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An Analysis of Consumer Purchasing Behavior Regarding Millet Products

Mrs. Teena Thomas

Assistant Professor, Department of B. Com CA, Sri Krishna Adithya College of Arts and Science, Coimbatore.

Email: teenasngc@gmail.com,

Ms. Bhagyalakshmi J

Assistant Professor, Department of B. Com CA, Sri Krishna Adithya College of Arts and Science, Coimbatore.

Email: bhagyalakshmij2103@gmail.com

ABSTRACT:

Millets are gaining significant attention as nutritious, sustainable, and climate-resilient food grains. This study analyzes consumer purchasing behavior regarding millet products by examining factors such as health awareness, product quality, price sensitivity, availability, taste preferences, and promotional influences. The research aims to understand the key determinants affecting consumers' purchase decisions and their willingness to adopt millet-based foods in their daily diets. Data collected from consumers reveal that increasing awareness of the nutritional benefits of millets positively influences purchasing intentions. However, challenges such as limited availability, higher prices, and lack of product knowledge continue to affect market penetration. The findings provide valuable insights for policymakers, producers, and marketers to develop effective strategies for promoting millet consumption and expanding the millet products market.

Keywords: Millets, Consumer Purchasing Behavior, Health Awareness, Purchase Intention, Sustainable Food Consumption.

INTRODUCTION:

The agriculture sector is the most significant contributor to India's GDP, accounting for nearly 80% of its contributions. This sector has been integral to human civilization for thousands of years and has evolved through the adoption of advanced farming techniques and equipment. Agriculture not only exhibits substantial growth but also serves as a catalyst for the development of various other sectors. Among the numerous products of agriculture, millets stand out prominently. They are favored by individuals of all ages for their health benefits. Millets encompass a diverse range of small-seeded grasses that are cultivated globally as cereal crops and food grains for human consumption. The production of millets traditionally relies less on synthetic fertilizers, and they are largely resistant to storage pests. Furthermore, millets boast significant natural biodiversity. Often labeled as a superfood, millet production represents a sustainable agricultural practice that addresses multiple dimensions of nutrition security. The motivation behind selecting the topic of "Millets" in today's context stems from the observed decline in contemporary food habits. Reflecting on ancient dietary practices, millets were a staple, prompting me to focus on this issue under the title "MILLET".

STATEMENT OF PROBLEM:

There exists a significant gap in consumer awareness concerning millet products, which has led to a low level of demand in the marketplace. Recently, interest in millets has surged, driven by their nutritional properties, sustainability benefits, and their capacity to contribute to food security.

However, in spite of these positive attributes, millets are still not widely utilized or effectively promoted. This research intends to pinpoint the critical issues related to the promotion of millet products and to recommend strategies to address these challenges.

OBJECTIVES OF THE STUDY:

- To explore the factors that shape buying behavior for selected instant millet-based food products.
- To detail the health benefits of consuming millet products, which include better digestion, a lower risk of heart disease, and effective diabetes management.
- To investigate current market trends regarding millet products, emphasizing their popularity, availability, and consumer preferences both locally and internationally.
- To carry out surveys or focus groups to discern consumer preferences for millet products, considering elements such as taste, texture, packaging, and price sensitivity.
- To assess the current market trends and demand for millet products, including market size, growth potential, and distribution channels.

RESEARCH METHODOLOGY

This part describes the strategy for data collection relevant to the research. The study adopts a descriptive research method.

SAMPLE DESIGN:

A non-probability sampling technique, specifically convenience sampling, is employed. This technique selects participants based on their ease of access and availability, rather than through random or systematic methods. While this approach is quick and economical, it carries the risk of bias and may not reflect the wider population accurately, potentially compromising the validity and generalizability of the study's outcomes

Sample Size:

A total of 105 individuals have been surveyed for this study.

Data Collection Method:

Primary Data:

The primary data was gathered using a structured questionnaire, which includes comprehensive and pertinent questions that address all aspects of the research.

