



Exploring Egg Consumption Habits in Surat and Rajkot Cities of Gujarat: A Consumer Behavior Study

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The study was conducted to figure out who are the consumers of egg in the concerned area, how much awareness do they have about the enriched egg, what they perceive of an enriched egg in comparison to a conventional egg, to understand the purchasing and consuming behavior of the consumers for an egg and to find out what are the major factors that motivate consumers to purchase enriched egg. The study was conducted in the Surat and Rajkot cities of Gujarat. The objectives of the study were achieved with the help of primary data, which was collected through face-to-face interview using a structured schedule, which was made with the help of pilot survey and review of literatures. Using convenience sampling, 200 households (100 from each city) were surveyed, among which 100 households were enriched egg consumers while the remaining 100 were conventional egg consumers. The majority of the consumers of egg are married male, with education up to graduation, working as a private employee with income in range of ₹35,001 - ₹60,000 but for enriched egg a unanimous consensus on the impact of the socioeconomic factors

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viz., gender, age, family type and family size, in acceptance of enriched egg, because of the variation in both the geographies can't be established. The awareness about the enriched egg was less, even among the consumers of enriched egg. The major sources of awareness are friends/relatives, online sources, educational institutions. The date of production, price, size and color highly influence the buying decision whereas health benefit, season and avian disease outbreak highly influence the consumption of egg. The consumers are motivated to purchase enriched egg by the factors in order freshness, health claim, packaging, odorless, golden yellow yolk color and nutritional claim respectively.

Keywords: Functional food; enriched egg; consumer behavior; awareness; perception.

1. INTRODUCTION

Sustainable Development Goal two is about creating a world free of hunger by 2030, but it's not about the mere access to food but also envisions a balanced diet to all. Globally, 149.2 million children under 5 years of age, or 22.0 per cent, were suffering from stunting (low height for their age) in 2020, a decrease from 24.4 per cent in 2015 [1]. The number increases when it comes to hidden hunger, a less visible forms of malnutrition which occur when children become deficient in essential vitamins and other micronutrients. These micronutrient deficiencies affect more than 340 million children under 5 globally, delaying their growth, weakening their immune systems and impairing their brain development [2].

India, ranked 107th out of 121 assessed countries on the 2022 Global Hunger Index (GHI). With an overall score of 29.1, the level of hunger in India has been categorised as "serious". The GHI that tracks and measures hunger across the world says that malnutrition among children under five years in India is very high. The report has highlighted that child wasting (low-weight-for-height) rate in India, at 19.3 per cent, is the highest of any country in the world. With 35.5 per cent of children below five years stunted (low height for age). This has put India off-track regarding the progress needed to achieve the Sustainable Development Goal of "Zero Hunger" (Goal 2) by 2030.

In many countries, and even within households, three forms of malnutrition – undernutrition, hidden hunger and overweight – co-exist [3]. And in this context egg, which is a wholesome, nutritious food with high nutrient density because, in proportion to its calorie count, it provides 12 per cent of the daily value for protein and a wide variety of other nutrients like vitamins, essential amino acids and minerals such as vitamin A, B6, B12, folate, iron, phosphorus,

Selenium, Choline and zinc etc. along with various other important ingredients so crucial for growth and good health, can be a potential solution to this triple burden of malnutrition along with other functional foods [4].

Functional foods are the one which have a positive impact on an individual's health, physical performance, or state of mind, in addition to its nutritious value. Thus, they are capable of providing health benefits beyond their nutritional capacity. They are further classified as conventional and fortified foods. Conventional foods are the one which include fruits, vegetables, millets, dairy products etc., and fortified foods are the one which are the result of food fortification, i.e., addition of vitamins, minerals or other nutrients to a food in order to increase its nutritional value. Food fortification is a proven, safe and cost-effective strategy for improving diets and for the prevention and control of micronutrient deficiencies.

One of the most popular fortified functional foods is egg. Enriched eggs are indeed a feasible source of omega 3 fatty acid, vitamins, several minerals such as selenium, proteins and other important nutrients. Feeding hens with foods that are rich in long-chain omega-3-fatty acids, such as camelina, that increases the amount of this kind of fatty acids within the yolk. As a consequence, eggs can be represented as an alternative to fish and oilseeds, both as a source of omega-3-fatty acids and also from an economic point of view due to the low price of table eggs. Moreover, the introduction of egg variants (such as eggs enriched with omega-3-fatty acids) on the market should represent an interesting alternative due to the growing consumer demand for healthy and safe food [5]. Despite of the interesting features of omega-3-enriched eggs, low attention has been paid to this arena by researchers in the sector. Even the factors motivating consumer for purchase of

eggs enriched with omega-3-fatty acids in India is largely unexplored.

