

SOCIO-ECONOMIC STATUS AND CONSTRAINTS FACED BY DAIRY FARMERS**M. B. Rajput² B. K. Ashwar² and S. J. Vekariya³**

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ABSTRACT

Socio-economic status of farmer is the position of an individual on the socio economic scale, which is determined by a combination of social and economic factors such as education, income, occupation, herd size and milk production. 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 result revealed that majority of dairy farmers were (78.89 per cent) in middle age group, (79.99 per cent) educated up to high school to graduate level, (81.67 per cent) were engaged in dairy farming along with agriculture, (70.00 per cent) had medium level of experience in dairy farming, medium level of knowledge and adoption about recommended animal husbandry practices. They had medium level of extension participation and mass media exposure and majority of them had received one training in a year regarding on scientific dairy farming. With regards to socio-economic characteristics the majority of dairy farmers (41.67 per cent) were in medium to big farmer category, (57.22 per cent) had small sized herd and economic motivation.

Keywords: dairy farming, socio-economic status, animal husbandry practices, north Gujarat

INTRODUCTION

Livestock rearing ensures maximum employment and there by an important source of income to rural population. Livestock and Dairy projects are being initiated and implemented so as to provide an assured and remunerative market to the milk producers in the rural areas and to make available dependable quality of milk and milk products at reasonable price to consumers in the urban areas. Around 40 million households have their main source of income from dairy farming. The majority are small-scale, marginal farmers (FAO Report - 2018). Dairy farming ensures regular monetary earnings to people in the situation of crop failure. Out of total agricultural GDP of India, livestock sector contributed about 25.6 per cent during 2020-21. India has been the largest milk producing country in the world with about 221.1 million metric tonnes of milk production during 2021-22 (NDDB - 2021).

Dairy farming from being a traditional family run business today has grown to an organized dairy industry in many parts of the country with technological specializations. 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.

Socio-economic is a combined measurement of economic and social position of an individual compared to others in society. It influences the accessibility to the resources, livelihood pattern, food and nutritional security. Dairying is a secure path and future of our rural development and it can contribute substantially to farmer's income (Gangasagare and Karanjkar, 2009) but in order to improve the economic condition of dairy farmers, it is of immensely importance to know their prevailing status which will help in identifying the major technological problems being faced by them in dairy farming.

OBJECTIVE

To know the socio-economic status and constraints faced by 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.

RESULTS AND DISCUSSION

Socio – Personal and economic characteristics of the dairy farmers

Age

The data present in table 1 indicated that majority (78.89 per cent) of dairy farmer belonged to middle age group, followed by 12.22 per cent and 8.89 per cent of respondents were from old age and young age group, respectively. From the above facts, it can be concluded that majority (78.89 per cent) of the dairy farmers were in middle age group. The probable reason might be that this age is considered to be an actively working age and so as it is applicable to the dairy farmers also in the study group. This is the group which is entrusted with responsibilities of earning for their families leading to finding that majority farmers belong to this group. The findings were supported by Patel *et al.* (2018) and Potdar *et al.* (2019).

Table 1: Age (n=180)

Category	Frequency	Per cent
Young age (up to 29 years)	16	8.89
Middle age (30 to 58 years)	142	78.89
Old age (above 59 years)	22	12.22
Mean	45.93	
S.D.	11.86	

Table 2: Education (n=180)

Category	Frequency	Per cent
Illiterate	03	01.67
Literate (can read and write 1-4 std.)	05	02.78
Primary school to middle school (5-7std.)	27	15.00
High school (8-10 std.)	44	24.44
Higher Secondary School (11-12 std.)	47	26.11
College level (graduate)	53	29.44
Above graduation	01	00.56
Mean	10	
S.D.	02	

Education

Data in the table 2 revealed that Majority (79.99 per cent) of the dairy farmers were educated from high school to graduate level, followed by 15.00 per cent were educated primary to middle school level, 02.78 per cent were literate who could read and write, 01.67 were illiterate and only 0.55 per cent of respondents had education above graduation. Throughout Gujarat state number of steps have been taken to improve literacy level and minimize dropout ratio since last three decades. This could have reflected in high literacy rate among the respondents. The finding is in line with the findings reported by Vekariya *et al.* (2016), Patel *et al.* (2018) and Singh *et al.* (2021).

