

RESEARCH ARTICLE

**Comparative Study of Level of Knowledge about Scientific Dairy Practices among Member and Non-member Dairy Farmers of Farmer Producer Company**

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Received: 12-04-2024; Revised: 21-05-2024; Accepted: 10-06-2024

**ABSTRACT**

An ex post facto research design was followed to study the comparison between knowledge of scientific dairy practices among members and non-members of purposively selected, *Shri Kamdhenu* dairy farmer producer company (FPC). In Nagpur district from two blocks, i.e., Katol and Narkhed total of 240 dairy farmers, comprising 60 members and 60 non-members from each of the two blocks selected randomly. The study revealed that 44.16% of FPCs members were middle-aged (30–50 years), with 40.00% young (up to 30 years) and 15.84% old (above 50 years), while non-members were primarily middle-aged (55.00%). A higher percentage of members were male (71.67%) compared to non-members (81.67%), indicating lower female participation. Members had higher educational attainment, predominantly small-to-medium landholdings, belonged mostly to nuclear families, and exhibited larger herd sizes and higher annual incomes. In addition, members had greater social participation and more experience in dairy farming, contributing to better productivity and economic conditions and a medium attitude toward FPC was higher in members than in non-members. Overall knowledge of scientific dairy practices in member respondents was medium (53.33%) and high, as compared to the higher percentage of non-members (25.83%) found in the low category of knowledge.

**Key words:** Comparative study, level of knowledge, member and non-member FPC dairy farmers

**INTRODUCTION**

India's small and marginal farmers, comprising 86% of the agricultural workforce, face challenges such as poor organization and limited access to loans, markets, and inputs.<sup>[13]</sup> To address these issues, the government introduced farmer producer companies (FPCs) to improve access to investments, technological advancements, and inputs. By April 2023, over 15,000 FPCs had been formed, including Agriculture and Animal Husbandry, aiming to achieve common objectives, such as fair milk prices, improved market access, and policy advocacy.<sup>[5]</sup>

These companies offer cattle feed, mineral mixture, artificial insemination facilities, fodder seeds, group medical insurance, AI facilities, input subsidies, loans, and better procurement.

The knowledge of scientific dairy practices is crucial for enhancing productivity, ensuring animal health, and improving the economic viability of dairy enterprises. Scientific dairy practices encompass a wide range of activities, including breeding, feeding, health care, and management techniques that are based on research and technological advancements. By adopting these practices, dairy farmers can increase milk yield, improve the quality of dairy products, and reduce the incidence of diseases. In addition, knowledge of scientific dairy practices enables farmers to utilize resources more efficiently, minimize waste, and adhere to sustainability

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standards. This not only boosts their income but also contributes to the overall development of the dairy sector, fostering rural development and food security.

In the Vidarbha region of Maharashtra State, BAIF Institute for Sustainable Livelihoods and Development has started *Shri Kamdhenu FPC* (SKDFPC) with financial assistance from the National Bank for Agriculture and Rural Development in the year 2020 at village *Parsodi* in Katol block of Nagpur district. The SKDFPC is implementing scientific dairy-related practices to develop dairy enterprises among small and marginal farmers. They offer services such as artificial insemination, mineral mixtures, silage making, and animal concentrates. The company also provides management, technical, managerial, and financial advice to its members. They also offer health-care facilities, including deworming and vaccinations against diseases.

## MATERIALS AND METHODS

The present study was designed and conducted in the operating area of a purposively selected FPC working in the dairy sector, i.e., SKDFPC operating in two blocks, i.e., Katol and Narkhed of Nagpur district in Vidarbha region of Maharashtra state. From each block, Katol and Narkhed 120 dairy farmers comprising 60 members and 60 non-member dairy farmers of FPC were randomly selected. The 120 member dairy farmer respondents comprising 60 from Katol and 60 from Narkhed were selected randomly from the list of the members of FPC collected from the Head Office, SKDFPC Parsodi. An organized interview schedule served as the study's primary tool. The required data were collected through personal interviews with respondents to obtain correct and comprehensive replies and to describe the practices used by member and non-member dairy farmers of SKDFPC in the research region. After the collection of data, each case was assigned a number to avoid difficulty at the time of tabulation. The gathered data were recorded in a primary table and then presented in a dissertation in the form of secondary tables.

