

CONSUMER PERCEPTION AND WILLINGNESS-TO-PAY FOR FUNCTIONAL DAIRY PRODUCTS: A2 MILK AND PROBIOTIC YOGURT.

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ABSTRACT

Functional dairy foods such as A2 milk and probiotic yogurt are fast-growing segments of the Indian dairy sector yet evidence on consumer awareness, preference drivers, willingness to pay and adoption barriers is limited outside metropolitan markets. This study surveyed 275 consumers with a through structured interview schedule by using the purposive sampling technique from major retail stores, dairy parlours and unregulated milk societies. Awareness was high for A2 milk (100%), functional dairy products (74.2%) and probiotic yogurt (69.8%), and was associated with age, gender and education ($p < 0.05$) but not occupation or income. Factor analysis extracted five reliable factors ($\alpha = 0.940$); Value for Money and Sensory and Health Quality were the strongest predictors in regression ($R^2 = 0.449$, $p < 0.001$), while brand trust and promotion were non-significant. Conjoint analysis showed willingness to pay a premium of Rs 85.15 for a popular brand and Rs 6.24 for fruit-flavoured yogurt over plain Greek yogurt. Garrett's ranking identified high price and low awareness of health benefits as the foremost constraints, with price reduction and awareness campaigns as preferred remedies. Findings indicate latent demand constrained by price and information, guiding pricing and communication strategy in this market. Keywords: A2 milk, Probiotic yogurt, Functional dairy products, Perception, Willingness to pay, Conjoint analysis, Garrett ranking

INTRODUCTION

Functional foods — Foods that offer additional health benefits beyond their basic nutritional value, containing bioactive compounds that can improve health or reduce the risk of developing chronic conditions (Frumuzachi et al., 2025) — are among the fastest-expanding categories in the global food industry, and dairy is one of the principal vehicles through which this trend has reached mainstream consumers. Functional dairy products are milk-based items (e.g., yogurt, cheese) enriched with bioactive peptides and probiotics like *Lactobacillus* spp., liberating smaller peptides during fermentation to aid lactose digestion and deliver benefits like antioxidant or antihypertensive effects (Kerry et al. 2018). India, as the world's largest milk producer, occupies a distinctive position in this trend: rising disposable incomes, urbanisation and a growing health-consciousness among consumers have converged with traditional, near-universal dairy consumption to create fertile ground for value-added and functional dairy products (Kumar et al. 2014). Two categories have gained particular visibility in this space. A2 milk, produced from cows that secrete only the A2 variant of β -casein, is marketed on claims of easier digestibility and reduced gastrointestinal discomfort relative to conventional A1/A2 milk, and has attracted growing consumer interest and a willingness to pay a premium in several international markets (Bentivoglio et al. 2020). Probiotic yogurt, fortified with live beneficial cultures, is positioned around gut-health, immunity and digestive benefits, and has likewise found increasing acceptance among Indian consumers, although awareness has historically been concentrated in urban, higher-income segments (Kumar et al. 2010).

Despite this growing commercial interest, systematic evidence on how Indian consumers perceive these products, what drives their preference relative to conventional dairy, how much of a price premium they are actually willing to pay, and what specifically holds back wider consumption remains fragmented. Existing work on Indian dairy preference has generally examined either broad dairy-purchase behaviour (Kiruthiga and Santhi 2019) or product-specific awareness in isolated urban pockets, without linking awareness, preference structure, monetary valuation and adoption barriers within a single analytical framework. This gap is practically important: functional dairy manufacturers, cooperatives and emerging farmer-producer organisations need integrated evidence — not just “who is aware” but “what they are willing to pay for” and “what is stopping them” — to design pricing, product and communication strategies that convert stated positive perception into actual purchase.

LITERATURE REVIEW

Awareness and Perception of functional dairy products

Consumer familiarity with A2 milk and other functional dairy attributes has so far been documented mostly in isolated urban or international settings rather than through an integrated framework.

Mounika et al., (2020) examined consumer buying behaviour and awareness of A2 milk in Hyderabad and found that awareness was concentrated among health-conscious, higher-income urban buyers, with limited penetration beyond this segment.

Bentivoglio et al., (2020) similarly reported that Italian consumers who were aware of A2 milk associated it with easier digestibility and reduced gastrointestinal discomfort, but that awareness itself remained a binding constraint on wider uptake.

Kumar et al., (2010) found that Indian consumers' understanding of probiotic foods was generally favourable where awareness existed, but that technical knowledge of what constitutes a probiotic product was still limited outside metropolitan centres.

Arora (2020) studying probiotic food and beverage awareness in Sonapat district, Haryana, reported that willingness to purchase was closely tied to prior awareness and that interpersonal sources remained more influential than formal advertising in shaping this awareness.

