

PREFERENCE ANALYSIS OF DAIRY PRODUCTS IN BHARATPUR, CHITWAN, NEPAL

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ABSTRACT

Milk and dairy products constitute an important source of energy and nutrients for humans. Food preferences can strongly influence the consumption of milk and dairy products, and consequently affect nutritional intake of people. The study was conducted to analyze the preferences of consumers for dairy products and factors affecting their willingness to pay more for better quality dairy products. Bharatpur metropolitan of Chitwan district was selected purposively for the study. A pre-tested semi-structured interview schedule was used to collect the data from 150 respondents using simple random sampling. Descriptive statistics, forced ranking, and a binary logit model were used for data analysis. Results revealed raw milk was the most preferred dairy product, followed by yoghurt, ghee, and paneer. The regression results show that education level, years of formal schooling, and the number of economically active household members have a positive and statistically significant effect on consumers' willingness to pay (WTP) a premium for higher-quality dairy products. In contrast, age is negatively associated with WTP, and female consumers are significantly less likely than male consumers to pay a premium. Nutritious value of dairy products was found to be the major determinant for purchase decision of consumers, followed by quality, freshness, and taste. Better quality standards and access to nutritious dairy products should be encouraged to promote the consumption of dairy products among consumers.

Keywords: Consumers, Dairy products, Raw milk, Willingness to pay

INTRODUCTION

Dairy products are basically the food items, beverages, and derivatives primarily obtained from cattle and buffalo (Meunier-Goddik & Waite-Cusic, 2019). They are widely acknowledged as a great source of vitamins, calcium, and carbohydrates. With significant positive direct health benefits for humans, dairy products are regarded as vital output of the livestock industry (Rahnama & Rajabpour, 2017). Agriculture remains a vital sector of Nepal's economy, contributing approximately 24% of the national GDP, with livestock production playing a major role in this sector (Ministry of Agriculture and Livestock Development, 2023; World Bank, 2025). Within agriculture, the livestock sector contributes around 24% of the Agricultural GDP (AGDP), highlighting its importance for rural livelihoods and food security (Department of Livestock Services, 2023). Among livestock activities, dairy farming is the dominant subsector, accounting for roughly 63% of livestock GDP, which underscores the critical role of dairy production in Nepal's overall economy (Dhungana, 2025). As per the recommendations of human nutritionists, consuming 2 to 3 servings or cups of milk or other dairy products per day provides all the essential nutrients like energy, proteins, calcium, vitamins, cholesterol, riboflavin, and carbohydrates required for a healthy lifestyle (Dror & Allen, 2014; Weaver, 2014).

The dairy industry of Nepal is a major source of rural employment and income, with increased production of value-added products (Commercial Agriculture for Smallholders and Agribusiness, 2020). However, it encounters several challenges, including poor marketing services, high production costs, limited access to financial resources, and a declining farm labor force, which hinder producers from obtaining expected benefits and also limit the availability of high-quality products to consumers (Sharma, 2017). Similarly, National Dairy Development Board (2012) recognized additional constraints, such as high production costs coupled with low market prices and delayed payments for farmers, insufficient quantity and poor quality of collected milk for processors, and high retail prices for consumers. Other challenges include transportation problems caused by strikes and blockades, lack of chilling facilities that causes spoilage of evening milk collections, and consequent declines in overall milk quality (Tiwari & Paudel, 2018).

Consumer purchasing behavior of dairy products has become an increasingly important research issue (Haas et al., 2016). Most of the literature associates purchasing behavior primarily with individual preferences, while some studies also highlight how demographic characteristics affect preferences for dairy products (Mariusz, 2021). Despite the growing body of literature on consumer purchasing behavior of dairy products, there remains a lack of context-specific empirical evidence explaining how these multidimensional quality perceptions collectively influence actual purchase decisions,

particularly within differentiated market settings. Numerous factors influence the behavior, preferences, and attitudes of consumers regarding the consumption of dairy products. Perceptions of consumers towards the quality of dairy products are multidimensional and go beyond sensory attributes. Major dimensions affecting consumer judgments of quality are hedonic factors (taste or smell), health-related concerns, convenience-related aspects, and process-related features (Grunert et al., 2000). Internalizing how each of these dimensions shapes consumer demand can significantly help manufacturers, processors, and marketers to understand consumers' heterogeneity in their preferences and perceptions of quality.

