

# Food Labels and Nutrient Claims - Perceptions Shaping the Pre-Packaged Food Choices of the Urban Indian Consumer

<sup>1</sup>Rashida Vapiwala, <sup>2</sup>Dr Meena Godhia

<sup>1</sup>Ph.D Scholar, <sup>2</sup> Ex-Associate Professor,

<sup>1</sup>Department of Post-Graduate Research and Doctoral Studies, Food Science & Nutrition, S.N.D.T. Women's University, Juhu Campus, Mumbai.

**Abstract :** The research was undertaken to study the use of information on food labels that influence consumer purchase choices in pre-packaged foods, with emphasis on consumer awareness and perceptions of nutrient and health claims commonly found on food labels. A quantitative, cross-sectional consumer online survey was conducted using a purposive sampling technique in Mumbai, India amongst 302 adults, aged 25-54 years. A pre-tested, close-ended, online questionnaire was used to elicit responses on perceptions regarding factors considered while purchasing pre-packaged foods, use of information on the food label, and perceptions of common nutrient and health claims on pre-packaged food labels. Descriptive statistics and ranking tests like Relative Important Index (RII), and Garrett Ranking, were conducted using SPSS version25.

Majority participants (59.7%) read the 'nutrition facts panel' frequently or always. 'Taste/Flavour' was the most important factor considered while purchasing pre-packaged foods (RII=0.892), followed by 'nutrition & health benefits' (RII=0.873) and 'brand trust' (RII=0.856). Consumers preferred pre-packaged foods that are 'high in healthy components or nutrients', followed by products 'made with 100% real/pure ingredients' and 'minimally processed, 100% natural.' Characteristics like 'real fruit/vegetable', 'fibre', 'plant ingredients', 'whole-grains', 'protein', 'omega 3', and 'probiotics' were considered healthiest. Top-5 nutrient and health claims essential for consumers are '100% natural' (RII=0.884), 'high fibre' (RII=0.872), 'high protein' (RII=0.871), 'with real fruits/vegetables' (RII=0.860) and 'no added sugar' (RII=0.854).

Nutrition and health benefits of food products are significant drivers for pre-packaged food choices. Consumers are seeking products closer to their natural form, minimally processed, free from additives, and made with real ingredients.

**Index Terms :** pre-packaged foods, food labels, nutrient and health claims, consumer perceptions.

## I. INTRODUCTION

The consumption of processed food is rising in India. Nearly 10% of the average total caloric intake in both rural and urban India comes from processed food. High-income, urban households consume almost 30% of their total daily calories from processed food. Across different regions of India, the calorie share from processed food is highest in South-Indian and the lowest in North-East and North India<sup>(1)</sup>. A recent report released by ICMR-NIN found that 11% of daily calorie intake in urban adults, and 4% of daily calorie intake in rural adults, came from processed foods like chips, biscuits, sweets, juices, etc.<sup>(2)</sup>

Food labelling is the direct mean of communication between the producer and seller of food and the purchaser and consumer on the other. It is an effective tool to protect consumer health in terms of food safety and nutrition. Globally, all countries have a minimum requirement for food labelling to ensure that consumers have clear, non-misleading information about the products identity, intended use, and appropriate food safety information. Food labels are effective means to convey information about a product's nature, contents, instructions to use and its safety. With an increase in global trade and business across continents, it is further imperative to create food labels that are correct, clear and can be trusted.<sup>(3)</sup>

Food labelling includes any written, printed or graphic matter that is present on the label, accompanies the food or is displayed near the food, including that to promote its sale or disposal. Nutrition Labelling is a combination of various mandatory (Nutrition Facts Panel (NFP) and ingredients) and voluntary information (symbols and logos, nutrient claims, health claims, allergen declaration) on food labels.<sup>(4)</sup>

In India, the role of the food authority (FSSAI) as prescribed under FSS Act is to specify food labelling standards including claims on health, nutrition, special dietary uses and food category systems. Food Safety and Standards Authority of India (FSSAI) has set regulations on claims and advertisements by food business operators with respect of their food products, to establish fairness in claims and advertisements of food products and make food businesses accountable for such claims /advertisements to protect consumer interests.<sup>(4,5)</sup>

One of the most important components of a food label is the nutrition label and the claims mentioned on the packaged food product. The nutrition label (also known as the nutrition information panel) is usually found on the back of the pack, which is a detailed representation of the nutrition value of the food product. On the other hand, the front of the pack usually mentions information that is short and precise, like the nutrient and health claims. The understanding of nutrition labelling is a must for consumers to exercise healthy food choices basis the information written on the label. Nutrition labelling is the primary source of information regarding the nutritional content of food. It educates consumers about the nutrition components of the food like fat, sugar and salt, that can have serious health implications such as obesity, cardiovascular disease and diabetes; or protein, fibre, vitamins and minerals, that can positively impact metabolic health.<sup>(4)</sup>

Health claims are defined as "any representation that states, suggests or implies that a relationship exists between a food or a constituent of that food and health and include (i) nutrition function claims which describe the physiological role of the nutrient in growth, development and normal functions of the body, (ii) other function claims that describes the specific beneficial effects of the

consumption of foods or their constituents, in the context of the total diet or normal functions or biological activities of the body, which relate to a positive contribution to health or the improvement of a function or to modifying or preserving health, and (iii) reduction of disease risk claims that refer to claims that state, suggest or imply that consumption of such foods or food constituents, in the context of the total diet, reduce the risk of developing a disease or health-related condition.<sup>(5)</sup>

