

Front-of-pack-labeling as a contribution to improving the dietary habits

A current situation analysis

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Providing simplified nutritional information on the front of packaged foods (FOP labeling) is considered a strategy to help consumers with healthier food choices, thereby improving their dietary habits and contributing to the prevention and control of obesity and noncommunicable diseases. Currently, a number of different FOP labeling models are used in a growing number of countries globally and in the EU and also by some food manufacturers and retailers even though FOP labeling still faces resistance. Consumer associations and health experts have been calling for mandatory uniform FOP labeling across the EU for some time. It is to be hoped that the recent publication of the WHO's "Guiding principles and framework manual for front-of-pack labeling for promoting healthy diet", the review of the Codex Alimentarius Commission's Guidelines on Nutrition Labeling to include FOP labeling as well as recent discussions initiated by the EU-Commission will further an early agreement.

In light of the dramatic increase in overweight, obesity and nutrition-related noncommunicable diseases, a number of strategies have been suggested to prevent these health issues by improving the dietary habits and food consumption patterns at the population level. Among these is the providing of nutritional and other health-related information on packaged foods so as to facilitate a healthier food choice for consumers [1]. Nutritional labeling of foods is currently practiced in over 70 countries globally, in the majority of cases on a mandatory basis [2]. The predominant form is a table on the back or side of the package, listing the contents of a preset selection of nutrients per 100 g or 100 mL or in a usual serving of the food. In the European Union and many other countries, these include the amount of energy, total fat, carbohydrates, and protein as well as the contents of sugar, saturated fatty acids, and table salt. Other nutrients can be listed voluntarily or if there is a specific reference to them [3].

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Consumer-friendly nutritional labeling

However, studies on the usage and effects of the common back-of-pack labeling have repeatedly shown that this type of labeling is of little value for many consumers. This is particularly true for less educated population strata whose members often have difficulties in interpreting the nutrient tables. Moreover, the labeling on the back of the package are often perceived as not visible enough and hard to read so that studying them while shopping would be too time-consuming [4]. This is all the more relevant as many consumers are interested in healthy nutrition and wish for a clear, easily understandable nutrition labeling of foods enabling a fast evaluation of different products [4, 5].

This is best achieved by labels or symbols that are positioned on the front of the package and clearly visible, so called front-of-pack labels (FOPLs). Currently, several FOPL systems exist that differ in their form, the information provided and the tone of judgement. Nutrient-based systems provide separate information on every single included nutrient, whereas for summary labels, the criteria are summarized to evaluate the food. This can be

Basis	Information	Judgement	Example
nutrient-based	informative	none	GDA
	interpretive	gradual	Traffic light, Health Star Rating
		negative	Warning signals
summary label: selected nutrients enter into a summary evaluation whereby negative and positive aspects can to some degree compensate for each other	interpretive	positive	Health seals: Keyhole, Healthy Choice
		gradual	Nutri-Score, Health Star Rating

Tab. 1: Classification of FOPL-models

done using a score like for the French Nutri-Score or the Australian Health Star Rating systems. FOPLs can be further classified by the type of information into informative (also called reductive) labels that provide only information without any judgement or recommendation, and interpretive labels that evaluate the food against defined criteria and include a guidance about its consumption. There are also hybrid models like e.g. those that combine values for nutrients with color coding or numeric ratings. In the case of an evaluation, it can be exclusively positive in the sense of labeling of preferable products (health seals or symbols), exclusively negative (warning signals) or include a gradual rating [6]. A common feature of all FOPLs is that they are provided as a supplement to the detailed nutrition information on the back of the package and often contain graphical elements for an easily understandable representation of a food's nutritional quality [7]. An overview and a categorization of the different FOPLs is given in ♦ Table 1. Moreover, FOP labeling can be implemented on a mandatory or voluntary basis.

Which FOPL-models are currently used?

Some FOPLs commonly used in the EU are presented in ♦ Table 2. One of the most prevalent nutrient-based models that is also supported by the food industry is the so-called **GDA label** (more recently called Reference Intake) that shows the content of energy, total fat, saturated fatty acids, total sugars, and salt in 100 g or mL or an usual serving of the food as a percentage of the reference or the maximal recommended intake level. Originally a purely informative model, in a newer version, it is combined to a traffic light color coding based on defined threshold values [8].

