Original Article

Exploring Consumer Preferences for Fruit Juice Brands in Barak Valley: A Statistical Analysis

[1]Jarita Das, [2]Parag Shil
[1]Assistant Professor, Department of Statistics, M H C M Science College, Hailakandi, Assam, India.
[2]Professor, Department of Commerce, Assam University, Silchar, Assam, India.

Abstract: This study aims to analyze consumer preferences toward fruit juice brands in the Barak Valley region of Assam, India, through statistical analysis. The study conducted a mixed-mode survey on a sample size of 400 consumers using a structured questionnaire to collect primary data on their demographics, consumption patterns, and brand preferences. The data collected was analyzed using descriptive and inferential statistics, including frequency distributions, correlation matrix, and chi-square test with the Monte Carlo method. The research aims to identify the leading fruit juice brands in the Barak Valley region and to determine the factors influencing consumer brand preference. The findings of the study reveal that Tropicana and Real are the major players in the region's fruit juice market. Brand preference is found to be significantly associated with demographic parameters such as consumers' educational qualifications and income. The study revealed that brand image, price, and availability are significant factors affecting brand preference, whereas quality and taste do not have a significant impact. These findings of the study provide valuable insights into the fruit juice market in Barak Valley that can aid the fruit juice industries and marketers in improving their market position and sustainability.

Keywords: Fruit juice, Consumer preference, Brand preference, Packaged Juice.

I. INTRODUCTION

Fruit juices are liquids naturally contained in fruits. Juices are extracted "mechanically by squeezing or macerating fresh fruits [or vegetable flesh] without the application of heat or solvents" (NPCS Board of Consultants and Engineers, 2012, p. 98). According to the NPCS Board of Consultants and Engineers (2012, p. 98), various techniques are commonly employed to preserve and process fruit juices, such as canning, pasteurization, freezing, evaporation, and spray drying. These processes help not only produce juices from fruit extracts but also maintain the freshness, quality, and taste of the original fruit, thereby providing a longer shelf life.

Fruit juice is a popular beverage that has gained considerable attention among consumers globally. With the changing pace of life following globalization, technological advancement, and industrial outreach across far corners of the globe, fruit juices have emerged as a healthy alternative for fruit supplements. Besides, fresh fruits are mostly seasonal, region-specific, climate-dependent, and often costlier and tedious to consume than fruit juices. Juices, being mechanically produced, can also be preserved for a long period of time. Moreover, consumers are now more concerned about lifestyle and healthier products than before (Santos et al., 2018). Due to the relative advantages of juices over fresh fruits and the growth of health consciousness among societies, there has been increasing demand for fruit juices in the market. Fruit juices in different varieties as such are now available in the market and are welcomed by consumers.

In the 21st century, branding has almost become a common phenomenon with regard to sales and services. With the trend of globalization resulting in strong competition among peers, little difference has developed among industries with regard to products, services, and strategies. Brands, at this juncture, emerged as a useful form of product differentiation (Ghodeswar, 2008) and an asset for a company to maximize its value and succeed in the market (Wong & Merrilees, 2007). Thus, understanding consumer preferences towards fruit juice brands is vital for fruit juice industries and marketers to develop effective marketing strategies and achieve better market position and sustainability.

With the increasing demand for fruit juices, the companies have strategically begun to widen their market sphere. It is no longer a prerogative of companies to limit their products only to metropolitans. Rather, the companies are shifting their attention towards the smaller towns, exploring possibilities of market in semi-urban and non-urban towns. One obvious reason is the shift in economic assortments following globalization. Mehra (2008) mentioned that urban populations' disposable income in India was reduced to 30% by the end of 2007 from its initial income upto 40% in 2001 with the rising affluence levels of people in non-urban towns. Thus, the non-metro-urban areas came to be recognized as potential markets and an opportunity for the companies to penetrate and supply goods and services otherwise earlier found in the metropolis. With the

gradual penetration of different companies, the consumption patterns in non-metro-urban areas have also been changing considerably.

