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Changing consumer behavior for enriched egg in cosmopolitan cities of Gujarat

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Abstract

There is increasing urbanization which has certainly impacted food consumption of people worldwide. This change in pattern is further expected to rise and will lead to greater shift towards non vegetarian and protein rich diet. Moreover, it is believed that the increase in productivity of food grains has not been able to successfully meet consumer's nutritive demand, for which functional food and specifically an enriched egg could be of great importance. To understand the awareness and behavior of consumers towards enriched egg, this study was conducted in Anand and Vadodara cities of Gujarat. For which 100 consumers from each city were interviewed with a structured schedule through purposive sampling. It was found that mostly youth populations which were educated were attracted towards the intake of enriched egg. Further, it was found that consumers perceived an enriched egg to be better than an ordinary egg in terms of health benefits and other properties but when it came to price they were hesitant in consuming it. Enriched egg may be targeted with greater look, freshness, colour and nutritive value through effective leveling for enhancing more value to the consumers.

Keywords: Enriched egg, nutritive value, protein, Anand city, Vadodara city

Introduction

Over the next three decades, 2.3 billion more people will be living in urban areas worldwide and the UN estimates that 90 percent of future urban population growth will take place in Asia and Africa, with China, India, and Nigeria accounting for one-third of the growth between 2018 and 2050 (Anand *et al.* 2019) ^[1]. This will lead to higher consumption levels of animal-based products; refined animal fat, edible oil, refined sugar, and alcohol characterize diets in urbanized societies with higher economic development (Pandey *et al.*, 2020) ^[11]. Further according to Engel's and Bennett's laws, with rise in incomes, the share of spending on food decreases and shifts in diet are also be from starchy staples to proteinaceous and there is more diversified consumption towards meats, dairy, oils, fruits, and vegetables among the population. But, many scholars hold the opinion that this could be due to other reasons like increased food availability (Reardon *et al.*, 2012), the opportunity cost of women's time (Pandey *et al.*, 2020 & Ma *et al.*, 2006) ^[11, 8], access to cooking and availability of cold storage facilities (Gollin & Goyal, 2017) ^[7], and exposure-mediated changes in taste and preferences (Cockx *et al.*, 2018) ^[5].

According to Economic survey (2019-20), the term thalinomics was introduced which refers to "The economics of a plate of food in India" – an attempt to quantify what a common person pays for a Thali across the nation, India. In the respective survey, it was found that affordability of vegetarian thalis has improved over the time period from 2006-07 to 2019-20 by 29 per cent and that for non-vegetarian thalis by 18 per cent. This has been attributed to many government initiatives like PM AASHA, PMKSY, Soil Health card and others which have resulted in the increase of productivity of food grains. It is strange to admit that on one side where world is striving to provide food security to all, on the other side; there are 80 percent who consume food more than their requirement and suffer from poor health and diseases.

In this juncture, another food segment depicted and derived by functional food that provides additional nutrients to the body apart from the basic nutrients which conventional foods contain. Enriched food is a category of functional food wherein the conventional food is enriched with a specific nutrient in order to overcome the challenges possessed by the conventional food. An enriched egg is one such food which is rich in nutrients like omega 3 fatty acid, selenium and others which have positive impacts on human health.

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An egg which is enriched with omega 3 fatty acids has several health benefits such as it reduces heart diseases, cures skin ailments, and enhances brain functioning (Balić *et al.*, 2020) [3].

Changing food habit and its requirement many times do not match with the body metabolic balances. In the meanwhile, in macroeconomic spheres also, country achieved the food security and dominates over the hunger of the population. Meanwhile, hidden hunger arises among the populace due to deficiency of micro nutrients and proteins across the nation. To counter act this, functional food acts as a panacea in food basket segments where population are targeted through different products measures. Many studies were revealed facts and figures in context to functional food, but work done in Gujarat is very much abysmal. Even, a complete food like egg as a functional food is yet to be explored in true sense. This study is an attempt to understand the importance of enriched eggs, a kind of functional food through egg in vegetarian state of Gujarat.

