



EUROPEAN NUTRITION

WHICH TOOLS FOR THE RIGHT POLICY?



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European Nutrition

Which tools for the right policy?

Description of the current FOP in the market right now

Some ten public and private FOP labelling schemes exist and are already implemented in several MS in Europe. The FOP schemes developed or endorsed by the public sector are: the “Nutri-Score” (used in France, Belgium, Germany, Luxembourg), the “NutriInform Battery” (adopted by Italy and supported by Czech Republic, Poland, Cyprus, Greece, Hungary, Latvia, Romania), the British “Multiple Traffic Light” combined with the Reference Intakes, and the positive logos such as the “Keyhole” (used in Sweden, Denmark, Lithuania, and also in Iceland, Norway, and North Macedonia), the Finnish “Heart Symbol”, the Slovenian “Little Heart” sign, the Croatian “Healthy Living”, the “Choices” logo.

Legally speaking, as far as July 2019 the only implemented European FOP schemes that fell under [Art. 35](#) of the EU 1169/2011¹ are the UK Traffic light label and the Reference Intakes schemes. The other existing schemes in the EU do not strictly fall under Art. 35 as they do not repeat the information provided in the nutritional declaration (a qualifying criteria). Such other schemes are considered as “voluntary information” and fall under Article 36 since they do not repeat the information provided in the Back of pack label but provide information on the overall nutritional quality of the food.

At any rate, FOP nutrition labelling is defined as the nutritional information that appear on the principal field of vision on food and drinks packaging. According to the EU regulation, the FOP can repeat some or all the numerical information from the mandatory nutrition declaration in a neutral or in an evaluative way or express the overall nutritional value of a food to be applied on all products or only on products complying with certain nutritional criteria.

NUTRISCORE

How does the Nutri-Score work?

The FOP method called “Nutri-score” is, by far, the most discussed. It has been implemented as the standard in some European MS (France, Belgium, Germany, Luxembourg²) and taken as a reference and/or a marketing tool by some private food producers and retailers.

The ambition of the Nutri-score is to give synthetic information about the global nutritional outlook of a food product within a simple eye-look. This system is based on an algorithm whose outcome is a number. This number is then translated into a scale in which letters in alphabetical order from A to E and colours from green to red are displayed. The more the outcome leads towards the red and the letter E, the more dangerous for the health the product is supposed to be. The outcome of this representation is a graphic scale (to be seen in figure 6) divided into five classes with the purpose “to help the consumer better see, interpret and understand the nutritional quality” of the products.

¹ The article defines the requirements that additional forms of expression and presentation of the nutritional information must have.

² Spain and The Netherlands, have expressed, under different circumstances, the political will to consider it as a domestic standard tool.



Figure 6: “Scale of colours and letters in the Nutri-score FOP”. Source: Santé publique France

The algorithm is applied to the analysis of a standard measure of **100 g of product** as it is sold. The calculation of points depends on the amount of the following nutrients that are present in the product: **calories** (Kcal/Kj), amount of **fat** (g), amount of **saturated fatty acids** (g), amount of **carbohydrates** (g), amount of **sugars** (g), amount of **protein** (g) amount of **salt** (mg), **fibres** (g).

For each category of nutrients, a number is appointed depending on the quantity of it in the product. The algorithm foresees positive (to be summed) and negatives (to be subtracted) points. The sum of all the amounts gives the final number that will define the letter and the colour on the visual label. Promoting this tool, Santé publique France states that *“the nutritional score uses the nutrients and ingredients within the food that have a significant impact on health to derive a unique estimate value of the nutritional quality of the food on an ordinal scale ranging from ‘negative fifteen’ -15 (more nutritious) to ‘positive forty’ +40 (less nutritious)”* [Santé publique France, “Nutri-Score Frequently Asked Questions”,]³.

The positive points (unhealthy nutrients) can be accumulated with high amounts of calories (energy), fats and fatty acids (saturated fatty acids), sugars and carbohydrates (sugars), and salt (sodium) which are graded from 0 to 10 for each category. Negative points (healthier nutrients) are gained with higher amounts of fibres, proteins, and vitamins (fruits, vegetables, pulses, nuts, rapeseed, walnut and olive oils), which are graded from 0 to 5 for each category. All in all, the maximum positive points that can be gained are + 40 (four categories for which the maximum points are ten each), and the maximum negative points to be gained are – 15 (three categories for which the maximum points are five each). The final number is the outcome of the sum between total positive and negative points: the closer to -15 the amount is, the product will be evaluated closer to letter “A”; the closer to + 40 the amount is, the product will be evaluated closer to letter “E”. This process is graphically explained in figure 7.

It is worth noticing that there are already adaptations of the Nutri-score for cheeses, beverages, and added fats (oils, cream, butter, etc.), and different score methodology for beverages.

To conclude, it is important to note that the Nutri-Score does not apply to all categories of food and beverages: in fact, it does not apply to all the products that do not need a mandatory nutritional declaration according to regulation no. 1169/2011, notably, unprocessed products that comprise a single ingredient (such as fresh fruit and vegetable, cut raw meat, etc.), herbs, salt, coffee, tea, infusions, vinegar, flavourings water, beverages which contain more than 1.2% of alcohol, and more [11].

³ Three updated algorithms apply for cheeses, beverages, and added oils/fats.