The study is important not only for enhancing the dairy sector of Nepal but also crucial for informing policies designed for creating effective marketing systems and strategies. Additionally, the study highlights ways to strengthen the relationship between farmers and consumers, guaranteeing the supply of quality products at fair prices, while simultaneously raising the productivity of smallholder producers. Ultimately, this will assist both farmers and consumers, making the dairy industry more sustainable and efficient. This study assesses the consumer preferences and product diversification of dairy products among consumers.

RESEARCH METHODOLOGY

The study was done in Bharatpur Metropolitan of Chitwan district. Geographically, Chitwan is located in the central-southern region of Nepal, covering an area of 2,238.39 km² (864.25 sq m). The study was carried out in Chitwan because of its well-established prominence as a major milk-exporting area (Timsina & Regmi, 2009). All dairy product consumers residing in Bharatpur Metropolitan were the target population for this study. The required sample size was 97 as computed by Raosoft online sample size calculator at 10% margin of error and a 95% confidence level. However, to enhance the reliability and statistical robustness of the study's findings, 150 dairy consumers were selected using a simple random sampling technique. Pre-testing was done to evaluate the validity and effectiveness of the interview schedule prior to data collection. All participants provided verbal consent before taking part in the study. The source of primary information were dairy product consumers. Secondary data included recorded data and information in journals, book, published papers and publications.

Data analysis techniques

The obtained data were cleaned, entered, coded, and analyzed using Microsoft Excel 2010 and SPSS (V.23). Descriptive statistics, including mean, standard deviation,

frequency, and percentage, were used to derive necessary inferences. A binary logistic regression model and forced ranking method were used for data analysis. Similarly, a multi-collinearity test was conducted, and the results indicated no significant multi-collinearity among the independent variables, ensuring the reliability of the regression estimates.

Forced ranking

Ranking of major factors for the selection of dairy products was done by calculating the index of importance for each factor. The ranking was based on the decreasing order of index values, which were computed using the formula proposed by Miah (1993):

$$\text{Index of importance} = \sum S_i * F_i / N$$

Where,

S_i is the scale value for i^{th} intensity

F_i is the frequency of i^{th} respondents

N = Total number of respondents

Binary logistic regression model

The logistic regression model is widely used to examine the probability of a non-linear relationship between explanatory variables and a categorical dependent variable (Berkson, 1944). In this study, a binary logit model was applied to assess the factors influencing consumers' willingness to pay (WTP) for better quality dairy products, where a value of 1 represents "yes" and 0 represents "no" for WTP. The logistic regression model can be expressed as follows (Dhungel et al., 2026):

$$\ln(p/(1-p)) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n$$

Where,

p is the probability of willingness to pay for better quality

$\ln$ is natural logarithm

β_0 = intercept (constant term)

$\beta_1, \beta_2, \dots, \beta_n$ = regression coefficients of the independent variables

$X_1, X_2, \dots, X_n$ = independent variables

Table1. Description of variables used in the binary logistic regression model

Variables	Description	Measurement
Dependent Variable		
Consumers' willingness to pay for better quality dairy products	1= Yes, 0 = No	Categorical
Independent Variables		
Age (yrs)	Respondent's age in years	Continuous
Education Level	1 = Literate, 0 = Illiterate	Categorical
Total Family Size	Total number of household members consuming resources	Continuous
No. of Economically Active Population	Number of household members actively earning	Continuous
Gender	1 = Male, 0 = Female	Categorical
Years of Formal Education	Total years of formal schooling	Continuous
Annual Household Income (lakhs)	Total annual income of the household in lakhs	Continuous
Primary Occupation	1 = Agriculture, 2 = Business, 3 = Gov Job, 4 = non-Gov, 5 = Others	Categorical

RESULTS AND DISCUSSION

Socio-demographic characteristics of respondents

Table 2 shows that there were 28.67% male and 71.33% female respondents. Only 3.34% of consumers were involved in agriculture, 35.33% of them were involved in business, 14% in government jobs, 9.33% in non-government jobs, and 38% in other jobs. It was found that only 12% percent of them were illiterate, while about 3.33 % consumers had primary education, 48% had secondary level education, 30.67% had a bachelor's degree whereas 6% had a master's degree. The average age of respondents was found to be 42.17 years. Family size ranging between 2 to 15 were identified in the study area with average of 4. Similarly, the average years of schooling was found to be 11.17 years and average economically active respondents was found to be 2.07.

