ECONOMIC PERFORMANCE OF MILCH BUFFALO IN THE OPERATIONAL AREA OF DAIRY VIGYAN KENDRA, VEJALPUR

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ABSTRACT

The present study was emphasized on ''Economic Performance of Milch Buffalo in the Operational Area of Dairy Vigyan Kendra (DVK), Vejalpur, Gujarat (India)''. Data was collected with the help of a well-structured pretested interview schedule from 140 buffalo owners spread over 14 villages of seven talukas of Panchmahal district, Gujarat during the year 2016-17. After calculation of all components of inputs and outputs values of milch buffalo, Total feed cost of a milch buffalo per year and per day was ₹ 39081.16 and ₹ 107.07 respectively. It was 69.98 percent of total expenditure. The total expenditure of a milch buffalo per year and per day (Cost-C_3) was ₹ 55848.90 and ₹ 153.01 respectively. Total gross return of a milch buffalo was ₹ 63048.45 per year. Net profit over Cost-A, Cost-B, Cost-C_1 and Cost-C_2 was ₹ 20517.54, 16823.97, 12276.73 and 7199.56 respectively. Per liter cost of milk production over Cost-A, Cost-B, Cost-C_1 and Cost-C_2 were ₹ 25.67, 27.99, 30.85 and 34.03 respectively. Farm Business Income, Family Labour Income and Farm Investment Income were ₹ 20517.54, 16823.97 and 15970.30 per buffalo per year respectively. The benefit-cost ratio of a milch buffalo on basis of different costs Cost-A, Cost-B, Cost-C_1 and Cost-C_2 was 1.48, 1.36, 1.24 and 1.13 respectively. The major constraints of buffalo owners were lack of knowledge of balance ration and the high cost of feed.

Keywords: *milch buffalo, gross input, gross output, net income, B:C ratio*

INTRODUCTION

In India, Animal husbandry/dairy farming is an integral part of rural families and it plays a significant socio-economic roles. Livestock rearing provides supplementary income to most of the families dependent on agriculture. Gujarat is a leading state (3rd position) in milk production which supplies around 12.26 million tonnes of milk to the total milk pool of the country and the state's per capita milk availability was 545 g/day during the year 2015-16. Buffalo is the backbone of milk production of Gujarat state. Milk Production of Gujarat is good but as far as productivity is concerned. It is not up to its potential. Therefore profitability of dairy farmers looks not impressive and therefore it is essential to know the economic performance of milch buffalo.

OBJECTIVES

(1) To study the profile of buffalo owners

(2) To work out total expenditure of milch buffalo

(3) To work out cost-benefit ratio of milch buffalo

(4) To study the constraints faced by buffalo owners in feeding practices

METHODOLOGY

The present study was conducted in the operational area of Dairy Vigyan Kendra (DVK), Vejalpur, Gujarat (India). The operational area of DVK is Panchmahal district. It is situated on the eastern end of the Gujarat state. It is bordered by Dahod District to the north-east & east, Vadodara District to the south (southeast and southwest also), Kheda District to the west and Sabarkantha District to the northwest. All the talukas of Panchmahal district (Ghoghamba, Godhra, Halol, Jambughoda, Kalol, Morva hadaf and Sehara) were selected for the study. Two villages were selected randomly from each taluka and 10 buffalo owners were randomly selected from each village, thus making the total sample of 140 buffalo owners. A well-structured pre-tested Gujarati version interview schedule was prepared in light of the objectives in consultation with veterinary extensionist, economist and animal husbandry experts. The data was collected through personal interview method.

Economic performance of milch buffaloes was worked out as per the standard procedures as below.