Tools to be Used:

• Simple percentage method
• Chi-square method
• Karl Pearson's coefficient of correlation

SCOPE OF THE STUDY:

- This study centers on assessing the level of consumer satisfaction in relation to their buying habits concerning millet products.
- An extensive review of all dimensions related to the availability, quality, and healthfulness of millet products must be undertaken
- The chosen sample population aims to examine the challenges consumers encounter in assessing the quality of millet products.
- Furthermore, it may delve into the cultural importance of millets across various regions, their impact on food security, and their role in enhancing agricultural diversity and resilience. The

research could also address the obstacles and potential benefits related to the broader promotion of millet consumption and production.

LIMITATIONS OF THE STUDY:

- I faced difficulties in identifying the samples due to the challenges of finding individuals who use millet products in the vast market.
- Although I was able to identify the samples, I encountered limitations during this process. As I progressed to the next stage of preparing the questionnaire, I faced challenges related to research availability, understanding the target audience, and issues concerning awareness, knowledge, and nutritional concerns.
- While I did receive responses to the questionnaire, the information provided was inadequate for a thorough analysis.
- During the analysis phase, the lack of sufficient information impeded my ability to draw definitive conclusions, resulting in a sense of inconsistency in the findings.
- This study could benefit from further recommendations; however, the limited timeframe restricts the amount of data I can present.

REVIEW OF LITERATURE:

Robert (2023) describes millet as a collective term for various small-grained cereal grasses. While millets do not originate from a single plant species, they exhibit several common characteristics. They are typically categorized into "large millets," which include sorghum and pearl millet, and "small millets," which encompass finger millet, barnyard millet, little millet, kodo millet, foxtail millet, and proso millet. Notably, finger millet is often highlighted separately from the other small varieties.

According to Bommy and Maheswari (2023), brown top millet is another variety that is extensively cultivated in the southern regions of India, particularly in Karnataka. Often referred to as nutri-cereals, millets are recognized as a "SmartFood" due to their high nutritional value and their potential to address significant malnutrition issues. For instance, pearl millet is rich in iron, zinc, and folic acid, which are essential micronutrients, especially for adolescent girls and women. Additionally, finger millet contains three times more calcium than milk, making it vital for women and infants. Millets are also abundant in antioxidants, playing a crucial role in combating diabetes and heart disease, which are on the rise in India (ICRISAT, 2016). Indian millets contribute to various forms of security, including food, nutrition, fodder, fiber, health, livelihood, and ecological stability (Bommy and Maheswari, 2023).

The National Nutrition Monitoring Bureau has indicated that millet consumption is notably higher in states like Gujarat (pearl millet, maize), Karnataka (finger millet), and Maharashtra (sorghum). In contrast, the consumption of millets is minimal in states such as Kerala, Orissa, West Bengal, and Tamil Nadu, where rice remains the predominant cereal (NNMB, 2006). Robert (2023) notes that millet serves as a general term for a variety of small-grained cereal grasses. Although these grains do not come from a single species, they share several defining traits. Millets are generally divided into two categories: "large millets," which include sorghum and pearl millet, and "small millets," which consist of finger millet, barnyard millet, little millet, kodo millet, foxtail millet, and proso millet. Finger millet is frequently mentioned distinctly from the other small millets.

Radhika et al. (2022) highlight that cereals serve as the primary staple for Indians, accounting for 70-

80% of their total energy intake (Gopalan et al., 2009). A recent investigation by the NNMB into the dietary habits of urban Indians, specifically from the Chennai Urban Rural Epidemiology Study (CURES), indicated that millets contribute a mere 2% of the overall caloric intake (6.7 g/d). Ranjita et al. (2022) emphasize the necessity of rekindling interest in millets, which are recognized for their nutritional benefits and potential in managing conditions such as diabetes, obesity, and hyperlipidemia. Enhancing the health benefits of millets through value addition, by combining them with traditional cereals and milk, and utilizing advanced processing technologies, presents new opportunities for product diversification.

