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Exploring consumer awareness, perceptions, and barriers to millet consumption among young adults (18-25yrs) in Varanasi

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Abstract

Growing global concern about diet-related diseases and environmental sustainability has renewed interest in nutrient-dense traditional grains such as millets. Despite their nutritional and ecological advantages, consumption among young adults remains low. This study assessed awareness, perceptions, and barriers to millet consumption among 100 young adults (18-25 years) from Banaras Hindu University. A descriptive, cross-sectional, survey-based quantitative design was used. Data were collected through a structured questionnaire and analyzed using percentages and frequency distributions. Results showed that 91 % of respondents were aware of millets, and 95 % recognized them as nutritious foods; however, only 7 % consumed them regularly. Limited recipe knowledge (48 %), perceived higher price (33 %), and inconsistent availability (56 %) emerged as major barriers. Most participants viewed millets positively as a blend of traditional and modern foods and expressed willingness to replace rice or wheat if millets were more accessible and affordable. The findings emphasize that awareness alone does not guarantee adoption. Tailored nutrition-education campaigns, simplified cooking resources, and improved market accessibility could help mainstream millets in young adults' diets, supporting both public health and sustainable food systems.

Keywords: Millets, consumer perception, awareness, barriers, young adults, sustainable diets

Introduction

Lifestyle-related disorders and growing ecological pressures have shifted global attention toward sustainable and nutrient-rich food sources. Millets small seeded cereals resilient to adverse climates are emerging as "smart foods" because they are good for the farmer, good for the planet, and good for health. In India, major millets include sorghum (jowar), pearl millet (bajra), and finger millet (ragi), along with small millets such as foxtail, kodo, proso, barnyard, and little millet.

Millets provide approximately 65 % carbohydrates, 9 % protein, 3 % fat, and 2-7 % fiber, plus abundant B-vitamins, magnesium, iron, and antioxidants (Singh *et al*., 2023) [20]. Their low glycemic index and gluten-free nature make them valuable for managing diabetes, cardiovascular disease, and obesity (Bell, 2012; Puranik *et al*., 2017) [22, 23]. Despite these benefits, millet consumption has declined due to modernization, urban food preferences, and limited culinary awareness. Historically labeled a "poor man's food," millets now attract renewed attention from health-conscious consumers.

Young adults (18-25 years) strongly influence future dietary trends through social media engagement and openness to new foods. Yet, their awareness and perception of millets remain under-explored. Understanding their knowledge gaps and practical barriers is essential for designing effective interventions to promote millet consumption.

The present study therefore aimed to:

1. Assess the level of awareness about millets among young adults.
2. Explore their perceptions and attitudes toward millets.
3. Identify barriers limiting their inclusion of millets in daily diets.

2. Methodology

2.1 Research Design

This study adopted a quantitative, descriptive, and cross-sectional survey design to assess the awareness, perceptions, and barriers to millet consumption among young adults aged 18-25 years. The design enabled a snapshot understanding of consumer attitudes and behaviors at a single point in time, aligning with the objectives of the study.

2.2 Study Population and Area

The study was conducted among female students of Banaras Hindu University (BHU), Varanasi, Uttar Pradesh. Participants were enrolled in undergraduate and postgraduate programs in various departments of Mahila Mahavidyalaya. The age range of respondents was 18-25 years, representing young adult consumers.

2.3 Sampling Method and Sample Size

A non-probability purposive and convenience sampling method was used to select respondents who were available and willing to participate. The final sample size consisted of 100 respondents, considered adequate for descriptive

quantitative analysis.

2.4 Data Collection Tool

Primary data were collected using a structured questionnaire containing both closed- and open-ended questions. The questionnaire covered:

- Demographic information (age, education level)
- Awareness of millet nutrition and health benefits
- Frequency and pattern of millet consumption
- Sources of information about millets
- Perceptions and barriers related to affordability, accessibility, and taste

The questionnaire was pre-tested for clarity and reliability before the final survey.

2.5 Data Collection Procedure

Data were collected through face-to-face interviews and self-administered questionnaires over a period of four weeks. Respondents were briefed about the study objectives, and informed consent was obtained prior to participation. Ethical approval was secured from the institutional ethics committee.

