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Market analysis and consumer preferences for major millet based functional foods in Hyderabad, Telangana

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Abstract

Millet has re-entered urban Indian diets as “nutri-cereals,” but how the businesses that sell millet-based functional foods segment their markets, and how consumers actually choose among ready-to-eat, ready-to-cook, ready-to-drink and raw/whole-grain formats, has not been documented for Hyderabad. This study surveyed 20 millet-based functional food businesses (manufacturers, retailers, supermarkets, distributors and organic stores, drawn equally from Hyderabad's five GHMC zones) and 100 consumers (drawn equally from the same five zones) using separate structured schedules administered between April and July 2026. Businesses were analysed by percentage analysis; consumers were additionally analysed by arithmetic mean, Garrett's ranking technique, five-point Likert scaling and the chi-square test of independence. Families were the primary target segment for 60.0 per cent of businesses, yet health-conscious consumers, the primary target of only 10.0 per cent, generated the highest revenue share for 35.0 per cent of businesses, and word of mouth (55.0%) outperformed every other promotional method by more than double. Among consumers, awareness was highest for raw/whole-grain products (83.0%), but actual preference was highest for ready-to-eat products (94.0%), followed by ready-to-drink (81.0%) and ready-to-cook (78.0%) products, a reversal that places convenience ahead of familiarity. Health benefits ranked first on both a direct importance rating (mean 4.66 of 5) and Garrett's ranking technique (score 62.05), while price displaced taste to second place once the forced-choice Garrett method was applied (52.81 against 50.37). Age group and monthly household income were each significantly associated with preference for three of the four product categories ($p < 0.05$), gender with none, and a separate chi-square test confirmed that consumers' stated willingness to pay more for health benefits was reflected in their actual expenditure ($\chi^2 = 22.805$, $df = 12$, $p = 0.029$). High price (48.0%) and limited availability in nearby shops (33.0%) were the two leading barriers to purchase. The findings indicate that Hyderabad's millet-based functional food market is converging on convenience-oriented, health-positioned products ahead of traditional raw grain, and that age- and income-targeted, relationship-based promotion is likely to outperform generic advertising or price-led strategies alone.

Keywords: Millets, functional foods, market segmentation, consumer preference, Garrett ranking, Hyderabad

Introduction

Millets, the small-seeded cereal grasses that include pearl millet (bajra), sorghum (jowar), finger millet (ragi) and a group of minor millets, have been reclassified by the Indian Council of Agricultural Research as “nutri-cereals” on account of their dietary fibre, mineral density and low glycaemic index (FAO/WHO, 2020). India produced about 180.15 lakh tonnes of millets in 2024–25, roughly 38–40 per cent of world output, retaining its position as the largest producer globally (MoAFW, 2025; APEDA, 2025). The push received further momentum from the International Year of Millets 2023, proposed by the Government of India and endorsed by the FAO (FAO, 2023), which combined with a documented rise in diet-related disease, an estimated 101 million diabetics and 136 million pre-diabetics nationally (ICMR, 2023), to redirect consumer attention toward millets

as a preventive food. Government incentive schemes for millet processing and value addition have accompanied this shift; sales under the Production Linked Incentive Scheme for Millet-Based Products rose from about ₹35 crore in 2020–21 to ₹814 crore in 2024–25 (PIB, 2025).

Hyderabad, with its dense supermarket and organic-store network, its Rythu Bazaars and its health-conscious urban population, has become one of south India's principal markets for millet-based ready-to-eat, ready-to-cook, ready-to-drink and raw/whole-grain products. Prior Hyderabad-focused work has established that health motivates roughly half of local millet consumers (Sangappa *et al.*, 2023)^[13] and that social media and word of mouth both play a role in awareness-building (Alekhya and Shravanthi, 2019)^[1]. Elsewhere, income, price sensitivity and packaging have been shown to condition functional-food acceptance more

broadly (Sharma *et al.*, 2022; Baker *et al.*, 2022) ^[14, 3], age-based segmentation has separated traditional from convenience-seeking consumers (Devi *et al.*, 2021) ^[5], and cluster-based targeting of health-seeker segments has outperformed generic marketing in other Indian cities (Gupta and Meena, 2021) ^[8]. What these studies have not done is examine, within one city and using one instrument, both sides of the same transaction: how businesses segment and position millet-based functional foods, and how the consumers on the receiving end of those strategies actually behave. Reddy and Rao (2023) ^[12] documented a 22 per cent post-IYoM rise in Hyderabad retail availability but also a repurchase problem among first-time buyers, precisely the kind of business–consumer disconnect that a paired survey can help explain. This study therefore surveys millet-based functional food businesses and consumers in Hyderabad side by side, and asks three questions. First, how do businesses in this market segment and target their customers, and how do they position and price their products? Second, which product categories, ready-to-eat, ready-to-cook, ready-to-drink or raw/whole-grain, do consumers actually prefer, and what factors drive that preference? Third, do socio-demographic and psychographic characteristics significantly shape consumption and purchase decisions, and what does that imply for promotion? The null hypothesis tested is that socio-demographic and psychographic characteristics of consumers do not significantly influence the consumption and purchase decisions of major millet-based functional foods in Hyderabad; the alternative hypothesis is that they do.