Cost concepts and estimation of own inputs

The cost concepts used in the present study are those laid down in the different management studies (Hanumantha Rao committee 1990) and are shown below

Cost-A

I Value of green fodder

II Value of dry fodder

III Value of concentrate

IV Depreciation on animal

V Depreciation on shed

VI Depreciation on equipments

VII Value of hired human labour

VIII Miscellaneous expenditure

IX Interest on working capital for dry period

Cost-B

Cost-A + Imputed interest on fixed capital investment

Cost-C_1

Cost-B + imputed value of family labour

Cost-C_2

Cost-C_1 + 10 percent of the Cost-C_1

Cost-C_2 has been computed to include the management input of farmer as suggested by Hanumantha Rao committee (1990)

Definitions of the concepts used

(a) Cost of feed

Data about different types of feeds and fodders (green fodder, dry fodder and concentrates) fed to milch buffaloes during the study period were collected. The total quantities of different feeds used and the cost incurred per animal per day on the basis of respective prevailing market prices.

(b) Labour cost

Labour charges (Family & Hired) per animal per day were worked out on the basis of prevailing wage rate in the area and the hours of labour utilization on the farm.

(c) Miscellaneous cost

The veterinary, health care, breeding, electricity charges and others were calculated for a complete year and worked out for a buffalo per day.

(d) Depreciation on shed

Annual depreciation on shed was calculated by the straight-line method. Depreciation on shed was worked out at the rate of 2 percent per annum for '*pucca'* shed and 5 percent for '*semi pucca'* (with tiles) assuming the useful life of buildings at 50 and 20 years respectively. (Grover *et al.*, 1992)

(e) Depreciation on machinery and equipments

Depreciation cost for chaff cutter, milking machine and other equipments were calculated using straight-line method. It was taken as the rate for machinery at 10 percent per annum (Baruah *et al*., 1996). Estimation was worked out per a buffalo per day.

(f) Depreciation on animal

The depreciation charges on animal were worked out according to straight-line method. The productive life of the cows and buffaloes was considered as 13 years. The depreciation on the value of milch animals having age 5 or above 5 years was calculated at the rate of 8 percent per annum (Acharya. R. K, 1992).

(g) Interest on working capital

Interest on working capital was charged at the rate of 12 percent per annum for the duration of the dry period of buffalo. During milk period, the interest on working capital was not taken into account as that was period when there was cash flow of income to the milk products.

(h) The interest on owned fixed capital

The interest on owned fixed capital comprising value of shed equipments appliances and animal was calculated at the rate of ten percent per annum.

(i) The management charge

The management charge was taken into account at the rate of ten percent of Cost-C_1.

Income from milch buffalo

1 Return from milk

The average milk yield per day per buffalo was recorded, at present production and lactation stage. It was

multiplied by the market price in order to get its monetary value.

2 Return from dung

Total dung production was estimated based on information given by buffalo owners. It was multiplied by the prevailing market price of dung in the area in order to get its economic value.

3 Return from gunny bags

A farmer got all gunny bags from concentrate feed for a buffalo in a year. All the gunny bags multiply by the prevailing market value.

Farm Business Income = Gross Income – Cost-A

Family Labour Income = Gross Income – Cost-B

Farm Investment Income =

Farm Business Income – imputed value of family labour

Per liter cost of milk production

To work out per liter cost of milk production the following formula was used

Per Liter Cost = (Total expenditure – Receipts from dung) / Liters of milk Produced

(Total expenditure i.e. cost-A or cost-B or cost-C_1 or Cost-C_2)

Net Profit (Net Income): Value of gross output minus cost-C_2

B: C ratio

It is the ratio of cash inflows to cash outflows which must be one or more for an enterprise to be considered meaningful. The minimum ratio required is 1:1, which indicates no loss and no benefits. But as a rule, the ratio should be more than one in order to give some additional returns on the costs.

$$\text{B : C ratio} = \frac{\text{Total return}}{\text{Total expenditure}}$$

Limitations

(a) The appreciated value and rearing cost of young stock have been ignored in estimating the gross income and gross cost respectively.

(b) In this study, Information was collected by interviewing the individual milk producers. It is necessary to be noted that the data provided by respondents are only broad entities, as they are not based on actual accounting records but based on individual perception and expressed opinion of the respondents.