2.6 Data Analysis

Data were tabulated and analyzed using Microsoft Excel. Descriptive statistics such as frequencies and percentages were used to summarize responses.

3. Results and Discussion

Table 3.1: Distribution of Respondents Based on Age

S. No	Age	Frequency	Percentage (%)
1.	18-19	8	8
2.	20-21	36	36
3.	22-23	30	30
4.	24-25	26	26
	Total	100	100

The above table 3.1, illustrates the distribution of respondents based on their age. Out of the total 100 respondents: 36% belonged to the age group 20-21 years, making it the largest segment of participants. This was followed by 30% in the 22-23 years age group, and 26% in the 24 25 years age group. A smaller proportion, 8%, were from the youngest age group of 18-19 years.

Table 3.2: Distribution of Respondents Based on Education Level

S. No	Education level	Frequency	Percentage%
1.	Undergraduate	31	31
2	Postgraduate	68	68
3.	PhD	1	1
4.	Total	100	100

The above table 3.2, illustrates the majority of respondents (68%) were postgraduates, indicating a highly educated sample population. Undergraduates made up 31% of the respondents, while only 1% were pursuing a PhD. This suggests that most participants had completed or were pursuing higher education.

Table 3.3: Distribution of Respondents by Millet Consumption Frequency

S. No	Frequency of Millet Consumption	Frequency (N)	Percentage%
1	Regularly(weekly twice or thrice)	7	7
2	Occasionally(monthly once)	45	45
3	Yearly once	28	28
4	Never	20	20
5	Total	100	100%

The above table 3.3 illustrates that, only 7% of individuals consume millets regularly, while the majority (45%) consume them occasionally. Notably, 48% consume millets rarely or never, indicating low regular millet consumption in the population.

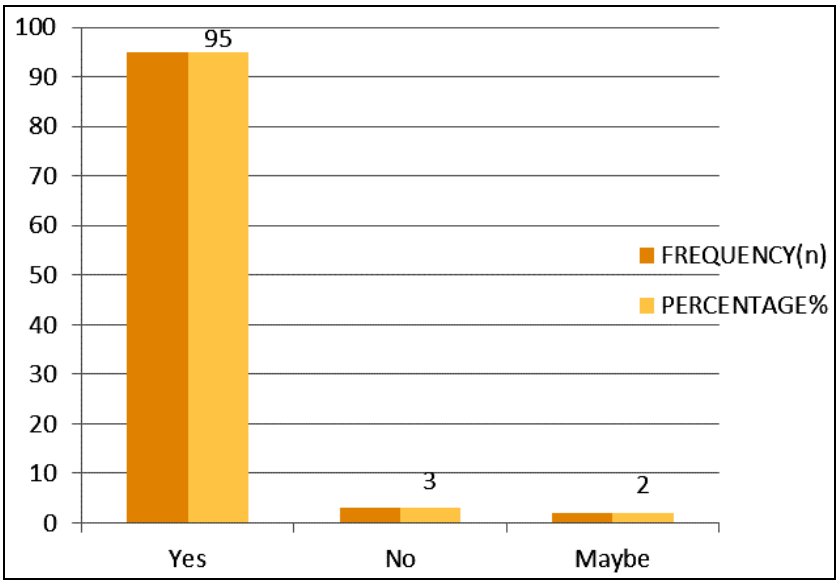

Fig 1: Distribution of Respondents Based on Awareness of Millets as a Nutritious Food

The above figure fig 3.1illustrates that, most of the people responded with clear “yes” of 95% who are aware of millets as nutritious food only a handful of people were unsure which is of 2% and disagreed of 3%.

