

THE EMERGENCE OF SUPER SEEDS: AN EMPIRICAL STUDY ON CONSUMER PREFERENCES ON SUPER SEEDS

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ABSTRACT

The functional food market has significant importance because of increasing health awareness, rapid urbanization and changing lifestyle. This study analyses the consumer buying behaviour of functional seeds (often called super seeds), examines the factors that influence the buying behaviour of consumer and identifies the barriers faced by consumer in purchasing the super seeds. This study includes seven specific seeds for the analysis are chia seeds, flax seeds, sabja (basil) seeds, pumpkin seeds, sunflower seeds, sesame seeds and watermelon seeds. The variables used in the study were nutritional knowledge, price sensitivity, health benefits, brand image and social influence are considered for analysis. The data included in the study was primary data through a well-structured questionnaire from the respondents in Coimbatore city of Tamil Nadu and alongside secondary data from the credible industry sources. The collected data were subjected to various tools like percentage analysis, factor analysis and Garrett ranking technique for the meaningful interpretations. This study aims to help the agribusiness marketers, entrepreneurs and local farmers for prioritize health-based products and make their strategies to meet the current pattern of urban consumer preference.

KEYWORDS: Adoption barriers; Consumer behavior; Functional foods; Functional seeds; Purchase intention.

INTRODUCTION

In global scenario, the agribusiness and food processing sector are beginning the profound transformation due to shifting of dietary habits of consumers. The food consumption was historically depended on nourishment and process of maintaining livelihood. The modern consumers like Gen Z are views the food as a preventive healthcare. This shift leads to result of expansion of the functional food market, which also focus on physiological benefits and reduce the risk of chronic lifestyle disease [1,2].

The shifting of consumer behaviour is to identified because it crucial for food-based firms to align their strategies with the expectation of consumers. The term "super seeds" classifies seeds as expectational nutritional density. In this study, seven seeds are included for analysis are Chia (*Salvia hispanica*), Flaxseed (*Linum usitatissimum*), Pumpkin seeds (Cucurbitaceae), Sunflower seeds (*Helianthus annuus*), Sesame seeds (*Sesamum indicum*), Basil/Sabja seeds (*Ocimum basilicum*) and Watermelon seeds (*Citrullus lanatus*). These seeds are having vast amount of polyunsaturated fatty acids, dietary fiber, plant-based proteins, and vital trace minerals such as zinc and magnesium [3-8].

In India, the health-oriented food demand is increasing gradually because of urbanization and rising of consumer income level. Coimbatore is a major industrial city in Tamil Nadu with a diverse consumer base. Recent consumer studies in Coimbatore demonstrate a growing willingness among urban consumers to adopt novel, plant-based dietary alternatives driven by health and sustainability motives [9]. However, while these consumers seek to make their meals healthier, they often refuse to compromise on their traditional flavors. Culinary practices of sabja seeds and sesame seeds provide a psychological bridge for the adoption of other functional seeds in a dietary habit of consumers.

To successfully penetrate the modern retail landscape, it is vital to understand the specific consumer dynamics of Millennials and Generation Z [10,11]. Recent retail market analyses indicate that young, educated urbanites particularly university students and early-career professionals are the primary demographic driving the functional food trend in emerging economies. Their heightened exposure to global wellness trends, digital health information, and preventative healthcare makes them the definitive "early adopters" of super seeds. Consequently, evaluating the buying behaviour and

retail preferences of this specific youth-driven demographic is scientifically critical for formulating effective FMCG marketing and retail distribution strategies.

The Purpose and Objectives of the Study

- (i) Understand consumer behaviour towards major functional seeds involves chia seeds, sabja seeds, flax seeds, pumpkin seeds, sunflower seeds, sesame seeds and basil seeds.
- (ii) Investigate the factors influencing consumer buying behaviour towards functional seeds.
- (iii) Identify purchase and consumption barriers faced by urban functional seed consumers in Tamil Nadu, India.

LITERATURE REVIEW

Growing consumer awareness regarding nutrition and preventive healthcare has substantially increased the demand for functional foods worldwide. Among these, functional seeds have attracted considerable attention owing to their rich nutritional composition and diverse health-promoting properties. Research has consistently demonstrated that consumer acceptance of these products is influenced not only by their nutritional benefits but also by purchasing behaviour, product accessibility, convenience, and market awareness.