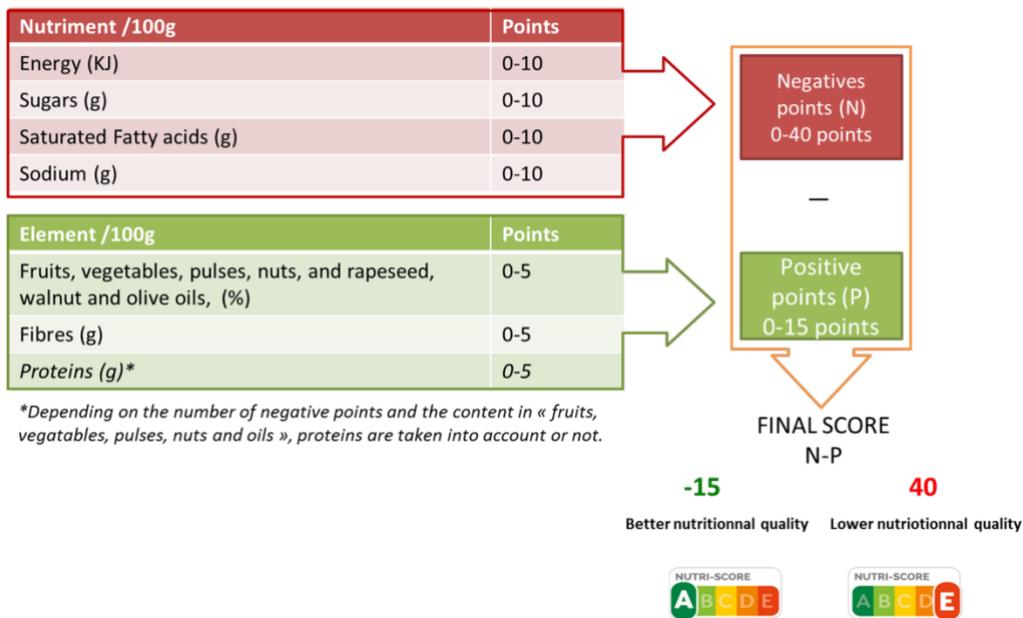


Figure 7, "Points in the Nutri-Score". Source: Santé Publique France

Discussion on the functioning of the Nutri-score

UNEQUAL POINTS IN CATEGORIES: The way the system allocates the points of the categories related to colours and letters is not proportionate. As it can be seen in figure 8, a product can be included in the category "A – green" if the final score is in a range of 15 points, whereas in order for a product to be labelled in the category "E - red", the score should be in a range of 21 points. Likewise, the other categories: "B – light green" ranges 3 points, "C – yellow" 8 points, and "D – orange" 8 points. It is clear that the categorisation is unbalanced and the chances for a product to be labelled with lower mark are higher than the others. Little changes in the points assigned lead to disproportionate change in the classing.

Points		Logo
Solid foods	Beverages	
Min to -1	Waters	
0 - 2	Min - 1	
3 - 10	2 - 5	
11 - 18	6 - 9	
19 - max	10 - max	

Figure 8, "Points and categories in the Nutri-Score",
Source: Santé Publique France

IT CAN CONFUSE THE CUSTOMER: Nutri-score has been criticised by many saying that it oversimplifies the classification of foodstuff, notably, by labelling with the "D orange or E-red" signs products that are considered by experts as healthy if introduced in moderation within a balanced diet. Products like olive oil, fish, dairy products, etc. risk to be excluded from the shopping baskets because of the "bad" stigmatisation the yellow, orange or red labels imply, while scientific consensus agrees on the fact that avoiding some nutrients that can be found in them could cause health problems.

IT REFLECT NEITHER THE INTAKE NOR THE FINAL USE OF THE PRODUCT: scoring per 100 gr of sold products, the Nutri-Score does not take into account the quantity usually eaten within a normal balanced diet and thus sends a wrong message to consumers (that D orange or E red products should be excluded from a healthy diets). On the opposite, focusing solely on the products as sold, Nutri-score does not take into account the cooking of the products. As a result, frozen French fries can be scored A or B green while butter or crude olive oil are D or E red.

IT CREATES JUDGMENTS FOR PRODUCTS: the Nutri-Score as it is structured now tends to privilege some products (or even producers) rather than others, while the role of the label itself should be to inform the end user without creating a sense of judgment towards the product. Studies (Tarabella and Voinea, 2013) have shown that western cultures tend to judge badly something related to the colour red, and "good" something related to the colour green. The Nutri-Score system uses unconscious signals to change the purchasing behaviour of customers creating a *judgmental attitude* in the consumer during the purchasing experience and resulting in a distorted perception of specific products and brands that are already used by some actors as a marketing tool. This system categorises food products in a binary,

simplistic and discriminatory way (what is “good” vs. what is “bad”), going against the principle that every food can have its place in any diet.

IT IS USED AS A MARKETING TOOL: the Nutri-Score has already been used by some market operators (notably resellers) as a marketing tool, making the French-conceived FOP the subject of promotions and incentive in the prices. In a supermarket brand, it has been implemented a revision of the nutritional outcome for the Nutri-Score, so to “*improve the Nutri-Score of your [the customers’] favourite products*”⁴. With this approach, the supermarket chain does not fix its results to objective standards, but it uses the Nutri-Score as a marketing tool, changing it following the swings of the demand of their customers. In this way, **the concept of an educational tool is overturned**, indulging on profit-based logics rather than educational and health ones.

IT CHANGES AMONG COUNTRIES: Since Nutri-score is based on National Dietary Guidelines, producers and retailers in Member States have developed their own specific adaptation of the tool. It occurs that some same products sold in two different countries have different classification on the Nutri-score⁵. The fact that the Nutri-score grading for the same product can be changed on the basis of the country where it is applied, it puts into question the coherence and the purpose of this tool.

IT RESULTS IN AN INCENTIVE TO MORE ULTRA-PROCESSED: in order to get a better score, food processing companies have tended to reformulated their products and switch from mix of natural components to more and more processed products using chemistry to maintain appearance and taste of the sold product and gain A or B green scores. Not to remind the scientifically proven link between ultra-processed food and risk of NDCs and notably cancer.

On the positive remarks, the Nutri-Score is:

EASY TO UNDERSTAND: the design of the label makes the purchasing experience very easy and quick. By attributing colours and letters, the customers already feel that they know which kind of products they intend to buy when doing their grocery. No need to read the specifics, nor scientific background knowledge is required to understand the message that the Nutri-score is meant to send. The easiness derived from this system enables to reach all the social strata of the population (regardless the education level and the economic situation).

COMPLETE: the system implies the analysis of a high amount of nutrients that can be found in the majority of food products. The standard categories analysed by the algorithm of nutrients leads the system to easily adapt to almost every product.

ADAPTABLE and already been adapted: in order to answer to some concerns raised by sectors and consumers, the Nutri-Score algorithm was adapted for some products as cheese, beverages... Nevertheless, traditional cheese producers have taken recently position against it, underlining the disconnection between the quality of their products and the A or B scoring

⁴ <https://www.delhaize.be/fr-be/nutriscore-update>

⁵ We have compared the classification in Nutri-score of several same products (same brand) sold by the same retailer in France and Belgium and concluded that they have different rating in the two countries.

given to ultra-processed and unhealthier competitors. As a result, the French Minister for Agriculture opened the gate to a new adaptation of the algorithm. However, this raises as well the question of the scientific objective basis of the tool and its algorithm.

The study led by the French Comité Scientifique (2017) found that the label itself has an impact during the purchasing experience, notably by underlining that the products that did not show any FOP label tended to be excluded from the purchase.

NUTRIFORM

How does the NutrInform work?

As for the French method, the Italian one found its legal basis in Art. 35 of the 1169/2011 regulation. The NutrInform aims at informing the consumers of a food product nutritional values through a battery-design, visually representing the percentage of a certain nutrient compared to the recommended daily amounts (Figure 9). This system analyses **energy** (kilojoule and calories), **fats, saturated fats, sugars, salt**. The daily reference amounts are displayed in Table 1. The filling level of the battery corresponds to the percentage of that specific nutrient that the recommended portion of the food brings to the consumer's diet, referring to the Reference Intakes. The consumer must therefore be careful not to "fill" more than necessary the battery corresponding to the individual nutrients, taking into account the other foods, and therefore nutrients and calories, consumed throughout the day.

