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Exploring the Profile of Dairy Farmers in Jabalpur District, Madhya Pradesh, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The investigation was conducted in Panagar and Jabalpur blocks of Jabalpur district, selecting 203 commercial dairy farmers purposively. According to the results, the majority (65.52 per cent) of the commercial dairy farmers were from the middle age group (36 to 55 years). Most of the respondents (32.51 per cent) had education up to high school level. Approximately half of the respondents (47.29 per cent) had medium-sized families (6 to 8 members). A majority (61.08 per cent) of the respondents had 9 to 16 years of experience in dairy farming. About half of the respondents (49.75 per cent) had low social participation. Most respondents (61.58 per cent) received only 1 to 2

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training sessions about dairying. Approximately half (50.25 per cent) of the respondents were marginal farmers with land holdings up to 1 hectare. For 70.94 per cent of commercial dairy farmers, dairy farming was the major source of income. More than half (58.62 per cent) of the respondents had a herd size of 101 to 250 animals. The majority (66.01 per cent) of the respondents had a milk production of 251 to 1000 litres per day. More than half of the respondents (59.61 per cent) consumed 2.01 to 4 litres of milk per day for their own use. Most respondents (66.01 per cent) sold 251 to 1000 litres of milk per day. The majority (82.76 per cent) of the respondents processed only up to 100 litres of milk per day. Most respondents (92.61 per cent) had a net annual income of up to Rupees 29,13,600. More than half (54.19 per cent) of the respondents had a medium level of mass media exposure, and a higher percentage (52.71 per cent) of commercial dairy farmers had medium extension contact. More than half (55.67 per cent) of the respondents had a medium scientific orientation, majority (61.08 per cent) had medium economic motivation and a higher share (45.81 per cent) had a high level of knowledge about scientific dairy farming practices.

Keywords: Commercial dairy farmers; knowledge; profile; socio-economic.

1. INTRODUCTION

Commercial dairy farming plays an important role in the vital and growing economy of the agriculture sector in the Jabalpur district of Madhya Pradesh. Due to its favourable climate, rising demand for dairy products, and rich agricultural heritage, Jabalpur is a prime destination for the commercial dairy business. Jabalpur is situated in the center of India, making it easy to access transport facilities to sell produced milk in neighbouring cities. Its strong infrastructure and easy access to markets significantly benefit the dairy farmers. By using a combination of technological innovations and traditional dairy farming practices, dairy farmers in Jabalpur can enhance milk production and quality. The locale is ideal for rearing high-yield dairy cattle breeds due to its fertile soil, abundant water resources, and friendly environment [1-4].

The commercial dairy farming industry in Jabalpur not only contributes to the local economy but also plays an important role in ensuring nutritional security. The sector enhances employment opportunities, supports allied sectors, and promotes sustainable agricultural practices. The growing population and expanding urbanization in the region increase the demand for fresh milk and dairy products, offering beneficial opportunities for commercial dairy farmers. This growing enterprise is further supported by government policies aimed at boosting the dairy sector, including offering veterinary services, training programmes and financial support. The commercial dairy farming enterprise represents evidence of the locale's potential in agriculture and its impact on the overall economy of Madhya Pradesh.

Understanding the profile of commercial dairy farmers in Jabalpur district is vital for optimizing the growth and sustainability of the dairy sector in this region. This paper aims to profile the demographic, educational, and economic attributes of these farmers, alongside their farming practices and resource utilization. By examining factors such as socio-economic, communication, and psychological attributes, this research provides a comprehensive overview of the overall landscape of commercial dairy farming in Jabalpur.

2. METHODOLOGY

The Jabalpur district of Madhya Pradesh was purposively selected for the study because it is well known for good quality fresh milk production and considered as commercial dairy farming hub and has a well-established infrastructure for the development of the dairy industry including numerous milk collection centers, processing facilities owned by the public and private sectors, networks of cooperatives and a high demand for fresh milk. The district comprises of seven blocks out of which Panagar and Jabalpur blocks were selected for the present investigation because these two blocks have the maximum number of commercial dairy units/farmers among the all other blocks. A list of Commercial Dairy farmers of the selected blocks is acquired with the assistance of the Executive of the Veterinary Department, Directorate of Veterinary Extension Jabalpur, Madhya Pradesh, India. Total 203 commercial dairy farmers were included in the study. The data was collected through personal interview technique. The data was analyzed using OPSTAT.