Suri et al. comprehensively reviewed the nutritional composition and functional properties of chia seeds (*Salvia hispanica* L.) and identified them as one of the emerging functional food ingredients with considerable therapeutic potential. The authors reported that chia seeds are rich sources of omega-3 fatty acids, dietary fiber, antioxidants, high-quality proteins, vitamins, and essential minerals. Regular consumption was associated with improved cardiovascular health, better glycemic control, weight management, and reduced risk of several non-communicable diseases, thereby establishing chia seeds as an important component of health-oriented diets [12].

With the rapid growth of digital retailing, consumer purchasing behaviour has also undergone significant changes. Nafisah and Hayati examined consumer behaviour in the online purchase of seeds and ornamental plants and found that trust in sellers, website quality, convenience, and availability of product information were the major determinants of online purchase intention. Their findings demonstrate the increasing role of e-commerce platforms in influencing consumer buying decisions, particularly for specialty agricultural products where consumers actively seek reliable information before purchase [13].

Motyka highlighted the expanding role of chia seeds within the functional food sector and emphasized their contribution to healthy dietary patterns. The study indicated that increasing consumer preference for plant-based superfoods is primarily driven by growing awareness of nutritional quality, disease prevention, and sustainable food choices. The author further suggested that scientific evidence supporting the health benefits of chia seeds has strengthened their positioning in the functional food market [14].

From a consumer marketing perspective, Khanum investigated consumer preferences for chia-based products using conjoint analysis. The study revealed that consumers preferred whole seeds and convenient ready-to-use product formats over highly processed alternatives. Health consciousness emerged as the strongest determinant of purchase intention, while nutritional value and product convenience significantly enhanced consumer preference. These findings demonstrate that product attributes play an important role in influencing purchasing decisions within the functional food market [15]. Although previous studies have extensively documented the nutritional benefits of individual functional seeds and examined consumer preferences for specific products, most investigations have focused on a single seed type or a limited set of purchasing factors. Comprehensive studies evaluating consumer behaviour across multiple functional seeds, while simultaneously examining purchasing patterns, influencing factors, and consumer barriers, remain limited, particularly in the Indian context. Therefore, the present study attempts to address this gap by analysing consumer behaviour towards seven major functional seeds and identifying the key determinants and constraints influencing their purchase decisions among consumers in Coimbatore, Tamil Nadu.

MATERIALS AND METHODS

This research was carried out in Coimbatore city, one of the major industrial and fastest-growing urban centers in Tamil Nadu, India. Due to rapid industrialization and changing lifestyles, there is a significant shift in consumer demand towards convenient and health-based functional foods in this region. A stratified random sampling technique was used in this study to accurately capture the core target market for functional foods. To eliminate spatial and institutional convenience bias, a total of 300 sample respondents specifically young, educated urban consumers, university students, and working professionals were randomly intercepted across all five diverse administrative zones of Coimbatore city.

Primary data were obtained through face-to-face structured scheduled interviews, alongside secondary data gathered from credible industry sources. A well-structured questionnaire was utilized for primary data collection, which had different sections focusing on the participants' socio-demographic profile, functional seed consumption and spending patterns, factors influencing purchase decisions, and constraints faced by the consumers.

A Likert scale, ranging from 1 (strongly agree) to 5 (strongly disagree), was used to assess the factors affecting respondents' preferences for functional seeds. The variables considered for analysis included nutritional knowledge, price sensitivity, health benefits, brand image, sensory attributes, and social influence.

Three specific tools for analysis were adopted for meaningful interpretations:

1. Percentage Analysis:

This traditional statistical tool was utilized to analyze the demographic profiles, spending patterns, and general buying behaviour of the respondents. It is calculated as follows:

$$\frac{\text{Number of responses for specific questions}}{\text{Total number of responses}} * 100$$

2. Factor Analysis:

This method was employed to reduce a large number of variables into a few core underlying factors influencing consumer preferences. Principal Component Analysis (PCA) with a Varimax rotation technique was used as the extraction method [16]. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity were utilized to evaluate sampling adequacy and variable correlations. Furthermore, Cronbach's alpha was calculated to verify the internal consistency and reliability of the Likert scales [17].