Materials and Methods

Study area: Hyderabad city, Telangana, was purposively selected for the study on account of its well-developed retail infrastructure of supermarkets, organic food stores, millet cafés and weekly Rythu Bazaars, and its diverse consumer base across income, occupation and education groups. For sampling purposes the city was divided into five analytical zones, Central, North, East, West and South, coinciding with the jurisdiction of the Greater Hyderabad Municipal Corporation (Census of India, 2011). **Sample:** Purposive sampling was used to select 20 business respondents, manufacturers/processors, retail stores, supermarkets, distributors and organic stores, four from each of the five zones. A further purposive sample of 100 consumers, twenty per zone, was drawn from supermarkets, organic stores, millet cafés, kirana shops and weekly markets; only consumers with prior exposure to millet-based functional foods were included, so that all respondents could speak to the study's objectives from direct experience. The study was carried out between April and July 2026.

Data collection: Primary data were collected using two separate pre-tested structured questionnaires. The business schedule recorded firm profile, target-customer segment, segmentation criterion, revenue-contributing segment, product positioning, pricing strategy, sales channel, promotional method, factors influencing customer purchase and repeat purchase, category demand, and ratings of marketing effectiveness and future market potential. The consumer schedule recorded socio-demographic characteristics, awareness and purchase status, product-category preference, expenditure and willingness to pay, ranking of purchase factors, and Likert-scale attitudinal statements. Secondary data on millet production, government schemes and market size were drawn from the Ministry of Agriculture and Farmers Welfare, APEDA, FAO, NITI Aayog, ICAR and the Press Information Bureau.

Tools of analysis: Percentage analysis and arithmetic mean were used to summarise the socio-demographic and business profile, awareness levels and Likert-scale ratings. Garrett's ranking technique was used to convert respondents' rankings of six purchase factors, health benefits, price, taste and flavour, brand trust, product availability, and ease of preparation, into percent positions using the formula Percent Position = $100 \times (R_{ij} - 0.5) / N_j$, where R_{ij} is the rank given to the i -th factor by the j -th respondent and N_j is the number of factors ranked by that respondent; percent positions were converted to scores using Garrett's conversion table and averaged for each factor. Consumer attitudes were measured on a five-point Likert scale (Strongly Agree = 5 to Strongly Disagree = 1). The chi-square test of independence, $\chi^2 = \sum [(O - E)^2 / E]$, with expected frequency = (row total $\times$ column total) / grand total and degrees of freedom = $(r - 1)(c - 1)$, was used to test association between socio-demographic characteristics (gender, age group, educational qualification, occupation and monthly household income) and consumer preference, expenditure and retail-channel choice, at the five per cent level of significance.

Results and Discussion

Market Segmentation and Targeting Strategies of Businesses

The 20 businesses surveyed, drawn equally from the five GHMC zones and equally split among manufacturers, retail stores, supermarkets, distributors and organic stores, dealt predominantly in raw/whole-grain products (85.0%), followed by ready-to-eat (70.0%), ready-to-cook (60.0%) and ready-to-drink (30.0%) products; 35.0 per cent had been operating for one to three years and a further 50.0 per cent for four years or more, indicating a market that mixes recent entrants with established players (Table 1).

Table 1: Profile of surveyed millet-based functional food businesses in Hyderabad (n = 20)

Particulars	No. of businesses	Per cent
GHMC Zone		
North Zone	4	20.0
South Zone	4	20.0
East Zone	4	20.0
West Zone	4	20.0
Central Zone	4	20.0
Type of Business		
Manufacturer	4	20.0
Retail Store	4	20.0
Supermarket	4	20.0
Distributor	4	20.0
Organic Store	4	20.0

Duration of Operation		
Below 1 year	3	15.0
1–3 years	7	35.0
4–6 years	5	25.0
Above 6 years	5	25.0
Major Product Categories Handled (multiple response)		
Raw / Whole Grain Products	17	85.0
Ready-to-Eat Products	14	70.0
Ready-to-Cook Products	12	60.0
Ready-to-Drink Products	6	30.0

Source: Primary data

Families were the primary target customer segment for 60.0 per cent of businesses and the leading revenue-contributing segment for 45.0 per cent, confirming that household purchasing anchors this market. Health-conscious consumers were the primary target for only 10.0 per cent of businesses, yet this smaller segment contributed the highest revenue share for 35.0 per cent, the second-largest share after

families, indicating that health-focused consumers are disproportionately valuable relative to the marketing attention they currently receive. Half of the businesses (50.0%) segmented customers primarily by a health-conscious lifestyle, ahead of age group (30.0%), location (15.0%) and income (5.0%) (Table 2).