Singh et al., (2026) surveying yogurt awareness and purchase behaviour across India, likewise found that the market operates on a push-marketing model in which relatives and friends are the dominant information source and that awareness is markedly higher among urban, educated consumers than among other segments.

Preference drivers and willingness to pay for functional dairy attributes

Beyond awareness, a separate stream of research has examined what specifically drives consumer preference and monetary valuation of dairy attributes.

Verbeke (2005) argued that acceptance of functional foods is shaped jointly by cognitive factors, such as perceived health benefit and price-value judgement, and by socio-demographic characteristics including age and education, rather than by health benefit alone.

Kaliji et al., (2019) found that, among the attributes influencing dairy product choice, price and intrinsic quality dominated brand-related considerations, a finding consistent with the view that value-for-money judgements, rather than brand identity, anchor preference in price-sensitive markets.

Willingness-to-pay evidence for functional dairy attributes specifically remains limited but points in a similar direction: Bentivoglio et al., (2020) estimated a modest willingness to pay of around 11% for A2 milk among Italian consumers using a conjoint-based approach, characterising this as a real but incremental rather than transformative premium.

Van Loo et al., (2013) studying consumer attitudes toward organic yogurt, similarly reported that willingness to pay a premium was closely linked to product-specific knowledge and label trust rather than to general environmental or health attitudes. Taken together, this literature suggests that functional dairy premiums are realisable but conditional on consumers perceiving clear, credible value rather than on brand positioning or health claims in isolation.

Barriers and consumption behavior

Despite generally favourable attitudes, several studies point to persistent barriers that limit regular consumption of functional dairy products.

Das et al., (2019) examining consumption patterns of fermented probiotic dairy products in metropolitan Delhi, found that irregular purchase was linked to higher relative price and to limited availability of preferred products in neighbourhood retail outlets.

Arora (2020) reported that, even where awareness of probiotic products existed, cost considerations and doubts about specific health claims continued to discourage conversion of positive attitude into actual purchase.

Kiruthiga and Santhi (2019) studying dairy purchase behaviour more broadly, observed that brand loyalty and habitual purchase patterns often outweighed product-specific health considerations in routine dairy buying decisions, suggesting that functional attributes must compete with strongly entrenched conventional dairy habits.

Singh et al., (2026) similarly noted that, despite growing probiotic-sector potential in India, limited retail availability outside supermarkets and hypermarkets constrains regular access for a large share of consumers. These findings collectively indicate that adoption barriers for functional dairy products in India are less about scepticism toward the products themselves and more about price, availability, and the credibility of health communication.

Although earlier studies have examined awareness, attitude, and, to a lesser extent, willingness to pay for functional dairy attributes individually, few have combined awareness, preference-factor structure, monetary valuation, and adoption constraints within a single analytical framework, and fewer still have done so for the Indian market outside a handful of metropolitan centres. In particular, limited research has applied conjoint analysis to estimate rupee-denominated willingness to pay for A2 milk and probiotic yogurt attributes, or used Garrett's ranking technique to systematically prioritise the constraints and remedial measures that consumers themselves identify. The present study addresses this gap by integrating these four dimensions Indian market, with the following specific objectives.

OBJECTIVES OF THE STUDY

The present study was therefore undertaken to

- (i) To assess consumer awareness and perception of functional dairy products.
- (ii) To identify the factors that influence consumer preference for these products.
- (iii) To estimate consumers' willingness to pay for functional dairy products using conjoint analysis.
- (iv) To identify the constraints faced by consumers and elicit their suggestions for improving the adoption of functional dairy products.

MATERIALS AND METHODS

This study was conducted during 2025-2026 among consumers of functional dairy products in Coimbatore, Tamil Nadu, an urban and semi-urban market with an active and growing base of A2 milk and probiotic yogurt buyers. Purposive sampling was used as a sampling method in this study. Data were collected using a structured, pre-tested questionnaire administered through Google Forms to consumers who guaranteed the consumption of functional dairy products. A total of 275 valid responses were obtained and used for the analyses at strategically identified points. A structured interview schedule had different sections for the participants socio-demographic profile, awareness and perception; factors influencing purchase and consumption pattern; willingness to pay and constraints and suggestion for purchase and consumption of functional dairy products. Statements rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) covering digestibility, health benefits, suitability and overall quality of A2 milk and probiotic yogurt and 26 preference-related statements covering sensory quality, price-value, brand trust, availability and promotional influence (Temesi et al., 2019)

Four different tools for analysis were adopted. Percentage analysis was conducted for the demographic, awareness and consumption pattern data. To assess the consumer perception of functional dairy products, one sample t-test was performed on each statement measured in 5-point Likert scale with test value set at 3. Chi square test of independence proposed by Pearson in 1900 has been utilized to check for significant relationships among chosen demographic variables as well as the variables of consumer awareness/consumption (Pearson, 1900). Internal consistency of the 26-item preference scale was assessed using Cronbach's alpha, and its factorial structure was examined using exploratory factor analysis (Principal Component extraction with Varimax rotation), preceded by the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity to confirm suitability of the data for factor analysis. The resulting factor scores were entered as predictors in a multiple linear regression with overall product preference as the dependent variable, and one-way ANOVA was used to test for differences in consumption quantity across income groups.

