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A study on consumer preference and perception towards mango varieties in India

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Abstract

Mango is one of the most delicious fruits in India and also India is the largest producer of mango in the World. Moreover, Indians are fond of consuming mango fruits and juice especially during summer season. Since the mangoes are grown under various climate regions and its distribution also vary from tropical regions to sub-tropical regions. The marketing of mango fruits and its prices are fluctuating from high to low during the production season. Consumers ascribed value to its taste, health benefits, seasonal span and socio-cultural importance. By keeping the above in view a study was carried out to assess the consumer preference and marketing strategies in mango varieties in two different locations. Banaganapalli was the most preferred variety which was confirmed by the consumers' response. Wholesalers and retailers take decisions based on important factors related to mango varieties viz., price, consumer preference and keeping quality. Quality attributes of mangoes like colour, aroma, taste, size and shape were ranked by wholesalers and retailers in both the markets. Taste of the fruits was ranked as first by, while colour and shape of fruit were ranked second and third, size of the fruit in fourth rank and surprisingly, aroma was ranked in fifth place by wholesalers, retailers and consumers. Hence for marketing of mango taste including colour and shape are the deciding qualities to fetch more price in the market. Farmers can choose suitable mango varieties having good taste and colour and shape for cultivation in future.

Keywords: Mango, consumer preference, garret ranking, varietal traits

Introduction

Mango denoted as "king of fruit" in India and also the largest producer of mango in the World. Moreover, Indians are fond of consuming mango fruits and juice especially during summer season. Mangoes are cultivated under various climatic conditions to sub-tropical regions. The marketing of mango fruits and its prices are fluctuating from high to low during the production season. After the harvest, the fruits have to pass through several agencies before reaching the consumers at high prices whereas the producer farmer who will get only minimum prices. Consumers ascribed value to its taste, health benefits, seasonal span and socio-cultural importance (Badar *et al.*, 2016) ^[1]. Hence in order to obtain more and reasonable profit they have to adopt proper sale of marketing strategies.

A brief review of literature on Mango marketing and consumer preference is furnished below; Ferrier *et al.*, (2012) ^[2] reported that Indian mangoes are likely to be confined to a premium niche for U.S. consumers, including South Asians living in the United States who have taste preferences for the Indian varieties. However, cost reductions, through use of sea freight and other efficiencies that may arise from larger volumes of trade, have the potential to make Indian mangoes more cost competitive. Jose and Jose (2012) ^[10] studied the European Fresh

Mangoes market for Indian Mangoes and reported that it is a highly competitive market, there will be no room for poor quality mangoes. These forces improved efficiency of the production chain and sales strategies resulting from good agricultural practices, increased production and reduced prices that enable competitive prices and better-quality products. Sarada (2013) ^[8] reported the number of players in the marketing channel is more and the mango grower's share in consumer's rupee is less in India. On line spot trading has been introduced by Safal National Exchange (SNX) for Tothapuri mangoes in Krishnagiri district of Tamil Nadu. SNX, by a joint venture between National Dairy Development Board and Multi - Commodity Exchange of India (MCX) are carrying out the spot electronic trading of mangoes in Krishnagiri and Pochampalli. Badar *et al.*, (2016) ^[1] observed that consumers ascribed value to its taste, health benefits, seasonal span and socio-cultural importance. The main attributes consumers considered in buying mangoes were price, taste, freshness, and freedom from damage and blemish. Consumers expressed concerns about high mango prices, non-availability of safely ripened mangoes, retailer malpractices and ineffective regulations by the government. A study by Thulasiram *et al.*, (2016) ^[9] revealed that the important quality attributes considered by

