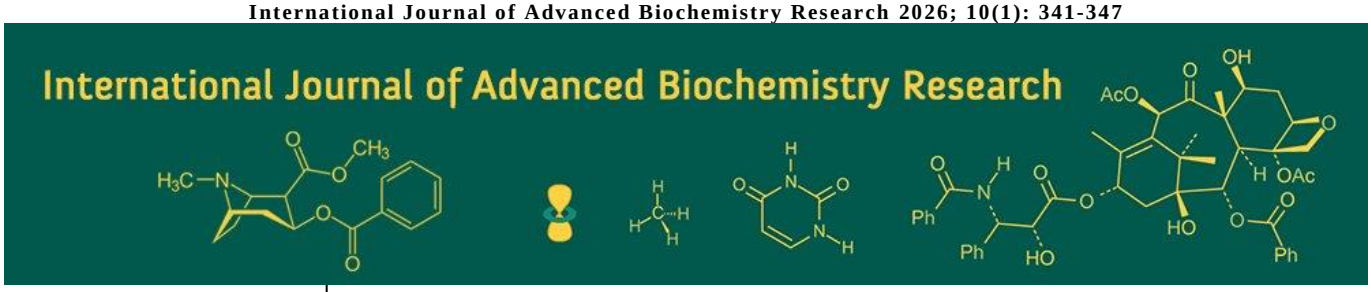

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Aditya Kumari
Division of Veterinary and Animal Husbandry Extension Education, SKUAST-Jammu, Jammu & Kasmhir, India

Pranav Kumar
Division of Veterinary and Animal Husbandry Extension Education, SKUAST-Jammu, Jammu & Kasmhir, India

Khushboo Panwar
Avian Immunology Laboratory, Immunology Section, ICAR-IVRI, Izatnagar, Bareilly, Uttar Pradesh, India

Mohit Sharma
Department of Veterinary and Animal Husbandry Extension Education, LUVAS, Hisar, Haryana, India

Corresponding Author:
Aditya Kumari
Division of Veterinary and Animal Husbandry Extension Education, SKUAST-Jammu, Jammu & Kasmhir, India

Study on socio personal, psychological and economic profile of farm women on value addition of milk

Aditya Kumari, Pranav Kumar, Khushboo Panwar and Mohit Sharma

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Abstract
The present study was conducted on 100 farm women to assess the impact of training on milk value addition. Recognizing the importance of value addition in enhancing the socio-economic status, decision-making abilities, and entrepreneurial skills of farm women, a series of training programmes were organized by the Division of Livestock Products Technology, Faculty of Veterinary Sciences and Animal Husbandry, SKUAST-Jammu. These programmes were implemented across various blocks of the Jammu district under a DST (Government of India) funded project. The findings revealed that the majority of trainee respondents were young, had attained education up to middle school or matriculation, owned marginal landholdings, and lived in nuclear families. Most had medium-sized herds and limited prior experience in dairy farming and milk value addition. However, following the training, 82% of the trainees reported earning a high income from dairying—primarily through the sale of milk and milk products—compared to non-trainees. The study also found that trainee farm women had significantly higher exposure to mass media and more frequent contact with extension services than their non-trainee counterparts.

Keywords: Farm women, trainee, non-trainees, entrepreneurial

Introduction
The livestock sector is vital for boosting family incomes and creating rural employment, especially for landless laborers, marginal farmers, and women. As a key human resource, women can contribute even more effectively when granted equal status and opportunities (Team and Cheryl, 2011; Arshad *et al.* 2010; Pal, 2013) [20, 1, 1, 21].

In India, livestock production is predominantly managed by women. Beyond their household and community duties, rural women balance multiple complex roles within the farming system, handling the reproductive, productive, and management aspects of livestock care.

The extent of women's involvement in livestock sub-sectors varies by region and community, shaped largely by their economic status and socio-cultural environment (Naz *et al.* 2022; Sennuga *et al.* 2022) [19, 28]. In India, women have traditionally been the backbone of livestock rearing and dairy farming, leading to a sector that is predominantly female-dominated (Bajpai & Kushwaha, 2020; Rajpurohit & Sareen, 2022) [5, 26]. Furthermore, research indicates that women often dedicate significantly more time to dairy farming activities than their male counterparts (Hansen *et al.* 2020) [10]. Currently, Women constitute approximately 70% of the workforce in India's dairy sector, an industry that remains deeply embedded in the nation’s socio-cultural and family traditions (Bidhan *et al.* 2024) [7].