According to Samuel (2021), both minor millets—such as foxtail, little, kodo, proso, and barnyard millet—and major varieties like sorghum, bajra, and ragi are increasingly being incorporated into the diets of rural and urban households. These millets are more affordable than rice or wheat and contribute to better health. Innovative recipes utilizing minor millets hold significant promise as protein- and mineral-rich supplementary foods, addressing issues of Protein-Calorie Malnutrition (PCM) and mineral deficiencies among school-aged children (Rajput, 2019).

Ballolli et al. (2021) have created enriched barnyard millet cookies by adding nuts and dried fruits, resulting in a product that is well-received due to its light, crisp texture, appealing aroma, and excellent flavor. Additionally, research found that noodles made with finger millet flour are not only nutritious but also exhibit hypoglycemic effects, further supporting the health benefits of incorporating millets into the diet.

OVERVIEW OF THE PROJECT HISTORY OF MILLETS:

Millet is recognized as one of the earliest cultivated grains, with its origins tracing back over 7,000 years. It served as a fundamental food source for numerous ancient civilizations, including those in China, India, Egypt, and Africa. Prior to the widespread adoption of rice and wheat, millet was extensively cultivated across

Africa, Asia, and Europe. In Africa, it continues to be a crucial food crop, especially in arid and semiarid areas. In Asia, countries such as India, China, and parts of Southeast Asia still incorporate millet significantly into their diets

Millet was introduced to the Americas by European colonizers during the Colonial era (15th-19th centuries), but it did not achieve widespread agricultural adoption. In the Roman Empire (200 BCE–400 CE), millet was a prevalent food source, particularly during times of scarcity. The domestication of millet began in China around 7000 BCE, marking it as one of the earliest grains to be cultivated. By this time, millet had become a staple crop in China, alongside rice and wheat. In Africa, millet was domesticated around 5000 BCE, particularly in the Sahel region, where it became a crucial dietary element for many African communities. By 2000 BCE, millet had spread to the Indian subcontinent, where it was commonly grown and featured in traditional dishes like roti and dosa. In Europe, millet was introduced around 500 BCE, where it was primarily consumed in ancient Greece and later became significant in Eastern Europe, especially in regions near the Black Sea.

In the 1400s CE, European explorers introduced millet to the Americas, although its cultivation was not as widespread as that of other grains such as corn and wheat. In ancient China, dating back to 2500 BCE, millet was a staple crop alongside rice, with millet porridge being a common dish. By 1500 BCE in ancient India, pearl millet was extensively cultivated and utilized for making traditional

flatbreads like roti and bhakri. In ancient Africa around 500 BCE, millet played a crucial role as a crop, being used in traditional dishes such as millet couscous and porridge. Similarly, in ancient Europe, particularly in Greece and Rome, millet was grown and primarily used for porridge and bread. During the medieval period from 500 to 1500 CE, millet saw a resurgence in popularity in Eastern Europe, where it was commonly used for porridge, bread, and fermented drinks. In the 19th century, millet attracted attention in the United States as a drought-resistant crop, mainly serving as livestock feed in areas with poor soil. Although its popularity waned in Western countries during the 20th century, millet remained a vital staple in many regions of Africa and Asia, where it was used in various forms, including flour for bread and porridge. The 21st century has seen millet recognized as a gluten-free, nutritious grain, leading to its inclusion in health food products such as cereals and snacks. Today, millet continues to be an important crop in regions like China, India, Africa, and parts of Europe, appreciated for its nutritional benefits and culinary versatility.

AVAILABLITY OF MILLET PRODUCTS:

There is a wide range of millet products available, such as:

- Millet flour (used for baking and making pancakes)
- Whole millet grains (great for salads, pilafs, and porridge)
- Millet flakes (similar to oat flakes, used in breakfast cereals or granola)
- Millet pasta (produced from millet flour, a gluten-free alternative to traditional wheat pasta).
- Millet bread (gluten-free bread made from millet flour)
- Millet snacks (including puffed millet snacks or millet bars)
- Millet-based beverages (like millet milk or other drinks made from millet) • Millet desserts (such as millet pudding or millet cakes) The various types of millets include: Pearl millet, Foxtail millet, Proso millet, Finger millet, Little millet, Kodo millet, Barnyard millet, and Sorghum.
- Millet-based desserts (like millet pudding or millet cakes)