In western or developed nations, number of studies have focused on the preferences of consumers for these alternative types of egg, but no or not many studies have focused on Indian consumers' preferences for functional eggs, and even when the studies have reported that for food industries, the studies related to consumers' perception and purchase motivations are essential, as they help to define the best strategies of commercialization [6] not much have explored. For these reasons, this study will try to fill a gap in the literature, with the objectives of understanding socio-economic profiles of the egg consumers, finding out the awareness level of the egg consumers about the enriched egg, understanding the perception of enriched egg consumers about the enriched egg vis-à-vis conventional egg, to know the consumer behaviour for eggs, and finding which characteristics of enriched egg, motivate the consumers to purchase the enriched eggs.

2. REVIEW OF LITERATURE

With regard to the impact of socioeconomic factors on the acceptance and consumption of functional food it was observed in a study that among all the age groups, maximum buyer population belongs to the 25 to 44 years age group [7]. While in another study it was observed that as compared to male consumers, the female consumers were more willing to pay a premium price for functional eggs and majority of the egg consumers were not married additionally the probability of the high-income group of consumers to show higher willingness to pay for the functional eggs was found to be high. Therefore, it was observed in the study that several different factors can influence acceptance of functional food by consumers, and among these factors, socio-demographic characteristics of people such as gender, marital status and income are important drivers [5].

When it comes to awareness level it was observed that there exist three categories of consumer knowledge which are: i) knowledge of the concept of functional foods (i.e., knowledge of the definition of functional food and functional food description), ii) nutritional knowledge associated with consuming functional foods (i.e., knowledge about nutrition, diet-related issues and health claims), and iii) specific functional food products' knowledge (i.e., knowledge about

specific functional foods, functional ingredients, functional foods brands) [8]. In another study it was found that the knowledge about micronutrient deficiencies and the availability of fortified staple foods is low in India and along with it the study revealed that although the awareness and consumption of fortified food was found low but the males were found to have good awareness and the source of information gain was family members, peers, internet and media [9].

Understanding the perception of the consumers helps a lot and, in that direction, it was observed in the study that sensory attributes such as size, appearance, and yolk colour and nutrient properties (omega-3-enriched) were the most relevant factors affecting consumer perceptions and preferences towards eggs. Other than that sustainability, price, pack size, freshness, and health related beliefs were found to affect consumer purchases of eggs, were also found to affect consumer perceptions, and preferences towards eggs [10]. In another study it was observed that the consumers relate the omega 3 enriched egg with the healthy diet and vitamin enriched eggs were considered to be preferred by someone with health disorders [11].

In the same line with regard to consumer behaviour it was observed in some of the studies that consumer preferences for eggs are mainly driven by intrinsic (Sensory properties such as size, eggshell colour, appearance, and yolk colour and nutrient properties (omega-3-enriched)) and extrinsic characteristics (such as production method, sustainability, price, pack size, freshness, and origin), as well as socio-cultural factors (e.g., income, food habits, usage, educational level, attitudes, and trust in the certification institution). Price was observed as very important, particularly in developing countries, and the production method in the developed countries is a relevant and important sub-factor, through which consumers make image about the health, safety, and sensory properties of eggs [10]. Additionally, in another study it was found that Supermarkets were the preferred channel of purchase and production date was found to be the most important factor looked after by consumers while purchasing eggs. Most often the eggs were consumed in the morning and the consumers prefer eggs in boiled form for consumption. In the same study it was also revealed that the majority of the families preferred eggs with deep yellow yolk colour and in the event of an avian influenza epidemic, it is

generally believed that egg consumption will decrease [12].

3. MATERIALS AND METHODS

The study entitled "Exploring Egg Consumption Habits in Surat and Rajkot Cities of Gujarat: A Consumer Behavior Study" was carried out in Surat and Rajkot cities of Gujarat the two major cities in the south and Saurashtra region of Gujarat respectively. Within the cities the specific location of the survey were the frozen food stores which were selected purposively as mostly through these stores the enriched egg and other packaged and branded eggs are sold.

3.1 Sample Classification

The households which were consumers of egg were chosen as sample unit and the sample size of 200 was taken out of which 100 sample size from each city (Surat and Rajkot) was selected through non-probability sampling method using convenience sampling technique. Further, the sample size was divided equally in the survey among consumers and non-consumers of enriched egg and 50 respondents for enriched egg and 50 for conventional egg from each city were finally chosen for the study.

3.2 Research Design

Descriptive research with household as a sample unit for the study and a sample size of 200 (100 Enriched Egg consumers & 100 Conventional Egg consumers) was conducted. The non-probability method was adopted for the sampling which was done using convenience sampling technique.

