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Dairy Value Addition as a Pathway to Women's Empowerment: A Perception Study among Dairy Farm Women

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Abstract

Dairy value addition offers an important opportunity for improving the economic and social position of farm women by converting raw milk into marketable products with better utility and income potential. The present study was conducted to analyse dairy farm women's perception towards dairy value addition as a pathway to women's empowerment. The study was carried out in Mathura district of Uttar Pradesh using a descriptive research design. A total of 150 dairy farm women were selected through multistage random sampling. Data were collected through a structured interview schedule and analysed using frequency, percentage, weighted mean score, ranking and Pearson's correlation for overall perception index, while Spearman's rank correlation was used for item-wise perception statements. The findings revealed that most of dairy farm women belonged to the middle-aged group had small to medium herd size, medium dairy income and low social participation, while a large proportion were landless. The respondents showed a favourable perception towards milk value-added products, particularly regarding their potential for stable income generation, reduction of raw milk wastage, enhancement of women's social and economic status, consumer preference, and the importance of packaging and branding; however, dissatisfaction with prices paid by buyers and lack of marketing information were perceived as major constraints. The overall perception index was calculated to assess the level of perception among 150 respondents, and the respondents were further categorized into low, medium and high perception groups. Although overall perception index was not significantly related with independent variables, item-wise analysis showed that education was significantly associated with packaging, branding and marketing information. The study concludes that dairy value addition can serve as a practical strategy for strengthening women's livelihood, enterprise development and empowerment in rural dairy households.

Keywords: Dairy value addition; dairy farm women; perception index; women empowerment

1. Introduction

Dairying is one of the most important components of India's rural economy and provides regular income, nutrition and employment to millions of farm households. India holds the position of the largest milk-producing country in the world (Gayathri *et al.*, 2023) ^[3], contributing nearly one-fourth of global milk production (DAHD, 2025). The country produced 239.30 million tonnes of milk during 2023–24, with per capita milk availability reaching 471 grams per day (DAHD, 2025). Nearly 70 percent of the workforce engaged in dairy farming consists of women, indicating their major contribution to the dairy sector (PIB, 2025) because dairy farming is largely household-based,

and women play a central role in feeding, milking, cleaning and processing such as curd, ghee, paneer, khoa, butter, other milk-based products. These products help in reducing raw milk wastage, increasing shelf life, improving consumer acceptability and generating additional income. The Indian dairy processing sector is expanding due to rising disposable income, changing food habits, urbanization, improved cold-chain facilities and increasing demand for hygienic and branded dairy products (MoFPI, 2025). Although women play a major role in dairy farming, their participation in income generation through dairy enterprises remains limited. Dairy value addition offers significant opportunities for women to achieve sustainable income generation and

develop as entrepreneurs. Rashmi *et al.* (2025) ^[10] also reported that Gaushala had positive net income whenever they were engaged in various entrepreneurial activities and established commercial dairy farm.

Therefore, understanding farm women's perception towards dairy value addition is essential for promoting their involvement in value-added dairy enterprises for sustainable income generation activities.

Materials and Methods

The study was conducted in Mathura district of Uttar Pradesh, selected purposively to analyses dairy farm women's perception towards dairy value addition. Mathura was chosen due to its strong dairy animal population and high demand for milk-based products, supported by its religious and tourist importance, which promotes the production and sale of traditional dairy sweets. A descriptive research design and multistage random sampling were adopted for selecting blocks, villages and dairy farm women. In the first stage, five blocks were selected from the district. In the second stage, two villages were selected from each selected block, making a total of ten villages. Finally, 15 dairy farm women were selected from each village, constituting a total sample size of 150 respondents. The data were collected with the help of a pre-tested structured

interview schedule. Responses were recorded on a five-point Likert-scale ranging from strongly agree to strongly disagree with scores of 5, 4, 3, 2 and 1 respectively. The collected data were tabulated and analysed using frequency, percentage, weighted mean score, rank, perception index and Pearson's correlation for overall index and Spearman's rho for item-wise statements.

$$\text{Perception Index} = (\text{Obtained perception score} \div \text{Maximum obtainable score}) \times 100$$

Based on the overall perception index, respondents were categorized into low, medium and high perception groups using Mean $\pm$ SD values used to form the categories. Spearman's rank correlation coefficient was used to examine the relationship between independent variables and item-wise perception statements. Statistical analysis was carried out using SPSS software.