A study on brand preference of fruit juice consumers of Barak Valley at this point bears immense significance as empirical substantiation from the literature survey shows that no comprehensive study has so far been conducted to unearth the consumer-fruit juice-brand preference dynamics in the context of Barak Valley. The study considered five selected fruit juice brands such as "Tropicana," "Real," "Sunkist," "B Natural," and "Patanjali," which are commonly available in the different markets of Barak Valley. The primary aim of this study is to identify the leading fruit juice brands in Barak Valley and determine the factors influencing brand preference. This research also examines the demographic parameters associated with brand preference, such as gender, age, educational qualification, and income level. Furthermore, this study attempts to evaluate the relative importance of various factors such as brand image, quality, price, taste, and availability in influencing brand preference. It is expected that the study will help the marketers to understand the behaviour and profile of fruit juice consumers in Barak Valley, resulting in greater expansion of the fruit juice market in this region of Southern Assam and in greater ease for the consumers to access their preferred brand of fruit juices.

II. REVIEW OF LITERATURE

The review of existing literature reveals that analysis of consumer brand preferences plays a vital role in establishing sustainable and enduring relationships between consumers and marketers/companies. At the level of marketers/companies, it helps the marketers/companies in formulating and recuperating marketing strategies, while at the consumers' level, it aids the consumers in reducing stress pertaining to search, decision making, and other needs (Casidy *et al*., 2018). Brand preferences reflect consumers' pre-dispositions towards a brand (Farquhar, 1990), highlight the biased position of the consumers, and operate as an intermediate factor between consumer satisfaction and repurchase intention (Chang & Liu, 2009). Brand preferences, thus, accentuate the heterogeneity of consumer choices, aid in market segmentation strategies, and help build brand loyalty (Alamro & Rowley, 2011) to the benefit of both the consumers and the marketers/companies.

The review of the literature further reveals a handful of studies that have been conducted with respect to packaged fruit juices in India. Gupta and Gupta (2008) conducted a study on the healthiness and safety dimensions of fruit juices. The study demonstrates that the consumption of fruit juices is related to health consciousness and the changing lifestyle of the urban population. Urban households are gradually shifting their attention from soft drinks to fruit juices due to the use of pesticides in soft drinks. The study, however, finds that despite its health benefits, fruit juices should not be fed to infants below 6 months. Bedi and Paul (2013) discern deep concerns among consumers about the health and potential of health drinks in the Indian market. Among the different cues that drive the market, the study found that brand name and palatability are the most important ones. At the same time, factors such as price, packaging, and product details also influence consumers' decision to purchase health drinks. Shashank (2014) found that Real is the most favoured brand among fruit juice consumers in Bangalore City. The majority of the city's consumers purchase fruit juices out of their needs, and the taste of the product serves as an important factor in their selection. As concerns about awareness about fruit juices in Bangalore city, television is a key medium. Karra (2015) found that consumer satisfaction towards aerated drinks in Delhi began to decrease with the introduction of fruit juices with added emphasis on health-related factors by the consumers. Nasery (2015) found that students form a considerable section of consumers of packaged fruit juices in Hyderabad city. Quality and taste are key factors in determining consumer preference for packaged fruit juices in the city. Sharma (2015) found that compared to carbonated drinks, consumption frequency for fruit juices is higher in Ajmer among the consumers of all considered age groups owing to people's rising health consciousness. The study conducted by Ceasar and Sundari (2016) in Tamilnadu revealed the dominance of local brand mango juices in the Tirunelveli district. The study suggests that larger brands need to change their strategies to survive in the market there. Consumers' purchasing behavior has been studied extensively over the years, with researchers identifying several factors that influence consumer choice. One such factor is taste, which has consistently been found to be a critical determinant of consumer preference (de Pelsmaeker, *et al*. 2017). Consumers are more likely to choose a product that they enjoy the taste of, and this holds true for fruit juices as well. Quality is another crucial factor that affects consumer preference. The studies conducted by Heuvel *et al*. (2007) and Bonila (2010) found that consumers are more likely to choose a product that they perceive to be of high quality. Price is another factor that influences consumer choice (Bonila, 2010). Finally, brand image is another important factor that can influence consumer preference (Chaitra & Kerur, 2020). Goyal *et al*. (2019) report a comparative advantage for fruit juice industries to grow in the Indian market following the inclusion of fruit-based beverages under a low tax slab by the Government compared to carbonated drinks, which have a higher growth rate in the country.

III. DATA AND METHODOLOGY

Primary data is collected by serving a structured questionnaire both online and offline across different urban areas of all three districts of Barak Valley. It covers a geographical area of 6922 sq. km with a total population of 36 24,599 as per census 2011. The urban population of Barak Valley, as per the 2011 census, is 4, 73,304 of which 315,464 are from Cachar, 48,140

from Hailakandi, and 109,700 from Karimganj. With respect to the total population of the districts, the share of the urban population in Cachar is 18.17% in Hailakandi, which is 7.3%, and 8.93% in Karimganj.