Nutrition claims are defined as any representations which states, suggests or implies that a food has particular nutritional properties including but not limited to the energy value and to the content of protein, fat and carbohydrates, as well as the content of vitamins, minerals and other permitted listed nutrients and nutrition claims may include (i) nutrient content claim that directly or indirectly describes the level of a nutrient contained in a food or (ii) nutrient comparative claim that compares the nutrient levels of two or more foods.<sup>(5)</sup>

A study in New Delhi and Hyderabad consumers found that 92% urban shoppers read food labels, while 40% of them reported a regular check of food labels before purchasing pre-packaged foods to evaluate the safety, quality, genuineness. However, only 20% of participants checked food labels for nutrition information. A positive association was observed between education levels and the reading of product-related nutrition information, nutrient and health claims, and quality symbols. Women and adolescent girls in the study were reading the labels for their fat and sugar content, intending to choose low fat and low sugar products.<sup>(6)</sup>

Conversely, another study in Chennai found that 46.5% of the participants were more interested in the carbohydrate and protein content of the food products while only 13.2% were interested in the sugar content. However, the participants were confused about which form of sugar was usually found in pre-packaged foods, most of them were aware of the negative impact of excessive sugar consumption on health.<sup>(7)</sup>

The Indian youth (18-30 years) is beginning to attach importance to reading the food label, and all the product attributes having health implications are considered as extremely important<sup>(8)</sup>. Studies highlight the increasing concern for the nutrition quality and the possible health risk associated with the consumption of pre-packaged foods amongst youngsters. Another survey conducted in Gujarat (Ahmedabad, Surat, Vadodara and Rajkot) found that 88% consumers read nutrition labels, from which the most important information for them was total fat, calories from fat and cholesterol<sup>(9)</sup>.

Consumers are increasingly giving importance to healthy eating and the same is reflected in the food products we see on the shelves of the supermarket. Newly launched food products, positioned on the promise of health and wellness, claiming to be nutritious, are gaining momentum. Each of these nutrient and health claims are different from one another and trying to create a perception that the food product is suitable for one's health in seemingly different ways. Some claims focus on negative elements that are absent in the food – e.g., 'gluten-free', 'no added sugar', some focus on positive elements present in the food – e.g., 'made with whole grains', 'high protein', some suggest that the food is made with cleaner processing methods – e.g., '100% natural', 'cold-pressed', 'organic', while some suggest improved product attributes – e.g., 'fortified', 'enriched with vitamins and minerals.

It is imperative to understand the importance that consumers assign to the various factors contributing to a product's nutrition and health quality and measure the levels of consumer awareness and knowledge of various nutrient and health claims declared on pre-packaged foods, both from a public-policy point of view for the regulator, and the consumer need point of view that would interest food manufacturers.

The present study aimed to identify the factors that influence consumer food choices in pre-packaged foods and components of the food label that consumers read while purchasing pre-packaged foods, in adults (age 25-54 years) living in Mumbai city. Further, this survey assessed consumer awareness and opinion on food and nutrient components in food, and their perceptions of various nutrient and health claims commonly found on food labels.

## II. METHODOLOGY

The present study was a quantitative, cross-sectional consumer online survey, using a purposive sampling technique. The participants were both male and female, between the age group 25 to 54 years. The survey was carried out in the metropolitan city of Mumbai, between September 2019 and April 2020. 734 consumers were invited to participate in the survey, out of which 302 participants completed the survey and were included in the analysis. Voluntary informed consent for participation in this study was obtained from all the study participants after explaining the objectives and nature of the study.

### a. Quantitative Data Collection:

Data was collected using a pre-tested, close-ended questionnaire administered to participants using an online survey tool (Table 01). This questionnaire sought information from participants on demographic characteristics like gender, age, education, professional status, family dynamics and number of children.

The participants were asked to share information on the factors they consider while purchasing pre-packaged foods from the market – like 'price', 'brand trust', 'taste/flavour', 'familiarity', 'convenience', 'nutrition & health benefits', 'advertising', 'recommendations by friends/family', 'sustainability/ environmental friendliness' or 'promotional offers', and the sections of the food label they referred to while purchasing pre-packaged foods. Participants were asked for their opinion about characteristics they believe are important to be present in pre-packaged foods, like, presence of healthy components (protein, fibre, omega-3, etc.), absence of unhealthy components (sugar, fat, sodium, etc.), minimal processing, natural products with real ingredients, fortified products or organic products.

Participants were surveyed for their awareness regarding common nutrients and health claims that are often found on pre-packaged foods, as well as their opinion on the nutrient and health claims they believe are essential to be present in pre-packaged food products amongst 'real fruits/vegetables', '100% natural', 'organic', 'fortified', 'preservative-free', 'low fat', 'low sugar', 'no added sugar', 'gluten-free', 'high fibre', 'high protein', 'trans-fat-free', 'low calorie / zero calorie', 'made with whole grain', 'low sodium' and 'no artificial ingredients' (colours, flavours, additives, etc.). The questionnaire used a 5-point Likert scale or a ranking scale to collect all responses.

