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Factors Influencing the Consumer Buying Behavior towards Alternate Forms of Sugar in Tamil Nadu, India

G. Vivek [a*#], N. Venkatesa Palanichamy [b†], D. Murugananthi [b‡], K. M. Shivakumar [c¥] and M. Balakrishnan [d┴]

[a] Department of Agricultural and Rural Management, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India.
[b] Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India.
[c] Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India.
[d] Department of Food Process Engineering, AEC AND RI, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

In today's world, people are more aware of the product they consumed. Consumers are mainly relying on their health consciousness. However, people nowadays shift their consumption towards the traditional forms of sugar as they have better nutritional compounds compared to the refined forms of sugar. Here sample respondents are taken based on the traceability of value chains of alternate forms of sugar (Jaggery and Khandsari sugar, Coconut sugar, and Palm sugar). The study was limited to 150 sample respondents in Erode, Tiruppur, Namakkal, and Coimbatore districts of

[#] Ph. D. Scholar;
[†] Dean (Agriculture);
[‡] Assistant Professor (ARM);
[¥] Professor;
[┴] Professor and Head;
**Corresponding author: E-mail: vivek14996@gmail.com;*

Tamil Nadu where these sugars are transferred with all actors involved in the value chain with the help of markets. Principal Component Analysis is used to analyze the major factor to influence the purchase of sugar. The approximate chi-square statistic (0.774) is also large (>0.50). These factors account for 66.43 percent of the variance in the data. The three components that have the Eigenvalue of 6.58, 2.17, and 1.20 showed the percentage of variance were 43.87, 14.50, and 8.05 respectively. Based on varimax rotation with Kaiser Normalisation, three factors have arrived. The major factors that influenced highly were Health and convenience factor (Issues in white sugar, taste, traditional sweetener, Health consciousness, and Quality), Branding (Price, service of the seller, texture, packaging, Colour, market cleaning, non-perishable and popularity) and the other factor influenced in a fewer way. The result of the study concluded that consumers were mainly oriented about their health conscious and shifting towards traditional based products. Promotional measures were taken to promote these kinds of sugar and aim to bring back the traditional forms of sugar with its innovative technology. Packaging may be improved with biodegradable bags.

Keywords: Buying behaviour; market intelligence; consumer preferences; principal component analysis.

1. INTRODUCTION

Indian food consumption patterns have seen a tremendous chain in millennial years with rapid change in people's lifestyles. The cooking and utilization design shifts definitely from the northern part to the southern piece of India [1]. Today's health-conscious consumer tends to think twice while walking down the processed food aisle. Rather than thinking of the convenience of the products, they are now considering the perceived low nutritional quality and negative news stories. The same consumer is laden down by a busier lifestyle and may not have the luxury of time to prepare a fresh meal three times a day. Changing consumption habits with regards to processed foods along with a growing population and social, political, and economic forces are driving significant change in the processed food industry on a global scale. Consumer preferences are just another notch in the belt of challenges driving innovation in the sector. Food processing technologies will need to keep this in mind when developing and communicating new innovations. Many are already making use of market intelligence to aid in this, tools that allow them to keep abreast of consumer behavior and trends analytics allowing them to factor this data into decisions.

Processed foods are a critical component of everyday diets. Although consumers are now opting for fresh or minimally processed foods where possible, they seem to acknowledge the positive aspects of processed foods such as convenience, value, and consistency of taste. Even in an industry facing unparalleled calls for innovation, today's fresh-first consumer can understand that it is generally infeasible to be solely fresh, local, and organic. Nowadays, the demand for healthier sweeteners in chocolate and foods, in general, is increasing. Health issues related to high sugar levels and calories are a major concern (Aidoo et al. 2014); [2,3]. This situation compels food technologists to seek healthier alternatives for common mono- and/or disaccharides. The research was carried out mainly to determine the factors influencing the consumer buying behaviour towards alternate forms of sugar (Jaggery and Khandsari sugar, Palm sugar, and Coconut sugar).

2. LITERATURE REVIEW

Vijayabaskar and Sundaram [4] showed that ingredient content and health benefit created a major impact on the consumer in decision making to go for ready – to- eat products. Also, most consumers felt that products with different ingredients will reduce their weight and make them fit.

Jain et al. [5] showed that nutritional labels influence the consumer in the purchase decision and considered taste as "neither most important nor not important". Consumers considered that nutritional labeling details help them to make better choices. Further, it helps to identify easily understood information on product labels.