3.3 Research Tools

Keeping in view the nature of the study and for obtaining correct and perfect information from the respondents, the information was collected through personal interview using the schedule after pretesting it.

3.4 Analytical Tools

To understand the socioeconomic profile of the consumers, to find out the awareness level about the enriched egg and to know the consumer behavior of the egg consumers, percentage analysis and tabular analysis was conducted, which is among the simplest way to analyze the

data and display in a tabular form which is an array of rows and columns in which within the cells the frequency and percentage of each category of the criteria to be studied is calculated and finally a comparison is done.

To find out the perception of the enriched egg consumers vis-à-vis conventional egg, Likert scale method [13] was used to collect the data and weighted average mean was used to analyze the data.

- 5-point Likert was used, as follows 1 (Highly Inferior), 2(Inferior), 3(At par), 4 (Superior), 5 (Highly Superior).
- Weighted Average Mean

Statistically, the weighted mean is calculated using the formula given below:

$$WAM(X) = (F_1X_1 + F_2X_2 + F_3X_3 + F_4X_4 + F_5X_5) / X_t$$

Where, F = Weight given to each response

X = Number of responses

X_t = Total number of responses

Finally, to find out the motivating factors for the purchase of enriched eggs Garrett ranking method was used. The method was developed by Henry Edward Garrett in the year 1969 [14]. The formula used in the method to calculate the percent position is given below

$$Percent\ position = \frac{100(R_{ij} - 0.5)}{N_j}$$

Where,

R_{ij} = Rank given for the ith variable by jth respondents,

N_j = Number of variables ranked by jth respondents

4. RESULTS AND DISCUSSION

4.1 Socio-Economic Profile of the Respondents

Out of the total 200 respondents, 152 respondents were male and the remaining 48 were the females, indicating the more foot fall of the males at the market place for the purchase of eggs. However, in particular to the enriched egg consumers it was observed that in the Rajkot city 34 percent were females which was more as compared to Surat city where only 18 percent females were found.

Age of the respondents was majorly found below 49 years (74.5 percent). Followed by the respondents with age more than or equal to 50 years (25.5 percent). In particular to the enriched egg, in Surat city the majority of the respondents belong to the age category of 20-34 years (38 percent), whereas in Rajkot city the majority of the respondents were found to have age in between 35-49 years (74 percent).

Majority of the respondents were found to be married (89 percent) while only 11 percent were unmarried. And in that, more number of unmarried respondents who were purchasing enriched eggs were present in the Surat city (8 respondents) as compared to the Rajkot city where no such respondent was found.

With respect to the education, majority of the respondents were found to have education up to graduation or above it (53.5 percent). Which was followed by the respondents with education up to HSC (35 percent), SSC (10 percent) and primary (1.5 percent). In case of enriched egg, the Surat city have more number of respondents (31 respondents) with education level of graduation and above as compared to the Rajkot city (26 respondents).

The major proportion of the respondents were private employee (67.5 percent), followed by 21 percent respondents who had reported self-business as occupation. Among enriched egg consumers, the Rajkot city was found to have more respondents with self-business (30 percent) than Surat city (24 percent).

Monthly income of majority of the respondents, was found in the range of ₹35,001 - ₹60,000 (44.5 percent) followed by ₹10,001 - ₹35,000 (28 percent), ₹60,001 - ₹75,000 (16.5 percent), ₹≤ 10,000 (6 percent) and ₹ > 75,000 (5 percent). In Rajkot city among the enriched egg consumers the monthly income of the 40 percent respondents was found to be more than ₹60,000 where as in case of Surat city 32 percent respondents had reported salary more than ₹60,000.

The family size in the Rajkot city was found to be larger as 68 percent respondents had reported more than 5 members in their family and this reaches to 84 percent in case of enriched egg, while only 26 percent such families were found in the Surat city and which reduces to 24 percent in case of enriched egg consumers. In the same line in the Rajkot city the majority of the

respondents had reported that they have a joint family (64 percent) while only 28 percent of the respondents in the Surat city had reported joint family type.

For the family food purchase, majority of the respondent families were found to have no dominance of any gender (51 percent), while 36 percent of the families had reported that females are majorly responsible for the family food purchase and the remaining 13 percent of the families had reported males are responsible for the family food purchase.

4.2 Awareness about Enriched Egg

The awareness about the enriched egg was found to be low, as out of 200 respondents only 30 percent of the respondents had previously heard about the term enriched egg. The scenario differs in different geographies as in Surat city only 40 percent out of the 50 enriched egg consumers, and 4 percent out of the 50 conventional egg consumers were aware about the term enriched egg, whereas in Rajkot city the awareness was a little more as 60 percent out of the 50 enriched egg consumers and 16 percent out of the 50 conventional egg consumers were aware about the term enriched egg.

