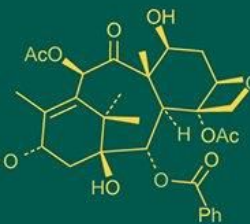
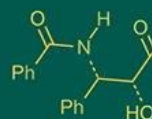


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A study on the acid lime purchasing and quality parameter preferred by the households in the Vijayapura district of Karnataka, India

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Abstract

The purchasing behaviour of households toward acid limes reflects a strong preference for visual attributes, with both rural and urban respondents prioritizing external qualities over internal ones. An analysis of the quality parameters influencing these decisions reveals that colour is the most significant factor, cited by 60% of rural and 62% of urban respondents. This suggests that consumers equate vibrant and appealing colours with freshness and quality, making it a crucial determinant of choice. Appearance, too, holds considerable importance, with 52% of rural and 55.33% of urban households considering it a vital characteristic. Similarly, size emerges as another key factor, valued by 56.67% of rural and 58.67% of urban respondents. These findings underscore the dominance of visual appeal in shaping consumer preferences, with larger, well-shaped limes likely being perceived as more desirable or indicative of superior quality. Conversely, juice content, a functional attribute, appears to play a less significant role in purchase decisions. Only 15.33% of rural and 10% of urban households identified it as a deciding factor. Aroma, ranking as the least important quality parameter, was mentioned by just 4.67% of rural and 3.33% of urban respondents. The study suggests that producers and marketers should focus on enhancing the visual appeal of acid limes to align with consumer preferences. Overall, these findings emphasize the critical role of visual characteristics in determining consumer behaviour in both rural and urban settings.

Keywords: Consumer behavior, purchasing preferences, acid limes, quality parameters

Introduction

The Kagzi lime variety, originating from the Vijayapura district, has earned the prestigious Geographical Indication (GI) tag, recognizing its distinctiveness and importance (Kumar *et al.*, 2017) [6]. In the district, Indi taluka stands out with 4,681 hectares dedicated to lime cultivation, resulting in a production of 107,601 metric tons and a productivity rate of 22.98 metric tons per hectare. In comparison, Sindagi taluka cultivates 1,496 hectares, yielding 31,592 metric tons at a productivity rate of 21.11 metric tons per hectare (Government of Karnataka, Department of Horticulture, 2021). The limes from this region are highly sought after by the food processing industry due to their impressive characteristics, including large size, abundant juice content, pronounced acidity, high ascorbic acid content and excellent shelf life (Conner and Booth, 1988) [3]. So, the present study aims to offer a comprehensive view of acid lime parameters involved in purchasing by the consumer based on the appearance their market study and the selection of the lime based on quality parameters. This study explores these variations to understand the underlying factors influencing household choices.

Materials and Methods

The study was conducted during 2023-24 in Vijayapura district of Karnataka, to study the purchasing and quality parameters considered by the households in the acid lime fruits in the Vijayapura district of Karnataka, India.

The parameters were measured, the color and appearance of fruit were measured as per the DUS guidelines of citrus. The maturity data was collected from the households on their purchasing time.

Keeping in view the objectives and variables of the study, a structured interview schedule was developed by consulting experts and referring to the relevant literature. Pretesting of the schedule was carried out in non-sample area for its practicability and relevance. The final schedule was prepared by making necessary corrections based on pre-testing results.

Statistical tools used

The following statistical tools were made use in the study to analyze the data.

Arithmetic Mean: The arithmetic mean represents the average of a dataset, calculated by dividing the total sum of all values by the number of observations. It serves as a basis for categorizing independent variables into categories such as low, medium, and high.

Frequency: Frequency refers to the occurrence or count of respondents under various selected parameters. It helps in identifying and analyzing the distribution pattern of farmers across different variables based on their perceived significance.

Percentage: Percentage is a statistical tool used to draw simple comparisons. By converting data into proportional values, it allows for an easy and concise understanding of differences and trends across categories.

Standard Deviation: Standard deviation quantifies the amount of variation or dispersion within a dataset. It is calculated as the square root of the average of the squared deviations from the mean. This measure aids in classifying dependent and independent variables into distinct categories—low, medium, and high—based on the extent of variability observed.