In today’s globalized world, women represent an essential economic and social force. While they were historically confined to domestic roles within Indian society, they are now active participants in diverse sectors, including entrepreneurship. Specifically, the value addition of livestock products serves as a vital pathway for empowerment. By engaging in these higher-value activities, women can significantly boost their income and secure better livelihoods, providing the financial stability needed to meet daily household expenses.

The demand for value-added dairy products in India is rising steadily, fueled by increased purchasing power and a growing consumer focus on health. Recognizing that milk processing can significantly enhance the socio-economic status, decision-making power, and entrepreneurial skills of rural women, the Division of Livestock Products Technology (SKUAST-Jammu) launched a series of targeted training programs across the Jammu district.

These initiatives were funded by the Department of Science and Technology (DST), Government of India, under the Women Technology Park (WTP) scheme. Through this project, motivated participants received intensive, hands-on training in advanced processing technologies. The curriculum focused on high-demand dairy products, including Mozzarella cheese, functional Kalari, Paneer, and traditional milk-based sweets like milk cake.

The first-ever Women Technology Park in Jammu and Kashmir was established in Deoli Village, Bishnah Block, under the DST's "Science for Equity, Empowerment and Development" programme, and is supported by SKUAST-Jammu. Therefore, a study has been undertaken to assess the impact of these training programmes on farm women, particularly in the area of milk value addition. The present study aims to explore the socio-psychological characteristics of these women.

Materials and Methods

The study were conducted in two blocks R.S.Pura and Bishnah of Jammu district which were purposively selected, because a number of training programmes were organised by the Division of Livestock Products Technology (LPT) of the Faculty of Veterinary Sciences and Animal Husbandry, R.S.Pura, SKUAST-Jammu under the DST (GoI) sponsored project in various blocks of Jammu district. For trainee respondents 5 villages where training was conducted were selected purposively. Five villages adjacent to trainee villages were selected for non-trainee respondents. For the selection of trainee respondents, a list of farm women beneficiaries was prepared from the selected villages. A total sample size of 100 comprising of 50 beneficiaries/trainees and 50 non beneficiaries/non-trainees were selected for the study by using Multistage, purposive and random sampling technique. Ex post factor research design was used for conducting the study since the variables chosen have already been occurred. These variables thus selected were broadly categorized into independent (Age, Sex, Caste, Education, Family type, Family size, social participation, Experience in dairy farming, Land holding, Annual income) and dependent variables (Knowledge level, Entrepreneurial behavior, Entrepreneurial activities, Constraints). The respondents has been divided into three group's viz., low, medium and high based on the statistical tool like frequency and percentage were used for analyzing the collected data. All the respondents were individually interviewed using pretested interview schedule.

Results and Discussion

Socio-personal profile of farm women

Table 1: Socio-personal profile of Trainee and Non-Trainee farm women

S. No.	Variables		Trainees f(n = 50)			Non-Trainees f(n = 50)			Overall f(n = 100)		
	Variables	**Category**	**Mean ± SE**	**F**	**%**	**Mean ± SE**	**F**	**%**	**Mean ± SE**	**F**	**%**
1	Age	Young (18-37 Yrs)	35.08±1.43	33	66.00	44.56±1.71	17	34.00	39.82 ± 1.21	50	50.00
		Middle (38-56 Yrs)		15	30.00		24	48.00		39	39.00
		Old (57-75 Yrs)		02	04.00		09	18.00		11	11.00
	t-test value = -4.234^{NS}										
2	Education	Illiterate		14	28.00		20	40.00		34	34.00
		Primary		08	16.00		04	8.00		12	12.00
		Middle		08	16.00		18	36.00		26	26.00
		Matriculate		13	26.00		08	16.00		21	21.00
		High Secondary		06	12.00		00	0.00		06	6.00
		Graduate and above		01	02.00		00	0.00		01	1.00
	Mann-Whitney U Test = 972.00^{NS}										
3	Caste	General		21	42.00		13	26.00		34	34.00
		OBC		16	32.00		03	6.00		19	19.00
		SC		13	26.00		34	68.00		47	47.00
		ST		00	0.00		00	0.00		00	0.00
4	Family size	Small (2-6)	7.28±0.30	20	40.00	5.74±0.30	38	76.00	6.51 ± 0.22	58	58.00
		Medium (7-10)		26	52.00		09	18.00		35	35.00
		Large (11-14)		04	08.00		03	06.00		07	07.00
	t-test value = 3.579^{NS}										
5	No. of Family members involved in value addition	2		41	82.00		48	96.00		89	89.00
		3		05	10.00		02	04.00		07	07.00
		4		04	8.00		00	00.00		04	04.00
	t-test value = 24.25**										
6	Family type	Joint		22	44.00		7	14.00		29	29.00
		Nuclear		28	56.00		43	86.00		71	71.00
7	Social Participation	No of membership		0	0.00		17	34.00		17	17.00
		Member of one organization		24	48.00		33	66.00		57	57.00
		Member of > one organization		21	42.00		00	0.00		21	21.00
		Office bearer/holder		04	8.00		00	0.00		04	4.00
		Distinctive leader		1	2.00		00	0.00		01	1.00
	Mann-Whitney U Test = 495.00**										
8	Experience in dairy farming (in years)	Low (5-20)	18.12±1.23	36	72.00	27.06±1.65	17	34.00	22.59 ± 1.11	53	53.00
		Medium (21-40)		14	28.00		30	60.00		44	44.00
		High (41-60)		00	0.00		03	6.00		03	03.00
	t-test value = -4.340^{NS}										
9	Experience in value addition of milk (in years)	Low (1-9)	7.26±0.83	32	64.00	6.24±0.63	41	82.00	6.75 ± 0.54	73	73.00
		Medium (10-18)		17	34.00		07	14.00		24	24.00
		High (19-27)		01	2.00		02	04.00		03	03.00
	t-test value = 0.942^{NS}										