Table 2: Market segmentation, targeting, positioning and pricing strategy adopted by businesses (n = 20)

Particulars	No. of businesses	Per cent
Primary Target Customer Segment		
Families	12	60.0
Working Professionals	4	20.0
Students and Youth	2	10.0
Health-conscious Consumers	2	10.0
Segmentation Criterion Used		
Health-conscious Lifestyle	10	50.0
Age Group	6	30.0
Location	3	15.0
Income Level	1	5.0
Customer Segment Contributing Highest Revenue		
Families	9	45.0
Health-conscious Consumers	7	35.0
Students and Youth	2	10.0
Working Professionals	2	10.0
Market Positioning of Products		
Traditional Millet Foods	7	35.0
Health & Wellness Products	6	30.0
Convenience Foods	6	30.0
Affordable Everyday Foods	1	5.0
Pricing Strategy Adopted		
Moderate / Competitive Pricing	10	50.0
Value-based (health premium) Pricing	7	35.0
Premium Pricing	1	5.0
Other	2	10.0

Source: Primary data

Products were positioned almost evenly as traditional millet foods (35.0%), health and wellness products (30.0%) and convenience foods (30.0%), and half of all businesses (50.0%) relied on moderate or competitive pricing rather than a premium strategy, which only 5.0 per cent adopted. Wholesalers were the most important sales channel (40.0%), ahead of organic stores (30.0%), local grocery stores (20.0%) and supermarkets (10.0%). Word of mouth was

overwhelmingly the most effective promotional method (55.0%), more than double the share of in-store promotion (25.0%) or exhibitions (20.0%), and health awareness programmes and events (35.0%) were the leading route to reach target customers, ahead of distributors and wholesalers (30.0%). This pattern, relationship-based communication outperforming mass-media promotion, recurs on the consumer side of the survey and is discussed further below (Table 3).

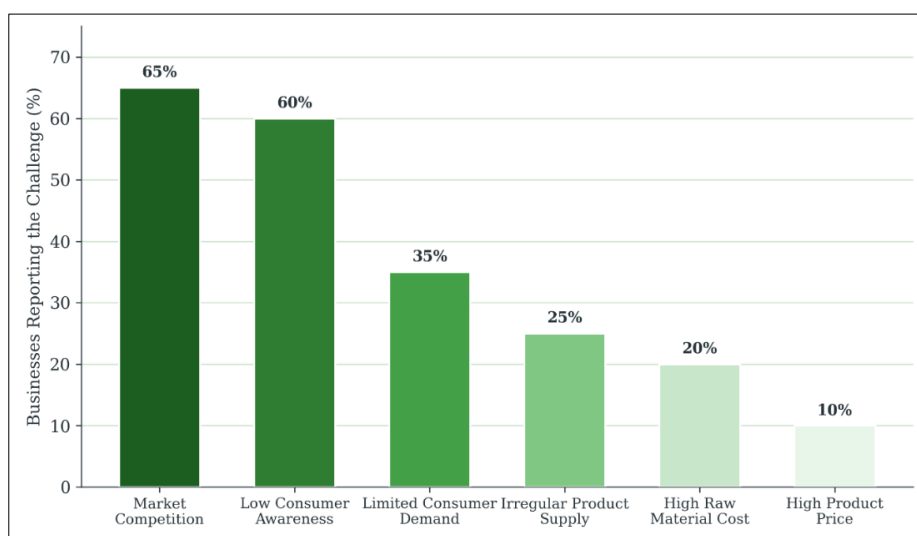
Table 3: Sales channel, promotion, purchase-influencing factors and business challenges (n = 20)

Particulars	No. of businesses	Per cent
Most Important Sales Channel		
Wholesalers	8	40.0
Organic Stores	6	30.0
Local Grocery Stores	4	20.0
Supermarkets	2	10.0
Most Effective Promotional Method		
Word of Mouth	11	55.0
In-store Promotion	5	25.0
Exhibitions	4	20.0
Factors Influencing Customer Purchase (multiple response)		
Health Benefits	15	75.0
Taste	14	70.0
Availability	14	70.0
Price	13	65.0
Brand Reputation	10	50.0
Packaging	5	25.0
Factor Most Influencing Repeat Purchase		
Health Benefits	9	45.0
Availability	6	30.0
Price	3	15.0
Taste	2	10.0
Major Business Challenges (multiple response)		
Market Competition	13	65.0
Low Consumer Awareness	12	60.0
Limited Consumer Demand	7	35.0
Irregular Product Supply	5	25.0
High Raw Material Cost	4	20.0
High Product Price	2	10.0

