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Attributes Influence Customers towards Ice Cream Purchase with Brand Preference and Income Effect on Purchasing Ice Cream: An Empirical Study on Dhaka City

Cao Yong [α], Md Shazzat Hossain [σ] & Abdul Waaje [ρ]

Abstract- This paper identifies various attributes influencing consumers to purchase Icecream from a retail store. Our team has done this research during the year 2021. Notably, it confesses the behavioural patterns of consumers and perceptions regarding ice cream with the association between the income effect and purchase decisions. To conduct the research, we collected raw data from an online survey of 152 consumers of different ages. Participants from the separate age group provided their opinion in the pre-setted questionary. After gathering the raw data, we used three effective methods, Henry Garrett's ranking technique, Chi-Square Independence Test, and PCA, to rank the consumer-preferred ice cream flavour, income effect on purchasing ice cream and factors that attract consumers to buy ice cream. Raw data was gathered from the survey and coordinated with the Excel Programme. SPSS was used to implement Chi-Square and PCA tests, but Henry Garret's ranking was done on Excel Programme. This step-by-step analysis shows the consumer inside regarding existing brand preferences regarding ice cream in Bangladesh. Furthermore, this research depicts the scenario of the Dhaka city dwellers about their choosing factors for ice cream, favourite flavours and purchase power.

I. Introduction

Ice cream is a perishable, delicious, wholesome, nutritious frozen dairy food. Globally, the Ice cream market grew at the Compound Annual Growth Rate (CAGR) of around 6% during 2009-2016, which reached approximately 19.7 million metric tons in 2016 (Helmold & Terry, 2021; Munawar & Disman, 2023). European countries dominated the global ice cream market with more than 40% of the total volume in the same year. On the other hand, China and Brazil jointly became the reason for two-fifths of global ice cream sales (Brandenburg et al., 2019; Hamad & Omar, 2013; Sawant, 2014). Furthermore, the ice cream industry contributes 0.053 percent of the world's GDP. Ice cream is unquestionably one of Bangladesh's most renowned and favourite food products among children and adults (Islam & Liang, 2012; Shazzat Hossain et al., 2021). The ice cream sector of Bangladesh has been in place for decades. The ice cream industry of Bangladesh started to grow by establishing Igloo Ice Cream Unit by Abdul Monem Ltd in 1964 (Ramadani et al., 2022; Shazzat Hossain et al., 2022). Since then, the business scope in this field has been increasing. To gain and maximise the company's profit, several local giant companies have invested in ice cream production units (Martin, 2018).

As a result, Bangladesh has seven branded ice cream companies that mix with new wings of ice cream production of various companies along with previously established renowned brands (Puspitasari et al., 2020; Sawant, 2014).

According to Lanka Bangla Investment Guide 2018, this industry had a market of exactly 1200 cores BDT in 2018. Again, they reported that it would grow positively near about 15% in recent years (Wang et al., 2023). The study said that three companies hold a 79% share of the market volume. Igloo Ice Cream Ltd placed first with acquiring 38%, and Polar Ice Cream became second with 28% of the market share. Bellissimo and Za'n Zee are the brands of The Kazi Food Industry and had a sales contribution jointly of 11% in 2018 (Kalogiannidis et al., 2023). Other brands and non-branded ice cream companies achieved a sharp 10% that year. Studies on this industry depicted that it contributes 0.064% of the gross domestic product (GDP) (Bulc & Ojstršek, 2008; Shazzat Hossain et al., 2021).

The Ice Cream manufacturers have come a long way. This industry evolves with loads of ice cream makers bringing creativity in quality, pricing, flavours, and packaging. Expanding market opportunities along with the changing behavioural pattern of consumers regarding perishable products like ice cream is the essential purpose of this study (Martin, 2018). The study revealed consumer preferences regarding the flavour of ice cream. As consumers are the heart of any business, purchasing decisions based on income also carry significance. This study has been done based on influencing factors directly connected with consumers'

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perceptions of ice cream (Barykin et al., 2022; Seuring & Müller, 2008). The preferable environment for customer ice cream consumption was a partial analysis area in this paper. Nevertheless, the main issue to determine was the consumer behavioural pattern for ice cream and the most renowned brand among the people of Dhaka city (Dian Nailiyah, 2013).

