

Food labeling in the European Union: a review of existing approaches

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Abstract

Purpose – This review explores the phenomenon of front-of-pack nutrition labels (FoPNLs) in the European Union (EU). FoPNLs highlight the nutritional quality of food and non-alcoholic beverages and help consumers to make healthier choices. The review explores different types of FoPNLs and evaluates their effectiveness.

Design/methodology/approach – A policy analysis was conducted, relying on extant academic literature, grey literature and policy documents. The use of current FoPNLs is interpreted in light of national and economic interests.

Findings – Our review identifies and describes seven government endorsed FoPNLs that are currently used in the EU. Five are positive endorsement labels (Croatia, Czech Republic, Denmark, Lithuania, Slovenia and Sweden), which only provide a positive indication on more healthy products. The Keyhole is used in three EU countries (Denmark, Lithuania and Sweden), while the others are used in one country each. The Nutri-Score represents a summary label, which provides an overall grade of how healthy a product is. It is used in six countries (Belgium, France, Germany, Netherlands, Spain and Luxembourg). Finally, the Nutrinform battery is a nutrient-specific non-interpretive scheme, indicating the content of nutrients in a portion of a food product. All identified labels are only used on a voluntary basis, encouraging selective use.

Originality/value – This review contributes to a significant discussion about food labeling in the EU. It summarizes existing approaches and evaluates them in terms of their effectiveness. The current schemes in use reflect regional clustering. The most common scheme is the Nutri-Score. This is predominantly found in western EU states. Another major label is the Keyhole, with summary endorsement schemes being prevalent in northern EU states. The least common is Nutrinform, which has some support in southern EU states. The Nutri-score is most effective although economic interests are pushing for the Nutrinform battery in a small number of states. Finally, the review suggests that all existing FoPNLs are voluntary, these labels fail to provide consumers with adequate information about nutrition quality of food products. The EU needs to mobilize support to agree on a single one.

Keywords Food safety, Health policy, Health law or regulation, Public health regulations, Political strategy, Determinants of health

Paper type Literature review

Introduction

Consumers nowadays live in a high-choice food environment, in which the food industry has substantial influence on consumption behavior. In this environment, the industry is mainly marketing and promoting the sales of ultra-processed food, yielding high profits



(White *et al.*, 2020). In this environment, consumers need to have easily understandable and more visible information about the nutritional quality of these products. Unfortunately, existing food labeling is complicated, and individuals require high levels of both functional (e.g. reading tables) and nutritional (e.g. knowledge about macronutrients) literacy to judge, understand and act upon nutrient-related information (Krause *et al.*, 2018; Ayaz *et al.*, 2021). To assist consumers in this process, new legal approaches on *front-of-pack nutrition labels* (FoPNLs) are needed. FoPNLs serve to inform consumers about the nutritional quality of food and non-alcoholic drinks, and thus help consumers in making healthier choices.

Hitherto, no uniform regulation on FoPNLs has been achieved in the EU. However, as part of the Farm to Fork Plan of 2020, the European Commission will submit a proposal for a harmonized and mandatory FoPNL by the end of 2022. Ahead of this, the European Commission has asked the European Food Safety Authority (EFSA) to provide scientific advice on nutrient profiling, based on which a harmonized FoPNL could be developed. The report concluded that saturated fat, added and free sugar and sodium should be included due to their adverse health effects when consumed in excess, whereas dietary fiber and potassium are currently consumed in too small amounts (Turck *et al.*, 2022). However, the advice does not entail the creation of a new model to rank nutrients, nor does it offer recommendations on the existing models that have already been implemented.

This review explores government-endorsed FoPNLs used in the EU and provides an overview of the currently applied labels. The review thus contributes to a better understanding of existing types of labels, their use and their advantages as well as disadvantages within the context of the current discussion about a new standard for FoPNLs at the EU level. Following this endeavor, the review also discusses barriers of harmonizing FoPNLs across the EU. The following research questions are investigated: Which types of FoPNLs exist in the EU? How informative are they in terms of the nutritional quality of food products? And how do conflicting economic interests on the national level affect the choice of FoPNLs?

