



WHY THE EUROPEAN COMMISSION MUST CHOOSE THE NUTRI-SCORE NUTRITION LABEL

- A PUBLIC HEALTH TOOL BASED ON
RIGOROUS SCIENTIFIC EVIDENCE -
**AS THE HARMONIZED MANDATORY
NUTRITION LABEL FOR EUROPE**



As part of its farm to fork strategy, the European Commission (EC) has announced its intention to introduce a harmonized and mandatory Front-Of-Pack Nutrition Labeling (FOPNL) in the European Union (EU) by the end of 2022. The European Commission is currently considering several types of FOPNL to create a harmonised labelling system among all member states. The present report is a scientific contribution from European scientists and health professionals explaining why they support the FOPNL Nutri-Score to be chosen as the harmonized mandatory nutrition label for Europe.

CONTENTS

| | | |
|----------|--|-----------|
| | INTRODUCTION | 4 |
| 1 | NUTRI-SCORE: A PUBLIC HEALTH TOOL DEVELOPPED AND REGULARLY UPDATED BY SCIENTISTS WITH A RIGOROUS SCIENTIFIC BASIS | 7 |
| | Development of the initial Nutri-Score algorithm | 9 |
| | Scientific update of the Nutri-Score algorithm in 2022 | 10 |
| 2 | NUTRI-SCORE: A PUBLIC HEALTH TOOL VALIDATED BY NUMEROUS SCIENTIFIC STUDIES | 11 |
| | Validation of the algorithm corresponding to the nutrient profiling system underlying the Nutri-Score | 13 |
| | Ability of the nutrient profiling system to classify foods adequately | |
| | Validation of the nutrient profiling system vs food consumption, nutrient intake and biomarkers of nutritional status at the individual level | |
| | Association of the individual dietary index corresponding to the nutrient profiling system underlying the Nutri-Score with risk factors and health outcomes in prospective epidemiological studies | |
| | Effectiveness of the Nutri-Score graphical design | 17 |
| | Perception, attractiveness and preferences | |
| | Objective understanding | |
| | Impact on the nutritional quality of food purchases | |
| | Ability of the Nutri-Score to prevent health halo effects caused by nutrition claims | |
| 3 | RESULTS OF THE INITIATIVES OF THE EUROPEAN COMMISSION TO GUIDE ITS FUTURE CHOICE OF A SINGLE MANDATORY FOPNL | 20 |
| | The JRC Science for policy report “Front-of-pack nutrition labelling schemes: an update of the evidence” | 21 |
| | The European Commission public consultation | 23 |

| | | |
|----------|--|-----------|
| 4 | THE UPDATE OF NUTRI-SCORE TO CORRECT SOME LIMITATIONS IDENTIFIED AND OBTAIN A BETTER ALIGNMENT WITH FOOD-BASED DIETARY GUIDELINES | 24 |
| | Changes in the algorithm for general foods | 25 |
| | Focus on changes for fats | 26 |
| 5 | WHAT IS THE CURRENT SITUATION IN EUROPE? | 30 |
| | Implementation of the Nutri-Score in European countries | 31 |
| | Support of european scientists | 31 |
| | The societal demand in Europe | 31 |
| | The uptake by food companies in Europe | 32 |
| | Effects of Nutri-Score on sales of food items in stores | 32 |
| 6 | NUTRI-SCORE: ONE ITEM OF A MULTICOMPONENT PUBLIC HEALTH NUTRITION POLICY | 34 |
| 7 | SUMMARY OF SCIENTIFIC RESPONSES TO FREQUENTLY ASKED QUESTIONS ABOUT NUTRI-SCORE: AGAINST FAKE NEWS AND MISUNDERSTANDING | 36 |
| | How to use the Nutri-Score? Does it characterize foods as “healthy” or “unhealthy”? | 37 |
| | Why Nutri-Score does not take into account ultra-processing? | 39 |
| | Why Nutri-Score is calculated per 100 g/100 ml? | 41 |
| | Why Nutri-Score does not include all nutrients/components of interest contained in foods? | 43 |
| | Is Nutri-Score a substitute for general nutritional public health recommendations? | 44 |
| | Does the Nutri-Score attack the traditional foods and penalizes good products with PDO and PGI labels? | 46 |
| | Is the Nutri-Score opposed to the Mediterranean diet? | 47 |
| | Is the Nutrinform battery system a legitimate alternative to Nutri-Score in Europe? | 48 |
| | CONCLUSION | 50 |
| | Glossary | 51 |
| | References | 52 |

INTRODUCTION

NUTRITIONAL RISK FACTORS, and especially unhealthy diets, are considered as some of the main drivers of Non-Communicable Diseases (NCDs) in Europe, including obesity, cardiovascular diseases, diabetes and some types of cancers¹. They are key levers to public health policies as they represent modifiable determinants of health that could be influenced through primary prevention interventions².

In order to tackle the growing burden of these chronic diseases, government-led strategies have been developed worldwide to improve the diet and the nutritional status of populations through the implementation of multifaceted nutritional policies³⁻⁵.

DIET-RELATED CHRONIC DISEASES IN EUROPE

In Europe, in 2017, Non-Communicable Diseases (NCDs) accounted for:

almost
90%
of total mortality
(≈ 7.9 million deaths)

Of these diseases, cardiovascular diseases accounted for about 43% of total mortality (3.8 million deaths), cancers accounted for about 23% of mortality (nearly 2 million deaths), chronic respiratory diseases for 4% of mortality (just under 400,000 deaths) and diabetes by almost 1.6% (nearly 142,000 deaths)⁶.

82.5%
of premature mortality
(≈ 2.3 million deaths)

Overweight and obesity affect almost 60% of adults and is a common problem affecting 4.4 million children under 5 years of age, representing 7.9% of all children in this age group⁷.

Among the variety of possible interventions, Front-Of-Pack Nutrition Labels (FOPNLs) have received growing attention from public authorities⁸⁻¹¹. National and international public health expert committees such as the World Health Organization (WHO) have considered for several years that FOPNL are an effective public health tool to encourage consumers to adopt healthier eating habits^{3,10}.

While back-of-pack nutritional labelling is now mandatory in most countries and in particular in the EU since 2016^{12,13}, only a fraction of consumers use it for food selection¹⁴. Conversely, FOPNLs are considered a helpful guidance for

consumers towards healthier food choices at the point of purchase, as they deliver at-a-glance nutritional information¹⁵⁻¹⁷. Such information can be easily incorporated into food choices in shopping environments, where food selection is operated in a matter of seconds¹⁴. Moreover, they are thought to be incentives for manufacturers to reformulate their products towards healthier composition (decrease in nutrients of concern as sugars, saturated fats or salt), which would be materialized on the FOPNL^{18,19}.

DIFFERENT TYPES OF FOPNLS

Various front-of-pack nutritional schemes have been developed and implemented worldwide following government-led or industrial voluntary initiatives. The various formats include purely informative or interpretative labels. Informative schemes display only numeric information with monochrome labels such as Reference Intakes (RIs) label implemented world-wide since 2006, following a voluntary initiative from manufacturers and Nutrinform Battery, based on the RIs, adopted in Italy in 2020. Interpretive schemes provide guidance to consumers to interpret the nutritional quality of foods using colours, texts or symbols.

There are 3 main categories of interpretive FOPNLs.

1. The first encompasses endorsement labels to highlight **“recommended” foods**, such as the Nordic Keyhole label that has been implemented in Sweden in 1989, then in Denmark and Norway in 2009, and Lithuania and Iceland in 2013.
2. The second category is **warning labels**, such as those implemented in Chile since 2016, Peru since 2018, Mexico since 2020, and Israël since 2019, highlighting when a product exceeds threshold values for specific nutrients of concern.
3. The third category of labels is **spectrum labels**, which aim to advise consumers of the relative healthiness of food products across the full range of nutritional values. Examples include the Nutri-Score that is being implemented in France since 2017 and then in Belgium, Germany, Spain, the Netherlands, Luxembourg and Switzerland; the Multiple Traffic Lights introduced in the United Kingdom since 2004, and the Health Star Rating system that operates in Australia and New Zealand since 2019.

In particular, it has been shown in the literature that interpretive FOPNLs were better understood by consumers than purely informative formats, and especially among vulnerable populations with a lower socio-economic status^{20,21}.

THE NUTRI-SCORE is an interpretative front-of-pack nutrition label with summary graded colour-coding, based on a five-colour nutritional scale (from dark green to dark orange) associated with letters, from A to E, to optimize label accessibility and understanding by consumers of food products^{22,23}.



Based on a rigorous scientific background, the Nutri-Score nutrition label was developed with the aims to inform consumers, in a simple and understandable way, on the overall nutritional value of foods, in order to help them make better informed and healthier choices at the point of purchase. The second objective of the Nutri-Score is to encourage manufacturers to improve the nutritional composition of their products through reformulations and/or innovations, in order for their products to contain lower amounts of nutrients of concern and thus to be better positioned on the Nutri-Score colour scale.

An important characteristic of the Nutri-Score is the comprehensive and impartial nature of the evidence on which it is based. Its construction relies on robust scientific observations, including data from more than 100 studies published in inter-national peer-reviewed scientific journals, which have validated its calculation method and its graphic format, and demonstrated its effectiveness and its superiority compared to other labels that have been implemented in other countries or that are being supported by food-industry lobbying groups.

Despite **i)** the numerous scientific work that validate its algorithm and demonstrate its effectiveness, **ii)** the recent conclusions of the EC Joint Research Center (JRC)²¹ highlighting that consumers, including those with lower income, appear to prefer simple, colourful and evaluative summary front-of-pack labels, **iii)** the support from European consumer associations and Non-Governmental Organizations (NGOs), and **iv)** its adoption by 7 European countries, Nutri-Score is strongly opposed by some food lobbies and political parties that try to discredit it and to prevent Nutri-Score from being chosen as the mandatory label for Europe.

The objective of this report is to present the robust scientific evidence supporting Nutri-Score, what can be expected (or not) from a front-of-pack nutritional label and to answer questions both legitimate and those bordering on fake news about the Nutri-Score.

1

**NUTRI-SCORE:
A PUBLIC HEALTH
TOOL DEVELOPPED
AND REGULARLY
UPDATED BY
SCIENTISTS WITH
A RIGOROUS
SCIENTIFIC BASIS**

THE NUTRI-SCORE was developed in France by a joint academic research team, the Nutritional Epidemiology Research Team (EREN) of Sorbonne Paris Nord University, Paris Cité University, the French Institute of Health and Medical Research (Inserm), the French Research Institute for Agriculture, Food and Environment (INRAE) and the National Conservatory of Arts and Crafts (Cnam). The development of Nutri-Score was based on the existing literature on front-of-pack labels at the time, and thus incorporated knowledge from an existing body of evidence.

The algorithm assigning the Nutri-Score colours/letters was based on a nutritional profile model that was initially developed by researchers at the University of Oxford, for the UK Food Standard Agency (FSA), with the goal of setting rules for regulating television advertising for children²⁴⁻²⁹.

