	11.23 (12.51)	14.91 (15.69)
Total feeding cost	60.13 (60.60)	58.74 (61.13)	47.46 (52.88)	55.44 (58.35)
Human labour	22.72 (22.90)	20.98 (21.83)	25.92 (28.88)	23.21 (24.43)
Interest on animal value	12.07 (12.16)	12.07 (12.56)	12.07 (13.45)	12.07 (12.70)
Housing expenditure	2.75 (2.77)	2.75 (2.86)	2.75 (3.06)	2.75 (2.89)
Miscellaneous	1.55 (1.56)	1.55 (1.61)	1.55 (1.73)	1.55 (1.63)
Total cost	99.22 (100.00)	96.09 (100.00)	89.75 (100.00)	95.02 (100.00)

Figures in parenthesis indicate percentage to total cost.

Table 3: Season wise maintenance cost of buffalo milk production in medium herd size groups. (Rs. per milch animals per day)

Items of cost	Medium (three & above milch animals)			
	Winter	Summer	Rainy	Overall
Green fodder	28.23 (31.13)	25.09 (28.52)	22.27 (26.89)	25.20 (28.91)
Dry fodder	13.47 (14.86)	14.27 (16.22)	11.55 (13.94)	13.10 (15.03)
Concentrate	14.12 (15.57)	15.52 (17.64)	10.76 (12.99)	13.47 (15.45)
Total feeding cost	55.82 (61.56)	54.88 (62.38)	44.58 (53.82)	51.76 (59.39)
Human labour	20.44 (22.54)	18.68 (21.23)	23.84 (28.78)	20.99 (24.08)
Interest on animal value	11.34 (12.51)	11.34 (12.89)	11.34 (13.69)	11.34 (13.01)
Housing expenditure	1.95 (2.15)	1.95 (2.22)	1.95 (2.35)	1.95 (2.24)
Miscellaneous	1.12 (1.24)	1.12 (1.27)	1.12 (1.35)	1.12 (1.28)
Total cost	90.67 (100.00)	87.97 (100.00)	82.83 (100.00)	87.16 (100.00)

Figures in parenthesis indicate percentage to total cost.

**Table 4: Season wise economics of buffalo milk production in marginal herd size groups.
(Rs. per milch animals per day)**

Particulars	Marginal (one milch animal)			
	Winter	Summer	Rainy	Overall
Total cost	105.8	102.9	95.8	101.5
Income from dung	3.95	3.95	3.95	3.95
Net cost	101.85	98.95	91.85	97.55
Milk Yield (lit.)	5.64	5.38	6.31	5.77
Price of milk	30.52	31.28	28.25	30.02
Gross return	172.13	168.29	178.26	172.89
Net profit	70.28	69.34	86.41	75.34
Cost per liter of milk	18.06	18.39	14.56	16.91
Benefit cost ratio	1.63	1.64	1.86	1.71

**Table 5: Season wise economics of buffalo milk production in small herd size groups.
(Rs. per milch animals per day)**

Particulars	Small (two milch animals)			
	Winter	Summer	Rainy	Overall
Total cost	99.22	96.09	89.75	95.02
Income from dung	3.15	3.15	3.15	3.15
Net cost	96.07	92.94	86.60	91.87
Milk Yield (lit.)	5.41	5.13	6.20	5.58
Price of milk	33.65	34.46	30.78	32.96
Gross return	182.05	176.78	190.84	183.22
Net profit	85.98	83.84	104.24	91.35
Cost per liter of milk	17.76	18.12	13.97	16.46
Benefit cost ratio	1.83	1.84	2.13	1.93

**Table 6: Season wise economics of buffalo milk production in medium herd size groups.
(Rs. per milch animals per day)**

