

RELATION BETWEEN CHARACTERISTICS AND PROFITABILITY OF DAIRY FARMERS**M. B. Rajput¹, B. K. Ashwar² and D. V. Parmar³**

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ABSTRACT

The profit derived from a dairy farm operation is the ultimate concern of the farmer in his role as entrepreneur. Many factors influence the patterns of livestock farming and its profitability. The present study was conducted in Banaskantha, Sabarkantha and Gandhinagar district of North Gujarat. The data was collected from 180 dairy farmers from 18 villages of selected districts by personal interviewing. The research was carried out with objective to analyses of profitability of dairy farmers and assess its relationship with selected socio-personal attributes of dairy farmers. Profitability analysis observed that the expenditure on total feed and fodder was highest among all components of gross cost. Milk contributed 96.29 per cent and dung contributed 03.71 per cent to the total return. The Net cost of milk production per liter was found as Rs. 25.40 and net return per liter was found as Rs. 10.26. The Cost benefit ratio was 1:1.62. Correlation coefficient analysis revealed that herd size, milk production and economic motivation were positive and highly significant, while knowledge, adoption, training received, mass media exposure, extension participation and land holding had positive but non-significant effect on profitability of dairy farmers.

Keywords: dairy farming, correlation coefficient, profitability

INTRODUCTION

Dairying has emerged as an important source of income and employment in rural areas, especially for small and marginal farmers of livestock owner. Dairy farming ensures regular monetary earnings to people in the situation of crop failure. Dairy is the single largest agricultural commodity contributing 5% of the national economy. India's per capita milk consumption was at 444 grams /day during 2021-2022, already exceeds the world average of 394 grams/day in 2021. (Press Information Bureau - 2023). India is completely self-sufficient in the dairy sector, since dairy farmers produce enough milk to fulfill the demand of milk and milk products in the country. Gujarat shared 7.71 per cent of milk production in the total milk produced in India during 2019-20 (GCMMF Annual Report - 2021).

To obtain maximum economic benefits from dairy farming, modern and well-established improved practices and skills are being used. Dairy farming has become more industrial in character, with output becoming more concentrated on commercial farms. Livestock farming in rural and peri-urban varies widely in number of animals maintained and other characteristics like economic performance, type of herd maintained, feeding systems followed, housing, mechanization, health coverage, breeding practices, marketing

strategies etc. These varying size and varying characteristics of dairy farmers have problems of diverse in nature. Many factors influence the patterns of livestock farming and its profitability. North Gujarat is a major milk production hub of the state. The region also possesses a large population of dairy cows and buffaloes. To achieve maximum profit, farm manager must identify and solve problems relating to breeding, feeding, herd health, farm organization, unwanted expenses, capital outlay, marketing of milk and labour. cost minimization is an important tool in the hands of dairy farm entrepreneur through which profit could be maximized.

OBJECTIVES

- (1) To assess the profitability of dairy farmers
- (2) To analyses the factors associated with profitability of dairy farmers.

METHODOLOGY

The study was conducted in Banaskantha, Sabarkantha and Gandhinagar district of North Gujarat. Ex-post facto research design was used for the study. Two talukas were randomly selected from each selected district. From each selected taluka, villages were selected at random and from each selected village, 10 respondents were selected by

random method, thus making a list of total 180 respondents for present study.

A suitable interview schedule was developed for dairy farmers. The contents of interview schedule contained name of farmers, age, occupation, education, knowledge, adoption, land holding, herd size, milk production, extension participation, mass media exposure, training received, economic motivation and major problems of farmers. All these selected variables were included in the schedule. The suitable indices were also developed for the measurement of variables. The interview schedules pre-tested on similar respondents in non-sample area to work out their reliability and validity. The suitable modification was made in the schedules accordingly. With the help of interview schedule, the data was collected from dairy farmers personally by the researcher at the convenient time. Some informal discussion pertaining to the study was carried out. After collection of information, the classification and tabulation of data was done keeping in view the objectives of the study. The suitable statistical analysis of data using SPSS-16.0 software such as mean, standard deviation, frequency and percentages were applied to draw meaningful inferences.

Profitability of milk production of cattle and buffaloes was evaluating as per the standard procedures as: (A) Fixed cost and (B) Variable cost.

The fixed cost included interest on fixed capital and depreciation cost on shed, animals and equipments present on farm of farmers. The variable cost included cost of green fodder, dry fodder, concentrate, labour, veterinary service charges, transportation of milk, miscellaneous charges (electricity and other charges if any). As the dairy farmer maintained animals of different species-breeds and of different age groups so, the livestock maintained at the farm was converted into Standard Animal Units (AU's) as per the methodology suggested by Rathva et al. (2021). Profitability of dairy farmer was taken as dependent variable and socio-personal factors taken as independent variables. To find out association between dependent variable and independent variables the data were fit to Pearson's correlation coefficient analysis.