A rigorous process incorporating numerous studies had been used to justify the nutrients or elements retained in the algorithm (given their potential impact on health) with a limitation of their number and redundancy between elements through sensitivity studies. For example, the inclusion of fruits and vegetables in the calculation was shown to be an excellent proxy for the quantity of certain vitamins, such as vitamin C and pro-vitamin A (beta-carotene)^{25,26}. Similarly, proteins were selected as a proxy for the quantity of minerals and trace elements in food products, such as calcium and iron. Finally, this work allowed the identification and inclusion in the final global nutritional score of only those nutrients and elements that were relevant for health and whose consumption should either be limited or promoted in the public health interest.

Moreover, a fundamental requirement of any practically applicable labelling system is the inclusion of nutrients and elements that are already described in the mandatory nutritional tables and lists of ingredients found on the back of food products in Europe, which are so difficult for many consumers to interpret.

The decision to base the Nutri-Score algorithm on composition data which is already available and accessible to consumers allows complete transparency and the ability for everyone (in particular parties independent from industry) to verify the correct attribution of the colour/letter of the Nutri-Score. By taking into consideration proxies for some vitamins and minerals, the algorithm accounts for more items than only those listed for its calculation.

DEVELOPMENT OF THE INITIAL NUTRI-SCORE ALGORITHM

The final nutrient profiling system, named FSA-NPS, underlying Nutri-Score was initially intended to be used as a binary indicator in the United Kingdom to authorize(or not) TV advertising for foods aimed at children. In 2015 this nutrient profile model was the subject of modelling studies by the French High Council of Public Health (HCSP), an expert independent agency providing public health advice for policymakers³⁰. This agency set the four thresholds defining the five colours/ letters of Nutri-Score, from A (dark green) to E (dark orange).

Based on public health arguments, the HCSP made some specific adjustments to the original FSA-NPS for three food categories: beverages, cheeses and added fats, with the aim of improving the visibility of the observed variability of the nutritional quality within these three food groups.



Concerning cheeses, the initial algorithm FSA-NPS placed all cheeses in the same category (E) and was not sufficiently aligned with food-based dietary guidelines with respect to fat or calcium content of cheeses. After modest adjustment of the algorithm by the HCSP incorporating proteins as a proxy of calcium content with specific rules for cheese products, the cheeses were mainly distributed in categories D and E with some in C (such as Italian Ricotta and Mozzarella), allowing consumers to visualize their relative differences in nutritional composition.

The same reasoning was applied for beverages and added fats to allow a better discrimination of products within these groups in alignment with public health nutritional recommendations. Based on scientific data, and in particular results of intervention studies with olive oil³¹, the French Public Health Agency (Santé Publique France) responsible for developing Nutri-Score has subsequently included olive oil (as well as nuts and rapeseed oils) as positive and desirable element in the algorithm in 2019, leading to a modification in the classification of these products from D to C.

Category C was the best possible class for added fats, consistent with the Mediterranean diet model and with the food-based dietary guidelines of most European countries highlighting that added fats should only be consumed in limited quantities, with a preference for certain vegetable oils with favourable compositions.

SCIENTIFIC UPDATE OF THE NUTRI-SCORE ALGORITHM IN 2022

When it was proposed by scientists in 2014, and stated at the time of its adoption in France in 2017, and then in other European countries, the Nutri-Score algorithm was designed to be regularly revisited on the basis of the evolution of scientific knowledge, the experience of its implementation in real life and the modification of the food supply available to consumers. Safeguards measures have been planned to avoid undue influence from industry. For this purpose, a European Scientific Committee has been set up within the framework of the transnational governance of Nutri-Score coordinating the activities of the 7 countries that have adopted Nutri-Score. This Scientific Committee in charge of the update of the Nutri-Score is composed of 1-2 independent experts from each of the 7 European countries that have adopted Nutri-Score and was set up in February 2021. After 18 months of intensive scientific work, it proposed several optimizations³².

The changes introduced for the main algorithm for general foods included an increase in the number of points for unfavourable elements (sugars and salt), a modification in the allocation of points for fibre and protein, and the exclusion of nuts and specific oils from the “favourable” component. Nuts were also no longer classified in the main algorithm for general foods, but were included in the specific category of fats (with oils, butter, margarine...). Minimal changes in the threshold between A and B were also proposed both for general foods and for the specific group of fats. Moreover, a specific rule within the main algorithm for general foods was introduced: a limitation of points for protein for red meat.

Overall, the modifications recommended by the Scientific Committee of the Nutri-Score allow for a correction of limitations identified for the Nutri-Score, while maintaining the overall consistency of the system and the general classification of the products. Overall, there is a better alignment between the Nutri-Score classifications and food-based dietary guidelines across the 7 countries having adopted the Nutri-Score. The main impacts of the change of the Nutri-Score algorithm on classification of some foods planned in 2023 are presented in details in Chapter 4.

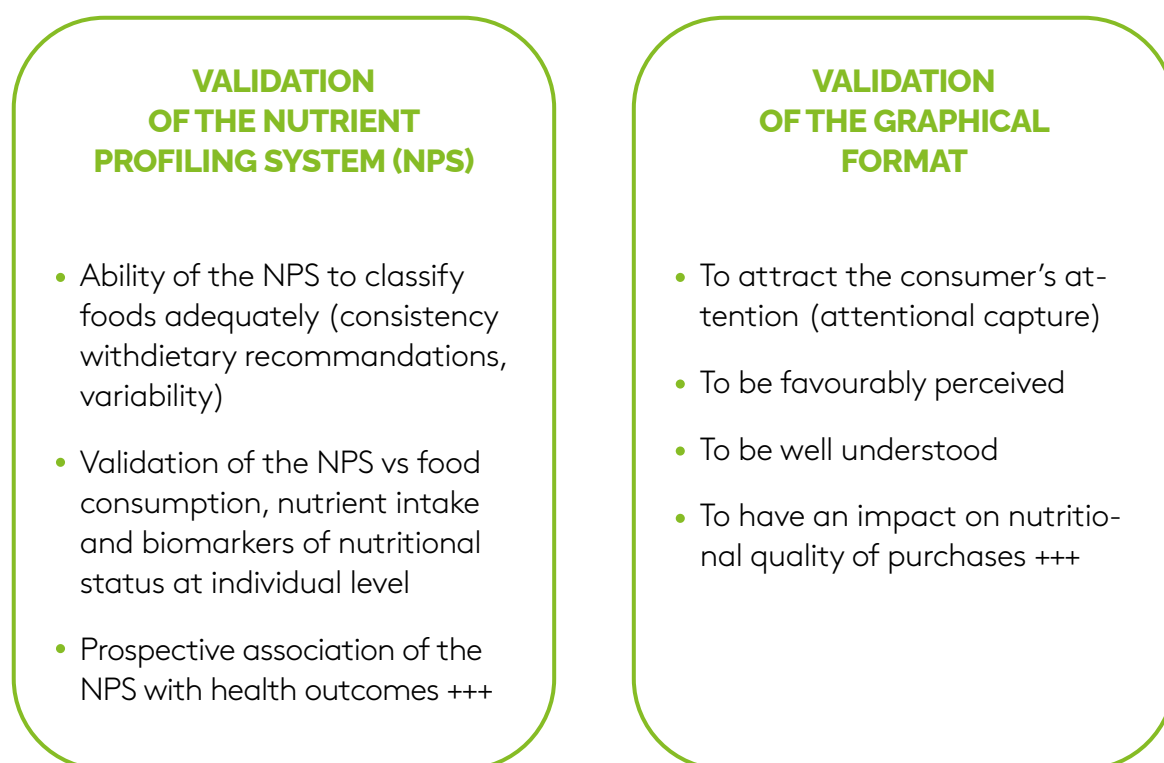


The background is a solid green color with a repeating pattern of white line-art icons representing various food items. These icons include fruits like strawberries, pears, and tomatoes; vegetables like a cucumber; fast food items like french fries, burgers, and pizza slices; beverages like coffee cups, a milkshake, and a beer mug; and other items like a croissant, a cupcake, a fish, and a bowl of soup.

2

**NUTRI-SCORE:
A PUBLIC HEALTH
TOOL VALIDATED
BY NUMEROUS
SCIENTIFIC STUDIES**

To assess the real quality of a nutrition front-of-pack label, it is necessary to be able to estimate both the relevance of the algorithm on which its computation is based as well as the performance of its graphical format. For that, there is a conceptual scheme described in the scientific literature^{33,34} and a detailed process published by WHO Europe³⁵⁻³⁷, describing the validation studies required to evaluate and select a nutrition front-of-pack label.



CONCEPTUAL FRAMEWORK DESCRIBING THE VALIDATION STUDIES REQUIRED TO EVALUATE AND SELECT A NUTRITION FRONT-OF-PACK LABEL.

Nutri-Score is the only label for which studies were performed at each stage of the conceptual framework of validation. Numerous scientific publications in peer-reviewed international journals have validated both its computational algorithm and its graphic format³⁸.

VALIDATION OF THE ALGORITHM CORRESPONDING TO THE NUTRIENT PROFILING SYSTEM UNDERLYING THE NUTRI-SCORE

ABILITY OF THE NUTRIENT PROFILING SYSTEM TO CLASSIFY FOODS ADEQUATELY

Two studies analysing generic food composition tables from 8 European countries – EuroFIR database³⁹ and Open Food Facts database⁴⁰, a large database of branded products covering the food markets of 13 European countries – have highlighted that for all the tested European countries, the food classification by Nutri-Score was generally consistent with public health nutritional recommendations, in alignment with previous studies conducted specifically in France^{41,42}.

For instance, the majority of products containing mainly fruit and vegetables were classified in A or B, while the majority of sweet and salted snacking products, sauces and animal fats were classified in D or E. The consistency was also confirmed within specific food groups: in the cereal-based and starchy food group, pulses, pasta and rice were overall ranked more favourably than breakfast cereals, and in the dairy group, milk and yogurt were ranked more favourably than cheeses. Composite dishes were widely distributed, highlighting the variability in nutritional composition of products in this specific category. Finally, concerning beverages, while the majority of fruit juices were classified C, soft drinks were mainly classified E and only water was classified as A.

In addition, in all European countries, a high variability was observed for all food groups, insofar as the foods in each category were systematically distributed into at least three classes of the Nutri-Score. For similar products from different brands, at least two-colour classes were identified each time. The ability of the Nutri-Score to highlight differences in nutritional value of foods is particularly useful to enable consumers to compare foods within specific categories. Moreover, the 2022 update of the Nutri-Score corrected some identified limitations and led to a better alignment between the Nutri-Score classifications and food-based dietary guidelines of the various European countries.