Results and discussion

The findings showed that most respondents belonged to the middle-age group (47.33%), followed by old (31.33%) and young (21.33%) age groups, indicating greater involvement of middle-aged women in dairy farming.

Table 1: Socio-personal profile of farm women (N=150)

S.No.	Independent Variable	Frequency	Percentage
1.	Age		
	Young(Less than 35years)	32	21.33
	Medium(35-50years)	71	47.33
	Old(Morethan50years)	47	31.33
2.	Education		
	Illiterate	39	26.00
	Primary	34	22.67
	Middle	29	19.33
	Secondary	35	23.33
	Higher secondary	13	08.67
3.	Landholdings		
	Landless	129	86.00
	Marginal	20	13.33
	Small	01	0.67
4.	Herd size		
	Small	65	43.33
	Medium	74	49.33
	Large	11	07.33
5.	Income from dairy		
	Low	62	41.33
	Medium	79	52.67
	High	09	06.00
6.	Social participation		
	Low	88	58.67
	Medium	41	27.33
	High	21	14.00

Further table 1 indicate that a majority of respondents were literate (74.00%), with primary and secondary education being the most common levels (22.67% each). Most respondents (86.00%) were landless, possibly due to land ownership being predominantly held by male family members. Nearly half of the respondents (49.33%) maintained medium-sized herds. More than half (52.67%) had a medium level of annual income from dairy farming, while 58.67 percent exhibited low social participation, which may be due to household responsibilities and limited involvement in community organizations.

Perception of dairy farm women towards milk value-added products (VAPs)

The findings of table 2 revealed that "dairy value-added products enhance women's social and economic status" ranked first (WMS = 4.02), indicating that respondents viewed value addition as an important means of socio-economic empowerment and this finding is supported by Asha *et al.* (2021), who reported positive economic perceptions of dairy enterprises among women farmers. The statement prices paid by buyers for dairy value-added products are not satisfying ranked second (WMS = 3.73),

highlighting price dissatisfaction as a major constraint followed by lack of marketing information regarding dairy value-added products ranked third (WMS = 3.68), reflecting limited access to market information and Kaur *et al.* (2021) also reported that pricing and marketing information major constraints in this sector. Further packaging and branding (WMS = 3.35) ranked fourth, followed by stable income generation (WMS = 3.34), consumer preference (WMS = 3.16), and reduction of raw milk wastage (WMS = 2.88) these findings agreed with Jaiswal *et al.* (2024) [5]

highlighted the role of value-added dairy products in income enhancement and loss reduction. Overall, respondents had a positive perception of dairy value addition, particularly for women's empowerment and income generation, but identified low prices and inadequate marketing information as key barriers. Geetha and Srikantha Murthy (2022) [4] and Ravichandran *et al.* (2021) [9] also emphasized the contribution of dairy activities to women's empowerment and income control.