Moreover, the NutrInform takes into consideration **portions** as the analysed unit, and not the 100g reference. Only information regarding the energy will be displayed in the 100g/ml form, as the 1169/11 regulation obliges. Nutrition information should be expressed both in terms of absolute amount (in kJ and kcal for energy and in grams for nutrients) and reference intake percentage, based on a portion that is easily recognisable and meaningful to the consumer. Besides, the NutrInform is not applicable to the GIs, PGIs, PDOs. For more specific information on how to measure portions and nutrients, please refer to the source

[https://www.tuttocamere.it/files/alimenti/Dichiarazione_Nutrizionale_Schema_Decreto_02_2020.pdf].

Energia (kJ)	8.400
Energia (kcal)	2.000
Grassi	70g
Grassi Saturi	20g
Zuccheri	90g
Sale	6g

Table 1: Recommended daily nutrient intakes. Source: Ministero dello sviluppo economico italiano

As for the NutriScore, the NutrInform is “owned” by the Italian ministry of economic development, which manages it. The usage of the mark is voluntary and for free. The users can be a physical or juridical persons, producers, and distributors of foodstuff to be sold in Italy and on the European market.

Italy adopted it and forwarded the request to the Commission early in November 2020.



Figure 9: Nutrinform battery design. Source: Ministero dello sviluppo economico italiano

Discussion on the Nutrinform tool:

COUNTERINTUITIVE: in the general perception, the battery symbol is normally supposed to be filled. In this case if one fills it all, he/she will reach the maximum allowed amount of nutrients – the consumer should not reach the 100% mark because doing so would mean essentially that too many calories, total fat, saturated fat, sugars or salt of the day’s total ration are being filled.

IT LACKS IMMEDIATE UNDERSTANDING: because of the way its design is structured, the NutrInform can create confusion. In fact, the consumer is asked to add the sum of percentages in nutrients in different foods in order to be able to evaluate if the shopping cart is balanced or not.

AVERAGE DIET STANDARDS: the GDAs are based on the nutrition requirements for an average adult of healthy weight and average activity level so several consumer segments can make uncorrected choices like children, woman, and elder.

However, the NutrInform is not based on a point-given algorithm whose outcome is a vote on the food product. On the contrary, it considers every main nutrient within the context of a **diet**; the outcome are suggestions towards which nutrient a person should turn to decrease or increase in his/her diet. In fact, NCDs are the consequences of the nutritional unbalances, that do not depend only on one product, but from the proportions of the food that a person eats. This approach is closer to reality and to eating habits. Furthermore, Tarabella and Voinea, (2013) found out that the concept of Reference Intake (or GDA -Guideline Daily Amount-) on which the NutrInform is based, is well understood by customers. 89% of the studied population could correctly define a guideline daily amount as a maximum rather than a target to reach.

It does not discriminate nor judge the product: the way the NutriInform is designed does not imply any kind of unconscious judgment towards the targeted food. In fact, the principle that stands behind this FOP label is the one to inform, and quality information is the process of transmitting data without the intention of influence the perception of reality. Moreover, a neutral information should be the principle for every consumer to make an independent choice.

Portions, not 100 g: this way of measuring is found to be closer to the real alimentation habits of customers, helping to better understand the nutrients intake when eating the food product. The reference portions have been defined for each product category on the basis of scientific studies conducted by CREA⁶ and the “Istituto Superiore di Sanità”⁷.

TRAFFIC LIGHTS

Traffic light system is the FOP method used by the UK government that has been developed by the Food Standards Agency in 2006⁸. As the others FOP in Europe, it is not mandatory, but many supermarkets and food processors have adopted it as a standard.

This system considers the following nutrients: calories, fats, saturated fats, sugars, and salt, and it displays them in the label linking the amount of the nutrients to be found in the product to a percentage and, therefore, to a colour. The percentage refers to the relative adult’s reference intake, and the colour shows if a product is high (red), medium (amber) or low (green) in fat, saturated fat, sugars, and salt. It also provides the information about how much energy (calories and kilojoules) it provides. Nutrients are labelled red if the amount of the nutrient per 100g or 100ml of the food represents more than 25% (for food) and 12,5% (for drinks) of an adult’s recommended daily maximum intake for the particular nutrient.

The Traffic light system is appreciated by some resellers but also by some health organizations (Tarabella and Voinea, 2013) given its **intuitive visual design** that enables it to convey efficiently the message it is supposed to send. The analogy with the traffic light, which the majority of people are confident with (regardless of their age, sex, or social strata), makes the Traffic Light FOP very easy to understand.

In the case that many foodstuffs have an equal combination of red and green colours, this FOP does not give a clear indication of which one is recommended. This outcome is not necessarily a negative one, on the contrary it is the expression of the principle that it is the consumer who is the one responsible for the choice and that the role of the FOP stops at **informing** her/him **without manipulating** her/his purchasing actions. The same principle can be found in the similar FOP NutriInform.

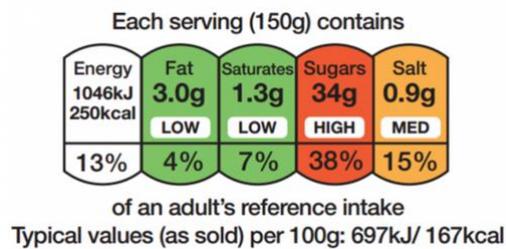
On the downside, **it focuses only on the unhealthy nutrients**, making it difficult to perceive the general outlook of a product, and making it inefficient when comparing foods from the same category. Moreover, it does not provide guidance on the consumption frequency of a

⁶ The Italian Government’s Council for research in agriculture

⁷ The main public center for research, control and technical-scientific consultancy in the field of public health in Italy

⁸ For more information: [https://www.nutrition.org.uk/healthyliving/helpingyoueatwell/324-labels.html?start=3#:~:text=Using%20the%20government%20scheme%2C%20a,calories%20and%20kilojoules\)%20it%20provides.](https://www.nutrition.org.uk/healthyliving/helpingyoueatwell/324-labels.html?start=3#:~:text=Using%20the%20government%20scheme%2C%20a,calories%20and%20kilojoules)%20it%20provides.)

product in the overall diet, and it might disadvantage certain categories of products, notably dairy ones. Besides, from Tarabella and Voinea’s (2013) research, it seems that the Traffic Light system is characterised by some exaggeration of the meaning of the colours, with 73% of the consumers that thought that red indicated avoidance rather than the occasional consumption.



