



Purchasing Behavior & Consumer Preferences of Dragon Fruit: A Case Study in Aizawl, Mizoram

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Abstract: This study explores the factors influencing consumer purchasing decisions and preferences for dragon fruit in Aizawl. The findings reveal that consumer choices are predominantly guided by quality attributes such as visual appeal, sweetness, freshness, and organic production. Attributes like shiny pinkish-red peel with green bracts, smooth and juicy flesh, and affordability (Rs. 80 to 200 per kilogram) emerged as top priorities among consumers. Demographically, middle-aged participants (41–50 years) and government employees exhibited the highest propensity for regular purchases, indicating the influence of health awareness and financial stability. While novelty was the primary motivation for 70.9% of buyers, a significant segment (29.1%) valued the fruit for its nutritional benefits. No significant associations were found between gender or household income and purchasing behavior, suggesting a broad appeal across socio-economic boundaries. The study's implications extend to farmers, marketers, and policymakers. Farmers are encouraged to focus on consumer-preferred attributes, while marketers can develop targeted campaigns emphasizing health benefits and affordability. Policymakers can promote sustainable cultivation and support small-scale farmers. However, limitations such as the small, geographically specific sample and reliance on self-reported data suggest the need for further research with larger, diverse samples and longitudinal designs to capture evolving consumer preferences.

Index Terms - Dragon fruit, consumer preferences, purchasing behavior, quality attributes, Aizawl

I. INTRODUCTION

The growing preference of consumers for healthier dietary options has led to increased interest in exotic and nutrient-rich fruits. Among these, dragon fruit (*Hylocereus* spp.), a member of the Cactaceae family and native to Central America, has gained significant attention worldwide. Its unique appearance, appealing taste, and recognized health benefits have contributed to its growing reputation as a “superfood” or “functional food” (Dayal et al., 2018). Rich in vitamins, minerals, antioxidants, and dietary fibre, dragon fruit is not only a nutritious option but also contributes to the physiological functions of the body, promoting better health and reducing the risk of chronic diseases (Kantaria et al., 2024).

In India, dragon fruit cultivation began in the late 1990s with imports from countries like Vietnam, Thailand, and Malaysia. However, domestic production has expanded rapidly, with states such as Gujarat, Karnataka, and Maharashtra leading the way and collectively accounting for nearly 70% of the national output (Press Information Bureau, 2023). Gujarat has renamed the fruit “Kamalam” due to its resemblance to the lotus flower, aligning with cultural preferences. Moreover, northeastern states like Mizoram have recently adopted dragon fruit cultivation, which works in favour of the region's agro-climatic conditions to support horticultural growth (National Bank for Agriculture and Rural Development, 2021).

Dragon fruit is widely acknowledged for its nutritional and health-promoting properties. It contains high levels of antioxidants, flavonoids, and essential vitamins such as B1, B2, B3, and C, which are associated with enhanced cardiovascular health, better glucose metabolism, and improved skin health (Kantaria et al., 2024). Its significant dietary fibre content aids in digestion, while its calcium and phosphorus contribute to stronger bones (Mori et al., 2023). Also, bioactive compounds found in dragon fruit have demonstrated anti-

inflammatory properties and potential in managing type 2 diabetes and reducing the risk of chronic diseases such as cancer (Poolsup et al., 2017; Song et al., 2016; see also Paško et al., 2021; Luu et al., 2021).

Consumer Preferences and Market Trends

The changing preferences of consumers in the food industry are influenced by factors such as sensory attributes, perceived health benefits, convenience, and cultural considerations (Petrescu et al., 2019). Specifically for dragon fruit, key attributes such as size, skin colour, pulp colour, sweetness, and freshness significantly affect purchasing decisions (Del Carmen et al., 2020). These sensory and quality attributes are particularly valued in markets across India, where the visual appeal and health benefits of dragon fruit have gained prominence among consumers (Wakchaure et al., 2021).

The global dragon fruit market is projected to grow at an annual rate of 3.9% over the next five years, driven by increasing demand for fresh and nutritious produce (Kantaria et al., 2024). In India, awareness regarding the nutritional value of dragon fruit, along with government support and the adoption of advanced farming techniques like drip irrigation, has further driven its popularity. Projections indicate that the area under dragon fruit cultivation in the country could increase tenfold within the next decade (Wakchaure et al., 2021).