Food labeling regulation in the EU

Food labeling is regulated at the EU level. The Food Information to Consumers Regulation (EU regulation 1169, 2011) specifies that most food products must be accompanied by a mandatory back-of-pack nutrition declaration, displaying pertaining to fats, carbohydrates, sugars, protein and salt. The values are to be calculated per 100 grams/100 milliliters and can be complemented by the portion size and value. In addition, Article 35(1) permits additional nutrition labeling on the front of food packaging subject to certain conditions, and Article 35(2) permits member states to recommend such labeling. However, such labeling is voluntary and member states are not permitted to make it mandatory (Gokani, 2022).

This Article specifies that, apart from mere words or numbers, the nutritional information “may be given by other forms of expression and/or presented using graphical forms or symbols” provided the following requirements are fulfilled. In terms of content, the information must be “based on sound and scientifically valid consumer research”, has to facilitate consumer understanding, must be “supported by scientifically valid evidence of understanding of such forms of expression or presentation by the average consumer” and it has to be “objective and non-discriminatory”. From a procedural perspective, the information has to be “the result of consultation with a wide range of stakeholder groups”.

Despite existing research highlighting the importance of simplifying nutritional information, no uniform format for FoPNLs across the member states has been established. However, a single compulsory FoPNL is currently under consideration and mentioned in the Farm to Fork Strategy of 2020, aiming at encouraging healthier food choices

Research method

In order to answer the research questions, a policy analysis has been conducted to examine the current policies on FoPNLs implemented on an EU-wide level (Browne *et al.*, 2019). The policy analysis includes a pragmatic review of existing academic and grey literature, and a review of relevant policy documents written in English or German language. As opposed to systematic literature reviews, it was not the goal to incorporate the entire body of literature, but to answer specific questions as outlined in the introduction. We particularly searched the literature and policy documents up to a point of saturation, in order to produce a competent overview of FoPNLs implemented in the EU.

The academic literature was screened via database and searching platforms, including PubMed, ScienceDirect and Google Scholar. To identify further policies and approaches on FoPNLs, grey literature has been searched for in databases from relevant organizations and EUR-Lex, which is an official website from the European Union and GINA, the Global database on the implementation of Nutrition Action from WHO. These sources provide valuable country-specific information to overcome the limitation of language barriers. The main search terms (*food label**, *front-of-pack**, *Nutri-Score*, *nutrition label**, *FoPNL*) were combined with the region-specific keywords *European Union*, *EU* and *Europe*.

Results

In the EU, we can identify three different types of labels recommended by member states. The first type comprises endorsement labels, which indicate that the product in question is healthier in comparison to other products in the same category. The second type pertains to summary graded labels providing a rating on the product as a whole. The third type refers to nutrient specific labels, which offer non-interpretive information on the content of specific nutrients with the percentage of reference intake calculated per daily adult needs (Kelly and Jewell, 2018). Figure 1 depicts an overview of the FoPNLs discussed below and used in the EU. The map shows EU member states only and was created with the world map package in R (South, 2011).

Endorsement labels

Green keyhole. The Keyhole was created by the Swedish national nutrition authority and was first introduced in 1989. As other positive endorsement logos, it is used by the industry on a voluntary basis. The Keyhole logo demonstrated a trademarked symbol by the food safety authorities in Denmark, Iceland, Norway and Sweden. The aim of the tool is to promote healthy food choices (Norwegian Directorate of Health, 2008) and to empower individuals to follow a healthy diet in line with the official dietary recommendations (Nordic Co-Operation, 2021). For this purpose, the label promotes low fat, low sugar, low salt and high fiber alternatives for consumers (Larsson *et al.*, 1999). Another goal is to encourage the food industry to manufacture healthy products (Nordic Co-operation, 2021). The Green Keyhole was also introduced in Denmark in 2009 and Lithuania in 2013. Moreover, non-EU countries such as Norway and Iceland have also opted for it (EU Commission, n.d.).