POSITIVE LOGOS

Keyhole, choices, heart symbol- positive logos⁹- these systems are the most used in the Nordic countries (keyhole), Finland (heart logo), Poland, and Czechia (Choices). Through a symbol (that can be either a green circle with the shape of a white keyhole in the centre, a heart shape, or a check) these methods imply the identification of the food that are considered “best in class” within their product category. It is applied only to the products that are considered healthy and that comply with one or more of the following characteristics: less and healthier fats, less sugar, less salt, more dietary and wholegrain (keyhole), compared to food products that are not labelled, or, more in general, whose quantity of nutrients remains under a certain threshold.

These methodologies – called “Positive logos” – shown to be very effective in being recognized and understood, however, they neglect the complete nutritional information to the customer. They value the products as a whole and do not consider each nutrient as a single element. Moreover, they do not take into consideration the diet of the individual.

The keyhole does not require the customer to read detailed nutritional information, which makes it easy to identify and understand; at the same time, it lacks information that might be of interest to the final user of the product. The Keyhole is the oldest positive system in the continent, implemented since 1989 in Sweden, and then spread to Denmark and Norway.

Table 2 reports the Positive logos used in MS.

FOP name	Country	Visuals	Key features
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⁹ For more information (Keyhole): <http://norden.diva-portal.org/smash/get/diva2:700822/FULLTEXT01.pdf>

For more information (Choices): <https://www.choicesprogramme.org/>

For more information (Heart symbol): <https://www.sydanmerkki.fi/en/>

Keyhole	Sweden, Norway, Denmark, Iceland, Lithuania, North Macedonia		<ul style="list-style-type: none"> - Endorsement scheme based on thresholds levels for energy and various nutrients depending on product category. - Food labelled with the Keyhole contain less sugars and salt, more fiber and wholegrain and healthier or less fats than food products of the same type not carrying the logo. - Some food categories are not permitted to carry the logo (sweet and savory snacks). - Reference base typically is 100g or 100 ml.
Choices logo	Poland, Czech Republic		<ul style="list-style-type: none"> - Endorsement scheme based on threshold levels for saturated and trans fatty acids; added sugars, salt, dietary fiber, and/or energy, with category-specific cut-offs. - Foods are generally subdivided into core and non-core foods, and the logo is meant to identify the healthiest options in a given category. - Applicable to most foods and beverages. - Reference base typically is 100g or 100ml.
Finnish Heart Symbol	Finland		<ul style="list-style-type: none"> - Endorsement scheme based on threshold levels for energy and various nutrients depending on product category. - The logo identifies option with a better nutrient profile in a given category regarding fat (quality and quantity) and salt; in some group products, also sugar and fiber contents are considered. - Reference base is 100g.

Table 2: “positive logo in the EU”. Source: JRC, 2020.

Degree of Processing

All in all, the FOP systems described in the previous pages are all the expression of public and private initiatives towards guiding the consumer choice towards the healthier food product.

Despite their actual effectiveness, a common shortcoming, is the **lack of information on the degree of processing**. Several studies (Moubarac et al., Poti et al., Steele et al. Pereira et al., NutriNet Santé, etc.) strongly correlate the higher level of processing of food (ultra-processed foods) to the appearance of non-communicable diseases, notably cancers. The more

processed the food is, the less nutrition (less fibres, minerals, vitamins, nutrients as such) and more palatable (sweeter, saltier, more caloric) it is, leading to “empty” calories. If the final aim of Front of package labels is to increase awareness of what citizens are eating, every respectable European-wide FOP system should inform about the degree of processing so to increase transparency and knowledge in the public.

The **Nova-Score** or the **Siga-Score** both well represents the front of package system that focuses on processing: in its four-scale colours-and-letters label design, the Nova-score is supposed to inform the consumer of the different stages of processing a product went through¹⁰. Despite this added level of information, this FOP neglects to provide information about nutritional aspects of the product.

COMMUNICATION CAMPAIGNS

Social marketing

Communication campaigns in the public health/nutrition field, mostly, take the form of **social marketing** strategies. These campaigns have been implemented with the aim to educate the citizens and improve their eating habits. The institute of medicine (2006) describes it as “*[the application of] marketing concepts and techniques – exchange theory, audience segmentation, consumer orientation, competition, and an integrated marketing mix – to promote voluntary behaviour change in specific groups or target audiences based on their sociodemographic, behavioural, and psychological characteristics*”.

As in all marketing campaigns, all media are used as a basis to expand the message; all kind of sponsorships (better from non-profit, non-commercial, and government organisations) are welcomed; and more active participation of the target population is wished. Effective social marketing programs use multiple reinforcing communication channels along with public policy and environmental changes to influence consumer behaviours. In order to do that, governments set up communication units in charge of the mass media coverage (notably on social media), community-based programs, interpersonal communications, posters, pamphlets, promotions, etc.

In these kinds of campaigns, the notion of “exchange” is important to be kept in mind (Institute of medicine, 2006) as the communication efforts aim at changing customers’ behaviours in “exchange” of something that offers more value, in this case, a behaviour that will improve / avoid health problems. However, every exchange is based on trade-offs, and the older the targeted consumer is, the more difficult the trade-off will be from the public point of view, thus “*an effective social marketing program identifies the motives or drivers of behaviour, structures these motives as part of the benefits offered, and develops choices for consumers that provide a comparative advantage*”. A well-known public campaign that was

¹⁰ Group 1: Unprocessed or minimally processed foods. Group 2: Processed culinary ingredients. Group 3: Processed food. Group 4: Ultra-processed food and drink. For more information, [here](#).

implemented in a majority of MS is the one aimed at increasing the daily servings of fruits and vegetables, to increase the awareness of the risks related to fat intake and smoking habits.

All of these campaigns, after all, could be considered as examples of “**behavioural branding**”, in the sense that they try to change the lifestyle of millions of people through the constant proposition of images, slogans, and a general perception of the individual attitude towards society. As a private brand, the relationship between the consumer and such a brand can be strong and long-lasting, with brands offering a symbolic instrument that allows groups of individuals to project a specific self-image and in its social norms. Public authorities have at their disposal powerful tools that should be directed towards the notion of the public good, which correspond to the citizens’ interests. Improving public health through nutritional information, is one of these interests.

Advertising

Advertising is one, if not the major, tool that is used in communication campaigns. It manages to deliver messages to targeted population in a direct and effective way and it is successful in influencing perception and behaviours.

Advertising for food products is well spread in all media, and public authorities have already implemented some policies that aimed at banning the advertisement of some food products that are considered unhealthy, or at reducing the exposure of marketing of these foods¹¹, especially for children. Options for advertising regulation in various countries include partial restrictions on advertising by type of food, target group, portion size, and the times of advertising exposure; establishing upper and lower limits of advertising exposure to children, and complete ban on advertising.