Note: 'f' denotes frequency; %: percentage; NS: Non-significant; SE: Standard Error

1. Age
The socio-personal profiles of the participants are presented in Table 1. The data reveals that a majority of the trainees (66%) fell within the younger age bracket (18-37 years), whereas nearly half of the non-trainees (48%) belonged to the middle-aged category. These results suggest that younger rural women demonstrate a higher inclination toward professional training and a greater potential for transitioning into entrepreneurship. This observation aligns with the findings of Arya *et al.* (2018) [2], who noted a negative correlation between age and knowledge acquisition, indicating that younger individuals often derive greater benefits from skill development and training initiatives.

2. Education
According to the data in Table 1, educational attainment was notably higher among the trainee group. While 42% of trainees had completed at least a secondary education—comprising 26% who were matriculates and 16% who reached middle school—the non-trainee group faced significant educational barriers. Notably, 40% of non-trainees were illiterate, and none within this group had achieved a higher secondary certificate or a university degree. These findings are consistent with studies by Kaur *et al.* (2024) [12], Arya *et al.* (2018) [2], and Patel *et al.* (2016) [22, 23], which similarly identified low literacy levels among non-participating farm women and a distinct educational disparity between those who seek training and those who do not.

3. Caste
As illustrated in Table 1, the caste distribution among participants revealed a significant demographic contrast. Nearly half of the trainees (42%) identified with the General category, followed by 32% from Other Backward Classes (OBC) and 26% from the Scheduled Caste (SC) category.
Conversely, the non-trainee group was predominantly composed of individuals from the SC category (68%), with the General category representing a much smaller proportion at 26%. This disparity suggests a correlation between socio-demographic background and the participation rates in technological training initiatives.

4. Family size
As indicated in Table 1, more than half of the trainees (52%) originated from medium-sized families, while 40% belonged to small family units. In stark contrast, the vast majority of non-trainees (76%) were associated with small families. This demographic trend likely reflects a growing preference for nuclear family structures and the successful penetration of rural family planning initiatives. These findings are consistent with the research conducted by Atreya *et al.* (2018) [2] and Singh *et al.* (2021) [29], who also reported a prevalence of smaller family sizes among rural populations, regardless of their participation in training programs.

5. No. of Family members involved in value addition
The data in Table 1 indicates that a substantial majority of trainees (82%) reported having two family members engaged in milk value addition. This trend was even more pronounced among the non-trainee group, where 96% exhibited the same level of intra-family participation. These figures suggest that milk processing remains a collaborative household endeavor across both cohorts.

6. Family type
Data analysis reveals that 56% of trainees resided in nuclear families, while a notable 40% lived in joint family structures. In contrast, the vast majority of non-trainees (86%) were part of nuclear families. This distinct preference among non-trainees for nuclear setups may be attributed to an increased desire for domestic autonomy, improved living conditions, and better access to essential amenities. Furthermore, these structures are often chosen to facilitate specialized investments in their children's future. Interestingly, these findings diverge significantly from the earlier research conducted by Kamble *et al.* (2024) [11], highlighting a shift in contemporary rural family dynamics.