## RESULTS AND DISCUSSION

### Socioeconomic Profile of Members and Non-members Dairy Farmers of FPC

Table 1 shows that FPC members have more young (40%) and middle-aged (44.16%) members and non-members have more middle-aged (55%). The younger age group of FPC members may be more open to new organizational structures among younger farmers. This finding is in line with Pandey *et al.* (2021).<sup>[11]</sup> Members (71.67%) and non-members (81.67%) were predominantly male. Majority of the respondents both members and non-member were male-dominated whereas, there was the lesser involvement of women in dairy enterprises. This finding is similar with Sharma *et al.* (2022).<sup>[15]</sup> The member respondents of FPC (23.33%) were more educated i.e., graduate as compared to non-member respondents. Non-members have higher percentages of lower education levels, with secondary school at 31.67%. Better-educated individuals may be more likely to join FPCs, seeking better opportunities through collective efforts. This finding is similar with Babu *et al.* (2021).<sup>[5]</sup> Members have more evenly distributed in small (37.50%) and medium (26.66%) land holdings. Non-members had a higher proportion (39.16%) of marginal landholders. Small and marginal farmers, who increased their livestock and land after joining FPC, have been able to generate sustainable income from the milk-producing organization. This finding is similar with Shalini *et al.* (2020).<sup>[14]</sup> Members have higher involvement in dairy (45%) and agriculture (40.83%) and non-members predominantly in agriculture (57.5%). It might be due to a large number of dairy farmers had attracted to join the FPC in view of its advantages of services, such as marketing of milk. This finding is similar with Rahman and Gupta (2017).<sup>[12]</sup> The majority of members (60.83%) and non-members (47.50%) have medium-sized families. It might be due division of large families into nuclear and medium-sized families. This finding is similar with Kumar *et al.* (2016).<sup>[6]</sup> Members (65.83%) and non-members (53.33%) have predominantly nuclear families. Nuclear families might find FPCs more appealing due to the perceived economic benefits. This finding is in line with Pandey *et al.* (2021).<sup>[11]</sup> and Nanda *et al.* (2022).<sup>[10]</sup> Members have medium

**Table 1:** Distribution of members and non-members dairy farmers of farmer producer company according to their socioeconomic profile

Sr. No.	Variable	Category	FPC members (n=120)		FPC non-members (n=120)	
			Freq.	%	Freq.	%
1	Age	Young (Up to 30 years)	48	40.00	21	17.50
		Middle (30–50 years)	53	44.16	66	55.00
		Old (50 years and above)	19	15.84	33	27.50
2	Gender	Male	86	71.67	98	81.67
		Female	34	28.33	22	18.33
3	Education	Illiterate (0 Std.)	2	1.67	5	4.16
		Primary (1 <sup>st</sup> –4 <sup>th</sup> std.)	6	5.00	14	11.67
		Middle school (5 <sup>th</sup> –8 <sup>th</sup> std.)	14	11.67	21	17.50
		Secondary school (9 <sup>th</sup> –10 <sup>th</sup> std.)	29	24.17	38	31.67
		Higher secondary school (11 <sup>th</sup> –12 <sup>th</sup> std.)	40	33.33	29	24.17
		Graduate	28	23.33	13	10.83
		Postgraduate	1	0.83	0	0
4	Landholding	Landless (0 Acres)	4	3.34	12	10.00
		Marginal (Up to 2.5 Acres)	19	15.84	47	39.16
		Small (2.6–5 Acres)	45	37.50	39	32.50
		Medium (5.1–10 Acres)	32	26.66	19	15.84
		Large (10.1 and above Acres)	20	16.66	3	2.50
5	Occupation	Dairy	54	45	21	17.5
		Agriculture	49	40.83	69	57.5
		Job	12	10	17	14.17
		Labor	5	4.17	13	10.83
6	Family size	Small (1–3)	21	17.50	30	25.00
		Medium (4–6)	73	60.83	57	47.50
		Large (7 and above)	26	21.67	33	27.50
7	Family type	Nuclear	79	65.83	64	53.33
		Joint	41	34.17	56	46.67
8	Herd size	Small (1–10)	15	12.50	39	32.50
		Medium (11–20)	62	51.67	51	42.50
		Large (20 and above)	43	35.83	30	25.00
9	Annual income	Low (Rs. 100000–240000)	23	19.16	45	37.50
		Medium (Rs. 240000–590000)	65	54.17	56	46.66
		High (Rs. 590000 and above)	32	26.67	19	15.84
10	Social participation	Yes	120	100	64	53.33
		No	0	0	56	46.67
11	Experience in dairy farming	Low (1–10)	33	27.50	16	13.33
		Medium (11–20)	50	41.67	60	50.00
		High (21 and above)	37	30.83	44	36.67
12	Daily Milk production	Low (1–7 L)	17	14.17	49	40.83
		Medium (7–35 L)	71	59.16	58	48.33
		High (35 L and above)	32	26.67	13	10.84
13	Extension contact	Yes	73	60.83	45	37.50
		No	47	39.17	75	62.50
14	Mass media exposure	Low (0–10)	28	23.33	35	29.16
		Medium (11–15)	52	43.34	65	54.17
		High (16–20)	40	33.33	20	16.67
15	Attitude toward FPC	Low (1–20)	11	9.16	34	28.33
		Medium (21–40)	65	54.17	56	46.67
		High (41–60)	44	36.67	30	25.00