3. RESULTS AND DISCUSSION

The results obtained from the present investigation have been summarized under the following heads:

3.1 Personal and Socio-Economic Profile of Commercial Dairy Farmers

Age: It refers to the chronological age of the respondent in years at the time of data collection. It was measured by direct questioning to the respondents. Majority (65.52 per cent) of the commercial dairy farmers were from middle age group (36 to 55 years), followed by 23.15 per cent were from young age group (up to 35 years) and 11.33 per cent were from old age group (above 55 years) showing that middle age are considered as most productive earning age of the person and they are more likely to involve new techniques in their enterprise. The finding is in agreement with observations of Chandrasekar et al. [5], Kirar et al. [6], Meenia et al. [7].

Education: Majority of the commercial dairy farmers (32.51 per cent) only have high school education followed by 31.03 per cent were graduated and above, 21.19 per cent were educated up to higher secondary school, 9.85 per cent were educated up to middle school, 2.46 per cent were illiterate, 1.48 per cent can read and write and 1.48 per cent were educated up to primary school education. This could be due to shortage of higher education schools and colleges in the area and involvement of the respondents in the business or enterprise from a very young age. This finding is in line with the results of Vishwakarma et al. [8], Meenia et al. [7].

Family Size: Majority of the commercial dairy farmers (47.29 per cent) had a medium (6-8 members) family size followed by 30.05 per cent had a small (up to 5 members) family size and 22.66 per cent had large (9-12 members) family size. It is because of fragmentation of the family structure from generation to generation. The results supported by the finding of Meenia et al. [7].

Table 1. Personal and Socio-economic characteristics of commercial dairy farmers

Variables	Category	F	%
Age	Young Age (up to 35 years)	47	23.15
	Middle Age (36 to 55 years)	133	65.52
	Old Age (above 55 years)	23	11.33
Education	Illiterate	5	2.46
	Can read and write	3	1.48
	Primary school	3	1.48
	Middle school	20	9.85
	High school	66	32.51
	Higher secondary school	43	21.19
	Graduate and above	63	31.03
Family Size	Small (up to 5 members)	61	30.05
	Medium (6-8 members)	96	47.29
	Large (9-12 members)	46	22.66
Experience in dairying	Up to 8 years	48	23.65
	9 to 16 years	124	61.08
	Above 16 years	31	15.27
Social Participation	Low	101	49.75
	Medium	77	37.93
	High	25	12.32
Training received about dairying	1 – 2 Training	125	61.58
	3 – 4 Training	55	27.09
	More than 4 Training	23	11.33
Land Holding	Marginal farmers (up to 1 ha.)	102	50.25
	Small farmers (1.01 – 2 ha.)	67	33.00
	Medium farmers (2.01 – 5 ha.)	21	10.34
	Large farmers (Above 5 ha.)	13	6.40
Occupation	Commercial dairy farming	144	70.94
	Commercial dairy + Agriculture	43	21.18
	Commercial dairy + Agriculture + other	16	7.88

Variables	Category	F	%
Herd Size	up to 100 animals	64	31.53
	101 – 250 animals	119	58.62
	Above 250 animals	20	9.85
Milk Production	up to 250 litres/day	32	15.76
	251 – 1000 litres/day	134	66.01
	Above 1000 litres/day	37	18.23
Milk Consumption	Up to 2 litres/day	21	10.34
	2.01 – 4 litres/day	121	59.61
	Above 4 litres/day	61	30.05
Milk Sale	Up to 250 litres/day	32	15.76
	251 – 1000 litres/day	134	66.01
	Above 1000 litres/day	37	18.23
Milk Processing	Up to 100 litres/day	168	82.76
	101 – 200 litres/day	25	12.32
	Above 200 litres/day	10	4.92
Annual Income	Up to Rs. 2913600	188	92.61
	Rs. 2913601 - 5646000	11	5.42
	Above Rs. 5646000	4	1.97
Mass Media Exposure	Low	50	24.63
	Medium	110	54.19
	High	43	21.18
Extension Contact	Low	49	24.14
	Medium	107	52.71
	High	47	23.15
Scientific Orientation	Low	42	20.69
	Medium	113	55.67
	High	48	23.64
Economic Motivation	Low	42	20.69
	Medium	124	61.08
	High	37	18.23

Experience in dairying: Experience is the key of doing things efficiently and effectively. Majority (61.08 per cent) of the commercial dairy farmers had 9 to 16 years of experience followed by up to 8 years of experience (23.65 per cent) and above 16 years of experience (15.27 per cent) in dairy farming. Kalaivani et al. [9] observed in their study that majority of the dairy farmers had medium (11-20 years) of experience in dairy farming.