RESULTS AND DISCUSSION

It is clear from Table 1 that average gross cost and gross return per AU per day was Rs. 160.74 and Rs. 238.92, respectively. Regarding different components of gross cost, expenditure on total feed and fodder was highest, which was 85.87 per cent, followed by labour cost (9.93 per cent), total fixed cost (interest on fixed capital + depreciation on fixed assets) 2.24 per cent, veterinary expenses (1.28 per cent) and

miscellaneous expenses (0.68 per cent). In care of feed and fodder cost, the concentrate feed contributed 33.50 per cent of total gross cost followed by dry fodder (29.05 per cent), green fodder (20.62 per cent) and mineral mixture cost (2.70 per cent).

Table 1 : Different input cost on dairy farms (n=180)

Sr. No.	Items of expenditure	Cost per AU/day
1	Fixed cost	
2	Interest on Fixed Capital (₹)	00.00 (00.00)
3	Depreciation on fixed assets (₹)	03.60 (02.24)
4	Total fixed cost (₹)	03.60 (02.24)
5	Variable Cost	
6	Green fodder cost (₹)	33.14 (20.62)
7	Dry fodder cost (₹)	46.70 (29.05)
8	Concentrate cost (₹)	53.85 (33.50)
9	Mineral Mixture cost (₹)	04.34 (02.70)
10	Total feed and fodder cost (₹)	138.03 (85.87)
11	Labour cost (₹)	15.96 (09.93)
12	Veterinary expenses (₹)	02.06 (01.28)
13	Miscellaneous expenses (₹)	01.09 (00.68)
14	Gross Cost (₹)	160.74 (100.00)
15	Returns	
16	Returns from dung	08.86
17	Net cost	147.18
18	Sale price of milk (₹/litre)	35.66
19	Milk production (litres)	06.70
20	Gross return	238.92
21	Net Return	91.74
22	Cost per litre of milk (₹/litre)	25.40
23	Net Returns per litre (₹/litre)	10.26

Figures indicates per cent of the respective value.

It can be concluded from Table 1 that for improving profitability and more return from the business, it is necessary to cut down the cost of feed and fodders as it contributes highest cost to the input cost. By way of making homemade concentrate with available resources purchased from nearby market and when ingredients for concentrate are available in surplus at low price. Preserving the green fodder at the time of surplus availability by making silage that can be used at the time of scarcity of green fodder, using urea treated fodder that can add to the availability of more nutrients; all these practices can help dairy farmers to drop down the cost on feed and fodder and ultimately increases the profit level.

The more or less similar investment pattern was found by Sunil et al. (2016), Patel et al. (2018a), Agrawal and Raju (2021).

It is obvious from Table 1 that returns from dung and gross return from milk was Rs. 08.86 and Rs. 238.92

respectively. Milk contributed 96.29 per cent and dung contributed 03.71 per cent to the total return. Net return per liter per AU per day was found to be Rs. 10.26. The Cost benefit ratio was 1:1.62. Gadhvi *et al.* (2021) reported the similar result.

Table 2 : Relation between characteristic of dairy farmers and profitability of dairy farms (n=180)

Sr. No.	Independent variables	Correlation coefficient (r)
X ₁	Age	-0.192**
X ₂	Education	-0.032 ^{NS}
X ₃	Occupation	-0.186*
X ₄	Dairy farming experience	-0.220**
X ₅	Knowledge	0.024 ^{NS}
X ₆	Adoption	0.059 ^{NS}
X ₇	Land holding	0.060 ^{NS}
X ₈	Herd size	0.291**
X ₉	Milk production	0.466**
X ₁₀	Economic motivation	0.355**
X ₁₁	Extension participation	0.125 ^{NS}
X ₁₂	Mass media exposure	0.109 ^{NS}
X ₁₃	Training received	0.139 ^{NS}

**Significant at 01.00% level of probability,

*Significant at 05.00% level of probability,

NS=Not-significant.

It is evident from Table 2 that out of the 13 variables examined, the correlation coefficient of four variables were found to be negative and nine were found to be positive. Out of nine positively related variables, three variables namely herd size, milk production and economic motivation were found to be significant at 0.01 level of probability and other six variables namely extension participation, mass media exposure, training received, knowledge, adoption, and land holding were found non-significant. The variable viz. age, education, occupation and experience in dairy farming were negatively correlated. Age, occupation and experience in dairy farming were negatively and significantly associated with profitability at 0.05 level of significance. Education had negative and non-significant relationship.