the traders were variety, size, colour, shape and flavor for mango export. The results of conjoint analysis on the average part-worths and the relative importance of each attribute of mango showed variety was found to have the greatest influence on the trade of mango. The size of mango was yet another important factor influencing the traders. The results also showed the quality attributes preferred by the traders of mango are Alphonso variety, 200-250 g size and yellow to green colour and ovate oblique shape with high flavour. Saraswat *et al.*, (2018) studied the distribution process and reported that the mango fruit has to pass through more than one hand except when it is directly sold to the consumer by the producer which is a rare phenomenon. In this chain, various agencies like grower, pre-harvest contractors, commission agents, wholesaler, retailers, etc., are engaged. This chain of intermediaries / functionaries is called marketing channel. The followings are the channels generally used by selected organic and inorganic fruit growers: 1. Grower to consumer. 2. Grower – Retailer – Consumer 3. Grower – Preharvest Contractor – Wholesaler – Retailer – Consumer 4. Grower – Postharvest Contractor – Wholesaler – Retailer – Consumer 5. Grower – Postharvest Contractor – Retailer – Consumer 6. Grower – Postharvest Contractor – Wholesaler – Retailer – Consumer 7. Grower – Local Wholesaler – Retailer – Consumer 8. Grower – Processor – Consumer. Nandi and Nithya (2018) reported that organic mango farmers are unorganised and prevailing mango value chains vary from long chains where multiple intermediaries involved to very short where farmers directly sell their products to consumers through online. Considering the growing e-commerce retailing trend in fresh products like mango, there is enormous potential for linking smallholder producers to market through organised producer's group in an effective way. Farmer's education, frequent contact with extension staffs, proximity to the market, access to information and collective action in marketing were the main determinants for linking smallholder organic mango farmers to the market. Madhuri (2019) studied the marketing practices of the farmers and observed three predominant marketing channels: at the farm gate to the pre-harvest contractor; at the village Agricultural Produce Market Committee (APMC) yard; or directly in city retail markets or government authorised wholesale centres such as the Horticultural Producers' Cooperative Marketing and Processing Society (HOPCOMS) and Safal. A majority of farmers (60%) sell their produce at the farm gate to the pre-harvest contractors, who in most cases are also the wholesale agents at the APMC yard, under a mutually agreed contract. In open market system, mangoes are supposed to be sold on an auction basis here. But this kind of auction system rarely exists. The prices are fixed by wholesale agents operating in the yard, with farmers lacking any power to negotiate them.

Mangoes, often referred to as the "King of Fruits," hold a special place in the hearts of people across India. With their vibrant flavors, diverse textures, and distinct aromas, mangoes are deeply embedded in the cultural and culinary fabric of the nation. The vast geographical and climatic diversity of India has given rise to a remarkable array of mango varieties, each offering its own unique sensory experience. Against this backdrop, understanding consumer awareness and perception towards these mango varieties

becomes crucial, both for producers and consumers alike. This study aims to delve into the intricate relationship between consumers and the diverse world of mango varieties in India. Consumer preferences, buying behaviors, and perceptions play a pivotal role in shaping the mango market and influencing agricultural practices. By analyzing consumer awareness and perception, this study endeavors to provide insights into the factors that guide mango purchasing decisions, shed light on the attributes that resonate most with consumers, and uncover the factors that contribute to the popularity of specific mango varieties.

With globalization, urbanization, and evolving consumer trends, the mango market in India has witnessed significant transformations. Consumers today are more informed, discerning, and health-conscious than ever before. In this context, it becomes crucial to explore how consumers perceive factors such as taste, aroma, appearance, and quality when making choices among the diverse array of mango varieties available in the market.

This study not only holds implications for farmers and distributors but also for policymakers and researchers working towards sustaining and enhancing the mango industry. By understanding consumer preferences, producers can better align their cultivation practices with market demands. Distributors can tailor their offerings to match consumer expectations, while policymakers can make informed decisions to support sustainable mango production. Moreover, this study could contribute to enhancing consumer experiences, ensuring that they are exposed to a wider range of mango varieties that align with their preferences.

In the pages that follow, this study will unfold the findings of a comprehensive investigation into consumer awareness and perception towards mango varieties in India. Through surveys, interviews, and data analysis, we aim to provide a comprehensive overview of the mango market landscape and contribute valuable insights to the larger discourse surrounding agriculture, consumer behavior, and food culture.

Materials and Methods

The Garrett ranking procedure is a systematic method used to assess and prioritize different options based on the preferences or opinions of a panel of experts or stakeholders. In the context of ranking mango varieties, the procedure involves several key steps. Firstly, specific criteria, such as taste, aroma, color, size, and texture, are defined to evaluate the mango varieties. A panel of experts, ideally well-versed in mango attributes, is selected to participate in the ranking process. Each panel member is provided with a predetermined ranking scale, typically ranging from 1 to N, where N represents the number of mango varieties being considered.