Table 3.4: Distribution of Respondents Regarding Health Advantages of Millets

S. No	Health Advantage Identified by Respondents	Frequency(N)	Percentage%
1.	Improved digestion due to high fiber content	42	42
2.	Better blood sugar control because of low glycemic index	25	25
3.	Overall nutritional boost from vitamins and minerals	22	22
4.	Maybe enhanced heart health through cholesterol reduction	6	6
5.	Weight management due to increased satiety	5	5
6.	Total	100	100%

The above table 3.5 illustrates that, the most commonly recognized health benefit of millets among respondents is improved digestion (42%), followed by better blood sugar control (25%) and overall nutritional boost (22%). Fewer respondents associated millets with heart health (6%) or weight management (5%), indicating varying levels of awareness about specific health advantages

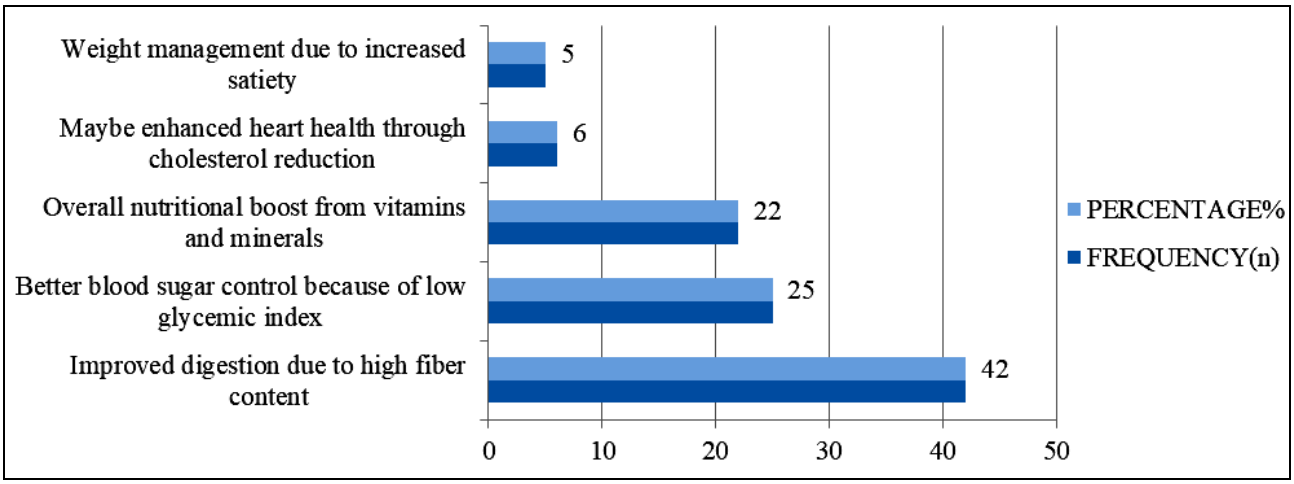

Fig 2: Distribution of Respondents Regarding Health Advantages of Millets

Table 3.5: Distribution of Respondents by Sources of Information Influencing About Awareness of Millets and their Health Benefits

S. No	Source Of Information	Frequency(N)	Percentage%
1	Health professionals	17	17
2	Scientific research	16	16
3	Social media	22	22
4	Television or radio programmes	0	0
5	Family or friends	24	24
6	Online blogs or articles	4	4
7	Books or magazines	8	8
8	Cultural or traditional knowledge	6	6
10	Food packaging and by brands	3	3
	Total	100	100%

The above table 3.6 illustrates that, the most common sources of information about millets were family or friends (24%) and social media (22%), followed by health professionals (17%) and scientific research (16%). Traditional media like television or radio had no influence, while other sources such as books, blogs, and cultural knowledge were mentioned less frequently, indicating