The sample size was determined by using the Taro Yamane sampling method, $n=N/\{1+N(e^2)\}$ at a 95% level of confidence with a 5% precision level (Yamane, 1967, p. 886). A total of 400 samples were selected using a systematic random sampling technique from among the 473,304 targeted populations. The respondents were chosen based on their age, gender, and location. The survey included questions related to the factors that influence brand preference, including brand image, quality, taste, price, and availability. The responses are coded into the SPSS 25 version, checked for consistency, and used for the purpose of analysis. Data analysis has been carried out by using statistical tools such as tabulation, graphs, percentages, descriptive statistics, correlation matrix, as well as Pearson Chi-square (χ^2) test using the Monte Carlo method for testing hypotheses. Secondary data is collected from available resources, including books, journals, magazines, newspapers, periodicals, and online resources.

The following hypotheses are adopted in the study:
   H0: There is no significant difference between the demographic parameters and fruit juice brand preference.
   H02: There is no significant difference between the consumers' brand preference and factors of brand preference.

IV. RESULTS AND DISCUSSION

This section presents and analyzes the findings in relation to the research objectives. The demographic profile of the respondents, consumer preference for fruit juice brands, and their relationship with each other are discussed in this section. The factors affecting brand preference and their significance are also analyzed and presented in the section.

A) Demographic Profile of the Consumers

The study takes into account demographic factors such as gender, age, educational level, and monthly income of consumers, which were analyzed using statistical tools such as frequency and percentage. Table 1 presents the demographic profile of the consumers.

Table 1: Demographic profile of the consumers

Demography	Category	Frequency	Percentage
Gender	Male	234	58.5
	Female	166	41.5
Age	upto 20	77	19.2
	21-30	120	30.0
	31-40	89	22.2
	41-50	63	15.8
	Above 50	51	12.8
Monthly Income	Upto 15,000	71	17.8
	15001-30000	89	22.2
	30001-45000	92	23.0
	45001-60000	76	19.0
	Above 60000	72	18.0
Educational Qualification	Below Matriculation	15	3.8
	Matriculation	30	7.5
	Higher Secondary	85	21.2
	Graduation	141	35.2
	Post Graduation	129	32.2

Source: Compiled from survey data

Table 1 shows that the majority of consumers are male, accounting for 58.5% of the sample, while female consumers make up 41.5% of the sample. The table also exhibits the participation of respondents of different ages, income, and educational groups. It is evident from the table that the highest number of respondents belong to the age group 21-30 years, which shares 30.0% of the total respondents. This is an obvious implication of the dominance of youths in the market of packaged fruit juices in the Barak Valley region. It is observed that more than 67% of the respondents are graduates or post-graduates, which indicates the role of education in awareness and understanding of the health benefits of packaged fruit juice. Moreover, the respondents are almost evenly distributed around different selected income groups.

B) Consumers' Preference of Brand

Out of the five selected brands for the study, the consumers are asked to choose one as their preferred brand. The frequency and percentage distribution of brand preferences among consumers are illustrated in Figure 1, using a pie chart.

It is evident from Figure 1 that the consumers of Barak Valley prefer Tropicana the most, followed by Real, Patanjali, B Natural, and Sunkist. Tropicana and Real combined together capture 68% of the consumers' preference, which suggests the pre-eminence of these two brands in the market of Barak Valley.
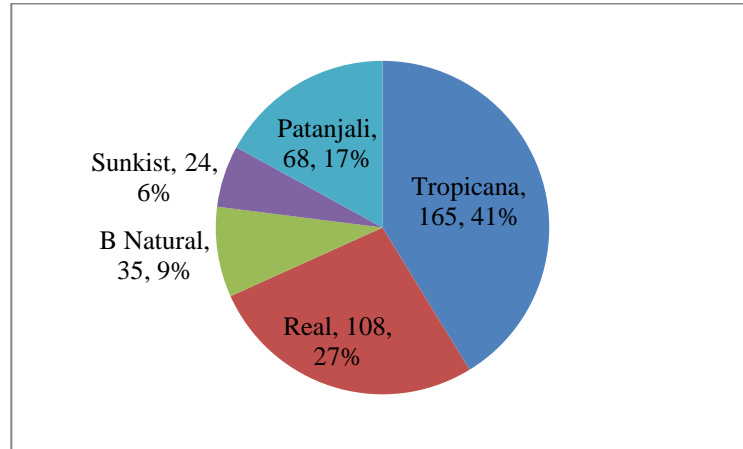

Figure 1: Consumers' preference for brands

Source: Survey data

C) Chi-square Test between Brand Preference and Demographic Parameters

Pearson Chi-square (χ^2) test has been conducted to find out the association between demographic parameters and consumers' preference for brands. The results obtained through Chi-square analysis are compiled and presented in Table 2.