Materials and Methods

The research work was conducted in the cities of Anand and Vadodara where a greater dominance of cosmopolitan culture exists due to presence of educational institutions and industries, respectively. For successful execution of the work a sample size of 200 was taken with 100 from each city. To counteract the problem statement highlighted here, a comprehensive approach was adopted by utilizing both primary and secondary data sources. The primary data was collected through a structured schedule in an interview method. Respondents were targeted at shopping floor either at superstore and convenient store. Complete data collection were done during February to April, 2023. Analytical techniques like tabular and percentage analysis, Likert scale, and weighted average mean and Garrett ranking methods were used in this study. Likert scale was taken to understand the data reliability, weighted average mean were done to understand importance of each responses in the given variables mentioned, and Garrett ranking techniques were taken to position the variables in accordance to their importance from the respondents' viewpoints.

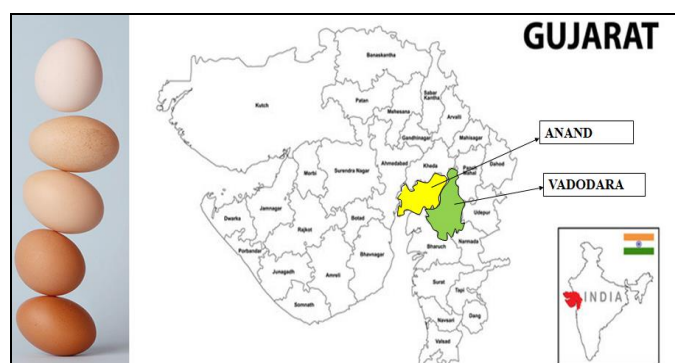


Fig 1: Study area

Results and Discussion

The socio-economic parameters like gender, age, marital status, education and income were found to have a remarkable impact on consumers' awareness and acceptance of healthy food products. According to Palmieri *et al.* (2022) [10], it was observed that unmarried females were more willing to pay (WTP) a premium price for functional eggs than male consumers, and the probability of having a higher WTP for

functional eggs increased among consumers with increase in their annual income. The data presented on table 1 revealed the socio-economic characteristics of the respondents. In terms of gender, the sample was heavily skewed towards males, constituting 84 percent and 76 percent of the respondents in Anand and Vadodara city respectively, while females represented only 16 percent and 24 percent in Anand and Vadodara city, respectively. The age wise distribution indicated that the majority of respondents fell within the younger age groups (20-34), with 36 percent in Anand and 44 percent in Vadodara in the same categories followed by age group of 35-49 years range (32%) in the study area. Regarding marital status, 72 percent in Anand and 64 percent of the respondents in Vadodara were married, while the remaining 28 percent and 36 percent were unmarried in Anand and Vadodara, respectively. In terms of education, 48 percent have completed their HSC in Anand city with many higher studies institutions while 32 percent in Vadodara city have completed their HSC. Thus, education can be said to have a direct relation with consumption of enriched eggs or functional foods in general as per the data revealed in the table. The occupational distribution highlighted that 64 percent in Anand and 68 percent in Vadodara city were the private employees followed by 20 percent and 12 percent engaged in self-business in Anand and Vadodara respectively. Very less respondents (16%) were students in both the cities. In terms of monthly income, the largest group (43%) in Anand fell within the range of 10,001-35,000 while in Vadodara, major respondents (30%) were in the range of 35,001-60,000. Family types were fairly evenly split in Anand city, with 48 percent in nuclear families and 52 percent in joint families whereas in Vadodara majority of the families (80%) were nuclear. The majority of respondents come from families with more than five members (52%) in Anand while in Vadodara, family size of 3-5 was found more common with 76 percent respondents were coming from such families. Lastly, food purchasing decisions were shared among males (24%), females (28%), and both male and female family members (48%) in Anand, but in Vadodara females (48%) were found to be more active in family food shopping than male (4%), though some families have no such distinction and both male and female (48%) were more or less equally do family food shopping.