Anjum et al. [6] revealed that consumers were aware of the companies providing some voluntary details on their products like FSSAI license number, etc. On the whole, it was found that most of the customers were not aware of the mandatory and voluntary labelling.

Sivathanu [7] revealed that the consumer preferred to buy organic food, as they perceived that these food products were safe and healthy, nutritious, and environmentally friendly. However, research also investigated that consumers in the high-income class group preferred organic-based food products. Finally, the research helps to implement suitable marketing strategies to promote the product in a market for various groups of consumers in society.

Baka et al. [8] revealed that consumers purchasing brown sugar were partially influenced by the service of the seller, market cleaning, and customer vocation. Further results revealed that brown sugar market share can be improved for people in the upper-middle economic class if brown sugar producers can improve and maintain the quality and appearance of brown sugar commodities that can enter the modern market to international markets.

Hadi et al. [9] revealed that the major attributes the consumer preferred were taste followed by health and Price to purchase MSME industries of food and beverage. The physical look attribute was considered the third attribute preferred by the consumers followed by texture and aroma respectively.

Melvoic et al. [10] revealed that price and promotion were the highest impacts on accepting organic food products and consumer purchasing decisions. However, organic food products have premium prices and promotion measures had a role in educating consumers about environmental, health, and other benefits involved in organic production to inform consumers about product availability and their offer in the market. Finally, concluded that consumers were lack of information about organic production concepts and organic food products.

The above literature depicting about major factors like health conscious and environmentally friendly products and also shifting natural forms of products in day-to-day life consumption [11].

3. METHODOLOGY

The study was conducted in the cities like Coimbatore, Tiruppur, Erode, and Namakkal where the alternate forms of sugar value chain. The data were collected through a well-structured interview schedule and information was collected from the people who purchased alternate forms of sugar. Principal Component Analysis was used to analyze the factors that influence the consumer to purchase alternate forms of sugar.

4. RESULTS AND DISCUSSION

4.1 Factors Influencing the Consumer Buying Behaviour towards Alternate Forms of Sugar

The fifteen purchase variables analyzed the importance of consumers buying alternate forms of sugar. However, all these variables were analyzed as the importance of consumer selection for their purchase influence. The factors have been arranged based on their ranking as given in Table 1.

Table 1. Factors influenced by purchase - factor analysis

S. No	Factors	Mean Score	Standard Deviation (SD)
1.	Price	3.12	1.58
2.	Service of the seller	3.18	1.35
3.	Issues in white sugar	3.64	1.57
4.	Taste	3.66	1.35
5.	Texture	3.49	1.37
6.	Package	3.33	1.35
7.	Traditional sweetener	3.51	1.56
8.	Colour	3.76	1.23
9.	Market cleaning	3.52	1.45
10.	Health-conscious	3.88	1.51
11.	Easy availability	3.26	1.24
12.	Quality	3.71	1.37
13.	Nonperishable	3.22	1.39
14.	Popularity	3.10	1.37
15.	Others (specify)	2.97	1.39

It could be inferred from Table 1 that, health-conscious (3.88) was the main factor that influenced the consumers to purchase alternate forms of sugar followed by colour (3.76), quality (3.71), taste (3.66), and issues in white sugar (3.64) respectively. The sixth factor considered to purchase was market cleaning (3.52) followed by traditional sweetener (3.51), texture (3.49), package (3.33), easy availability (3.26), and non-perishable (3.22), and service of the seller (3.18) respectively. However, the thirteen most factors considered to purchase were price (3.12) followed by popularity (3.10) and others (2.97) factors with minimum influence on the consumers.

Hence, to identify the consumers underlying purchase influencing criteria, so as to group them into the specific market segment to enable the designing of the appropriate marketing strategy, factor analysis was done using Principal Component Analysis.

To have a better understanding of the data, factor analysis is conducted. From Table 2 it is clear that the approximate chi-square statistic is with 103 degrees of freedom which is significant at 0.01 levels. The KMO statistic (0.77) is also large (>0.5). Hence, factor analysis is considered an appropriate technique for further analysis of data. Hence, the total variance explained by the included variables analyzed is presented in Table 3.

It was found from Table 3 that, three factors are explaining about 66.43 percent of the variance. Eigen value above one is considered. The three components that have the eigen value of 6.58, 2.17, and 1.20 showed the percentage of variance were 43.87, 14.50, and 8.05 respectively. The component matrix formed is shown in Table 4.