Table 2: Chi-square test between brand preference and demographic parameters

Demographic Parameters	Chi-Square (χ^2) value	p-value	Significant/Not significant
Gender	5.996	.231	Not significant
Age	19.487	.244	Not significant
Educational Qualification	31.151	.013	Significant
Household Income	24.003	.049	Significant

Source: Compiled from survey data

The chi-square test in Table 2 demonstrates that consumers' preference for brands is insignificant with respect to 'gender' ($p=0.231 \geq 0.05$) and 'age' ($p=0.244 \geq 0.05$) at a 5% level of significance, resulting in acceptance of H01, which indicates that there is no significant association of consumers' preference of brand with gender and age. Again, the p-value for educational qualification ($p=0.013$) and income ($p=0.049$) are less than 0.05, leading to the rejection of H01, which indicates that educational qualification and income of the fruit juice consumers of Barak Valley are significantly related to brand preference.

D) Factors Effecting Brand Preference

The fruit juice consumers are asked to specify the factor(s) that contribute to their preference for a particular brand. Five factors, viz., brand image, quality, price, taste, and availability, have been identified based on the review of literature and pilot survey for this purpose. The consumers are asked to respond on a 5-point rating Likert scale with strongly disagree (1) to strongly agree (5).

a. Reliability Statistics

The internal consistency of the variable is tested with reliability analysis. Cronbach's alpha coefficient of reliability is used to find out the internal consistency of the scale.

Table 3: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.715	.719	5

Source: Authors' Calculation

The Cronbach's Alpha value of .715, as shown in Table 3, indicates that the constructs are adequately reliable. The internal consistency of the variable is also examined when one item is deleted at a time, and the result is shown in Table 4.

Table 4: Item-Total Statistics

Factors	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Brand Image	15.08	6.953	.400	.239	.679
Quality	14.89	7.196	.473	.268	.658
Price	16.01	6.261	.475	.274	.650
Taste	15.06	6.510	.474	.229	.650
Availability	15.74	5.729	.508	.279	.637

Source: Authors' Calculation

Table 4 demonstrates that the removal of any of the items would lead to a lower Cronbach's alpha score, and as such, none of the items should have been removed from the survey.

b. Correlation Matrix

A correlation analysis has been made to understand the interdependence of the selected factors for brand preference. Table 5 presents an inter-item correlation matrix of the selected components of brand preference.

It is evident from the table that the inter-item correlation scores are in the range of 0.21-0.46. So, it can be assumed that the factors are plausibly identical and are not isomorphic with each other.

Table 5: Inter-Item Correlation Matrix between factors

		Brand Image	Quality	Price	Taste	Availability
Brand Image	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	400				
Quality	Pearson Correlation	.457**	1			
	Sig. (2-tailed)	.000				
	N	400	400			
Price	Pearson Correlation	.213**	.279**	1		
	Sig. (2-tailed)	.000	.000			
	N	400	400	400		
Taste	Pearson Correlation	.292**	.305**	.380**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	400	400	400	400	
Availability	Pearson Correlation	.275**	.315**	.450**	.348**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	400	400	400	400	400
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: Authors' Calculation

E) Comparison of Different Factors Affecting Brand Preference

The consumers' responses to factors influencing brand preference were presented using descriptive statistics. Table 6 shows the mean, median, standard deviation (sd), and variance, as well as the minimum and maximum responses for each of the five factors of brand preference.