Source: Primary data

Health benefits were the factor most often cited as influencing customer purchase (75.0%), ahead of taste and availability (70.0% each) and price (65.0%), and health benefits again led as the single factor most responsible for repeat purchase (45.0%), ahead of availability (30.0%). Market competition (65.0%) and low consumer awareness

(60.0%) were the two most widely reported business challenges, and 60.0 per cent of businesses identified introducing new millet-based products as their highest-priority strategy for future growth, well ahead of expanding distribution (15.0%), raising awareness (15.0%) or strengthening brand positioning (10.0%) (Figure 1).

**Fig 1:** Major challenges faced by millet-based functional food businesses in Hyderabad

Ready-to-cook products were reported to carry the highest customer demand by more than half the businesses (55.0%), ahead of ready-to-eat (25.0%) and raw/whole-grain products (20.0%), even though ready-to-cook products were stocked

by only 60.0 per cent of the businesses surveyed, a smaller share than raw/whole-grain (85.0%) or ready-to-eat (70.0%) products. This points to a supply–demand gap that later-entering or diversifying businesses could exploit. Businesses

rated both the effectiveness of their current marketing strategy (mean 4.15 of 5) and the future market potential of millet-based functional foods (mean 4.20 of 5) positively, with no business rating either aspect below 4, reflecting strong confidence in continued market growth.

Socio-Demographic Profile and Purchase Behaviour of Consumers

The 100 consumers surveyed, twenty from each of the five

GHMC zones, were 58.0 per cent male and 42.0 per cent female. Almost two-thirds (64.0%) fell in the 26–45 year age range, and the sample was well educated, 51.0 per cent graduates and a further 16.0 per cent postgraduates. Students (34.0%) and salaried employees (32.0%) were the two largest occupational groups, and 75.0 per cent of respondents reported a monthly household income between ₹25,001 and ₹75,000, indicating a predominantly middle-income sample (Table 4).

Table 4: Socio-demographic profile of consumer respondents (n = 100)

Particulars	No. of respondents	Per cent
Gender		
Male	58	58.0
Female	42	42.0
Age Group		
Below 18 years	3	3.0
18–25 years	24	24.0
26–35 years	38	38.0
36–45 years	26	26.0
46–55 years	8	8.0
Above 55 years	1	1.0
Educational Qualification		
Below Secondary	4	4.0
Secondary / Higher Secondary	17	17.0
Diploma / ITI	12	12.0
Graduate	51	51.0
Post-Graduate	16	16.0
Occupation		
Student	34	34.0
Salaried Employee	32	32.0
Homemaker	17	17.0
Self-Employed / Business Owner	15	15.0
Other	2	2.0
Monthly Household Income (INR)		
Below ₹ 25,000	23	23.0
₹ 25,001 – 50,000	46	46.0
₹ 50,001 – 75,000	29	29.0
Above ₹ 75,000	2	2.0
GHMC Zone of Residence		
East / South / West / North / Central Zone	20	20.0 each

Source: Primary data

All 100 respondents (100.0%) reported that they were aware of, and had purchased, millet-based functional foods, and 79.0 per cent consumed a mix of different millets rather than a single type. Awareness was highest for raw/whole-grain products (83.0%) and ready-to-eat products (75.0%), and markedly lower for ready-to-cook (37.0%) and ready-to-drink (29.0%) products, indicating that processed categories still have room to build awareness. Friends and family were the first source of information for 63.0 per cent of respondents, more than four times the share of the next most common source, health professionals (13.0%), a pattern that

mirrors the primacy of word of mouth reported by businesses (Table 3). Purchase frequency was fairly evenly split, with 31.0 per cent buying daily, 28.0 per cent weekly and 36.0 per cent occasionally; breakfast (53.0%) and snacks or tea-time (43.0%) were by far the most common consumption occasions. A large majority (69.0%) reported that their purchase was motivated by a specific health condition, consistent with the 32.0 per cent who reported managing a health problem such as diabetes or blood pressure through diet, and the 23.0 per cent who followed a fitness-focused diet (Table 5).