Occupation

Table 3: Occupation (n=180)

Category	Frequency	Per cent
Dairy farming	13	07.22
Dairy farming + Agriculture Farming	147	81.67
Dairy farming + Agriculture Farming + Any other	20	11.11
Mean	2.04	
S.D.	0.43	

It can be concluded from table 3 that all the dairy farmers were engaged in dairy farming along with agriculture farming (81.67 per cent) and agriculture and other occupations (20.00 per cent) like government service or other business and

13.00 per cent respondent was found to have dairy farming alone as an earning occupation. It is fact that even today about 67 per cent population in villages have their major source of livelihood as agriculture and animal husbandry. The dairy farming has emerged out from agriculture farming as an interdependent business enterprise. They have continued agriculture and other business as a security point of view in case of failure of either agriculture or dairy farming in uncertainties of nature and might have found mixed farming as a secured source of additional income. Furthermore, the respondents were highly literate and educated enough to get aware of market trends for running independent business, independent profession or engaging in services. These findings are essentially similar to Patel *et al.* (2018), Gopi *et al.* (2020) and Barman (2022).

Dairy farming experience

Table 4: Dairy farming experience (n=180)

Category	Frequency	Per cent
Short experience (less than 10 years)	25	13.89
Medium experience (10 to 30 years)	126	70.00
Long experience (above 30 years)	29	16.11
Mean	21.53	
S.D.	12.15	

It is evident from table 4 that majority (70.00 per cent) of the dairy farmers were in medium experience group, followed by long experience (16.11 per cent) and only 13.89 per cent of the respondents had short span of experience. It is obvious from table-4.4 that majority of the dairy farmers had medium to long experience in dairy farming. In North Gujarat, the livestock keeping or the dairy farming is a way of life in rural areas. Since their adolescent stage, the members are involved in routine of livestock farming. This would have helped them to run dairy farming from young age resulting in medium to long experience in dairy farming. The present finding gets support from the findings reported by Raina *et al.* (2016) and Singh *et al.* (2021).

Knowledge

It is clear from table 5 that majority (67.78 per cent) of the dairy farmer had medium level of knowledge regarding recommended practices of animal husbandry, followed by high (17.78 per cent) and low (14.44 per cent) level of knowledge. The mean score of knowledge was 74.88 out of total score of 92. It led to a conclusion that dairy farmer possessed very good knowledge about scientific dairy farming practices. The similar findings reported by Gunaseelan *et al.* (2018), Patel

(2018) and Kavithaa *et al.* (2020) reported findings medium to high level of knowledge of scientific animal husbandry practices.

Table 5: Knowledge of dairy farmer about scientific dairy farming practices (n=180)

Category	Frequency	Per cent
Low level of knowledge (less than 68 years)	26	14.44
Medium level of knowledge (68 to 83 years)	122	67.78
High level of knowledge (above 83 years)	32	17.78
Mean	74.88	
S.D	7.66	

Adoption

It is clear from table 6 that 64.44 per cent of dairy farmers had medium level of adoption followed by 20.56 per cent of respondents who had high level and 15.00 per cent of respondents were with low level of adoption of scientific animal husbandry practices. The average adoption index was 71.14 per cent leading to a conclusion that their average adoption level was more than 71 per cent. This indicated that the dairy farmers put efforts to improve the knowledge for success of the dairy farm business and had put quiet a good number of scientific practices in to operation on their farms. This finding is supported by the findings of Raina *et al.* (2016), Patel (2018) and Sudhanshu *et al.* (2019).