According to the work of Baker *et al.* (2022) [2], the different factors like knowledge of functional food definition, knowledge of functional food description, knowledge about nutrition associated with consuming functional foods, knowledge about nutrition, knowledge about diet-related issues, knowledge about health claims, and knowledge of specific functional food products were important to be assessed in order to get complete idea of the information held by the consumers. Apart from this the source of information deemed helpful by the consumers should also be understood (Narayana *et al.*, 2020) [9]. According to table. 2, In Anand city, out of the total 100 respondents, 28 per cent of the respondents were found to have the awareness of enriched egg, while the remaining 72 percent of the population were found unaware of it. Regarding sources of awareness out of the total 100 respondents, 71 percent mentioned that their major source of information was friends or relatives. While the other 29 percent reported online sources as their major source of information. In online sources the YouTube blogs and health blogs on different websites were the two sources

that were followed by the respondents in general. In Vadodara city (table 2), out of total 100 respondents, 24 per cent of the respondents who had reported that they were aware of enriched egg, while the majorities i.e., 76 per cent of the respondents have unaware about enriched egg. In case of source of information, the outcome was similar to that found in Anand i.e., the major influence among consumers was made by their friends and relatives. These points towards the need of using social media for better awareness creation and overall promotion of these eggs are important one to be heed on it.

Table 1: Socio economic profiles of consumers of enriched egg of Anand & Vadodara city

Socio-economic characteristics		Anand city	Vadodara city
		Frequency (Percentage)	Frequency (Percentage)
Gender	Male	84 (84)	76 (76)
	Female	16 (16)	24 (24)
	Total	100	100
Age group (years)	20-34	36 (36)	44 (44)
	35-49	32 (32)	32 (32)
	50-64	24 (24)	16 (16)
	65 & above	8 (16)	8 (8)
	Total	100	100
Marital Status	Married	72 (72)	64 (64)
	Unmarried	28 (28)	36 (36)
	Total	100	100
Education	SSC	8 (8)	-
	HSC	48 (48)	32 (32)
	Graduation & above	44 (44)	68 (68)
	Total	100	100
Occupation	Student	16 (16)	16 (16)
	Government employee	-	4 (4)
	Private employee	64 (64)	68 (68)
	Self-business	20 (20)	12 (12)
	Total	100	100
Monthly income	≤ 10,000	8 (8)	20 (20)
	10,001 – 35,000	43 (43)	21 (21)
	35001 – 60,000	30 (30)	30 (30)
	60,000 - 75000	11 (11)	27 (27)
	>75000	8 (8)	2 (2)
	Total	100	100
Family type	Nuclear	48 (48)	80 (80)
	Joint	52 (52)	20 (20)
	Total	100	100
Family size (Household member)	2	4 (4)	4 (4)
	3-5	44 (44)	76 (76)
	>5	52 (52)	20 (20)
	Total	100	100
	Family food purchaser	Male	24 (24)
Female		28 (28)	48 (48)
Male & Female		48 (48)	48 (48)
Total		100 (100)	100 (100)

Source: Primary data from the study area
 *Parenthesis in bracket showing the percentage position of the respondents

To find out how the consumers perceive the enriched eggs, the consumers were asked to rate the parameters size, appearance, yolk colour, taste, price, packaging, freshness, availability, odour, healthy/nutritive value of yolky egg in comparison to the ordinary egg on a scale of 1 (Highly Inferior) to 5 (Highly Superior). In Anand city, the consumers were found to have a positive perception for the appearance, yolk colour, packaging, freshness, odour and healthy/nutritive

value, while for the size, taste and availability, the respondents were found to have neither positive nor negative perception (table 3). Whereas, regarding price, the respondents had a negative perception for enriched eggs in the study area.

Table 2: Awareness about enriched egg among the respondents of Anand and Vadodara city

Awareness		Anand	Vadodara
		Frequency (Percentage)	Frequency (Percentage)
Before today, have you heard of Enriched Egg?	Yes	28 (28)	24(24)
	No	72(72)	76(76)
	Total	100	100
Source of Information	Online Sources	8 (29)	4(17)
	Friends/Relatives	20 (71)	8(33)
	Total	28	24

Perusal of the table 3 also highlighted that the appearance, yolk colour and nutritive value were the attributes which were considered to be highly superior to the ordinary egg, while the packaging, freshness and the odour of the enriched egg were the attributes on which enriched egg was perceived as superior to the ordinary egg. The size, taste, and availability were the parameters on which the respondents found the enriched egg at par with the ordinary egg and the price was the parameter for which the consumers considered the enriched egg to be inferior to the ordinary egg, which means for this particular factor the respondents were not able to get the satisfaction of the level which ordinary egg could provide. As per table 4 in Vadodara city, it was observed that the perception parameters viz., appearance, yolk colour, freshness, odour, healthy/nutritive value had a positive picture in the minds of the consumers, while size, taste, packaging and availability were the parameters which were found to have neither positive nor negative perception among the consumers. Whereas with respect to the price, just like in Anand city the consumers were found to have a negative perception of enriched egg.