II. Methodology

In regard to performing the research analysis

The ice cream industry and consumer perceptions were the root point. Ultimately, various participant's emotions about the attributes that influence customers towards icecream purchase with brand preference have been considered. This research reveals the key attributes influencing the consumer of an ice cream buyer and their income effect on having an ice cream.

a) Research Approach/way

The convenience sampling technique was adopted for this study, and the study is based on two types of data sources. The entire research process was conducted based on primary data through a questionnaire comprising 152 consumers and secondary data. It is a quantitative study collecting data by interviewing the respondents, who are consumers of ice cream in Dhaka, Bangladesh. The quantitative analysis represents a given reality in data collection by taking interviews based on a questionnaire and acquiring respondents for an electronic survey. There-fore, the study process had to be split into two parts: primary research and secondary research. In this cross-sectional survey research design, the nature of data is described by detailed explanations and mood of analysis survey results.

b) Data Collection

The primary data is collected by an open-ended interview questionnaire and collecting respondent's responses using an online research survey method with some descriptive questions. All the respondents belong to the capital of Bangladesh, called Dhaka. Initially, the personal-contact approach was administered for the responses to the survey questionnaire. The Google survey form has been used to collect the responses from the respondents. Ice cream lovers were the respondents for the survey, and 152 respondents took part. Among all the respondents, only 30 respondents were willing to provide an interview. Therefore, 120 respondents completed the survey form digitally through email and social media. Three sections had developed to gather the responses accurately from the interview throughout the questionnaire. Different sources were considered for collecting secondary data, such as books, available literature, newspapers, magazines and websites.

c) Data Analysis and Representation

Data is processed carefully to make comparisons, statistical analysis, and interpretation. In this paper, the techniques of data and information are presented in three different ways: textual, tabular, and graphical. Data analysis has determined the relation-ships among the factors or variables.

1. *Percentage Analysis:* This method has been used to depict the respondent's demographic information and various responses from the respondents to some important factor-related questions. The survey participants have chosen their favourite brand of the country, and this analysis method has been taken to declare the country's number one ice cream brand.
2. *Henry Garrett Ranking Technique:* This technique was used to evaluate the ranking of ice cream flavour. Respondents rank their favourite flavour from one to eight in the survey form. The order of merit the respondents gave was transferred into a rank using the formula. Garrett's ranking technique highlighted the favourite flavour the respondents love to take. For conducting the method, respondents have been asked to provide the rank for all the given eight flavours. Then, the outcomes of such ranking have been converted into score values with the help of the following formula.

$$Percentage\ (\%)\ Position = \frac{100\ (R_{ij}\ -\ 0.5)}{N_j}$$

Where,

$$R_{ij}\ =\ Rank\ given\ for\ the\ ithariable\ by\ jth\ respondents N_j\ =\ Number\ of\ variables\ ranked\ by\ jth\ respondents$$

The percentage position has been estimated, and then it is converted into scores with the assistance of Garret's Table. After that, for each flavour, we had to calculate the mean score with the help of a percentage position-based ranking table (appendix) and frequency table. The flavour with the highest mean value is considered the higher rank, and then other ranks are done by the sequential order of the high mean value to the low mean value.

3. *Chi-Square Independence Test:* Chi-square test of independence determined whether there is a significant relationship between categorical variables of the respondent's monthly income and the ice cream purchase frequency. The Chi-Square independence test is also known as the chi-square test of association. The theoretical formula of the chi-square test is given below.

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$$x_c^2 = \sum \frac{(O_i + E_i)^2}{E_i}$$

Where,

C=Degrees of freedom
O=Ovserved value (s)
E=Expected value(s)

The Chi-square test of association evaluated relationships between categorical variables between the monthly income of respondents and the purchase frequency of ice cream. The Chi-square the test has two types of statistical hypotheses. Those are provided below.

a. *Null Hypothesis:* If there are no relationships between the selected categorical variables for this research. If we can know the value of one variable, it will not assist us in predicting the value of another variable.
b. *Alternative Hypothesis:* If there are relationships between the selected categorical variables for this research. Learning about the value of one variable will assist us in predicting the value of another variable.

Finally, a chi-square test on SPSS will give us a p-value. The p-value will explain whether our test results are significant or not. We needed two pieces of data to perform a chi-square test and acquire the p-value. Those are degrees of freedom, just the number of categories minus 1 and the alpha level (α). The researcher usually selects the alpha level. We used the alpha level of 0.05 or 5% for this research.

3. *Principal Component Analysis:* This research has used PCA to analyse the perception of consumers of Dhaka related to ice cream. The method is also widely known as principal component analysis, principal value decomposition, singular value decomposition, singular system analysis, singular spectrum analysis, bi-orthogonal decomposition, proper orthogonal decomposition, empirical orthogonal functions, and Karhunen-Loeve decomposition. In this way, PCA is a handy tool for the research as the respondents were more than 150, which is helpful for the large data set. PCA is performed in a sequence of steps, with subjective decisions made at many steps. The amount of components extracted equals the number of variables being analysed. We have considered four factors to figure out the variance of the components.