Table 6: Adoption of dairy farmer about scientific dairy farming practices (n=180)

Category	Frequency	Per cent
Low level of adoption (less than 63 score)	27	15.00
Medium level of adoption (63 - 79 score)	116	64.44
High level of adoption (above 79 score)	37	20.56
Mean	71.14	
S.D	08.02	

Socio-Economic Variables

Land holding

Data in table 7 indicated that 41.67 per cent farmers were in big farmer category, followed by medium farmer category (21.11 per cent), marginal farmer category (19.44

Table 7: Land holding (n =180)

Category	Frequency	Per cent
Landless labourer (No land)	03	01.67
Marginal farmer (Up to 1 hectare land)	35	19.44
Small farmer (1.01 to 2 hectare land)	29	16.11
Medium farmer (2.01 to 4 hectare land)	38	21.11
Big farmer (Above 4 hectare land)	75	41.67
Mean	4.84	
S.D	4.05	

per cent), small farmer category (16.11 per cent) and 01.67 per cent dairy farmers had no land. This clearly reflected that most of the people engaged in dairy farming had more than 1.01 hectare land. Probable reason may be that dairy farming needs more capital and resources as well as also require risk taking ability which may not be within the capacity of land less labourers, it results in more number of farmers in medium to big farmers' category.

This finding is similar to the findings of Kumar *et al.* (2016) and Patel *et al.* (2018).

Herd size

Table 8: Herd size (n =180)

Category	Frequency	Per cent
Small herd size (Less than 10 AU)	103	57.22
Medium herd size (10.1 – 20 AU)	55	30.56
Large herd size (More than 20 AU)	22	12.22
Mean	11.42	
S.D.	08.13	

The data show in table 8 that 57.22 per cent of the dairy farmers had small sized herd (less than 10 AU), followed by 30.56 per cent dairy farmers who had medium sized herd (10.1-20 AU) and only 12.12 per cent dairy farmers had large sized herd (More than 20 AU). This also indicated that average animal number was more than 11 heads per household in farm families under investigation. The high SD value also indicated that there was quiet wide variation among the farm families as far as the herd strength was concerned. This finding is similar to the findings of Rai *et al.* (2017) and Khode *et al.* (2020).

Milk production

Table 9: Milk production (n=180)

Milk production	Frequency	Per cent
Small producers' group (up to 96 lit/day)	129	71.67
Medium producers' group (In between 96.1 to 192 lit/day)	41	22.78
large producers' group (More than 192 lit/day)	12	06.67
Mean	76.72	
S.D	69.20	

It is clear from the data in table 9 that majority (71.67 per cent) of dairy farmers were in small producers' group i.e., less than 96 liters per day followed by 22.78 per cent in medium producers' group and 06.67 percent in large producers' group. It is very important to note that average milk production per household was about 76 liters which is indicative of significant contribution of dairy farming in farmers' livelihood security as about Rs. 2500 daily cash flow was from dairy farming. Singh *et al.*, (2021) revealed similar findings that majority of the dairy farmers were in low to medium producers' group.

Economic Motivation

Table 10: economic motivation (n =180)

Economic motivation	Frequency	Per cent
Low economic motivation (up to 15 score)	34	18.89
Medium economic motivation (16 – 19 score)	119	66.11
High economic motivation (above 19 score)	27	15.00
Mean	17.40	
S.D	1.94	

The data pertaining to economic motivation of dairy farmers are presented in table 10. It was quite evident that majority of the respondents (66.11 per cent) were in medium economic motivation group, followed by 18.89 per cent in low economic motivation group and 15.00 per cent in high economic motivation group. In present scenario, majority of the people aspire quality life with better amenities. Thus, they are always in search of opportunities for enhancing income which is reflected as 81.11 per cent dairy farmers were in medium to high economic motivation group. The average motivation score being high i.e., 17.40 indicated farmers

interest for maximizing profit out of the dairy farming business. It is in line with the findings of Rathod and Chander (2017), Patel *et al.* (2018) and Mahesh *et al.* (2020).