Willingness to pay was estimated using choice-based conjoint analysis, following the general approach outlined by (Green and Srinivasan, 1978) with part-worth utilities estimated in the SPSS Conjoint module using an ordinary-least-squares-based main-effects model.

$$WTP = (U_{\text{target}} - U_{\text{baseline}}) / |\beta_{\text{price}}|$$

For the A2 milk brand-tier conjoint, in which respondents ranked brand $\times$ price profiles directly, WTP was computed as $WTP = \Delta U_{\text{brand}} / \beta_{\text{price}}$, where ΔU_{brand} is the utility difference between the target and baseline brand levels (e.g., Popular vs. Local), and β_{price} is the estimated marginal utility of price (utility units per rupee), obtained as the slope of utility on price.

For the yogurt ranking exercise, in which respondents assigned rank 1 to their most preferred profile, the sign of the SPSS utility estimates is inverted relative to conventional conjoint output (a negative utility denotes higher preference, since it pulls the rank toward 1); this inversion was accounted for before WTP was computed as $WTP = \Delta U_{\text{flavour}} / (dU/d\text{Price})$, where $\Delta U_{\text{flavour}}$ is the utility difference between the least- and most-preferred flavour, and $dU/d\text{Price}$ is the estimated utility change per rupee of price, obtained as the slope of utility on price. Finally, the relative severity of consumption constraints and the priority of suggested remedial measures were assessed using Garrett's ranking technique (Garrett and Woodworth 1969).

$$\text{Percent position} = 100 (R_{ij} - 0.5) / N_j$$

Where, R_{ij} - rank given to the i th item by the j th respondent

N_j - number of items ranked

Percent positions are converted to scores using Garrett's conversion table, averaged across respondents, and used to rank items by mean score.

RESULT AND DISCUSSION

Socio-demographic profile of the respondents. Out of 275 respondents, male constitutes of 52.7% while female is 47.3% (see Table 1). This indicates nearly equal representation of both the genders which enhances representativeness and reliability of the study. It clearly shows that majority of the population sampled were in the range of 25–35 years followed by 36–45 years (22.9%). This showing that consumption of functional dairy products is more popular among younger consumer. Undergraduates formed the majority of the sample population at 46.5%, while, postgraduates formed 32.7%. This showing maximum part of population sampled were educated (Manuelian, C. L., 2025). Occupationally, 39.3% were salaried employees, following business and students with a small proportion of homemakers. This occupational distribution is significant because salaried employees and business professionals represent economically active urban consumers with considerable purchasing power. Monthly household income was fairly evenly spread, with 30.9% in the ₹30,001–60,000 which denotes the

consumers of functional dairy products are generally middle-income households. It is also observed that 28.7% earning above ₹90,000 which indicates there is considerable count of customers who can afford premium priced functional dairy products.

Table 1: Socio-demographic profile of respondents (N = 275)

Demographic variable	Category	n	%
Gender	Male	145	52.7
	Female	130	47.3
Age (years)	Below 25	46	16.7
	25-35	104	37.8
	36-45	63	22.9
	Above 45	62	22.5
Education	School level	35	12.7
	Undergraduate	128	46.5
	Postgraduate	90	32.7
	Professional degree	22	8.0
Occupation	Salaried	108	39.3
	Business	86	31.3
	Student	48	17.5
	Homemaker	23	8.4
	Others	10	3.6
Monthly household income (₹)	Below 30,000	55	20.0
	30,001-60,000	85	30.9
	60,001-90,000	56	20.4
	Above 90,000	55	20.0

Source: Primary data

Consumer awareness and perception of functional dairy products. Awareness of A2 milk was universal in the sample, while 74.2% of respondents were aware of functional dairy products in general and 69.8% were specifically aware of probiotic yogurt. This suggests that consumers are increasingly aware of health-oriented organic products. The findings indicate that family and friends (53.5%) were the primary source of awareness, followed by social media (34.9%). This suggests that interpersonal communication remains the most influential channel for creating awareness (Mounika et al., 2020) while digital platforms also play a significant role in disseminating information about functional dairy products, surpassing traditional advertising channels. The principal reasons cited for consuming functional dairy products were to improve digestion/gut health (57.1%) and to boost immunity (42.9%). It was also observed that suitability for children, owing to their health benefits was also one of the primary reason for their consumption among respondents.