It could be revealed from Table 4 that, cross-loadings have arrived. To get a meaningful conclusion, rotation of components was done using varimax rotation with Kaiser normalization. The rotated component matrix is presented in Table 5.

Table 2. KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.774
Bartlett's Test of Sphericity	Approx. Chi-Square	1.274E32
	Df	103
	Sig.	0.000

Table 3. Total Variance Explained by the Included Variables

S.No	**Initial Eigen values**			**Extraction Sums of Squared Loadings**		
	Total	**Percentage of Variance**	**Cumulative Percentage**	**Total**	**Percentage of Variance**	**Cumulative Percentage**
1	6.580	43.870	43.870	6.580	43.870	43.870
2	2.175	14.503	58.373	2.175	14.503	58.373
3	1.208	8.057	66.429	1.208	8.057	66.429
4	1.144	7.625	74.054			
5	.866	5.775	79.829			
6	.724	4.826	84.655			
7	.573	3.822	88.477			
8	.374	2.492	90.970			
9	.328	2.188	93.158			
10	.296	1.971	95.129			
11	.225	1.498	96.627			
12	.171	1.139	97.766			
13	.162	1.080	98.846			
14	.102	.677	99.523			
15	.072	.477	100.00			

Extraction method: principal component analysis

Table 4. Component Matrix

S. No.	Factors	1	2	3
	Price	.506	.545	.341
	Service of the seller	.408	.638	.000
	Issues in white sugar	.598	-.496	.222
	Taste	.710	-.386	.203
	Texture	.799	.256	-.199
	Package	.837	.237	-.092
	Traditional sweetener	.766	-.374	.119
	Colour	.745	.179	.081
	Market cleaning	.591	.550	.319
.	Health conscious	.780	--.414	-.089
.	Easy availability	.677	-.116	.034
.	Quality	.773	-.350	.064
.	Nonperishable	.686	.127	.012
.	Popularity	.572	.120	-.287
.	Others (specify)	-.064	.378	.858

Extraction method: principal component analysis

Table 5. Rotated Component Matrix

S. No	Factors	1	2	3
	Price	-.019	.807	-.132
	Service of the seller	-.073	.721	.220
	Issues in white sugar	.807	-.028	.033
	Taste	.822	.127	.052
	Texture	.410	.751	.101
	Package	.476	.734	-.007
	Traditional sweetener	.838	.195	-.022
	Colour	.480	.588	.135
	Market cleaning	.193	.692	.488
.	Health-conscious	.826	.229	-.231
.	Easy availability	.595	.345	-.012
.	Quality	.816	.231	-.065
.	Nonperishable	.450	.530	.052
.	Popularity	.300	.531	.230
.	Others (specify)	.082	.004	.936

Extraction Method: principal component analysis, rotation method: varimax with kaiser normalization

Table 6. Factors and Qualities - Mean and Standard Deviation

Factor	% variance	Qualities	Mean	SD
1. Health and convenient	43.870	Issues in white sugar	3.18	1.35
		Taste	3.64	1.57
		Traditional Sweetener	3.51	3.51
		Health-conscious	1.56	1.56
		Quality	3.88	3.88
		Easy Availability	3.26	1.24
2. Branding	14.503	Price	3.12	3.12
		Service of the seller	1.58	1.58
		Texture	3.18	1.34
		Package	3.33	1.34
		Colour	3.76	1.24
		Market cleaning	3.52	1.44
		Nonperishable	3.22	1.39
		Popularity	3.10	1.37
3. Others	8.057	Other factors	2.97	1.39

It could be concluded from Table 5 that, based on varimax rotation with Kaiser normalization, three factors have emerged. Each factor was constituted of all those variables that have factor loadings greater than or equal to 0.5. The identified variables with each factor are named and represented in Table 6.

Table 6 represents the three factors. Factor one is labeled as healthy and convenient as it is comprised of three items such as issues in white sugar, taster, traditional sweetener, health conscious, and quality. Factor two is labeled as branding as it consisted of price, service of the seller, texture, package, color, market cleaning, nonperishable, and popularity. Factor three is labeled as Others (Convenient, etc). All three factors are important as they have items that were rated with an important mean score of around three.

5. CONCLUSION

Hence, the above qualities are important for consumers to switch to alternate forms of sugar. This analysis helps the producers to produce based on the consumer preferred qualities at the right place at right time. However, consumers were aware of the product they consume but still did not learn about the details of product. Consumers should have deep knowledge about the product.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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