Out of the 60 aware respondents (22 from Surat city + 38 from Rajkot city) the major source of awareness was found to be friends/relatives with 33.33 percent respondents (18 from Rajkot city + 2 from Surat city) subscribing to it as their major source of awareness. Followed by online sources with 31.66 percent respondents (11 from Rajkot city + 8 from Surat city) reporting it as a source of awareness. Another important source was educational institutions as 15 percent respondents (8 from Surat city + 1 from Rajkot city) reported that they had heard this term in their schools/college/university. These major sources were followed by the medical practitioner (6.67 percent) and dietician (6.67 percent) in Rajkot city and mass media (6.67 percent) in Surat city.

Among the aware respondents, majority of the respondents were male (100 percent within Surat city + 66 percent within Rajkot city) and only in Rajkot city out of 38 aware respondents, 34 percent were females, whereas no aware females were found in the Surat city. And when it comes to age, it was found that in Surat city, majority of the respondents belongs to the age category of 20-34 (50 percent), followed by 35-49

(22.73 percent), above 65 (18.18 percent) and 50-64 (9.09 percent), whereas in Rajkot city, the majority of the respondents belong to the age category of 35-39 (63.15 percent) followed by 20-34 (34.21 percent) and 50-64 (2.64 percent). It was observed that for the age category 20-34 the major source of awareness was online sources as out of the total 24 respondents in 20-34 age group from both the geographies, 58.33 had reported online sources as their major source of information, followed by educational institutions (33.33 percent). While for the age group 35-49 out of the total 29 respondents from both the geographies, major source of awareness was friends/relatives (55.17 percent), followed by the educational institutions (17.24 percent). Additionally, it was found that for the consumers with age above 65 the source of information was mass media. Apart from this it was also observed that in both the cities 78.34 percent (30 from Rajkot city + 17 from Surat city) of the aware respondents from both the cities had education level up to graduation or above and among these respondents the major source of awareness was found to be online sources (40.42 percent). Whereas only 16.66 percent of the respondents (8 from Rajkot city + 2 from Surat city) were found to have education up to HSC, and among these respondents, friends/relatives (60 percent) were found to be the major source of awareness.

Among all the 60 aware respondents in order to check the concept clarity an attempt had been made by asking them about the nutritional enrichment made in an enriched egg and it was observed that 65 percent of the aware respondents think that omega 3 enrichment is done in an enriched egg, while 15 percent of the aware respondents reported that an enriched egg is enriched with omega 3 fatty acid as well as vitamins. This was followed by the respondents who were found to have awareness but not with the clarity about its enriched content as 13.33 percent of the aware respondents reported that enrichment of omega 3 fatty acid and protein is done in an enriched egg, 3.33 percent were such who thinks that protein content is more in an enriched egg and another 3.34 percent were just found to give a general response that an enriched egg is enriched with all the nutrients. Interestingly, it was observed that the respondents with less clarity about the enrichment of nutrients were the enriched egg consumers, whereas although the less number (10 respondents) of regular egg consumers were found aware about the term enriched egg but

only 10 percent of those were have unclarity about the concept.

Generally, the omega 3 fatty acid, vitamin D3 and selenium enriched eggs are available in these markets, so the respondents were asked about these nutrients and health benefits associated with them to know whether it could have an impact on the consumers if such claims are made by the available brands, and it was found that, out of the total 200 respondents, 49 percent of the respondents had heard about at least one of these nutrients. In which 32.65 percent were conventional egg consumers while 67.35 percent were enriched egg consumers. Among these 98 respondents, majority of the respondents were those who had heard of both omega 3 fatty acid and vitamin D3 (57.15 percent) followed by those who had heard of vitamin D3 only (32.65 percent) and omega 3 fatty acid only (10.20 percent), no respondent was found who ever had heard of selenium. Among the health benefits associated with these nutrients it was found that majority of the respondents had reported good bone health as the major health benefit as it was found to be present either alone or in combination with other benefits in the responses of 65.30 percent of the respondents, this was followed by the good heart health which was present either alone or in combination in the responses of 46.94 percent of the respondents. This was followed by the response good health overall which was reported by 12.24 respondents and good eyesight which was reported by 4.08 percent respondents.

When asked about the source of awareness for different brand available in the market place the major source of awareness was reported to be the shelf visibility (45 percent) of the brand, followed by Point-of-Purchase advertisement including retailers push (28 percent) and friends/relatives (27 percent).