Health seals or logos indicate foods that do not exceed defined thresholds for certain nutrients the intake of which should be limited and/or contain minimum amounts of health-promoting components like dietary fiber, vegetables, fruit, nuts or wholegrain. This category includes one of the oldest FOPLs, the Nordic Keyhole logo (*Nyckelhålet*) that was introduced in Sweden already in 1989 and has since been adopted by Norway, Denmark, and Iceland as well as Lithuania and Macedonia [6, 9]. However, this type of FOPL is sometimes considered a health claim rather than a nutrition label [9]. Opposed to these are labels indicating foods of lower nutritional quality that should be consumed with moder-

ation, taking the form of **warning symbols** that signal high contents of nutrients to be limited like those for salt used since 1993 in Finland and those for sodium, saturated fatty acids, total sugar and energy in Chile. Uruguay, Peru, Israel, and Canada also intend to introduce this type of FOPL [9].

Both, health seals and summary labels are generally based on nutrient profiling models using defined thresholds, the focus being mostly on energy, total fat, saturated fatty acids, sugar and salt/sodium. Some models also include trans-fatty acids or beneficial nutrients and food groups like vegetables, fruits, nuts and wholegrain cereals. The evaluation criteria can be the same across all food categories like in the case of the UK traffic light labeling that only distinguishes between solid food and beverages. More common, however, is the use of category-specific criteria [10]. A greater focus on relevant food groups would be reasonable considering that dietary recommendations for consumers are generally food-based and aimed at composite dietary patterns [11].

FOP labeling to promote healthier dietary habits

Although various studies differ in their findings on the effects of FOPLs on food choice and the buying and consumption behaviors of consumers, a recent meta-analysis found that the use of GDA labeling, traffic light labeling or other FOPLs increased the number of consumers making healthier food choices by 18% on average, with the traffic light model showing the best performance with an about 29% increase [12]. Summary labels, warning signals, and color-coded models are generally better understood and best liked by consumers [13–16]. The Nutri-Score model recently

The WHO's five overarching principles for FOPL [7]

1. The FOPL system should be aligned with national public health and nutrition policies and food regulations, as well as with relevant WHO guidance and Codex guidelines.
2. A single system should be developed to improve the impact of the FOPL system.
3. Mandatory nutrient declarations on food packages are a prerequisite for FOPL systems.
4. A monitoring and review process should be developed as part of the overall FOPL system for continuing improvements or adjustments as required.
5. The aims, scope and principles of the FOPL system should be transparent and easily accessible.

(2017) introduced in France has shown great promise in a number of studies conducted in various countries [15, 17–19]. A particular strength of this system is that unlike the UK traffic light, it also accounts for beneficial aspects of foods, namely the content of dietary fiber, protein and components of the vegetable, fruit and nut group [20].

In addition, the introduction of an FOPL may not only influence the behavior of consumers but can also prompt food producers to optimize their products to obtain better ratings. This is particularly achieved by rating FOPL systems or health seals as has been shown for the Healthy Choice Logo that was voluntarily used in the Netherlands until 2018, where its introduction was followed by a decline of the average content of saturated fatty acids, trans-fatty acids, salt, and sugar in the analyzed food categories [21].

However, health logos may be adapted by food producers to suit their own purposes as shown by the example of a modified traffic light label developed by some large food companies that is based on the nutrient content in a serving instead of 100 g of the food, leading to better ratings especially for energy-rich snack foods. This strategy has been criticized by consumer associations such as Foodwatch [22]. In the Netherlands, the Healthy Choices Logo (known as “*het Vinkje*”) issued by the Choices Foundation was discontinued in 2018 at the instigation of the consumer association *Consumentenbond* and replaced by a mobile app after the logo had been criticized for its lack of comprehensibility to consumers and its allocation system that allowed the placement on less healthy products unless certain criteria were met [23]. This underlines the importance of a uniform regulation of FOP labeling by the Government as recommended by the World Health Organization (WHO) [7].

Guidelines for the implementation of FOP labeling and efforts for harmonization

The reduction of unhealthy diet patterns is an objective of the WHO's Global Action Plan for the Prevention and Control of NCDs 2013–2020 and FOP labeling can contribute to this goal [1]. To promote the use of FOP labeling and support Member States in its implementation the WHO has only this year published its „Guiding principles and framework manual for front-of-pack labeling

for promoting healthy diet“. It indicates basic steps and measures to successfully develop and implement FOP labeling (♦ box) including an initial contextual analysis of the national nutrition and health situation, the analysis of the legal framework as well as an evaluation of relevant national nutrition policies with which the model has to be dovetailed. The engagement of all involved stakeholders and parties in a government-led development process and the information of the population are further determinants of the success of FOP labeling [7].