VALIDATION OF THE NUTRIENT PROFILING SYSTEM VS FOOD CONSUMPTION, NUTRIENT INTAKE AND BIOMARKERS OF NUTRITIONAL STATUS AT THE INDIVIDUAL LEVEL

The scoring algorithm underlying the Nutri-Score was validated in various epidemiological studies (in general populations of volunteers and in representative samples randomly selected from the general population) based on data from individual food surveys conducted on several thousands of participants with biological markers in some studies⁴³⁻⁴⁵.

Individuals with a nutritional profile of the foods consumed corresponding to a better Nutri-Score tended to have higher consumption of fruits, vegetables and fish, lower consumption of sweet, fatty and salted snacking products, higher intake of fibres, vitamin C, beta-carotene, calcium, zinc and iron, lower intakes of energy, added sugars, saturated fatty acids, and overall, a better compliance with public health nutritional guidelines. In terms of nutritional status, a diet with on average a higher nutritional quality of the foods consumed was found to be associated with lower blood glucose, lower Body Mass Index (BMI) and more favourable antioxidant profiles (higher blood levels of vitamin C and beta-carotene)^{43,45}.

Population-based studies demonstrated that eating foods that are on average better ranked by the Nutri-Score algorithm is associated with better overall nutritional quality of the diet and better nutritional status of individuals, thereby supporting the validity of the nutrient profiling model underlying Nutri-Score.



ASSOCIATION OF THE INDIVIDUAL DIETARY INDEX CORRESPONDING TO THE NUTRIENT PROFILING SYSTEM UNDERLYING THE NUTRI-SCORE WITH RISK FACTORS AND HEALTH OUTCOMES IN PROSPECTIVE EPIDEMIOLOGICAL STUDIES

Ultimately, the most important consideration regarding the usefulness and importance of the Nutri-Score algorithm from a public health perspective is whether or not it is associated with health outcomes in individuals. The Nutri-Score has been validated in this way in several prospective cohort studies. The Nutri-Score algorithm has been investigated in large cohorts in France, Spain and in a large pan-European cohort.

- The French SU.VI.MAX study (6,435 subjects followed for 13 years)⁴⁶⁻⁴⁹ as well as the NutriNet-Santé cohort (46,864 subjects followed for 6 years)^{50,51} showed that the consumption of foods with higher FSA-NSP scores modified by the HCSP (FSAm-NPS), corresponding to foods with a less favourable rating by Nutri-Score, was associated with a higher risk of developing chronic diseases, including cancers, cardiovascular disease, weight gain and metabolic syndrome.
- In a Spanish prospective cohort study (Predimed-Plus), including elderly people with overweight/obesity and metabolic syndrome, the consumption of food items with higher FSAm-NSP scores was also associated with increased levels of several major risk factors for cardiovascular diseases including adiposity, and elevated fasting plasma glucose, triglycerides, and diastolic blood pressure⁵².
- In two other Spanish cohorts – the SUN cohort (20,503 subjects followed for 10 years)⁵³ and the ENRICA cohort (12,054 adults followed for 10 years)⁵⁴ – the consumption of foods with a less favourable Nutri-Score classification was also associated prospectively with a higher rate of all-cause mortality, cancer mortality and cardiovascular mortality. Moreover, in the ENRICA cohort, higher Nutri-Score dietary index was associated with higher kidney function decline in older adults⁵⁵.
- Two studies were carried out within the European Prospective Investigation on Cancer and nutrition (EPIC) on a very large European population including 521,000 participants in 10 European countries with a follow-up of more than 15 years. The first study⁵⁶, including data on 49,794 incident cancers cases diagnosed during the follow-up period, found that the consumption of foods with higher FSAm-NPS was associated with an increased risk of developing cancer, most notably of the gastrointestinal tract, as well as lung cancer in men, and liver and breast cancer in women. In the second study⁵⁷, where 53,112 deaths occurred during more than 17 years of follow-up, consumption of foods with higher FSAm-NPS was associated with greater all-cause, cardiovascular and cancer-related mortality.
- Regarding the association between diet and weight gain, several studies were designed to validate the algorithm underlying the Nutri-Score using the data of

the NutriNet-Santé cohort, involving more than 71,000 participants followed for 9 years⁵⁸. Different forms of the FSA-NPS algorithm were tested: the original british model used for the regulation of the advertisements, the variant used to calculate the Nutri-Score (FSAm-NPS) and the one modified for the calculation of the Australian and New Zealand front-of-pack (Health Star Rating) or the definition of health claims in those two countries. The statistical analyses showed that all versions of the algorithm FSA-NPS used in the different countries around the world were associated with weight gain. Interestingly, the variant used to calculate the Nutri-Score (FSAm-NPS) was even more strongly associated with the risk of weight gain and obesity than the original model and the other versions of the FSA-NPS score.

Finally, all the prospective cohort studies conducted in different contexts have consistently found an association between the consumption of foods with a favourable Nutri-Score and a lower risk of chronic diseases as well as reduced all-cause mortality. These results lead to the conclusion that, if each of the nutritional elements taken into account in the calculation of the Nutri-Score has a solid scientific justification in itself, the aggregation of these components within the overall algorithm of its calculation has been consistently validated. This validation confirms the relevance and the reliability of the algorithm in terms of the different constituent elements that have been selected to be incorporated, and in terms of point allocation.

Several prospective cohort studies conducted in different contexts on large samples of populations from different EU countries have consistently found an association between the consumption of foods with a more favourable Nutri-Score algorithm and a lower risk of chronic diseases as well as decreased all-cause mortality.

EFFECTIVENESS OF THE NUTRI-SCORE GRAPHICAL DESIGN

Numerous studies have evaluated the effectiveness of the five-colour graded Nutri-Score graphical format at consumer level, particularly compared to other existing logos.

PERCEPTION, ATTRACTIVENESS AND PREFERENCES

The results of scientific studies performed on large populations (several thousands or tens of thousands of subjects)⁵⁹⁻⁶¹ and consumer surveys carried out in France⁶², Spain⁶³, Belgium⁶⁴ and Germany⁶⁵ consistently demonstrated the superiority of Nutri-Score compared to other nutrition labels tested, in terms of perception, ease of identification and speed of interpretation.

All studies show that the Nutri-Score is perceived favourably by consumers and appears as the preferred format compared to other labels, particularly in populations with the lowest levels of nutritional knowledge. However, the fact that a graphical format is well perceived, appreciated and preferred by the population is not sufficient. The label must also be effective in influencing consumers' food choices. For this reason, the graphical format should demonstrate its capacity to allow consumers to correctly categorise foods according to their nutritional quality.

OBJECTIVE UNDERSTANDING

Here again, the Nutri-Score has been the subject of extensive studies, particularly in 12 European countries⁶⁶ on more than 12,000 participants and in 6 countries in North America, Latin America, Asia and Oceania on more than 6,000 participants⁶⁷. These studies have shown that Nutri-Score is the most effective label compared to other labels (e.g., UK Multiple Traffic Lights, Chilean Health Warnings, Australian Health Star Rating, GDA/RIs supported by food companies) to improve the ability of consumers to correctly classify foods according to their nutritional value, in all groups of the population, including those with more disadvantaged backgrounds.

A secondary analysis of the data collected on these 18 countries also showed that Nutri-Score was effective in guiding consumers towards healthier food products and performed best in terms of both "attraction" (steering them towards healthier options) and "aversion" (steering them away from unhealthy options) in terms of understanding and simulated choice outcomes. So, Nutri-Score appears effective in guiding consumers towards healthier food products and can also be effective in steering them away from unhealthy options⁶⁸.

In 2021, a study performed on a representative sample of 4,404 British participants, comparing four FOP nutrition labels and a control group with no label found that all FOPNLs were effective in improving participants' ability to correctly rank products according to healthiness, with the greatest effectiveness seen for Nutri-Score, followed by Multiple Traffic Lights^{69,70}.

Different analysis have highlighted that Nutri-Score is particularly well understood on nutritionally at-risk subpopulations, such as young adults or those with low literacy or numeracy skills. A study carried out in France on more than 14,000 individuals⁷¹ showed that the probability of correctly classifying products using Nutri-Score, compared to a control situation with no label available, was particularly high in participants from lower socio-economic backgrounds and in those with lower levels of nutritional knowledge.

Another study carried out in 2022 among 2,295 Belgian students showed, with respect to objective understanding, that the Nutri-Score outperformed all other labels across all health literacy levels and would be a useful strategy for those disadvantaged by limited health literacy⁷².

IMPACT ON THE NUTRITIONAL QUALITY OF FOOD PURCHASES

The most important and relevant studies to examine the effectiveness of nutrition labels consider their impact on the nutritional quality of food actually purchased by the consumers.

Several studies in France⁷³⁻⁷⁷ and the Netherlands^{78,79} have tested the effect of Nutri-Score compared to no label or to other labels on consumers' choices in terms of types of foods and nutritional composition of shopping baskets. Some were carried out in virtual supermarkets, testing purchasing intentions in the general population, in students, in participants with chronic diseases and in populations from low socio-economic backgrounds⁷⁴⁻⁷⁷. Two large studies were carried out in experimental stores testing the effects of several labels on real purchases⁸⁰⁻⁸². A large "real-world" study was also carried out in 60 French supermarkets^{83,84}: 10 displaying the Nutri-Score, 10 the Traffic Lights, 10 the SENS label proposed by food retailers, 10 the GDA/RIs proposed by food product manufacturers, and 20 supermarkets without any labelling. In total, 1.7 million cash receipts were analysed.

The results of all these studies on purchasing are consistent and show that the presence of the Nutri-Score improves the choice of healthiest options for same food types and the overall nutritional quality of shopping baskets. These studies demonstrate that the performance of the Nutri-Score is superior to all other tested labels. They found that the overall nutritional quality of the shopping basket assessed using the FSA-NPS improved from 4.5 to 9.4% with Nutri-Score use and that the effect of Nutri-Score was particularly clear in participants from lower socio-economic backgrounds. This improvement in overall nutritional quality of the shopping basket is reflected in lower amounts of energy and nutrients of concern in the basket. In some of these studies, Nutri-Score led to substitution

between food groups with a transfer towards raw/unprocessed products and in particular fresh fruits and unprocessed meat.

A modelling study, using the UK Preventable Risk Integrated Model (PRIME)⁸⁵ based on the observed effects of Nutri-Score on the nutritional quality of the food product selections in shopping baskets from an experimental study, estimated that overall mortality from chronic diseases could be reduced by 3.4% with its implementation. Another study⁸⁶ showed that the Nutri-Score was the most effective label to reduce the size of the portions chosen by consumers for products with a “low nutritional quality” thus helping to limit the overconsumption of these products.

ABILITY OF THE NUTRI-SCORE TO PREVENT HEALTH HALO EFFECTS CAUSED BY NUTRITION CLAIMS

Some nutrition claims aiming especially at advertising a lower sugar content (e.g., “without added sugar” or “30% less sugar”) can lead to false assumptions about the healthiness of foods and can lead to health halo effects. Some nutrition claims make products appear healthier than they actually are, the aspect advertised in the nutrition claim being then transferred to the entire food product. As a result, food products can be perceived as healthy even though they are not. A study performed in Germany on more than 1,000 respondents showed that, depending on the initial perceived healthiness of a product, the Nutri-Score was able to prevent health halo effects caused by claims on sugar so reducing misperceptions about unhealthy foods⁸⁷.

