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Front of Pack Nutritional Labeling : A Treat or Threat for Food Industries in India?

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Abstract

Due to increased evidence of obesity and overweight over the past few decades, obesity and overweight have become an epidemic over the nations and are considered a 'New World Syndrome' in the category of non-communicable diseases. The underlying reasons for these diseases primarily lie in lifestyle changes like diet on unhealthy foods, consumption of HFSS (High in fat, sugar and salt) foods and sedentary working culture. Several international and national laws are reformulating their health laws and food standards to reduce the consumption of HFSS foods and direct consumers towards choosing healthy food choices. For easier identification and to enlighten vision on nutritional facts in food packs the concept of Front of Pack Nutritional Labelling (FOPNL) was introduced. The importance of studies on findings of FOPNL by academicians or researchers and their impact on consumer preference plays an indispensable role in drawing health policies by governments, harmonising the FOPNL food labelling around the world's population and tracking the evidence of impact on health by this policy. Implementing the FOPNL system could greatly affect consumer's healthier food choice process, which drives the food industries to reformulate the food product for continuing their business even more preferable.

Keywords : Front-of-Pack Nutritional labelling, Healthy food choices, Beverage, Sugar, India.

Due to increased evidence of obesity and overweight over the past few decades, obesity and overweight have become an epidemic over the nations and are considered a 'New World Syndrome' in the category of non-communicable diseases. The prevalence of obesity was found to be 1 in 6 children in Western countries. In India, there is a drastic peak in obesity and overweight was observed, 11-17 per cent in the states of the country, 4.7 per cent in the rural population and 10-30 per cent in adults (Kalra and Unnikrishnan, 2012). By 2030, it was predicted by worldwide 5.0 per cent of Indians will be obese and 27.8 per cent of them would be overweight (Luhar *et al.*, 2020). The well-known consequences of being overweight and obese were cardiovascular diseases, stroke, hypertension and type 2 diabetes. The underlying reasons for this disease primarily lies in lifestyle changes like diet unhealthy foods, consumption of foods in HFSS (High in fat, sugar and salt) and sedentary working culture.

Several international and national laws are reformulating their health laws and food standard to reduce the consumption of HFSS foods and directing consumers to choose healthier food choices over a wide range of foods, especially pre-packed foods. To date in India, the nutritional information along with Recommended Daily Allowance (RDA) was provided at the back of the pack according to Food

Safety and Standards Act (FSSA), 2006. Although FSS (Advertising and Claims) Regulations, 2018 has mentioned the health claims like low or free of sugar, salt and trans fat; high or rich in protein, fibre and vitamins; synonyms such as zero or without or no or negligible. These types of word representative nutritional claims were less appealing to the consumers, which may or may not be identified who were unaware of healthy food choices due to ignorance and lack of easily recognizable indications on the label of the pack.

Hence, for easier identification and to enlighten vision on nutritional facts in food packs the concept of Front-of-Pack Nutritional Labelling (FOPNL). The concept of FOPNL finds its way back to 'The Keyhole' programme implemented by Sweden in 1989 as a voluntary national strategy to lower the rate of food-related diseases. Followed by the Swedish Food law, many European Union (EU) countries have successfully launched the FOPNL systems such as the healthy choice logo, Nordic green keyhole logo and traffic light label etc. (Bottari and Mark, 2022) Table 1. FOPNL can be briefly defined as a symbol presented in the principle display panel on the retail food product that testifies to the nutritional content and status of healthier food choices. The importance of studies on findings of FOPNL by academicians or researchers and their impact on consumer preferences play an indispensable role in drawing health policies by governments, harmonizing the FOPNL food labelling and tracking the evidence of impact on health. In terms of corporate food companies, it would be used to understand consumer buying behaviour and able to reformulate their product and label to fit into the safer zone of healthy foods.

The Ministry of Health and Family Welfare & Food Safety and Standards Authority of India (FSSAI) released drafting notice F. No. Std./SP-08/T on 13th September, 2022. The FSS (Labelling and Display) Regulations, 2020 which pertain to FOPNL has proposed the 'Indian Nutrition Rating' (INR) system based on the health star rating per 100 ml or 100 mg. The rating of the star will be ranging from 0.5 (least healthy) food to 5 stars (healthiest) food (FSSAI, 2020).