3. Garrett's Ranking Technique:

This technique was adopted to rank the severity of the various constraints faced by consumers when purchasing functional seeds (e.g., high price, lack of culinary knowledge, storage issues). It determines scores that prioritize constraints based on the rank assigned by respondents. The percent position formula for calculating the ranking is given by:

$$\text{Garrett's ranking} = 100 \times \frac{R_{ij} - 0.5}{N_j}$$

Where,

R_{ij} represents the rank given for the i^{th} constraint by the j^{th} individual, and

N_j represents the total number of constraints ranked by the j^{th} individual.

The calculated percent positions are then converted into Garrett scores using the Garrett ranking conversion table to find the mean score and final rank for each constraint.

RESULTS AND DISCUSSION

Demographics of respondents:

Table- 1 presents the demographic details of the respondents for the analysis. Among the respondents, 51.33% are male and 48.67% are female, it indicates a relatively balanced yet health-conscious market segment. The major 84.67% of consumer falls within 18-40 age group, it highlights a youth driven market consists of Millennials and Gen-Z.

The respondents are having high educational qualifications with 87.33% are holding at least undergraduate degrees. In terms of occupation, students with 36% and working professionals with 34.67% are heavily dominated.

Economically, the respondents are middle income segment with monthly income range of 30,000 to 50,000 up to 44%. The place of residence of respondents is resided in urban areas with 55.72%, it reflects the study will focus on Coimbatore city's administrative zones, while 27.14% belongs to semi-urban areas. Regarding family size, 58% of respondents live in households with 4 to 6 members, followed by 42% having up to 3 members. A previous study showed that younger, educated consumers tend to be engage more with functional food consumption due to lifestyle preferences and health-enhancing products [18].

Table 1. Demographic details of respondents

Characteristics	Category	n	%
Gender	Female	146	48.67
	Male	154	51.33
Age in years	18-24	136	45.33
	25-40	118	39.33
	41-60	28	9.33
	60 & above	18	6.00
Educational qualification	School	12	4.00
	Under graduate	158	52.67
	Postgraduate	104	34.67
	others	26	8.67
Occupation	Student	108	36.01
	Business	64	10.67
	Employed (Govt)	50	16.67
	Employed (Private)	54	18.01
	Home maker	46	15.33
	Others	10	3.33
Monthly Income level	< ₹30,000	34	11.33
	₹30k- ₹50k	132	44
	₹50k- 1lakh	86	28.67

	> ₹ 1 lakh	48	16
Number of family members	2	72	24.00
	3	54	18.00
	4	150	50.00
	5 & above	24	8.00

Furthermore, age and gender majorly significantly the motivations on functional foods, with young urban demographics driving demand for preventive health care products [19]. The prevalence of middle-income consumers in the market shows the importance of product affordability and a desire for health benefit of super seeds [20].

The Table-2 indicates that 69.79% of the respondents are highly aware of functional seeds, that means the respondents are known about various seeds and their nutritional benefits. Whereas 30.21% of respondents are no aware of functional seeds indicates that no knowledge about functional seeds available in the market. The previous study shows that nutritional education and awareness for the prophylactic benefits of functional foods significantly impact the consumer purchase intention [21]. Similar results were observed in emerging economies, where high awareness among consumers regarding lifestyle diseases significantly correlates with the acceptance and regular consumption of functional dietary supplements [22]. These findings aligned with findings that demonstrating the critical role of consumer attitudes and perceived healthiness in the adoption of functional foods [23].

The table- 3 indicates that Sesame seeds are preferred by most of respondents about 25.15%, its suggest that the consumers are deeply inclined in traditional functional seed over newly introduced seeds. Where 21.05% of respondents prefer chia seeds, it indicates the consumer prefer nutrient dense seeds with high bioactive value. The strong preference for both modern nutrient-dense chia seeds and culturally familiar seeds like sesame supports the findings of Ali et al. [20]. which shows a growing consumer preference for enhancing food products that offers health benefits in the urban Indian markets. Consumers are increasingly preferring over functional agricultural products with high bioactive values in recent days, explaining the dietary shift toward traditional remedies and modern functional foods like chia and flax seeds [4,24].