NUTRI-SCORE, A FOPNL BASED ON SCIENCE

Finally, the adoption of the Nutri-Score by public health bodies, different European states (France, Belgium, Germany, Spain, Luxembourg, the Netherlands, Switzerland), consumer associations (in particular the European Bureau of Consumer Associations (BEUC) gathering 43 European associations) and some food companies (several hundred in Europe adopted it after fighting it for several years)⁸⁸⁻⁹⁰ is based on the extensive scientific literature that validated both the relevance of the algorithm and the effectiveness of its graphical format, following the theoretical framework presented by WHO Europe.

These validation studies were conducted by independent academic research teams and have been published in peer-reviewed international scientific journals. No other labels currently discussed in Europe present such a robust scientific basis to validate their use. All these studies were methodologically rigorous and demonstrated the superior performance of Nutri-Score compared to other labels. These findings support the widespread adoption and implementation of the Nutri-Score by governments in several European countries.

3

RESULTS OF THE INITIATIVES OF THE EUROPEAN COMMISSION TO GUIDE ITS FUTURE CHOICE OF A SINGLE MANDATORY FOPNL

In May 2020, the European Commission (EC) announced its intention to adopt a harmonized and mandatory FOPNL before the end of 2022, as part of its farm to fork strategy. The EC launched several initiatives in the last two years to definitely serve as an input for its future proposal to revise the EU rules on the information provided to consumers for the choice of a unique and mandatory label in Europe (originally expected by the end of 2022, and postponed to 2023).

Only scientific evidence must guide political decisions of the EC in the field of public health and the choice of a nutrition label for Europe must correspond to this requirement alone, and not to the interests of economic power players or the member states that defend them. The extensive research body of work concerning the Nutri-Score supports the adoption of the Nutri-Score by EC as a harmonised and mandatory nutrition label for Europe.

THE JRC SCIENCE FOR POLICY REPORT “FRONT-OF-PACK NUTRITION LABELLING SCHEMES: AN UPDATE OF THE EVIDENCE”

On September 10th 2022, the Joint Research Center (JRC) that is the European Commission's science service carrying out research and providing independent scientific evidence and advices to support EU policy, published the results of four scientific analyses related to consumer information on foodstuffs. Regarding front-of-pack nutrition labelling, the 230-page scientific report signed by 13 international JRC's scientists²¹ analysed 173 scientific articles with a rigorous and extensively described methodology.

In this report, emphasis was placed on consumers' attention and awareness of labels; determinants of consumer liking and acceptance of labels; understanding of labels and inferences regarding healthfulness made from labels; the extent to which labels inform purchase decisions; effects of labels on diet and health, and potential effects of FOPNL on reformulation of food products. Apart from general considerations on nutritional labels, the main finding of the JRC analyses were:

- Consumers generally value FOPNL as a quick and easy way to acquire nutrition information when making purchase decisions.

- The use of colour makes FOPNLs more salient and stimulates attention paid to the labels.
- Less complex labels require less attention to be processed.
- Most of the reviewed studies suggest consumer preference for coloured FOP nutrition labels.
- In general, consumers appear to prefer simple labels and colourful and directive FOPNL schemes.
- Simpler, evaluative, colour-coded labels (most of which use a traffic lights colour coding) are more easily understood than more complex, reductive and monochrome labels.
- Salient, consistent and simple reference quantities are preferred and consumers generally understand nutritional information better when it requires less “mental math” to process the information.
- “High-in” warning labels seem to be more effective than other types of labels in discouraging purchase of less healthy products. Other FOPNL schemes (Traffic Lights, Multiple Traffic Lights, Health Star Rating, Nutri-Score and to a lesser extent GDA/RIs) seem to work better at improving overall healthiness of choices – i.e., combining both increase of the healthy and decrease of the unhealthy products – and not at effecting changes on the purchases of solely healthy or solely unhealthy products.
- Evidence from experimental studies suggests that colour-coded FOP schemes serve consumers better than their monochrome versions in encouraging overall healthier food purchases.
- Experimental studies suggest that the presence of FOP nutrition labels can have a positive impact on consumers’ dietary intake.
- Evaluative FOP nutrition labels seem to be preferred by consumers with lower income.

Nutri-Score checks all the boxes in terms of positive characteristics regarding its usefulness and effectiveness, as it is classified by the JRC as a simple synthetic, color-coded, evaluative FOPNL based on a simple standard reference quantity (100 g or 100 ml). Conversely, the Italian battery system Nutrinform is classified as a monochrome, non-evaluative and complex FOPNL, corresponding to labels less well positioned by JRC in terms of usefulness and efficiency.

THE EUROPEAN COMMISSION PUBLIC CONSULTATION

A public consultation was launched by the European Commission between December 2021 and March 2022 to gather the views of EU and third country citizens, as well as professional and non-professional stakeholders, on initiatives to revise EU legislation on consumer information on food, including front-of-pack nutritional labelling⁹¹.

This consultation showed that consumer associations, citizens, NGOs, research and educational structures, and public authorities consistently supported a label providing gradual information on overall nutritional quality of foods which corresponds totally to the characteristics of the Nutri-Score. Economic stakeholders preferred other options or no label.

On the same line of the positions taken by numerous associations of European experts and medical structures, the scientific analyses published by the JRC and the results of the EC public consultation should guide the EC's decision on the choice of the future single mandatory nutrition label for Europe in the interest of European consumers and public health.

4

THE UPDATE OF NUTRI-SCORE TO CORRECT SOME LIMITATIONS IDENTIFIED AND OBTAIN A BETTER ALIGNMENT WITH FOOD-BASED DIETARY GUIDELINES

An international Scientific Committee composed of independent experts from the 7 European countries that have adopted Nutri-Score was mandated by the Steering Committee (national authorities of the 7 European countries that have adopted Nutri-Score) to make recommendations for the update of its algorithm. A report detailing the recommended changes to the algorithm for the general case, including a specific rule for red meat, fats, nuts and seeds, was delivered in July 2022³².

The steering committee unanimously approved these changes, which will therefore be incorporated into the new version of the Nutri-Score. Their implementation is planned in 2023, after the necessary changes of the regulatory texts governing the use of the Nutri-Score.

CHANGE IN THE ALGORITHM FOR GENERAL FOODS

The changes made in the algorithm for general foods are as follow:

- An increase in the number of points for sugars up to 15 points, and an alignment of the allocation of points with the FIC regulation, based on a nutritional reference of 90 g/d of sugars.
- An increase in the number of points for salt (instead of sodium) up to 20 points.
- A change in the allocation of points for fibre, to align with a nutritional reference of 30 g/d. The initial value for having at least 1 point for fibres is set at the threshold for obtaining the claim “source of fibres”.
- An increase in the number of points for protein up to 7 points, with a change in the allocation of points based on a nutritional reference of 64 g/d.
- A change in the “fruit, vegetables, pulses, nuts and rapeseed, olive and nut oils” component to include only fruit, vegetables and pulses (exclusion of nuts and specific oils).
- A change in the threshold between A and B to 0/1 (currently -1/0).

Finally, a specific rule within the main algorithm for general foods is introduced: a limitation of points for protein for red meat, which can no longer earn more than 2 points in this component. This modification allows a better alignment between the Nutri-Score classification and national nutritional recommendations, for which a limitation of red meat consumption is indicated.

These modifications lead to average changes for some food groups in preference to others, with in particular a better discrimination between food products according to their nutritional composition:

- Fish, and in particular fatty fish without added nutrients (salt or oil), are improved and mainly classified in the A and B categories of the Nutri-Score.

- Low-salt hard cheeses (e.g., Emmental) can now be classified as C.
- Products with a high salt or sugar content are shifted towards less favourable classifications: these products are now classified as E in the Nutri-Score, with an equalized classification for products with a high saturated fatty acid, salt or sugar content.
- For sweet products in general, the allocation of points is now stricter. Breakfast cereals with a relatively high sugar content can no longer be classified as A in the Nutri-Score, and are on average more likely to be classified as C. Similarly, sweetened dairy products tend to shift towards less favourable classifications, and are now more likely to be classified as C.
- For bread, there is a better discrimination between wholegrain products, mostly A, and refined products, between B and C according to their salt content.
- Composite products (ready-to-eat meals, pizzas...) are generally shifted towards less favourable classifications, moving on average from classes A-B to classes B-C or even D for certain product categories such as pizzas.

For the other food groups, the classifications generally remain unchanged. The changes identified here are changes on average. Of course, given the variability that can be observed in the nutritional composition of food products, there is variability in the Nutri-Score classification, with some specific products having a more favourable classification, others less favourable, depending on their nutritional composition.

FOCUS ON CHANGES FOR FATS

- An improvement for vegetable oils: in general, vegetable oils are improved by one class of the Nutri-Score. Vegetable oils with low levels of saturated fatty acids (rapeseed, walnut, oleic sunflower oil) can reach the B classification, as does olive oil. Sunflower oil is shifted to the C category.
- A better discrimination for nuts and seeds without added salt or sugar, which are mostly classified in A or B, while salted and/or sweetened versions are on average in C or even D.

For the other products in the category, the classification remains unchanged, with coconut oil and butter remaining classified as E in the Nutri-Score.

Overall, the modifications recommended by the Scientific Committee of the Nutri-Score allow for a correction of limitations previously identified for the Nutri-Score, while maintaining the overall consistency of the system and the general classification of the products. They led to a better alignment between the Nutri-Score classification and the nutritional recommendations of the various European countries that have adopted the Nutri-Score.

IMPACT OF THE UPDATE OF THE ALGORITHM ON THE CLASSIFICATION OF FOODS BY NUTRI-SCORE

The Scientific Committee in charge of updating Nutri-Score considers that overall, the current algorithm performs well. However, some modifications have been proposed and tested. Main impact for classification of some foods is presented below.

1

A better differentiation between foods based on salt or sugar content: products with a high salt or sugar content are shifted towards less favourable classifications.

2

For sweet products in general, the allocation of points is now stricter. Breakfast cereals with a relatively high sugar content can no longer be classified as A in the Nutri-Score, and are on average more likely to be classified as C.

3

A better differentiation between sweetened and unsweetened dairy products: sweetened dairy products shift towards less favourable classifications.

4

For bread, there is a better discrimination between wholemeal products, mostly A, and refined products, between B and C according to their salt content.

5

Vegetable oils with low levels of saturated fatty acids (rapeseed, walnut, oleic sunflower oil) are classified as B, as does olive oil. Sunflower oil is shifted to C. For the other products in the category, the classification remains unchanged, with coconut oil and butter remaining E.