Comments from WTO members were received till 28 November 2022, on the FSSAI draft. The final version of the FSS (Labelling and Display) Amendment Regulations (2022) will be published in the Indian Official Gazette with modifications as received through comments. Following 48 months from the date of the final notice of these regulations, compliance will be voluntary and mandatory thereafter. Under this regulation, food products are classified into the category I-solid foods, II-liquid foods and III-foods that are exempted (common foods like dairy products, infant formula, alcoholic beverages, spices, fresh vegetables & fruits, meat, sugars, salt, herbs, mustard, vinegar and seasoning). This paper sets out to introduce FOPNL, its background, its beneficial effect on consumer health and the prediction of potential threats to corporate companies in India.

Background of FOPNL

Nutritional profiling of the food and beverage is the principle behind the FOPNL policy. Four criteria have been fixed by World Health Organization (WHO) along with the European Union, which are:

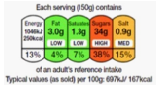
1. Nutrients covered
2. Specifications of nutrient
3. Limits of nutrients and
4. Category of foods (Kelly and Jewell, 2018)

Each criteria has many obstacles to be covered.

Nutrients Covered and Specifications of Nutrient : The summary indicator logos and label are primarily designed to highlight the unhealthfulness of the food products that are high in salt, sugar and fat than the baseline reference value. Under the FOPNL-INR system (one of the summary indicator systems), the baseline reference values for nutrients are covered into 2 sections, negative (health risk increasing) and positive factor. In negative (health risk increasing) factors, energy, total sugars, saturated fat and sodium per 100 g or 100 ml of the product are covered and

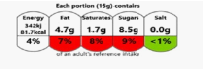
TABLE 1

Impact of FOPNL Policy on Nutritional Status in different countries

FOPNL system	FOPNL label	Country	Year	FOPNL representation	Impact of FOPNL	Reference
Summary indicator systems	The Nordic Green keyhole	Sweden	1989		The subjects understood the sign and significant reduction in low-fat and low-salt food labeled green keyhole. Reduction of 40% in consumption of saturated fat and 9% in sugar.	Larsson *et al.* (1999)
Summary indicator systems- Positive endorsement logo	Protective food logo	Slovenia	1992		64% of Slovenian are able to identify the symbols, which displays their care towards food consumption.	Miklavec *et al.* (2016)
Summary indicator systems- Positive endorsement logo	Healthier choice symbol(HCS)	Singapore	1998		Contains 30 nutrient labels. Increased purchase of HCS labeled foods. But no effect on calorie intake. More HCS confuses the consumer.	Finkelstein *et al.* (2021)
Summary indicator systems- Positive endorsement logo	Heart Symbol	Finland	2000		Increasing trend in usage of symbolized product, educated people were highly familiar with the symbol	Lahti-Koski *et al.* (2012)
Nutrient-specific colour-coded system	Traffic light system	UK, South Korea, Ecuador	2004		In UK, consumer chose less the product with red label and prefer the one with green label	Scarborough *et al.* (2015)
Summary indicator systems- Positive endorsement logo	Heart Tick	Nigeria	2005		80% of the products have the heart tick, which will be definitely identified by the consumers	Oghojafor *et al.* (2012)
Reductive systems	DIG Daily Intake Guide	Australia	2006		The consumers found hard to understand DIG and no significant impact on buying behaviour was found	Talati *et al.* (2017)
Nutrient-specific numerical systems	Reference Intakes label (RIL)	UK	2006		The subjects are not familiar with RIL and complex to understand	Gibson *et al.* (2021)
Nutrient-specific systems	Clear on Calories	Canada	2011		Introduced by Canada Beverage Association. 59% of subjects were able to recognizes government mandated label.	Vanderlee *et al.* (2012)

Continued....

TABLE 1 Continued....