Initially, the first counted component can be expected to account for an immense amount of the overall variance. It is found that each succeeding component reasoned for progressively smaller amounts of variance. Although a large integer of components may extract in this specific way, only the first few components will be potential enough to be retained for interpretation. An eigenvalue represents the amount of variance that is accounted for by a given component. It is shown that the Principal Component Analysis (PCA) reduces data dimensionality by performing a covariance analysis between factors.

d) Data Assortment and Inspect

According to the survey report for this study, we have collected responses from 152 respondents from various age groups with different educational qualifications. Most of the respondents were from the age group 20-30. It found that 76% of participants belonged to the age group of 20-30. Similarly, the second-highest participants came from the age group of 15-19, which counted exactly 15% of the total participants. People aged 31-45 showed less interest, and only 5% took part in the survey. Undoubtedly, the lowest respondents counted from the age group of 46-60. Only a person from that group paid attention to taking the interview face-to-face. The survey was conducted only in Dhaka, Bangladesh. Dwellers of Dhaka showed a variety of preferences in terms of ice cream.

e) Final Data Scraping and Analysis

Final Data scraping and analysis were not easy for this specific research. As we have focused on 3 different areas,

1. Attributes that influence consumers to purchase ice cream
2. Assuring that there has any income effect on consumers for purchasing ice cream or not
3. Ranking the consumer-preferred flavour for ice cream and ranking among the existing ice cream brands

Data analysis is regulated through the consumers given information regarding a set of questions and using a Likert scale to gather data from the survey participants. PCA has been done to get the consumer's preferences on ice cream purchases, and KMO Bartlett's test was done for the data accuracy of that factor analysis.

f) Magnitude and Measurement

For data collection, we tried to build a sample size of 152 ice cream consumers for respondents, and we took their opinion based on the pre-settled questions on the questionnaire. On the contrary, we collected data on which attributes attract them to purchase a specific ice cream. Eventually, the authors can collect Data and information from respondents from different age groups of Dhaka Dwellers.

g) Data Manipulation and Integration

Data integration is crucial to getting accurate results from the gathered data. Based on the definition when it is an element of quality research where the process observed various analyse with the same data points. It controlled ideal and correct decisions with

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decreasing misleading data. This process can evaluate and recognise data where the specific statistics come from respondents. That's why this combination is implemented for quality results.

III. Primary Analysis & Discussions

a) Consumer's Source of Information about Ice Cream

In the survey form, we gave five different sources from which consumers can get news about ice cream-related products. According to the survey findings, most respondents can learn about ice cream from social media like Facebook, Instagram, TikTok etc. The provided news of friends can also transmit the influencing power of consuming ice cream. 20% of respondents gather information about new ice cream products from their friends. Television advertisements play a moderate contribution in spreading out information about ice cream. Only 16% of survey takers believe they get news from TV ads about ice cream. Family members have little influence in sharing knowledge about newly released ice cream brands. We observed that 11% of the respondents learned about ice cream from their families. A few survey takers said they could get news while visiting trade fairs. Table 3 will clarify the viewpoint of the respondents, which are the sources of information about ice cream products.

Table 1: Source of Information about Icecream

Source Name	Number of Respondents Answered
Social Media	73
Friends	31
Television Ads	25
Family Members	17
Trade Fair	6

This bar chart illustrates software users' priority level considering some attributes- however, the following bar diagram was created with almost the same data and value.

b) Preferable Season and Place for Consuming Ice Cream with the Purpose of Consumption

All the seasons are preferable to consuming ice cream, according to 49% of the survey takers. At the same time, 45% of the participants think summer is the best season for enjoying ice cream. People are unlikely to consume ice cream during cold weather like winter and the rainy season. From Figure 1, the customer's seasonal priority of eating ice cream can be simplified. It has been reported from the survey results that customers are unwilling to eat ice cream when it is winter season. Only 2% of people were interested in having ice cream during the winter- similarly, less interest from the customers found for biting ice cream when it is raining outside.