Dragon Fruit Cultivation in Mizoram

Mizoram, located in northeastern India, is characterized by its hilly terrain and favorable climate, making it an ideal location for dragon fruit cultivation. In recent years, the dedication of local farmers and the support of government initiatives have significantly increased production in the production of dragon fruit as a cash crop. The state's Horticulture Department has provided essential resources, including seeds, fertilizers, and technical expertise, enabling farmers to optimize their efforts (Government of Mizoram, 2022).

Also, the Mizoram Market (Regulation and Facilitation) Act, 2022, has played an instrumental role in regulating prices, ensuring fair trading practices, and providing equitable market access to small-scale farmers. These efforts have not only improved the income levels of farmers but have also expanded their market reach, with dragon fruit now being sold to other districts and states (Government of Mizoram, 2022).

This study aims to analyze consumer preferences and purchasing behavior for dragon fruit in Aizawl. The objectives of the study are as follows:

1. To identify the key quality attributes that influence consumer purchasing decisions.
2. To examine the socio-demographic factors impacting consumer preferences and purchasing behavior.

II. RESEARCH METHODOLOGY

2.1 Population and Sample

The population of the study comprised residents of Aizawl and college students from Mizoram Christian College. Initially, a total of 250 respondents were selected as the sample for the study using convenience sampling. However, only 103 forms were completed, which were used in the final analysis. These participants were drawn from educational institutions and prominent shopping areas in Aizawl, to ensure diversity in consumer representation across the city.

3.2 Data and Sources of Data

Primary data for the study was collected through a structured survey instrument. The survey was developed based on findings gathered from Focus Group Discussions (FGDs) conducted with residents of Aizawl and students from Mizoram Christian College. The questionnaire consisted of two sections: the first section concerns the sociodemographic background of the respondents, while the second section was on their purchasing habits and preferences for dragon fruit quality attributes.

3.3 Analytical Framework

The collected data was analyzed using SPSS V.22. Descriptive analysis such as counts (N) and percentages (%) were used to summarize the characteristics of the respondents and their purchasing behavior. Also, Chi-Square tests and Fisher's Exact Test were used to examine the relationships between sociodemographic variables and consumer behaviour, while counts and percentages were depicted in graphical forms to represent consumer preferences of dragon fruit attributes.

III. RESULTS AND DISCUSSION

3.1 Demographic Profile of the Study Participants

Table 3.1: Demographic Profile of the Study Participants

Demographic Variable	Categories	N	%
Age	18-30	29	28.2%
	31-40	18	17.5%
	41-50	30	29.1%
	51-60	26	25.2%
Gender	Male	40	38.8%
	Female	63	61.2%
Household Monthly Income	Below 25,000	2	1.9%
	Between 25,000 and 40,000	7	6.8%
	Between 40,000 and 50,000	41	39.8%
	Above 50,000	53	51.5%
Occupation	Unemployed, homemaker, student or currently looking for work	24	23.3%
	Own business	17	16.5%
	Private organization	19	18.4%
	Government	43	41.7%

The demographic profile of the study participants is presented in Table 3.1. Among the 103 participants, the age distribution was as follows: 29 participants (28.2%) were in the 18-30 age group, 18 participants (17.5%) were in the 31-40 age group, 30 participants (29.1%) were in the 41-50 age group, and 26 participants (25.2%) were in the 51-60 age group.

Regarding gender, 40 participants (38.8%) were male, while 63 participants (61.2%) were female. In terms of household monthly income, 2 participants (1.9%) reported an income below 25,000, 7 participants (6.8%) earned between 25,000 and 40,000, 41 participants (39.8%) earned between 40,000 and 50,000, and 53 participants (51.5%) reported an income above 50,000.

The occupational distribution of the participants was as follows: 24 participants (23.3%) were unemployed, homemakers, students, or currently looking for work; 17 participants (16.5%) were engaged in their own business; 19 participants (18.4%) worked in private organizations; and 43 participants (41.7%) were employed in government positions.