Results and Discussion

The purchasing patterns of acid lime across rural and urban households reveal distinct preferences shaped by socio-economic and environmental factors exhibited in Table 1. Rural households exhibit a higher dependence on self-cultivation as a means of acquiring acid lime, with 43.34% of respondents engaging in this practice. This trend reflects the agrarian nature of rural communities, where household farming is a prevalent tradition. Self-cultivation allows rural households to reduce reliance on external sources and maintain sustainable access to produce, highlighting their resilience and self-sufficiency (Mulligan, 2022) ^[7]. However, the comparatively lower percentage (16.67%) of urban households practicing self-cultivation underscores a different lifestyle characterized by limited space for cultivation and greater reliance on market-based acquisition. Urban households show a tendency toward frequent purchasing, with 42% buying acid lime once a week and 23.33% purchasing twice a week. This purchasing frequency can be attributed to urban lifestyles, where convenience and accessibility to markets play a significant role. The relatively higher population density in urban areas ensures proximity to retail markets, enabling households to purchase smaller quantities more regularly to meet immediate needs. On the other hand, the lower percentage of rural households purchasing once a week (25.33%) may reflect their preference for bulk purchasing, supported by

their ability to store produce or supplement with self-cultivated resources. Purchasing acid lime once every 15 days is notably more common among urban households (18%) compared to rural households (9.33%). Urban respondents may balance between frequent market visits and occasional bulk purchases, adapting to their varying schedules and consumption patterns. For rural households, lower reliance on this practice is consistent with their dominant self-cultivation habits.

The contrast in acquisition methods underscores broader socio-economic differences. Rural households' reliance on self-cultivation illustrates their connection to land and agricultural traditions, while urban households' purchasing behavior is shaped by market dynamics and convenience (Budiarto *et al.*, 2019) ^[1]. These findings provide valuable insights into consumer behavior, offering opportunities for targeted interventions, such as enhancing supply chains to support urban demand or promoting sustainable farming practices among rural communities to increase agricultural output (Castillo *et al.*, 2023) ^[2]. Understanding these patterns can aid stakeholders in addressing the diverse needs of both rural and urban populations effectively.

Table 1: Purchasing pattern of acid lime by households

(N=300)

Sl. No.	Purchasing	Rural (n ₁ =150)		Urban (n ₂ =150)	
		f	%	f	%
1.	Once in a week	38	25.33	63	42.00
2.	Twice in a week	33	22.00	35	23.33
3.	Once in every 15 days	14	9.33	27	18.00
4.	Self cultivation	65	43.34	25	16.67

f-Frequency, %-Percentage

The consumer preferences for acid lime among rural and urban households demonstrate distinctive trends shaped by visual and sensory attributes presented in Table 2. Colour emerges as a critical determinant, with a significant majority of both rural (76.67%) and urban (73.34%) households showing a preference for acid limes at the light green stage. This shared inclination underscores the importance of ripeness, as the light green colour likely reflects optimal freshness and acidity levels, which are essential for culinary applications and flavour preferences in both demographics. However, variations in colour preference between the two groups highlight nuanced consumer behaviours. A higher percentage of urban households (19.33%) favoured yellow fruits compared to rural households (8%). This preference may be linked to urban consumers' perception of ripeness or sweetness, which yellow fruits might signify. Conversely, green fruits were more preferred by rural households (15.33%) than urban respondents (7.33%), possibly due to traditional consumption habits or the availability of acid lime at different stages of maturity in rural areas (Mulligan *et al.*, 2024) ^[7]. When it comes to fruit shape, oval-shaped acid limes were favoured by a majority of rural (58%) and urban (54.67%) households. The preference for oval fruits could be attributed to perceptions of better quality, ease of handling, or a cultural association of this shape with desirable traits. Despite this majority preference, round-shaped fruits also found significant acceptance, with 42% of rural and 45.33% of urban households favouring them. The relatively balanced preferences for fruit shape suggest that both groups are adaptable, likely influenced by availability and market exposure.

These findings underscore the pivotal role of visual characteristics, such as colour and shape, in influencing consumer choices (Gao *et al.*, 2011; Davus *et al.*, 2020) ^[5, 4]. While shared preferences for light green and oval-shaped acid limes reflect common quality standards, the divergence in preferences for yellow and green fruits between rural and urban households highlights the interplay of cultural, economic and market-driven factors. Understanding these preferences provides valuable insights for producers and retailers to tailor offerings, optimize marketing strategies and enhance customer satisfaction across diverse consumer segments.

