

## Economics of Buffalo Milk Production in Rural Areas of Faizabad District of Eastern Uttar Pradesh

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### ABSTRACT

*Livestock contributes to food and nutritional security by providing milk, meat and eggs; it provides draught power and manure for crop production raw materials for industries and acts as insurance during bad crop years. Uttar Pradesh is the largest contributor to the national milk production contributing around 18 per cent of total milk production in the country. Buffalo rearing also serve as an insurance cover for the poor households being sold during times of distress. Keeping in view the importance of livestock in rural development this study was carried out in five villages of Faizabad district of Eastern Uttar Pradesh. Hundred milk producing households were selected randomly for the study. The highest feeding cost was worked out in marginal followed by small and medium herd size groups. This study highlights that cost of feed and fodder per milch buffalo per lactation was higher on marginal (Rs.17898) as compared to small (Rs.16632) and medium (Rs.15528) herd size groups. The net maintenance cost of per milch buffalo per lactation was estimated by deducting the income from dung from the total maintenance cost. The net cost of maintenance per milch buffalo per lactation was Rs. 29256, 27561 and 25389 on marginal, small and medium herd size groups, respectively. The benefit cost ratio per milch buffalo per lactation was 2.24, 1.93 and 1.71 on medium, small and marginal herd size groups, respectively. The break-even output was worked out to be 18.19, 14.28 and 10.87 per cent of the total milk yield on marginal, small and medium herd size groups, respectively. The livestock sector is positioned to be a major growth area because the total annual employment generation per household was observed 328 man days.*

**Key words:** *Economics of buffalo milk production; Break-even analysis; Livestock sector; Employment generation;*

Livestock makes a significant contribution to the growth and development of India's rural economy. Livestock contributes to food and nutritional security by providing milk, meat and eggs; it provides draught power and manure for crop production raw materials for industries and acts as insurance during bad crop years. Milk being the highly perishable commodity needs quick and efficient marketing system. There is growing concern that the consumer are losing purchasing power due to rising prices while the producer are not getting remunerative prices of their products. An efficient marketing system is one which minimises the cost of marketing services so as to ensure the largest share of the consumer's price to the producer and availability of

the product to the consumer's at reasonable prices in the desired form. The collection and sale of rurally produced milk is dominated by hierarchy of mobile milk vendors. These middlemen not only exploit the producers by paying low price and using faulty weights of measures but also cheats the consumers by way of charging high price and resorting to malpractice's. Dairy co-operative have been considered one of the most important measures for the improvement in the marketing mechanism of milk in the rural areas by providing effective marketing facilities to the milk producer and enabling them to get remunerative price for their milk. Dairy co-operative links the milk producers in the rural areas and the consumers in the distant urban areas. Its

efficiency is essential to achieve the goal set for the dairy industry as an instrument of economic and social change. Implementation of dairy development programmes and improvement of dairy farming technologies have increased milk production in India from 17 million tonnes in 1950-51 to 155.50 million tonnes in 2015-16 (Department of Animal Husbandry, Dairying & Fisheries, Govt. of India). India ranks first in milk production, accounting for 18.5 per cent of world production (Press Information Bureau, Government of India, February, 2016).

The present study was conducted on the production aspect of milk with the following specific objectives: (i) to work out the milk production of buffalo in different herd size groups (ii) to work out the economics of milk production of buffalo in different herd size groups and (iii) to work out the breakeven point of dairy enterprises (iv) to find out the human labour employment in milk production in selected villages of Faizabad district.

## METHODOLOGY

The present study was conducted in rural areas of Faizabad district of Eastern Uttar Pradesh. Multistage stratified sampling method was used for the selection of the ultimate unit of the sample. Bikapur block of Faizabad district was selected for the study. A list of all the villages was prepared and arranged in ascending order on the basis of availability of number of milch animals. The five villages were selected randomly for this purpose from the set of villages. The total households of the selected village were post-stratified according to the number of animals into marginal (one milch animal), 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 background. From the villages, hundred milk producer households were selected through random sampling. The collection of information on various aspects of dairy farming such as input used like green fodder, dry fodder, concentrates, labour charges, house expenditure and miscellaneous etc. The primary data on different variables required for the study on the detailed questionnaire present for the purpose were collected from the milk producer households.

The weighted average of the variable X has been calculated by using following formula.

$$\text{Weighted average} = \frac{\sum W_i X_i}{\sum W_i}$$

Where-  $W_i$  = Weight assigned

$X_i$  = Value of the variable

Break- even analysis was employed to work out break-even output for a buffalo on different herd size groups.

$$\text{BEP} = \frac{\text{TFC}}{\text{ASP} - \text{AVC}}$$

Where-

BEP = Break-even point in litres of milk.

TFC = Total Fixed cost per milch animal in rupees.