Social Participation: It refers to the involvement of the person in social activities. The majority (49.75 per cent) of commercial dairy farmers had a low level of social participation, followed by 37.93 per cent with medium and 12.32 per cent with a high level of social participation. The reason might be that dairy farming is a highly time-consuming business and milk is highly perishable. Punctuality is very important in commercial dairy farming, and due to the shortage of time, commercial dairy farmers have low social participation.

Singh et al. [10], in their study "A Study on Socio-Economic Profile of the Dairy Farmers in Central Plain Zone of Uttar Pradesh," concluded that the majority (56.36 per cent) of dairy farmers had a medium level of social participation.

Training received about dairying: Majority of the commercial dairy farmers (61.58 per cent) had received 1 to 2 training followed by 27.09 per cent received 3-4 training and 11.33 per cent respondents received more than 4 training about dairy farming. The reason behind it is most of the commercial dairy farmers get dairy units as their paternal property and they engaged in the business from a very young age and had good experience and knowledge of dairying. But there is lack of trainings about processing of milk.

Raina et al. [11] in their study “Training needs of dairy farmers” reported that even in the most popular areas of training, there was an inadequacy in terms of frequency of training imparted by dairying extension agencies.

Land Holding: Most commercial dairy farmers (50.25 per cent) were in the category of marginal farmers, with land holdings up to 1 hectare, followed by 33 per cent in the small farmers (1.01 - 2 ha) category, 10.34 per cent in the medium farmers (2.01 - 4 ha) category, and 6.40 per cent in the large farmers (more than 4 ha) category. The reason behind the very small land holdings is the frequent fragmentation of land among family members. This finding is in line with the studies by Chandrasekhar et al. [5], Kirar et al. [6], and Meenia et al. [7].

Occupation: The primary occupation for the majority of commercial dairy farmers (70.94 per cent) was commercial dairy farming followed by 21.18 per cent doing commercial dairying + agriculture and 7.88 per cent were doing commercial dairying + agriculture + other as their occupation. This is primarily attributed to the fact that most respondents were marginal farmers with land holdings of up to 1 hectare, and commercial dairying is considered a profitable business for improving socio-economic status nowadays.

This finding resonates with the findings of George [12] & Nabeel et al. [13], reinforcing the notion that dairying holds significant importance as the primary occupation among farmers

Herd Size: Maximum number of commercial dairy farmers (58.62 per cent) had a herd size of 101 to 250 animals followed by 31.53 per cent had a herd size of up to 100 animals and 9.85 per cent respondents had herd size of above 250 animals at their dairy unit. The reason behind it is high demand of fresh milk and maximum number of respondents commercially running the dairy enterprise.

Koli et al. [14] in their study “Personal, socio-economic, communication and psychological characteristics of dairy farmers” observed that 76.50 per cent of the dairy farmers had 7 to 14 animal (medium) herd size whereas 15.00 per cent respondents had up to 6 animal (small) herd size.

Milk Production: Milk production was a very crucial factor related to commercial dairy farming. Majority of the commercial dairy farmers (66.01 per cent) produced 251 to 1000 litres of fresh milk per day followed by 18.23 per cent produced up to 250 litres milk per day and 15.76 per cent produced above 1000 litres fresh milk per day at their dairy unit. The reason behind it is large herd size rearing on the dairy unit at a commercial level.

Singh et al. [10] in their study “A study on socio-economic profile of the dairy farmers in central plain zone of Uttar Pradesh” concluded that majority (38.18 per cent) of the dairy farmers produce 6 to 10 litres of milk per day from their lactating animal.

Milk Consumption: ajority of the commercial dairy farmers (59.61 per cent) use 2.01 to 4 litres of milk per day for their consumption followed by 30.05 per cent above 4 litres milk and 10.34 per cent respondents use up to 2 litres milk per day for their own consumption. The reason might be that the respondents belong to a medium sized family. The finding is in line with Wetal et al. [15].

