



A Study on Consumers' Awareness and Preference towards Millets and Its Products in Vizianagaram District, Andhra Pradesh, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

This study was conducted to understand the buying pattern of consumers and the factors influencing them in the Vizianagaram district of Andhra Pradesh. To achieve the objectives, primary data was collected from 200 respondents using the convenience sampling method. The study shows that 96% of the respondents are aware of at least one type of millet in the Vizianagaram District of Andhra Pradesh, followed by sorghum, bajra, and korra. Minor millets are of less prominence in the study area. The majority of respondents believe that millets help prevent type 2 diabetes and agree that they are better for health than rice and wheat. The study shows that the main source of information about millets and their health benefits is word of mouth, followed by

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social media. In the study, it was observed that seniors and adults consume millets more frequently, and most people prefer millets for dinner followed by breakfast. The accessibility of the millet products was found to be low and needs improvement. The most preferred platforms to purchase value-added products of millets are supermarkets, and for raw millets, Kirana stores are preferred. In the study area, consumers are eating millets such as ambali, sangati, korra rice, korra payasam, laddu, kichadi, and upma. Few consumers stated that they are using ragi, korra in dosa batter along with pulses and rice. Snacks such as cookies, chips, and murukulu are highly preferred by consumers. Accordingly, this study proposes suggestions to develop millet products and the use of promotion strategies to increase consumption.

Keywords: Millets; consumer; awareness; preferences; factors.

1. INTRODUCTION

Millets or nutri-cereals are high-energy foods; that were domesticated and cultivated as early as 10,000 years ago [1] and they continue to be an important crop in Indian agriculture and cuisine. India produces around 17 million tonnes of millets annually making it the largest producer of millets in the world (Indian Council of Agricultural Research). However, the area under millet cultivation in India had decreased from nearly 10 million hectares in the 1960s to just 3 million hectares in 2014. Despite this decline, millets are now enjoying a comeback in India thanks to growing knowledge of their nutritional value and health advantages [Directorate of Economics and Statistics]. The health advantages of millets and its products are Good Digestion, Asthma Prevention, cholesterol Regulation, Clear Up Toxins, Diabetes Management, Cancer Prevention, Prevent Anemia, Prevent Gallstones [2]. India's government has started programs like the "National Mission for Sustainable Agriculture" and the "Millet Mission" to encourage the cultivation and consumption of millets. Between 2014 and 2019, the area under millet cultivation in India expanded by 50% (Directorate of Economics and Statistics) [3,4]. Millets benefit customers as well as farmers and the environment. Millets are becoming more and more popular among health-conscious consumers as more people learn about their nutritional benefits. Millets are a good source of dietary fibre, vitamins, and minerals, as well as proteins that are gluten-free and low in glycaemic index, all of which can be used to treat and prevent chronic conditions like diabetes and heart disease (NCBI). Millets are also a great choice for people with celiac disease or gluten intolerance because they are gluten-free [5,6]. Millets are now being used by many businesses to create products including breakfast cereals, snacks made of millet, and baked millet foods [6,7]. These goods provide

consumers a healthier option to currently available processed foods, which are frequently heavy in sugar and fat and are regarded as harmful. Since millet-based products are less common in supermarkets and grocery stores than other grains, customers looking to purchase millet-based products may want to check out speciality shops or internet vendors [8,9]. Consumers who choose to eat millets can benefit from better health and help sustainable agriculture. The United Nations' International Year of Millets in 2023, which India is a major supporter of, has the potential to make a big contribution to food security and environmental sustainability in India and elsewhere (FAO).