(c) The study was based on the information collected from the respondents for only one year i.e. 2016-17

RESULTS AND DISCUSSION

Table: 1 Profile of buffalo owners **n=140**

Sr. No.	Profile	Frequency	Percent
1	**Age**		
i	Young (≤30 years)	26	18.57
ii	Middle aged (31–50 Years)	74	52.86
iii	Old (>50 Years)	40	28.57
2	**Education**		
i	Illiterate	20	14.28
ii	Can read and write	15	10.71
iii	Up to primary education	26	18.58
iv	Up to secondary education	41	29.29
v	Up to higher secondary education	27	19.28
vi	Above higher secondary education	11	07.86
3	**Caste**		
i	ST	57	40.71
ii	SC	18	12.86
iii	SEBC	44	31.43
iv	General	21	15.00
4	**Family members**		
i	Up to 5 members	67	47.86
ii	more than 5 members	73	52.14
5	**Family type**		
i	Joint family	93	66.43
ii	Nuclear family	47	33.57
6	**Land**		
i	Landless	01	0.71
ii	Marginal farmer (Up to 1.00 ha)	58	41.43
iii	Small farmer (1.01 to 2.00 ha)	38	27.14
iv	Medium farmer (2.01 to 4.00 ha)	25	17.86
v	Large farmer (Above 4.00 ha)	18	12.86
7	**No. of buffalo animals**		
i	Up to 2 buffaloes	62	44.29
ii	More than 2 buffaloes	78	55.71
8	**Milch buffalo animal**		
i	Up to 2 milch buffaloes	124	88.57
ii	More than 2 milch buffaloes	16	11.43

Age is an important factor which influences the interest and needs of an individual. The data in table 1 revealed that majority of the buffalo owners (52.86 %) belonged to middle aged group followed by old (28.57 %) and young (18.57 %) age group.

Education is the process of producing desirable changes in human behaviour in terms of knowledge, skill and attitude. Keeping this in view, the level of education of the respondents was studied. A perusal of data revealed that 29.29 percent of the buffalo owners were educated up to secondary level education followed by up to higher secondary level education (19.28 %), primary education (18.58 %), illiterate (14.28 %), can read & write (10.71 %) and above higher secondary level education (7.86 %).

In the operation area, Majority of the respondents (40.71 %) were from scheduled tribe (ST) followed by 31.43, 15.00 and 12.86 percent from SEBC, General and SC category, respectively.

The data in table 1 revealed that 52.14 and 47.86 percent of the respondents in the operation areas belonged to more than 5 family members and up to 5 family members respectively. The data revealed that majority (66.43 %) of the buffalo owners belonged to joint family while rest 33.57 percent belonged to nuclear family.

The land is one of the most important indicators of one's economic status. In the operational areas, 41.43 percent of the respondents were marginal farmers followed by small (27.14 %), medium (17.86 %), large (12.86 %) and landless (0.71%) farmers.

It is evident from table 1 that majority (55.71 %) of the respondents had more than two buffalo animals and rest 44.29 percent respondents held kept up to two buffalo animals. Majority (88.57 %) of the respondents had up to two milch buffaloes and rest 11.43 percent respondents kept more than two milch buffaloes.

Table 2 : Total expenditure of a milch buffalo (₹/Animal/ Year) n=140

Components of Cost	Expenditure	
	Cost in ₹	Percent
1. Green fodder	9935.82	17.79
2. Dry fodder	12952.29	23.19
3. Concentrate feed	16193.05	29.00
Total feed cost	39081.16	69.98
Human labour		
(a) Family	4547.24	08.14
(b) Hired	0.00	00.00
Sub-total	4547.24	08.14
Depreciation		
(a) Animal	2108.00	3.77
(b) Shed	59.46	0.11
(c) Equipments	14.76	0.03
Sub-total	2182.22	3.91
1. Interest on working capital	913.65	1.64
2. Interest on fixed capital	3693.57	6.61
3. Miscellaneous charges	353.89	0.63
4. Management cost	5077.17	9.09
Expenditure		
Cost-A	42530.92	76.15
Cost-B	46224.49	82.77
Cost-C_1	50771.73	90.91
Cost-C_2	55848.90	100