4.3 Perception about the Enriched Egg vis-à-vis Conventional Egg

In Surat city, the consumers were found to have a positive perception for the appearance (4.48), yolk colour (3.64), packaging (4.36), freshness (4.48) and healthy/nutritive value (3.96), while for the size (2.84), taste (2.80) and odour (3.20) the respondents were found to have neither positive nor negative perception. Whereas for price (2.36) and availability (2.36) the respondents were found to have a negative perception about the enriched egg. Whereas in Rajkot city, it was

Table 1. Perception about Enriched Egg

Parameter	Surat city		Rajkot city	
	Score	Perception	Score	Perception
Size	2.84	At par	3.38	At par
Appearance	4.48	Highly Superior	4.04	Superior
Yolk color	3.64	Superior	4.00	Superior
Taste	2.80	At par	2.62	At par
Price	2.36	Inferior (Higher Price)	2.28	Inferior (Higher Price)
Packaging	4.36	Highly Superior	4.08	Superior
Freshness	4.48	Highly Superior	4.88	Highly Superior
Availability	2.36	Inferior (Less Availability)	2.60	Inferior (Less Availability)
Odor	3.20	At par	4.16	Superior
Healthy/Nutritive value	3.96	Superior	4.90	Highly Superior

observed that the parameters appearance, yolk colour, packaging, freshness, odour, healthy/nutritive value had a positive perception in the minds of the consumers, while size and taste were the parameters which were found to have neither positive nor negative perception among the consumers. Whereas in relation to the parameters price and availability like Surat city the consumers were found to have a negative perception of enriched egg. For both cities, the respective parameters, score and perception about them is given above in the Table 1.

4.4 Consumer Behaviour for Egg

Consumer behaviour for egg varies in both the geographies in various aspects, as when asked about the consumption, in Surat city, out of the 100 egg consumers, 64 percent reported that every member of the family has equal share in egg consumption, while 20 percent of the respondents reported that young members consume eggs mostly in the family, followed by 10 percent respondents where sick persons are major consumers of the family and 6 percent where children consumes most eggs in the family. Whereas, in case of Rajkot city, it was found that 60 percent families are such where every member of the family has equal share in egg consumption while 40 percent families are such where youth or young members consumes most eggs.

To know the consumption pattern of the families in both the geographies respondents were asked about the frequency of consumption and number of eggs consumed by per person per day in the family and it was found that, in Surat city out of the total 100 respondents, it was found that majority of the respondents viz., 58 per cent consumes egg on a regular basis, while

remaining 42 per cent of the respondents were found to consume eggs occasionally. The average egg consumption in Surat city was found to be at least 1.82 eggs/person/day. Whereas, In Rajkot city, majority of respondents were occasional consumers (72 percent), while remaining 28 percent of the respondents were regular consumers of egg. Here, in Rajkot city, the average egg consumption was found to be 1.93 eggs/person/day. With regard to enriched egg consumers out of 50 respondents in each city, it was found that in Surat city regular egg consumers were in more proportion (74 percent) while in Rajkot occasional egg consumers were more (82 percent), and the average enriched egg consumption in Surat city was found to be 1.66/person/day and in Rajkot city it was found to be 2.08 eggs/person/day.

The purchase frequency was also found to differ in both the geographies as, it was found that in Surat city, it was found that 42 percent respondents purchase eggs occasionally and another 42 percent were found to purchase eggs on a weekly basis. This was followed by the respondents who go to purchase eggs twice a week (8 percent), thrice a week (4 percent) and on daily basis (4 percent). While, in Rajkot city, 72 percent respondents were found to go for buying eggs occasionally, followed by the respondents who purchase eggs weekly (24 percent) and thrice in a week (4 percent). This was in line with the consumption pattern, as in case of Surat city majorly the eggs were found to be bought on a regular basis, while in case of the Rajkot city the occasional buyers were found in more proportion.

Multiple channels as preferred channel for buying eggs are selected by the respondents so to find out the most preferred channel, the channel which was mentioned by most number of

respondents in their response was figured out and it was considered to be the most preferred channel overall. In Surat city the most preferred channel was found to be neighbourhood bazaar which was included in the preferred choices of 80 respondents. This was followed by the Supermarket, which had been found common in 30 respondents' responses. Grocery stores were common in the preferred list of channels of 20 respondents and only 4 respondents had included direct sale from the farm in their preferred list of channels to purchase eggs. While in Rajkot, the supermarket is the most preferred channel among the list of channels from which respondents used to purchase eggs as it was found common in the list of 76 respondents. The second most common channel that was found in the list of 64 respondents was grocery store. This was followed by the neighbourhood bazaar which was common in the list of 24 respondents and the least common channel was found to be direct sale from farm which was common in the list of 8 respondents only.