7. Social participation
As evidenced by Table 1, a substantial 90% of trainees actively participated in social organizations, with many holding memberships in multiple groups. In contrast, 66% of non-trainees maintained membership in only a single organization. These results suggest that trained women demonstrate higher levels of social capital and community engagement, likely bolstered by their entrepreneurial activities. While these findings align with the observations of Upadhyay and Desai (2011) [32] regarding high participation rates among trained farm women, they diverge significantly from the lower engagement levels reported by Maurya *et al.* (2021) [16] and Kamble *et al.* (2024) [11].

8. Experience in dairy farming
According to the data, 72% of trainees in the dairy farming sector possessed between 5 and 20 years of experience, while the remaining 28% had an extensive professional background of 21 to 40 years. In contrast, the non-trainee group was characterized by a higher level of seniority, with 60% reporting 21 to 40 years of experience and only 34% falling within the 5 to 20-year bracket. These findings, which suggest that younger or mid-career professionals are more likely to seek formal training, are consistent with the results reported by Pathade *et al.* (2017) [24].

9. Experience in value addition of milk
Analysis of the specialized experience in milk value addition reveals that 64% of trainees possessed between 1 and 9 years of experience, while 34% reported a tenure of 10 to 18 years. Among the non-trainee cohort, a vast majority (82%) had 1 to 9 years of experience, with only 14% exceeding a decade. Given that the trainee group predominantly comprised younger individuals, their relatively shorter professional history in both dairy farming and value-added processing is a direct reflection of their age. These results concur with the findings of Wanga *et al.* (2009) [34] and Kaur *et al.* (2021) [12], who also noted a positive correlation between age and years of technical experience.

Table 2: Socio-economic profile of Trainee and Non-Trainee farm women

S. No.	Variables		Trainees f(n = 50)			Non-Trainees f(n = 50)			Overall f(n = 100)		
	Variables	Category	Mean ± SE	F	%	Mean ± SE	F	%	Mean ± SE	F	%
1	Land holding (in Ha)	Landless	0.82±0.09	09	18.00	0.72 ± 0.06	02	4.00	0.77±0.05	11	11.00
		Marginal (<1)		20	40.00		37	74.00		57	57.00
		Small (1-2)		18	36.00		08	16.00		26	26.00
		Semi medium (2-4)		03	06.00		03	06.00		06	06.00
		Medium (4-10)		00	00.00		00	0.00		00	00.00
		Large (> 10)		00	00.00		00	0.00		00	00.00
t-test value = 0.837**											
2	Herd size	Small (0-3)	4.04±0.24	14	28.00	3.28 ± 0.18	31	62.00	3.66±0.14	45	45.00
		Medium (4-6)		34	68.00		19	38.00		53	53.00
		Large (7-9)		02	04.00		00	00.00		02	2.00
t-test value = 2.673*											
3	Income from dairying	Low (305000-714567)	1224180.00 ± 13932.19	00	00.00	475801.60 ± 9677.73	50	100.0	849990.80 ± 38542.62	50	50.00
		Moderate (714568-1019567)		01	02.00		00	0.00		01	1.00
		High (1019568-1324567)		41	82.00		00	0.00		41	41.00
		Very high (1324568-1629567)		08	16.00		00	0.00		08	8.00
t-test value = 44.116*											
4	Annual income	Low (404400-782975)	1376868.12 ± 21112.16	00	0.00	641843.60 ± 22875.73	47	94.00	1009355.86 ± 40051.22	47	47.00
		Moderate (782976-1161550)		00	0.00		02	4.00		02	4.00
		High (1161551-1540125)		43	86.00		01	2.00		44	44.00
		Very high (1540126-1918700)		07	14.00		00	0.00		00	0.00
t-test value = 23.612^{NS}											

Note: 'f' denotes frequency; %: percentage; NS: Non-significant; SE: Standard Error

1. Land holdings

The socio-economic profiles of the participants are detailed in Table 2. The data indicates that both trainees and non-trainees are predominantly categorized as small-scale landholders, possessing either marginal plots (<1 ha) or small farms ($1-2$ ha). This prevailing landholding pattern reflects broader demographic shifts, specifically the intensifying population pressure and the ongoing transition toward nuclear family structures, which often lead to land fragmentation. These observations are consistent with the findings reported by Princess *et al.* (2024) [25].