Consumer perception. The results indicate that consumers have a positive perception of both the functional dairy products. Among the A2 milk attributes, "**A2 milk provides long-term health benefits**" has the highest mean score of 3.82 which indicates consumers strongly perceives that A2 milk has varied health benefits, followed by "**A2 milk is suitable for children and elderly people**" has Mean score of 3.81 as they supports growth and easier digestion with reduced discomfort. while "**A2 milk reduces stomach discomfort or bloating**" recorded the lowest mean score of 3.29, suggesting comparatively lower awareness or personal experience regarding this benefit.

Similarly, for probiotic yogurt, the statement "**Probiotic yogurt improve gut health**" obtained the highest mean score of 3.94, reflecting good consumer awareness of digestive health benefits. In contrast, the statement "**They are a healthy daily snack option**" received the lowest mean score of 3.46, indicating that most of the consumers not yet consider probiotic yogurt a routine daily food.

The one-sample t-test showed that all mean scores were significantly greater than the neutral value of 3 ($p < 0.001$). Therefore, the null hypothesis that consumers hold neutral perceptions of these health benefits is rejected. These findings suggest that respondents generally perceive A2 milk and probiotic yogurt as functional dairy products with positive health attributes.

Table 2: consumer perception on functional dairy products.

Statement	Mean	t-value	Sig.
A2 milk is easier to digest	3.64	10.875	<0.001
A2 milk reduces stomach discomfort or bloating	3.29	4.453	<0.001
A2 milk is suitable for children and elderly people	3.81	11.992	<0.001
A2 milk provides long-term health benefits	3.82	12.285	<0.001
A2 milk is healthier than regular milk	3.76	11.096	<0.001
Probiotic yogurt improves digestion	3.80	11.101	<0.001
Probiotic yogurt improves gut health	3.94	13.037	<0.001
Probiotic yogurt boosts immunity	3.63	9.004	<0.001
Probiotic yogurt is a healthy daily snack option	3.46	5.894	<0.001
Probiotic yogurt improves overall health	3.74	10.070	<0.001

Source: Primary data.

Chi-square test was conducted to determine the existence of a statistically significant association. Awareness of probiotic yogurt was significantly associated with age ($\chi^2 = 22.174$, $df = 4$, $p < 0.001$) where respondents are young adults at the age 25-35 (42.2%) are more aware than the age Above 45(15.1%) indicating an age-related exposure gap, plausibly linked to lower social-media penetration and digital word-of-mouth reach in this cohort (Goliszek, A et al., 2025). In regards to gender associated with awareness of probiotic yogurts ($\chi^2 = 10.572$, $df = 2$, $p = 0.005$), female respondents (53.1%) seem to have higher level of awareness compared to male respondents (46.4%). This difference may be attributed to women's relatively greater involvement in household food purchasing and meal planning, as well as their higher interest in nutrition, health, and wellness information. There exists a significant association between awareness of probiotic yogurt and educational qualification of respondents ($\chi^2 = 46.241$, $df = 3$, $p < 0.001$). Respondents who have higher educational qualification like undergraduate (45.8%) and postgraduate (41.1%) are seen with increased awareness indicating consumers with higher education tend to possess better health literacy and greater exposure to nutrition information, resulting in higher awareness of probiotic yogurt.

Respondents' awareness of A2 milk was found to be significantly associated with their occupation ($\chi^2 = 15.846$, $p = 0.001$) where homemakers exhibited the lowest proportion of unawareness (3.5%) due to their active involvement in household food purchasing and meal preparation, exposing them to dairy products and related promotional information. These patterns are broadly consistent with international evidence that awareness of functional-food attributes is strongly age- and education-linked (Bentivoglio et al. 2020) and with earlier Indian findings that probiotic awareness has historically skewed toward younger, more educated urban consumers (Kumar et al. 2010).

Consumption pattern. The highly consumed product in the market is A2 milk (46.9%) than yogurt (18.20%). The percentage of consuming both the products is 34.90%. Daily purchase was the modal frequency (49.8%), and local retail stores and supermarkets/hypermarkets were the leading points of purchase. On average, 36% of people consume less than 250ml of A2 milk per day while only 8.4% of people consume more than 1L. In case of probiotic yogurt, 37.5% of people consume less than 1 cup per day while 2.2% of people consume more than 2 cups per day. Though highest percentage of people (42.2%) consume A2 milk daily, maximum percentage (23.3%) of people consume probiotic yogurt occasionally. The highest percentage (28.7) of consumers have been consuming A2 milk since, more than 2 years while consumers are gaining awareness recently as highest percentage (21.8%) of consumers started to consume within 6 months to 1 year. When these are cross-tabulated, it was found out that Product choice was significantly associated with age ($\chi^2 = 23.063$, $p = 0.003$) where consumers within the age of 25-35 are more likely to consume both the products (47.9%).