The table-4 shows 55.29% of respondents prefer to consume the raw form of functional seeds particularly chia seeds and sabja (basil) seeds because soaking of these seeds activates their mucilaginous fibre which significantly improves gut health and digestive efficiency. Whereas 27.65% of consumers prefer roasted form of functional seeds because of sensory profile-like taste and crunchiness found in sesame, pumpkin and sunflower seeds.

The table-5 indicates 68.02% of respondents buying functional seeds from supermarkets and hypermarkets, followed by e-commerce with 20.93%. Most of respondents prefer organized retail shops because of product authenticity, hygienic packaging and availability of vast variety of seed brands. This suggests that trust, quality assurance and brand visibility are most important factors in purchase decision for health-oriented foods. The increasing preference for supermarkets and organized retail outlets, demonstrating that changes in retail landscapes and the availability of diverse, authenticated brand significantly influences consumer buying decision in Indian market. Trust, product authenticity and organic certification are important when purchasing premium health-oriented foods, it driving consumers towards modern hypermarkets rather than unorganized local stores.

Table 2. The level of awareness

Awareness	n	%
Aware	300	69.79
No aware	130	30.21

Table 3. Preferred types of seeds

Type of seeds	n	%
Sesame seeds	172	25.15
Chia seeds	144	21.05
Pumpkin seeds	104	15.20
Sabja (Basil) seeds	98	14.33
Flax seeds	64	9.36
Watermelon	54	7.89
Sunflower seeds	48	7.02

Table 4. Preferred form of seeds

Form of seeds	n	%
Raw	188	55.29
Roasted	94	27.65

Powdered	34	10.00
Flavored	24	7.06

Table 5. Preferred place of purchase

Form of seeds	n	%
Supermarkets and Hypermarkets	234	68.02
E-commerce	72	20.93
Organic stores	38	11.05

The table-6 shows 72.82% respondents prefer zip-lock pouches as a packaging material because of their moisture resistance, affordability and ability to maintain product freshness after opening the packet. Whereas 17.95 % prefers PET/ Glass jars for their durability, premium appeal and ease of storage.

Regarding volume of purchase, the table-7 indicates the most preferred pack size is 250grams with 48.00% of sample respondents due to fresh and avoid rancidity of seeds and the 500-gram packet closely followed by 32.67% of respondents. These findings show that consumer tends towards the bulk purchasing of functional see consciously prefer moderate, functional purchase volumes over bulk buying to maximize product shelf life." Consistent with modern dietary studies, these findings indicate that consumers are consciously integrating super seeds into their daily diet in moderate, portion-controlled amounts to manage body weight and preventative health, rather than engaging in bulk consumption [25]. The motivation to consumes functional seeds in specific functional doses reflects the broader global perspective on functional food science, which emphasizes daily, sustained physiological benefits [26,27].

The table-8 shows the frequency of purchase of functional seeds, the data shows that 48.67% of respondents prefer to buy monthly twice, which this trend aligns with standard urban grocery shopping cycle in Coimbatore city. Whereas 18.67% of respondents prefer to purchase weekly basis, which often correlates with those purchasing pack sizes like 100g or 250g pouches to ensure maximum freshness and prevents from rancidity of natural oils presents in seeds like sesame and flax seeds. Only a small fraction 15.33% of respondents prefer to buy at most once a month.

The table-9 illustrates that monthly expenditure allocated by consumers specifically for the functional seeds. The 42.67% of respondents prefer to spend ₹201-₹500 per month for functional seeds. The spending pattern indicates the dedicated, cautious and dietary budget allocation of middle-income consumers. Meanwhile 39.33% of respondents prefer to spends between ₹501 and ₹1000, reflects the premium segment of consumers that likely to spend on wide variety of exotic seeds like chia and pumpkin seeds.

The consumption pattern indicates the daily routine of respondents to include the functional seeds in their dietary lifestyle. The table-10 shows that 58.67% of the respondents prefer to consume them in the early morning as empty stomach to maximize the digestive benefits. The data reflects a highly disciplined consumption pattern driven by preventative health routines rather than casual snacking or impulse buying.

As detailed in table-11, there is 34.40% of respondents utilize the seeds primarily for weight management and digestive health to capitalize the high dietary fibre content. Another significant motivation is skin and hair health by 32.00% due to rich in vit-E and omega fatty acids. And another notable segment of motivation is general wellness and immunity boosting with 18.40% which aligns the preventive care factor identified in the factor analysis. This consumption pattern proves that the modern urban consumer views super seeds not just as food, but as a specialized functional supplement.