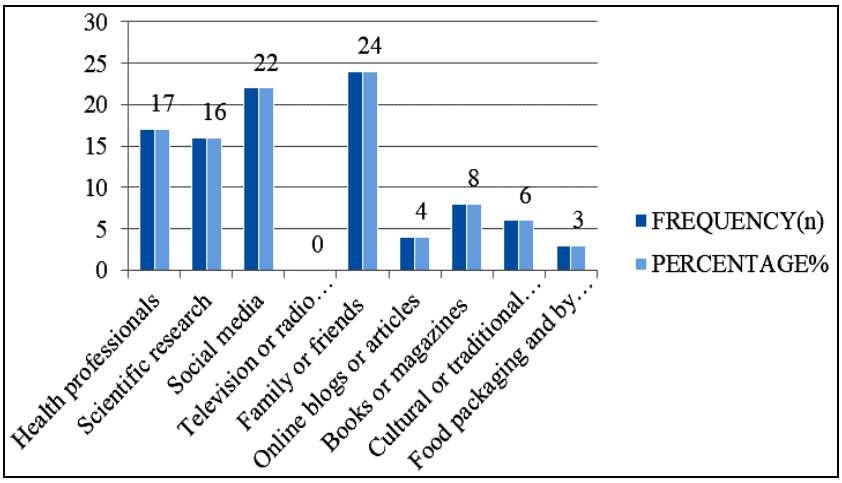

Fig 3: Distribution of Respondents by Sources of Information Influencing About Awareness of Millets and their Health Benefits

Table 3.6: Distribution of Respondents Based on the Challenges Faced While Cooking Millets

S. No.	Challenges faced by respondents	Frequency (n)	Percentage %
1	Limited recipe knowledge	48	48
2	I find it challenging to achieve the right texture	18	18
3	Time consuming to prepare	17	17
4	Flavour management	10	10
5	Digestion concerns	7	7
	Total	100	100

The table 3.7 shows that, limited recipe knowledge (48%) is the main challenge to regular millet use. other include difficulty achieving the right texture (18%) and time-consuming preparation (17%) fewer respondents faced problems with flavor (10%) and digestion (7%) highlighting the need for better cooking familiarity

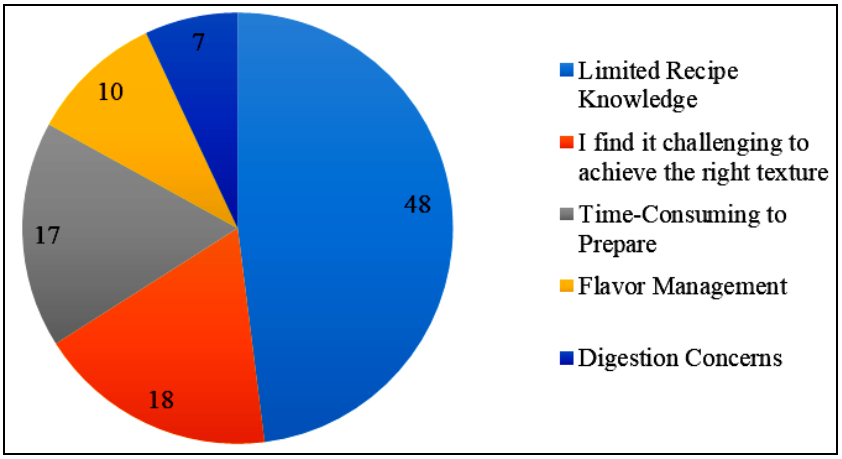

Fig 4: Distribution of Respondents Based on the Challenges Faced While Cooking Millets

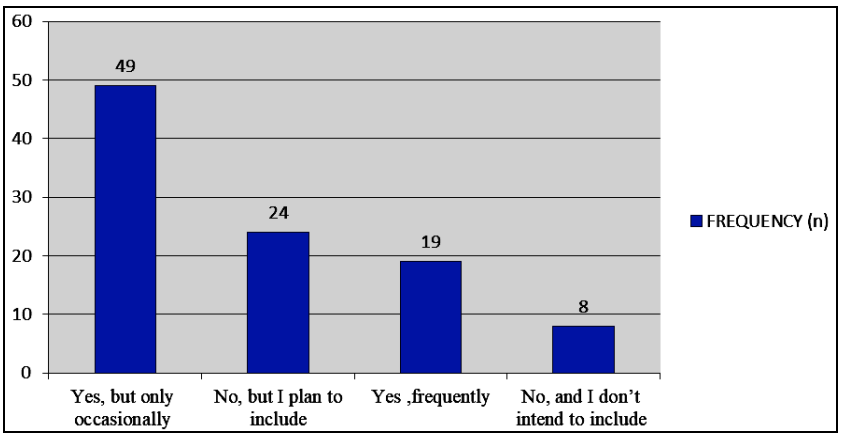

Fig 5: Distribution of Respondents Based on Experience of Cooking Millets at Home