Factors influencing consumer preference dimensions. The factor analysis was applied to 26-item preference statements on a five-point Likert scale which showed excellent internal consistency (Cronbach's $\alpha = 0.940$). The Kaiser-Meyer-Olkin (KMO) measure was 0.909 together with Bartlett's test of sphericity was statistically significant ($p < 0.001$) confirmed that the data were well suited to factor analysis. The eigen value-more-than-one criterion yielded five factors which explains 71.4% of total variance

Table 3: Rotated component matrix of factors influencing consumer preference for functional dairy products.

Factor Loadings	1	2	3	4	5
They improve digestion	.760				
They enhance immunity	.812				
They improve gut health	.756				
Taste is appealing	.685				
They are fresh	.711				
Texture is satisfactory	.742				
Overall quality	.737				
They contain natural ingredients	.726				
Price is reasonable		.759			
Good value for money		.761			
Willingness to pay premium		.713			
Price is justified		.761			
Brand influence reputation			.783		
They trust manufacturer			.636		
Certification and assurance			.815		
Brand association			.519		
Easily available in market				.832	
Preferred packs are available				.782	
Ad influence					.759
Recommendations of friends and doctors					.604

Source: Primary data

The factor 1 was named as Sensory & Health Quality explained greater portion of variance which is 26.86% which includes 8 variables – digestion (0.760), immunity (0.812), gut health (0.756), taste (0.685), freshness (0.711), texture (0.742), overall quality (0.742), natural ingredients (0.726) ($\alpha = 0.923$). They recorded mean score of 3.58, which indicates that respondents generally agreed that influence their preference for functional dairy products. The significance of physical representation and health is perceived by customers as a part of overall experience (M, D., Sen et al 2025).

The factor 2 was named as Value for Money which had 4 variables - reasonable price (0.759), value for money (0.761), willingness to pay a premium (0.713), price justification (0.761); ($\alpha = 0.849$). They recorded mean score of 3.25 which suggests differences in consumers' price sensitivity and willingness to pay a premium.

The factor 3 was named as Brand Trust which had 4 variables brand reputation (0.783), manufacturer trust (0.636), certification (0.815), brand association (0.519); ($\alpha = 0.802$). They recorded the mean score of 3.32, which indicates variation in responses reflect differences in familiarity and confidence across dairy brands.

The factor 4 was named as Convenient Availability which had 2 variables - easy availability (0.832), availability of preferred packs (0.782); ($\alpha = 0.760$). They recorded the mean score of 2.87 indicating that respondents generally disagreed that functional dairy products were easily available or that their preferred pack sizes were readily accessible which act as a barrier to consumer purchase.

The factor 5 was named as Promotional Influence which had 2 variables - advertisement influence (0.759), recommendations of friends/doctors (0.604); ($\alpha = 0.590$). They recorded the mean score of 3.40 indicating moderate agreement that advertisements and recommendations from friends or doctors affected consumer preferences.

Table 4: Factor structure of consumer preference for functional dairy products

Factor	% of variance	Cumulative %
F1 – Sensory & Health Quality	26.860	26.860
F2 – Value for Money	14.404	41.264
F3 – Brand Trust	12.345	53.610
F4 – Convenient Availability	9.076	62.685
F5 – Promotional Influence	8.725	71.411

Source: Primary data

When these five factor scores were regressed on overall product preference, the model was significant ($R^2 = 0.449$, adjusted $R^2 = 0.438$, $F(5, 269) = 43.78$, $p < 0.001$) and free of multicollinearity concerns (all VIF < 2). Value for Money emerged as the strongest predictor which highly influence the purchase decision and preference of the consumer.

Table 5: Multiple regression of overall preference on preference factors

Predictor	Standardised β	t	p-value	Significance
F2 – Value for Money	0.380	6.357	<0.001	Significant
F1 – Sensory & Health Quality	0.226	3.533	<0.001	Significant
F4 – Convenient Availability	0.117	2.168	0.031	Significant
F5 – Promotional Influence	0.099	1.844	0.066	Not significant
F3 – Brand Trust	0.020	0.336	0.737	Not significant

Source: Primary data

These results indicate that, in this market, price-value perception and intrinsic sensory/health quality are what convert awareness into preference (Kaliji et al. 2019), while brand trust and promotional messaging play a comparatively (not significant) minor role — a pattern consistent with (Zaman, S. U et al., 2025).