The objectives of the study are:

- To find out the socio-economic status of the respondents
- Study the consumer awareness and perception of millets
- Consumers purchasing behavior of millets
- Study the factors influencing the purchase of Millets and its products
- Study about consumer preference for millets and products of millets

2. MATERIALS AND METHODS

2.1 Research Methodology

- Type of Research: Descriptive research
- Sampling unit: Residents of Vizianagaram District
- Sample size: 200 Respondents
- Sampling method: convenience sampling
- Research Instrument: Semi-structured Schedule
- Area of the survey: Vizianagaram city, Bobbili town, Bondapalli, Boddavalasa, Seethayya peta, Rajupeta, Dibbagudivalasa villages of Vizianagaram District of Andhra Pradesh

2.2 Analytical Tools

To study respondents' socio-economic status and awareness and perception of respondents' percentage analysis and tabular representation were used. To study Consumer purchasing behaviour, Influencing Factors of millet consumption weighted average mean was used and to study the Consumer Preference for millets and its products weighted average mean, percentage analysis and tabular representation were used.

Preferred channels to purchase is studied by using Garrett ranking Technique. The main benefit of this method over a straight forward frequency distribution is that the Preferences are ranked according to respondents' perceptions of their importance [10]. The orders of merit given by the respondents were converted in to rank by using the formula [11]. According to this method, respondents were asked to rate all of the elements, and the results of those rankings were then transformed into score values using the following formula:

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

Here,

R_{ij} is called as rank given for the i th variable by j th respondents.

N_j is called as the number of variables ranked by j th respondents.

3. RESULTS AND DISCUSSION

3.1 Socio-Economic Status of the Respondents

From Table 1, it was found that 107 respondents (53.5%) are males and others are females, making a nearly equal proportion of males and females. Out of 200 respondents, 12% (24 respondents) are children aged less than 16 years and contribute the least. 34.5% of respondents are teenagers aged 16–24 years. 35.5% of respondents are between 24-50 years old, and 18% of respondents are over 50 years old.

Out of 200 respondents, respondents from rural areas comprise 66% of the total respondents, slightly higher than the percentage of the rural population of the district. 12% of the respondents are involved in business, 29.5% are job holders, 41% are students, and 17.5% are involved in other occupations. The average family size of

respondents is 3.615 members, with most families being nuclear and extended families.

Out of 200 respondents, 34% of respondents' family income is above Rs.75,000, followed by family income of Rs.40,000 to Rs.75,000 at 36%, Rs.20,000 to Rs 40,000 at 21%, and below 20,000 at 9%.

Table 1. Demographic characteristics of respondents

Factors	Frequency	Percentage
Gender		
Male	107	53.5%
Female	93	46.5%
Age		
Upto 16	24	12.0%
16 to 24	69	34.5%
25 to 50	71	35.5%
Above 50	36	18.0%
Type of area		
Urban	132	66.0%
Rural	68	34.0%
Education		
No formal education	21	10.5%
School level	104	52.0%
College level	77	38.5%
Occupation		
Business	24	12.0%
Job holder	59	29.5%
Students	82	41.0%
Others	35	17.5%
Monthly income* (₹)		
Below 20,000	18	9.0%
20,000 to 40,000	42	21.0%
40,000 to 75,000	72	36.0%
Above 75,000	68	34.0%
Members of the family		
2 Members	27	13.5%
3 Members	71	35.5%
4 Members	62	31.0%
Above 5 Members	41	20.5%

*Income is in Indian Rupees

3.2 Consumer Awareness and Perception of Millets

From Table 2, it is observed that 96% of the respondents knew about millets and their products. But when asked about the types of millets, the majority of respondents knew about major millets but didn't know about minor millets. During the study, it was observed that seniors and adults know more about millets and their types, while children and teenagers know the least.

Table 2. Awareness of types of millets

Sl. No	Millet type	Percentage	Frequency
1	Finger Millet	92.0%	184
2	Sorghum	89.5%	179
3	Pearl Millet	84.0%	168
4	Fox Tail Millet	55.5%	111
5	Kodo Millet	38.0%	76
6	Little Millet	35.0%	70
7	Proso Millet	16.5%	33
8	Barnyard Millet	15.5%	31

From the data represented in Table 3, most respondents believe that millets are healthier than cereals. It is observed that 71% of the respondents believe that it helps prevent type 2 diabetes. 61% of respondents accept that it is good for pregnant women and babies. 68% believe that it is rich in minerals and proteins.

