ECONOMIC PERFORMANCE OF BUFFALO OWNERS IN OPERATIONAL AREA OF DAIRY VIGYAN KENDRA, VEJALPUR, GUJARAT

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ABSTRACT

This study focuses on the cost, returns and benefits of buffalo owners in Operational area of Dairy Vigyan Kendra (DVK), Vejalpur, Gujarat. 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 panchmahals district, Gujarat during 2016-17. Total feed cost of a buffalo per year and per day was 42507.90 and 116.46 Rs. respectively. It was almost 70% of the total expenditure. Total expenditure of a buffalo per day (Cost-C_2) was 166.28 Rs. Total gross return of a buffalo was Rs. 68564.02 per year. Net profit over Cost-C2 was Rs. 7871.24 in operational area of DVK. Per liter cost of milk production over Cost-A was 26.90 Rs. The benefit cost ratio of a buffalo on basis of different costs Cost-A, Cost-B, Cost-C1 and Cost-C2 was 1.42, 1.32, 1.23 and 1.13 respectively. The major constraints of buffalo owners were lack of knowledge of balance ration and high cost of feed.

INTRODUCTION

Economic stability is essential to allow adoption of adaptation strategies that requires access to capital (Vinaya et al 2017). In India, animal husbandry is an integral part of rural families and it plays significant socio-economic role. Livestock rearing provides supplementary income to most of the families dependent on agriculture. India is the largest milk producing country in the world. Gujarat is a leading state in milk production which supplies around 11.1 million tonnes of milk to the total milk pool of the country and the state's per capita milk availability was 476 g/day during 2013-2014. The milk production is highest in India but as far as productivity is concerned. It is not up to its potential. Therefore profitability looks not impressive and therefore it is essential to know the cost, returns and benefits of buffalo owners.

OBJECTIVES

(a) To study the profile of buffalo owners

(b) To work out total expenditure in milch buffalo

(c) To work out cost benefit ratio in milch buffalo

(d) To study the constraints faced by buffalo owners

METHODOLOGY

The present study was conducted in operational area of Dairy Vigyan Kendra, Vejalpur. All the talukas of panchmahals districts 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 economist and veterinary experts. The data was collect through personal interview method.

Economics of milk production of buffaloes were 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-A

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

The variable cost included green fodder, dry fodder, concentrate, labour, miscellaneous charges (veterinary, breeding service and other charges) and fixed cost included interest on fixed capital, depreciation on shed, animal and chaff cutters and other equipments, etc. Variable and fixed costs were estimated using following procedure.

(A) Variable cost

Feed cost comprised cost of green fodder, dry fodder and concentrate.

(a) Cost of green fodder

Information on quantities of different combinations of green fodder was obtained for each household on the basis of information furnished by the buffalo owners. The physical values of green fodder were transformed into monetary value. In order to get the monetary values of green fodder, their physical values were multiply by prevailing market prices.

(b) Cost of dry fodder

The quantities of dry fodder fed to each of the buffalo were determined on the basis of information given by the farmers regarding composition of fodder and availability of straw. It was also converted into monetary terms.

(c) Cost of concentrate

Information on quantities of different combinations of concentrate fed per buffalo was obtained on the basis of information furnished by the buffalo owners.

(d) Labour cost

Family labour and hired labour charges per day per buffalo were worked out on the basis of prevailing wage rate in the area and the hours of labour utilization in the farm.

(e) Miscellaneous cost

The veterinary, health care, breeding, electricity charges and others were calculate for complete year and worked out for an animal per day.

(B) Fixed costs

(a) Depreciation on cattle shed

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

(b) Depreciation on machinery and equipments

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

(C) Depreciation on animal

The depreciation charges on animal were worked out according to straight-line method of depreciation.

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

The depreciation charges on animal were worked out according to straight-line method of depreciation.

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

(F) The management charge was taken into account at the rate of ten percent of Cost-A.

Income from buffalo

(1) Return from milk

The average milk yield per day per buffalo was recorded, at present production and lactation stage. It was multiply by the market price in order to get its monetary value.

(2) Return from dung

Total dung production was estimated annually based on information given by the farmers. It was multiply by the prevailing market price of dung in the area in order to get its monetary value.

(3) Return from gunny bags

Total gunny bags were multiply by the market value.