2. Herd size

As illustrated in Table 2, a clear disparity exists in livestock ownership between the two groups. Nearly two-thirds (68%) of the trainees possessed a medium-sized herd, whereas 28% managed smaller herds. Conversely, a majority of the non-trainees (62%) maintained small-sized herds. These findings regarding the prevalence of specific herd sizes among rural participants are consistent with the research conducted by Nande (2019) [18], Mahesh (2020) [15], and Usadadiya (2021) [33].

3. Income from dairying

The results, as detailed in the study, indicate a profound disparity in income levels between the two groups. A substantial majority (82%) of the trainees attained a high level of income from dairying, while an additional 16% reported very high income levels. In stark contrast, 100% of the non-trainees remained within the low-income category, with no representation in the higher income brackets.

This significant economic advantage is largely attributed to the trainees' shift from selling raw milk to marketing processed, value-added products, which historically command higher market premiums. These findings align with the research of Devaki *et al.* (2015) [9], Mahesh (2020) [15], and Khode *et al.* (2020) [14], who also highlighted the superior profitability of dairy value addition over traditional raw milk sales.

4. Annual Income

The analysis reveals a striking divergence in annual income levels between the two cohorts. A substantial majority of trainees (86%) achieved a high annual income, with the remaining 14% reaching very high income levels; notably, no trainees were recorded in the low or moderate categories. Conversely, the vast majority of non-trainees (94%) were situated in the low-income bracket, with a negligible 2% attaining high-income status and none reaching the very high category. When viewed collectively, the total respondent pool was divided primarily between low annual income (47%) and high annual income (44%), with only 7% occupying the very high bracket. These findings regarding income disparity are consistent with the research reported by Khode *et al.* (2020) [14].

Table 3: Socio-psychological profile of Trainee and Non-trainee farm women

Training received	Trainees		Non-trainees		Overall	
	f (n = 50)	%	f (n = 50)	%	f (n = 100)	%
Yes	50	100.00	00	00.00	50	50.00
No	00	00.00	50	100.00	50	50.00
Training received from LPT Division, SKUAST-Jammu						
Yes	50	100.00	0	0.00	50	50.00
No	0	0.00	50	100.00	50	50.00
Marketing behavior						
Mode of milk and milk products transport						
By walk	05	10.00	28	56.00	33	33.00
By cycle	00	0.00	00	00.00	00	00.00
By two-wheeler	45	90.00	22	44.00	67	67.00
By four-wheeler	00	0.00	00	00.00	00	00.00
Available marketing channel for milk and milk products						
Milk vendor	00	0.00	11	22.00	11	11.00
Co-operative societies	00	0.00	04	08.00	04	04.00
Neighbour	00	0.00	12	24.00	12	12.00
Own shop	50	100.00	23	46.00	73	73.00
Credit/input facilities						
Milk vendor	0	0.00	6	12.00	6	6.00
Co-operative societies	6	12.00	4	8.00	10	10.00
Neighbour	19	38.00	14	28.00	33	33.00
Bank	25	50.00	26	52.00	51	51.00
Payment pattern of milk and milk products						
Weekly/partially	29	58.00	31	62.00	60	60.00
Monthly/fully	21	42.00	19	38.00	40	40.00
Price Satisfaction of milk and milk products						
Yes	49	98.00	50	100.00	99	99.00
No	1	2.00	0	0.00	1	1.00
More profitability is attributed to						
Sale of liquid milk	0	0.00	20	40.00	20	20.00
Sale of milk products	50	100.00	30	60.00	80	50.00
Dairy is good source of employment						
Yes	43	86.00	07	14.00	50	50.00
No	07	14.00	43	86.00	50	50.00
Entrepreneurship development through trainings on value addition of milk is an added advantage/scope for income generation to rural people						
Yes	45	90.00	05	10.00	50	50.00
No	05	10.00	45	90.00	50	50.00

Note: 'f' denotes frequency; %: percentage

1. Marketing behavior

The socio-psychological profiles of the participants are detailed in Table 3. The study indicates that respondents who participated in milk value-addition training managed their enterprises with significantly greater efficacy than their untrained counterparts. These results align with research conducted by Ranuji (2006) [27] regarding the entrepreneurial behavior of dairy farmers.

Significant disparities were also observed in logistics and commercial strategy. Regarding transportation, a substantial majority (90%) of trainees utilized motorized two-wheelers, whereas 56% of non-trainees relied on foot transport. Furthermore, a distinct shift in marketing channels was evident: 100% of the trainees managed their own retail outlets, while less than half (46%) of the non-trainees possessed similar direct-to-consumer marketing capabilities.