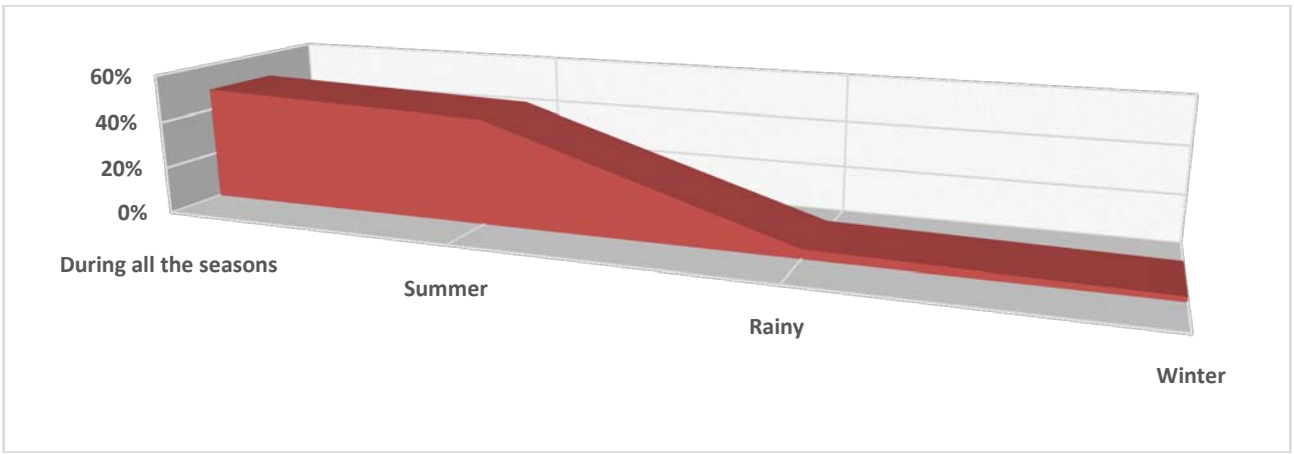


Figure 1: Preferable Season of Consumers to take Ice Cream (3d Graph)

It has been reported from the survey results that customers are unwilling to eat ice cream when it is winter season. Only 2% of people wanted ice cream during the winter. Similarly, customers have less interest in biting ice cream when it is raining outside.

The survey found that Home is the preferred place for people to consume ice cream. 50% of the participants will likely enjoy ice cream at their Home. 35% of respondents are likely to have ice cream during the hangout. People may like to eat ice cream in a condition where they can have a satisfactory comfort level. Various researchers have reported that consumers are too fond of eating their favourite food in any situation with comfortableness. Below, we provide a figure that will clear the readers about the consumer's preference for the place where they most want to eat ice cream.

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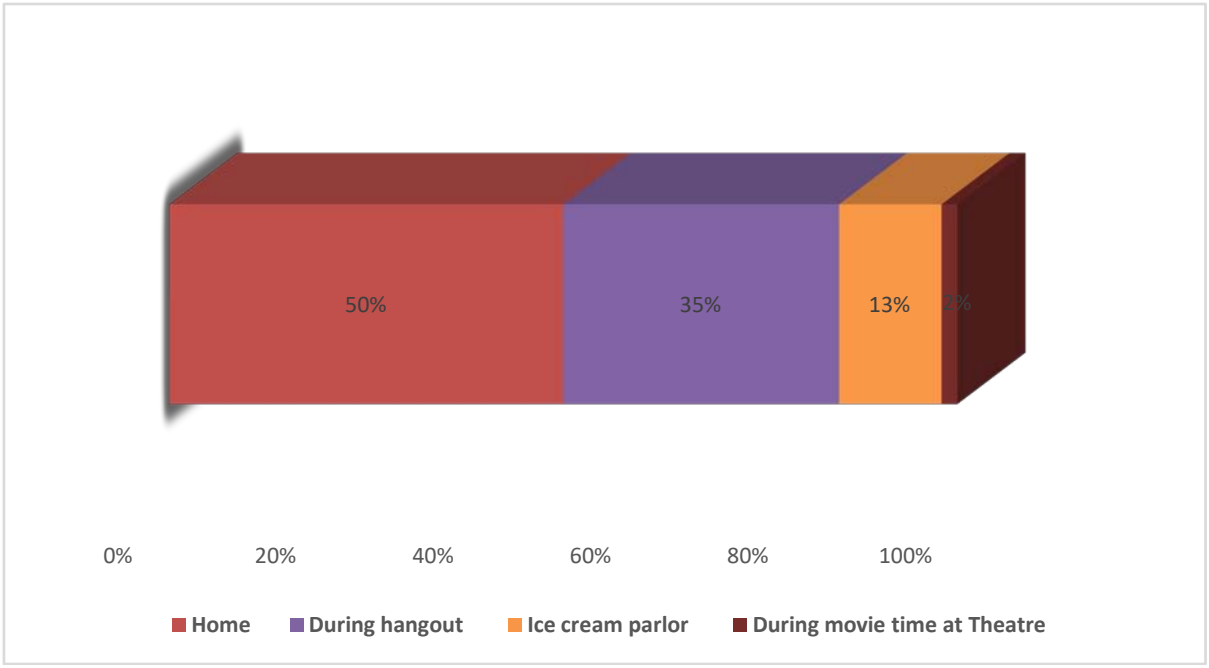


Figure 2: Preferred Place by Respondents to Enjoy Ice Cream

In this survey, around 40% of respondents consume ice cream for enjoyment. Among other goals of having ice cream, it becomes first according to the high response. Some people think that they eat ice cream for a sense of refreshment. Their amount is counted as nearly 39%. Only 16% of respondents agreed that icecream consumption has no reason or is taken by them habitually. A few people take ice cream during any celebration.