Communication variables

Extension participation

It is apparent from the data in table 11 that 54.44 per cent of the dairy farmers were found to have medium level of extension participation, followed by 27.78 per cent of respondents with high level of extension participation and 17.78 per cent respondents had low level of extension participation. It is concluded that a majority of the dairy farmers were found to have medium level of extension participation. The probable reason might be various effective transfer of technology approaches made by co-operative milk society, dairy union, state veterinary department and veterinary college. Hence, the dairy farmers might have been properly motivated by the extension functionaries to participate in various extension activities. Same time it was also very clear that their participation was limited to only one extension activity. Vekariya *et al.* (2016) and Patel *et al.* (2018) revealed similar findings that majority of the respondents had medium level of extension participation.

Table 11: Extension participation (n =180)

Category	Frequency	Per cent
Low extension participation (below 1.0)	32	17.78
Medium extension participation (1 to 2)	98	54.44
High extension participation (above 2)	50	27.78
Mean	1.10	
S.D	0.67	

Mass media exposure

The data presented in table 12 indicate that 48.33 per cent of the dairy farmers had medium level of mass media exposure, followed by 31.67 per cent and 20.00 per cent of the farmers had high and low level of mass media exposure, respectively. From the above facts, it is concluded that majority (80.00 per cent) of dairy farmers had medium to high level of mass-media exposure. Easy to mobile access and television in every household might be the probable reasons for above finding. Moreover, their skill in use of modern mass media technologies, economic condition and other social factors might have played a role in their level of

exposure to mass media. The comparable findings were also concluded by Bhatt & Patel (2011).

Table 11: Mass media exposure (n =180)

Category	Number	Per cent
Low mass-media exposure (below 1.0 score)	36	20.00
Medium mass-media exposure (1 to 2 score)	87	48.33
High mass-media exposure (above 2 score)	57	31.67
Mean	1.12	
S.D	0.71	

Training received

The data in table 13 shows that about 47 per cent of the dairy farmers received training once in a year, followed by 30.00 per cent dairy farmer who did not receive any training pertaining to dairy farming before engaging themselves in dairy farming and only about 23 per cent dairy farmers had received more than one training. Generally, most training are on campus in nature, farmers did not find leisure time exclusively for such training sessions leading to their less participation in training programmes. Even training was not mandatory for getting loans or subsidies for dairy farming business. The findings are in line with the findings of Singh and Rampal (2016) and Khode (2018).

Table 13: Training received (n =180)

Training received	Frequency	Per cent
No training received	54	30.00
One training received	85	47.22
More than one training received	41	22.78
Mean	0.93	
S.D	0.72	

Profitability of dairy farmers: it's relationship with independent variables

It is evident from Table 14 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.

Table 14: Correlation between characteristic of dairy farmers and profitability of dairy farmers

Sr. No.	Independent variables	Correlation with profitability of dairy farmers
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 1.00 per cent level of probability,

* Significant at 5.00 per cent level of probability.

NS=Non-significant.

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).

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).

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).

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).

In multiple regression analysis, all 13 independent variables and one dependent variable were fitted to explain the variation in profitability of dairy farmers. All the independent variables mentioned in Table-4.18, explained as much as 63.17 per cent of total variation in profitability of dairy farmers. The 'F' value was found to be highly significant (probability <0.01). The unexplained variation of 37.83 per cent may be due to factors beyond purview of the study. It can also be revealed that the "t" values of three variables viz., Herd size, milk production and economic motivation were found to be positively significant (probability <0.05).

Table 15: Multiple regression analysis of respondents' profitability of dairy farmers with independent variables (n=180)

Sr. No.	Independent Variable	Regression coefficient	't' value
X ₁	Age	-0.147	-2.604
X ₂	Education	-0.209	-0.423
X ₃	Occupation	-3.964	-2.523
X ₄	Dairy farming experience	-0.165	-3.013
X ₅	Knowledge	0.029	0.321
X ₆	Adoption	0.067	0.789
X ₇	Land holding	0.135	0.799
X ₈	Herd size	0.327	4.064*
X ₉	Milk production	0.061	7.034*
X ₁₀	Economic motivation	1.674	5.074*
X ₁₁	Extension participation	1.698	1.675
X ₁₂	Mass media exposure	1.399	1.464
X ₁₃	Training received	1.750	1.874