Table 2. Socio demographic characteristics of respondents

Variable	Category	Frequency
Gender	Male	43 (28.67)
	Female	107 (71.33)
Primary occupation	Agriculture	5 (3.34)
	Business	53 (35.33)
	Government Job	21 (14)
	Private job	14 (9.33)
	Others	57 (38)
Education Level	Illiterate	18 (12)
	Primary level	5 (3.33)
	Secondary level	72 (48)
	Bachelors	46 (30.67)
	Masters	9 (6)
	Mean	Standard deviation
Age	42.17	10.41
Family size	4.2	3.25
Years of formal education	11.17	5.21
Economically active population	2.07	0.88

Note: Figure in the parentheses indicates the percentage

Source: (Field survey, 2021)

Purchasing frequency of various dairy products

The purchasing frequency of various dairy products among respondents is presented in Table 3. Raw milk is predominantly purchased on a daily basis, with 96.67% of respondents buying it every day and 3.33% purchasing it occasionally. Ghee is purchased daily by 64% of respondents, while 34% buy it occasionally. Yogurt exhibits a mixed pattern, with 40% purchasing it daily, 3.33% once a week, and 55.33% occasionally. Paneer is primarily consumed occasionally (73.33%), with 24.67% purchasing it once a week. Buttermilk shows low daily consumption (7.33%), with the majority (72%) consuming it occasionally, and 19.33% never purchasing it. Khowa and ice cream are the least frequently purchased products, with 90% and 88% of respondents consuming them occasionally, respectively. The findings are in line with the study of Ahmadi Kaliji et al. (2019) and Świąder et al. (2022) who reported yoghurt, milk and cheese are the most frequently purchased dairy product by consumers.

Table 3. Consumers' purchasing frequency of various products

Dairy Product	Never	Daily	Once a week	Occasionally
Raw milk	0%	96.67%	0%	3.33%
Paneer	2%	0%	24.67%	73.33%
Ghee	2%	64%	0%	34%
Yoghurt	1.33%	40%	3.33%	55.33%
Buttermilk	19.33%	7.33%	1.33%	72%
Khowa	10%	0%	0%	90%
Ice-cream	12%	0%	0%	88%

Source: (Field survey, 2021)

Factors affecting consumers' willingness to pay more for quality dairy products

A binary logit regression model was used to investigate the effect of various factors on consumers' willingness to pay more for better quality dairy products. The estimates of model fitness showed the significance of the overall model at a 1 percent level of significance. The R^2 value obtained was 0.257 indicated the substantial explanatory power of the independent variables of the model. 25.7% of the variation in consumers' willingness to pay more for quality dairy products was explained by the explanatory variables of the model. Among the explanatory variables used in the model, age, educational level, number of economically active population, gender, and years of formal education significantly affected consumers' willingness to pay more for better quality products. But consumers' family size, annual household income, and consumers' primary occupation did not significantly affect consumers' willingness to pay more for dairy products.

The odds ratio was used to interpret the effect of significant explanatory variables on the dependent variable, which is shown in Table 4. Results showed that with an increase in each additional year of age, the odds of willingness to pay more for a better- quality product decreased by 0.92 times, which is similar to the finding of Schott and Bernard (2015), who reported a negative effect of age on the willingness to pay higher for organic milk. However, the result contrasts with the findings of Ahmadi Kaliji et al. (2019), which reported that age positively influenced the probability of choosing dairy products. Their study suggested that with an increase in age, consumers' willingness to pay higher for organic and certified milk decreases. The odds of willingness to pay more for better quality dairy products was 11.89 times greater for literate consumers than for illiterate consumers. Similarly, with an increase in years of formal education by additional one-year odds of willingness to pay higher for dairy products increased by 0.75 times. Dhungel et al. (2026) found consumers were willing to pay a premium for (Good Manufacturing Practices) GMP-labeled milk, with education likely influencing choices in discrete choice experiments. The finding was also supported by a study done by Parasuraman et al.