Table 01: Survey questions in the data collection tool

Research Objective	Survey Questions
Factors affecting pre-packaged food choice	How important are the following factors for you, while you purchase packaged foods from the market?
Reading and checking Label Information	Which parts of the packaging information on the food label do you refer to while purchasing a packaged food
Factors defining healthy pre-packaged foods	Rank the following factors that define healthy packaged food, in order of importance
Consumer awareness and opinion on food and nutrient components in pre-packaged foods	Rate the healthfulness of the following food components/nutrients
	If 2 products have the same nutritional content, which one is healthier? (choose A or B or Both)
Consumer perceptions of Nutrient and Health Claims	Rate the Health Claims you believe are essential in a packaged food or beverage.

### b. Data Analysis:

The quantitative data were scrutinized and checked for consistency before being used for the final analysis. The statistical software package SPSS Statistics (version 25) for Windows was used for data analysis.

Descriptive statistics like percentages, frequency distribution, mean+sd, as well as cross-tabulations were done to assess the significance of associations between variables. Relative Important Index (RII) Analysis and Henry Garrett Ranking method were used to identify and rank statements based on consumers response.

The Relative Important Index allows us to identify the most important criteria based on a participant's response and is an appropriate method to prioritise factors that are rated on a Likert scale. Henry Garrett's Ranking Technique converts the orders of merit given by participants into a rank by using a formula. This method helps in finding the most significant factor that influences the consumer responses.

## III. RESULTS AND DISCUSSION

### a. Demographic profile of the consumers

Out of 734 consumers approached to participate in the study, 302 participants (response rate of 41.1%) between the age group 25 to 54 years, purchasing pre-packaged foods, completed the survey. Among the participants (Table 02), 180 were females (59.6%) and 122 (40.4%) were males. 65% of the participants were in the age group of 25 to 34 years. Majority of the participants (93.7%) were graduates or post-graduates, living in nuclear families (60.9%). It is interesting to see the evolution of family dynamics of Mumbai through the demographics of participants in this study – nuclear families, live-in relationships, without children; the current study is truly representative of the population living in urban India.

Table 02. Demographic profile (%) of participants, Mumbai

Characteristics	Categories	Total (N=302)	
		n	%
Gender	Female	180	59.6%
	Male	122	40.4%
Age Group	25 – 34 years	196	64.9%
	35 – 44 years	64	21.2%
	45 - 54 years	42	13.9%
Education	High School	9	2.9%
	Graduation	100	33.1%
	Post-Graduation	183	60.6%
	Ph.D.	10	3.3%
Household Income [Monthly INR (₹)]	< 20,000 p.m.	34	11.3 %
	20,000 – 40,000 p.m.	59	19.5%
	40,000 – 80,000 p.m.	45	14.9%
	>80,000 p.m.	79	26.2%
	Choose not to answer	85	28.1%
Professional Status	Full-time Employed	132	43.7%
	Self-Employed	77	25.5%
	Student	44	14.6%
	Unemployed or Housewife	29	9.6%
	Part-time Employed	20	6.6%
Marital Status	Married	175	57.9%
	Living with partner	11	3.6%
	Single, never married	107	35.4%
	Widowed	5	1.7%
	Other	4	1.3%
	Divorced or separated	0	0.0%
Family status	Nuclear	184	60.9%
	Joint	118	39.1%

Children	Do not have any children (None)	165	54.6%
	3 - 12 years old	82	27.2%
	18 or older	37	12.3%
	Newborn - 2 years old	30	9.9%
	13 - 17 years old	22	7.3%
	Prefer not to say	0	0.0%

### b. Factors affecting pre-packaged food choice

'Taste/Flavour' of the food product ranked as the most important factor while purchasing package food from the market as seen by the Relative Important Index (RII=0.892), followed by 'nutrition & health benefits' (RII=0.873) and 'brand trust' (RII=0.856). 58.9% of participants said that taste/flavour was very important to them while choosing pre-packaged food, followed closely by nutrition & health benefits, that was very important for 57.9% participants (Figure 01). It is surprising to see 'price' being a considerably less important factor (RII=0.748) than 'convenience' (RII=0.785) and 'familiarity' (RII=0.772). Promotional offers (RII=0.630) and advertising (RII=0.527) were the least important factors. Surprisingly, in a 'price-sensitive' market like India, price ranked much lower in order of importance than convenience and familiarity. This illustrates the evolution of purchase habits in urban consumers, who are now willing to spend more money for convenience.