Little heart. Slovenia was one of the first countries to implement this label in the year of 1992. The Little Heart or Protective Food label marks a fulfillment of certain nutritional values of a pre-packaged product and with its written quote “Protect your Health” it further aims to highlight healthier options within the same category (European Heart Network, 2020). The criteria were developed by the Society of Cardiovascular Health of Slovenia (Kelly and Jewell, 2018). The label itself is monitored by the Slovenian Heart Foundation. During a

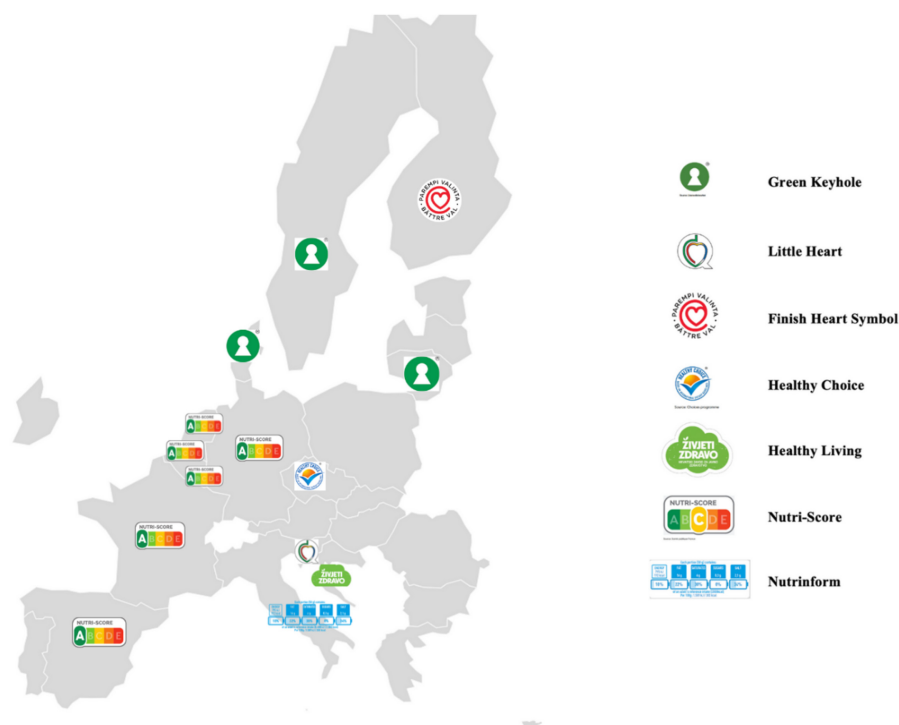


Figure 1.
Map of FoPNLs used in
the European Union

research study in 2014, nearly 75% associated the logo with health or healthy lifestyle (Miklavc *et al.*, 2016). According to a study in Ljubljana in 2012, 2% of food products displayed the Little Heart FoPNL (European Heart Network, 2020).

Finnish heart symbol. The Finish Heart Symbol was introduced in 2000. This voluntary label aims to endorse “better-for-you choices” and is a heart symbol with an encircled quote in it reading “better choice” (Kelly and Jewell, 2018). The criteria for the label were drafted by the Finnish Heart Association and the Finnish Diabetic Association (Lahti-Koski *et al.*, 2012). Authorities from the Finnish heart- and diabetes association promote the use of the logo. After its implementation, around 100 to 150 products have been added to its pool on a yearly basis. Now it is displayed on more than 1400 products and is actively used by 83 food industry companies and 54 high volume vegetable producers. This constitutes an estimated 10% of all products on the Finnish market (European Heart Network, 2020). A modeling study shows that both saturated fat and sodium consumption are effectively reduced when consumers replace the intake of products not complying with the Heart Symbol with products complying with the criteria of the Heart Symbol (European Heart Network, 2020; Raulio *et al.*, 2017).

To determine the effectiveness of the Finnish Heart Symbol, a longitudinal study was conducted between 2001 and 2009. The results concluded that in the first four years of its use, the awareness of and reliance on the symbol was prominent amongst the population group with a higher education. However, throughout later years, more consumers from other education levels joined in until there was no further notable difference between the groups from 2005 to 2009 (Lahti-Koski *et al.*, 2012).