Table 5: Awareness, information source, purchase frequency and consumption context (n = 100)

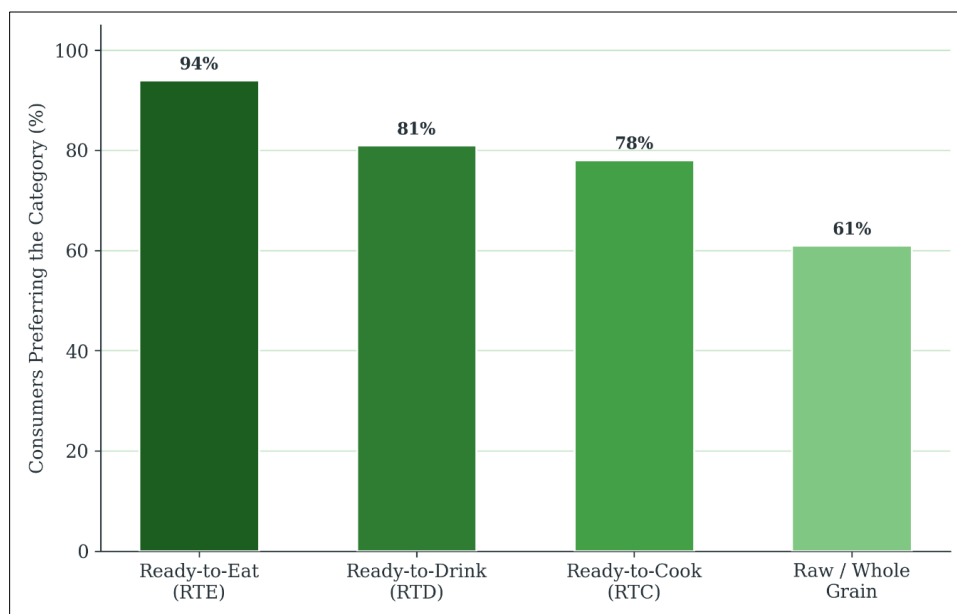
Particulars	No. of respondents	Per cent
Product Categories Aware Of (multiple response)		
Raw / Whole Grain	83	83.0
Ready-to-Eat (RTE)	75	75.0
Ready-to-Cook (RTC)	37	37.0
Ready-to-Drink (RTD)	29	29.0
First Source of Information		
Friends or Family	63	63.0
Health Professionals	13	13.0
Social Media / Internet	8	8.0
Stores / Supermarkets / Rythu Bazaar	8	8.0
Advertisements	7	7.0
Other	1	1.0
Purchase Frequency		
Daily	31	31.0
Weekly	28	28.0
Occasionally	36	36.0
Rarely	5	5.0
Meal Occasion for Consumption (multiple response)		
Breakfast	53	53.0
Snacks / Tea-time	43	43.0
No fixed occasion	14	14.0
Dinner	10	10.0
Lunch	6	6.0
Purchase Motivated by a Specific Health Condition		
Yes	69	69.0
No	31	31.0
Product Category		
Ready-to-Eat (RTE) e.g., Biscuits, Cookies, Snacks	94	94.0
Ready-to-Drink (RTD) e.g., Ragi Malt, Health Drinks	81	81.0
Ready-to-Cook (RTC) e.g., Noodles, Pasta, Idli/Dosa Mix	78	78.0
Raw / Whole Grain - e.g., Ragi, Bajra, Jowar Grain/Flour	61	61.0

Source: Primary data

Consumer Preference for Product Categories, Expenditure and Purchase Behaviour

Ready-to-eat products were preferred by the large majority of consumers (94.0%), ahead of ready-to-drink (81.0%), ready-to-cook (78.0%) and raw/whole-grain products (61.0%), which recorded the lowest preference of the four categories despite having the highest awareness (Table 5, Figure 2). This

reversal, awareness highest for the traditional raw category but preference highest for the most convenient category, indicates that familiarity with millets is no longer the binding constraint on this market; convenience and ready-made formats now carry the greater pull, a conclusion in line with the age-based convenience-seeking documented by Devi *et al.* (2021) among younger urban consumers.

**Fig 2:** Consumer preference across major millet-based functional food categories

Actual monthly expenditure on millet products was concentrated in the ₹501–1,000 range (49.0%), but the amount consumers considered acceptable to spend was higher, with the largest share (41.0%) willing to spend ₹1,001–2,000. Consumers willing to spend above ₹1,000 (46.0%) considerably outnumbered those who actually did so (14.0%), indicating unrealised demand that businesses could capture through wider availability rather than price competition alone. Supermarkets or malls (48.0%) and local

grocery shops (44.0%) were the two leading retail channels, ahead of organic or health stores (28.0%) and online platforms (8.0%). Brand loyalty was moderate: only 20.0 per cent of consumers always preferred the same brand, while the remaining 80.0 per cent were open to trying different brands. Repurchase intention was strongly positive, with a mean score of 4.08 of 5, and 80.0 per cent of respondents rated their intention to repurchase at 4 or 5 (Table 6).