From the Table 4, the study unveiled that, the main source of information about millets and their health benefits is word of mouth, which is opted for by 85 respondents (36.5%), closely followed by social media (38% of respondents), YouTube (7.5% of respondents), and others (12% of respondents). Others include books, newspapers, and websites.

3.3 Consumers Purchasing Behavior of Millets

In Table 5, it is seen that 143 People are are consumers of millets and their products, and the majority of them consume them a few times a week. The remaining 57 respondents are not consuming millet. Most consumers take millet a few times a week. Regular consumers are observed to be mostly seniors and adults. It is observed that they are more health conscious.

From Table 6, we can understand that the most preferred time of consumption is dinner, followed by breakfast, and the least preferred is snacks. Reasons for not preferring millets during lunch are that working people and students pack the food made in the morning, and millets don't taste better than cereals by afternoon.

3.4 Factors Influencing the Purchase of Millets and Its Products

- From Table 7, it is clear that the most influencing factors are the health benefits and the fact that it is part of a traditional diet, whereas the least influencing factors are promotional activities by the seller. The

following observations were made for each of the factors:

- Attitude factors like health benefits (nutritional value, control of diabetes, reduction of inflammation in the gut, etc.), recommendation by a doctor, and taste have a positive effect on millet consumption.
- Perceived behavior control factors like the price and availability of millets and their products also affect the behavior of consumers. Price affects consumption negatively (as price increases, preferences decrease). Consumers also pay more attention to price and quality simultaneously and select the best value product. Availability affects consumption positively (consumption increases with availability in the required form).
- The factors like promotional activities by the seller have a positive effect, but their effect is lesser among all the existing factors.
- Demographic factors like urban, rural, and tribal areas are also influential. like raw millet consumption is higher among tribal areas, followed by rural and urban areas, whereas it is reversed in the case of processed foods. Biscuits, murukulu (ready to eat), and ready-to-cook products like malt, vermicelli, idli, and dosa mix products with rising income and preference for millet value-added products like RTE and RTC is also rising. With rising education, awareness is found to be rising, but it is having less effect on consumption.

3.5 Consumer Preference for Millets and Products of Millets

From Table 4, it is found that the availability of various millets is very good but the availability of millet products is fair and needs a lot of improvements. Some respondents said that

some millet products are not available in the market and new foods and products have to be developed.

Consumers prefer to buy Millets from Kirana stores the most followed by supermarkets, Special health stores, and E-Commerce sites. For millet products, Supermarket is preferred the most followed by Bakeries, E-Commerce, and others.

Consumers prefer Kirana stores to purchase the millets. Millet products for snacks are not popular. Consumers prefer medium-sized packs (0.5 to 1 kg) for raw millets (84 out of 143

respondents) followed by large-sized packs (37 out of 143 respondents) and smaller-sized packs for millet processed products by the majority of respondents. Respondents are not interested in soups but are more interested in idli rava and dosa mix, cookies and Murukulu that are already popular and widely available, millet upma mix (especially RTE upma), vermicelli and laddu. The majority of respondents are willing to consume newer products. Respondents are a bit cautious about taste and quality, and they want to try the product once. When it comes to existing products respondents prefer medium-sized packs (Biscuits of sizes 5 and 10 cookies are more desirable).