Total expenditure of a milch buffalo per year presented in table 2 revealed that total feed cost per a milch buffalo per year was ₹ 39081.16 in the operational area of DVK. The cost of green fodder, dry fodder and concentrate feed was respectively 9935.82, 12952.29 and 16193.05 ₹/buffalo/year respectively. Total family labour charge per buffalo per year was ₹ 4547.24 in the operational area. Depreciation on an animal, shed and equipment were 2108.00, 59.46 and 14.76 Rs./buffalo/year in operational area respectively. Interest on working capital and fixed cost was ₹ 913.65 and 3693.57 respectively per buffalo per year. Miscellaneous charges which included veterinary, health care, breeding and other charges were ₹ 353.89 per buffalo per year. Management cost was ₹ 5077.17 in the study area. Gross cost/Gross input/Total expenditure (Cost-C_2) per buffalo per year was estimated to be ₹ 55848.90 in the operational areas of DVK.

Table 3: Total expenditure of a milch buffalo (₹/Animal/ Day) n=140

Components of Cost	Expenditure	
	Cost in ₹	Percent
Green fodder	27.22	17.79
Dry fodder	35.49	23.19
Concentrate feed	44.36	29.00
Total feed cost	107.07	69.98
Human labour		
Family	12.46	08.14
Hired	0.00	00.00
Sub-total	12.46	08.14
Depreciation		
Animal	05.78	03.77
Shed	00.16	00.11
Equipments	00.04	00.03
Sub-total	05.98	03.91
Interest on working capital	02.50	01.64
Interest on fixed capital	10.12	06.61
Miscellaneous charges	0.97	00.63

Management cost	13.91	9.09
Expenditure		
Cost-A	116.52	76.15
Cost-B	126.64	82.77
Cost-C_1	139.10	90.91
Cost-C_2	153.01	100

Total expenditure of a milch buffalo per day was presented in table 3 revealed that cost of green fodder, dry fodder and concentrate feed was ₹ 27.22, 35.49 and 44.36 per animal per day respectively. The cost of green fodder, dry fodder and concentrate feed was respectively 17.79, 23.19 and 29.00 percent of total expenditure in the study areas. Total feed cost per animal was ₹ 107.07 per day and its 69.98 percent of total expenditure. The similar result was found by Mahajan *et al.* (2013) who reported that total feed cost per milch buffalo was 72.01 percent of total maintenance cost.

Cost of concentrate feed was a major component of total expenditure for mich buffalo. The similar result was found by Jadav *et al.* (2016) who reported that Cost of concentrate was the major component in total expenditure of milk production in both rural and periurban areas. Family labour charge per buffalo per day was ₹ 12.46 and it was 8.14 percent of total expenditure in the operational area. The similar result was found by Parmar *et al.* (2010) who reported that family human labour charge was 8.21 percent of total maintenance cost of buffalo. Depreciation on an animal, shed and equipments were 5.78, 0.16 and 0.04 ₹/buffalo/day in the operational area respectively. Depreciation on an animal, shed and equipment was 3.77, 0.11 and 0.03 percent of total inputs. Interest on working capital and fixed capital was ₹ 2.50 and 10.12 per buffalo per day. The miscellaneous cost was ₹ 0.97 per buffalo per day. Management cost was 13.91 ₹/buffalo/day in the operational area and its 9.09 percent of total expenditure. The value of Cost-A, Cost-B and Cost-C_1 per buffalo per day was ₹ 116.52, 126.64 and 139.10 respectively. Gross cost/Total expenditure (Cost-C_2) per buffalo per day was calculated to be 153.01 ₹ in the operational areas.