Preferred time for egg consumption was found to be more or less same in both the geographies, egg consumption was found to take place at different times of a day and each respondent had given multiple responses to it, among those the most common response was breakfast which was the time that was included in their preferred time duration for egg consumption by 106 respondents. This was followed by 68 respondents who were found to have no such preferences and were consuming egg at any time of the day. 62 respondents were found to prefer egg in dinner. The another most common response was lunch time with preference of 48 respondents. The least preferred among all other was evening time which was preferred by 44 respondents only.

Similarly, the preferred form of consumption was also observed to be more or less same in both the geographies. As in case of preferred time and channel, the multiple preferences were reported by the respondents, so the most common preference was considered to be the most preferred form of consumption and it was found that boiled egg was the most preferred form of consumption with 180 respondents mentioned it in their response. This was followed by omelette which was preferred by 166 respondents, egg fry with 104 respondents' preference and curry which was preferred by 66 respondents only.

To get an idea of the factors that affect the buying decision of the respondents the respondents were asked to rate the different factors and it was observed that in Surat city out of 100 egg consumers, 84 percent of consumers were highly influenced by date of production. This was followed by size of an egg which was highly influencing for 74 percent of the respondents, the price which was highly influencing factor for 54 percent of the respondents and the colour which was highly influencing factor for the 50 percent respondents. Availability is the factor which was a moderately influencing factor for the 90 percent respondents. Brand although was a moderately influencing factor for more than half of the consumers, still for 40 percent of the respondents it was not an influencing factor at all. While in Rajkot city, the scenario was a little different, as out of 100 consumers of egg, all of the respondents that is 100 percent reported a high influence of date of production on their buying decision. Other important factor was size, which was highly influencing factor for 68 per cent of the respondents. These two factors were found to be more or less in line of the Surat city, but the colour, unlike the Surat city was a moderately influencing factor for 52 per cent of the respondents and price is another change that was observed as compared to Surat city, as here in Rajkot city, though the price was a highly influencing factor for 40 percent consumers but for the other 40 percent proportion it was a moderately influencing factor. The availability as in Surat city, here also was a moderately influencing factor for 60 per cent of the respondents and the brand was also in the line of Surat city, as for the same proportion of consumers as in Surat city it is moderately and not influencing factor both.

Similarly, in case of the factors affecting consumption of egg, it was observed that, in Surat city, 90 percent of the respondents are highly influenced by the health benefit of the egg. The season was found another important factor which was highly influencing factor for the 86 percent of the respondents. In the same line the avian disease outbreak was another important factor that was highly influencing for 80 percent of the respondents. Yolk colour was a factor that was found to affect the consumption moderately in 80 percent of the consumers. Following it were the organoleptic cause like taste, smell and appearance of an egg which was moderately influencing factor for 76 per cent consumers, production method which had a moderate

influence on 72 percent respondents and the availability which was found to moderately influence the consumption of 62 percent respondents. While in Rajkot city, all of the respondents i.e., 100 percent respondents were found to be highly influenced by the health benefits of egg. But unlike in Surat, in Rajkot city instead of the season, avian disease outbreak was found to be more influencing factor as 96 percent of the respondents were found to be highly influenced by it, while only 70 percent of the respondents considered season as highly influencing. Availability, in Rajkot also was a major factor that was found to have a moderate influence on the consumption of respondents but in case of Rajkot for the 32 percent respondents, availability is not an influencing factor which was a little bit more as compared to Surat (14 percent). Production method another major moderately influencing factor was also found to have a downfall in the percentage of people considering it moderately influencing from 72 percent in Surat city to 56 percent, and additionally in Rajkot more respondents were found to consider it as a highly influencing factor. The situation of organoleptic cause as a moderately influencing factor remains more or less same compared to the Surat city whereas yolk colour in Rajkot was found to become a non-influencing factor with 52 percent of the consumers considering it as non-influencing factor.

4.5 Factors Motivating Consumers to Purchase Enriched Eggs

Major factors which motivate the consumers for the purchase of enriched egg in the area concerned are recognized with the help of a pilot survey and based on the secondary data research. In an attempt to figure out which factor among the major factors is more critical from the consumers' perspective, in the survey

respondents were asked to rank the motivating factors in the order of their importance. As a result, in the Surat city it was observed that freshness is the major motivating factor among other with a highest garret mean score of 72.21. Followed by health claim viz., the consumption of enriched egg improves cardio vascular health and boosts immunity (64.84), packaging (53.54), odourless (46.18), nutritional claim that enriched egg is enriched with omega 3 fatty acids and selenium (33.00) and golden yellow yolk colour (30.23) respectively. In case of Rajkot city, a slight difference was observed that is golden yellow yolk colour was given higher importance as compared to nutritional claim. Other than that, in Rajkot city similar to the Surat city, the major factor which motivate the consumers for the purchase of enriched egg with a highest garret mean score of 72.87 was found to be freshness. Followed by health claim viz., the consumption of enriched egg improves cardio vascular health and boosts immunity (64.45), packaging (54.97), odourless (45.85), golden yellow yolk colour (36.73) and nutritional claim that enriched egg is enriched with omega 3 fatty acids and selenium (25.13) respectively.