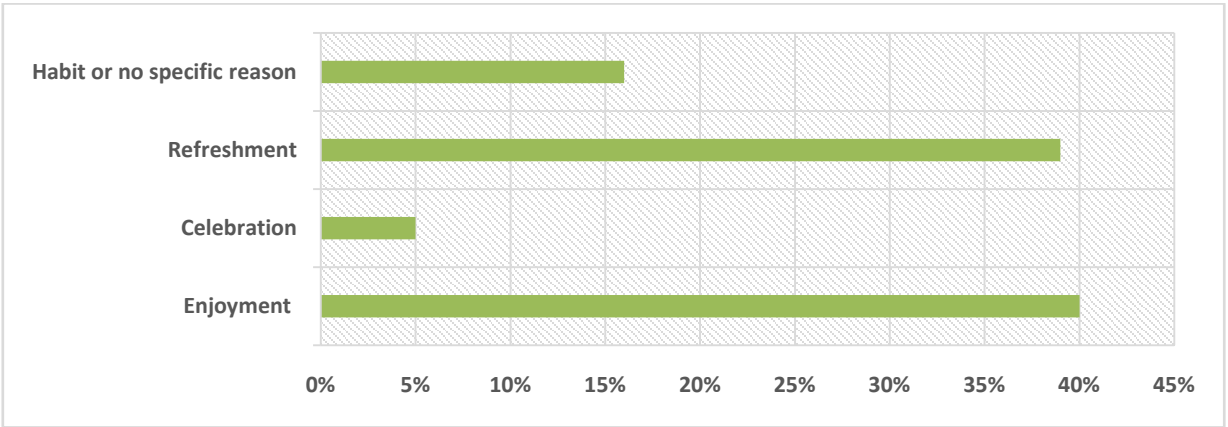


Figure 3: Purposes of Consumers for Consuming Ice Cream

c) *Purchase Frequency of Ice Cream by the Respondents and Brand Awareness of Different Brands*

Seventy-two people from 152 respondents said they rarely buy ice cream once a week. Over 40 people used to purchase ice cream occasionally, twice a week. We saw that 38 total respondents love ice cream to eat. They usually eat ice cream frequently, more than thrice or above in a week.

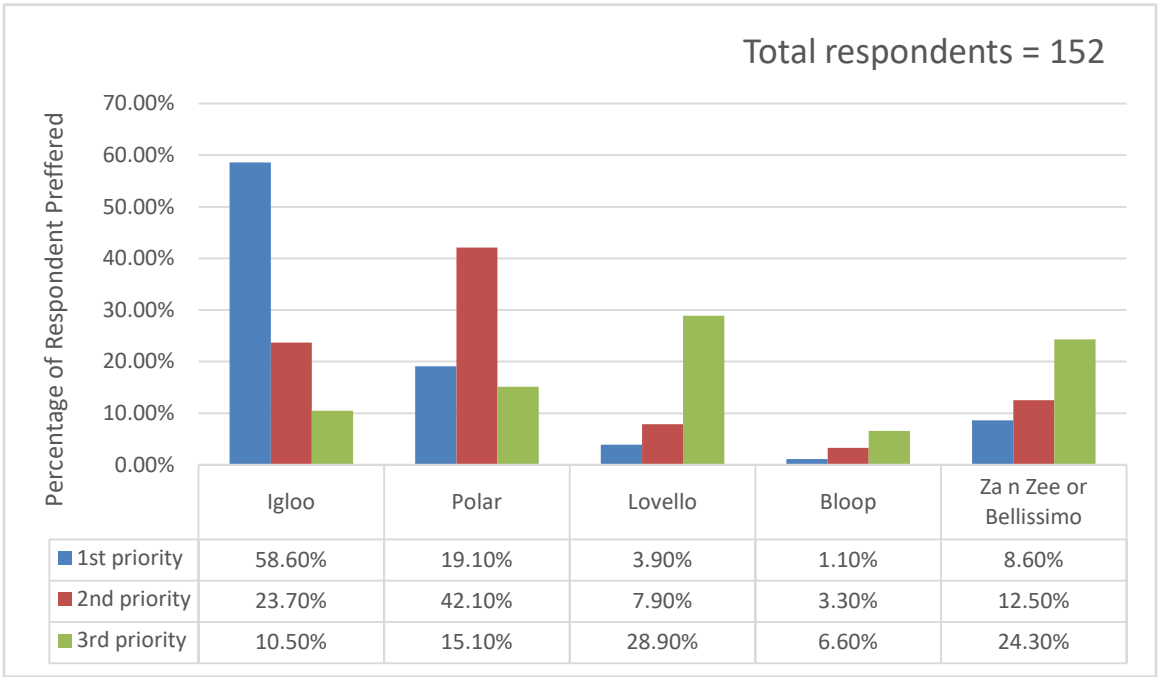
Table 2: Frequency of Ice Cream Purchases by the Respondents in a Week

Frequency Name	Frequency of Purchase (Weekly)	Number of Respondents Responded
Rarely	Once	72
Occasionally	Twice	42
Frequently	Thrice or above	38

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Consumers take those products that provide them with a certain level of satisfaction that can depend on various types of things. Satisfaction of consumers can come from the tastes of the product, after-sales service of the product, pricing of the products or any cash discount.