Table 2: Perception of dairy farm women towards dairy value-added products

S. No.	Perception parameter	WMS	Rank	Nature
1	Dairy value-added products enhance women's social and economic status	4.02	I	Positive
2	Prices paid by buyers for dairy value-added products are not satisfying	3.73	II	Constraint
3	Lack of marketing information regarding dairy value-added products	3.68	III	Constraint
4	Packaging and branding are important for dairy value-added products	3.35	IV	Positive
5	Producing dairy value-added products can provide a more stable income	3.34	V	Positive
6	Dairy value-added products are preferred by people	3.16	VI	Positive
7	Dairy value-added products reduce wastage of raw milk	2.88	VII	Positive

Overall Perception Index of Dairy Farm Women towards Dairy Value-Added Products

The findings revealed that the majority of the respondents (70.67%) belonged to the medium perception category, followed by low perception (17.33%) and high perception (12.00%) categories. This indicates that most dairy farm women had a moderate level of perception towards dairy value-added practices. The medium level of perception may be due to their practical involvement in dairy activities and awareness about the benefits of value addition, while limited exposure to organized marketing, packaging, branding and price realization might have restricted them from attaining a higher perception level.

Table 3: Distribution of respondents according to overall perception towards dairy value-added practices

S. No.	Perception category	Perception index range	Frequency	Percentage
1	Low perception	Below 51.59	26	17.33
2	Medium perception	51.59–69.37	106	70.67
3	High perception	Above 69.37	18	12.00
	Total		150	100.00

Low, medium and high categories were formed using Mean $\pm$ SD.

Relationship between independent variables and overall perception of dairy farm women

The relationship between selected socio-personal and economic variables of dairy farm women and their overall perception towards dairy value-added practices was examined using Pearson's correlation coefficient. The results presented in Table 4 revealed that none of the selected independent variables had a significant relationship with the overall perception of dairy farm women except total dairy animals showed a very weak positive and non-significant relationship with perception index ($r = 0.006$, $p = 0.944$). This indicates that the overall perception of dairy farm women towards dairy value-added practices was not

significantly influenced by their age, education, landholding, social participation and annual income.

Table 4: Correlation between selected independent variables and perception index of dairy farm women (N = 150)

S. No.	Independent variable	Correlation coefficient (r)	p-value
1	Age	-0.076	0.357
2	Education	-0.081	0.325
3	Landholding	-0.119	0.146
4	Total dairy animals	0.006	0.944
5	Social participation	-0.005	0.947
6	Annual income	-0.062	0.451

All correlations were non-significant at 0.05 level

Further, item-wise correlation analysis was carried out using Spearman's rank correlation coefficient to examine the relationship between selected independent variables and individual perception statements showed in Table 5. The results showed that education level was significantly associated with two perception statements. Education had a weak but significant negative relationship with packaging and branding statement ($\rho = -0.192$, $p = 0.019$). This indicates that with an increase in education level, agreement with the importance of packaging and branding showed a slight decreasing trend due to fact that dairy farm women were not aware the importance of packaging and branding in dairy sector. Education also showed a significant positive relationship with lack of marketing information regarding dairy value-added products ($\rho = 0.192$, $p = 0.019$). This suggests that relatively more educated respondents may be more critical of market access and information gaps, which explains the positive association with perceived lack of marketing information. No other independent variable showed a significant relationship with the perception statements.

Table 5: Only significant item-wise relationship between independent variables and dependent variable (N = 150)

S. No.	Independent variable	Perception statement	Spearman's rho (ρ)	p-value
1	Education	Packaging and branding are important for dairy value-added products	-0.192*	0.019
2	Education	Lack of marketing information regarding dairy value-added products	0.192*	0.019

*Significant at 0.05 level; only significant item-wise relationships are presented.

Conclusion

The study concluded that dairy farm women had a moderate to favourable perception towards dairy value addition as a pathway to women's empowerment. However, unsatisfactory prices paid by buyers and lack of marketing information were perceived as major constraints. The overall perception index was not significantly associated with selected socio-personal and economic variables, suggesting that perception towards dairy value addition was almost uniform across different respondent categories. However, education showed significant item-wise association with packaging, branding and marketing information. Therefore, extension interventions should be focus on market linkage, price negotiation, packaging, branding and entrepreneurship-oriented training to strengthen dairy value addition as a sustainable livelihood option for rural dairy farm women.

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