The panel members then independently rank the mango varieties based on each defined criterion using the provided scale. The assigned ranks reflect the perceived performance of each variety for each criterion. Once the rankings from all panel members are collected, average ranks are calculated for each mango variety across all criteria. These average ranks are then summed up to determine an overall ranking for each variety. Mango varieties with lower overall sums of average ranks are considered more preferred by the panel.

Throughout this process, it's essential to consider any potential biases or subjectivity that might affect the results. The interpretation of the findings involves discussing the implications of the rankings, identifying the top-ranked mango varieties, and understanding the reasons behind the preferences. The Garrett ranking procedure offers a structured approach to capture and analyze preferences, aiding decision-making for various stakeholders, including mango producers, sellers, and consumers. However, it's important to recognize that this method has its limitations, such as potential biases from panel members and the subjectivity inherent in ranking processes. Despite these limitations, the Garrett ranking procedure provides a valuable tool for evaluating and prioritizing different options based on expert opinions.

Results and Discussion

The results obtained from the study are furnished here under:

Table 1: Varietal Ranking of Mango

Sl. No.	Variety	Garret Score	Rank
1	Mallika	61.55	2
2	Amrapali	55.61	4
3	Totapuri	55.25	3
4	Neelam	52.53	5
5	Alphanso	64.89	1
6	Raspuri	49.61	6
7	Banganpalli/ Safed	46.53	7
8	Malgova	42.42	9
9	Dasheri	43.45	8
10	Any other	28.16	10

The table presents a ranking of ten different mango varieties based on their popularity or preference, with rankings ranging from 1 to 10. The data provides insights into the relative popularity of these mango varieties, offering valuable information for consumers, growers, and researchers alike.

Alphanso mango has secured the top rank, indicating that it is the most favored or renowned among the listed varieties. Alphanso is well-known for its distinct flavor, aroma, and luscious texture, making it a premium choice in many markets. Its superior taste and relatively short harvesting window contribute to its popularity. Mallika holds the second position in terms of popularity. While it might not be as widely recognized as Alphanso, it still enjoys a significant consumer base. Mallika mangoes are appreciated for their sweetness and pleasant taste. Totapuri mangoes secure the third position in the ranking. This variety is distinct from others due to its elongated shape and tangy taste. Totapuri mangoes are often used in culinary preparations such as pickles and chutneys. Amrapali is ranked fourth, indicating that it is a moderately preferred variety. Its balanced taste and medium size make it a suitable choice for both fresh consumption and processing into products like juice. Neelam ranks fifth, suggesting that it holds a decent standing among the listed varieties. Neelam mangoes are appreciated for their juicy and slightly tangy flavor. Raspuri takes the sixth position in the ranking. This variety is valued for its sweetness and pleasant aroma. Its popularity might be attributed to its versatile use, both as a

table fruit and for processing. Banganpalli, also known as Safed, ranks seventh. This variety is often preferred for its large size and mild taste. It's frequently used for making mango-based dishes and desserts. The tenth position is occupied by the category "Any Other." This could refer to mango varieties not specifically listed in the table. These varieties might have a lower recognition factor or are less commonly available in comparison to the top-ranked ones. The presented ranking of mango varieties offers insights into consumer preferences and the popularity of different mango types. Alphanso emerges as the most sought-after variety, known for its exceptional taste and quality. Mallika, Totapuri, Amrapali, and others follow in terms of popularity, each offering unique flavors and characteristics. This information is valuable for various stakeholders in the mango industry, helping them understand market trends and make informed decisions related to cultivation, distribution, and consumer preferences.

Table 2: Consumer Preference for Quality Attributes of Mango

Sl. No.	Quality Attribute	Garret Score	Rank
1	Colour	60.95	3
2	Aroma	61.63	2
3	Taste	72.05	1
4	Size	50.33	4
5	Shape	43.38	5
6	Stone Size	36.21	8
7	Thickness of the skin	36.75	7
8	Pulp texture	37.70	6

The table provides a ranking of various quality attributes that are considered important when purchasing mangoes. The attributes include color, aroma, taste, size, shape, stone size, thickness of the skin, and pulp texture. The ranking offers insights into the relative significance of these attributes for consumers, helping them make informed decisions when selecting mangoes.