6

A better discrimination for nuts and seeds without added salt or sugar, which are mostly classified in A or B, while salted and/or sweetened versions are on average in C or even D.

The background of the entire page is a repeating pattern of various food and drink icons in a light orange color. These icons include items like strawberries, french fries, donuts, coffee cups, pizzas, burgers, fish, and various types of bread and pastries. The icons are scattered across the page, creating a textured, food-themed background.

7

Composite products (ready-to-eat meals, pizzas...) are generally shifted towards less favourable classifications, moving on average from classes A-B to classes B-C or even D for certain product categories such as pizzas.

8

Low-salt hard cheeses (e.g., Emmental) are now classified as C in the Nutri-Score. Other cheeses stay D or E depending on their content in salt and saturated fatty acids.

9

Red meat receive overall less favourable Nutri-Score ratings than poultry and fish. This modification allows a better alignment between the Nutri-Score classification and national nutritional recommendations, for which a limitation of red meat consumption is indicated.

10

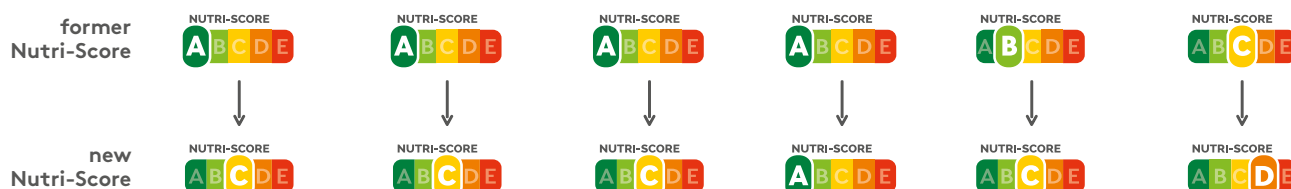
For the other food groups, the classifications generally remain unchanged.

11

While beverages have also been identified as a food group that could be subject to changes in the algorithm, the revision process is still ongoing and some proposals of the Scientific Committee are expected for the beginning of 2023.

12

The update of the Nutri-Score corrects some identified limitations, while maintaining the overall consistency of the system and the classification of the products, and permitting a better alignment between the Nutri-Score classifications and nutritional recommendations.

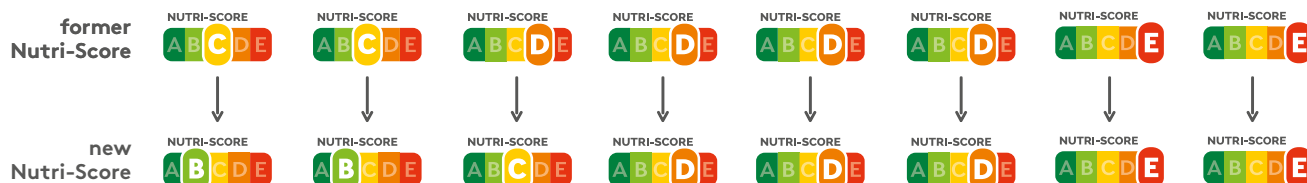


EXAMPLES OF THE IMPACT OF THE UPDATE OF THE NUTRI-SCORE ALGORITHM,
MADE BY THE EUROPEAN SCIENTIFIC COMMITTEE NUTRI-SCORE, ON BREAKFAST CEREALS

For sweet products in general, the allocation of points is now stricter.

For example, breakfast cereals with a relatively high sugar content can no longer be classified A and are classified C instead (only low-sugar cereals are classified A or B).

Olive Rapeseed Sunflower Corn Peanuts Soya Coco Butter



EXAMPLES OF THE IMPACT OF THE UPDATE OF THE NUTRI-SCORE ALGORITHM,
MADE BY THE EUROPEAN SCIENTIFIC COMMITTEE NUTRI-SCORE, ON FATS

Vegetable oils with low levels of saturated fatty acids (rapeseed, walnut, oleic sunflower oil) reach the B class, as does olive oil. Sunflower oil is shifted to C. For other products in the category, the classification remains unchanged, with coconut oil and butter remaining as E.

5

WHAT IS THE CURRENT SITUATION IN EUROPE?

IMPLEMENTATION OF THE NUTRI-SCORE IN EUROPEAN COUNTRIES

After its adoption in France in 2017, the front-of-pack nutrition label Nutri-Score has been selected by Belgium in 2018, Switzerland in 2019, Germany in 2020 and Luxembourg in 2021, while Spain and the Netherlands announced officially their intention to adopt it. On February 12th 2021, these 7 countries have officially announced the establishment of a transnational coordination mechanism to facilitate the use of the front-of-pack nutrition label Nutri-Score, through a Steering Committee and a Scientific Committee.

SUPPORT OF EUROPEAN SCIENTISTS

Concerning the scientific community, the Nutri-Score is supported by many European scientists⁹²: 417 scientists and 30 European learned societies and associations representing thousands of experts from the fields of nutrition, public health, oncology, pediatrics, diabetes or cardiovascular diseases have called to implement Nutri-Score in Europe, since its effectiveness has been scientifically demonstrated.

Moreover, the International Agency for Research on Cancer (IARC/WHO) stressed the superiority of the Nutri-Score to other nutrition labels, and called in 2021 for its widespread and systematic adoption in Europe⁹³.

THE SOCIETAL DEMAND IN EUROPE

In Europe, the societal demand was clearly expressed with, among other things, the involvement of the European Bureau of Consumer Associations (BEUC)⁹⁴ and NGOs such as FoodWatch⁹⁵ which support the Nutri-Score.

Concerning the awareness, the perception and the declared impact of Nutri-Score, three years after the adoption of Nutri-Score in France, a study showed that 93% of consumers considered Nutri-Score useful to know the nutritional quality of food products, 94% are in favour of the display of Nutri-Score on packaging and even 89% in favour of its mandatory implementation on food packagings⁹⁶. For 70% of consumers, Nutri-Score yields a better image of the brands and 57% declared that they have already changed at least one of their purchasing habits thanks to Nutri-Score.

In a specific study performed on adolescents in 2022, 97% had seen or heard of the Nutri-Score and adolescents act both as prescribers and buyers of food products⁹⁷. As in adults, their perception, knowledge and use of the Nutri-Score are very favourable.

THE UPTAKE BY FOOD COMPANIES IN EUROPE

When it was proposed in France in 2014, no food company was in favour of the Nutri-Score and all opposed it. For four years, almost everything was done by powerful lobbies to prevent the implementation of this public health measure in France. Finally, only 6 companies adopted it at the time of the publication of the decree officializing it in France in October 2017.

Thanks to consumers pressure, after five years of implementation, in 2022, more than 870 brands in France have finally committed to display it on the packaging of their food products. In Germany, they are currently 560 food companies. In the first year of implementation in Belgium, Nutri-Score appeared on roughly 10% of the total food supply.

Many food companies and retailers are also displaying Nutri-Score in the other countries that adopted it (Belgium, Spain, the Netherlands, Luxembourg, Switzerland) and even in other European countries that have not adopted it.

It is interesting to note that some firms that were initially very reluctant to Nutri-Score changed their stance under consumer pressure. It is the case of Nestlé, which notably participated in 2016 with Coca-Cola, PepsiCo, Mars, Mondelez and Unilever to the Big 6 initiative to press for an alternative label to Nutri-Score to appear healthier: the Evolved Nutrition Label (ENL), calculated by serving, which was unsurprisingly advantageous for their products.

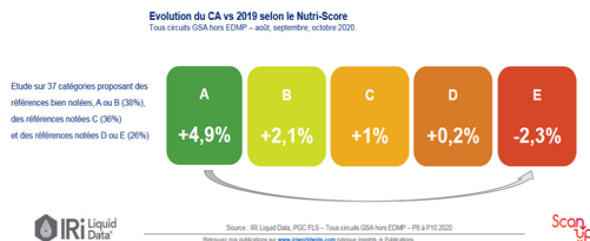
In 2019, three years after its formal adoption in France, Nestlé finally caved in to scientific works and the strong consumer demand. However, while some large companies have finally agreed to its adoption, Nutri-Score has been and is still being opposed by many large conglomerates (Coca-Cola, Mars, Mondelez, Unilever, Ferrero, Lactalis, Kraft...) and powerful agricultural sectors such as those of the processed meats and cheeses.

EFFECT OF NUTRI-SCORE ON SALES OF FOOD ITEMS IN STORES IN THE REAL LIFE

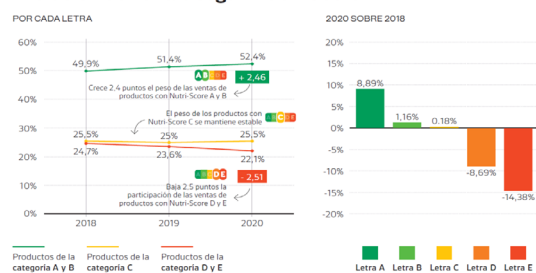
Sales data in supermarkets in France and Spain show, since they introduced the Nutri-Score, a reduction in sales of food products D and E and an increase in sales of food products A and B.



Evolution of sales of food products according to NutriScore between 2019 and 2020 in supermarkets



Evolución de ventas según Nutri-Score



EVOLUTION OF SALES OF FOOD PRODUCTS
ACCORDING TO NUTRISCORE IN SUPERMARKETS IN FRANCE AND SPAIN

The background of the slide is a dark grey color with a repeating pattern of white line-art icons representing various food and drink items. These include strawberries, french fries, burgers, pizza slices, donuts, coffee cups, croissants, sandwiches, pears, tomatoes, fish, cucumbers, chicken legs, and various pastries and desserts.

6

NUTRI-SCORE: ONE ITEM OF A MULTICOMPONENT PUBLIC HEALTH NUTRITION POLICY

The implementation of the Nutri-Score front-of-pack nutrition label is not, by itself, able to solve all the nutritional problems faced by European countries. But this simple measure of transparency, which has been scientifically demonstrated as effective, will be an important step to help consumers make healthier food purchases and contribute to the reduction of nutrition-related NCDs in the region.

The background is a solid blue color with a repeating pattern of white line-art icons. These icons represent various food and drink items, including strawberries, french fries, burgers, donuts, coffee cups, pears, fish, croissants, sandwiches, and vegetables like tomatoes and cucumbers. The icons are scattered across the entire page.

7

SUMMARY OF SCIENTIFIC RESPONSES TO FREQUENTLY ASKED QUESTIONS ABOUT NUTRI-SCORE: AGAINST FAKE NEWS AND MISUNDER- STANDING



HOW TO USE THE NUTRI-SCORE?

DOES IT CHARACTERIZE FOODS AS “HEALTHY” OR “UNHEALTHY”?

The basic idea of the Nutri-Score is simple: to translate the unintelligible and often unreadable data of the nutrition composition table located on the back of packs (the nutrition declaration made mandatory by a European regulation voted in 2011) to a synthetic label easily visible and interpretable on the front of packs, for all to understand. Its purpose is to offer consumers transparency on the overall nutritional quality of prepack-aged foods, allowing them, within the few seconds of the purchase act, to recognize and compare the nutritional quality of foods and guide their choices towards better alternatives.