ASP = Average selling price per litre of milk and

AVC = Average variable cost per litre of milk

## RESULTS AND DISCUSSION:

*Cost of Milk production & Maintenance:* The Data in Table 1 resulted that the cost of green fodder per milch buffalo per lactation was Rs 8217, 7956 and 7560 in marginal, small medium herd size groups, respectively. It was clear that the cost of green fodder per milch buffalo per lactation was higher on marginal followed by small and medium herd size groups, respectively. The cost of dry fodder per milch buffalo per lactation was Rs 4695, 4203 and 3930 in marginal, small medium herd size groups, respectively. The cost of concentrate including mineral per milch buffalo per lactation was Rs 4986, 4473 and 4041 in marginal, small medium herd size groups, respectively. The cost of feed and fodder per milch buffalo per lactation was higher on marginal (Rs. 17898) as compared to small (Rs.16632) and medium (Rs. 15528) herd size groups. The total feeding cost of green fodder, dry fodder, concentrates and mineral mixture constituted the most important items of the total maintenance cost accounting for 58.82 per cent of the total cost. It was Rs. 17898, 16632 and 1552 on marginal small and medium herd size group respectively. The cost of human labour per milch buffalo per lactation was comparatively higher marginal as compared to small and medium herd size groups. The average cost of human labour per milch buffalo per lactation was Rs. 6834. This shows that the cost of human labour decreased with increased in herd size groups. The interest on animal value per milch buffalo per lactation was higher on medium and lower on marginal herd size groups. It was Rs. 3798, 3620 and 3402 on marginal small and medium herd size group respectively. The interest on animal value on all the herd size groups accounted for 12.71 per cent of the total maintenance

**Table 1. Maintenance cost of per milch Buffalo per lactation in different herd size groups (Rs. per milch animal)**

Items of cost	Marginal	Small	Medium	Overall
<i>Fixed cost</i>				
Interest on animal value	3798.00 (12.47)	3620.00 (12.7)	3402.00 (13.01)	3607.00 (12.71)
Housing expenditure	996.00 (3.27)	825.00 (2.89)	585.00 (2.24)	802.00 (2.83)
Total fixed cost	4794.00 (15.74)	4446.00 (15.59)	3987.00 (15.25)	4409.00 (15.54)
<i>Variable cost:</i>				
Green fodder	8217.00 (26.99)	7956.00 (27.91)	7560.00 (28.91)	7911.00 (27.89)
Dry fodder	4695.00 (15.42)	4203.00 (14.75)	3930.00 (15.03)	4276.00 (15.07)
Concentrate	4986.00 (16.37)	4473.00 (15.69)	4041.00 (15.45)	4500.00 (15.86)
Total feed cost	17898.00 (58.78)	16632.00 (58.35)	15528.00 (59.39)	16686.00 (58.82)
Human labour	7242.00 (23.78)	6963.00 (24.43)	6297.00 (24.08)	6834.00 (24.09)
Miscellaneous	516.00 (1.70)	456.00 (1.63)	336.00 (1.28)	439.00 (1.55)
Total variable cost	25656 (84.26)	24060 (84.41)	22161 (84.75)	23959 (84.46)
Total cost	30450.00 (100)	28506.00 (100)	26148.00 (100)	28368.00 (100)

Figures in parenthesis indicate percentage to total cost.

cost. The housing expenditure per milch buffalo per lactation was higher on marginal (Rs. 996) followed by small (Rs. 825) and medium (Rs. 585) herd size groups. The average housing expenditure on per milch buffalo per lactation accounting for 2.83 per cent of the total maintenance cost on all the herd size groups. The average miscellaneous expenses accounted for 1.55 per cent of the total maintenance cost. The results of this study in line with the findings by *Kaur et. al (2013)*, *Jaiswal et. al. (2015)*, *Kumar et. al (2015)* and *Anbukhani, P. (2016)*.

*Economics of Buffalo milk production:* The data in Table 2 highlighted that the net maintenance cost of per milch buffalo per lactation was estimated by deducting the income from dung from the total maintenance cost. The net maintenance cost per milch buffalo per lactation was Rs 29256, 27561 and 25389 in marginal, small medium herd size groups, respectively. The average net

**Table 2. Economics of Buffalo milk production per milch animals per lactation (Rs. per milch animal)**

Particulars	Marginal	Small	Medium	Overall
Total cost	30450	28506	26148	28368
Income (Dung)	1185	945	759	963
Net cost (Rs.)	29256	27561	25389	27405
Milk Yield (lit.)	1731	1674	1629	1678
Price of milk (Rs.)	30.02	32.97	36.12	33.04
Gross return (Rs.)	51867	54966	58479	55104
Net profit (Rs.)	22602	27405	33093	27700
Cost/liter of milk	16.90	16.46	15.59	16.33
B:C ratio	1.71	1.93	2.24	1.96