Table 6. Preferred packaging types

Packaging material	n	%
Plastic zip lock pouch	284	72.82
Glass or PET	70	17.95
Tin	36	9.23

Table 7. Preferred package quantity

Quantity	n	%
100g	46	15.33
250g	144	48.00
500g	98	32.66
1kg or more	12	4.00

Table 8. Frequency of purchase

Frequency of purchase	n	%
Monthly once	46	15.33
Monthly Twice	146	48.67

Weekly once	56	18.67
Occasional	52	17.33

Table 9. Spending pattern

Spending pattern	n	%
< ₹ 200	36	12.00
₹ 200- ₹ 500	128	42.67
₹ 501- ₹ 1000	118	39.33
> ₹ 1000	18	6.00

Table 10. Preferred time of consumption

Spending pattern	n	%
Early morning	176	58.67
With evening snack	58	19.33
With dinner	24	8.00
No preferred time	42	14.00

Table 11. Purpose of consumption

Purpose of consumption	n	%
Weight Management	172	34.40
Skin and Hair	160	32.00
Immunity & General Health	92	18.40
Energy Boosting & Healthy snacking	76	15.20

Key influencing factors in consumer buying behaviour

To determine the underlying dimensions that influence the consumer buying behaviour on functional seeds, the factor analysis technique is used. The variables considered for this study included taste, price, health benefits, macronutrient profile, disease management, brand trust, organic certification, texture of seeds, packaging of products, culinary adaptability among consumers, peer influence and dietary lifestyle. The Cronbach's alpha is a statistical measure to identify internal consistency or reliability of a set of scale particularly those measured using the Likert Scale. The Cronbach's alpha value lies between 0 to 1, the high value shows greater internal consistency. A common rule of thumb is 0.90, above 0.90 indicates that excellent reliability.

The values range from 0.80 to 0.89 are considered as good, the values range from 0.70-0.79 considered as acceptable, the values range from 0.60 to 0.69 are seen as questionable and the values 0.60 or below are typically poor.

Table 12. Result of kaiser-Meyer-Olkin (KMO) and Bartlett's test

KMO and Bartlett's Test		
KMO measure of sampling adequacy	0.875	
Bartlett's test of sphericity	Approximate chi-square	906.603
	df	105
	significance	0.001

Table 13. Eigenvalues and extracted sum of scores of components

Components	Initial Eigenvalues			Extended sums of scores leadings		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	6.183	41.22	41.22	3.553	23.689	23.289
2	1.944	12.961	12.961	3.144	20.959	44.648
3	1.055	7.035	7.035	2.444	16.293	60.94

4	1.01	6.735	6.735	1.051	7.01	67.95
5	0.768	5.117	5.117			
6	0.69	4.597	4.597			
7	0.611	4.075	4.075			
8	0.499	3.324	3.324			
9	0.418	2.784	2.784			
10	0.404	2.691	2.691			
11	0.387	2.583	2.583			
12	0.305	2.032	2.032			
13	0.297	1.981	1.981			
14	0.226	1.509	41.22			
15	0.203	1.356	12.961			

The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity are significant tools for assessing the appropriateness of factor analysis in research. The tests evaluate sampling adequacy and variables correlations, respectively the KMO values above 0.6 and Bartlett's test shows suitability of data reduction. The table-12 indicates that KMO values of sampling adequacy is 0.875. Being significantly greater than the 0.6 threshold, this demonstrates that the data was highly adequate for factor analysis. The Bartlett's test of sphericity has chi-square value of 906.603, which is significant at the 0.001 level. Hence, it confirms the correlations among the selected variables in the analysis.

The principal component analysis (PCA) was used as an extraction method [17]. The number of components to retain was determined by Kaiser criterion (Eigenvalue >1) [28]. Based on Table-14, four primary components were retained for further analysis as the Eigenvalue exceeds the threshold.

This decision was further supported by the scree plot, which indicated a noticeable decline in the Eigenvalues after the third component, confirming the statistical suitability of retaining three factors.