We set a question in the questionnaire by asking about most favourite brands based on priority order. Respondents could select three brands from given brands to respond to that question. We have investigated that a maximum number of participants are willing to take ice cream from the Igloo Ice Cream Ltd brand as their priority choice. Similarly, people preferred Polar Ice Cream, the sister concern company of Dhaka Ice Cream Ltd., as the second priority of ice cream. Lovello ice cream brand of Toufiqa Food Ltd. has become the third priority of consumers where the availability of the first two brands is low.



	Igloo	Polar	Lovello	Bloop	Za n Zee or Bellissimo
1st priority	58.60%	19.10%	3.90%	1.10%	8.60%
2nd priority	23.70%	42.10%	7.90%	3.30%	12.50%
3rd priority	10.50%	15.10%	28.90%	6.60%	24.30%

Figure 4: Consumer Priority Order of Ice Cream Brands of Bangladesh

One hundred fifty-two respondents responded individually to the priority-based question for the first, second, and third priorities. We consider which brand gets the highest percentage as the priority of the vote for becoming the number one brand by the consumer choice. Similarly, we will apply this logic for counting the second and third most favourite brand by consumer choice and reasoning for the consumer choice of brands. We saw that non-branded ice cream has no attraction among the customers. Among all the brands, three brands achieve a high level of consumer satisfaction. Figure 7 depicts the consumer's three most preferable brands in Dhaka city.

The unavailability of a particular brand of ice cream forces the customers to alter the brand with the available one. We have found that 59% of customers buy igloo ice cream from other options for this specific case. At the same time, 42% of consumers love Polar ice cream, and 30% prefer to purchase Lovello ice cream. Interestingly, the ice cream brands of Kazi Firms Ltd. make a place in the consumer list of choice. 24.3% of consumer selects Za n Zee or Bellisimo ice cream as the second-third choice. Moven Pick ice cream is the only brand from abroad that carries nearly 8% of consumer's initial priority. Local brands Bloop and Savoy have little consumer awareness among the respondents.

d) Association between Family Monthly Income and Frequency of Ice Cream Purchase by the Consumer

We have applied the Chi-Square test to investigate this association between family monthly income and ice cream purchase frequency.

H_0: There has no significant association between the consumer's family monthly income and the frequency of their purchase of ice cream.

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Table 3: Association between Family Monthly Income and the Frequency Purchase of Ice Cream

Chi-Square Tests			
	Value	Df	Asymptotic significance (2-sided)
Pearson Chi-Square	3.485[a]	6	0.746
Likelihood Ratio	3.483	6	0.746
N of Valid Cases	152		
a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 8.50.			

To determine whether the two variables, family monthly income and frequency purchase of ice cream, are not dependent, compare the p-value to the exceptional level- usually, an extraordinary level (marked as α or alpha) of 0.05 functions well. An incredible level of 0.05 represents a 5% risk of winding up that an association between the variables exists when there is no actual association.

Therefore, we must consider the null and alternative hypotheses to decide on the Chi-Square test. We have investigated that the computed value 0.746 is greater than the significance level. Then, we move to the null hypothesis, which is accepted based on the respondent's given data for this particular test. In these results, the Pearson Chi-square Statistic is 3.485 and the p-value = 0.746. The likelihood chi-square statistic is 3.483, and the p-value = 0.746. Here, the P-value $> \alpha$, which can not conclude that the variables are associated. At a significance level of 0.05, we can conclude that the association between the variables is not statistically significant. Consumers are free from the income boundary to satisfy themselves by consuming ice cream. Finally, the income of the consumers has no crucial impact on the purchase of ice cream.

e) Ranking the Flavours of Ice Creams

The Respondents were asked to rate their favourite flavours of ice cream from one to eight during the survey session. We have provided eight different flavour names, which are available in the shops of Dhaka city. Then, survey report data was used to analyse the flavours ranking by the Garret ranking analysis method.

Table 4: Frequency Table of Flavours

Rank	Vanilla	Chocolate	Mango	Strawberry	Blue Berry	Red Velvet	Pistachios	Butter Scotch
1	35	71	5	7	2	2	6	24
2	34	39	21	14	9	9	10	16
3	22	12	42	19	8	20	8	21
4	15	9	23	46	13	14	10	22
5	27	7	20	14	23	13	19	29
6	10	4	15	14	39	22	30	18
7	3	5	15	15	27	47	37	3
8	6	5	11	23	31	25	32	19

Table 4 illustrates how many respondents provide an individual rank for the particular flavour. This frequency table has been established based on the variety of flavours in the questionnaire. The total amount of respondents for this specific question was 152 same as the total number of respondents. With the frequency of flavours ranked by the participants, we have to calculate the individual mean score for particular flavours for every rank from one to eight. Then the sum of the mean score's percentage of individual flavours assists in figuring out the Garret Score to rank the flavours. From the table below, one can easily get an idea of the people's taste in Dhaka city. Ranking of Flavours by Garret Ranking Analysis makes sense that most consumers love to enjoy the taste of chocolate-flavoured ice cream. It placed first based on the analysis. The other eight flavours also being ranked in the following *Table 5*.