Table 3: Perception about the enriched egg in Anand City

Parameter	Score	Perception
Size	3.16	At par
Appearance	4.4	Highly Superior
Yolk colour	4.4	Highly Superior
Taste	2.68	At par
Price	2.24	Inferior
Packaging	3.84	Superior
Freshness	4.2	Superior
Availability	2.76	At par
Odour	4.08	Superior
Healthy/Nutritive value	4.65	Highly Superior

The freshness and healthy/nutritive value were the parameters for which enriched eggs were considered to be highly as compared to an ordinary egg. While the appearance of yolk colour were perceived as superior in an enriched egg as compared to an ordinary egg. The size, taste and availability were the parameters for which the enriched egg was perceived at par with the ordinary egg. And, the parameter of price for which the enriched eggs were perceived as of inferior nature with respect to ordinary eggs. This indicated that the enriched eggs were considered a little costlier when compared to ordinary eggs and if somehow the price difference can be

narrowed it, might result in greater consumption of enriched eggs.

Table 4: Perception about the enriched egg in Vadodara City

Parameter	Score	Perception
Size	2.76	At par
Appearance	3.52	Superior
Yolk colour	4.16	Highly Superior
Taste	2.68	At par
Price	2.08	Inferior
Packaging	3.28	At par
Freshness	4.56	Highly Superior
Availability	2.96	At par
Odour	3.72	Superior
Healthy/Nutritive value	4.8	Highly Superior

Major factors which motivate the consumers for the purchase

Table 5: Ranking order of motivating factors in purchase of enriched egg in Anand City

Rank	Motivating Factor	Garrett Score	Mean Score
1	Freshness	7375	73.75
2	Health Claim Enriched egg improves cardio vascular health and boosts immunity	6302	63.02
3	Packaging	5543	55.43
4	Odourless	4618	46.18
5	Nutritional Claim Enriched with omega 3 fatty acids, vitamin D3 and selenium	3510	35.10
6	Golden Yellow Yolk Colour	2652	26.52

In case of Vadodara city, no such difference was observed just the scores values varied rest the order remained same as in Anand city (table 6). In Vadodara city similar to the Anand city, the major factor which motivated the consumers for the purchase of enriched egg with a was freshness followed by health claim *viz.*, the consumption of enriched egg improves

cardio vascular health and boosts immunity, packaging, odourless, nutritional claim that enriched egg was enriched with omega 3 fatty acids and selenium and golden yellow yolk colour, respectively. This outcome shows that if an egg is produced and is being made available to consumers in fresh condition than it will have more preference.

Table 6: Ranking order of motivating factors in purchase of enriched egg in Vadodara City

Rank	Motivating Factor	Garrett Score	Mean Score
1	Freshness	7277	72.77
2	Health Claim Enriched egg improves cardio vascular health and boosts immunity	6400	64.00
3	Packaging	5625	56.25
4	Odourless	4563	45.63
5	Nutritional Claim Enriched with omega 3 fatty acids, vitamin D3 and selenium	3664	36.64
6	Golden Yellow Yolk Colour	2471	24.71

Conclusion

There is a quite similarity in consumption pattern of eggs in both Anand and Vadodara city of Gujarat due to their cosmopolitan nature. Still, there is a great scope to identify and target the consumers in the enriched egg market segmentation. In Anand city, consumers are grouped in to male dominated joint family structure having more than five members in the family who are majorly in their self-business and are earning ₹ 10000-₹35000 montly income for their sustenance. In the same time, Vadodara district consumers are majorly female dominated having nuclear family structure having 3-5 members in the family and getting ₹60000-₹70000 income for their sustenance. Between the two cities, access to information is better in Anand than Vadodara through friends, relatives, and online sources regarding enriched egg. Both the cities consumers highlight about appearance, colour, Nutritive value of enriched egg are major Determining factors that separate it out from the ordinary egg. Yes, they show bit of concernedness regarding price of enriched egg in comparision to the ordinary egg. Still, consumers like the freshness and health related aspect of enriched egg and getting connected with it as time passes on and taking it in

their routine consumption patter.

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