Willingness to pay for functional dairy products. Willingness to pay was estimated through two independent conjoint exercises: one evaluating trade-offs between brand tier and price for A2 milk, and a second evaluating trade-offs between flavour and price for probiotic yogurt.

Brand-tier willingness to pay. Part-worth utilities estimated from the brand $\times$ price conjoint design (Table 6) show that a Popular brand carried the highest utility (0.375), followed by Premium (0.045) and Local (−0.420), while utility declined monotonically as price rose from ₹80 to ₹130. The estimated marginal utility of price was $\beta_{\text{price}} = -0.00934$ utility units per rupee.

Table 6: Part-worth utility estimates: brand tier $\times$ price conjoint design

Attribute	Level	Utility estimate	Std. error
Brand	Local	−0.420	0.700
	Popular	0.375	0.700
	Premium	0.045	0.700
Price	₹80	−0.236	0.606
	₹110	−0.473	1.213
	₹130	−0.709	1.819
(Constant)		−5.085	1.310

Source: Primary data

Applying the formula, to these part-worths yields a WTP of ₹85.15 to move from a Local to a Popular brand, ₹49.80 to move from Local to Premium, and ₹35.34 to move from Premium to Popular. That is, consumers in this sample placed a materially higher monetary value on “popular” (mass-market, high-visibility) branding than on “premium” (exclusivity-oriented) branding, a pattern that mirrors the regression finding that brand trust per se was not a significant preference driver, while value-for-money was — suggesting that in this market, brand equity operates primarily through perceived popularity/social proof rather than through prestige positioning.

[It should be noted that the price part-worths in the brand-tier design carried relatively wide standard errors (Table 5), reflecting the limited number of price levels and sample size in this sub-analysis; the WTP estimates reported here should therefore be interpreted as indicative magnitudes rather than precise point values, and larger-sample replication would help narrow their precision.]

Yogurt attribute willingness to pay. A separate conjoint exercise administered to respondents asked them to rank nine yogurt profile cards, varying by flavour (Fruit-Blueberry, Honey and Fig, Plain Greek) and price (₹50, ₹55, ₹60), from 1 (most preferred) to 9 (least preferred). Because a lower rank denotes higher preference, negative utility estimates in this design indicate higher preference (Table 7).

Table 7: Part-worth utility estimates: yogurt flavour $\times$ price conjoint design

Attribute	Level	Utility estimate	Std. error
Flavour	Fruit-Blueberry	−1.644	0.145

Attribute	Level	Utility estimate	Std. error
	Honey and Fig	0.017	0.145
	Plain Greek	1.627	0.145
Price	₹50	26.192	1.259
	₹55	28.811	1.385
	₹60	31.430	1.511
(Constant)		-23.811	1.389

Source: Primary data

Fruit-Blueberry was the clear market leader among flavours, while Plain Greek yogurt was the least preferred, and utility worsened steadily as price rose from ₹50 to ₹60 — confirming rational, monotonic price sensitivity. Converting the utility scale to currency (a ₹10 price change corresponded to a 5.238-unit utility change, i.e., 0.5238 utility units per rupee) and applying it to the utility gap between Plain Greek and Fruit-Blueberry (3.271 utility points) yields a willingness to pay of ₹6.24 for a cup of Fruit-Blueberry yogurt over a plain Greek cup. This premium is modest in absolute terms but is nonetheless commercially meaningful: provided the incremental ingredient and processing cost of a fruit-flavoured variant remains below ₹6.24 per cup, its introduction would be expected to expand, rather than compress, unit margins.

Taken together, the two WTP exercises indicate that brand-tier positioning commands a substantially larger monetary premium (₹35–85) than flavour differentiation within a single product category (₹6.24), implying that pricing and branding strategy — rather than incremental product variation alone — offer the larger short-run lever for value capture in this market, while flavour innovation remains a smaller but still profitable secondary lever. These magnitudes are broadly consistent with international evidence that consumers are willing to pay measurable, if often modest, premiums for functional dairy attributes: Bentivoglio et al, for instance, reported a relatively low but positive willingness to pay for A2 milk among Italian consumers, reinforcing that functional and brand-related premiums for dairy tend to be real but incremental rather than transformative, and must be reinforced through awareness-building to be realised at scale (Bentivoglio et al. 2020).

Constraints faced and suggested measures for functional dairy products. There are several constraints faced by the consumers in consumption as well as purchase of the functional dairy products. The first major barrier was the high price relative to regular dairy products with the Garette score of 63.68. The second major constraint was lack of awareness of health benefits (60.84). the other constraints are limited availability in nearby retail stores (59.05), and doubt about health claims made by companies (52.15). Lack of trust in brands/manufacturers (47.03), limited variety of product options (46.00), unpleasant taste relative to regular dairy products (45.29) and inadequate information on product labels (44.48) were of intermediate concern, while short shelf life (40.54) and inconvenient packaging size (37.21) were the least severe constraints.