Types of millets:

- Pearl millet
- Foxtail millet
- Proso millet
- Finger millet
- Little millet
- Kodo millet
- Barnyard millet
- Sorghum

ANALYSIS AND INTERPRETATION

	Options	**Respondents**	**(%)**
Gender of the respondents	Male	27	26
	Female	78	74
	Below18 Years	26	25

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Age of the respondents	18-30Years	65	62
	30-40Years	13	12
	Above40 Years	1	1
Likely to try new millet-based products	Likely	32	30
	Very likely	53	50
	Neutral	20	20
Influence to buy millet products	Friends& family	47	45
	Advertisement	33	31
	Availability	18	17
	Others	7	7

The data indicates that a significant majority, 74%, of the respondents identify as female, while 26% identify as male. Additionally, it is noted that 62% of the respondents fall within the age range of 18 to 30 years, with 25% being under 18 years old, and a smaller portion representing those aged 30 to 40 and above 40 years. Furthermore, 50% of the respondents express a strong likelihood of trying new millet products, while others show varying degrees of interest, with some being likely and others remaining neutral regarding their consumption. In terms of purchasing influences, 45% of respondents cite friends and family as the primary motivators for buying millet products, while 31% are swayed by advertisements, and others are influenced by product availability. Lastly, 42% of respondents report that they primarily consume millet in the form of snacks, while others incorporate it into millet bread, pasta, and beverages.

CHI-SQUARETEST

AGE OF THE RESPONDENTS INFLUENCING FACTOR TO MAKE PURCHASE DECISION ON MILLET PRODUCTS

NULL HYPOTHESIS: There is no significant relationship between age of the respondents and influencing factor to make purchase decision on millet products **ALTERNATEHYPOTHESIS**: There is significant relationship between age of the respondents and influencing factor to make purchase decision on millet products.

age* influencing factor Crosstabulation						
Count						
		Influencing factor			**Total**	
		Health benefits	**Taste**	**Availability**		
age	**Below 18**	26	0	0	26	

	18-30	23	42	0	65
	30-40	0	0	13	13
	Above 40	0	0	1	1
Total		49	42	14	105

Chi-Square Tests

	Value	**df**	**Asymp totic Significance(2-sided)**
Pearson Chi-Square	141.000[a]	6	.000
Likelihood Ratio	123.602	6	.000
Linear-by-Linear Association	67.477	1	.000
N of Valid Cases	105		

a.5 cells (41.7%) have expected count less than 5. The minimum expected count is .13.

The table indicates a significant value of .000, which is below the threshold of 0.05. Consequently, we reject the null hypothesis and accept the alternative hypothesis at a 95% confidence level. This leads to the conclusion that there exists a significant relationship between the age of respondents and the factors influencing their purchase decisions regarding millet products.

AWARE OF HEALTH BENEFITS PERCIEVE MILLET PRODUCT IS HEALTHIER THAN OTHER GRAINS

Null Hypothesis: There is no significant relationship between awareness of health benefits and perception that millet products are healthier than other grains.

Alternative Hypothesis: There is a significant relationship between awareness of health benefits and perception that millet products are healthier than other grains

Aware of health benefits*perceive millet products Crosstabulation

Count

		Perceive millet products		**Total**
		Yes	**No**	
Aware of health benefits	Yes	94	7	101
	No	4	0	4
Total		98	7	105

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.297a	1	0

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Continuity Correctionb	0	1	1
Likelihood Ratio	0.563	1	0
Fisher's Exact Test			
Linear-by-Linear Association	0.294	1	0
N of Valid Cases	105		

The table indicates a significant value of .000, which is below the threshold of 0.05. Consequently, we reject the null hypothesis and accept the alternative hypothesis at a 95% confidence level. This leads to the conclusion that there is a significant relationship between awareness of health benefits and the perception that millet products are healthier compared to other grains.