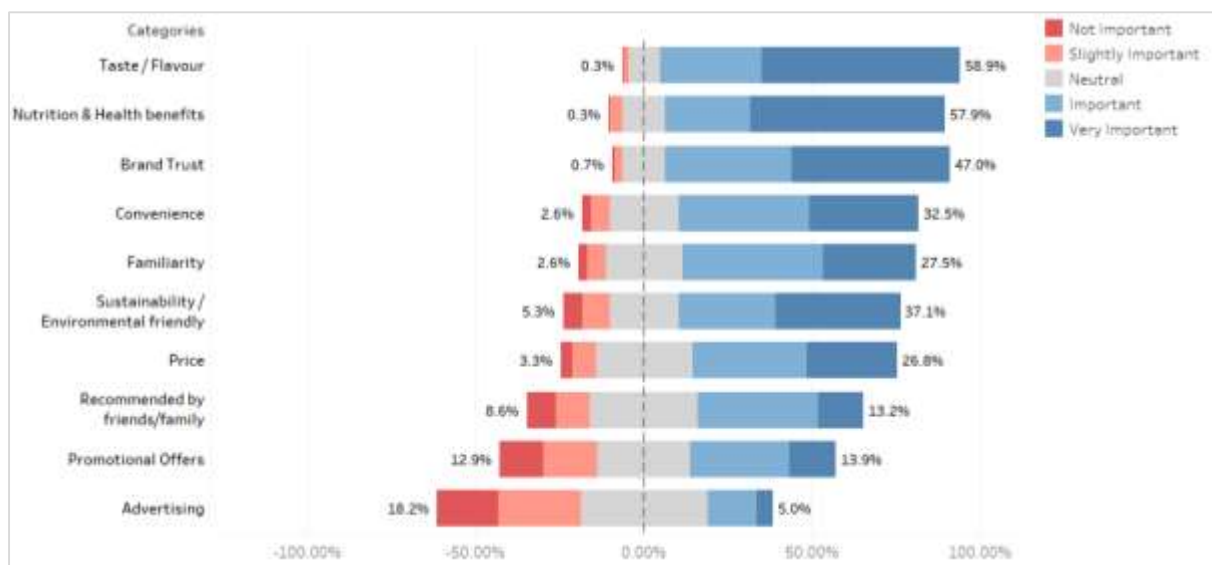


Figure 01: Factors affecting pre-packaged food choice amongst consumers, Mumbai.

A recent study<sup>(8)</sup> showed that 75% participants (age 18-30 years) read the food label before making a food purchase and that 55% participants felt that reading the food label influenced their food choice, clearly indicating that food label has become an important source of product information for young consumers to make purchase decisions. It was also revealed that 75% participants read the food label intending to understand the nutrition information in detail. In this study, the findings indicated that information on product price, instruction about health risks, manufacturing date along with the best before or expiry date, amount of nutrition, information about each artificial ingredient used, and storage instructions had been reported to be "extremely essential" by a majority of the consumers.

Similar findings were observed in consumers from New Delhi and Hyderabad<sup>(6)</sup>, where 'taste' was the biggest consideration while purchasing pre-packaged foods, followed by 'price'. Nutrition label information was considered by 71% participants of the consumers of all age groups. The study also found that elderly adults considered that quality and quantity are assured in pre-packaged foods and assumed that adulteration is hardly possible and that 'brand name' was a major consideration for buying these foods. In another focus group study on women<sup>(10)</sup>, taste, price and packaging were the most frequently cited reasons for purchasing food products, from which 'taste' was the predominating factor. Participants did not purchase foodstuffs if they did not 'taste good', irrespective of their health or any other issue.

The 2020 Food and Health Survey conducted in USA<sup>(11)</sup> found that the largest drivers of food purchase were 'taste', 'price', 'healthfulness', 'convenience' and 'environmental sustainability' respectively. 63% participants over the age of 50 years and 46% participants below the age of 50 years self-reported that 'healthfulness' has a larger impact on their food choices now, compared to the last 10 years.

In contrast, a study in Slovenian population (age 18-65 years) showed that specifically for the purchase of breakfast cereals, nutrition information of the breakfast cereal was the most important influencing factor for choice, followed by price, taste and nutrient and health claims respectively. The origin of the product (country of origin), trademark and expiry date were last in place.<sup>(12)</sup>

While 'taste' and 'price' remained the most important factor influencing food choices, over the last decade, it has been observed that 'health' and 'nutrition' is grabbing people's attention and interest, the results of which are seen in the current study, where 'nutrition & health benefits' came a close second to 'taste/flavour' in terms of factors impacting food choices.

### c. Reading and checking Label Information

When questioned on which parts of the food label were checked or read frequently, majority of the participants mentioned that expiry date (80.5%) and best before date (74.5%) were always referred to when purchasing a pre-packaged food product (Figure 02). 'Expiry date', 'best before date', 'MRP' (maximum retail price) and 'brand' name ranked the highest as information that was referred

to on the food label respectively, and ‘nutrition facts panel’ followed the same. 59.7% of participants read the ‘nutrition facts panel’ frequently (27.2%) or always (32.5%). However, the least checked element of the food label was the ‘statements on health benefit’ and the ‘front-of-pack health claims’. Only 24.5% of participants read the ‘statements on health benefit’ always, and 25.5% of participants read the ‘front-of-pack health claims’ always.