The table-13 shows 67.95% of cumulative variance was explained by first four factors, it indicates that the four components were formed with Eigenvalues of 6.183, 1.944, 1.055 and 1.010 corresponds to variance percentages of 41.22%, 12.96%, 7.03% and 6.73% respectively. To improve the clarity of factor structure, varimax rotation technique that assumes independence among factors was applied. The values of 0.5 or above for factor were taken into consideration.

Table 14. Rotated component matrix of factor analysis

Rotated Component matrix	Components			
	1	2	3	4
Visual Transparency	0.787			
Health Claim Trust	0.798			
Weight Management	0.782			
Price Value	0.49			
Family / Peer Influence	0.584			
Expert Advice	0.597			
Taste & Texture		0.796		
Price Value		0.646		
Promotions		0.547		
Ease of use		0.681		
Digital Influence		0.719		
Energy Maintenance			0.826	
Nutrient Awareness			0.813	
Natural/Pure			0.701	
Disease prevention				0.951

Each component that was extracted was provided with the specific nomenclature based on grouping of its underlying variables. The table-15 indicates that the first component, named as Information and social influence factor, it explains the highest variance and comprises variables related to visual transparency, health claim trust, weight management, price value, family/peer influence, and expert advice. The next component is Product Experience & Marketing factor, it explained taste & texture, promotions, ease of use, digital influence, and price value. And the third Nutritional Credibility factor, it comprises energy maintenance, nutrient awareness, and natural/pure attributes. Finally, the fourth component is the Prevention Care, which is primarily driven by disease prevention.

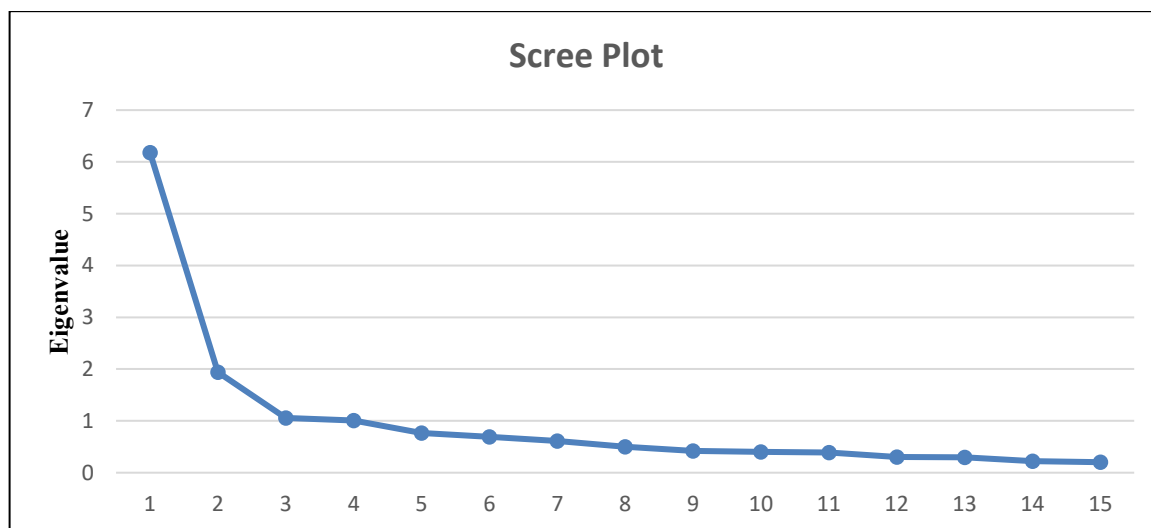


Fig-1, Scree plot of eigenvalues for the extracted components.

Table 15. Components of factor analysis

Components	Factors	Variance %
Informational & social influence	Visual Transparency	23.68%
	Health Claim Trust	
	Weight Management	
	Price Value	
	Family / Peer Influence	
	Expert Advice	
Product Experience & Marketing	Taste & Texture	20.95%
	Price Value	
	Promotions	
	Ease of use	
	Digital Influence	
Nutritional Credibility	Energy Maintenance	16.29%
	Nutrient Awareness	
	Natural/Pure	
Prevention care	Disease prevention	7.01%

Constraints faced by the consumer to purchase functional seeds

The variables analysed using Garrett's ranking technique are high price, inconsistent habit, lack of availability, taste & texture preferences, lack of awareness, lack of culinary knowledge, storage issues, and packaging issues. Table 16 indicates that the highest ranked constraint was high price, with a Garrett mean score (GMS) of 61.61. It shows that despite rising health awareness, economic affordability acts as the primary barrier to the regular consumption of premium functional seeds.