FOPNL system	FOPNL label	Country	Year	FOPNL representation	Impact of FOPNL	Reference
Summary indicator systems- Positive endorsement logo	Healthy Choices logo	Czech Republic	2011		Czech peoples perceive that food quality labels increases the healthiness of the food and have influence on decision-making factor.	Sadílek, (2019)
Nutrient-specific colour-coded system	Traffic Light System	South Korea	2011		Applied to children snack items, to prevent childhood obesity. 78% of carbonated beverages reformulated with substituted sugar. In 2020, 23.7% salt reduction among adults was observed.	Lee *et al.* (2014) and Park *et al.* (2020)
Summary indicator systems- Positive endorsement logo	Keyhole Lithuania	Iceland and	2013		90% of Icelandic people trusted FOPNL system.	Moodie *et al.* (2013)
Summary indicator systems- Positive endorsement logo	Food stamp	Netherlands	2013		90% of Dutch people recognize the symbol. Green-healthy; Blue-processed foods.	Moodie *et al.* (2013)
Graded systems- Positive endorsement logo	Health star rating system	New Zealand and Australia	2014		In New Zealand, reformulated products had higher purchase rate that non- HSR labeled product.	Mhurchu *et al.* (2017)
Nutrient-specific colour-coded system	Traffic light systems	Ecuador	2014		The children were not familiar with symbol, consumers avoided products with red label	Freire *et al.* (2017)
Nutrient-specific interpretive systems	Multiple traffic light (MTL)	Portugal	2015		Not understood by less educated people. Further rejected by Portuguese Parliament.	Graca *et al.* (2018)
Summary indicator systems- Graded logo	Nutri score	Portugal	2019		Easily identified by consumers, than other FOPNL.	Graca *et al.* (2019)
Summary indicator systems- Positive endorsement logo	Healthy Living Guaranteed Mark	Croatia	2015		Nutritional label positively affects consumption of fruits intake and educated people were more familiar with food labels.	Kelly and Jewell, (2018)
Summary indicator systems- Graded logo	Nutri-score	France	2017		Five-letter system (A, B, C, D, E) with different colors. Found to be more effective than traffic light systems. Reduced usage of unhealthy products.	Ducrot *et al.* (2016)Van den *et al.* (2022)

Continued....

TABLE 1 Continued....

FOPNL system	FOPNL label	Country	Year	FOPNL representation	Impact of FOPNL	Reference
Summary indicator systems- Graded logo in numerical value	NOVA Food Classification System	Brazil	2019		Four different colour tags. Reduced consumption of red (Ultra processed) labeled foods.	Costa *et al.* (2021)
Summary indicator systems- Graded logo	Nutri-score	Belgium	2019		Identified by most peoples, highly effective especially among low income household than other FOPNL system.	Vandevijvere *et al.* (2020)
Nutrient-specific numerical systems	NutrInform Battery	Italy	2020		It better describes the nutrients per portion, consumer understood the symbol. But Nutri-score outscored the objective understanding.	Fialon *et al.* (2022)
Nutrient-specific warning endorsement logo	Chilean Warning labels	Mexico	2020		Most understandable and effective in reduction of non-communicable diseases.	White and Barquera, (2020)
Nutrient-specific warning endorsement logo	Red label warning	Israel	2020		Reformulation of beverages and 70% consumers willing to change dietary food habits.	Shahrabani, (2021)

for positive factors protein and fibre were considered (FSSAI, 2020). Meanwhile, other nutrients like vitamins and minerals are omitted from the consideration. For example, a fruit juice fortified with Vitamin C which contains increased sugar content above baseline reference would not be given a higher rating than unfortified fruit juice. So this creates a misfortune for manufacturers and misguidance for the negligible act for consumers to note the difference. Hence, future developments in the upgrading of the FOPNL system shall include fortified nutrients, essential amino acids and other bioactive components intentionally enriched in the food products.