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Table 5: Ranking the Varieties of Flavours of Ice Cream

Flavour	Mean Score	Rank
Vanilla	55.9	II
Chocolate	62.7	I
Mango	47.7	IV
Strawberry	43.3	V
Blue Berry	35.1	VII
Red Velvet	36.3	VI
Pistachios	34.9	VIII
Butter Scotch	48.1	III

After cross-matching both the Garret Score Table and the sum of the mean score from our calculation of individual flavours, we have moved to build a position value table to rank the flavours. This position value table is attached in the appendix. The results of the Garret ranking showed that Chocolate flavour is in the most vital position to become a prioritised flavour by the consumers surrounding Dhaka. We were followed by four other ice cream flavours; Vanilla, Butter Scotch, Mango and Strawberry. If we put a view on the ranking table, we can find that Chocolate flavoured ice cream could achieve a mean score of 63.7; as Chocolate has acquired the highest Garret Mean Score, it is placed first. In addition, vanilla has the second-highest achieved mean score, 55.9. We reported a premium ice cream product based on consumer preference in the third position. With 48.1 mean scores, Butter Scotch has become Dhaka's third favourite ice cream. Similarly, an average score was gained by Strawberry flavoured ice cream and became secured fifth place with a mean score of 43.3.

Customers showed less affection for having three flavours, Blue Berry, Red Velvet, and Pistachios. According to the analysis of flavour ranking, we found that Red Velvet ranked sixth with a mean score of 36.3, Blue Berry ranked seven with a mean score of 35.1, and Pistachios became eighth with a mean score of 34.9.

f) Factor Analysis to Determine the Consumer Perceptions

From frequency analysis, we can interpret that consumers primarily eat Chocolate flavoured ice cream, which has huge demand. In contrast, customers rated Vanilla flavoured ice cream just after the Chocolate flavoured ice cream.

Table 6: Factor Analysis for Consumers

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.866	
Bartlett's Test of Sphericity	Approx. ChiSquare	812.544
	Df	105
	Sig.	0

KMO measure of sampling adequacy was found to be 0.866, and Bartlett's test represented a significance of 0.000. It showed that the above parameters are highly significant. Due to having perfect results from the statistical calculation, sampling adequacy should be more than 0.5 to perform factor analysis. The above table shows a sampling adequacy of 0.866, which means factor analysis can be achieved. Hence, factor analysis had applied to 15 variables measuring the perception of consumers regarding ice cream.

Table 7: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	5.544	36.958	36.958	5.544	36.958	36.958	3.006	20.037	20.037
2	1.388	9.25	46.208	1.388	9.25	46.208	2.867	19.114	39.151
3	1.168	7.789	53.997	1.168	7.789	53.997	2.145	14.303	53.453
4	1.016	6.771	60.768	1.016	6.771	60.768	1.097	7.315	60.768

Extraction Method: Principal Component Analysis

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It has been found that 15 variables have been reduced into four predominant factors. These four factors are quality of ingredients, quantity, appearance, price, and taste. Individually the factors have a variance; respectively, quality of ingredients was observed at 20.037%, quantity has 19.114% of the variance, appearance noted 14.303% of the variance, and price and taste, counted 7.315% of the variance. The total variance was explained as 60.768%.

Table 8: Customer's Perception Regarding Ice Cream

Rotated Component Matrix					Defined Name of the Factor
Variables	Components				
	1	2	3	4	
Toppings of ice cream are lucrative	0.625				Quality of Ingredients used in ice cream
I prefer to buy ice cream if there is a combo offer	0.693				
Ingredients level of quality used in ice cream is satisfactory	0.743				
I love ice cream for the freshness and coldness	0.709				
I am pleased with the weight of the ice cream with its price		0.726			Quantity of Ice cream
I buy ice cream for its extraordinary packaging		0.370			
I feel the price charged is authentic		0.829			
Ice creams are available in a wide variety		0.642			
I buy ice cream due to the influence of catchy advertisements			0.727		Appearance
The visual image of ice cream convince me to purchase it			0.418		
The price of ice creams does not match with its given quality				0.294	Price & Taste
I will buy ice cream no matter that how much the price of it				0.232	
I love to consume ice cream throughout the first week of the month				0.251	
I'm not too fond of the perishability of ice cream				0.841	
I think the ice cream is yummy				0.110	