B : C ratio

It is the ratio of cash inflows to cash outflows which must be unity or more for an enterprise to be considered worthwhile. The minimum ratio required is 1:1, which indicates the coverage of costs without any surplus benefits. But usually the ratio should be more than unity in order to provide some additional returns over the costs. The benefit cost ratio can be stated both verbally and mathematically as

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

Per liter cost of milk production

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

$$\text{Per Liter Cost} = \frac{\text{(Total expenditure – Receipts from dung)}}{\text{Liter of milk Produced}}$$

(Total expenditure i.e. cost-A or cost-B or cost-C_1 or cost-$_2$)

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

Limitations

- The appreciated value and rearing cost of young stock has been ignored in estimating the gross income and gross cost respectively.
- 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.
- 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 of buffalo owners	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	67	47.86
ii	more than 5	73	52.14
5	**Family type**		
i	Joint	93	66.43
ii	Nuclear	47	33.57
6	**Land**		
i	No land	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	62	44.29
ii	More than 2	78	55.71
8	**Milch animal**		
i	Up to 2	124	88.57
ii	More than 2	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 per cent) belonged to middle aged group followed by old (28.57 per

cent) and young (18.57 per cent) age group. Similar findings were reported by Yadav and Grover (2013) who reported that majority of the dairy farmers were middle aged.

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 per cent of the buffalo owners were educated up to secondary level education followed by up to higher secondary level education (19.28 per cent), primary education (18.58 per cent), illiterate (14.28 per cent), can read & write (10.71 per cent) and above higher secondary level education (7.86 per cent).

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

The data in table 1 revealed that 52.14 and 47.86 per cent of the respondents in operation areas belonged to more than 5 family members and up to 5 family members respectively. The data revealed that majority (66.43 per cent) of the buffalo owners belonged to joint family system while rest 33.57 per cent belonged to nuclear family. Land holding is one of the most important indicators of one's socio-economic status. In the operation areas 41.43 per cent of the respondents were marginal farmers followed by small (27.14 per cent), medium (17.86 per cent), large (12.86 per cent) and landless (0.71) farmers.

It is evident from table 1 that in operation area majority (55.71 per cent) of the respondents had more than two buffalo animals and rest 44.29 per cent respondents held kept up to two buffalo animals. Data revealed that in operation area majority (88.57 per cent) of the respondents had up to two milch animals and rest 11.43 per cent respondents kept more than two milch animals.

Table 2: Total expenditure of a buffalo (₹/Animal/Year)

Components of Cost	Expenditure	
	Cost ₹	Percent
1. Green fodder	9935.82	16.37
2. Dry fodder	12952.29	21.34
3. Concentrate feed	19619.79	32.33
Total feed cost	42507.90	70.04
Human labour		
(a) Family	4092.52	6.75
(b) Hired	0.00	0.00
Sub-total	4092.52	6.75
Depreciation		
(a) Animal	4780.00	7.88
(b) Shed	59.46	0.10
(c) Equipments	14.76	0.02
Sub-total	4854.22	8.00
1. Interest on working capital	603.70	0.99
2. Interest on fixed capital	3448.57	5.68
3. Miscellaneous charges	353.89	0.58
4. Management cost	4831.97	7.96
Expenditure		
Cost-A	48319.72	
Cost-B	51768.29	
Cost-C_1	55860.80	
Cost-C_2	60692.77	100

Total expenditure of a buffalo presented in table 2 revealed that total feed cost per buffalo per year was ₹ 42507.90 Rs. in operational area of DVK. The cost of green fodder, dry fodder and concentrate feed was respectively ₹ 9935.82, ₹ 12952.29 and ₹ 19619.79 /buffalo/year in study areas.

Cost of concentrate was the major component in total expenditure in operational areas. It was 32.33 per cent of total expenditure. Cost of concentrate was the major component in total expenditure of milk production in both rural and periurban areas.

Total labour charge per buffalo per year was ₹ 4092.52 in operational area. Depreciation on animal, shed and equipments were ₹ 4780.00, ₹ 59.46 and ₹ 14.76 /buffalo/ year in operational area respectively. Interest on working capital and fixed cost was ₹ 603.70 and 3448.57 ₹ per buffalo per year. Miscellaneous cost which included veterinary, health care, breeding and other charges was ₹ 353.89 Rs per buffalo per year. Management cost was almost 8 percent of total expenditure. Gross cost/Total expenditure (Cost-C_2) of buffalo owner per buffalo per year was estimated to be ₹ 60692.77 in operational areas of DVK.