Limits of Nutrients : For example in determining the limit or reference level of nutrients, most of the FOPNL policies cover nutrition information on g/100ml or g/100g basis, whereas in the keyhole FOPNL, it covers nutrients based on per serving basis. In the case of FOPNL labelling of biscuits and cupcakes, if nutrients were indicated per serving in (8-15 g) smaller portions then consumers will perceive that the product was healthful. Usually the consumer will be taking an increased amount of food than the recommended serving, if the percentage of Recommended Daily Intake (RDI) was given as a whole, the consumer will underestimate the product that has the whole portion may not meet the RDI per cent. This affects the manufacturer to manipulate the information in nutritional information to meet the consumer's attention (Genannt & Wills, 2012 and Egnell *et al*., 2018).

Category of Foods : All the food categories cannot be justifiable under FOPNL system. Certain products like dairy products, infant formula, alcoholic beverages, spices, fresh vegetables & fruits, meat, sugars, salt, herbs, mustard, vinegar and seasoning shall be exempted (FSSAI, 2020). Similarly, seasoned nuts, cured, smoked meats and marine products are critical to give ratings as the product in its natural state itself contain fat and salt in higher amount. Traditional foods around the world such as pickle, kimchi and sauerkraut are high in salt and delicacies like knafeh and baklava, Indian sweets like Gulab Jamun, peda and various burfi are high in sugar. Production of these products under the FOPNL system like Nutrient-Warning labels and other summary indicators like Nutri-score and Traffic light labels would definitely score low rank and warning signs misguides the consumer that the product is unhealthy or less healthy. The sugar and salt in these products can't be replaced by reformulation in other packed foods. Hence, the FOPNL system should also consider traditional products and specialty food products to labelled promptly without stepping into misguiding the consumers.

Overview of Food and Beverage Industries in India

India holds first rank in the production of milk, banana, papaya, mango and ginger, second in the cultivation of fruits, vegetables, food grains and plantation crops like tea and sugarcane and holds third in coconut and egg production. Despite these factors, India's food processing sector is considered as lead sector globally and the growth is anticipated to hit $535 billion by 2025-2026. Major investors in India are Mars, Kellog's, Coca-Cola, Kraft, Danone, Yakult, Pepsi, Nestle, Ferrero, Del Monte, Unilever, Cargill, ITC Limited, Britannia and Walmart etc. (Invest India, 2023).

Indian beverage market has a wide variety of drinks based on geography and weather. Next to drinking water, the soft drinks market was growing at the rate of 1.3 billion rupees at the global level and is expected to peak at 15.36 per cent during 2022-2025. Most type of beverages belongs to thirst-quenching, refreshing drinks followed by energy drink which highly belongs to the category of Sugar-Sweetened Beverage (SSB) or carbonated beverage or both. These beverages are formulated to satisfy consumer needs rather than being a healthier choice or public concern. India stands as a lead producer of sugarcane over the other countries and the consumption of sugar by Indians is higher. Sugar manufacturing industries are highly resistant to health policies against SSB (Myers *et al.*, 2017). In 2017, India has imposed a 40 per cent increased tax rate of Goods and Services Tax (GST) on SSB (Law *et al*., 2021), a recent study related to SSB found that the consumption of aerated

SSB was not affected rather it increased slightly on a state-level monthly basis even after the tax imposition (Lobstein *et al*., 2020). This proves that serious measures have to be taken to create public health awareness of sugar intake, especially through beverages, as it is one of the potentially growing markets in India.

Potential Threats for the Beverage Industries due to Implementation of FOPNL Policy

Relabelling the Products

The label on the food products has seasonal and promotional variations, hence the manufacturer has to frequently redesign the label and print for small batches based on the demand and supply. A narrative review by Barahona *et al*. (2020) states that FOPNL labelling was highly cost-effective based on cost-benefit analysis, equity implication and acceptability to stakeholders. The findings also showed that the stakeholders highly oppose the FOPNL warning sign, as it has a greater impact on sales of HFSS and less healthfulness of the food. As each country has multiple FOPNL systems, transnational companies have to relabel their product labels following each country's food law. This creates a non-uniformity among the stakeholders and the global market. Hence, Indian food and beverage manufacturers should be ready to reformulate their products as soon as Indian FOPNL is launched.