The first factor is "Quality of Ingredients used in ice cream", and it includes four sub-variables, Toppings of ice cream are lucrative, I prefer to buy ice cream if there is a combo offer, Ingredients level of quality uses in ice cream is satisfactory, I like ice cream for the freshness and coldness. The quality of ingredients used in Ice cream is satisfactory. I like ice creams due to the freshness and coldness, which explains 20.037% of the variances. "Quality of Ice cream" comes next to the previous factor. It has been comprised of 4 variables: I am pleased with the weight of ice cream with its price, I buy ice cream for its extraordinary packaging, I feel the price charged is authentic, Ice creams are available in a wide variety, and it reports 19.114% of the variance. The next factor is "Appearance", which comprises two different variables respectively; I buy ice cream due to the influence of catchy advertisements. The visual image of ice cream convinces me to purchase it, showing 14.3030% of the variance. "Price and Taste" is the last factor of this factor analysis part. Based on five separate variables, the related question was there for the consumers. Those are the price of ice creams that do not match their given quality I will purchase ice cream no matter that how much the price of it I will buy ice cream no matter how much the price is; I love to consume ice cream throughout the first week of the month, and I'm not too fond of the perishability of ice cream, and I think the ice cream is yummy. The last factor explains 7.315% of the variance.

IV. Significant Findings of the Study

- There is no association between the family's monthly income and ice cream purchase frequency.
- Chocolate-flavoured ice cream becomes the first in position according to the consumer's purchasing frequency and rank.
- The majority (40%) of the respondents eat ice cream for enjoyment.
- Maximum (49%) of the consumer learn about ice cream from social media.
- Igloo ice cream became the number one brand according to consumer preferences.
- A large number of respondents (72 participants) consumed ice cream only once a week.
- 50% of the customers prefer ice cream in their home environment.
- Factor Analysis revealed four factors: quality of Ingredients used in ice cream, the quantity of ice cream, appearance, and price & taste.

V. Conclusion

This study aimed to assess the consumer behavior of city people regarding ice cream. Luckily, the paper found the attributes that influenced the city dwellers of Bangladesh to buy ice cream and checked the income effect on purchasing power for ice cream. Despite having various limitations, this research

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provides valuable information about consumer behavioural patterns. As the consumer is the heart of any business, the consumer's choice of flavour for ice cream consumption is significant. Usually, a consumer gets a wide variety of options. Consumer choice for a particular commodity on a specific flavour is mainly built on the fair value the customer gains after paying for the product. The research has demonstrated which flavours carry consumer preference to consume.

Again, this industry is growing up rapidly due to the changing tastes of consumers. After the liberation war of the independents of Bangladesh, there was only one ice cream company except for traditional handmade ice creams. In 2021, we are aware of more than seven branded ice creams. The conventional form of eating ice cream is also changing. For this purpose, a few foreign brands have introduced their ice cream parlour in the town. Competition is enhancing without any doubts. We have seen that only three locally branded ice creams dominate the market, besides having many competitors.

Similarly, consumers also prefer to get new tastes around the year. Most of the consumers get refreshments while they are eating ice cream. It can be their mental satisfaction regarding ice cream products. Three specific flavours are the most renowned among the customers. People love to enjoy a variety of flavours during their celebrations at the house. We collected a satisfactory amount of data throughout the study's survey. The information from the survey simplifies the analysis regarding the purchasing factors. We have defined only four factors contributing to an individual rate of variance when consumers purchase ice creams. Overall, this study creates new grounds for further research in the area of the ice cream industry of Bangladesh. Other studies can be done to develop the marketing concept of ice cream and develop a new product based on a large scale of consumer opinion.

VI. Suggestion for Future Work

This research has unbarred an enormous scope for future studies. The potential scopes are discussed below:

1. It is a way forward for the existing companies to do nationwide surveys and apply provided methods to get consumer insights. Popular brands will reduce their possibility of destruction as they are already mature.
2. Upcoming brands can also be benefited by getting consumer preference in different areas like pricing of ice creams and preferred sizes, discovering new SKUs and taking the opportunity of economies of scale.
3. This research will help determine the less popular flavours with only a 1-5% contribution to a company's total sales. Thus, companies can stop making those flavours and reduce their cost of production.

Nevertheless, this research can also be implemented in other FMCG sectors like beverage, bakery products, and chain restaurants like pizza hut, Mac Donald etc.

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Conflicts of Interests

We do not have any conflict of interest to disclo se. All authors declare that there is no Conflict of interes.

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The content is original, unpublished, and signed and not reviewed for publication elsewhere. We acknowledge that all named authors have read, reviewed, and approved the manuscript and that no one else is authorised to write it but is not stated to have participated in this study. We reiterate in the article that we all agree with the regulation of the registrants. We know that the author is the only person the writing process will come in contact with. It is responsible for informing other authors about their work, making corrections and writing permission documents.

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