Milk Sale: Majority of the commercial dairy farmers (66.01 per cent) sale 251 to 1000 litres of total milk per day. About 15.76 per cent respondents sale up to 250 litres milk and 18.23 per cent respondents sale more than 1000 litres of milk per day. Koli et al. [14] in their study “Personal, socio-economic, communication and psychological characteristics of dairy farmers” observed that 92.50 per cent of the dairy farmers sale 12 to 34 litres milk followed by 4.50 per cent sale above 34 litres of milk.

Milk Processing: Milk processing is a crucial aspect of commercial dairy farming, indicating the total quantity of milk processed or value added. The majority of commercial dairy farmers (82.76 per cent) process up to 100 litres of milk per day. This is followed by 12.32 per cent of respondents processing 101 to 200 litres of milk, and 4.92 per cent processing more than 200 litres of milk daily. The preference for processing smaller quantities of milk could be attributed to several factors. Many respondents sell fresh milk directly to vendors, consumers, and cooperative societies, as consumers often prefer fresh milk over packaged varieties. Additionally, the lack of training in milk processing techniques may contribute to the limited processing of milk among respondents.

Annual Income: Majority (92.61 per cent) of the commercial dairy farmers had a annual income of up to Rs.2913600 followed by 5.42 per cent of the total respondents had annual income between Rs. 2913601 to 5646000 and 1.97 per cent of the respondents had annual income more than Rs.5646000.

Khalangre and Suryawanshi [16] in their study concluded that majority (57.18 per cent) of the dairy farmers had medium income levels between 0.75 to 1.50 lakh rupees.

Mass Media Exposure: More than half (54.19 per cent) of the commercial dairy farmers had medium level of mass media exposure followed by 24.63 per cent low and 21.18 per cent had high level of mass media exposure. The reason could be that the majority of the respondents owned mobile phones, newspapers, internet and television to seek the information regarding dairy and agriculture. The results supported by finding s of Gautam et al. [17] and Kumar et al. [18].

Extension Contact: Most of the commercial dairy farmers (52.71 per cent) had medium level of extension contact followed by 24.14 per cent respondents had low extension contact and 23.15 per cent respondents had high extension contact. The probable reason behind it is dairy farmers visit the dairy extension department, agriculture department for their dairy and farm concerns. The results supported by findings of Vekariya et al. [19], Kumar et al. [20].

Scientific Orientation: More than half (55.67 per cent) of the commercial dairy farmers had medium level of scientific orientation followed by high (23.64 per cent) and low scientific orientation (20.69 per cent). The findings closely supported by Chandrasekar et al. [5], Vishwakarma et al. [9], Dhabi et al. [20] and Meenia et al. [7].

Economic Motivation: Majority of the commercial dairy farmers (61.08 per cent) had medium level of economic motivation followed by 20.69 per cent had low and 18.23 per cent respondents had high economic motivation. This distribution may be attributed to the cautious approach of commercial dairy farmers when making investment decisions in dairy farming. They may aim to maximize returns while minimizing investments, given the uncertainty of dairy product prices and the high cost of dairy inputs. This observation is supported by similar findings reported by Satyanarayana and Jagadeeswary [21], Vishwakarma et al. [8], and Meenia et al. [7].

3.2 Knowledge About Scientific Dairy Farming Practices

Table 2 illustrates the distribution of commercial dairy farmers based on their knowledge of scientific dairy farming practices. Each practice is listed alongside the frequency of dairy farmers mentioning it and the corresponding percentage:

i. **Breeding Practices:** Among the breeding practices, a high percentage of farmers mentioned knowledge about the time for Artificial Insemination (86.21 per cent) and the time/duration a cow/buffalo should be served after calving (87.68 per cent). Slightly lower percentages were reported for the best time for pregnancy diagnosis after insemination (82.76 per cent) and the breeding age and body weight of heifers (83.74 per cent).

ii. **Feeding Practices:** In feeding practices, the majority of farmers provided information on balanced feed (84.73 per cent) and the requirement of green fodder for adult cow/buffalo (85.71 per cent). A higher percentage of farmers indicated knowledge about the requirement of colostrum for newly born calves (88.67 per cent) and the amount of concentrate feed for cows/buffaloes giving more than 5 kg of milk per day (91.13 per cent).