FPC: Farmer producer company

(51.67%) and (35.83%) large herds. Non-members have small herds (32.5%). Larger herd owners may join FPCs for better market access and collective bargaining power. This finding is consistent with Kumar *et al.* (2016).<sup>[6]</sup> The higher percentage of the respondents i.e., 26.67 per cent were found in high income group i.e., Rs. 5,90,000 and above whereas, among non-member respondents higher percentage i.e., 37.5 per cent was found in low income groups i.e., Rs. 1,00,000 to 2,40,000. FPC members have higher incomes, suggesting that those with resources are more likely to join and benefit from FPCs. This finding is similar with Amitha *et al.* (2021),<sup>[1]</sup> and 100% members are socially active. 53.33% of non-members are socially active. Socially engaged farmers are more likely to join and support FPCs, as evidenced by the fact that active social participation is a significant. This finding is similar to Shalini *et al.* (2020).<sup>[14]</sup> The member respondents 41.67 per cent had medium dairy experiences followed by high (30.83%) whereas; half of the non-member respondents had medium experience in dairy enterprises. This finding is inconsistent with Gorai *et al.* (2022).<sup>[4]</sup>

Members have higher with 26.67% daily production. A higher proportion (40.83%) of non-members has low production. Higher producers might join FPCs to leverage better market access and collective bargaining. This finding is consistent with Kumar *et al.* (2021).<sup>[7]</sup> 60.83% of members have higher extension contact. 37.50% of non-members have lower extension contact. Access to extension services is likely a crucial benefit of FPC membership, helping farmers improve practices and productivity. This finding is similar with Kumar *et al.* (2016).<sup>[7]</sup> The member respondents (33.33%) had high followed by medium (43.34%) mass media exposure whereas, higher percentage of non-member

respondents were found in medium (54.17%) and low (29.16%) category of mass media exposure. Better-informed farmers through mass media are more likely to join FPCs, recognizing the benefits. This finding is in line with the finding of Babu *et al.* (2021).<sup>[2]</sup> Members have a more positive attitude, with 36.67% in the high category. Non-members have more neutral or negative attitudes. Positive perception of FPCs correlates with membership, suggesting that attitudes significantly influence the decision to join. These findings are consistent with Gorai *et al.* (2022).<sup>[4]</sup>

### Level of Knowledge about Scientific Dairy Practices of Member and Non-member Dairy Farmers of FPC

#### Breeding

It is observed from Table 2 that overall knowledge of breeding practices was found higher among majority (74.36%) member respondents as compared to non-members (53.66%). However, only 46.34% non-members were not aware about the breeding practices of dairy animals. This finding is in line with Maruti *et al.* (2018)<sup>[8]</sup> and Chadda *et al.* (2021).<sup>[3]</sup> FPCs often provide training and access to better breeding technologies, contributing to higher knowledge among members.

#### Feeding

Table 3 shows that overall knowledge of feeding practices was found higher among majority (74.66%) member respondents as compared to non-members (61.50%). However, only (38.50%) non-member respondents were not aware about feeding practices. This finding is in line with Maruti *et al.* (2018)<sup>[8]</sup> and Chadda *et al.* (2021).<sup>[3]</sup> Members benefit from training on balanced ration and advanced feeding

**Table 2:** Distribution of respondents according to the knowledge of breeding practices

I	Knowledge of breeding practices	FPC members (n=120)		FPC non-members (n=120)	
		Yes	No	Yes	No
1.	Duration of estrous of cattle	83 (69.17)	37 (30.83)	66 (55.00)	54 (45.00)
2.	Sign of heat	74 (61.67)	46 (38.33)	53 (44.17)	67 (55.83)
3.	Artificial insemination	90 (75.00)	30 (25.00)	70 (58.33)	50 (41.67)
4.	Insemination of dairy cattle within 12–18 h of onset of estrus	80 (66.67)	40 (33.33)	63 (52.50)	57 (47.50)
5.	Milch breeds of cattle	86 (71.67)	34 (28.33)	70 (58.33)	50 (41.67)
	Overall average (%)	74.36	33.64	53.66	46.34

FPC: Farmer producer company



practices provided by FPCs, leading to better overall herd health and productivity.