Healthy Choice and healthy living. Poland introduced the Healthy Choice label in 2008 and the Czech Republic in 2011. It is managed by the Choices International Foundation and, like

other positive endorsement labels, is assigned to products with appropriate levels of overall calories and specific nutrients (saturated fat, trans fatty acids, added sugar, salt and fiber). The International Choices criteria are also used in other logos, such as Croatia's Healthy Living logo (Storcksdieck *et al.*, 2020). In Croatia, the Healthy Living logo has been introduced as part of the national "Healthy Living" program, launched in 2015 (EU Commission, n.d.). The use of the label is promoted by the Croatian Institute for Public Health, approved by the Croatian Ministry of Health and is a green cloud with a written quote in it, stating "live well" (Kelly and Jewell, 2018).

Summary graded labels

Nutri-Score. The Nutri-Score is the most frequently used FoPNL in the EU. It is considered an effective tool for nudging consumers toward healthier choices (De Temmerman *et al.*, 2021). The Nutri-Score takes all existing nutrients of the respective food product into account and rates the level of healthiness it provides. It consists of five colors that are each attributed to a specific letter. "A" marks the highest nutritional value and is associated with the color dark green. "E" has been assigned dark orange and stands for the lowest value (Egnell *et al.*, 2020). The Nutri-Score assesses a product's nutritional value based on the amount of healthy versus less or unhealthy ingredients. For example, fiber, protein, vegetables or fruits receive positive scores, whereas large amounts of sugar, salt or saturated fat adds a negative score. Thus, sweets or fatty snacks would receive a more negative score, representing a "warning" message (The European Consumer Organization, 2019).

It was developed and endorsed by the French government (Kelly and Jewell, 2018). France was the first country to implement the Nutri-Score in 2017 after a two-year consultation process and period of extensive testing of effectiveness of the tool (Chantal *et al.*, 2017). Spain also adopted the Nutri-Score in November 2018, followed by the Netherlands in November 2019, while Luxembourg introduced the tool in February 2020. In March 2020, Germany introduced a national executive order on the usage of the Nutri-Score (EU Commission, n.d.). Meanwhile, other countries such as Austria or Poland are considering to recommend the Nutri-Score in their country.

Nutrient-specific labels

Nutrinform. The Nutrinform label was proposed by Italy's Ministry of Economics and was adopted as a voluntary FoPNL in January 2020 (EU Commission, n.d.). The label encompasses five batteries (calorie, fat, saturated fat, sugar and salt) that illustrate the weight of the nutrient in the manufacturer-recommended portion size of the product and what percentage this reflects of an adult's reference intake (Ministry for Economic Development, 2021). Observers argue that the label was created in resistance to the Nutri-Score, and responds to the needs of the Italian food industry (Morrison, 2020).

Discussion

The review indicated a trend toward regional clusters of FoPNLs. Western and central EU countries prefer the Nutri-Score, whereas northern European countries have adopted the Green Keyhole or other positive endorsement labels. Several Mediterranean countries have expressed interest in the Nutrinform battery.

The Nutri-Score is the most widespread FoPNL in terms of use and recommendation by member states. The Nutri-Score is easily comprehensible in comparison to other FoPNLs, as it offers one single scale, subsuming multiple nutritional indicators of a product and does not require high levels of food literacy. It is also the most thoroughly tested FoPNL until now and performs better than other schemes in improving consumer decisions (Egnell *et al.*, 2020).

Positive endorsement logos are also frequently used FoPNLs in the EU and signify that the specific product the logo is printed on is a healthy choice. Even though they may work well to nudge consumers to buy healthier products, they cannot inform about less healthy choices. From this perspective, summary graded labels like the Nutri-Score have a strong advantage compared to mere endorsement labels. Although endorsement labels enable consumers to identify healthier products, endorsement labels do not burden market players that offer unhealthy food products (Jones *et al.*, 2019).