Reformulation of Food Products

As a consequence of health policies and tax imposition on target foods, many food producers due to their commercial interest try to reformulate their products to sustain in the market among the competitors. Chilean food law was the first nation to adopt mandatory FOPNL warnings and a study on consumer buying and consumption behaviour disclosed more information. SSB products were one of the most reformulated food products, as cane sugar was replaced by artificial sweeteners. Barahona *et al*. (2020) also stated that consumers prefer reformulated products without Front-of-Package Warning Label (FOPWL) over reformulated products with FOPWL. A review by da Silva *et al*. (2022) shows that consumers are not willing to pay more if the products have more changes and their findings specify that the reformulation was only done for incentive nutrients like sugar, sodium and fat but not focusing on vitamins, minerals and fibre, by which the overall nutritional profile of the product can be increased.

Nutri-Score FOPNL profiling on nuts and nut-containing products would be changeling as the plain nuts contain natural fat and processing operations like frying, seasoning and coating may further increase the sugar, salt and fat content which may reduce the Nutri-score. In case of such contents, plain nuts have to be given the best Nutri-score to help the consumer choose healthier food choices. Hence, reformulation in nuts and nut-containing products is difficult and almost impossible (Braesco *et al*., 2022). The overall summary of FOPNL reformulation shows that natural products like honey, nuts, milk, meat, seeds and their derived products cannot be technically reformulated based on incentive nutrients.

Distrust of FOPNL on Impact of Consumer Behavior

The objective of the implementation of FOPNL was to create healthier choices and nutritional awareness for the consumer, but the complex FOPNL systems and more changes could negatively affect the FOPNL. As the illiteracy rate in rural India is higher, understanding complex FOPNL would be indefinitely difficult for most of the population. In Chile, buying trend in 2016, showed that the FOPWL system in the case of cookies and chocolates has failed and people continued to purchase foods 'high in' even after the Chilean food law (Da Silva *et al*., 2022). This concludes that the importance and healthfulness of the FOPNL system should be well established before launching mandatory FOPNL by the Indian government.

The Australian Food and Grocery Council (AFGC) established the voluntary labelling known as Daily Intake Labelling in November, 2006 which is implemented by 180 brands to notify consumers about the sugar, calories, carbohydrates, protein, fat,

saturated fat and sodium per serve in a mono chromatic style. There are some distinctions to be made between Daily Intake Labelling and Traffic Light Labelling. The first is more complicated (Park *et al*., 2020). The information on daily consumption labels is about the number of nutrients, not the quality of nutrition. In a situation like this, the FOPNL system may likely fail. The FOPNL system will be only successful if the consumer cares and can identify the FOPNL signs. Hence, the Indian manufacturers have obliged to take care that the proposed Indian Nutrition Rating should provide both quality and quantity of nutrients per serving.

Hollow Threats by TFBCs

Trans-national Food and Beverage Company (TFBC), if they planned to go for judicial laws in the case of FOPNL, would result in utter failure. Therefore, TFBCs may create hollow threats to the Indian government, which tries to block or interpret in setting deadlines that can delay the process of implementation of FOPNL (Crosbie *et al*., 2022). As most of the beverage available in the Indian market, consists of higher amount of sugar that can be easily categorized under 'high sugar' labelled products, this affects the consumers purchasing intention that ultimately grounds the brand preference. Hence, before the implementation of mandatory FOPNL in India clear guidelines, limitations, deadlines and claims should be made that harmonise with national and international guidance.

Decreased Purchasing Trend

A study showed that for products containing one or more FOPWL in Chile, 78.5 per cent of respondents felt that the labelling would influence their buying behaviour, including a decrease in consumed portions (26.6%), decrease in consumption recurrence (26.2%) and cessation of intake (25.7%) (Da Silva *et al.*, 2022).

Potential Treats for the Beverage Industries due to Implementation of FOPNL Policy

Increased Sales of FOPNL Labeled Products

Several studies support that consumers likely prefer FOPNL-labeled products to non-labelled ones. This consumer behaviour helps to regain the brand's consumer loyalty. Food products displayed with worded claims have lesser attention, whereas FOPNL has a stronger impact on the healthfulness of the product. Purchase intention was positively influenced by the FOPNL mark. Warning symbols FOPWL had a greater impact than FOPNL on consumers' purchasing trends (Arrua *et al*., 2017). Implementation of FOPWL on SSB had a greater impact on lower-income people, it would not readily reduce the consumption rate but may lower the level of consumption frequency. This is in-return advantageous in the area of public health interest that has associated with common health problems like obesity (Grummon *et al*., 2019), diabetes type 2, hypertension and cardiovascular diseases (Beckles & Chou, 2016 and Abdalla *et al*., 2020).