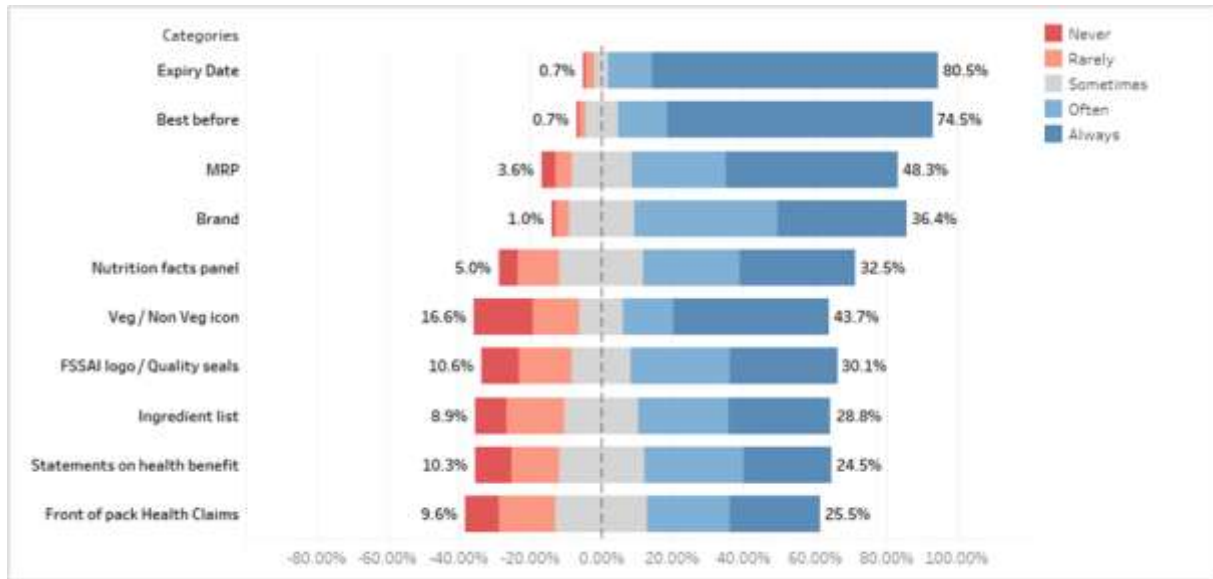


Figure 02 : Components of the Food Label read and checked by consumers at the time of purchase

The FDA Health & Diet Survey in USA<sup>(13)</sup> showed that 77% of U.S. adults reported using the Nutrition Facts label always, most of the time, or sometimes when buying a food product. It was also cited that when the label was used by participants, it was most often used to find out the nutrient contents of a product or to compare nutrient contents between products.

Vemula et.al<sup>(6)</sup> also found that 40% individuals reported that they always checked food labels before buying pre-packaged foods to be assured of safety and genuineness/quality and usually checked dates of manufacture and expiry only. Brand name (85%) was the most commonly checked component by consumers, followed by the date of expiry/best before date (80%). List of ingredients (20%) was checked the least, and less than 40% of consumers across all age groups reported that they checked ‘nutrition information’ on the food labels.

Another study conducted in participants from Chennai<sup>(7)</sup> and found that more than 62% of participants always checked the price of the product and offers associated with the food products during their purchase. On the other hand, more than 60% of participants did not check ingredients in the purchased food product. In the study conducted in Srinagar<sup>(14)</sup>, it was observed that 100% participants (n=51) often referred to ‘price’ and 94.1% participants often referred to ‘expiry date’ while purchasing pre-packaged food. This was followed by ‘manufacturing date’ (80.4%) and ‘list of ingredients’ (64.7%). ‘Nutrition facts’ were referred only by 51.0% of participants.

**d. Factors defining healthy pre-packaged foods**

Basis the Henry Garrett Ranking method, most of the participants (29.1%) ranked ‘high in healthy components or nutrients’ as the first, most important factor that defines healthy package food, followed by ‘made with 100% real/pure ingredients’ and ‘minimally processed, 100% natural’. ‘organic’ and ‘fortified (with essential nutrients, vitamins and minerals)’ were ranked at the bottom of the list (Figure 03). Participants clearly appreciated the presence of positive characteristics in pre-packaged foods, compared to absence of negative characteristics. We can clearly see a shift in consumer preference for positive characteristics in pre-packaged foods, and an increasing appreciation for foods that are closer to their natural form. However, a contradictory study conducted with participants in Gujarat showed that 64.91% of participants used the nutrition label to avoid harmful nutrients<sup>(9)</sup>.



Figure 03 : Consumer ranking of factors defining healthy pre-packaged foods

**e. Consumer awareness and opinion on food and nutrient components in pre-packaged foods**

Participants were questioned on the healthfulness of various food and nutrient components in pre-packaged foods. They rated ‘real fruit /vegetable’, ‘fibre’, ‘plant ingredients’, ‘whole grains’, ‘protein’, ‘omega 3’, and ‘probiotics’ as ‘healthy’ and ‘very healthy’; ‘animal ingredients’, ‘fortified foods’ and ‘calories’ were rated as ‘average’ and ‘fat’, ‘sodium’, ‘saturated fat’, ‘trans-fat’ and ‘sugar’ were rated as ‘unhealthy’ and ‘very unhealthy’ (Figure 04). Based on Relative Important Index, the majority of participants ranked ‘real fruit /vegetable’ as healthiest, followed by ‘fibre’ and ‘plant ingredients’. ‘sugar’ was ranked as the unhealthiest nutrient component from the list.