Industry lobbying against Nutri-Score

The review has demonstrated a regional cluster of Southern European countries, which promote the nutrient-specific Nutrinform battery. Of course, ultra-processed food companies, which fear profit loss due to bad grading, are lobbying against the Nutri-Score (Julia *et al.*, 2022). However, various countries also fear that the Nutri-Score would grade some of their traditional domestic products as unhealthy (Fortuna, 2021). For instance, economic stakeholders in Greece are advocating against the Nutri-Score, arguing that Feta or olive oil are rated less healthy than sugarless soft drinks. The reason for this is that the Nutri-Score takes multiple individual parameters into account and creates one overall score based on the best available evidence (European Parliament, 2021a, b). The Nutrinform battery, on the other hand, evaluates individual nutrients of a product based on a reference intake of the individual product. The intention behind this is to avoid negative evaluations of high fat products which are usually consumed in small amounts, like olive oil, which is also known to be a healthy alternative to other vegetable oils.

However, this renders the Nutrinform Battery less interpretable. For example, it demands higher nutritional literacy to properly understand the reference intake and to determine whether the product constitutes a truly healthy food choice (De Petris and Warhem, 2021). Furthermore, there is no standardized portion size for all products. In fact, consumers would have to identify the recommended portion size and calculate the number of portions they are supposed to eat from each product they are purchasing. Consequently, the Nutri-Score system may be better suited to enable an informed *in situ* decision (European Commission, n.d.; Storcksdieck Genannt Bonsmann *et al.*, 2020).

Problem of voluntary use

A major critique of the current use of the discussed FoPNLs is that these labels are still used voluntarily by the food industry (Champagne *et al.*, 2020; Kelly and Jewell, 2018). The consequence is that some brands with genuinely healthy food products are more likely to voluntarily apply the labels, whilst others opt out from using them. For example, some large food companies may use the Nutri-Score to promote some of their healthier product lines, and thus present themselves as a responsible company. For example, Nestlé prints the Nutri-Score on some of its healthier sub-brand products, such as Nestlé Wagner, Nestlé Cereals, Garden Gourmet and Maggi. Simultaneously, Nestlé does not print it on ultra-processed sweets, such as Lion bars or Smarties (see Nestlé Germany, n.d.; Nestlé, n.d.).

Both the practice of tokenism and the countries' concerns are issues that demand more attention by governments and public health institutions. The EU is currently working on harmonizing FoPNLs across all EU member states by building on the Farm to Fork Strategy of 2020. The goal for its proposal is to achieve this standardized format by the end of 2022 (Gokani, 2021).

Despite the different national and industry interests, a harmonization of FoPNLs is advisable on the EU level, facilitating healthier consumer choices. In doing so, they need to find solutions toward a uniform labeling system. The Nutri-Score system appears to provide a well-tested solution, which is also supported by consumer interest groups

(Foodwatch, 2021). To accelerate this process, national campaigns are required and more awareness throughout the population is needed.

For example, the European “Pro-Nutri-Score” citizens’ initiative aimed at mobilizing support for the implementation of the Nutri-Score on the EU level. The EU-wide introduction should minimize confusion about labeling, ensure an easier comprehension of food ingredients, advocating the use of better ingredients in food products (Pro-Nutri-Score, 2020). However, the initiative was withdrawn due to a lack of support (i.e. signatures) in April 2020 (EU, n.d.). This might indicate rather low public awareness of the discussion on FoPNL, hence rendering it less urgent on the political or media agenda. Thus, politicians and public health representatives need to invest more in public campaigns to raise societal awareness about FoPNLs.

Conclusion

In this review, we described different types of labels currently used in the EU and analyzed them in terms of their regulatory foundation. Even though the Nutri-Score has been identified as the most commonly used label, label implementation is diverse and all labels are used on a voluntary basis, only. However, in order to maximize the positive impact of more transparent and easy to understand labeling, a harmonization of FoPNL on the EU level is beneficial, regardless of different national and industry interests. The Nutri-Score provides a well-tested solution, which is also advocated by consumer interest groups (e.g. Foodwatch, 2021). Introducing a new scheme should coincide with encouraging consumers to use the labels for better food choices. In other words, introducing a more useful FoPNL does not mean that the responsibility for healthier choices should be shifted to the consumers. In fact, the introduction of a new label needs to be accompanied by measures to raise awareness and to support consumers to use the new available information effectively. Only then can the full potential of a new label be unleashed.

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