Multiple R = 0.7948

R² = 0.6317

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

It could be concluded that 63.17 per cent variations in profitability of dairy farmer was explained by a set of 13 independent variables taken together. Furthermore, out of 13 variables, three variables viz., herd size, milk production and economic motivation had significant contribution in profitability of dairy farmers. This study provided evidence about the important role played by three significant variables in improving profitability of dairy farmers. Regression coefficient had clearly indicated that one unit change in herd size, milk production and economic motivation would affect 2.857, 5.364 and 4.986 unit changes respectively in the profitability of dairy farmers. This implied that herd size and economic motivation had exerted positive influence on profitability of dairy farmers. So, herd size and economic motivation may be utilized positively to further improve profitability of dairy farmer.

The present results are in line with the findings of Kumar and Tripathi (2011), Nyekanyeka (2011), Kashfi *et al.* (2012), Winsten *et al.* (2012), Masuku (2014), Kapadiya *et al.* (2022), Mahammad *et al.* (2022a and 2022b), Ninama *et al.* (2022) and Patel *et al.* (2022).

Constraints faced by dairy farmers

The data presented in table 19 revealed that high cost of concentrate feed and its ingredients was the main constraint as reported by 76.67 per cent of dairy farmers, followed by Non remunerative price for milk (72.22 per cent), Short

Table 14: Constraints faced by dairy farmers

(n=180)

Sr. no.	Constraints faced by dairy farmers	Resp. No.	Per cent of Resp.	Rank
1	High cost of concentrate feed and its ingredients	138	76.67	I
2	Non remunerative price for milk	130	72.22	II
3	Short supply and high cost of dry fodder	128	71.11	III
4	Inadequate availability of green fodder throughout the year	122	67.78	IV
5	More number of animals with reproductive disorder	111	61.67	V
6	Government scheme doesn't reach to real beneficiary	106	58.89	VI
7	High investment for cattle shed and building	90	50.00	VII
8	The concentrate quality changes from time to time	78	43.33	VIII
9	Low productivity of dairy animals	72	40.00	IX
10	Inadequate training on dairying and animal husbandry	63	35.00	X
11	Forced rearing of male calf is a problem	60	33.33	XI
12	Fraudulent practices by some members affect profitability of other innocent members in dairy co-operative	18	10.00	XII

supply or poor availability of dry fodder in monsoon and if available then it cost more (71.11 per cent), Less availability of green fodder throughout the year (67.78 per cent), More number of animals with reproductive disorder (61.67 per cent), High investment for cattle shed building (50.00 per cent), Frequent change in the quality of concentrate (43.33 per cent), Low productive animals (40.00 per cent), Inadequate training on dairying and animal husbandry (35.00 per cent), Male calf rearing (33.33 per cent), Fraudulent practices by some members (10.00 per cent).

CONCLUSION

Regarding personal characteristic of dairy farmers, study revealed that majority (78.89 per cent) of dairy farmers belonged to middle age group, 79.99 per cent dairy farmers were educated from high school to graduate level. 81.67 per cent had major occupation of dairy farming along with agriculture; majority (70.00 per cent) of them were in medium experience group, while 67.78 and 64.44 per cent of the dairy farmers had medium level of knowledge and adoption, respectively. 62.78 per cent dairy farmer were in medium to big farmer category, 57.22 per cent of the dairy farmers had small sized herd (less than 10 AU), majority (71.67 per cent) of dairy farmers were in small producers' group and 66.11 per cent were in medium economic motivation group, respectively. While 54.44 per cent of the dairy farmer were found to have medium level of extension participation. 48.33 per cent of the dairy farmers had medium level of mass media exposure and 47.22 per cent dairy farmer received only one training in an assessment year.

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CONFLICT OF INTEREST:

All authors declare that they have no conflict of interest

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