Overall, in general the order in which the factors motivate the consumers to purchase enriched egg of both the cities together is shown in Table 2.

4.6 Discussion

As was found in some of the studies that females are more inclined towards consuming the functional food [5], though such distinction was not at a level that the same can be verified but it was observed in the Rajkot city, females had good share in the enriched egg consumption but when it comes to the consumption of egg in general the males have a dominance over females. With increasing awareness about the

Table 2. Ranking order of motivating factors in purchase of eggs

Rank	Motivating factor	Garrett score	Mean score
1	Freshness	7287	72.87
2	Health Claim (Enriched egg improves cardio vascular health and boosts immunity)	6445	64.45
3	Packaging	5497	54.97
4	Odourless	4585	45.85
5	Golden Yellow Yolk Colour	3673	36.73
6	Nutritional Claim (Enriched with omega 3 fatty acids, vitamin D3 and selenium)	2513	25.13

health and nutrition because of increasing literacy level the life style of the consumers all around the world is changing and in the same direction the middle aged and young people with higher literacy levels even in the traditionally vegetarian societies such as the Gujarat state, where traditionally more vegetarian diet preferring people could be found, it can be observed that now the people over such areas are becoming the consumers of the egg in general as well as of enriched egg in particular also which is in line of the previous studies which says that educated people show a greater intention to buy functional food [5]. However, the difference in case of age of the enriched egg consumers is prevalent in both the geographies as in Surat the enriched egg consumers are younger than the consumers of Rajkot city, which indicates that there is not a particular range of age to which the functional food consumers belong [5]. Along with the increase of literacy levels the income of the consumers is also increasing and it can be observed that the most consumers of the enriched egg are highly educated which is in line of the observations of the studies that higher income level of people is positive factor which may have a positive impact on purchase decision of functional food [15]. The married consumers are more likely to consume eggs and enriched egg in contrast to the findings of some of the studies where it was observed that single consumers are more likely to consume functional foods than married people [16], the reason could be the development of sense of responsibilities towards the family health.

Though the awareness about enriched egg was found to be low, even among the consumers of enriched egg, but the awareness about the enriched egg can be found more in males [9] this could be due to males majorly consuming more eggs than females. Although the difference can be observed on geographical basis as in the place like Rajkot city where there is more consumption of packaged eggs as well as enriched egg due to the higher family income, the awareness about the enriched eggs can be found in females also to a good extent. The same can be observed in case of, the level of awareness about the nutritional information of enriched egg which was low even among the consumers of enriched egg. Indicating that the impulsive buying and consumption of the product, just because of its availability and aesthetic packaging was more prevalent which can also be confirmed with the observation that

the major source of awareness for the brands available in the markets was Point-of-Purchase advertisements including the retailers push. The education and literacy level of the aware people was high, which implies that with the increase in education the awareness about functional foods also increases [17]. Other than that, in case of source of awareness about enriched egg among the aware people the major source of information for the young people are online sources and the educational institutions, whereas with the increase in the age a shift towards friends/relatives and media can be observed. Similarly, the major source of information for the people with higher education are the online sources and the educational institutions, whereas for the consumers with lower levels of education the mass media and friends/relatives become the major sources of information. Omega 3 fatty acid and vitamin D3 were the nutrients which were known to consumers more prevalently and the good bone health was the benefit that was mostly known to the consumers of egg, indicating that consumers may relate easily with the good bone health as a health benefit of consuming eggs.

The enriched eggs are perceived to be superior in appearance, freshness, packaging, healthy and nutritive value, yolk colour as compared to ordinary egg. The reason could be that the enriched eggs are sold majorly in packaged and branded manner as compared to the ordinary eggs which are sold in a loose way or unattractive packaging, and so a proper care is taken by the brands to ensure that the product is attractive in looks and/or appearance, and is provided as fresh as possible to maintain the good image of the brand in the market. Whereas in case of yolk colour the experience of the consumers must be playing an important role in developing the perception and for the perceived higher healthy and nutritive values of the eggs the promotion of the product in such a way and/or the knowledge of the nutrient composition of eggs could be the reason behind the development of the perception, while with respect to price as the price of enriched egg is higher as compare to conventional egg and availability is also less so in both aspects it was found to have an inferior perception among the consumers.

The difference in the consumers purchasing and consuming behaviour can be observed in both the geographies which can be attributed to the population mix and cultural differences as well.