To foster an accurate understanding of Nutri-Score and avoid any confusion or mis-interpretation, an important consideration is that it does not inform consumers about the absolute nutritional value of food products, only their relative value in comparison to other similar products. It is not intended to characterize foods as “healthy” or “unhealthy” as a binary labelling scheme would, such as the Scandinavian Key Hole to mark “recommended” foods or the Chilean warning logos which mark foods to “avoid”.

The Nutri-Score is a gradual label with five categories which makes it possible to provide information in relative terms on the fact that, depending on the colour/letter, the overall nutritional composition is more or less nutritionally favourable, thus facilitating comparisons of nutritional value across


different foods. However, this comparison between foods is only of interest if it concerns foods that the consumer needs to compare in real-life situations during purchase or consumption. Here again, it should be remembered that the Nutri-Score allows for a comparison of the nutritional value of:

- Foods belonging to the same category, for example in breakfast cereals, comparing mueslis to chocolate cereals, or chocolate and filled cereals; or in biscuits, comparing fruit cookies to chocolate cookies; or meat lasagne to salmon lasagne or spinach lasagne; or different pasta dishes; different types of pizzas; or different types of beverages (e.g., water, fruit juices, fruit drinks, sodas). In each of these categories, the Nutri-Score can vary largely, with the ultimate aim of providing useful information with which consumers can make an informed choice.
- Similar food items proposed by different brands, for example comparing chocolate-filled cereal from one brand to its “equivalent” from another brand, or chocolate cookies from different brands. The Nutri-Score can vary largely, which is also useful information to help consumers recognize foods of better nutritional value.
- Foods belonging to different categories but taking into consideration that these comparisons are of interest and meaningful only if they are truly relevant, comparing foods that are really “comparable” in their conditions of use (alternatives used under the same conditions of usage, e.g.,

the different fats for cooking or seasoning; or in connection with the same time of consumption, e.g., food taken for snacking, at breakfast, in dessert, or as an appetizer) or in their conditions of purchases (alternatives sold in the same aisles, e.g., beverage sections, cooking oil sections, ready-meal sections, dairy products, breakfast cereals or sandwiches).

Thus, it is important to note that the Nutri-Score does not endorse or give a “seal of approval” and therefore does not recommend foods classified as A or B on the pretext that they would be “healthy” and should be consumed exclusively. Rather, Nutri-Score serves to emphasize that these products are preferable over their lower-ranked Nutri-Score alternatives that might be “competing” for purchase or consumption.

In the same way, it may be perfectly reasonable to consume foods that are classified as D or E as part of a balanced diet, especially traditional foods, but Nutri-Score ought to prompt consumer awareness that they need to be eaten only in limited quantities/frequency. This is entirely consistent with the principles of the Mediterranean diet model and with food-based dietary guidelines.



WHY NUTRI-SCORE DOES NOT TAKE INTO ACCOUNT ULTRA- PROCESSING?

Certainly, the nutritional and ultra-processing dimensions, although different, are partially overlapping: there is an overall association between the degree of transformation (defined by the NOVA classification from 1 to 4) and the nutritional quality of foods. However, if there is a concordance between being an ultra-processed food and, on average, of lower nutritional quality, it is not surprising that some foods presenting a favourable nutritional quality can be ultra-processed.

If the vast majority of products classified D and E by Nutri-Score are ultra-processed (classified NOVA 4), and if ultra-processed foods are predominantly classified C, D and E, some ultra-processed foods may have a fairly good nutritional quality and be classified A or B.

But, on the other hand, some of the foods considered “not ultra-processed” accord-

ing to NOVA (NOVA 1, 2, and 3) can also present a low nutritional quality (high in saturated fat, sugar or salt...). For example, pure grape juices are NOVA 1 (no or minimally transformed) but they contain more than 16 g of sugar/100 ml, justifying their classification as Nutri-Score E.

Moreover, the NOVA classification does not include the variability in nutritional composition of products within each of its categories. For example, for NOVA 2 products (not ultra-processed foods, ingredients), there is no differentiation between vegetable and animal fats. And even, for vegetable oils, it does not allow to recognize those whose nutritional composition is the most favourable and has to be preferred in terms of public health, such as olive oil or rapeseed oil, compared to other vegetable oils (sunflower, corn, peanut, coconut, palm...).

In contrast, Nutri-Score discriminates between these different oils with currently rating from C to E and even B to E with the coming update of Nutri-Score, making it possible to recognize the most beneficial oils, in line with public health recommendations. In fact, each classification, Nutri-Score and NOVA, has its own scope and limits.

As with all other FOP nutritional label, Nutri-Score only provides information on the composition/nutritional quality of food, and does not include in its calculation the other health dimensions of food: ultra-processing, presence of additives, neo-formed compounds or pesticide residues.

As important as they are, these dimensions are not integrated into any FOP nutritional label in the world, because it is for now impossible scientifically to encompass them into a synthetic indicator and therefore into a single FOP label. We cannot therefore ask of the Nutri-Score, as with all other

nutritional labels, to cover these different dimensions alone.

Of course, synthesizing all the health dimensions of food through a single and reliable indicator, which would predict the overall risk to health would, obviously, be the dream of any scientist working in the field of public health nutrition. But it is not by chance, and certainly not by incompetence, that no research team in the world, no public health structure, no national or international expert committee, or even the WHO has been able to come up with such a synthetic indicator.

Epidemiological studies confirm the importance of each of these dimensions in the development of chronic diseases, independently from each other. Although Nutri-Score focuses only on the nutritional information of consumers, this already represents a lot in terms of public health. Some of these studies involved more than 500,000 people followed in Europe for more than 15 years, showing at the individual diet level that consuming foods well classified by the Nutri-Score algorithm is associated with lower mortality and a lower risk of developing chronic diseases like cancers, cardiovascular diseases and obesity.

In more than 50 prospective studies around the world, it has been shown that the associations between ultra-processed foods and increased risk of chronic diseases remained significant, even after adjustment for the nutritional quality of the diet⁹⁸. Conversely, the effect of the nutritional component is also independent of the level of processing/ultra-processing: in different cohort studies, the associations between the nutritional score underlying the Nutri-Score and cancer risk (or other health criteria) still remain significant after adjustment for the pro-

portion of ultra-processed foods in the diet. Finally, it is clear that the nutritional composition and ultra-processing are likely to affect, each and independently, the risk of chronic diseases through different specific and complementary mechanisms.

However, helping consumers to recognize ultra-processed foods is also very important and must be the subject of a specific information in a complementary way to the label informing on the nutritional dimension (like Nutri-Score). It is therefore essential from a public health viewpoint to provide consumers with complementary graphic information on these different dimensions (Nutri-Score and ultra-processed foods) associated with appropriate communication. A possibility would be to add a graphical information to the current Nutri-Score to indicate whether the food is ultra-processed or not (see figure).

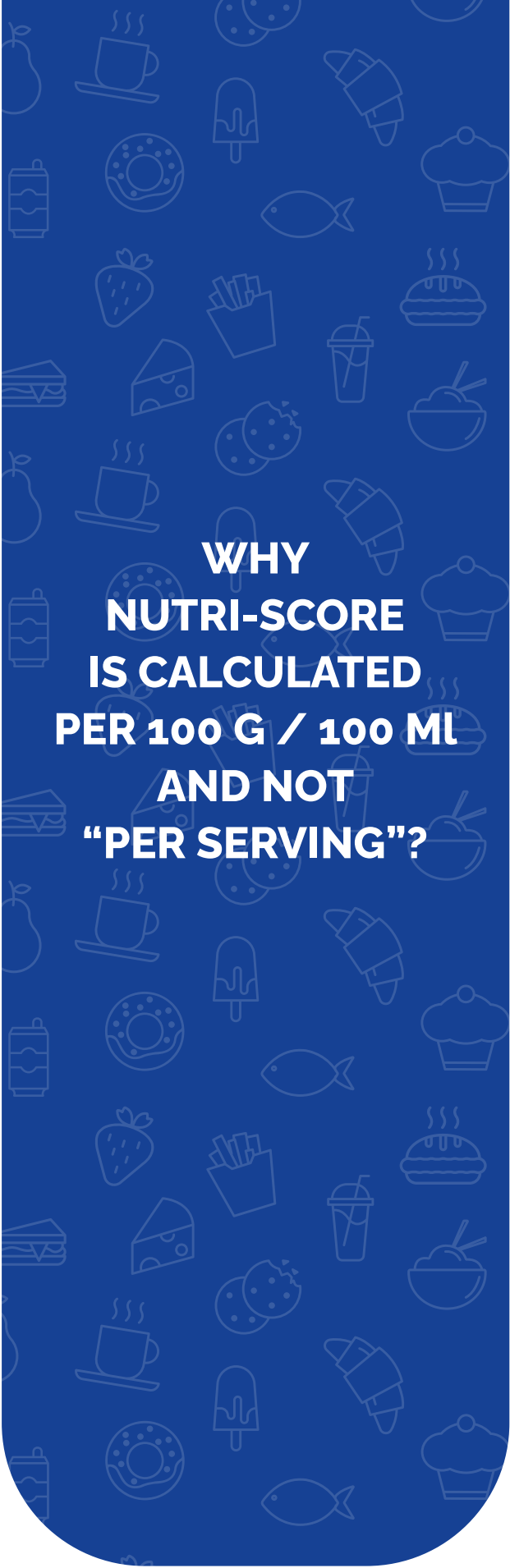


ULTRA-PROCESSED
FOODS



NOT ULTRA-PROCESSED
FOODS

This prototype was recently tested in a randomised controlled trial to evaluate the capacity of such logo to improve simultaneously the capacity of citizens to rank products according to their nutritional quality, and to identify foods that are ultra-processed⁹⁹. This study demonstrated the interest of a front-of-pack label combining the Nutri-Score (informing on the nutritional dimension) with an additional graphic mention indicating when the food is ultra-processed. The results showed that participants were able to independently identify and understand these two complementary dimensions of foods.



WHY NUTRI-SCORE IS CALCULATED PER 100 G / 100 ML AND NOT “PER SERVING”?

Nutri-Score is calculated for 100 g while it is obvious, we do not eat 100 g of cheese, 100 g of mayonnaise or 100 g of chocolate spread... This choice is justified based on several arguments. One is the fact that the elements of the nutritional composition of foods which currently appear on food packaging and therefore usable to build a nutritional label (whatever it may be) are those contained in the mandatory nutritional declaration that appears on the back of the packaging as defined by European regulations. However, these data are always presented for 100 g, or 100 ml.