3.2: Dragon Fruit Purchasing Behaviour of the Participants

Table 3.2: Dragon Fruit Purchasing Behaviour of the Participants

Variable	Category	N	%
Frequency of Buying	Regularly	29	28.2%
	Sporadically	74	71.8%
Quantity of Fruits Bought/Obtained	1-3 Pieces	23	22.3%
	2 Kgs to 3 kgs	34	33.0%
	More than 3 kgs	46	44.7%
Source of Dragon Fruit	Market	31	30.1%
	Self-Grown	43	41.7%
	Roadside Stalls	29	28.2%
Reason for Consuming Dragon Fruit	Nutritional and health value	30	29.1%
	Novelty Consumption	73	70.9%

The dragon fruit purchasing behavior of the participants is summarized in Table 3.2. In terms of frequency, 29 participants (28.2%) reported buying dragon fruit regularly, while 74 participants (71.8%) bought it sporadically. Regarding the quantity of dragon fruit bought or obtained, 23 participants (22.3%) purchased 1-3 pieces, 34 participants (33.0%) bought between 2 kg to 3 kg, and 46 participants (44.7%) obtained more than 3 kg.

The sources from which participants obtained their dragon fruit were as follows: 31 participants (30.1%) purchased it from the market, 43 participants (41.7%) grew it themselves, and 29 participants (28.2%) bought it from roadside stalls. The main reasons cited for consuming dragon fruit were identified as follows: 30 participants (29.1%) consumed it for its nutritional and health value, while 73 participants (70.9%) consumed it for novelty.

3.3. Association Between the Demographic Variables and Purchasing Behaviour of the Participants

Table 3: Association Between the Demographic Variables and Purchasing Behaviour of the Participants

Purchasing Behaviour	Demographic Variable	Statistics	Test Statistic	p-value
Frequency of Buying	Age	Fisher-Freeman-Halton Exact Test	11.25	< .05
	Gender	Pearson Chi-Square	0.02	> .05
	Household Monthly Income	Fisher-Freeman-Halton Exact Test	0.87	> .05
	Occupation	Fisher-Freeman-Halton Exact Test	51.61	< .01
Quantity of Fruit Bought/Obtained	Age	Pearson Chi-Square	9.81	> .05
	Gender	Pearson Chi-Square	4.03	> .05
	Household Monthly Income	Fisher-Freeman-Halton Exact Test	7.01	> .05
	Occupation	Pearson Chi-Square	6.26	> .05
Source of Dragon Fruit	Age	Pearson Chi-Square	2.96	> .05
	Gender	Pearson Chi-Square	0.32	> .05
	Household Monthly Income	Fisher-Freeman-Halton Exact Test	6.27	> .05
	Occupation	Fisher-Freeman-Halton Exact Test	4.35	> .05
Reason For Buying	Age	Pearson Chi-Square	8.78	< .05
	Gender	Pearson Chi-Square	1.09	> .05
	Household Monthly Income	Fisher-Freeman-Halton Exact Test	3.38	> .05
	Occupation	Fisher-Freeman-Halton Exact Test	22.78	< .01

Table 3.3 presents the results of statistical tests examining the association between demographic variables and purchasing behavior. For frequency of buying, the analysis revealed a significant association with age (Fisher-Freeman-Halton Exact Test = 11.25, $p < .05$). However, no significant association was found with gender (Pearson Chi-Square = 0.02, $p > .05$), household monthly income (Fisher-Freeman-Halton Exact Test = 0.87, $p > .05$), or occupation (Fisher-Freeman-Halton Exact Test = 51.61, $p < .01$).

Regarding the quantity of fruit bought/obtained, no significant associations were observed with age (Pearson Chi-Square = 9.81, $p > .05$), gender (Pearson Chi-Square = 4.03, $p > .05$), household monthly income (Fisher-Freeman-Halton Exact Test = 7.01, $p > .05$), or occupation (Pearson Chi-Square = 6.26, $p > .05$).

For the source of dragon fruit, no significant associations were found with age (Pearson Chi-Square = 2.96, $p > .05$), gender (Pearson Chi-Square = 0.32, $p > .05$), household monthly income (Fisher-Freeman-Halton Exact Test = 6.27, $p > .05$), or occupation (Fisher-Freeman-Halton Exact Test = 4.35, $p > .05$).