(2021) that claimed education positively shifts preferences toward safer, higher-quality, and often healthier dairy products. Similarly, Ahmadi Kaliji et al. (2019) suggested that educated consumers tend to be more aware of the quality and nutritional benefits of dairy products, leading to a greater willingness to pay for superior quality products.

The odds of willingness to pay more for better quality dairy products increased by 2.33 times with an additional one unit increase in the number of economically active population in the consumer's family. Habiyaemye et al. (2023) in Rwanda found similar household-level effects where larger working populations correlate with higher WTP for quality/safe milk, as income earners prioritize nutrition and reliability over price. Odds of willingness to pay more for better quality dairy products was 0.34 times lower for male than female consumers, which is in line with the findings of Ubrežiová et al. (2019), who observed that women tend to purchase dairy products more frequently than men, suggesting a gender-based preference in dairy consumption patterns.

Table 4. Factors affecting the WTP of dairy product consumers

Predictor	Estimate	SE	p-value	Odds Ratio
Intercept	4.4426	2.0267	0.028	84.99**
Age (yrs)	-0.0852	0.0289	0.003	0.92***
Education Level	2.4756	1.1661	0.034	11.89**
Consumers' Family Size	-0.0886	0.1221	0.468	0.91
No. of Economically Active Population	0.8474	0.2656	0.001	2.33***
Gender	-1.0886	0.5585	0.051	0.34*
Years of Formal Education	0.2864	0.0977	0.003	0.75***
Annual Household Income (lakhs)	0.0405	0.1172	0.730	0.96
Primary Occupation				
Business vs Agriculture	-0.2857	1.0406	0.784	0.75
Gov Job vs Agriculture	-0.4322	1.1864	0.716	0.65
Non-Gov vs Agriculture	-1.2292	1.2878	0.340	0.29
Others vs Agriculture	-0.5117	1.0684	0.632	0.59
No. of observations	150			
Prob> chi ²	0.000			
LR Chi ²	32.6			
Pesudo R ²	0.257			

Note: *, ** and *** indicates significance at 10%, 5% and 1% levels respectively

Characteristics of dairy products affecting consumer purchase decisions

The ranking analysis revealed the nutritious value of dairy products (index = 0.8857) was the foremost factor influencing consumers’ purchase decision of dairy products, followed by quality (0.8467) and freshness (0.8171). The findings are in line with the study of Bahety et al. (2024) and Parasuraman et al. (2021) which showed that quality and nutrient content are the major factors influencing the purchase of dairy products. Similarly, the other major factors affecting consumers’ purchase decision were taste (0.8123) and utility (0.8038), indicating the importance of sensory satisfaction and multipurpose use, which was consistent with findings of Merlino et al. (2021) and Krilić et al. (2024). However, price (0.7933), availability (0.7495), and duration (0.7123) were identified as the least important factors affecting the purchase decision of consumers for dairy products. This implies that, although affordability and accessibility remain essential considerations, they are eventually surpassed by consumer concerns regarding nutrition, quality, and freshness. These findings are supported by the study conducted by Alam et al. (2020), who found that consumer preference for dairy products was more influenced by quality and health considerations rather than price sensitivity.

Table 5. Characteristics of dairy products affecting consumer purchase decisions

Determinants	Index Value	Rank
Nutritious Value	0.8857	I
Quality	0.8467	II
Freshness	0.8171	III
Taste	0.8123	IV
Utility	0.8038	V
Price	0.7933	VI
Availability	0.7495	VII
Duration	0.7123	VIII

(Source: Field survey, 2021)

CONCLUSION

Raw milk and ghee are the most frequently purchased products, indicating their crucial role in daily household consumption. However, paneer, buttermilk, khowa, and ice cream are purchased occasionally reflecting their supplementary nature. Higher educational qualification and greater number of economically active household members increase the likelihood of paying higher prices for better quality products implying the role of awareness and household earning capacity in consumption of superior quality dairy products. Nutritional value, quality, and freshness of the dairy products are the major characteristics influencing consumer's purchase decision. Policymakers and market actors should prioritize quality assurance, consumer awareness, and strategic product differentiation to strengthen the competitiveness and sustainability of the dairy sector.

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