In accordance with these principles, the Codex Alimentarius-Commission of the FAO/WHO intends a revision of the Guidelines on Nutrition Labeling of 1985 (CAC/GL 2-1985) to include FOP labeling, aiming at a harmonization of the different models currently used and a reduction of trade barriers. A stock taking survey by a specially established electronic working group identified a total of sixteen existing FOP labeling systems used in 23 countries in 2017 [24]. Draft guidelines on FOP labeling were proposed at the 45th session of the Codex Committee on Food Labeling held from 13th to 17th May 2019 in Ottawa, Canada [25].

Advances and obstacles in the implementation of FOP labeling

However, these endeavours were not universally welcomed as shown by the reaction of the Italian Government to the WHO Guidelines, criticizing it for a lack of transparency and scientific background and for being too simplistic as especially traditional food products like many cheese and meat products and olive oil would be given negative ratings [26].

	GDA/RI	Traffic light	Nutri-Score	Keyhole	Healthy Choice
Symbol					
Country of origin	UK, EU as industry standard, NO	UK	FR	SE	NL
Year of introduction	1998 (UK) 2009 (EU)	2013	2017	1989 2009 (NO, DK, IS)	2006 2018 discontinued in the NL
Operator	FoodDrink-Europe, governments	government	government	government	Choices Foundation
Rating criteria	energy, total fat, SFA, total sugar, salt	energy, total fat, SFA, total sugar, salt	⊖energy, SFA, total sugar, Na ⊕ dietary fiber, protein, fruit/vegetables/nuts	⊖total fat, SFA, total sugar, salt, artificial sweeteners ⊕ dietary fiber	⊖energy, SFA, TFA, Na, added sugars ⊕ dietary fiber
Covered foods	packaged	packaged	packaged	packaged, except snacks, sweets and sweetened bakeries	packaged and canteen meals
Display of nutrient values	yes	yes	no	no	no
category-specific thresholds	no thresholds	no ^a	yes	yes	yes

^a Discrimination between solid foods and beverages
 Na = Natrium; SFA: saturated fatty acids; TFA: trans-fatty acids

Tab. 2: Overview of some common FOPL models used in the EU

In turn, other EU Member States have shown great interest in FOP labeling, and Belgium, Spain, Portugal and Luxembourg are planning the introduction of the Nutri-Score model. The reactions of the food industry are just as divided. While some resistance still persists, the success and good applicability of the Nutri-Score model that broadly uses nutrient data that are part of the mandatory nutrient declaration, have convinced some large food producers and retail chains like Danone, Bonduelle, McCain and others that are already using the system in France and intend to do so in other countries [27]. In Germany, Bofrost and Iglo plan to follow the example of the above-mentioned companies, but in the latter case, this was prevented by an interim injunction of the Regional Court of Hamburg at the instigation of a private association fighting unfair competition, the exact intentions being unclear [28] (see ERNÄHRUNGS UMSCHAU 5/2019, p. M256).

The nationwide implementation of FOP labeling has been contemplated in Germany. To this end, the Max Rubner Institute (MRI) in Karlsruhe has been commissioned by the Federal Ministry of Food and Agriculture (BMEL) to evaluate eleven existing FOPL systems and its own newly developed model. The results have been published in a report in April 2019. A consumer test involving the new MRI model, the Nutri-Score and other FOP systems is planned for the summer of 2019 to find the most suitable model [29–31]. However, this approach has been criticized for the resulting delay, particularly since an immediately available fully tested system exists in form of the Nutri-Score [28]. In light of the variety of FOPL models currently used in the EU, consumer associations and health workers have been urging for some time the introduction of a uniform mandatory FOP food labeling and have lately made the case for the Nutri-Score model. After earlier attempts to establish mandatory FOP labeling at EU level failed in 2011, the Commission has now taken new steps in this direction by organizing talks on the subject between the Member State and industry representatives in Brussels in April, June, and October 2018 [32]. In line with this a European Citizens' Initiative was proposed that was registered by the Commission in early May 2019 under the name 'PRO-NUTRISCORE' [33].

Conclusion and outlook

The potential of nutritional food labeling as an instrument of health policy is widely acknowledged and there is an unprecedented interest in efficient, applicable FOP models. Especially consumer associations and health workers advocate their implementation and are supported by a number of food manufacturers and large retailers. Considering the need for effective approaches to improve the dietary habits and the promising results on the effects of FOP labeling the early implementation of an EU-wide uniform model would certainly be recommendable.

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Conflict of Interest

The authors declare no conflict of interest.

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