Table 6: Expenditure, willingness to pay and purchase behaviour of consumers (n = 100)

Particulars	No. of respondents	Per cent
Actual Monthly Expenditure on Millet Products (INR)		
Below ₹ 500	37	37.0
₹ 501 – 1,000	49	49.0
₹ 1,001 – 2,000	8	8.0
Above ₹ 2,000	6	6.0
Acceptable Monthly Spending, All Millet Products (INR)		
Below ₹ 500	15	15.0
₹ 501 – 1,000	39	39.0
₹ 1,001 – 2,000	41	41.0
Above ₹ 2,000	5	5.0
Preferred Retail Channel (multiple response)		
Supermarkets / Malls	48	48.0
Local Grocery Shops	44	44.0
Organic or Health Stores	28	28.0
Buy Wherever Available	15	15.0
Online Apps / Websites	8	8.0
Millet Cafés / Specialty Stores	3	3.0
Brand Preference		
Sometimes Prefer the Same Brand	28	28.0
No Brand Preference	27	27.0
Try Different Brands	25	25.0
Always Prefer the Same Brand	20	20.0
Repurchase Intention (5-point scale; mean = 4.08)		
Rating 5 (Highest)	34	34.0
Rating 4	46	46.0
Rating 3	15	15.0
Rating 2	4	4.0
Rating 1 (Lowest)	1	1.0

Source: Primary data

Health benefits received both the highest mean importance rating (4.66 of 5) and the highest mean Garrett score (62.05), ranking first under both methods and confirming health as the primary driver of preference. The two methods diverged for the remaining factors: taste and flavour scored second-highest on the direct rating (3.99) but only third under Garrett's forced-choice ranking (50.37), while price scored lower on the direct rating (3.51) but rose to second under

Garrett's method (52.81). This divergence suggests that although consumers rate taste as important in isolation, price weighs more heavily once they are forced to choose between competing factors, a distinction the direct-rating method alone would have missed. Ease of preparation or convenience ranked last under both methods, indicating that preparation effort is not a major purchase barrier in this market (Table 7, Figure 3).

Table 7: Mean importance rating and Garrett ranking of factors influencing consumer preference (n = 100)

Factor	Mean Importance Rating (of 5)	Mean Garrett Score	Garrett Rank
Health benefits	4.66	62.05	I
Price	3.51	52.81	II
Taste and flavour	3.99	50.37	III
Brand trust	3.55	47.94	IV
Product availability	3.63	47.61	V
Ease of preparation / convenience	3.75	39.23	VI

Source: Primary data

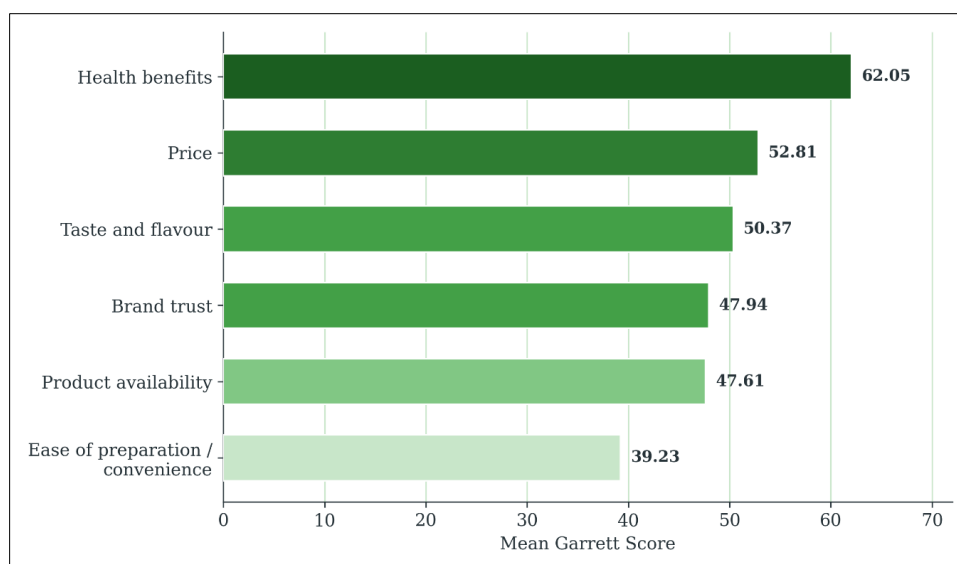


Fig 3: Garrett ranking of factors influencing consumer purchase decisions

Influence of Socio-Demographic Factors on Consumer Preference: Testing the Hypothesis

The influence of gender, age group, educational qualification, occupation and monthly household income on preference for the four product categories, and on expenditure and retail-channel choice, was tested by the chi-square test of

independence at the five per cent level (Table 8). Across the twenty product-category associations tested, the null hypothesis was rejected in nine cases and accepted in eleven, indicating that socio-demographic influence on this market is real but selective rather than uniform.