In Europe, the “*Television Without Frontiers*” directive of 2007, not only allows for the television broadcasting industry to be harmonized within the internal market, but it also protects children from exposure to “unhealthy” advertisement. Indeed, it states the “*Television advertisement shall not cause moral or physical detriment to minors*”, also, it does not allow children’s television programs of less than 30 minutes duration to be interrupted by any advertising. Besides, this directive regulates sponsorship and product placement, notably by not allowing a sponsor to influence the content of the television programme, by clearly identifying a sponsor as such at the beginning or end of the program, and by not allowing any encouragements to purchase the sponsor’s product.

Moreover, in Europe (European Commission, 2020a) the majority of food marketing (via TV and online channels) refers to advertisement of high-calorie, low nutrient-quality foods, high in fats, sugars and salt, with under-representation or absence of advertisement for fruits and vegetable; most food advertisings refer to sugary breakfast cereals, confectionary, high fat snacks, soft drinks, and quick service restaurants; and the advertised foods are at odds with those recommended for a healthy diet. Citing a WHO study¹², the European Commission (2020a) states that “*TV advertising still remained the main medium for food marketing in the EU, although a decline in TV advertising expenditures with a parallel significant increase in internet and digital marketing was observed*”.

¹¹ <https://www.bbc.co.uk/newsround/45110055> ; European Food and Nutrition Action Plan 2015-2020 (WHO, 2015)

¹² https://www.euro.who.int/_data/assets/pdf_file/0019/191125/e96859.pdf ; WHO (2015).

FISCAL TOOLS

Price is one of the most important factors that influences food choice (Smed et al., 2005) and pricing strategies have been proposed as a tool to improve population diets and reduce rates of obesity and NCDs (Eyles et al., 2012, WHO, 2015).

Some countries implemented food taxes in the past and some were subsequently abolished. Some countries have decided to specifically target only specific ingredients that can be dangerous for the health if introduced with no moderation¹³.

There are mainly two taxation models that have been applied until now, often at the same time:

- **Price support:** subsidies or lower VAT on healthy foods. Could take the form of a flat tax rate, or a proportionate one, positively correlated to the amount of the healthy nutrients.
- **Tax incentives:** an imposition of taxes on certain foods and beverages, particularly to the ones that are salty, high-calorie, high-fat, high in added sugars, and low-nutrient. A valuable disincentive to discourage the consumption of less healthful foods and beverages.

The European Food and Nutrition Action Plan 2015-2020 (WHO, 2015) suggests also a third tool:

Incentives along the **food supply chain:** actions such as investments in production, supply chain logistics, procurement policies, etc. might lead to *“realign broader food system policies with public health goals and improve the availability and affordability of healthy diets”*.

The Food and Resources Economics Institute in Denmark found out that taxes or subsidies could have an impact on consumption but with non-consistent results depending on nutrient category and on socioeconomic and geographical status. The authors of the study suggest that, for full effect, such economic incentives might require combination with other interventions, such as related public information campaigns (Smed et al., 2005).

The second-listed taxation principle has been used for tobacco products. Some studies found that taxing cigarettes, as a component of a comprehensive state-based program, it reduces tobacco use in the adult population, even if it does not necessarily affect the youth (Institute of medicine, 2006; Eyles et al., 2012). It has to be underlined, however, that food and tobacco are different products and fulfil completely different needs.

¹³ For instance, Norway, Hungary, Denmark, Bermuda, Dominica, St. Vincent and others, have applied specific fiscal policies only on unprocessed sugar and sugar-added foods (Pfinder et al., 2020).

Eyles et al. (2012) compared some studies on food pricing changes, specifically on *“the potential of food pricing strategies to improve the quality of population diets and associated health and NCD outcomes”* and found that, according to two of the analysed studies, subsidies on fruits and vegetables increased their purchase. This fact is also confirmed by the Institute of medicine (2006), according to which *“consumers are not very responsive to price changes for poultry, eggs, fish, milk, and cheese, but they are more responsive to the prices of some fresh fruits and vegetables, as well as pork and beef”*. However, it was not considered the possibility of *compensatory purchasing*, i.e., the fact that individuals faced with a subsidy on some healthy products may purchase more foods low in nutrients and high in sugars and salt, to compensate, indeed, the saved money and the healthy food with an unhealthy one. For instance, Smed (2005) demonstrated that taxes on all fats or saturated fats tend to increase sugar’s share of total energy intake for many consumer groups while reducing the consumption of the targeted nutrient.

With simulating modelling techniques, the authors were able to show that *“food taxes and subsidies have the potential to influence food consumption and health considerably, particularly when such taxes/subsidies are large (around 15% of product price or more)”*. At any rate, the 19 simulation modelling studies in where taxes were applied to sweetened beverages, carbonated soft drinks, saturated fat, sugar, and less healthy/junk food estimated that, in each category, the food consumption of the taxed food lowered. Besides, the more effective tax effect could be seen on products with high energies from saturated fats¹⁴. Nevertheless, it was also found that *“saturated fat taxes were estimated to increase consumption of sodium, energy, and sugar, and a tax on less healthy foods was estimated to increase consumption of saturated fat”* (Smed, 2005). There was substantial variability in outcomes assessed in the subsidy’s simulations.

MS in the EU which have in practice some kind of food pricing strategies are Denmark (that implemented a €2.41 levy per Kg on saturated fats), France (that applied a €0.0036 per litre tax on sweetened beverages), and Hungary (that introduced a 10-forint tax - €0.04 – per item on foods high in total fat, sugar, and salt).

The effects of taxes on socioeconomic strata

Notwithstanding more or less convincing results of pricing strategies on food, concerns on this policy tool have been raised by several studies. Notably, they focused on the impact that pricing food could have on socio-economical groups in the society. In fact, the regressively effect of taxes, affecting disproportionately lower income households has been underlined by at least three studies (Darmon et al., 2020; Eyles et al., 2012; Smed, 2005) resulting in possible discrimination in income-groups. As Darmon and al. write, there is the risk that *“improving the health of the overall population may increase health disparities between social groups”*, and that *“those who were formerly at a lower exposure to risk derive the most benefits that those who were formerly at a greater exposure to risk”*. Also, Smed (2005), analysing the Danish experience on a tax on unhealthy products, suggests that *“among social classes, the price responsiveness [to the tax] appears to be higher for households in the lower social*

¹⁴ For this category of products, the estimated change in demand with a 1% increase in price, was found to be higher than the others. In other words, if the price of the product changes by 1%, the products that will experience the highest loss in its demand will be the ones higher in energies from saturated fats.

classes, presumably because the budget constraint is more binding". In the same article, the author also argues that the lower the socio-economic class is, the more exposed to NCD, notably overweight and diabetes.