If they are not expressed per serving, and not used in the computation of Nutri-Score, it is because setting portion sizes is impossible for specific foods, because they vary widely according to individual energy requirements. To be relevant, they should be therefore defined specifically for men, women, adolescents, young children, elderly people, active or sedentary subjects... So, it makes it difficult to calculate a universal FOP nutrition label based on the different portion sizes (according the type of consumers) and displayed with a single logo on the packaging.

As serving sizes cannot be standardized on a scientific basis and defined according to different relevant consumer groups with specific nutritional needs, when they are proposed on packs of some foods, it is currently in the form of a single quantity fixed by the manufacturer itself and often largely below the servings actually consumed as observed in food consumption studies.

If they are so underestimated by manufacturers, it is because they are the ones providing the values for calories, fat, saturated fats, sugar and salt included, on a voluntary basis, on the table of the nutritional declaration displayed on the back of packs, next to the values given for 100 g which are mandatory.

It is common for breakfast cereals, that manufacturers suggest a serving size of 30 g while the majority of teens, for example, consume portions of 60 g, 80 g or more. For cheeses, the few manufacturers that display a serving size on packs, usually recommend 30 g. In reality, quantities are much more important. The consequence is to artificially reduce the amounts of nutrients of concern (salt fat and sugar) present in a serving of the product. Incorporating portion sizes to a label would lead to the “colours” of the labels fade from red to orange to yellow...

Portion size was also the basis of the ENL proposed by 6 large multinational companies and abandoned in 2018. It was inspired by the British Traffic Lights but instead of allocating the colour for “low, moderate and high” amounts by 100 g of food, ENL score was calculated on the basis of a “portion”... Since it is the manufacturers who define the size of the portion, the measuring instrument changes according to the manufacturer’s proposal. A study has shown that, unlike the Nutri-Score (which refers to 100 g of food), the use of the ENL (calculated per portion) had a very limited effect in reducing the portion size

of products with high contents of nutrients of concern and even tended to increase the portion size selected for spreads by falsely reassuring consumers⁸⁶.

To compare products between them, it is necessary to refer to a reference value. For example, when comparing the prices of food products, we systematically refer to the price per kilo, precisely to avoid the inconsistencies depending on the weight of the product. Even though we do not systematically buy and consume 1 kg of a food product... Using of a standard amount, such as 100 g for solid foods and 100 ml for liquid foods, is the best choice to define a nutritional label, allowing a valid comparison between foods without inducing an estimation error. It permits to compare 100 ml of olive oil to 100 ml of another oil, 100 g of breakfast cereals to 100 g of other cereals, 100 g of a pizza to 100 g of another pizza, 100 g of Comté to 100 g of Camembert, Roquefort or Mozzarella...



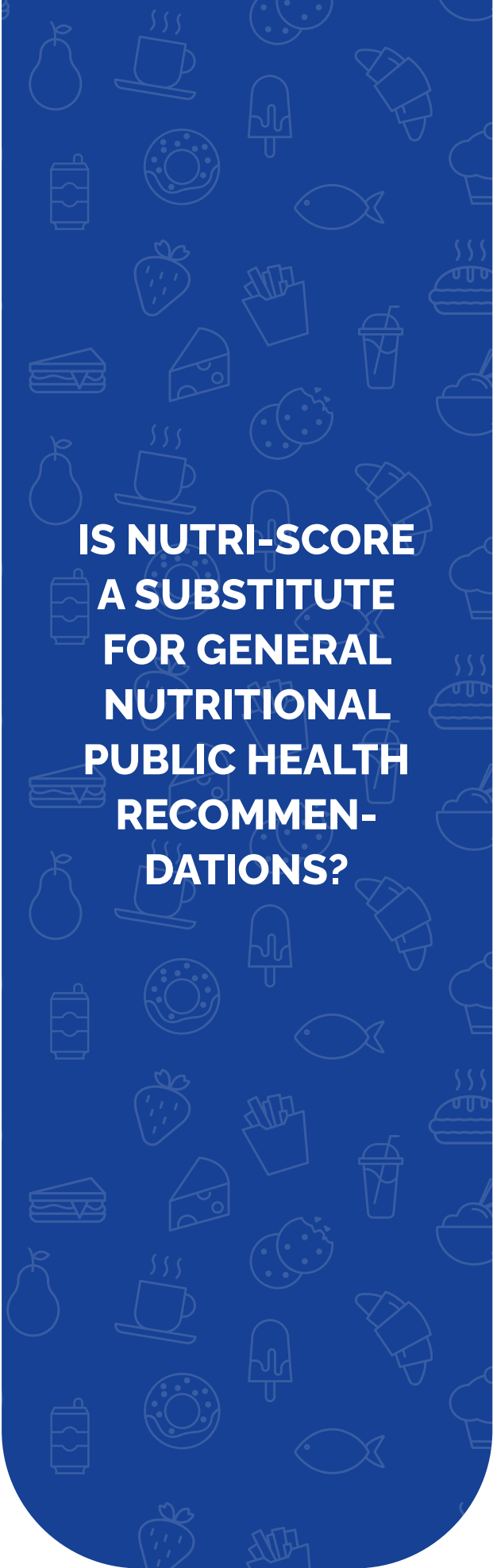
WHY NUTRI-SCORE DOES NOT INCLUDE ALL NUTRIENTS/ COMPONENTS OF INTEREST CONTAINED IN FOODS?

By choice, the Nutri-Score does not take into account vitamins, minerals or other compounds within the foods. The reason is that the Nutri-Score is a tool for transparency on the nutritional composition of foods, and data on the composition of foods in vitamins, minerals, polyphenols, free sugars or type of acids are not available in the nutrition declaration because they are not mandatory in the European regulations (INCO, n° 1169/2011).

The inability to access these nutritional data prevents their integration into the development of a tool for transparency, as it would necessitate to rely exclusively on proprietary data from the industry. But should the information be available at some point in time on a mandatory basis (on added or free sugars in particular), then the computation of the Nutri-Score algorithm may integrate them...

An additional interest of the Nutri-Score, as Health Star Rating in Australia, is that it takes into account in the calculation of its algorithm, unlike other existing front-of-pack nutritional label, not only “unfavourable” elements as calories, sugar, saturated fat and salt. It incorporates also other “favourable” elements such as the percentage of fruits and vegetables contained in the food. Fruits and vegetables ingredients are an excellent proxy for certain vitamins (such as vitamin C and beta-carotene) and proteins are an excellent proxy for certain minerals (such as calcium and iron).

A very rigorous scientific process, incorporating numerous studies conducted by the Oxford team^{34,35} that developed the initial FSA score, have been used to justify the nutrients or elements retained in the algorithm (given their potential impact on health), to limit, through sensitivity studies, their number and to avoid redundancies between elements. Thus, through its substitutes (its proxies), the algorithm underlying Nutri-Score takes into account many more elements than the list displayed for its calculation.



IS NUTRI-SCORE A SUBSTITUTE FOR GENERAL NUTRITIONAL PUBLIC HEALTH RECOMMEN- DATIONS?

Another major point regarding communication to the public is that the Nutri-Score, like all front-of-pack nutrition labels, is not a substitute for general public health recommendations and particularly for food-based dietary guidelines that aim to orient consumers towards a healthy diet. The two approaches are complementary.

While nutrition labels apply to specific products, nutrition recommendations focus on the consumption of large “generic” food groups like fruits and vegetables, legumes, dairy products, meat, fish, added fats and sweet products. For some of these food groups, a quantitative frequency of consumption is provided, for example at least five fruits and vegetables a day, fish twice a week, a handful of unsalted nuts a day. For others, qualitative advices are given such as limiting salt, sugar and fat, giving preference to whole grains and vegetable fats over animal fats, giving preference to olive oil. Finally, it is recommended to promote the consumption of unprocessed or minimally processed foods, limit ultra-processed foods and promote home-made meals.

However, within generic food groups (recommended or not), there is a large variability in composition across the range of industrial foods available to consumers. For example, fish can be bought raw, canned, smoked, breaded or chopped. All of these forms would fall within the definition of the “fish” group. Food-based dietary guidelines recommend eating fish, especially fatty fish. But fish, depending on the form of sale, may not contain any salt (if fresh) or up to 4 g of salt per 100 g (if smoked), corresponding to a large proportion of the daily recommendations for salt.

The Nutri-Score provides information on the differences in overall nutritional value according to variations of that particular type of food: fresh salmon is classified A, canned salmon is classified B and smoked salmon is classified D. This is particularly useful for consumers since the generic recommendation to “eat fish” does not differentiate the potential nutritional compositions of the different forms of the same food. Thus, the Nutri-Score acts in a complementary way to nutritional recommendations as it can help consumers modify the amount and frequency of consumption of different forms of fish and other foods.


Even for foods whose consumption must be limited according to nutritional recommendations (e.g., crisps, sweet desserts or pizzas), there is also great variability in terms of nutritional composition for salt, saturated fatty acids, sugar, calories and fibres. Thus, even if the generic recommendation is to limit the consumption of these products that are high in fat, salt or sugar, Nutri-Score can help consumers identify those with the least unfavourable composition.

Nutri-Score is also informative when comparing similar products with the same name on their packaging (e.g., “cheese pizza” or “chocolate cookies”), but with major differences in nutritional composition between brands. While pizza consumption should be limited overall, it is important to help consumers to identify the brands offering pizzas with the best Nutri-Score. This could ultimately incentivise food companies to reformulate their less healthy products.

Once again, the Nutri-Score does not claim that cheese pizzas or breakfast cereals, even correctly ranked by Nutri-Score, are necessarily “healthy”, rather its objective is to help consumers who have decided to eat them to choose the product with the least unfavourable composition (best ranked by Nutri-Score).

The alignment of the Nutri-Score with nutritional recommendations appears globally consistent for a very large majority of foods present on the market. Due to the high variability apparent both in food categories to promote as well as food categories to limit, Nutri-Score provides supplementary information to orient consumers toward foods with a better nutritional composition, with less unfavourable nutrients and/or more favourable elements. Even if this may lead to occasional discrepancies and misclassifications, these can be resolved in the future by minor modification of the components in the algorithm.

The Nutri-Score should serve as a complementary tool to food-based dietary guidelines. However, it is crucial to have accurate and clear communication to consumers, emphasising the primacy of nutritional recommendations on which food groups should be promoted or limited for optimal dietary health, including a preference for non- or minimally processed, home-made foods. Only then, for each food group, if pre-packed foods have to be selected, Nutri-Score can inform the selection of those packaged products with better nutritional value in any given category.



DOES THE NUTRI-SCORE ATTACK THE TRADITIONAL FOODS AND PENALIZES GOOD PRODUCTS WITH PDO AND PGI LABELS?

A majority of traditional foods with a designation of origin have a rather favorable composition and are classified Nutri-Score A and B. According to a recent study performed by the French consumers association UFC Que Choisir, 62% of traditional foods are actually classified as Nutri-Score A, B or C, versus 38% classified as D and E (mainly cheeses and processed meats).