### Housing

It is observed from Table 4 that overall knowledge of housing practices was found higher among majority (83.33%) members as compared to non-member (59.16%) respondents. However, 40.84% non-member respondents were not aware about the housing practices of dairy animals. This finding is in line with Chadda *et al.* (2021).<sup>[3]</sup>

### Management

It is reported from Table 5 that overall knowledge about management practices was found higher among majority (82.16%) member respondents as compared

to non-member respondents (62.63%). However, 37.17% non-member respondents were not aware about the management practices of dairy animals. This finding is consistent with Maruti *et al.* (2018).<sup>[8]</sup>

### Health-care management

It is reported from Table 6 that overall knowledge of health-care practices higher among majority (73.00%) member respondents as compared to non-members (66.66%). However, 37.34% non-member respondents were not aware about the health-care management practices. This finding is in line with Chadda *et al.* (2021).<sup>[3]</sup> FPCs facilitate access to veterinary services and regular health camps, improving member's knowledge and application of health-care practices.

**Table 3:** Distribution of respondents according to the knowledge of feeding practices

II	Knowledge of feeding practices	FPC members (n=120)		FPC non-members (n=120)	
		Yes	No	Yes	No
1.	Stall feeding	100 (83.33)	20 (16.67)	85 (70.83)	35 (29.17)
2.	Grazing+stall feeding	91 (75.83)	29 (24.17)	67 (55.83)	53 (44.17)
3.	Cultivation of fodder crops for green fodder production	98 (81.67)	22 (18.33)	79 (65.83)	41 (34.17)
4.	Use of mineral bricks or mineral mixture in feed?	82 (68.33)	38 (31.67)	65 (54.17)	55 (45.83)
5.	Do you know about silage and their making process?	77 (64.17)	43 (35.83)	73 (60.83)	47 (39.17)
	Overall average (%)	74.66	25.34	61.50	38.50

FPC: Farmer producer company

**Table 4:** Distribution of respondents according to the knowledge of housing practices

III	Knowledge of housing practices	FPC members (n=120)		FPC non-members (n=120)	
		Yes	No	Yes	No
1.	Loose housing system	103 (85.83)	17 (14.17)	75 (62.50)	45 (37.50)
2.	Conventional dairy barn system	102 (85.00)	18 (15.00)	66 (55.00)	54 (45.00)
3.	Need of manager for feeding	106 (88.33)	14 (11.67)	79 (65.83)	41 (34.17)
4.	Need of water trough for watering	97 (80.83)	23 (19.17)	70 (58.33)	50 (41.67)
5.	Need of sufficient space for animals	92 (76.67)	28 (23.33)	65 (54.17)	55 (45.83)
	Overall average (%)	83.33	16.67	59.16	40.84

FPC: Farmer producer company

**Table 5:** Distribution of respondents according to the knowledge of management practices

IV	Knowledge of management practices	FPC members (n=120)		FPC non-members (n=120)	
		Yes	No	Yes	No
1.	Disinfection of animal shed every week by disinfectant	100 (83.33)	20 (16.67)	82 (68.33)	38 (31.67)
2.	Daily washing and grooming of animals	102 (85.00)	18 (15.00)	77 (64.17)	43 (35.83)
3.	Disposal of excreta and waste material	106 (88.33)	14 (11.67)	80 (66.17)	40 (33.33)
4.	Vermicomposting	96 (80.00)	24 (20.00)	70 (58.33)	50 (41.67)
5.	Maintaining records of animals	89 (74.17)	31 (25.83)	68 (56.67)	52 (43.33)
	Overall average (%)	82.16	17.84	62.63	37.17

FPC: Farmer producer company

**Value addition of milk**

It is reported from Table 7 that overall knowledge of value-added milk products was found higher in majority (86.53%) member respondents as compared to non-members (58%). However, 42.00% of non-member respondents were not aware about the value-added milk products in dairy animals. This finding is in line with Singh *et al.* (2023).<sup>[16]</sup>

**Marketing**

It is reported from Table 8 that overall knowledge of marketing practices was found higher among majority (72.84%) member respondents as compared to non-members (50.17%). However, the majority 49.83% non-member respondents were not aware about the marketing practices. Members are more knowledgeable about marketing channels, self-marketing, pricing, branding, and insurance.