Paternalistic approach

The much-debated issue with taxing foodstuff is the approach that such an instrument involves ending up, notably, in a paternalistic tool: a tax does not trust the ability of the citizen to make a healthy choice by himself, therefore, as a padre/padrone "forces" their "children" to behave by imposing price constraints on something that is not considered "good", depriving the customer from his/her right to choose independently.

This approach might lead to: 1) only the wealthy could afford food treats and 2) as for children, when at age, start to have rebel attitudes, the population as well will react in a not-cooperative manner.

Effectiveness

To conclude, food pricing tools hide more unsolved fiscal & social questions when applied, notably: whether it is best to apply taxes/subsidies at the point of sale or point of production; whether price changes should be applied at a flat rate or at a rate per nutrient/volume of food; which percentage of tax or subsidy has to reach the consumer; the effects on the social-strata; the size of the tax; how easily manufacturers could move their resources to produce untaxed products; and on how consumers would respond to the taxes.

From the sources analysed it is difficult to take a clear-cut position on taxation as a positive or negative policy tool as it has been shown to have higher effectiveness on vegetables and fruits, and that targets mainly the lower socio-economic groups (which is the one that is most affected by NCD) resulting, therefore, in a moderate effective tool.

In addition, fiscal policies on food might create a rejection effect by the weaker economical groups in a society: by implementing higher prices on unhealthy food, weaker economic groups might perceive the purchase of healthier products as an obligation, rather than a possibility. This effect is underlined by the fact that low-income groups tend to find in food a higher value of comfort given, also, the relative affordability of food compared to other forms of distraction (such as cultural activities, travels, restaurant, etc.) resulting, eventually, in a higher risk of social fracture and rejection of these policies.

PART III

WHICH EUROPEAN SOLUTION?

The European Food and Nutrition Action Plan 2015-2020 (WHO, 2015) states that "*Nutrient profiling has emerged as a valuable tool for policy development and implementation to*

promote healthier food supplies". Of all the methodologies analysed, the FOP seems indeed an effective tool to be considered, even if a coordinated effort of all the policies (education programmes in the first place) is the optimal policy action to prefer.

Therefore, the European initiative that foresees to adopt a harmonised solution (programmed in the Farm to Fork Strategy) should, at large, take into consideration the following points:

- **NON-DISCRIMINATORY:** the labelling system should be in line with the requirements provided by Reg.1169/2011, therefore, it should aim at informing consumers. While a labelling system should be informative and easy to understand, it should not result in an over simplistic classification of "bad" and "good" food products.

- **EFFECTIVE:** a EU FOP system should be based on portions, in order to better inform consumers over the actual nutritional intake and value of every food. It should be objective and thus not penalise unduly nutritious agri-food products, often used as ingredients in other food preparations or consumed in portions lower than 100 g, as advised by dietary guidelines. Studies show that *"when the reference amount of 'per 100g' was very different from the 'typical' portion size, products with a 'per 100g' label were rated significantly less healthful than the 'typical' or 'half typical' portions"*. The portion is a closer-to-reality approach that does not confuse the consumer.

- **STANDARDISED:** the harmonised methodology should be applicable to the European markets. As a European standard, thus, it is foreseen the need to have common grounds and basics, and to respect general guidelines. In particular, the legislation should outline the basic characteristics that FOP label should follow in every MS, leading to the principle of standardisation which would allow the European consumer to recognise the nutritional value of the product/nutrient everywhere in Europe, regardless of the Member State or the distributor. Therefore, such a system should be developed in a way which ensures that specificities of each Member State's food culture, typical diet and national nutritional guidelines are followed. A EU system should be coherent with the EU policy on EU quality productions and should take into consideration the level of processing.

- **FLEXIBLE:** the chosen methodology should foresee a margin of flexibility, within the European standards agreed upon, so to respond to different diet habits and national priorities. Flexibility should also allow not to abruptly categorise a product/nutrient as "good" or "bad", but to empower the consumer about its effects on health and the dosage.

- **UNDERSTANDABLE:** in order to have a greater impact on societies, the methodology should be designed in a way that everyone could be able to understand it and receive the messages they are supposed to send, regardless of the social, economic, and educational level of the person, taking into consideration the notion of "product literacy". The shopper requires accurate information and means to evaluate that information. Obviously, product literacy is thwarted when consumers do not have access to the quality and type of information necessary to evaluate product choices. Thus, truthful information is necessary for product literacy. In addition, *"truthful information alone may not be sufficient to achieve product*

literacy, because information is useless if one does not understand how to use it and transform it into practical knowledge” (Pappalardo, 2012).

- **ENGAGING:** FOP labelling has been designed as an educational tool. First-time consumers and young adults are often the more receptive at the beginning. It is understood that the effects on the population can only be seen some years from its implementation. Thus, it is of imperative urgency to work on a common methodology that will be able to target also the population that is left behind by the labelling strategy, notably adults, elderly citizens with consolidated eating habits, and consumers who do not have the cultural knowledge to make the choice on what food to buy according to each individual’s particular conditions and state of health.

- **INCLUSIVE:** studies have shown that *“improving the health of the overall population may increase health disparities between social groups”* (Darmon et al, 2020), notably, *“those who were formerly at a lower exposure to risk derive the most benefits that those who were formerly at a greater exposure to risk”*. Guaresh (2018) also confirms the disparity in the usage of FOP: higher-income groups tend to pay more attention to the nutritional label compared to the low-income groups. Moreover, according to TNS study on the impact of food information on consumers’ decision making (2014), only *“less than a quarter of shoppers actually took time to read information on the package. Of these, only a fraction of consumers read relevant food information that informs about the healthiness of the product”*. On average, the consumer spends 2 seconds to choose the product on the shelf, it is clear the positive correlation between who reads the information and the educational level (the more educated, the more likely to read the nutritional label) (Guaresh, 2018). The European solution should consider the effects that such systems have on the overall society and take a socially-holistic approach. The *“leaving no one behind”* motto should then be fulfilled at once.

All in all, these guidelines should be able to guide the European debate in exploring solutions for a future Eu-wide Front-of-Package label.