When star rating FOPNL was yet to be introduced in India, every manufacturer try to reformulate their product in such a way as to reduce sugar intake by replacing it with artificial sweeteners. These reformulated beverages will have better reach among consumer improving their nutrition profile in purchasing behaviour.

An Opportunity to Design Equitable Food Label

Food labels are primarily designed to be consumer-oriented related to traceability and product positioning. FOPNL changes this typical food labelling system by completely projecting the design into the pathway of nutritional identification and perception of food ingredients. While equitable food labels are in a state of questioning their effectiveness and impact on public health, this approach should be more understandable (Pettigrew *et al*., 2023) and identifiable to every class and category of people for improvising its effectiveness.

Negative Impact of FOPNL-INR System on Indian Delicacies

As India is a land of peculiar cuisines, many food varieties contain ghee as their primary ingredient and are almost added to all vegetarian dishes. Especially, Indian delicacies like Gulab Jamun, Mysore pak and

halwa are fried in ghee (nowadays alternatively in refined edible oils) for the nutty flavour and other sweets like burfi, soanpapadi, milk peda are high in sugar. Burji, banana chips and murukku are the traditional savoury items in the Northern states of India, Kerala and Tamilnadu respectively that are deep fried in oil and also high in salt. India is also a land of geographical diversity, people in each ecosphere have their own tastes towards food. For example, people in coastal areas like Kerala and farmers tend to have more salted foods to gain minerals as they excessively sweat during working hours in the field. In such cases, their traditional dishes were also designed from that perspective.

The INR star system has a narrow spectrum of ranking the food focusing only on fat, salt and sugar. But the proposed system does not consider the consumption pattern, frequency of consumption and portion of the intake. This causes the FOPNL system to fail in the case of traditional Indian delicacies. In a study, INR star was assessed for traditional Indian delicacies, in which North Indian Mathura Peda (a religious offering) and Patisa received 0.5 stars, while South Indian delicacies such as Mysore Pak, Peanut Chikki (peanut hard candy) and Instant Poha (flavoured flattened rice) received 0.5 stars. Soan Papdi received one star (The Times of India, 2023). As a result of the INR system, Indian traditional delicacies received the very least ranking conveying that the food items are unhealthy for the consumer. This in turn economically affects the cottage industries and local sweet manufacturers.

As transnational companies can reformulate their sugar-rich product with artificial sweeteners to ensure better ratings. Small manufacturers of traditional delicacies may not be or are unable to replace the sugars in the sweets as it greatly affects the unique taste of the food. Hence, FSSAI has to exempt or classify these traditional food items into special categories where different nutritional profiling shall be given. At the same time, MSME (Micro, Small and Medium Enterprises) and cottage industries should not be alarmed by this INR system as introduced. A volatile committee shall be formed in association with sweet traders, MSMEs, cottage industries and food authorities to make this FOPNL-INR system successful in order to meet the national well-being.

As one of the fastest-growing countries, India has a lot of small enterprises and food manufacturing units actively engaging in food business operations. As the snacking behaviour of the population has been greatly affected since COVID-19, people tend to consume more packed foods, especially snacks. Hence, implementing the FOPNL system could greatly affect consumers' healthier food choice process, which drives the food industries to reformulate the food product for continuing their business even more preferable. Hence, the government should act in such a manner to create awareness of this system and draw clear outlines on replacements of ingredients. Technical support should also be provided for reformulation. On top, consumer awareness and their identification of nutritious food by the FOPNL system must be established through proper advertisement and campaign. Although the Indian government may face hollow threats from TFBCs, it is important to understand public health through nutritional policies that provide access to all categories of the population regardless of their income level.

Conflict of Interest : The authors declare no conflict of interest.

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