Table 3: Total expenditure of a buffalo (Rs./Animal/Day)

Components of Cost	Expenditure	
	Cost ₹	Percent
1. Green fodder	27.22	16.37
2. Dry fodder	35.49	21.34
3. Concentrate feed	53.75	32.33
Total feed cost	116.46	70.04
Human labour		
(c) Family	11.21	06.75
(d) Hired	0.00	00.00
Sub-total	11.21	06.75
Depreciation		
(d) Animal	13.10	07.88
(e) Shed	00.16	00.10

(f) Equipments	00.04	00.02
Sub-total	13.3	08.00
5. Interest on working capital	01.65	00.99
6. Interest on fixed capital	09.45	05.68
7. Miscellaneous charges	00.97	00.58
8. Management cost	13.24	07.96
Expenditure		
Cost-A	132.38	
Cost-B	141.83	
Cost-C_1	153.04	
Cost-C_2	166.28	100

Total expenditure of a buffalo per day was presented in table 3 revealed that total feed cost per animal per day was ₹ 116.46 in operational area of DVK. The cost of green fodder, dry fodder and concentrate feed was respectively 16.37, 21.34 and 32.33 percent of total expenditure in study areas.

Family labour charge and hired labour charge per buffalo per day was ₹ 11.21 and 0.00 in operational area. Similar result by Jadav *et al.* (2016) reported that Labour charge per SAU per day was ₹ 10 in rural and ₹ 18.27 in periurban area. Depreciation on animal, shed and equipments were ₹ 13.10, 0.16 and 0.04 buffalo/day in operational area respectively. Interest on working capital and fixed capital was ₹ 1.65 and 9.45 per buffalo per day. Miscellaneous cost was ₹ 0.97 per buffalo per day. Management cost was ₹ 13.24 / buffalo/day in operational area. Gross cost/Total expenditure per buffalo per day was calculated to be ₹ 166.28 in operational areas.

Table 4 : Total gross return per buffalo per year

Sr. No.	Items	₹
1	Milk production (Litres)	1735.39
2	Market price (₹/litre)	38.50
3	Value of milk (₹)	66812.52
4	Value of dung (₹)	1642.50
4	Value of Gunny Bags (₹)	109.00
5	Gross return (₹)	68564.02
6	Net Profit (₹)	
6.1	Net Profit over Cost-A	20244.3
6.2	Net Profit over Cost-B	16795.73
6.3	Net Profit over Cost-C_1	12703.22
6.4	Net Profit over Cost-C_2	7871.24
7	Per liter cost of milk production (Rs.)	
7.1	Per liter cost of milk production over Cost- A	26.90
7.2	Per liter cost of milk production over Cost- B	28.88
7.3	Per liter cost of milk production over Cost- C_1	31.24
7.4	Per liter cost of milk production over Cost- C_2	34.03

The average milk production per buffalo per year was found to be 1735.39 liters in study areas. Average milk price was ₹ 38.50 litre. Value of milk was ₹ 66812.52 per buffalo in a year. Value of dung and gunny bags was ₹ 1642.50 and ₹ 109.00 in a year. Gross return was ₹ 68564.02 /buffalo/year in study areas. Net profit over Cost-A, Cost-B, Cost-C_1 and Cost- C_2 was ₹ 20244.3, 16795.73, 12703.22 and 7871.24 per buffalo in a year. Per liter cost of milk production was found to be ₹ 34.03 in 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	1.42	1.32	1.23	1.13

Benefit cost ratio of buffalo owners was presented in table 5 and revealed that the overall cost benefit ratio was 1.13 in operational area of DVK. It indicates that an investment worth Rs. 1 on all inputs used for buffalo farming an output worth Rs. 1.13 in operational area of DVK. Cost benefit ration over Cost-A, Cost-B and Cost-C_1 was 1.42, 1.32 and 1.23 respectively.

Table 6: Constraints faced by buffalo owners in feeding livestock

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 majority of the respondents (97.14 per cent) area reported lack of knowledge of balanced ration as the major constraint. Other constraints faced by buffalo owners were high cost of feed (96.43 per

cent), Lack of awareness about treatment of poor quality straw to improve its nutritive value (90.00 per cent), Lack of knowledge about silage preparation (79.29 per cent), Lack of availability of fodder crop seeds (78.57 per cent), Non availability of green fodder round the year (76.43 per cent).

CONCLUSION

Cost of concentrate was a major component of total expenditure in operational area of DVK. Major cost of total expenditure of buffalo owners was feed cost. 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 operational area of DVK.

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