BIBLIOGRAPHY

1. Agra Facts, “Klockner hails constructive informal on resilience, labelling, transport”. No. 66, Brussels, 01/09/2020.
2. British nutrition foundation, “Looking at labels”, December 2016. Online resource, consulted on 08/09/2020; <https://www.nutrition.org.uk/healthyliving/helpingyoueatwell/labels.html?limitstart=0>

3. Comité Scientifique de l'étude d'expérimentation, "Evaluation ex ante of simplified graphical nutrition labelling systems", Final report from the scientific committee [in French]. 2017. Online source, consulted on 04/09/2020: https://solidarites-sante.gouv.fr/IMG/pdf/rapport_comite_scientifique_etiquetage_nutritionnel_150317.pdf
4. Council of the European Union, "Reflection process: innovative approaches for chronic diseases in public health and healthcare systems", 2013. Online source, consulted on October 30th, 2020: https://ec.europa.eu/health/sites/health/files/major_chronic_diseases/docs/reflection_process_cd_final_report_en.pdf
5. Darmon et al. "Food price policies improve diet quality while increasing socioeconomic inequalities in nutrition" International Journal of Behavioral Nutrition and Physical Activity 2014, 11:66. Online source, consulted on October 22nd, 2020: <http://www.ijbnpa.org/content/11/1/66>
6. Eyles et al., "Food pricings strategies, population diets, and non-communicable disease: a systematic review of simulation studies", PLoS Medicine, 2012. Online source, consulted on November 4th 2020: <https://www.researchgate.net/publication/233915556>
7. European Commission-a, "Health promotion and disease prevention – Food and non-alcoholic beverage marketing to children and adolescents", Brussels, 2020. Online source, consulted on November 9th, 2020: <https://ec.europa.eu/jrc/en/health-knowledge-gateway/promotion-prevention/other-policies/marketing>
8. European Commission, "Health Promotion and disease prevention – Dietary Fats", Brussels, 2020. Online source, consulted on October 28th, 2020: <https://ec.europa.eu/jrc/en/health-knowledge-gateway/promotion-prevention/nutrition/fats>
9. European Commission, "Health Promotion and disease prevention – Dietary salt/sodium", Brussels, 2020. Online source, consulted on October 27th, 2020: <https://ec.europa.eu/jrc/en/health-knowledge-gateway/promotion-prevention/nutrition/salt>
10. European Commission, "Impact Assessment report on general food labelling issues", Brussels, 2008. Online source, consulted on October 28th; 2020: https://ec.europa.eu/food/sites/food/files/safety/docs/labelling_legislation_general-food-labelling_en.pdf
11. European Commission, "Labelling and nutrition". Online source, consulted on November 6th, 2020: https://ec.europa.eu/food/safety/labelling_nutrition/labelling_legislation_en
12. European Commission, "Non-communicable diseases - European Core Health Indicators", 2018. Online source, consulted on October 29th, 2020: https://ec.europa.eu/health/non_communicable_diseases/indicators_en
13. European Commission, "Report from the Commission to the European Parliament and the Council regarding the use of additional forms of expression and presentation of the nutrition declaration", Brussels, 20/05/2020
14. European Commission, "Survey on Member States' implementation of the EU Salt Reduction Framework", 2021. Online resource, consulted on November 12th, 2020: https://ec.europa.eu/health/sites/health/files/nutrition_physical_activity/docs/salt_report1_en.pdf
15. European Commission, "The end of the sugar production quotas in the EU", 2017. Online source, consulted on November 10th, 2020: https://ec.europa.eu/commission/presscorner/detail/en/MEMO_17_3488
16. European Commission, "Trans fat in food". Online source, consulted on November 10th, 2020: https://ec.europa.eu/food/safety/labelling_nutrition/trans-fat-food_en
17. Fortuna, "EU-wide food label should not fall to the back-burner, say advocates", Euractiv, 30/04/2020. Online source, consulted on 04/09/2020: <https://agriculture.einnews.com/article/525513215?lcf=QFOhvafD10Gdd5bQ5t4khg%3D%3D>

18. Fortuna, "The battle between pro Nutri-score MEPs and Italy keeps ranging on", Euractiv, 16/01/2020. Online source, consulted on 04/09/2020: <https://agriculture.einnews.com/article/525513215?lcf=QFOhvafD10Gdd5bQ5t4khg%3D%3D>
19. Framework for National Initiatives on Selected Nutrients – Annex II: Added Sugars. European Commission; 2015. Online source, consulted on April 20th, 2021: https://ec.europa.eu/health/sites/health/files/nutrition_physical_activity/docs/added_sugars_en.pdf
20. Green et al., (2000). "Variation and trends in incidence of childhood diabetes in Europe". The Lancet 355. 873-876., 2000. Online source, consulted on April 20th, 2021: https://www.researchgate.net/publication/279791161_Variation_and_trends_in_incidence_of_childhood_diabetes_in_Europe
21. Grummon and Hall, "Sugary drink warnings: A meta-analysis of experimental studies". PLOS Medicine 17(5): e1003120. Online resource, consulted on November 3rd, 2020: <https://doi.org/10.1371/journal.pmed.1003120>
22. Gautam D, Naresh P. A, "Review of Research Studies on Factors Affecting Consumers' use of Nutritional Labels", Nutri Food Sci Int J. 2018; 7(3): 555713. DOI: 10.19080/NFSIJ.2018.07.555713. online source, consulted on December 45th, 2021: <https://juniperpublishers.com/nfsij/pdf/NFSIJ.MS.ID.555713.pdf>
23. Harvard Medical School, "The sweet danger of sugar", Harvard Health Publishing, 2017. Online source, consulted on October 27th, 2020 : <https://www.health.harvard.edu/heart-health/the-sweet-danger-of-sugar>
24. Harvard T.H. Chan, "The nutrition source – Salt and sodium". Harvard School of public health. Online source, consulted on October 27th, 2020: <https://www.hsph.harvard.edu/nutritionsource/salt-and-sodium/>
25. Himmelsbach, Allen, Francas, "Study on the impact of Food information on consumers' decision making", TNS European Behavior Studies Consortium, 2014. Online source, consulted on October 28th, 2020: https://ec.europa.eu/food/sites/food/files/safety/docs/labelling_legislation_study_food-info-vs-cons-decision_2014.pdf
26. Institute of Medicine, "Food marketing to children and youth: threat or opportunity?", Washington DC: the National Academies Press, 2006. Online source, consulted on November 2nd, 2020: <https://www.nap.edu/catalog/11514/food-marketing-to-children-and-youth-threat-or-opportunity>
27. JRC, "Front-of-Pack nutrition labelling schemes: a comprehensive review", European Commission, 2020. Online source, consulted on November 23rd, 2020: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC113586/kjna29811enn_1.pdf
28. Julia C, Herberg S. Development of a new front-of-pack nutrition label in France: the five-colour Nutri-Score. Public Health Panorama. 2017;3(4):712–725. Online source, consulted on 04/09/2020: <https://apps.who.int/iris/bitstream/handle/10665/325207/php-3-4-712-725-eng.pdf>
29. Kuller LH, "Dietary fat and chronic diseases: epidemiologic overview". J Am Diet Assoc. 1997 Jul;97(7 Suppl):S9-15. Online source, consulted on October 28th, 2020 on PubMed: <https://pubmed.ncbi.nlm.nih.gov/9216562/>
30. Law Malcolm, "Dietary fat and adult diseases and the implications for childhood nutrition: an epidemiologic approach", *The American Journal of Clinical Nutrition*, Volume 72, Issue 5, November 2000, Pages 1291s–1296s. Online source, consulted on October 28th, 2020: <https://doi.org/10.1093/ajcn/72.5.1291s>
31. Looking at labels", British nutrition foundation, December 2016. Online resource, consulted on 08/09/2020; <https://www.nutrition.org.uk/healthyliving/helpingyoueatwell/labels.html?limitstart=0>