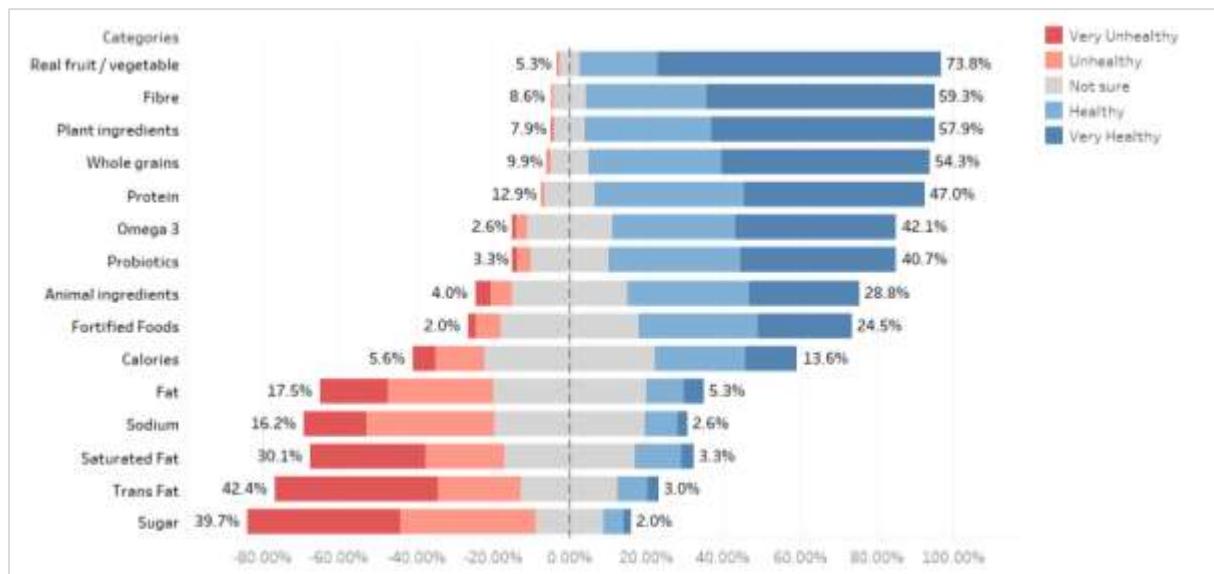


Figure 04: Consumer awareness on the healthfulness of various food and nutrition components in pre-packaged foods

Despite the same nutrition information, the majority of participants perceived ‘natural’, ‘fresh’, ‘branded’, ‘expensive’ as healthier. 85.1% of consumers believe that 100% natural products are healthier than fortified food products and that products with a shorter list of ingredients (54.6%) are healthier than products with a long list of nutrients. 97.4% of participants believe that fresh products are healthier than frozen products and 70.9% participants preferred products with a shorter shelf life (Figure 05).

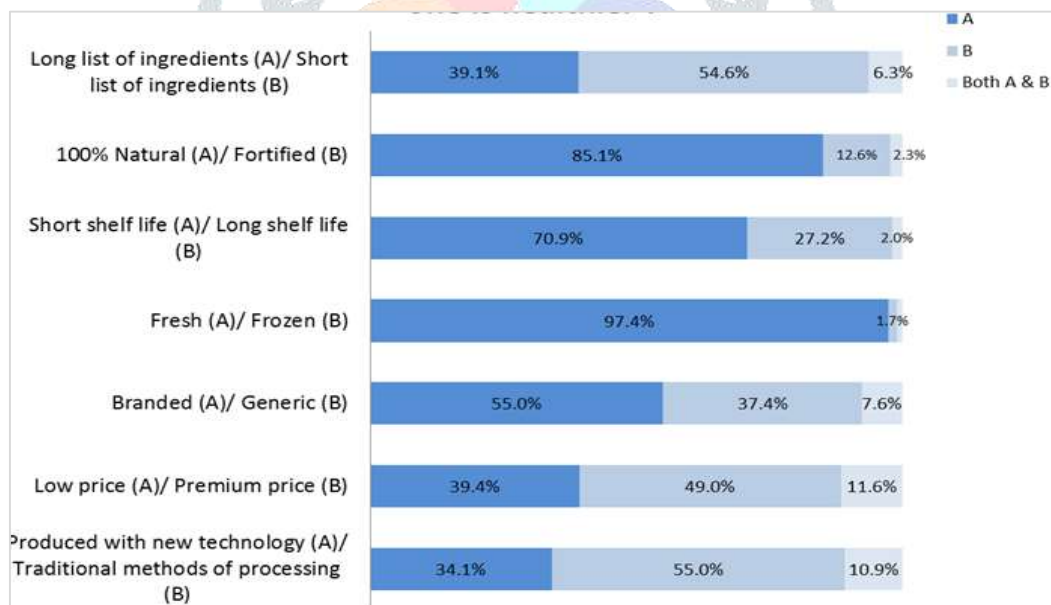


Figure 05: Consumer preference of various food characteristics in pre-packaged foods of same nutritional value

Similarly, Vemula et.al also reported that Indian adolescent girls and women in the study were concerned about high-fat and high-sugar foods<sup>(6)</sup>. It is heartening to see consumer awareness increasing in other qualitative aspects of nutrition which are beyond calories, fat, sugar and salt.

The Food and Health Survey conducted in USA<sup>(11)</sup> found that ‘fibre’ was perceived to be the healthiest amongst all food and nutrient components of food, followed by ‘whole grains’, ‘protein from plant sources’, ‘probiotics’ and ‘omega-3’ and it was observed that most participants above the age of 50 years tried to include the same in their diets regularly. ‘Sodium’ and ‘saturated fat’ were perceived to be the least healthy.