The data in fig 3.5 shows that, nearly half (49%) of respondents consume the item occasionally. about a quarter (24%) plan to include in the future, while 19% already use it frequently. only a small portion (8%) neither use nor intend to include it. Overall, the response indicates moderate current usage with potential for increased adoption

Nearly half of the respondents (49%) reported occasionally cooking various millet-based dishes indicating moderate awareness and usage of different millet varieties. commonly prepared recipes among them include ragi millet porridge, bajra Khichdi, ragi kheer, missi roti, and foxtail millet Khichdi. Respondents also mentioned making regional and innovative millet dishes such as ragi appey, chilla, chapatti, bajra tikki, jowar and bajra bhakri (a Maharashtrian special dish), jowar dosa and idli.

Other popular preparations included upma, uttapam, ragi kheer, millet rissoles, millet laddo, ragi pizza, kuttu halwa and sanwakheer, among dal and desserts, ragiladdu, ragihalwa, and bajra roti were particularly noted. The types of millets most commonly known to respondents were pearl millet (bajra), sorghum (jowar), barnyard millet (sanwa), foxtail millet (kangi or kakun) and finger millet (ragi). This demonstrates both traditional and experimental uses of millets in everyday diets and reflects a fair degree of awareness about diverse millet varieties.

Table 3.7: Distribution of Respondents Based on Perceived Afford Ability of Millets Compared to Rice or Wheat

S. No	Response	Frequency(N)	Percentage%
1	Yes, they are generally cheaper	15	15
2	No, they are more expensive	33	33
3	They are similarly priced	9	9
4	It depends on the variety of millet	39	39
5	Don't know about the prize	4	4
6	Total	100	100

The above table 3.9 illustrates that, the majority of respondents (39%) felt that the affordability of millets depends on the variety, while 33% believed millets are more expensive than other grains. Only 15% found millets generally cheaper, and 9% felt they are similarly priced. A small percentage (4%) were unsure about the price, indicating varied perceptions of millet affordability among the participants.

Table 3.8: Distribution of Responses on Ease of Finding Millets in Near By Shops

S. No	Response	Frequency(N)	Percentage%
1	Millets are widely available where I shop	31	31
2	Millets are available, but notin Every store I visit	56	56
3	Millets are hard to find where I live	4	4
4	I have never seen millets in my Local stores	6	6
5	Neverwent to purchase	3	3
6	Total	100	100

The above table 3.10 illustrates that, the majority of respondents (56%) said millets are available but not in every store they visit. About 31% find millets widely available in their usual shopping places. A small number (10%) find it hard to locate millets or have never seen them in local stores. Only 3% have never attempted to purchase millets, indicating general awareness and moderate accessibility.

Table 3.9: Distribution of respondents on their perception of millets as traditional or modern food

S. No	Response	Frequency(N)	Percentage%
1	Both-I view millets as a blend of traditional and modern	42	42
2	Traditional - I associate millets with traditional or cultural food practices	32	32
3	Modern-I see millets as part of modern health- conscious eating	13	13
4	I don't know- I have no particular view of millets	13	13
5	Total	100	100%

The above table 3.11 illustrates that, a significant portion of respondents (42%) perceive millets as a blend of both traditional and modern food practices. 32% associate millets mainly with traditional or cultural eating habits. Only 13% view millets solely as part of modern, health-conscious diets, whileanother13%haveno specific perception. This suggests that millets hold a balanced image rooted in heritage, with growing relevance in contemporary health trends.

Intervention

To address the barrier of limited knowledge about millet preparation, an individual-level intervention was designed and implemented during the study. Participants who reported low or no familiarity with cooking millets were approached and provided with one-on-one guidance on preparing simple, nutritious millet-based dishes.