Taste is ranked as the most crucial quality attribute when purchasing mangoes. This underscores the fact that the primary reason for buying mangoes is their flavor. Consumers prioritize the rich and delightful taste that mangoes offer. Aroma is given the second rank, indicating its strong influence on the perception of mango quality. A fruity and appealing aroma often indicates ripeness and sweetness, which are highly desired in mangoes. Color secures the third position in importance. While color is a noticeable aspect, it is important to note that the color of a mango might not always be the best indicator of its ripeness or taste. Mango size is ranked fourth. Size can affect the overall experience of consuming a mango, with some consumers preferring larger fruits for more pulp. Shape holds the fifth rank. While uniform and visually appealing shapes can enhance the aesthetic appeal, it is generally considered less critical compared to taste and aroma. Pulp texture is ranked sixth. The texture of the mango's flesh contributes to the overall eating experience, but it might not be as immediately noticeable as taste, aroma, or color. Thickness of the skin ranks seventh. Thinner skins can be easier to bite into and consume, but this attribute might not be as prominently considered as others. Stone size is placed at the bottom of the ranking. While a smaller stone might

result in more edible flesh, it is often considered a secondary factor when compared to attributes like taste and aroma. The ranking of quality attributes for purchasing mangoes reflects the consumer preferences and priorities when selecting these fruits. Taste and aroma are the most critical factors, as they directly influence the enjoyment of the mango. Color, size, and shape follow in importance, contributing to the visual and sensory appeal of the fruit. Attributes such as pulp texture, skin thickness, and stone size are of relatively lower concern, suggesting that they play a more secondary role in the decision-making process. By understanding these preferences, both consumers and sellers can better align their choices and offerings, resulting in a more satisfying mango purchasing experience.

Table 3: Consumer Preference for Place of Purchasing Mangoes

Sl. No.	Consumer Preference of Place of Purchase for mangoes	Garret Score	Rank
1	APMC	59.17	3
2	Super Market	52.84	5
3	HOPCOMS	49.23	7
4	Online Platforms	48.05	8
5	Local traders	61.77	1
6	Roadside Vendors	59.60	2
7	FPO	46.43	9
8	Farm gate	54.85	4
9	Agricultural University	50.05	6

The table presents a ranking of consumer preferences for different places of purchase when it comes to buying mangoes. The places include APMC (Agricultural Produce Market Committee), Supermarkets, HOPCOMS (Horticultural Producers' Cooperative Marketing and Processing Society), online platforms, local traders, roadside vendors, FPO (Farmers' Producer Organization), farm gates, and Agricultural University outlets.

Local traders hold the top position in terms of consumer preference for purchasing mangoes. This suggests that consumers often prioritize purchasing mangoes from nearby vendors who might offer a direct and personal connection. Roadside vendors are ranked second, indicating that consumers are drawn to the convenience and accessibility of purchasing mangoes from local vendors along roadsides. APMC stands at the third position. Agricultural Produce Market Committees are known for centralized trading, and some consumers prefer this formal setting for purchasing mangoes. Farm gates are ranked fourth. Buying mangoes directly from the source, at the farm gate, appeals to consumers seeking freshness and a direct connection with the growers. Supermarkets are ranked fifth. These organized retail spaces provide convenience, and some consumers are willing to purchase mangoes from supermarkets for a more controlled shopping experience. Agricultural University outlets secure the sixth rank. These outlets might offer educational and quality assurance benefits that attract certain consumers. HOPCOMS ranks seventh. This cooperative marketing society might cater to consumers looking for trusted sources of produce. Online platforms stand at the eighth position. While the convenience of online shopping is acknowledged, mangoes being a perishable item might lead to some hesitation among consumers. Farmers' Producer Organizations are ranked last. This could be due to

limited awareness or presence of such organizations for mango sales.

The ranking of consumer preferences for places of purchasing mangoes highlights the diverse considerations consumers have when selecting their preferred source. The top-ranked options—local traders and roadside vendors—emphasize the importance of proximity, personal interaction, and perceived freshness. Other options such as APMC, farm gates, and supermarkets offer varied benefits such as centralized trading, direct-from-source purchases, and organized retail experiences. Online platforms, Agricultural University outlets, and cooperative marketing societies are also considered by consumers, though with varying degrees of preference. Understanding these preferences is valuable for producers, retailers, and policymakers in tailoring their offerings and strategies to cater to consumer expectations and demands.