Age and profitability of dairy farmers

Age of dairy farm owners was negatively and significantly correlated with profitability of dairy farmers. In fact, majority (78.89 per cent) of dairy farmers were middle aged, between 30 to 58 years of age. Moreover, average age of respondents was about 46 years. Secondly, it was negatively associated with profitability indicating that with increase in age there was less profitability. Generally, older age individual is reluctant to change their practices leading to

affect their profitability on negative side. This might be the reason for the negative association of age with profitability of dairy farmers. *Cicek (2007) and Patel and Ashwar (2019)* reported that age did not influence the profitability of dairy farming. These findings did not support the findings of *Mumba et al. (2012), Musuku (2014).*

Education and profitability of dairy farmers

Education of dairy farmers was negatively and non-significantly correlated with profitability of dairy farmers. It was evident that majority of the respondents had above primary to graduate level of education and indicated that respondents were not significantly differentiated on their literacy level necessary for undertaking dairy farming activity leading to its negative but non-significant impact on profitability. Moreover, highly educated people might have not undertaken dairy farming as a source of regular income or as commercial farming. They reared the dairy animals only for their own family milk requirement ultimately were less attentive to profit maximization. This result is in line with the result reported by *Cicek et al. (2007) and Nyekanyeka (2011)*. This result is not in line with the result reported by the *Mumba et al. (2012)*.

Occupation and profitability of dairy farmers

Occupation of dairy farmers was negatively but significantly correlated with profitability of dairy farmer. It indicated that respondents who engaged in occupation other than dairy farming occupation had less profitability. It might be due to their more dependency on occupation other than dairy farming and less attention towards profit maximization from dairy farming leading to negative association with profitability. This result is in not in line with the findings of *Short (1993)*.

Dairy farming experience and profitability of dairy farmers

Dairy farming experience of dairy farmers was negatively but highly significantly correlated with profitability of dairy farmer. It indicated that respondents with higher age had less profitability from the business. Generally, more experience means higher age and higher age individual are reluctant to change their practices, less adoption of profit maximization practices leading to affect their profitability on negative side. This might be the reason for negative association of dairy farming experience with profitability of dairy farmers. These results are in compliance with the findings of *Nwachukwu and Onyenweaku (2007), Nganga et al. (2010), Nyekanyeka (2011)*.

Knowledge of scientific dairy farming practices and profitability of dairy farmers

Knowledge of dairy farmers about scientific animal husbandry practices was positively and non-significantly associated with profitability of dairy farmer. The better aware dairy farmer about scientific animal husbandry practices better would be the management practices resulting in increased profitability of dairy farmer. Knowledge influences interest and understanding. It widens the mirage and develops foresight of an individual. Exposure to latest technical expertise enables to arrive at a favourable conclusion regarding more profitability. In the present study knowledge also influenced farmers' profitability but it was not to that level to influence profitability significantly. Thus, leading to its positive and non-significant association with profitability of dairy farmers. *Biswas et al. (2012)* concluded same result in their research.

Adoption of scientific dairy farming practices and profitability of dairy farmers

Adoption of scientific animal husbandry practices by dairy farmers was positively and non-significantly associated with profitability of dairy farmer. By way of adoption of scientific animal husbandry practices, farmers convert their knowledge into use of new technology which could be reflected in better labour utilization, saving milk from spoilage, feed and fodder from wastage and improving yield per animal per lactation and thereby increasing profitability of farmers. But here with the adoption of scientific technologies the expenditure for technology might have increased input cost, curtailed profit resulting in its non-significant effect on profitability. These results are in compliance with the findings of *Carley and Fletcher (1986)*, *Quddus (2012)*.

Land holding and profitability of dairy farmers

The size of land holding possessed by dairy farmers was positively and non-significantly associated with the profitability of dairy farmers. Land is one of the most fundamental resources and is considered as an important socio-economic indicator in agricultural sector and rural development. Dairy farmers with more hectare of land would have more substantial visible capital earning from agriculture. They would be more attentive to agriculture farming as it is their main source of earning. More over with more agricultural land more input would be available for subsidiary occupation of dairy farming. It would have made them more attentive to dairy farming resulting in positive impact on profitability of dairy farmers. All these would have led to positive but non-significant association of land with profitability of dairy farming. The present finding is supported by the findings of

Kumar and Tripathi (2011).