The recipes selected for the intervention included:

- Millet Khichdi -a one-pot, protein-rich, digestible meal
- Ragi (Finger Millet) Porridge-calcium-rich and ideal for bone health
- Millet Upma-a high-fiber, filling breakfast or snack
- Bajra (PearlMillet) Roti -an iron-rich gluten-free flat

bread
- Jowar (Sorghum) Pancakes-a protein-rich and easy breakfast option Each recipe was explained in simple terms, covering:

Basic ingredients and measurements
Step-by-step cooking methods
Nutritional benefits of the chosen millet
Tips for making the recipe convenient and tasty
The sessions were informal, friendly, and adapted to each participant's current cooking skill and life style. This approach aimed to reduce hesitation, increase confidence, and promote the regular use of millets through familiar and easy recipes.

Purpose and Outcome
This personalized intervention served as a direct, practical solution to the cooking barrier. Many participants expressed that the simplicity and nutritional value of these recipes motivated them to try millets at home. The approach proved effective in bridging the gap between awareness and actual adoption of millets in daily diets.

Table 3.10: Distribution of respondents by millet consumption frequency

Response	Pre-Intervention	Post- Intervention
Regularly (weekly twice or thrice)	0	8
Occasionally (monthly once)	0	9
Yearly once	0	0
Never	20	3

Before the intervention, none of the 20 participants consumed millets regularly or occasionally, with all reporting no millet intake, post intervention, 8 began consuming millets weekly, 9monthly, and only 3 continued to avoid them. this significant shift indicates the interventions effectiveness in enhancing millet awareness, acceptance and dietary inclusion.

Table 3.11: Distribution of respondents based on belief in millets as a student alternative to rice or wheat before and after intervention

Response	Pre -Intervention	Post -Intervention
Yes, definitely	0	10
Yes, to some extent	0	5
Not sure	8	2
No, prefer rice? wheat	10	2

Before the intervention, none of the respondents viewed millets as a definite or partial alternative to rice or wheat: 8 were unsure ad 10 preferred traditional grains. post-intervention, 10 respondents believed millets were definitely a suitable alternative, 5 agreed to some extent, while only 4 remained hesitant. This shift reflects a strong improvement in perception due to increased awareness, practical experience, and confidence gained during the intervention.

4. Conclusion
The present study revealed that young adults in India, despite having high awareness about millets and their health benefits, exhibit low consumption patterns. Awareness campaigns and the International Year of Millets (2023) have successfully raised visibility, but barriers such as limited recipe knowledge, perceived higher cost, and poor availability continue to hinder regular intake.
The findings emphasize the need for multi-level interventions including nutrition education programs, millet-based menu inclusion in university canteens, and easy-to-cook product innovations. Encouraging public-private partnerships to enhance millet marketing, and integrating millet education into curricula, can help strengthen youth adoption. Promoting millets not only contributes to individual health but also supports sustainable food systems and national food security.

5. Suggestions
- **Nutrition Education Campaigns:** Launch awareness programs in colleges, universities, and on social media to educate young adults on the specific health benefits of millets
- **Incorporate Millets into Daily Menus:** Encourage institutions likehostels, canteens, and workplace cafeterias to include millet-based dishes in their daily diet
- **Simplify Millet Cooking:** Distribute easy-to-follow millet recipes through booklets, food blogs, and short videos.
- **Make Millets More Affordable:** Advocate for subsidies on millet production and sales, especially in urban areas, to make them price- competitive with rice and wheat
- **Improve Market Availability:** Ensure millets are stocked in mainstream supermarkets and local grocery stores. Dedicated millet sections or branding (e.g., "smart grains" or "future foods") can help grab the attention of younger consumers
- **Product Innovation and Packaging:** Promote ready-to-cook or ready-to- eat millet products (like flakes, bars, noodles) that appeal to fast-paced lifestyles.

References
1. Anitha S, Govindaraj M, Kane-Potaka J. Balanced amino acid and higher micronutrients in millets complements legumes for improved human dietary nutrition. Cereal Chemistry. 2020;97(1):74-84. doi:10.1002/cche.10227
2. Barratry D, Rajapushpam R. A study on perception of millet products among household consumers in Salem District. IOSR Journal of Business and Management.