A study on undergraduate students in Brazil<sup>(15)</sup> found that adolescent girls no longer associated calories to ‘healthiness’ of the food product. Calories were understood as energy units, and their excessive intake was associated with weight gain or fat gain.

In the current study, ‘calories’ was ranked in the middle of the healthy to unhealthy spectrum, indicating that consumers do not see calories as an indicator of the ‘healthfulness’ of any food product, and have a rather neutral view about it.

**f. Consumer perceptions of Nutrient and Health Claims**

The top 5 nutrient and health claims that majority participants believe are essential in a pre-packaged food to be ‘100% natural’ (RII=0.884), ‘high fibre’ (RII=0.872), ‘high protein’ (RII=0.871), ‘with real fruits/vegetables’ (RII=0.860) and ‘no added sugar’ (RII=0.854) using the Relative Importance Index test (Table 03). The highest number of participants (60.3%) believe it is very essential for a pre-packaged food product to be ‘100% natural’, followed by ‘high fibre’ and ‘high protein’ (Figure 06).

Table 03: Nutrient and Health claims on pre-packaged food labels ranked in order of consumer importance

Nutrient and Health Claim	1 (Not Essential)	2	3	4	5 (Very Essential)	Mean	SD	RII*	Rank
	%	%	%	%	%				
100% Natural	1.7	0.7	11.9	25.5	60.3	4.42	0.85	0.884	1
High fibre	1.3	1.3	12.6	29.8	55.0	4.36	0.85	0.872	2
High protein	0.7	2.3	12.3	30.5	54.3	4.35	0.83	0.871	3
With real fruits / vegetables	1.0	2.3	14.6	29.8	52.3	4.30	0.87	0.860	4
No added Sugar	2.0	4.0	11.3	30.5	52.3	4.27	0.95	0.854	5
Preservative free	1.7	2.0	12.9	35.4	48.0	4.26	0.88	0.852	6
Made with whole grain	1.3	1.7	15.9	34.8	46.4	4.23	0.87	0.846	7
No artificial ingredients	3.0	4.3	15.2	27.2	50.3	4.18	1.03	0.835	8
Low Sugar	1.7	6.3	17.5	30.8	43.7	4.09	1.01	0.817	9
Organic	3.6	6.0	18.2	27.5	44.7	4.04	1.10	0.807	10
Trans Fat free	3.3	5.6	22.8	25.8	42.4	3.98	1.09	0.797	11
Low Fat	3.0	7.0	17.9	34.1	38.1	3.97	1.05	0.795	12
Fortified	1.7	4.6	30.1	36.1	27.5	3.83	0.94	0.766	13
Low sodium	3.0	5.6	29.8	30.5	31.1	3.81	1.04	0.762	14
Gluten Free	7.3	12.3	26.5	22.5	31.5	3.59	1.25	0.717	15
Low calorie / Zero calorie	8.9	8.3	29.5	21.9	31.5	3.59	1.26	0.717	16

\*RII = Relative Important Indices of individual factors ranked according to the responses scored on the Likert scale.

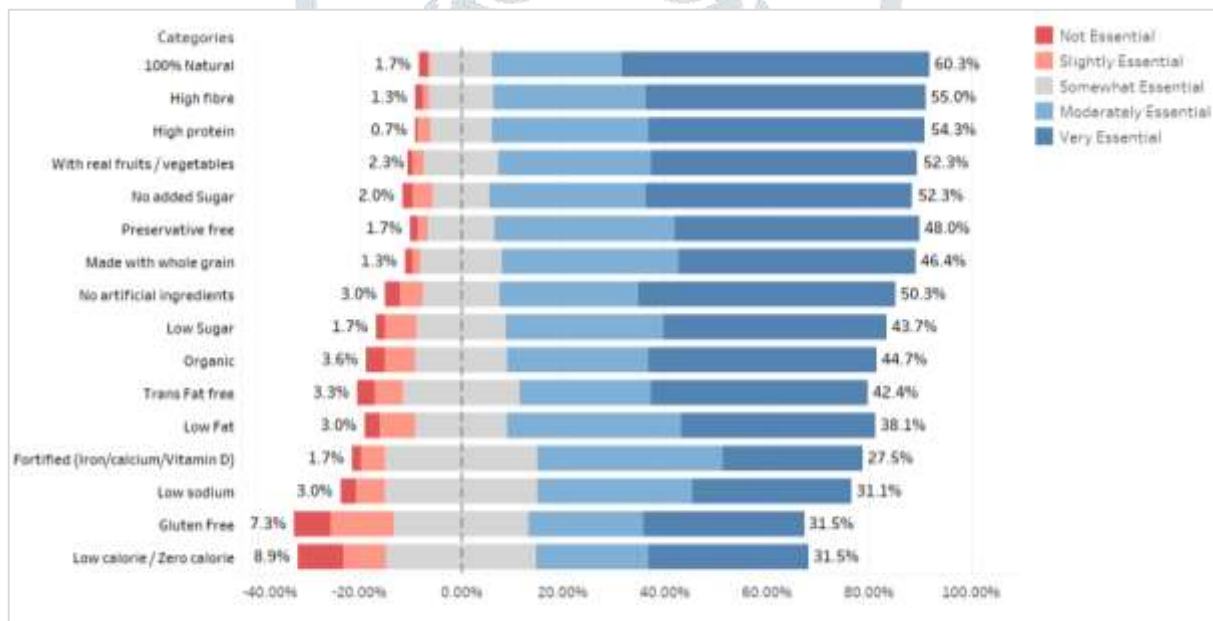


Figure 06 : Consumer perceptions on the essential nutrient and health claims in pre-packaged foods