Table 3. Perception of respondents

Reasons for health benefits	Frequency	Percentage
Prevents type 2 diabetes	142	71%
Rich in minerals, Proteins, and vitamins	136	68%
good for pregnant women	122	61%
High fiber content	92	46%
Helps in weight loss	85	42.5%
Controls High Bp	78	39%
Gluten-free and non-allergic	72	36%

Table 4. Source of information

Source of information	Percentage	Frequency
Word of mouth	36.5%	85
Social media	38.0%	76
YouTube	7.5%	15
T.V and Others	12.0%	24

Table 5. Frequency of consumption of millets

Age	Don't	Occasionally	Few times a week	Regularly	Total
below 16	12	6	4	2	24
16 - 24 Years	21	15	24	1	69
25 to 50 Years	13	12	33	13	71
Above 50 Years	3	2	18	13	36
Total	57	35	79	29	

Table 6. Time of consumption of millets

Factors	Highly not preferred	Less preferred	Neutral	Preferred	Highly preferred	Weighted average
breakfast	9	16	31	38	49	3.71
lunch	8	17	47	52	19	3.39
snacks	12	26	44	25	27	3.01
dinner	6	4	18	45	70	4.18

Table 7. Factors influencing consumers of millet and its products

Factors	Highly influenced frequency	Moderately influenced frequency	Not influenced frequency	Weighted average mean
Health benefits	122	21	0	2.853147
As a part of the traditional diet	61	68	24	2.398601
Availability of millets	50	79	14	2.251748
Recommended by doctors	64	48	31	2.230769
Availability of RTC and RTE products	49	65	29	2.13986
Taste	40	59	44	1.972028
Competitive prices in the market	45	59	39	2.041958
Promotions activity by sellers	27	54	62	1.755245

Table 8. Millet's products availability

	Poor	Fair	Good	Very good	Excellent	Weighted average
Millets	14	19	25	33	52	3.62
Millet products	29	26	27	26	25	2.73

Table 9. Preferred channels to purchase millets and its products

Type of store	Millets		Millet products		
	Average score**	Garrett rank	Type of store	Average score**	Garrett rank
Kirana store	61.47	1	Supermarket	59.28	1
Supermarket	54.93	2	Bakery	55.94	2
Special Health store	48.63	3	E-commerce	47.11	3
E-commerce	37.66	4	Special Health store	37.66	4

**Henry Garrett Score

Table 10. Preferred channels to purchase millets

Value-added products Frequency and percentage	Not interested		Will try once		Excited to purchase	
	Freq	%	Freq	%	Freq	%
Vermicelli	23	12	93	47	84	42
Soup mix	76	38	54	27	70	35
Idli rava/ Dosa Mix	13	6.5	74	37	113	57
Upma	33	17	72	36	95	48
Laddu	40	20	76	38	84	42
Cookies	25	13	71	36	104	52
Murukulu	28	14	76	38	96	48
Plain millet (Annam, Payasam)	30	15	96	48	74	37
Natural millet beverage	64	32	87	44	49	25

4. CONCLUSION

Nowadays, awareness of millets is gradually increasing, partly because people are becoming more health-conscious and partly due to efforts by the government to promote millets in both consumption and production. Millets are an important staple food in many semi-arid and tropical regions of the world, providing food security in areas of difficult environments because of their excellent nutraceutical

characteristics [12]. Such facts of millets not harming the environment for its production can be used to promote millets. Practical marketing strategies to promote sales of millet like cooking instructions, reasonable price policies, and social media for promotions should be thoroughly used [13]. Cooking instructions should be provided on the package so that those who are interested in millets but don't know how to cook will also be attracted to buying them. By using social media, millets and its products could be promoted more,

as they are not used to their potential. Awareness about health benefits and understanding of millet products should be further improved as they have a positive impact on consumer behavior.

In demographic factors age has a positive effect on respondents. The difference in consumption patterns and dietary structure between urban and rural areas affect their behavior. Consumer preferences change regularly due to the availability of lot of substitutes and the market arrival of new products [14]. By considering such factors new products have to be continuously developed according to their changing habits. The blending of wheat flour with millet to make multi-grain atta helps not only attract nonusers but also makes occasional consumers buy it frequently. The blending of millets is also known to increase the taste of food. The development of new RTE and RTC products will attract more students and working couples.

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COMPETING INTERESTS

Authors have declared that they have no known competing financial interests or non-financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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