Corresponding suggestions closely mirrored the constraint hierarchy, indicating that respondents' priorities for remedial action were internally consistent. Reducing the price of functional dairy products was the most preferred measure suggested by respondents with the Garette score of 61.02. The second significant suggestion given was consumers are increasing awareness through advertisements and campaigns (59.50) and increasing availability in local retail outlets (57.30). The other suggestions are Improving taste and introducing more flavours (50.66) and providing clear, reliable health information on labels (49.81) followed, while ensuring certification/quality assurance (47.45), offering discounts and promotional offers (46.65), promoting doctor/nutritionist recommendations (45.28), improving shelf life (41.50) and introducing smaller, more affordable package sizes (37.66) were assigned lower priority.

Table 8 constraints and suggestions to improve adoption of functional dairy products

Rank	Constraint	Garette score	Suggestion	Garette score
1	High price compared to regular dairy products	63.68	Reduce the price of functional dairy products	61.02
2	Lack of awareness about health benefits	60.84	Increase awareness through advertisements and campaigns	59.50
3	Limited availability in nearby retail stores	59.05	Increase availability in local retail outlets	57.30
4	Doubt about health claims made by companies	52.15	Improve taste and introduce more flavours	50.66
5	Lack of trust in brands/manufacturers	47.03	Provide clear and reliable health	49.81

			information on labels	
6	Limited variety and product options	46.00	Ensure certification and quality assurance	47.45
7	Unpleasant taste compared to regular dairy products	45.29	Provide discounts and promotional offers	46.65
8	Inadequate information on product labels	44.48	Promote doctor and nutritionist recommendations	45.28
9	Short shelf life of the product	40.54	Improve shelf life of the products	41.50
10	Inconvenient packaging size or type	37.21	Introduce smaller and affordable package sizes	37.66

Source: Primary data

The close correspondence between the top-ranked constraints (price, awareness, availability) and the top-ranked suggestions (price reduction, awareness campaigns, wider availability) provides convergent, triangulated evidence — consistent with the awareness patterns in Objective 1 and the value-for-money-led preference structure in Objective 2 — that the principal barrier to functional dairy adoption in this market is not consumer scepticism about the products themselves, but a combination of price positioning and insufficient, credible information reaching less-exposed demographic segments.

CONCLUSION

The study revealed that acceptance of functional dairy products such as A2 milk and probiotic yogurt is majorly affected by perceived value for money and health/sensory quality, rather than by brand trust or promotional exposure. Overall, there is a high level of awareness about these products, although it varies by age, gender, and educational attainment, with older and less educated consumers staying relatively ignorant. Customers showed a genuine willingness to pay more for these products, and this premium was significantly higher when associated with a reputable, well-known brand (up to ₹85.15) than when associated with flavour variation alone (₹6.24). This suggests that consumers place more value on brand credibility than category variety. Despite this favourable impression, a number of obstacles still prevent broader adoption, and the market has not yet realized its full potential. The first is price, as functional dairy products are priced considerably higher than conventional dairy products. The second is insufficient consumer awareness of the specific health benefits these products offer. The third is limited penetration of these products beyond urban and semi-urban retail outlets, restricting access for a large segment of potential consumers. For functional dairy products to move from a niche, health-conscious purchase to a mainstream dairy alternative, several changes are needed. These include Value-anchored pricing, Science-based credible communication of health benefits through interpersonal channels (friends, family, doctors) and social media, which already dominate how consumers currently learn about these products. Targeted awareness campaigns aimed specifically at older and less-educated consumer segments & Wider retail availability.

Authorship contribution statement

Dharsini S V: Conceptualisation, methodology, data collection, analysis, interpretation, manuscript preparation.

A Rohini: Conceptual development, supervision, project administration, critical revision.

N Deepa: Methodological guidance, manuscript revision.

R Pangayar Selvi: Statistical analysis, data interpretation, manuscript review.

M Kalpana: Validation, manuscript review.

M Radha: Statistical analysis, data interpretation, manuscript review.