Finally, for the reason for buying dragon fruit, a significant association was found with age (Pearson Chi-Square = 8.78, $p < .05$) and occupation (Fisher-Freeman-Halton Exact Test = 22.78, $p < .01$), while no significant association was found with gender (Pearson Chi-Square = 1.09, $p > .05$) or household monthly income (Fisher-Freeman-Halton Exact Test = 3.38, $p > .05$).

3.4. Comparison of Column Proportion for Significant Association Between the Demographic Variables and Purchasing Behavior of the Participants

Table 3.4: Comparison of Column Proportion (Bonferroni Adjustment Applied) for Significant Association Between the Demographic Variables and Purchasing Behaviour of the Participants

Age →		18-30	31-40	41-50	51-60
Occupation →		Unemployed, homemaker, student or currently looking for work	Own business	Private organization	Government
1. Frequency of Buying (by Age)	Regularly	3 _a	3 _{a, b}	14 _b	9 _{a, b}
	Sporadically	26 _a	15 _{a, b}	16 _b	17 _{a, b}
2. Frequency of Buying (by Occupation)	Regularly	0 _a	1 _a	0 _a	28 _b
	Sporadically	24 _a	16 _a	19 _a	15 _b
3. Reason for Consuming Dragon Fruit (by Age)	Nutritional and Health Value	14 _a	2 _a	9 _a	5 _a
	Novelty Consumption	15 _a	16 _a	21 _a	21 _a
4. Reason for Consuming Dragon Fruit (by Occupation)	Nutritional and Health Value	13 _a	1 _{b, c}	0 _c	16 _{a, b}
	Novelty Consumption	11 _a	16 _{b, c}	19 _c	27 _{a, b}

Note: Similar subscript letters indicate the groups that do not differ significantly from each other at the 0.05 significance level

Pairwise comparison for the significant associations between the demographic variables and the purchasing behavior of the participants are given in Table 3.4. The interpretation of the comparisons are given in the next passages:

3.4.1. Frequency of Buying Dragon Fruit (by Age)

Among participants who regularly buy dragon fruit, those aged 41-50 were significantly more likely to do so compared to the 18-30 and 31-40 age groups, as indicated by the differing subscripts ("b" vs. "a"). However, participants aged 51-60 fell into an overlapping category ("a, b"), showing no significant difference from any other group. For sporadic buyers, participants aged 18-30 had the highest proportion of buyers, significantly more than those in the 41-50 age group ("a" vs. "b"). Meanwhile, participants aged 31-40 and 51-60 fell into an overlapping category ("a, b") and did not significantly differ from the other groups.

3.4.2. Frequency of Buying Dragon Fruit (by Occupation)

Regular buyers were most prevalent among participants in government jobs, with a significantly higher proportion compared to participants in other occupational categories, such as the unemployed, own business, and private organization, all of whom did not significantly differ from each other ("b" vs. "a"). In contrast, sporadic buyers were most common in the unemployed, own business, and private organization categories, with no significant differences among them ("a"). Participants in government jobs, however, showed significantly fewer sporadic buyers ("b").

3.4.3. Reason for Consuming Dragon Fruit (by Age)

For the reason categorized as Nutritional and Health Value, no significant differences were observed among the age groups. All participants aged 18-30, 31-40, 41-50, and 51-60 were marked with the same subscript ("a"), indicating similar proportions across these categories. Similarly, for Novelty Consumption, all age groups shared the same subscript ("a"), showing no significant differences in their reasons for consuming dragon fruit based on novelty. In this, while the chi-square test (Table 3.4.3) indicates that there is a significant association between 'Reason for Consuming Dragon Fruit' and 'Age', the lack of significant

pairwise differences reveals that that the observed differences may be subtle and distributed across the age groups, rather than being isolated to specific pairs.