Table 6: Factors in Brand Preference

	Brand Image	Quality	Price	Taste	Availability
Mean	4.11	4.30	3.18	4.13	3.46
Median	4.00	4.00	3.00	4.00	4.00
Std. Deviation	.858	.709	.969	.901	1.075
Variance	.737	.503	.938	.812	1.156
Minimum	1	2	1	1	1

Maximum	5	5	5	5	5

Source: Authors' Calculation

As consumers are asked to respond on a Likert scale with strongly disagree (1) to strongly agree (5), the higher mean score reflects a greater influence on brand preference. Table 6 shows that the fruit juice consumers of Barak Valley are in agreement that quality (mean 4.30, sd. 1.075) marks the highest determinant for brand preference, followed by taste (mean 4.13, sd. 0.901), brand image (mean 4.11, sd. 0.858), availability (mean 3.46, sd. 1.156) and price (mean 3.18, sd. 0.969). The mean value of the factors influencing brand preference is represented in Figure 2 to interpret the results visually.
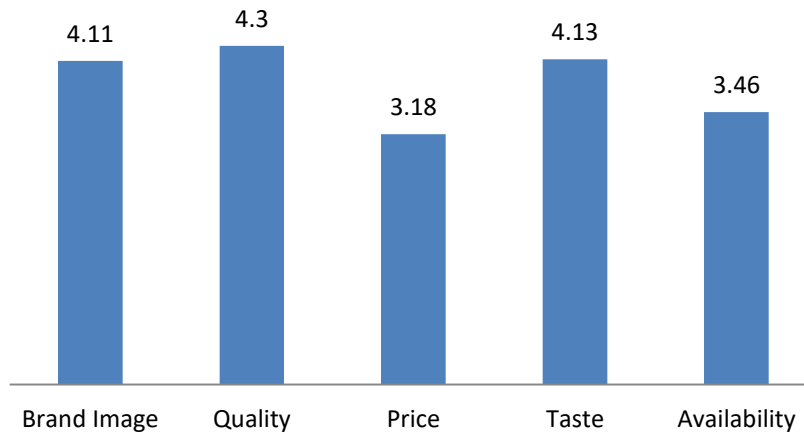

Figure 2: Factors influences in brand preference

Figure 2 demonstrates that quality, taste, and brand image are the dominant factors in consumers' preference for fruit juice brands.

F) Brand Preference vis a vis the Factors for Brand Preference

Chi-square analysis has been carried out between consumers' preference of brand and the factors considered by the consumers that influence their preferences. Pearson Chi-square (χ^2) test using the Monte Carlo method at 95% Confidence Interval has been conducted as more than 20% of expected cell frequency is less than 5. The results obtained are presented in Table 7.

Table 7 shows the p-value for the Monte Carlo method is significant with respect to 'brand image' (p=0.001<0.05), 'price' (p=0.00<0.05), and 'availability' (p=0.005<0.05) which results in rejection of H02 and lead to the conclusion that there exists a significant relationship of consumers' brand's preference with the factors brand image, price, and availability. While the p-value for quality (p=0.539) and taste (p=0.759) is more than 0.05, so H02 is accepted, and it is concluded that there is no significant difference with respect to quality and taste of fruit juice products in brand preference.

Table 7: Monte Carlo results of Pearson chi-square test for brand preference and factors

Factors	χ^2	Asymp. Sig. (2-sided) p-value	Monte Carlo Sig. (2-sided)			Significant/Not significant
			Sig.	Lower Bound	Upper Bound	
Brand Image	46.781	.000	.001	.000	.002	Significant
Quality	10.739	.551	.539	.526	.551	Not significant
Price	88.683	.000	.000	.000	.000	Significant
Taste	11.810	.757	.759	.748	.770	Not significant
Availability	34.532	.005	.005	.003	.003	Significant

Source: Compiled from Survey data

V. CONCLUSION

The study reveals that youths in the age group of 21-30 years are the major consumers of fruit juices in Barak Valley. Educational qualification and household income of fruit juice consumers are found to be significantly related to brand preference. Tropicana and Real constitute the major players in the region's fruit juice market. Consumers are more concerned

about the quality and taste of fruit juices. The findings of the study demonstrate that the availability of the product is an issue in Barak Valley, and the marketers/industries need to work on this, along with focusing on the price of the products and building a strong brand image. Fruit juice industries and marketers may use the results of the study for sustainability and better market position in the region. As consumers continue to become more health-conscious, the demand for natural and healthy fruit juices is expected to grow in the coming years. Thus, further research can be carried out to study the opportunities to develop new fruit juice products that offer additional nutritional benefits or are tailored to specific health needs.

VI. REFERENCES

[1]   Alamro, A., & Rowley, J. (2011). Antecedents of Brand Preference of Mobile Telecommunications Services. *Journal of Product & Brand Management, 20* (6), 475-486.

[2]   Bedi, M., & Paul, R. (2013). An Analysis of Indian Consumer's Attitude towards Health Drinks. *International Journal on Customer Relations, 1* (2), 16-24.