This extreme price sensitivity is a consistent trend across the functional food sector in Coimbatore; recent conjoint analysis studies on plant-based dairy alternatives in the same region also identified price as the single most dominant factor influencing consumer choice [29]. Inconsistent habit secured the second-highest rank with 52.65 GMS; it indicates that the consumers often struggle to integrate these seeds permanently into their daily routines.

Lack of availability secured the third rank with 50.89 GMS, it shows that while hypermarkets stock these products, neighborhood accessibility remains a challenge for the consumer who buys frequently. Taste/Texture preference secure fourth rank (50.36 GMS), shows consumers experience sensory reluctance towards unfamiliar textures of seeds when trying to adapt them to traditional palate.

Lack of awareness ranked fifth (47.62 GMS). Lack of culinary knowledge was another significant barrier; it stands at the sixth rank with 40.08 GMS. Unlike traditional staple grains, modern super seeds like chia and flax require different preparation methods (such as soaking or grinding) for optimal nutrient absorption, and consumers hesitate to integrate them into daily diets. Storage concerns secure seventh rank (38.04 GMS), highlighting preservation difficulties at the household level. Lastly, packaging issues ranked eighth with 30.79 GMS. Addressing these constraints through competitive pricing, value-added formulations, and educational marketing can help expand the market share of functional seeds.

Table-16. Constraints ranked after Garrett ranking technique

S. No.	Constraints	Garrett mean score	Rank
1	High Price	61.61	I

2	Inconsistent Habit	52.65	II
3	Lack of availability	50.89	III
4	Taste / Texture preference	50.36	IV
5	Lack of awareness	47.62	V
6	Lack of culinary knowledge	40.08	VI
7	Storage issues	38.04	VII
8	Packaging issues	30.79	VIII

CONCLUSION

The improving awareness of preventive health care has influenced the agribusiness and food processing sector to innovation, nutrient dense products to meet evolving consumer demands. This research indicates significant trends and challenges in the functional food market; it tends to manufacturers and stakeholders should focus on their product innovation and affordability to maximize the customer satisfaction. The factor influencing the purchase decision of consumers play a significant role in this study. It includes biochemical profile of seeds, disease management, taste and economic viability. According to this study, core factors such as Prevention Care, Nutritional Integrity, and Product Experience play a crucial role in influencing the final purchasing decision. Based on the study, it concludes that urban consumers are exceptionally health conscious, highly price aware and hesitate to unfamiliar preparation methods. The primary constraints faced by consumers are high costs and lack of culinary knowledge, it is key for agribusiness firms to remain competitive market share in functional food sector.

To improve the supply chain efficiency of functional seed by several policies and market recommendation. The manufacturer should prioritize the value-added product innovations like seed integrated ready-to-cook flours and roasted snack mixes should overcome the consumers lack of culinary knowledge barrier [30]. To address the primary constraints of high price, policymakers and agricultural extension systems should improves diversification among local farmers in Tamil Nadu. The cultivation of sesame, pumpkin and basil (sabja) seeds which are high demand and climate-resilient which enhances supply chain costa and improves import reliance and consumer trust. This study fills the critical gap by providing a detailed analysis of consumer buying behaviour towards functional seeds in Coimbatore city. This finding aims to guide FMCG markets, agribusiness firms and policymakers to enhance market dynamics and formulating effective, localized nutritional strategies.

Author Contributions

Selvabharathi V ¹	:	Conceptualization, methodology, data collection, analysis, interpretation, manuscript preparation.
C Muralidharan ^{2*}	:	Conceptual development, supervision, project administration, critical revision.
N Deepa ³	:	Validation, supervision, manuscript review.
M Shanthasheela ⁴	:	Validation, manuscript review.
Vijayabhama.M manickam ⁵	:	Statistical analysis, data interpretation, manuscript review.
Shuwetha R ⁶	:	Methodological guidance, manuscript review.

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Conflict of Interest

The authors declare no conflicts of interest.

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