32. Mahesh et al., "Relative contributions of recommended food environment policies to improve population nutrition: results from a Delphi study with international food policy experts". *Public Health Nutrition*: 21(11), 2142-21-48, 2017. Online resource, consulted on November 4th, 2020: doi:10.1017/S1368980018001076
33. Moubarac et al., "Consumption of ultra-processed foods and likely impact on human health. Evidence from Canada", 2012. Cambridge University press, consulted on December 3rd, 2020.
34. Morrison, "Food label fight Italy's Nutinform "confusing and counter intuitive", claim consumer groups", *Food navigator*, 31/01/2020. Online source, consulted on 08/09/2020: <https://www.foodnavigator.com/Article/2020/01/31/Food-label-fight-Italy-s-NutrInform-confusing-and-counter-intuitive-claim-consumers-groups>
35. NutriNet-Santé, "Ultra-processed food intake and risk of cardiovascular disease: prospective cohort study", 2019. BMJ, consulted on Decemebr 3rd, 2020.
36. OECD/EU, "Health at a Glance: Europe 2018: State of Health in the EU Cycle", OECD Publishing, Paris, 2018. Online source, consulted on October 30th, 2020: https://doi.org/10.1787/health_glance_eur-2018-en
37. Official Journal of the European Union, "Regulation (EU) Np 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, amending Regulation (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/205/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/97/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004", 2011. Online source, consulted on October 29th, 2020: https://ec.europa.eu/food/safety/labelling_nutrition/labelling_legislation_en
38. Pappalardo, "Product Literacy and the Economics of Consumer Protection Policy", *Journal of Consumer Affairs*, 2012. Online source, consulted on November 3rd, 2021: https://www.researchgate.net/publication/264466732_Product_Literacy_and_the_Economics_of_Consumer_Protection_Policy
39. Patterson et al., "Trends in childhood type 1 diabetes incidence in Europe during 1989-2008: evidence of non-uniformity over time in rates of increase". *Diabetologia*. 2012 Aug;55(8):2142-7. doi: 10.1007/s00125-012-2571-8. Epub 2012 May 26. PMID: 22638547. Online source, consulted on April 20, 202: <https://pubmed.ncbi.nlm.nih.gov/22638547/>
40. Pepin, Imbeault, " Les édulcorants de la controverse ». *Médecine Sciences* 2020; 36: 472-8, pp.472-477.
41. Pereia Machado et al., "Ultra-processed food consumption and obesity in the Australian adult population". *Nature*, 2020: <https://doi.org/10.1038/s41387-020-00141-0>, consulted on February 8th, 2021.
42. Pfinder M, Heise TL, Hilton Boon M, Pega F, Fenton C, Griebler U, Gartlehner G, Sommer I, Katikireddi SVittal, Lhachimi SK. Taxation of unprocessed sugar or sugar-added foods for reducing their consumption and preventing obesity or other adverse health outcomes. *Cochrane Database of Systematic Reviews* 2020, Issue 4. Online source, consulted on November 3rd, 2020: <https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD012333.pub2/epdf/abstract>
43. Poti et al., "Ultra-processed food intake and obesity: what really matters for health – processing or nutrient content?", 2017. Springer link, consulted on December 3rd, 2020.
44. Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, *Eur-Lex*, 25/10/2011. Online source, consulted on September, 2nd 2020: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011R1169&from=EN>
45. Santé Publique France, "Conditions of Use of the "Nutri-Score" logo", Paris, French National Public Health Agency, 21/06/2020

46. Santé publique France, “Nutri-Score Frequently Asked Questions”, 12/05/2020
47. Smed et al., « Differentiated food taxes as a tool in health and nutrition policy”, Food and resource economics institute, 2005.
48. Steele et al., “Ultra-processed foods and added sugars in the US diet: evidence from a nationally representative cross-sectional study”, 2016. [BMJ open](#), consulted on December 3rd, 2020
49. Tarabella and Voinea, “Advantages and limitations of the front-of-package (FOP) labeling systems in guiding the consumers’ healthy food choice”. *Amfiteatru Economic*, Vol XV, No 33: 198-209, 2013.
50. Tosti V, Bertozzi B, Fontana L, “Health Benefits of the Mediterranean Diet: Metabolic and Molecular Mechanisms”, *The Journals of Gerontology: Series A*, Volume 73, Issue 3, March 2018, Pages 318–326. Online source, consulted on 07/09/2020: <https://doi.org/10.1093/gerona/glx227>
51. TNS European Behaviour Studies Consortium, “Study on the Impact of Food Information on Consumer’s Decision making”, 2014. Online source, consulted on October 28th, 2020: [https://ec.europa.eu/food/sites/food/files/safety/docs/labelling legislation study food-info-vs-cons-decision_2014.pdf](https://ec.europa.eu/food/sites/food/files/safety/docs/labelling_legislation_study_food-info-vs-cons-decision_2014.pdf)
52. Weichselbaum et al., “Nutrition in schools across Europe: a summary report of a meeting of European Nutrition Foundations”, Madrid, 2011. Online source, consulted on November 10th, 2020: <https://doi.org/10.1111/j.1467-3010.2010.01881.x>
53. World Health Organization, Regional Office for Europe, “Eliminating trans fats in Europe – A policy brief”, 2015a. online source, consulted on November 10th, 2020: https://www.euro.who.int/data/assets/pdf_file/0010/288442/Eliminating-trans-fats-in-Europe-A-policy-brief.pdf
54. World Health Organization. Regional Office for Europe, “European Food and Nutrition Action Plan 2015–2020”, 2015b. Online source, consulted on November 10th, 2020. <https://apps.who.int/iris/handle/10665/329405>
55. World Health Organization. Regional Office for Europe, “European Salt action network restates its support for WHO goal of reducing salt intake to 5 g per day or less”, 2018. Online resource, consulted on November 10th, 2020: <https://www.euro.who.int/en/health-topics/disease-prevention/nutrition/news/news/2018/12/european-salt-action-network-restates-its-support-for-who-goal-of-reducing-salt-intake-to-5-g-per-day-or-less#:~:text=Partners-European%20Salt%20Action%20Network%20restates%20its%20support%20for%20WHO%20goal,g%20per%20day%20or%20less&text=This%20suggestion%20contradicts%20the%20recommendation,s,than%205%20g%20per%20day>