[3]   Bonilla, T. (2010). *Analysis of consumer preferences toward 100% fruit juice packages and labels.* LSU Master's Theses. 1981. Costa Rica: Louisiana State University and Agricultural and Mechanical College.

[4]   Casidy, R., Nyadzayo, M. W., Mohan, M., & Brown, B. (2018). The Relative Influence of Functional versus Imagery Beliefs on Sensitivity in B2B Professional Services. *Industrial Marketing Management*.

[5]   Ceaser, M. J., & Sundari, S. S. (2016). Consumer Perception on Fruit Drinks: A Field Survey in Tirunelveli District Tamilnadu, South India. *Pune Research Scholar, 2* (4), 1-16.

[6]   Chang, H. H., & Liu, Y. M. (2009). The Impact of Brand Equity on Brand Preference and Purchase Intentions in the Service Industries. *Service Industries Journal, 29* (12), 1687-1706.

[7]   Chaitra, G. B., & Kerur, N. M. (2020). Brand preferences and factors influencing for purchase of branded ready-to-eat food products in Belgaum City of Karnataka State, India. *International Journal of Current Microbiology and Applied Sciences*, 9(2), 540-545.

[8]   De Pelsmaeker, S., Schouteten, J. J., Lagast, S., Dewettinck, K., & Gellynck, X. (2017). Is taste the key driver for consumer preference? A conjoint analysis study. Food Quality and Preference, 62, 323-331. https://doi.org/10.1016/j.foodqual.2017.02.018.

[9]   Farquhar, P. H. (1990). Managing Brand Equity. *Journal of Advertising Research, 30* (4), 7-12.

[10] Ghodeswar, B. M. (2008). Building Brand Identity in Competitive Markets: A Conceptual Model. *Journal of Product & Brand Management, 17* (1), 4-12.

[11] Goyal, A., Nair, A., Kumar, B., & Sivakumaran, B. (2019). Enhancing Consumer Preference towards Healthy Drinks. *Great Lakes Institute of Management, Chennai, 13* (1), 41-60.

[12] Gupta, H., & Gupta, P. (2008). Fruit Drinks: How Healthy and Safe? *INDIAN PEDIATRICS, 45*, 215-217.

[13] Heuvel, T. van den, Trijip, H. van, Woerkum, C. van, Renes, R. J., Gremmen, B. (2007). Linking product offering to consumer needs: inclusion of credence attributes and the influences of product features. *Food Quality and Preference*, 18(2), 296-304.

[14] Karra, C. (2015). A Study on Factors Affected on Customer's Satisfaction Towards Aerated Drinks in Delhi. *International Journal of Interdisciplinary Research Centre, 1* (1), 1-7.

[15] Mehra, P. (2008, March 20). *Dhoni Effect: Urban Growth Story Spreads to Smaller Cities.* Retrieved July 7, 2023, from mint: https://www.livemint.com/Politics/DYU8L5z9YXZMw2SNE0HyZO/Dhoni-effect-urban-growth-story-spreads-to-smaller-cities.html

[16] Nasery, A. M. (2015). *Consumer's Preference for Packaged Fruit Juices in Hyderabad City of Telangana State.* PhD Thesis. Hyderabad, Telangana: Professor Jayashankar Telangana State Agricultural University.

[17] NPCS Board of Consultants and Engineers. (2012, Fruit Processing). *Handbook on Agro-based industries, 2nd edition*, 98-120. Delhi: NIIR Project Consultancy Services.

[18] Santos, A. B., Bottoni, S. d., Silva, D. A., São José, J. F., & Silva, E. M. (2018). Study of the Consumers of Ready-to-Drink Juices and Fruit Nectars. *Food Science and Technology, 38* (3), 504-512.

[19] Sharma, G. (2015). Consumers' Preference for Carbonated Drinks, Fruit Juices, and Dairy Drinks: A Comparative Study in the City of Ajmer. *Advances in Economics and Business Management, 2* (3), 298-302.

[20] Shashank, B. R. (2014). *Consumer Preference for Fruit Beverages in Bangalore City.* MBA Project Report. Bangalore: University of Agricultural Sciences.

[21] Wong, H. Y., & Merrilees, B. (2007). Multiple Roles for Branding in International Marketing. *International Marketing Review, 24* (4), 384-408.

[22] Yamane, T. (1967). *Statistics, An Introductory Analysis* (2nd ed.). New York: Harper & Row.