Table 4 : Total gross return per buffalo per year

Sr. No.	Items	₹
1	Milk production (Liters)	1592.62
2	Market price (₹/liter)	38.50
3	Value of milk (₹)	61315.99
4	Value of dung (₹)	1642.50
5	Value of Gunny Bags (₹)	89.96
6	Gross return (₹)	63048.45
7	Net Profit (₹)	
7.1	Net Profit over Cost-A	20517.54
7.2	Net Profit over Cost-B	16823.97
7.3	Net Profit over Cost-C_1	12276.73
7.4	Net Profit over Cost-C_2	7199.56
8	Per liter cost of milk production (Rs.)	
8.1	Per liter cost of milk production over Cost- A	25.67
8.2	Per liter cost of milk production over Cost- B	27.99
8.3	Per liter cost of milk production over Cost- C_1	30.85
8.4	Per liter cost of milk production over Cost- C_2	34.03
9	Farm business Income	20517.54
10	Family Labour Income	16823.97
11	Farm Investment Income	15970.30

The average milk production per buffalo per year was found to be 1592.62 liters in study areas. Average milk price was 38.50 ₹/liter. Value of milk was ₹ 61315.99 per buffalo in a year. Value of dung and gunny bags was ₹ 1642.50 and ₹ 89.96 respectively in a year. Gross return/Gross output was 63048.45 ₹/buffalo/year in study areas. Net profit over Cost-A, Cost-B, Cost-C_1 and Cost- C_2 was 20517.54, 16823.97, 12276.73 and 7199.56 ₹ per buffalo in a year respectively. Per liter cost of milk production over Cost-A, Cost-B, Cost-C_1 and Cost- C_2 was found to be ₹ 25.67, 27.99, 30.85 and 34.03 respectively. Farm Business Income, Family Labour Income and Farm Investment Income were ₹ 20517.54, 16823.97 and 15970.30 per buffalo per year respectively in the operational area of DVK.

Table:5 Cost-benefit ratio on basis of different costs

Item	Cost-A	Cost-B	Cost C_1	Cost C_2
B:C ratio	1.48	1.36	1.24	1.13

Benefit-cost ratio of milch buffalo was presented in table 5 and revealed that the overall cost benefit ratio (Cost-C_2) was 1.13 in the operational area of DVK. It indicates that an investment worth ₹ 1 on all inputs used for buffalo farming an output worth ₹ 1.13 in the operational area of DVK.

Benefit-cost ratio of different cost A, B, C_1 and C_2 were 1.48, 1.36, 1.24 and 1.13 respectively. The similar result was found by Parmar *et al.* (2014) who reported that cost benefit ratio of different costs over Cost-A, Cost-B, Cost-C_1 and Cost- C_2 was 1.39, 1.30, 1.18 and 1.09 respectively.

Table 6: Constraints faced by buffalo owners in feeding livestock n=140

Sr. No.	Constraints	Frequency	Percent
1	High cost of feed	135	96.43
2	Lack of knowledge of balanced ration	136	97.14
3	Lack of availability of fodder crop seeds	110	78.57
4	Non availability of green fodder round the year	107	76.43
5	Lack of awareness about treatment of poor quality straw to improve its nutritive value	126	90.00
6	Lack of knowledge about silage preparation	111	79.29

Data in table 6 revealed that major constraint of majority buffalo owners (97.14 %) was lack of knowledge of balanced ration. Other constraints faced by buffalo owners were high cost of feed (96.43 %), Lack of awareness about treatment of poor quality straw to improve its nutritive value (90.00 %), Lack of knowledge about silage preparation (79.29 %), Lack of availability of fodder crop seeds (78.57 %), Non availability of green fodder round the year (76.43 %).

CONCLUSION

Cost of concentrate (29.00 %) was a major component of total expenditure in the operational area of DVK. The major cost of the total expenditure of buffalo owners was feed cost (69.98 %) followed by management cost (9.09 %) and family labour cost (8.14 %). Buffalo owners should be adopted balance ration for their animal for reducing total feed cost. Major constraints of the buffalo owners were lack of knowledge of balanced ration and high cost of feed in the operational area of DVK.

IMPLICATION

For reducing feed cost and getting optimum production, more weightage will be given to the areas of nutritional intervention like balance ration, feeding of non-conventional feeds, record keeping etc. while designing of the training module for an effective, realistic and need-based training programme.

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