Particulars	Medium (three & above milch animals)			
	Winter	Summer	Rainy	Overall
Total cost	90.67	87.97	82.83	87.16
Income from dung	2.53	2.53	2.53	2.53
Net cost	88.14	85.44	80.30	84.63
Milk Yield (lit.)	5.32	4.87	6.10	5.43
Price of milk	36.45	38.78	33.12	36.12
Gross return	193.91	188.86	202.03	194.93
Net profit	105.77	103.42	121.73	110.31
Cost per liter of milk	16.57	17.54	13.16	15.59
Benefit cost ratio	2.14	2.15	2.44	2.24

Table 7: Employment generation in dairy farming

Sr No.	Particulars	Women (%)	Ranks	Male (%)	Ranks
1.	Feeding of animals	93.33	I	6.67	IX
2.	Grazing of animals	15.00	IX	85.00	I
3.	Milking of animals	86.67	III	13.33	VII
4.	Drinking of animals	78.33	IV	21.67	VI
5.	Bathing of animals	41.67	VII	58.33	III
6.	Arrangement of ration for animals	73.33	V	26.67	V
7.	Compost making	91.67	II	8.33	VIII
8.	Maintenance of cattle shed	18.33	VIII	81.67	II
9.	Supervision	46.67	VI	53.33	IV

Table- 8: Constraints faced by milk producers in dairy farming.

Sr. No.	Constraints	Percentage	Ranks
A.	Economics Constraints		
1.	Lack of credit facilities	76.67	V
2.	Low price of milk	98.33	I
3.	High price of feed and fodder	91.67	II
4.	High maintenance cost of dry animals.	86.67	III
5.	High cost of labour	80.00	IV
B.	Feed and fodder constraints		
1.	Inadequate green fodder	70.00	IV
2.	Inadequate dry fodder	75.00	III
3.	High cost of concentrate feed	96.67	II
4.	Inadequate knowledge about balanced feeding	98.33	I
C.	Veterinary oriented constraints		
1.	Unavailability of AI facility on time	90.00	II
2.	Repeat breeding problems	38.33	V
3.	Problems of heat detection	36.67	VI
4.	Disease infection is higher	81.67	IV
5.	Lack of vaccination at appropriate time	93.33	I
6.	Lack of veterinary doctor/ Hospital	86.67	III
D.	Marketing related Constraints		
1.	Lack of transportation facilities	88.33	III
2.	Untimely payments of milk	91.67	II
3.	Lack of storage facilities	81.67	IV
4.	Lack of dairy processing unit	100.00	I
E.	Others constraints		
1.	Lack of technical knowledge on dairy.	81.33	IV
2.	Lack of knowledge on disease	91.67	II
3.	Unavailability of risk cover	96.67	I
4.	Unavailability of labour	90.00	III

CONCLUSION

The study concluded that the net maintenance cost per milch buffalo per day was higher in winter season followed by summer and rainy season on all the herd size groups. The net profit of milk production per milch buffalo per day in summer, winter and rainy seasons was reported Rs. 70.28, 69.34 & 86.41, Rs. 85.98, 83.84 & 104.24 and Rs. 105.77, 103.42 & 121.73 on marginal, small medium herd size groups respectively. The net profit of milk production per milch buffalo per day was highest in rainy season followed by summer and winter seasons on all the herd size groups. The cost benefit ratio per milch buffalo per day was 1.63, 1.64 & 1.86 in winter, summer and rainy seasons, respectively on marginal herd size groups. The same trend was reported in small and medium herd size groups. The participation of women in milk production was higher in feeding, compost making, milking, drinking, arrangement of ration, and compared to other practices. Dairy farming is a

labour intensive enterprise for different activities are met out by the family members and hired labour. Provision for opening of more artificial insemination centers, arrangement for better health care and vaccination facility should be provided timely for high milk production. Crop based rural economy through diversification into an animal husbandry mixed farming system must be encouraged for rapid economic development and for generating equitable income and employment in the economy. The farmers need to make efforts to increase the productivity of buffaloes by adopting scientific dairy farming practices particularly by rearing newly improved breed animals and scientific nutrition, health and shed management practices.

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