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Conflicts Of Interest

The authors declare no conflict of interest.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

REFERENCE

1. Frumuzachi O, Flanagan A, Rohn S, Mocan A. The dichotomy between functional and functionalized foods - A critical characterization of concepts. *Food Res Int*. 2025 May;208:116173. doi: 10.1016/j.foodres.2025.116173. Epub 2025 Mar 13. PMID: 40263787.
2. Diez-Gutiérrez L, San Vicente L, Barrón LJR, Villarán MC, Chávarri M (2020) Gamma-aminobutyric acid and probiotics: multiple health benefits and their future in the global functional food and nutraceuticals market. *J Funct Foods* 64:103669. <https://doi.org/10.1016/j.jff.2019.103669>
3. Kumar A, Joshi PK, Kumar P, Parappurathu S (2014) Trends in the consumption of milk and milk products in India: implications for self-sufficiency in milk production. *Food Secur* 6(5):719–726. <https://doi.org/10.1007/s12571-014-0387-5>
4. Bentivoglio D, Finco A, Bucci G, Staffolani G (2020) Is there a promising market for the A2 milk? Analysis of Italian consumer preferences. *Sustainability* 12(17):6763. <https://doi.org/10.3390/su12176763>
5. Kumar M, Goyal R, Khandal H, Khilwani A, Gupta S, Lomash H et al (2010) Perception and attitudes of Indian consumers to probiotic foods. *Int J Probiotics Prebiotics* 5(4):217–220
6. Kiruthiga U, Santhi M (2019) A study on consumer behaviour towards Amul milk products in Namakkal District. *J Gujarat Res Soc* 21(5):507–512
7. Mounika V, Kumar B, Seema, Supriya K (2020) Study on consumer buying behavior, awareness and preference for A2 milk in Hyderabad, India. *Asian J Agric Ext Econ Sociol* 38(9):21–29
8. Arora PK (2020) Consumer awareness and willingness to purchase probiotic food and beverage products: a study of Sonapat district, Haryana. *Br Food J*. <https://doi.org/10.1108/BFJ-06-2020-0469>
9. Singh R, Sharma R, Dinakar JA (2026) Exploring yogurt awareness and purchase behaviour among Indian consumers. *Indian J Dairy Sci* 79(1)
10. Verbeke W (2005) Consumer acceptance of functional foods: socio-demographic, cognitive and attitudinal determinants. *Food Qual Prefer* 16(1):45–57
11. Kaliji SA, Mojaverian SM, Amirnejad H, Canavari M (2019) Factors affecting consumers' dairy products preferences. *Agris On-line Pap Econ Inform* 11(2):3–11
12. Van Loo EJ, Diem MNH, Pieniak Z, Verbeke W (2013) Consumer attitudes, knowledge, and consumption of organic yogurt. *J Dairy Sci* 96(4):2118–2129
13. Das J, Raju R, Sirohi S, Chandel BS, Raju PN, Meena BS (2019) Consumption pattern of fermented probiotic dairy products in metropolitan Delhi. *J Pharmacogn Phytochem* 8(1):45–49
14. Temesi, Á., Bacsó, Á., Grunert, K. G., & Lakner, Z. (2019). Perceived correspondence of health effects as a new determinant influencing purchase intention for functional food. *Nutrients*, 11(4), 740. <https://doi.org/10.3390/nu11040740>
15. Pearson K. On the criterion that a given system of deviations from the probable in the case of a correlated system of variables is such that it can be reasonably supposed to have arisen from random sampling. *Philos Mag*. 1900;50(302):157-175. doi:10.1080/14786440009463897.
16. Green PE, Srinivasan V (1978) Conjoint analysis in consumer research: issues and outlook. *J Consum Res* 5(2):103–123
17. Garrett HE, Woodworth RS (1969) Statistics in psychology and education. Vakils, Feffer and Simons, Bombay
18. Manuelian, C. L., Such, X., Juan, B., & Milán, M. J. (2025). Is there a potential market for A2 milk? Consumer perception of dairy production and consumption. *Foods*, 14(15), 2567. <https://doi.org/10.3390/foods14152567>
19. Goliszek, A., Białoskurski, S., Komor, A., Nowak, A., Jarosz-Angowska, A., Krukowski, A., Przybyłowicz, K. E., Staniewska, K., & Dąbrowska, A. (2025). Motives behind dairy product purchasing decisions among Polish doctors: An age-based analysis. *Foods*, 14(18), 3169. <https://doi.org/10.3390/foods14183169>
20. M, D., Sen, B., Mandal, S., & Singh, A. (2025). Analyzing the drivers and preferences of functional dairy food consumption: A socioeconomic perspective from Tamil Nadu. *Indian Journal of Dairy Science*, 78(5), 470–477.
21. Zaman, S. U., Hamidi, S. B. V., Alam, S. H., & Aziz, S. (2025). Perceived health benefits, brand trust, and emotional value in consumer adoption of fortified powdered milk products: A structural equation modeling approach. *Journal of Health, Wellness, and Community Research*, 3(3). <https://doi.org/10.61919/j2tfe031>