Table 8: Chi-square tests of association between socio-demographic/psychographic factors and consumer preference, expenditure and retail-channel choice (N = 100)

Association Tested	χ^2 value	df	p-value	Decision at 5% level
Gender $\times$ RTE	0.7573	1	0.3842	H ₀ accepted
Gender $\times$ RTC	0.1310	1	0.7174	H ₀ accepted
Gender $\times$ RTD	1.6939	1	0.1931	H ₀ accepted
Gender $\times$ Raw/Whole Grain	0.0000	1	1.0000	H ₀ accepted
Age Group $\times$ RTE	7.3037	5	0.1990	H ₀ accepted
Age Group $\times$ RTC	30.5064	5	< 0.001	H ₀ rejected
Age Group $\times$ RTD	11.3611	5	0.0447	H ₀ rejected
Age Group $\times$ Raw/Whole Grain	19.5580	5	0.0015	H ₀ rejected
Education $\times$ RTE	6.7193	4	0.1515	H ₀ accepted
Education $\times$ RTC	3.5319	4	0.4730	H ₀ accepted
Education $\times$ RTD	16.2940	4	0.0026	H ₀ rejected
Education $\times$ Raw/Whole Grain	8.5287	4	0.0740	H ₀ accepted
Occupation $\times$ RTE	12.3905	4	0.0147	H ₀ rejected
Occupation $\times$ RTC	6.5057	4	0.1644	H ₀ accepted
Occupation $\times$ RTD	8.0436	4	0.0900	H ₀ accepted
Occupation $\times$ Raw/Whole Grain	13.6599	4	0.0085	H ₀ rejected
Income $\times$ RTE	15.4279	3	0.0015	H ₀ rejected
Income $\times$ RTC	8.4505	3	0.0376	H ₀ rejected
Income $\times$ RTD	10.4931	3	0.0148	H ₀ rejected
Income $\times$ Raw/Whole Grain	0.9102	3	0.8230	H ₀ accepted
Income $\times$ Acceptable Monthly Spending	19.1295	9	0.0241	H ₀ rejected
Age Group $\times$ Supermarket Preference	6.7982	5	0.2361	H ₀ accepted
Age Group $\times$ Local Grocery Preference	9.1260	5	0.1041	H ₀ accepted
Willingness to Pay $\times$ Actual Expenditure	22.8049	12	0.0294	H ₀ rejected

Source: Primary data

Age group and monthly household income carried the widest influence, each significantly associated with three of the four product categories. Age was significant for ready-to-cook ($\chi^2 = 30.506$, $p < 0.001$), ready-to-drink ($\chi^2 = 11.361$, $p = 0.045$) and raw/whole-grain products ($\chi^2 = 19.558$, $p = 0.002$) but not for ready-to-eat ($p = 0.199$), suggesting that ready-to-eat

products enjoy broad appeal across age groups while the remaining categories are more age-specific. Income was significant for ready-to-eat ($\chi^2 = 15.428$, $p = 0.002$), ready-to-cook ($\chi^2 = 8.451$, $p = 0.038$) and ready-to-drink products ($\chi^2 = 10.493$, $p = 0.015$), and separately for acceptable monthly spending ($\chi^2 = 19.130$, $p = 0.024$), but not for raw/whole-grain products ($p = 0.823$), whose basic and low-cost nature

appears to place them within reach of consumers across income levels. Occupation was significantly associated with two categories, ready-to-eat ($p = 0.015$) and raw/whole-grain products ($p = 0.009$), education with one, ready-to-drink products ($p = 0.003$), and gender with none of the four categories, indicating that businesses have little basis for gender-specific product or promotional strategies in this market. Age group also showed no significant association with retail-channel choice, whether supermarket ($p = 0.236$) or local grocery ($p = 0.104$) preference, indicating that outlet choice, unlike product-category preference, is not strongly age-differentiated.

A further chi-square test linked stated attitude to actual behaviour: consumers' willingness to pay more for healthy millet products was significantly associated with their actual monthly expenditure ($\chi^2 = 22.805$, $df = 12$, $p = 0.029$), indicating that the positive psychographic orientation recorded on the attitudinal scale (Table 9) translated into real spending rather than remaining a stated preference alone. Taken together, these results reject the null hypothesis for age, income, occupation and the psychographic willingness-

to-pay measure, while failing to reject it for gender, providing partial rather than uniform support for the alternative hypothesis (H_1).

Psychographic and Attitudinal Assessment of Consumers

Consumer attitudes toward millet-based functional foods were assessed on six five-point Likert statements (Table 9). The belief that millet products are healthier than regular foods recorded the highest mean score (4.55, $SD = 0.89$) and fell in the "Strongly Agree" band, consistent with the primacy of health benefits in the Garrett ranking (Table 7). Willingness to recommend millet products to others (4.01), liking their taste (3.76), trust in their quality and health claims (3.65) and willingness to pay more for them (3.65) all fell in the "Agree" band. The influence of social media or online platforms on interest in millet products recorded the lowest mean score (3.25) and the only "Neutral" rating, consistent with social media's limited role as a first source of information (8.0 per cent, Table 5) and as a preferred purchase-encouragement method (13.0 per cent, discussed below).