**Table 6:** Distribution of respondents according to the knowledge of health-care management practices

V	Knowledge of health-care management practices	FPC members (n=120)		FPC non-members (n=120)	
		Yes	No	Yes	No
1.	Vaccination against various diseases	90 (75.00)	30 (25.00)	75 (62.50)	45 (37.50)
2.	Treatment of sick animals by veterinarian	95 (79.17)	25 (20.83)	90 (75.00)	30 (25.00)
3.	Deworming of dairy animals 3 times in a year	89 (74.17)	31 (25.83)	70 (58.33)	50 (41.67)
4.	Isolation of sick animals from a healthy animal	84 (70.00)	36 (30.00)	73 (60.83)	47 (39.17)
5.	Spraying of acaricide in case of attack of external parasite on animals	80 (66.67)	40 (33.33)	68 (56.67)	52 (43.33)
	Overall average (%)	73.00	27.00	66.66	37.34

FPC: Farmer producer company

**Table 7:** Distribution of respondents according to the knowledge of value addition of milk practices

VI	Knowledge of value addition of milk practices	FPC members (n=120)		FPC non-members (n=120)	
		Yes	No	Yes	No
1.	Clean milk production	100 (83.33)	20 (16.67)	73 (60.83)	47 (39.17)
2.	Training in processing of milk products	106 (88.33)	14 (11.67)	69 (57.50)	51 (42.50)
3.	Types of milk products	102 (85)	18 (15)	80 (66.67)	40 (33.33)
4.	Methods of making of products	91 (75.83)	29 (24.17)	56 (46.67)	64 (53.33)
5.	Preservative addition	85 (70.83)	35 (29.17)	70 (58.33)	50 (41.67)
	Overall average (%)	86.53	13.47	58.00	42.00

FPC: Farmer producer company

**Table 8:** Distribution of respondents according to the knowledge of marketing practices

VII	Knowledge of marketing practices	FPC members (n=120)		FPC non-members (n=120)	
		Yes	No	Yes	No
1.	Marketing channels for milk	94 (78.33)	26 (21.67)	66 (55.00)	54 (45.00)
2.	Self-marketing of whole milk	88 (73.33)	32 (26.67)	58 (48.33)	62 (51.67)
3.	Current price of milk and milk products	97 (80.83)	23 (19.17)	65 (54.17)	55 (45.83)
4.	Branding of the product	77 (64.17)	43 (35.83)	41 (34.17)	79 (65.83)
5.	Insurance of dairy animals	81 (67.50)	39 (32.50)	71 (59.17)	49 (40.83)
	Overall average (%)	72.84	27.16	50.17	49.83

FPC: Farmer producer company

**Table 9:** Distribution of respondents according to the overall level of knowledge of scientific dairy practices (n=240)

Variable	Category	FPC members (n=120)		FPC non-members (n=120)	
		Freq.	Percentage	Freq.	Percentage
Level of knowledge	Low (0–15)	11	9.17	31	25.83
	Medium (16–25)	64	53.33	73	60.84
	High (26–35)	45	37.50	16	13.33
Total		120	100	120	100

## Overall Level of Knowledge about Scientific Dairy Practices of Member and Non-member Dairy Farmers of FPC

It is reported from Table 9 that the majority (53.33%) of member respondents had medium knowledge of dairy enterprises followed by high (37.50%) and (9.17%) low. These findings correlate with Mukherjee *et al.* (2019).<sup>[9]</sup> In comparison to non-member, majority (60.84%) of the farmers belong to medium followed by low (25.83) and (13.33%) high. Member respondents had more knowledge than the non-member respondents in breeding, feeding, housing, management, health care, value-added milk products, and marketing because FPCs connect members to experts and training and non-members lack these direct channels, leading to limited exposure to the latest scientific advancements. These findings correlate with Chadda *et al.* (2021)<sup>[3]</sup> and Shalini *et al.* (2020).<sup>[14]</sup>

## CONCLUSION

The comparative study of socioeconomic status and knowledge levels between members and non-members of FPCs reveals significant benefits for members, including higher land holdings, larger herd sizes, greater incomes, and better adoption of scientific dairy practices. Non-members, however, face challenges such as poor market access, inadequate services, and limited training, which hinder their productivity and profitability. Targeted interventions to educate and support non-members through training programs, improved access to veterinary and marketing services, and strengthened infrastructure can bridge these gaps, ultimately enhancing the overall performance and sustainability of the dairy industry.

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