Herd size and profitability of dairy farmers

The herd size was positively and highly significantly correlated with the profitability of dairy farmer. The increase in number of milch animals tends to increase milk production, reduce per unit production cost and ultimately increase profit of dairy farmers. This might be the reasons that increased herd size had exerted significant influence on profitability of dairy farmers. The result is in accordance with the findings of *Winsten et al. (2012)* and *Masuku (2014)*.

Milk production and profitability of dairy farmers

The total milk production of dairy farmers was positively and highly significantly associated with the profitability of dairy farmers. The average milk production of dairy farmers was about 76 litres. With increased production, per unit cost usually comes down. In present study also more production per house hold helped them to cut down unit cost of milk production and increased profitability of dairy farmers from dairy farming business leading to positive and highly significant association of milk production and profitability of dairy farmers. This leads to a conclusion that though milk production influenced positively but it was not significant, means the management practices on farms where total milk production was high and turn in to more profit still needs improvement to take benefit of more milk production. The present finding is in line with the finding of *Kashfi et al. (2012)*, *Winsten et al. (2012)* and *Masuku (2014)*, *Mahammad et al. (2021)*.

Economic motivation and profitability of dairy farmers

Economic motivation of dairy farmer was positively and significantly correlated with the profitability of dairy farmers. This might be because of the reason that economically motivated dairy farmers put all their effort towards maximizing the profitability in milk production. Generally, economically motivated farmers try their best to generate more income from the enterprise they are involved in. Farmers with better economics motivation would have taken all possible measures to minimize cost of production and maximize per unit profit from their business leading to positive and significant effect on profitability. The result is in line with *Kumar and Tripathi (2011)*, *Patel and Ashwar (2019)* and *Mahammad et al. (2022a)*.

Extension participation and profitability of dairy farmers

Extension participation by dairy farmers was positively and non-significantly associated with the profitability of dairy farmer. Extension participation would

provide an impetus to critically watch the modern dairy farming practices in the field. Farmers' participation in field visit, progressive farmer's dairy farm visit, exhibition, etc. would facilitate them to observe on farm applicability of available technologies and practical utility of modern practices. It enables them to improve adoption and results in reduce input cost, more production and more profit leading to positive influence of extension participation on profitability of dairy farmer. But here also farmers' participation was almost similar leading to its non-significant effect on profitability. Present result is in line with the results of Patel and Ashwar (2019), Parmar et al., (2024), Singh et al. (2024), Chaudhary et al. (2024), Patel and Patel (2024), Naik et al. (2024), Mahammad et al. (2022a).

Mass media exposure and profitability of dairy farmers

Mass media exposure by dairy farmers was positively and non-significantly associated with the profitability of dairy farmers. Exposure to various media helps a farmer to acquire latest information on dairy farming practices and market information. Exposure to media indicates the degree of progressiveness of farmers. Today media is playing a pivotal role in dissemination of technologies. Information on latest farming practices are spread through various media like magazines, newspaper, radio, television, internet, telephone, etc. More emphasis on inclusion of recommended livestock farming practices in mass media will help in improvement of livestock farming status of farmers. But in the present study the respondents were more or less non-significantly differentiated and similar in mass media exposure leading to its non-significant effect on profitability. Similar results were observed by Priya et al. (2019).

Training received and profitability of dairy farmers

Training received by dairy farmers was positively and non-significantly correlated with profitability of dairy farmer. The rationality behind this would be that training on dairy farming makes people more aware of the scientific practices and ongoing technological changes. This would help them to acquire information regarding breeding management, feeding management, health care management and other information pertaining to improve dairy farming economics. This helps to reduce mortality, services period, inter calving period, dry period and feed wastage by better feeding management, reduction in per unit cost and increased profit margin. But in the present investigation the respondents were more or less non-significantly differentiated and similar in training participation leading to its non-significant influence on profitability. This result is in accordance with the findings of Sharma et al. (2014).

CONCLUSION

The study has clearly shown that there is a much more potential in dairy farming business. The cost of feed and fodder play a major role in cost of milk production. More training programmes should be initiated to educate the farmers about ration balancing and use of by products in animals feed, which would result in decline in the cost of production of milk and improve milk productivity and profitability. The correlation coefficient analysis clearly revealed that the variables namely herd size, milk production and economic motivation had positive and highly significant effect, while extension participation, mass media exposure, training received, knowledge, adoption, and land holding had positive and significant effect on profitability of dairy farmers. Extension agencies should organize knowledge building activities like group meetings, group discussions and impart training to influence farmers to adopt the scientific practices. Adoption of scientific practices on farm will substantially help in increase of production as well as income generation.

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CONFLICT OF INTEREST

All authors declare that they have no conflict of interest.

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