iii. **Health Care Practices:** Regarding health care practices, a significant percentage of farmers knew about the timing for vaccination against contagious or infectious diseases (83.74 per cent) and preventive measures to control ectoparasites (92.61 per cent). However, a slightly lower percentage mentioned knowledge about the important symptoms of Black Quarter Disease (78.82 per cent) and Mastitis Disease (80.79 per cent).

iv. **Management Practices:** Among management practices, a considerable number of dairy farmers provided information on the direction for the construction of cattle sheds (87.68 per cent) and preventive measures to check milk contamination during milking (91.13 per cent). However, fewer dairy farmers mentioned knowledge about the castration of males (81.28 per cent) and cleaning methods for milk pails (93.60 per cent).

In the present study scientific dairy farming practices encompass various aspects such as feeding, breeding, health care, and management of dairy operations. It is clear from Table 3 that among dairy farmers, 20.20 per cent exhibited low knowledge, 33.99 per cent had moderate knowledge and notably, 45.81 per cent had a high level of knowledge regarding scientific dairy farming practices. This data recommends that a significant proportion of commercial dairy farmers possess a commendable grasp of these essential practices, indicating a positive trend towards improved efficiency, productivity, and sustainability within the dairy industry.

Table 2. Distribution of commercial dairy farmers based on their knowledge about scientific dairy farming practices

S. No.	Practices	Frequency	%
(i)	**Breeding Practices**		
1	Time for Artificial Insemination (AI) in Cow/buffalo in heat	175	86.21
2	Time/duration a cow/buffalo should be served after calving.	178	87.68
3	Time for pregnancy diagnosis after insemination, if the signs of heat are not shown by cow/buffalo.	168	82.76
4	Age and body weight of Heifers during breeding	170	83.74
(ii)	**Feeding Practices**		
5	Balance feed	172	84.73
6	Requirement of green fodder kg/day to be given for adult cow/buffalo	174	85.71
7	Requirement of colostrum to be fed to newly born calf	180	88.67
8	Amount of concentrate feed to a cow/buffalo giving milk more than 5 kg per day	185	91.13
(iii)	**Health Care Practices**		
9	Time for vaccination against the contagious or infectious diseases	170	83.74
10	Important symptoms of Black Quarter Disease?	160	78.82
11	Important symptoms of Mastitis Disease?	164	80.79
12	Preventive measures to control ectoparasites like ticks, flies, lice and mosquitoes	188	92.61
(iv)	**Management Practices**		
13	Direction for the construction of cattle shed	178	87.68
14	Preventive measures to check the milk contamination during milking	185	91.13
15	Castration of male	165	81.28
16	Cleaning methods for milk pail	190	93.60

Table 3. Distribution of commercial dairy farmers based on their overall knowledge about scientific dairy farming practices

S. No.	Categories	Respondents	
		Frequency	Percentage
1	Low	41	20.20
2	Medium	69	33.99
3	High	93	45.81
Total		**203**	**100**

The finding of Kirar et al. [2] showed that majority of the dairy farmers (79.17 per cent) had medium level of knowledge regarding improved dairy management practices.

4. CONCLUSION

The study provides a comprehensive overview of the socio-economic profile of commercial dairy farmers in the region. The majority of farmers are in their middle age, with a significant portion having attained education up to high school level. Furthermore, a substantial number come from medium-sized families, with the majority having 9 to 16 years of experience in dairy farming. It is remarkable that many farmers have limited involvement in social activities due to time constraints, despite receiving some training in dairy farming. Additionally, most dairy farmers are marginal farmers with small land holdings, relying heavily on commercial dairy farming as their main occupation. The size of dairy herds varies, with most farmers producing a significant quantity of milk per day, a portion of which is processed. Majority of dairy farmers having annual incomes up to a certain threshold. Furthermore, levels of exposure to mass media, extension contact, and scientific orientation vary among farmers, with a significant proportion demonstrating a medium level of exposure. Importantly, most dairy farmers show a medium level of economic motivation, with a considerable portion demonstrating a high level of knowledge of scientific dairy farming practices. These findings underscore the diverse nature of commercial dairy farming in the region and highlight areas for potential intervention and support to enhance productivity and sustainability.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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