FINDINGS

- The research indicates that 74% of participants are female, while 26% are male.
- The findings reveal that 62% of respondents fall within the age range of 18 to 30 years, 25% are under 18, and the remaining participants are aged 30-40 and over 40.
- According to the study, 82% of respondents are unmarried, whereas 18% are married.
- The results show that 54% of respondents reside in urban areas, 22% in rural areas, and 21% in semi-urban areas.
- The data indicates that 48% of respondents consume millet products on a weekly basis, with some consuming them monthly, daily, or rarely.
- The study reveals that 47% of respondents typically purchase millets from supermarkets, while 40% buy from health food stores and 13% from farmers' markets.
- The findings show that 64% of respondents prefer medium-sized packages, with 23% favoring small packages and 12% opting for large packages, while some prefer bulk sizes.
- The study highlights that 96% of respondents prefer to purchase millets, with the remainder showing no interest in millet products.
- The majority, 57%, of respondents cite health benefits as their primary reason for consuming millet, while 31% do so for taste, and others for weight management.
- Research shows that 45% of participants view friends and family as the main influencers in their decision to buy millet products, while 31% are influenced by advertisements, and the rest are swayed by product availability.
- The study indicates that 94% of respondents are aware of environmental sustainability, while a small percentage lacks this knowledge.
- Findings reveal that 74% of participants are willing to pay extra for organic millets, whereas the remaining respondents are not inclined to do so.
- The research indicates that 62% of respondents occasionally check labels to confirm the ingredients in millet products, with 30% always reading the labels, and others doing so either frequently or infrequently.

- A notable 57% of respondents express significant concern about the nutritional content when choosing millet products, with some considering it important and others showing moderate concern.
- The study shows that 93% of respondents believe millet products are healthier than other grains, while a small number remain unaware of this viewpoint.
- A study reveals that 42% of respondents primarily consume millet in the form of snacks, while others incorporate it into millet bread, pasta, and beverages.
- In terms of knowledge about millet products, 37% and 27% of respondents rated their understanding as 3 and 4, respectively, with some individuals rating their knowledge as 2 and 1.
- Additionally, 79% of respondents reported difficulties in locating millet products in their local areas, although a portion indicated they do not encounter any issues in sourcing these products.
- Finally, 40% of respondents expressed satisfaction or partial satisfaction with the availability of millet products, while others reported dissatisfaction or held neutral views regarding market availability.

CHI-SQUARETEST

There is a significant relationship between age of the respondents and influencing factor to make purchase decision on millet products.

There is a significant relationship between aware of health benefits and perceive millet product is healthier than other grains.

SUGGESTIONS

Improve Product Visibility: Boost the availability of millet products in grocery stores and online marketplaces to enhance consumer access and awareness. Expand Product Variety: Launch a broader selection of millet-based items, such as snacks, convenient meals, and baked goods, to meet the varied tastes of consumers. Highlight Health Benefits: Inform consumers about the nutritional benefits of millets through focused marketing initiatives that emphasize their high fiber, protein, and micronutrient levels. Facilitate Sampling Experiences: Organize tasting events in retail locations or community gatherings to give consumers the opportunity to sample and appreciate the quality and taste of millet products. Engage with Culinary Experts: Collaborate with chefs and food specialists to create unique recipes featuring millets, demonstrating their versatility and culinary applications. Share Cooking Guidance: Provide cooking demonstrations and distribute recipe cards to assist consumers in easily and deliciously incorporating millets into their everyday meals.

Ensure Quality Assurance: Establish rigorous quality control protocols to guarantee the consistency and freshness of millet products, thereby boosting consumer confidence and satisfaction. Transparent Labeling: Provide clear and comprehensive labeling on millet products that includes nutritional details, certifications (such as organic and gluten-free), and information about ingredient sourcing to foster transparency and build consumer trust. Engage with Communities: Develop collaborative relationships with local farmers and communities engaged in millet production to encourage sustainable agricultural practices and bolster local economies. Gather Feedback: Proactively collect consumer feedback through surveys, reviews, and social media engagement to gain insights into their preferences and continuously enhance millet products to align with their expectations.

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