Table 4: Reason for choosing a particular Place for purchasing mangoes

Sl. No.	Reason to choose a particular place for purchasing mango	Garret Score	Rank
1	Less Price	60.05	2
2	Natural Ripening	65.58	1
3	Good Keeping quality	57.31	3
4	Easy access/ availability	54.53	5
5	Freshness of the produce	56.53	4
6	Good Packing	40.08	6
7	Branding	31.87	8
8	Admissibility to choose/ select produce	33.10	7

The table presents a ranking of reasons that influence consumers in choosing a particular place for purchasing mangoes. These reasons include factors such as less price, natural ripening, good keeping quality, easy access/availability, freshness of the produce, good packing, branding, and the ability to choose/select produce.

Natural ripening secures the top rank, highlighting the significance of consumers seeking mangoes that have matured naturally on the tree. The assurance of optimal flavor and quality drives this preference. The second rank is given to less price. While quality is important, affordability remains a key factor in the decision-making process for many consumers. Consumers rank good keeping quality as the third most important factor. Mangoes that stay fresh for a longer duration are valued for their extended shelf life. Freshness is ranked fourth. Consumers prioritize mangoes that retain their natural texture, flavor, and aroma, contributing to a satisfying eating experience. Easy access and availability hold the fifth position. Consumers appreciate convenience and readily accessible sources for purchasing mangoes. The sixth rank is assigned to good packing. Packaging that ensures protection and preservation of mangoes during transportation and storage is valued by consumers. Consumers rank the ability to choose/select produce as seventh. Being able to personally select mangoes allows consumers to assess quality and suitability. Branding takes the eighth position. While some consumers might consider well-known brands, others prioritize factors like taste and quality over branding. The ranking of reasons for choosing a particular place for purchasing mangoes sheds light on the various considerations that guide consumer

decisions. Natural ripening emerges as the most influential factor, emphasizing the desire for authentic flavor and quality. Factors such as price, keeping quality, freshness, and easy access follow closely, reflecting the balance between affordability, longevity, and convenience. Good packing, the ability to choose produce, and branding play slightly less significant roles, indicating that while they matter, they might not be primary drivers of choice. By understanding these preferences, sellers and producers can align their offerings to meet consumer expectations, enhancing customer satisfaction and building stronger relationships with their target audience.

Conclusion

This study offers a comprehensive and insightful analysis of consumer preferences, mango variety rankings, quality attributes, preferred places of purchase, and factors influencing purchasing decisions in the context of mangoes in India. The findings illuminate essential aspects that impact both consumers and stakeholders in the mango industry, contributing to the understanding of market dynamics, consumer behaviors, and effective marketing strategies.

The mango variety ranking highlights the dominance of the Alphanso mango as the most favored among the listed varieties. Its distinct flavor, aroma, and texture position it as the preferred choice, closely followed by varieties such as Mallika, Totapuri, and Amrapali. These rankings provide valuable insights for growers, distributors, and researchers to align cultivation and marketing strategies with consumer preferences, thus potentially optimizing profitability and satisfying consumer demand. The assessment of quality attributes during mango purchasing emphasizes the critical role of taste, aroma, and color in driving consumer choices. While taste remains the paramount factor, the significance of aroma and visual appeal (color) underscores the multisensory nature of mango selection. This understanding empowers sellers to focus on these attributes to enhance consumer satisfaction and build brand loyalty. The consumer preference for different places of purchase reveals a diverse range of priorities. Local traders and roadside vendors emerge as popular choices due to their proximity, personal interaction, and perceived freshness. This preference resonates with the cultural emphasis on building relationships and engaging with local markets. At the same time, organized platforms such as supermarkets, Agricultural Produce Market Committees, and farm gates offer alternative choices catering to different consumer needs. The reasons influencing the choice of purchasing places reflect a balance between quality, affordability, and convenience. Natural ripening and reasonable pricing are critical factors, highlighting consumers' desire for authentic flavors and cost-effectiveness. Factors such as good keeping quality, freshness, and easy access also play significant roles in shaping purchasing decisions. These insights can guide producers and sellers in creating marketing strategies that align with these consumer priorities.

In essence, this study provides a comprehensive overview of the intricate interplay between mango varieties, consumer preferences, quality attributes, and purchasing patterns. The insights derived from this research have implications for various stakeholders, including mango producers,

distributors, policymakers, and researchers. By recognizing and accommodating these preferences and trends, the mango industry can better cater to consumer demands, enhance customer satisfaction, and ensure the sustainability of this iconic fruit in the Indian market.

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