Similarly, a study in Indian consumers of NCR region(16) revealed that 46.2% participants use labels basically to identify the nutrient content of specific food product, 38.61% participants use descriptive nutritional labels made on the front of package, such as low in fat, high in DHA etc. and 33.33% use food labels when they and their family member are following a special diet for medical reasons. Alternately, 30.8% of participants said that they purchase food items out of habit without reading nutritional information on the label.

Earlier research found that the most important nutrition information on the label for consumers was ‘total fat’ (70.54%), followed by ‘calories from fat’ (67.1%), and ‘cholesterol’ (61.91%), while the least important information on nutrition labels was ‘sugar’ (33.9%) and calories (40.9%)(9). In contrast, research in Chennai studied the knowledge of sugar content in food labels among the supermarket users and found that most participants (46.5%) were interested in the carbohydrate and protein content of the food products. While 65% of participants were aware of the positive association between sugar consumption and the incidence of diseases, only 13.2% of participants were interested in knowing the sugar content of the product. 69% of participants were not aware of the terms like “artificial sweeteners” and “non-caloric sweeteners” (7).

In the FDA Health & Diet Survey(13), it was found that nine in ten U.S. adults said they used claims such as “low in sodium,” “rich in antioxidants,” “contains no added sugar,” and “no sugar added” when buying food products. Alternately, in a study conducted in California(17) tested the perceived healthiness of food products by label claims, namely ‘organic’, ‘natural’, ‘non/low fat’, ‘non-GMO’, ‘GMO’, ‘multi-ingredient’, ‘fruit’ and ‘raw’. Participants considered ‘organic’ to be the healthiest, safest, and most environmentally friendly, followed by ‘non-GMO’ and ‘natural’.

A recent study done in the Slovenian population showed that 43.1% of respondents pay attention to health claims and health-related symbols listed on the packaging. 45.1% of respondents believe that nutrient and health claims and health-related food symbols facilitate better food choices, allowing consumers to find healthier products faster<sup>(12)</sup>.

#### IV. CONCLUSION

This study has attempted to identify the factors that influence consumer food choices in pre-packaged foods and components of the food label that consumers read while purchasing pre-packaged foods, in adults (age 25-54 years) living in Mumbai city. Further, this survey assessed consumer awareness and opinion on food and nutrient components in food, and their perceptions of various nutrient and health claims commonly found on food labels, amongst consumers in Mumbai.

Taste/Flavour of the product was the most important factor while choosing pre-packaged food, followed closely by nutrition & health, and brand trust. For a price-sensitive market like India, it was surprising to see 'price' rank lower in the list of influencing factors in the current study. 'Expiry date', 'best before date', 'MRP' (maximum retail price) and 'brand' name was referred to on the food label always, followed by 'nutrition facts panel'. However, 'statements on health benefit' and 'front-of-pack health claims' were least checked on the label, implying that consumers are referring to the nutrition information panel on the back label, rather than health claims printed on the front of the pack. This could be due to the lack of consumer trust on nutrient and health claims printed on the label, or the absence of the same from food labels. Nutrient and health claims are voluntary declarations on the food label, compared to the nutrition information panel, which is a mandatory declaration.

While defining the healthfulness of pre-packaged foods, consumers foremost believe that a product must be high in healthy components or nutrients, followed by 100% real ingredients, and is minimally processed, natural and organic. It was also observed that consumers rated 'real fruit /vegetable', 'fibre', 'plant ingredients', 'whole grains', 'protein', 'omega 3', and 'probiotics' as 'healthy' and 'very healthy'. A major finding in this study is that the nutrient and health claims that consumers believe are most essential in any pre-packaged food product are '100% natural', 'high fibre', 'high protein', 'with real fruits/vegetables' and 'no added sugar'. Low calorie / zero calorie was the least essential claim, thus indicating that consumers are focussing on the quality of the calories, rather than the number of calories.

Overall, it can be concluded that while nutrition and health benefits of a food product is a big driver for pre-packaged food choice, the research points particularly in the favour of 'clean label' trends in pre-packaged foods. Consumers are no longer seeking food products that are low-fat or low calorie, but products that are close to their natural form, minimally processed, free from artificial additives, and made with real ingredients. Sustainability / Environmentally friendly products are being preferred over conventionally ultra-processed products.

The scenario post-Covid-19 shows that consumers are prioritising health as one of their major priorities and that people are actively avoiding foods and beverages due to food safety issues. People are beginning to get concerned about the food they purchase and nutrient and health claims on pre-packaged food labels are critical tools that empower the consumer to make the right choices in the favour of their health. Hence efforts should be focused to facilitate consumer awareness towards the importance of reading pre-packaged food labels, and the nutrient and health claim printed on the food labels.

#### V. STUDY LIMITATIONS

The current study was carried out only in one city, Mumbai.

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