2018;20(8):67-76.
3. Erler M, Keck M, Dittrich C. The changing meaning of millets: Organic shops and distinctive consumption practices in Bengaluru, India. Journal of Consumer Culture. 2022;22(1):124-42. doi:10.1177/1469540520902508
4. Indumathy M, Jeyalakshmi D. Consumer perception towards millets among households in Coimbatore city. JETIR. 2024;2349-5162.
5. Jeyalakshmi S. Consumer perception towards millets among households in Coimbatore city. 2024;11:b50-b59.
6. Indumathy M, Jeyalakshmi D. Consumer perception towards millets among households in Coimbatore city. JETIR. 2024;2349-5162.
7. Katkuri S, Saxena S, Komarraju S, Dasarathan S, Muralidharan S. Physician's perceived barriers to millet-based diet in clinical practice: A cross-sectional survey. Journal of Biological Methods. 2024;11(4). doi:10.14440/jbm.2024.0040
8. Kulkarni M, Patil P, Saoji A. Awareness regarding the health benefits of millet and its consumption among the population. Archives of Medicine and Health Sciences. 2024;12(2):143-47.
9. Lakra P, Gahlawat IN, Hussain A. Millet mania: Exploring awareness and consumption patterns among college students. Mysore Journal of Agricultural Science. 2024;58(1):232-40.
10. Malathi B, Appaji C, Reddy GR, Dattatri K, Sudhakar N. Growth pattern of millets in India. Indian Journal of Agricultural Research. 2016;50(4):382-6. doi:10.18805/ijare.v50i4.11257
11. Mohan AR, George A, George G. Consumer perception and factors influencing consumption of millets. Journal of Tropical Agriculture. 2021;59(2).
12. Pathak H, Kiran KNM, Gauraha AK. Consumer awareness and consumption pattern of millets and millet-based products in Raipur city, Chhattisgarh. Indian Journal of Agricultural Economics. 2023;78(3):486-500. doi:10.22004/ag.econ.345233
13. Priya KL, Shobana S, Sudha V, Gayathri R, Beatrice DA, Anjana RM, *et al*. Consumption pattern of millets among South Indian adults. Journal of Diabetology. 2024;15(1):63-9.
14. Rajakumar R, Shankar SG. Assessing consumption behaviour and expenditure pattern on millet and millet-based products in Southern India. 2024;84.
15. Rizwana M, Singh P, Ahalya N, Mohana-Sundaram T. Assessing the awareness of nutritional benefits of millets amongst women in Bangalore. British Food Journal. 2023;125(6):2002-18. doi:10.1108/BFJ-05-2021-0593
16. Shah P, Mehta N, Bist SS. What are the barriers to the consumption of millet-based foods in India? An innovation resistance theory perspective. Journal of International Food & Agribusiness Marketing. 2024;1-31. doi:10.1080/08974438.2024.2324451
17. Shah P, Mehta N, Shah S. Exploring the factors that drive millet consumption: Insights from regular and occasional consumers. Journal of Retailing and Consumer Services. 2024;76:103598. doi:10.1016/j.jretconser.2023.103598
18. Shukla K, Srivastava S. Evaluation of finger millet incorporated noodles for nutritive value and glycemic index. Journal of Food Science and Technology. 2014;51:527-34. doi:10.1007/s13197-011-0530-x
19. Singh S, Vemireddy V. Transitioning diets: A mixed-methods study on factors affecting inclusion of millets in the urban population. BMC Public Health. 2023;23(1). doi:10.1186/s12889-023-16872-5
20. Tiwari H, Singh PK, Naresh RK, Islam A, Kumar S, Singh A, *et al*. Millets-based integrated farming system for food and nutritional security, constraints and agro-diversification strategies to fight global hidden hunger: A review. International Journal of Plant Soil Science. 2023;35(19):630-43.
21. Venkataramanan S. Trend analysis of millet consumption in South India. EPRA International Journal of Multidisciplinary Research. 2023;9(11):327-31. doi:10.36713/epra14960
22. Bell S, Morse S. Sustainability indicators: measuring the immeasurable?. Routledge; 2012 May 4.
23. Gupta SM, Arora S, Mirza N, Pande A, Lata C, Puranik S, Kumar J, Kumar A. Finger millet: a "certain" crop for an "uncertain" future and a solution to food insecurity and hidden hunger under stressful environments. Frontiers in plant science. 2017 Apr 25;8:643.