3.4.4. Reason for Consuming Dragon Fruit (by Occupation)

For Nutritional and Health Value, participants in government jobs and the unemployed group showed significantly higher proportions compared to those in own businesses and private organizations. Specifically, participants in private organizations had the lowest proportion, significantly differing from the unemployed group and those in government jobs ("c" vs. "a, b"). For Novelty Consumption, participants in government jobs and private organizations reported significantly higher proportions than those in own businesses and the unemployed group. Those in own businesses shared overlapping categories with both higher and lower groups, falling into a middle range of proportions.

Participants' Preferences for Attributes of Dragon Fruit Bought

Table 3.5. Consumer Preferences for the Attributes When Buying Dragon Fruit

Attributes	Characteristics	N	%
Peel Colour	Shiny pinkish-red with green bracts	103	100.0%
	Dull red with yellowing bracts	0	0.0%
Size	Medium	26	25.2%
	Large	77	74.8%
Shape	Round & Symmetrical	96	93.2%
	Irregular or slightly elongated	7	6.8%
Firmness/Feel	Slightly firm (not too soft)	97	94.2%
	Moderately firm (ideal for crisp texture)	6	5.8%
Flesh Texture	Smooth and juicy	102	99.0%
	Crunchy & Dense	1	1.0%
Sweetness Level	Very sweet (high sugar content)	98	95.1%
	Balanced	5	4.9%
Flavour	Midly Fruity	95	92.2%
	Tangy with a subtle earthy taste	8	7.8%
Flesh Colour	Red flesh with small black seeds	92	89.3%
	White flesh with small black seeds	11	10.7%
Freshness Indicator 1: Bract Condition	Green, fresh-looking bracts (freshly harvested)	98	95.1%
	Yellowing or dry bracts (older fruit)	5	4.9%
Freshness Indicator 2: Peel Quality	Blemish-free, smooth peel	100	97.1%
	Minor blemishes or small spots	3	2.9%
Price Points	Affordable (e.g., Rs. 80 to 200 per kg.)	95	92.2%
	Premium-priced (e.g., Rs. 300+ per kg/Certified)	8	7.8%
Production System	Organically produced (no chemicals)	86	83.5%
	Conventionally produced	17	16.5%
Bonus Attribute: Added Value Options (Processing)	Fresh, whole fruit	100	97.1%
	Sliced, ready-to-eat pieces	3	2.9%

As per Table 3.5, the participants exhibited distinct preferences for the attributes of dragon fruit. All respondents (100%) preferred shiny pinkish-red peel with green bracts over dull red peel with yellowing bracts. For size, a majority (74.8%) favored large fruits, while 25.2% opted for medium size. Regarding shape, 93.2% of participants preferred round and symmetrical fruits, with only 6.8% selecting irregular or slightly elongated options.

In terms of firmness, 94.2% chose slightly firm fruits, while 5.8% preferred moderately firm ones, ideal for a crisp texture. Flesh texture preferences overwhelmingly leaned toward smooth and juicy (99.0%), with only 1.0% selecting crunchy and dense. A very sweet taste was chosen by 95.1% of consumers, compared to 4.9% who favored balanced sweetness.

For flavor, 92.2% preferred a mildly fruity taste, while 7.8% selected tangy with a subtle earthy undertone. Most participants (89.3%) chose red-fleshed fruits with small black seeds, whereas 10.7% preferred white-fleshed options. Freshness indicators such as bract condition and peel quality were important, with 95.1% favoring green, fresh-looking bracts and 97.1% opting for blemish-free, smooth peel.

Affordable pricing was highly preferred, with 92.2% selecting price points between Rs. 80 to 200 per kilogram, while only 7.8% opted for premium-priced fruit (Rs. 300+ per kilogram). Organically produced dragon fruit was favored by 83.5% of participants, compared to 16.5% who preferred conventionally produced alternatives. Fresh, whole fruit was overwhelmingly preferred (97.1%), while only 2.9% opted for sliced, ready-to-eat pieces.

Further statistical testing of these data is inappropriate due to the extreme skewness of the preferences observed. Several attributes, such as peel color, flesh texture, and sweetness level, showed near-unanimous preferences, leaving minimal variability in the data. This lack of variability undermines the assumptions required for meaningful statistical comparisons, as such tests would not yield additional insights beyond the descriptive proportions already provided.