maintenance cost per milch buffalo per lactation was Rs. 27405 in all herd size groups. It was highest on marginal herd size groups and lowest on medium herd size groups due to reason that cost of human labour, housing expenditure, and other expenditure were highest on marginal herd size groups and lowest on medium herd size groups. The average per lactation milk production per milch buffalo was highest on marginal herd size groups as compared to small and medium herd size groups. The average milk production per milch buffalo per lactation was 1678 liters in all herd size groups. The price of milk per liters received by the producer was highest medium followed by small and marginal herd size groups. The average milk price Rs. 33.04 per liter in all herd size groups. The gross return per milch buffalo per lactation was relatively higher on medium herd size group. The net profit from milk production per milch buffalo per lactation was highest on medium herd size group (Rs. 33093) followed by small (Rs. 27405) and marginal (Rs. 22602) herd size groups. The cost of production of milk is directly related to the net return of the product. An analysis of the cost of production of milk is an indicator of profitability of the enterprise. The per liter cost of milk production has been estimated for different herd size groups was worked out to be Rs. 16.90 in marginal followed by small (Rs. 16.46) and medium (Rs. 15.59) herd size groups. The results of this study in line with the findings by *Ghule et.al (2012)*, *Kaur et. al (2013)*, *Jaiswal et.al (2015)* *Kumar et. al (2015)* and *Anbukhani P. (2016)*.

**Table 3. Breakeven point for milch buffalo on different herd size groups (Rs. per milch animal)**

Particulars of breakeven point	Marginal	Small	Medium	Overall
Milk yield per animal (lit.)	1734	1674	1629	1679
Fixed cost per animal (Rs.)	4794	4446	3987	4409
Variable cost per animal (Rs.)	25656	24060	22161	23959
Total cost per animal (Rs.)	30450	28506	26148	28368
Variable cost per litre of milk (Rs.)	14.80	14.37	13.60	14.26
Price per liter of milk (Rs.)	30.02	32.97	36.12	33.04
Breakeven point (lit.)	315.39	239.03	177.04	243.82
% of breakeven point to total output	18.19	14.28	10.87	14.47

*Break- even analysis:* The Table 3 highlighted that the break-even analysis was done to estimate the minimum quantity of milk to be produced to cover the total cost on all herd size groups. It is calculated that the total fixed cost per milch buffalo per lactation on dairy farm was Rs. 4794, 4446 and Rs. 3987 on marginal small and medium herd size groups, respectively. Irrespective of the size groups, the average fixed cost per milch buffalo per lactation was worked out to be Rs. 4409 it is clear from the table that the total variable cost per milch buffalo per lactation on dairy farm was calculated at Rs. 25656, 24060 and 22161 on marginal, small and medium size groups, respectively. The average total variable cost incurred on per milch buffalo per lactation was estimated at Rs. 23959. The variable cost per litre of milk on marginal, small and medium herd size groups thus came out to be Rs. 14.80, 14.37 and 13.60 from buffalo milk. The average variable cost per litre of buffalo milk per lactation was estimated at Rs. 14.26. The table indicates that the total milk production per milch buffalo per lactation on marginal, small and medium size groups was 1734, 1674 and 1629 litres, respectively and the breakeven output to be 315.39, 239.03 and 177.04 litres on marginal, small and medium herd size groups, respectively. The average total milk production per milch buffalo per lactation was Rs. 1679.00 litres. Thus it is clear that the milk yield per

milch buffalo per lactation was higher than its breakeven output to cover the total costs of all the herd size groups. The break-even output was worked out to be 18.19, 14.28 and 10.87 per cent of the total milk yield on marginal, small and medium size groups, respectively. The average break-even output was worked out to be 14.47 per cent of the total milk yield. Thus, it can be concluded that the break-even output was achieved earlier on marginal size groups than on other size groups. These results are in line with the results of the study carried out by *Suvashree et. al (2016)*.

**Table 4. Human labour employment (Man hours/household per annum)**

Particulars	Man hours	%
Male	878	33.44
Female	1530	58.29
Children	217	8.27
Total	2625	100.00

*Human labour employment:* The Data in Table 4 resulted that the dairy farming is a labour intensive enterprise. For performing different activities of dairy farming, the requirement of labour is met by the family and hired labour. The study showed that the total annual employment generation per household was observed 328 man days were as contribution of women in dairy farming is 191 mandays, which is 58.29 per cent of the total annual employment. The women plays vital role in different dairy farming activities i.e. feeding, grazing, milking, drinking, bathing, arrangement of ration, compost making, maintenance of cattle shed and supervision. These results are in line with the results of findings carried out by *Chauhan et.al (2013)*.

## CONCLUSION

The study concluded that the variable cost was the most important item of the total maintenance cost accounting for 84 per cent of the total cost in the study area. The total feed cost, human labour, miscellaneous, interest on animal value, housing expenditure, total cost, net cost and milk production were highest in marginal herd size group followed small and medium herd size groups. The average net cost of maintenance per milch buffalo per lactation was Rs. 27405 in all herd size groups. The net profit of milk production per milch buffalo per lactation was highest on medium herd size

group followed by small and marginal herd size groups. The benefit cost ratio per milch buffalo per lactation was 2.24, 1.93 and 1.71 on medium, small and marginal herd size groups, respectively. The breakeven output was worked out to be 18.19, 14.28 and 10.87 per cent

of the total milk yield on marginal, small and medium herd size groups, respectively. The average break-even output was worked out to be 14.47 per cent of the total milk yield. The total annual employment generation per household was observed 328 man days.

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