2. Price Satisfaction of milk and milk products

According to the data, credit and input accessibility were relatively balanced between the two groups; approximately half of the trainees obtained bank assistance as required, while 52% of non-trainees similarly utilized banking facilities. Payment patterns also showed a degree of consistency: the majority of both trainees (58%) and non-trainees (62%) received weekly or partial payments. Conversely, 42% of trainees and 38% of non-trainees opted for full monthly settlements.

The most significant divergence was observed in financial satisfaction. The study revealed that a near-total majority (98%) of trainees were satisfied with the remuneration for their milk and value-added products. In stark contrast, only 50% of non-trainees expressed similar satisfaction, suggesting that value addition significantly enhances perceived financial returns.

3. Dairy is good source of employment

Regarding the potential for employment generation within the sector, 86% of the trainees affirmed that milk value addition and the subsequent sale of dairy products represent vital avenues for job creation. In a striking reversal of perspective, an nearly identical proportion of non-trainees expressed disagreement with this sentiment. This divergence in outlook suggests that training not only provides technical skills but also fosters a more optimistic and entrepreneurial perception of the industry's economic potential. These findings are corroborated by the research of Khode *et al.* (2020) [14] and Baindha *et al.* (2011) [4].

Table 4: Communication profile of Trainee and Non-trainee farm women

Mass Media Contact	Trainees		Non trainees		Overall	
	f (n = 50)	%	f (n = 50)	%	f (n = 100)	%
Low (0-3)	00	00.00	44	88.00	44	44.00
Medium (4-6)	25	50.00	06	12.00	31	31.00
High (7-9)	25	50.00	00	00.00	25	25.00
Mann-Whitney U Test = 11.500**						
Extension Agency Contact	Trainees		Non trainees		Overall	
	f (n = 50)	%	f (n = 50)	%	f (n = 100)	%
Low (0-3)	00	00.00	50	100.00	50	50.00
Medium (4-6)	11	22.00	00	00.00	11	11.00
High (7-9)	39	78.00	00	00.00	39	39.00
Mann-Whitney U Test = 0.570**						

Note: 'f' denotes frequency; %: percentage; NS: Non-significant; SE: Standard Error** significant at p<0.01

1. Mass media contact

As illustrated in Table 4, a significant disparity exists in the mass media exposure of the two groups. Exactly half (50%) of the trainees maintained a high level of mass media contact, with the remaining 50% reporting medium levels of engagement. In stark contrast, the vast majority of non-trainees (88%) were characterized by low mass media contact, while only 12% reached a medium level, and none achieved high engagement. When viewing the sample collectively, 44% of total respondents exhibited low mass media contact, followed by 31% with medium and 25% with high levels of contact. These results, indicating that training and information-seeking behavior are closely linked to media exposure, are in accordance with the findings of Nande *et al.* (2025) [17] and Swetank and Bose (2024) [31].

2. Extension agency contact

The results demonstrate a profound disparity in extension service engagement between the two cohorts. A substantial majority of trainees (78%) maintained a high level of extension contact, with the remaining 22% reporting medium levels of engagement. Notably, none of the trainees were situated in the low-contact category. In sharp contrast, the non-trainee group exhibited a complete lack of medium or high-level engagement, falling entirely within the low-contact bracket. On a cumulative basis, 50% of the total respondents reported low extension contact, while 39% maintained high levels. These observations, which underscore the role of training in bridging the gap between farmers and advisory services, are in accordance with the findings of Swetank and Bose (2024) [31].

Conclusion

The findings of this study elucidate the socio-economic and psychological profiles of farm women, underscoring their pivotal contributions to the animal husbandry sector. The results indicate that the trainee cohort was primarily composed of younger individuals who had achieved middle-school or matriculation-level education. While 56% of trainees resided in nuclear families, this structural preference was significantly more pronounced among non-trainees (86%). Furthermore, trainees exhibited higher levels of social capital, maintaining active participation in one or more community organizations.

Despite having relatively limited experience in both primary dairy farming (72%) and milk value addition (64%), trainees managed to achieve superior daily milk yields. Most notably, the data reveals a significant economic dividend: women who underwent training in milk value addition realized a 24% increase in income compared to their non-trained counterparts. This financial success is bolstered by their moderate-to-high proficiency in marketing behavior.

To capitalize on these gains, it is recommended that specialized training programs focusing on scientific dairy technologies and value-added processing be expanded. Encouraging farm women to transition from raw milk sales to value-added production will be instrumental in enhancing both milk productivity and household earnings.

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