IV. Discussion

The findings indicate that consumer preferences for dragon fruit are significantly driven by specific quality attributes. A unanimous preference for shiny pinkish-red peel with green bracts (100%) suggests that visual appeal is a critical factor. Similarly, the majority of consumers favored large-sized fruits (74.8%) and round, symmetrical shapes (93.2%), which shows the importance of size and aesthetics in consumer decisions.

Nearly all participants (94.2%) preferred slightly firm fruits, and 99% favored smooth and juicy flesh, which indicates a strong demand for freshness and a satisfying eating experience. Sweetness emerged as a top priority, with 95.1% of respondents selecting very sweet fruits, while 92.2% preferred a mildly fruity flavor over tangy options. Red-fleshed fruits with small black seeds were favored by 89.3%, which shows the preferences tied to taste and visual appeal.

Freshness indicators, such as green, fresh-looking bracts (95.1%) and blemish-free peel (97.1%), strongly influenced purchasing decisions, showing the consumers' concern for quality and freshness. Affordability was another key determinant, with 92.2% of participants preferring price points between Rs. 80 to 200 per kilogram. Also, the preference for organically produced dragon fruit (83.5%) may indicate the growing consumer demand for health-conscious and environmentally sustainable products.

The study also identified significant associations between socio-demographic variables and purchasing behavior. Age was found to influence buying frequency, with participants aged 41–50 being the most regular buyers, while younger participants (18–30) exhibited more sporadic buying patterns. This suggests that middle-aged consumers may have a stronger inclination towards integrating dragon fruit into their regular diets, which may be due to greater health awareness or purchasing power.

Occupation also played a significant role. Government employees were more likely to purchase dragon fruit regularly compared to participants in other occupational categories. This pattern may reflect greater financial stability or exposure to awareness programs about the health benefits of dragon fruit. On the other hand, no significant associations were observed between gender or household income and purchasing behavior, which may suggest that dragon fruit consumption transcends economic and gender-specific boundaries.

Regarding the reasons for consumption, novelty emerged as the primary driver, with 70.9% of participants citing it as their reason for buying dragon fruit. However, a notable segment (29.1%) emphasized nutritional and health benefits, particularly among middle-aged and government-employed individuals. This may serve as a valuable information for farmers and local merchants for the potential for shrewd marketing strategies that emphasize both the exotic appeal and health-promoting qualities of dragon fruit.

V. Implications for the Study

Results from this study can help stakeholders in the dragon fruit market to make better decisions in their respective practices. Farmers can optimize their production by focusing on attributes that align with consumer preferences, such as visual appeal, sweetness, and freshness. Marketers can craft campaigns targeting middle-aged consumers and government employees, as well as those from other sociodemographic sections,

emphasizing health benefits and affordability. Policymakers and agricultural agencies can make use of such findings to promote sustainable cultivation practices and support small-scale farmers in regions like Mizoram.

Moreover, the demand for organically grown fruits indicates a potential to engage in organic agricultural certifications and education. Expanding the availability of dragon fruit at reasonable prices can also assist in the conversion irregular purchases into regular customers, hence improving market stability and expansion.

VI. Conclusions

This study gives a glimpse of consumer preferences about dragon fruit purchasing behavior and consumer preferences of the fruit in the context of Aizawl, but it is important to understand the study limits. First, because of the small and geographically unique sample size, the results may not be representative of other populations or locations. Second, convenience sampling may have added biases, and depending on self-reported data increases the likelihood of memory or social desirability biases. Also, the lack of longitudinal data prevents us from determining whether preferences remain stable over time.

Yet, these limitations do not diminish the information gained from the study. The clear preference for visual appeal, sweetness, and organic production show areas where producers and marketers can focus their efforts. It is encouraging that even with its relatively high cost, dragon fruit remains appealing to many consumers, signaling its potential as both a functional and desirable food, and also as a potential cash crop.

Future research should recruit a larger, more diverse samples and investigate additional characteristics (such as texture, aroma, and packaging). These approaches would contribute to a deeper understanding of customer preferences and guarantee that findings are relevant across various markets. This will help stakeholders in dragon fruit production to adapt and succeed in a competitive and developing market.

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