As in Surat city, where the people from different places of the country are found in large number the egg consumption was found to be regular and so it is purchased on a weekly basis. Where as in case of Rajkot city, where there are more joint families and higher incomes of the families with less number of peoples from outside Gujarat, consumers consume and purchase eggs occasionally. Similarly, in case of Surat city, the neighbourhood bazaar and supermarket are the preferred channel but in case of the Rajkot city the supermarkets and grocery stores are preferred channels. The boiling form of consumption is preferred form of consumption and the breakfast is the preferred time for consuming eggs [12]. Date of production, price, size and colour have high influence on the buying decision of the consumers [12] however in Rajkot city price was a moderately influencing factor, hence if fresh, bigger sized, shiny white or brown coloured eggs with a competitive price are made available there are better chances of attracting more customers. Similarly, health benefits of egg, season and avian disease outbreaks have a high influence on the consumption of eggs [5,12] in both the cities, so the enriched eggs with more nutrient content, if can be projected as more healthy can have a positive impact on its demand and along with that there is need to create awareness among the consumers about egg, its nutritional composition, its production, and the regulation followed in its production to counteract the effect of season and avian disease outbreak.

The motivating factors for the consumers to purchase enriched eggs in both the cities are in the order freshness, health claims, packaging, odourless respectively. Although the order of the two factors viz. golden yellow yolk colour and nutritional claims, differs in both the cities as in Surat city nutritional claim is considered to be more motivating factor whereas in Rajkot city the golden yellow yolk colour is considered to be more motivating. The result obtained could be due to the fact that the knowledge about the nutrients is not much due to which its effect is not as it should be. But as the health benefit was observed to be the important influencing factor for the consumption in the studies [5] in the same line health claim has got the higher rank as compared to nutritional claim. Date of production was also observed as a factor and was found to be highly influencing factor for buying decision so, it could be the reason that freshness was considered to be a highest motivating factor for the purchase of enriched eggs. Similarly, it was

observed that odour and packaging both are important attribute that have an impact on purchase decision about functional food [5] and so the odourless and packaging were found to be another important characteristic that motivates the consumers to purchase the enriched egg. This information could be a vital information for the marketers as according to it they can modify their communication with the consumers by mentioning the factors of higher rank with more emphasis.

5. CONCLUSION

Overall, in general, the majority of the consumers of egg are married male, with education up to graduation, working as a private employee with income in range of ₹35,001 - ₹60,000, but some differences can be observed between both the geographies in case of consumers of enriched egg as in Rajkot city more females as compare to Surat city are enriched egg consumers, whereas the consumers of Surat city are younger than the consumers of Rajkot city. The joint families with bigger family size are more prevalent in Rajkot city than in Surat city, however in case of family food purchase, in both the cities both males and females were found equally responsible. Hence, a unanimous consensus on the impact of the socioeconomic factors viz., gender, age, family type and family size, in acceptance of functional egg, because of the variation in both the geographies can't be established [5].

The awareness level about the enriched egg including the nutritional knowledge related to it is low, even among the consumers of enriched egg. The major sources of awareness are friends/relatives, online sources, educational institutions followed by mass media, medical practitioners and dieticians which are comparatively less prevalent sources. The major source of awareness for consumers of younger age group and higher education are online sources and educational institutions, which with the increase in age turns into friends/relatives and mass media. Consumers may relate easily with the good bone health as a health benefit of consuming eggs.

The overall perception of enriched egg in comparison to conventional egg is that it is of superior quality in terms of appearance, is provided fresh with a quality packaging. Along with that it is more healthy or nutritive with a better yolk colour as compared to conventional

egg while its availability is less and its price is higher which makes it inferior in these two aspects.

The purchasing and consuming behaviour of consumers varies with the geographies as in Surat city regular consumers who purchase eggs on a weekly basis are found more, whereas in Rajkot city the occasional consumers who accordingly purchase on an occasional basis. Among the most preferred channel for purchasing eggs Supermarket is a common channel, while Grocery store in Rajkot and neighbourhood bazaar in Surat are another preferred choice. The boiled egg in breakfast is the major form of consumption in both the geographies. The date of production, price, size and colour are the highly influencing factors affecting buying decision while health benefit, season and avian disease outbreak are the highly influencing factors which affects the consumption. If fresh, bigger sized, shiny white or brown coloured eggs with a competitive price are made available then there are better chances of attracting more customers.

Freshness followed by the health claim are the most motivating factors which motivate the consumers to purchase enriched egg, these are followed by packaging, odourless, golden yellow yolk colour and nutritional claim respectively. This means if proper attention is given by the marketers on communicating these features effectively then there is a good potential for the enriched eggs in market.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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