Table 2: Quality characteristics of acid lime preferred by households

(N=300)					
Sl. No.	Characteristics	Rural (n1=150)		Urban (n2=150)	
		f	%	f	%
a. Colour					
1.	Green	23	15.33	11	07.33
2.	Light green	115	76.67	110	73.34
3.	Yellow	12	8.00	29	19.33
4.	Light yellow	9	6.00	17	11.33
b. Shape					
1.	Oval	87	58.00	82	54.67
2.	Round	63	42.00	68	45.33

f-Frequency, %-Percentage

The analysis of quality parameters in Table 3 influencing acid lime purchase decisions highlights the pivotal role of visual attributes over functional ones, reflecting distinct consumer preferences in both rural and urban areas. Among the evaluated factors, colour emerges as the most crucial attribute, with 60% of rural and 62% of urban households prioritizing it. This finding suggests a universal tendency to associate vibrant, appealing colours with freshness and quality. Similarly, appearance is another critical consideration, as evidenced by its significance to 52% of rural and 55.33% of urban respondents (Kumar *et al.*, 2017) ^[6]. These results point to the importance of external aesthetics in creating a perception of superior product quality.

Size also plays a prominent role in influencing consumer choices, with 56.67% of rural and 58.67% of urban households valuing it highly. This indicates that larger limes may be perceived as more desirable, potentially due to an assumption of higher juice yield or better quality. In contrast, juice content—a functional aspect—ranks notably lower in importance. Only 15.33% of rural and 10% of urban households considered it a determining factor (Mulligan *et al.*, 2022) ^[8]. This preference for external attributes over internal qualities could stem from the difficulty of assessing juice content at the time of purchase. Moreover, aroma receives minimal consideration, with just 4.67% of rural and 3.33% of urban respondents citing it as important. This may be due to practical challenges in evaluating aroma in market settings or a general perception that it is less critical to overall quality (Nastasi *et al.*, 2024) ^[9].

These findings indicate that producers and marketers should prioritize enhancing the visual appeal of acid limes—through measures such as improved grading, packaging and display—to align with consumer preferences. Additionally, efforts to educate consumers about the value of functional

qualities, such as juice content, could shift purchasing behaviour over time (Mavunalli *et al.*, 2024) ^[7] in guva.

Table 3: Quality parameters of acid lime used by households to purchase acid lime

(N=300)					
Sl. No.	Characteristics	Rural (n ₁ =150)		Urban (n ₂ =150)	
		f	%	f	%
1.	Colour	90	60.00	93	62.00
2.	Appearance	78	52.00	83	55.33
3.	Juice content	23	15.33	15	10.00
4.	Aroma	7	4.67	5	3.33
5	size	85	56.67	88	58.67

Multiple responses are possible, f-Frequency, %-Percentage

Conclusion

The purchasing patterns and quality preferences for acid lime among rural and urban households reveal distinct yet overlapping trends influenced by socio-economic, cultural and environmental factors. Rural households predominantly acquire acid lime through self-cultivation, highlighting their reliance on agricultural practices and self-sufficiency. Urban households, in contrast, depend more on regular market purchases, reflecting the influence of convenience and accessibility in shaping their behaviour. Preferences for quality characteristics, such as colour and shape, further emphasize the importance of visual and sensory attributes in consumer choices. The shared preference for light green acid limes among both rural and urban respondents signifies a common standard of ripeness and freshness.

Similarly, the slight inclination toward oval-shaped fruits in both groups underlines the perceived association with quality and ease of use. However, variations, such as a higher preference for yellow fruits among urban households and green fruits among rural ones, demonstrate the impact of differing consumption habits and perceptions. These findings underscore the necessity for producers and retailers to consider these diverse preferences in their strategies. By tailoring marketing, production and distribution practices to align with the unique needs of rural and urban consumers, stakeholders can enhance customer satisfaction and foster more effective supply chains. Understanding these behavioural patterns provides critical insights for addressing the broader socio-economic dynamics of agricultural produce consumption.

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