Table 9: Psychographic and attitudinal assessment of consumers towards millet-based functional foods ($n = 100$)

Attitudinal Statement	Mean Score	Standard Deviation	Level of Agreement
Millet products are healthier than regular foods	4.55	0.89	Strongly Agree
I would recommend millet-based products to others	4.01	1.02	Agree
I like the taste of millet-based food products	3.76	0.98	Agree
I trust the quality and health claims of millet products	3.65	1.06	Agree
I am willing to pay more for healthy millet products	3.65	0.77	Agree
Social media or online platforms influence my interest in millet products	3.25	1.11	Neutral

Source: Primary data

Table 10: Main Purchase Barriers towards millet-based functional foods ($n = 100$)

Main Purchase Barriers (multiple response)	No. of respondents	Per cent
High Price	48	48%
Not Easily Available in Nearby Shops	33	33%
Lack of Awareness about Millet Products	33	33%
Taste Not Familiar or Not Preferred	27	27%
Limited Product Choices	26	26%

Source: Primary data

High price was the most frequently cited barrier to purchase (48.0%), followed by limited availability in nearby shops and lack of awareness about millet products (33.0% each), taste unfamiliarity (27.0%) and limited product choice (26.0%). These barriers align closely with what consumers said would encourage them to buy more: discounts (33.0%) and better availability (29.0%) were the two most preferred forms of encouragement, ahead of health awareness campaigns (25.0%) and social media promotion, the least preferred option (13.0%). Just over half of respondents (51.0%) described their overall food-choice orientation as health-focused, ahead of convenience-oriented (21.0%) and tradition-oriented (19.0%) orientations, reinforcing health as the central axis around which this market is organised.

Implications for Promotion

Four implications follow from the combined business and consumer evidence. First, because high price and limited availability are the leading purchase barriers (Table 10) while businesses cite market competition and low awareness as

their leading challenges (Table 3), moderate discounting and wider stocking in supermarkets and local grocery shops, the two leading preferred channels, are likely to lift purchases more reliably than premium pricing. Second, because health benefits dominate both the business-reported purchase driver (75.0%) and the consumer-reported importance rating (4.66/5) and Garrett rank (I), health-based promotion through awareness programmes and health-professional endorsement should remain central, with social media reserved for reaching the 18–35 age band where it retains some influence on ready-to-cook and ready-to-drink preference (Table 8). Third, since ready-to-eat and ready-to-drink products carry the highest consumer preference (94.0% and 81.0%) while ready-to-cook products carry the highest reported business demand despite being stocked by a comparatively smaller share of businesses (Table 1 and Table 3), expanding the ready-to-cook and ready-to-drink range represents a concrete, evidence-based growth opportunity, consistent with the 60.0 per cent of businesses that already identify new-product introduction as their top priority. Fourth, because income and occupation significantly shape preference for

value-added categories while raw/whole-grain preference is largely income-independent (Table 8), pricing and promotion for ready-to-eat, ready-to-cook and ready-to-drink products can be tiered by income group, while raw/whole-grain products can continue to be positioned as an affordable, everyday healthy staple.

Conclusion

Health is the organising motive on both sides of Hyderabad's millet-based functional food market: it is the factor businesses report as most decisive for both first and repeat purchase, and the factor consumers rate highest on both a direct importance scale and Garrett's forced-choice ranking. Yet the market is shifting in a direction that a health-only narrative would not predict, consumers are most aware of raw/whole-grain products but most strongly prefer ready-to-eat and ready-to-drink formats, and businesses report the highest unmet demand for ready-to-cook products despite comparatively thin category-wise stocking. Socio-demographic influence on this market is real but selective: age and income each shape preference for three of the four product categories and jointly explain the largest share of the variation tested, while gender explains none, and a chi-square test confirms that consumers' stated willingness to pay for health benefits is reflected in actual spending rather than remaining an unexercised attitude. The null hypothesis of no socio-demographic and psychographic influence is therefore rejected for age, income, occupation and willingness to pay, and accepted for gender, giving partial rather than uniform support to the alternative hypothesis.

The study is confined to one city, a purposive rather than probability sample of 20 businesses and 100 consumers, and a single four-month window (April–July 2026), so seasonal variation in millet consumption and comparison with conventional grain substitutes fall outside its scope. Replication across other metropolitan markets, and a design that tracks the same businesses and consumers through a full annual cycle against actual sales records rather than self-reported figures, would establish how far the convenience-over-familiarity shift and the age–income segmentation pattern reported here generalise beyond Hyderabad.

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