If cheeses or processed meat (PDO/PGI or not) are mostly classified as Nutri-Score D or E, this is actually related to their high content of saturated fatty acids and salt, and their high calorie density. This does not mean that they should not be consumed. But being classified as Nutri-Score D or E simply reminds consumers that these products should be consumed in moderate quantities and with a limited frequency, or should lead to rebalancing in the rest of the meal or the food intake of the day/week.

This is the meaning of the classification of Nutri-Score D and E. And it is completely consistent with the nutritional recommendations concerning processed meats and cheeses that recommend moderation or even limitation in their consumption.

The fact that some of these products benefit from a PDO or PGI label does not preclude about the nutritional quality of these products. In fact, being awarded with official quality signs for a food product reflect, of course, positive elements, such as a virtuous mode of production, the link to a specific territory, manufacturing according to a sometime ancestral know-how and precise specifications. As important signals of these characteristics of culinary heritage, having a PDO or PGI designation of origin are certainly very respectable elements that deserve to be valued.

However, the PDO/PGI labels do not include in their definition, and therefore in their attribution, the notion of “nutritional value” (this is not their role). It is therefore incorrect to suggest that these labels of origin would give these food products a nutritional value that they do not have. Even with a PDO or PGI label, or being organic, processed meats or cheeses rich in fatty acids, salt and calories remain rich in fatty acids, salt and calories. Being part of the regional gastronomic heritage is certainly quite respectable, but it has nothing to do with having a nutritional quality favourable to health.

Although traditionally produced PDO/PGI foods should be supported and their methods of production promoted, information on their nutritional composition should not be obscured. It is the consumer's right to be informed. Obviously, nothing prevents to communicate that, among cheeses or deli meat, it is interesting to privilege those with PDO/PGI over those without, but not by hiding their nutritional quality: consume less but better.

IS THE NUTRI-SCORE OPPOSED TO THE MEDITERRANEAN DIET?

Nutri-Score is not opposed to the Mediterranean diet, on the contrary! It is totally in line with the traditional model of the Mediterranean diet. This one does not consist to support consumption of Pecorino romano, Gorgonzola, Prosciutto or Serrano ham. It is characterized by the abundant consumption of fruits, vegetables, pulses, cereals (especially whole grains), moderate consumption of fish, limited consumption of dairy products (including cheese), low consumption of meat, cold cuts and sweet, fatty and salty products, and a preferential consumption of olive oil among the added fats, without recommending its consumption ad libitum...

Cheeses and cold cuts are mostly classified in D, and sometimes in E, because they contain large amounts of saturated fat or salt and are also caloric. But like all products classified D or E, they can perfectly be consumed as part of a balanced diet but in limited quantities/frequencies, in line with the principles of the Mediterranean diet and with Nutri-Score.

Olive oil is currently C, and in 2023, it will rank B due to the update of Nutri-Score. It is the best grade for added vegetable fats and oils (with rapeseed oil, walnut oil, oleic sunflower oil) and better classified than sunflower oil (C), soya oil and corn oil (D), coconut oil and palm oil (E) or butter (E). Moreover, in the Spanish cohort SUN⁵³) the algorithm for calculating the Nutri-Score was consistent with the Mediterranean diet model evaluated by recognized indices such as the a priori nine-item Mediterranean Diet Score proposed by Trichopoulou *et al.*¹⁰⁰



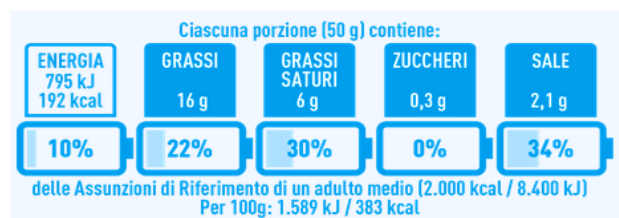
UNIVERSAL PYRAMID
OF THE MEDITERRANEAN DIET.

IS THE NUTRIFORM BATTERY SYSTEM A LEGITIMATE ALTERNATIVE TO NUTRI-SCORE IN EUROPE?

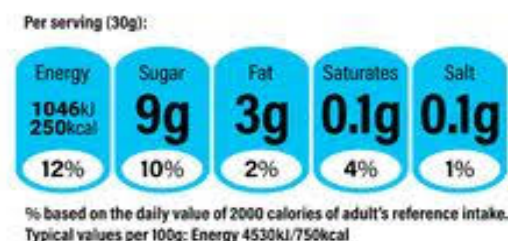
The Nutrinform battery front-of-pack label has been proposed by the Italian government, with the support of different economic actors (Federalimentare, Coldiretti), as an alternative to Nutri-Score. This system provides, in a single diagram, the quantity of energy, saturated fats, sugars and salt for a portion of food, and the percentage that these represent in relation to the average reference intakes for an adult. The theoretical percentage of reference intakes is also presented in the form of a battery on the model of those used for charging mobile phones.

The principle of this label and its graphic representation, which provides in a mono-

chrome way information by nutrients, is very close to the GDA/RIs set up by the companies in the 2000s.



NUTRIFORM BATTERY SYSTEM



GDA/RI

The Italian government decree notified at EC level refers to this lineage, stating that *"the Reference Intakes have been used as a scientific basis, by envisaging a kind of evolution of the current RIs icons (e.g., GDA) through the development of a graphical form that is easier for the consumer to grasp and which thus enables him to understand immediately the extent to which the portion of the food he will consume contributes to his energy and nutrient requirements, to which particular attention should be paid (fat, saturated fat, sugars and salt)"*.

However, a great deal of scientific work has demonstrated the ineffectiveness of GDA/RIs^{66-70,101}. All independent studies show that GDA/RIs is difficult for consumers to understand and interpret, and does not allow comparisons for food products. It does not show a favorable impact on consumer

purchasing behavior. That is why this type of label has been rejected by consumer associations and public health structures for many years, asking for a colorful, gradual and synthetic logo. Another major flaw of Nutrinform is its reference to the portion and not to the standard reference to 100 g of solid food or 100 ml for liquid. See specific box “Why Nutri-Score is calculated per 100 g/100 ml” and not “per serving”?

Moreover, the Nutrinform is all the more complex and difficult to understand as, if the quantities of nutrients refer to a portion, the percentages are related to the reference intakes for an adult (2,000 kcal) and the caloric intake per 100 g of food is added.

Last but not least, the Italian system seems particularly counter-intuitive, representing the nutrient content through the icon traditionally used to monitor the charge of a telephone or electrical devices, but to be used in the Italian label in the opposite direction: the more the battery is “discharged”, the better is the nutritional quality of the food. This misleading use of the battery diagram has been highlighted by consumer associations, particularly in Italy and at the European level by BEUC, which have rejected the system.

Three studies¹⁰²⁻¹⁰⁴ carried out by an Italian university team of business and management (among them, two funded by Federalimentare representing the Italian food and beverages industry) found better performances of Nutrinform vs Nutri-Score. However, these studies tested only liking and subjective understanding, but not the objective understanding of the labels, neither their impact on food choices that are more useful characteristics to measure the performances of nutritional labels.

As indicated in the Manual to develop and

implement front of pack nutrition labelling published by WHO Europe³⁶, it is necessary to distinguish subjective understanding (what the consumer thinks he/she has understood from the labelling system) and objective understanding (what the consumer actually understood, and whether this aligns with what was intended by the system). Subjective understanding in this case relates more to the attitude of the consumer to the FOPNL, and correspond to acceptability and perception of FOPNLs. According to the WHO report, the key study to evaluate the performances of a FOPNL is the investigation of consumers’ objective understanding.

It is the interest of an experimental study¹⁰⁵ conducted in 2021 on a representative sample of 1,064 Italian adults testing both the subjective and objective understanding (the capacity of participants to identify the most nutritionally favorable products) of Nutri-Score vs Nutrinform. Nutri-Score outperformed Nutrinform in all food categories tested for objective understanding, while differences in subjective understanding were much more limited. Overall, with Nutri-Score, Italian participants were more likely to intend to purchase nutritionally favorable products than with Nutrinform, demonstrating that interpretive format Nutri-Score was a more efficient tool than Nutrinform for orienting Italian consumers towards more nutritionally favorable food choices.

These results are fully in agreement with the conclusions of the JRC report²¹ indicating that simpler, evaluative, colour-coded labels (most of which use a traffic lights colour coding) are more easily understood than more complex, reductive, monochrome labels. Colour-coded FOPNL schemes serve consumers better than their monochrome versions in encouraging overall healthier food purchases.

CONCLUSION

The present report, led by European scientists and health professionals, reviews the abundant scientific literature demonstrating that the Nutri-Score, a clear and simple front-of-pack nutrition label that rates the nutritional quality of food products, is an effective tool to guide consumers towards healthier food choices.

The fear of a new regulation aiming to display Nutri-Score on all foods in Europe has brought out a large mobilization of lobbies disseminating fake-news and denying the importance of the science behind the Nutri-Score, including the numerous independent studies that have validated its algorithm and demonstrated the effectiveness of its graphical format.

Today, the detractors of Nutri-Score completely deny science and the opinion of scientists or cast doubt on their studies, which may disturb economic interests. Worse, we can see that economic lobbies and their political relays, even though they have no particular scientific skills, do not hesitate to express themselves as if they were nutritionists and to use and abuse science to criticize Nutri-Score. They hold outrageous positions on issues that are obviously well known to academic scientists (about ultra-processed foods, additives, portions, elements to be included in the calculation of a nutrient profile, graphical format...) who have established their decisions on scientific bases in order to build and validate Nutri-Score.

We are witnessing the development of a new form of debate in which economic and political actors substitute themselves to public health experts and give their opinion on what should or should not be a nutritional label on the front of packages by arguing and questioning the choices of scientists who are experts in this field. And yet, only real scientific arguments produced by real experts without any link or conflict of interests should guide public health policy decisions.

So, as scientists and health professionals, we want to remind the necessity to put science and public health at the forefront of the decision and safeguard it from influence from economic interests!

Based on a very strong scientific evidence, the European scientists and health professionals behind this report recommend the adoption of the Nutri-Score in Europe as it could help consumers lower the risk of non-communicable diseases which represent a major burden to health systems in the EU.

GLOSSARY

BEUC: European Bureau of Consumer Associations

BMI: Body mass index

Cnam: National Conservatory of Arts and Crafts

EC: European Commission

ENL: Evolved Nutrition Label

EU: European Commission

EREN: Nutritional Epidemiology Research Team

FOPNL: Front-Of-Pack Nutrition Labelling

FSA-NPS: Food Standard Agency-Nutrient Profiling System

FSAm-NPS: FSA-NPS modified by the HCSP

GDA/RIs: Guideline Daily Amount/Reference Intakes

HCSP: French High Council of Public Health

HSR: Health Star Rating

IARC: International Agency for Research on Cancer

INRAE: French Research Institute for Agriculture, Food and Environment

Inserm: French Institute of Health and Medical Research

JRC: Joint Research Center

NCD: Non-Communicable Diseases

NGO: Non-Governmental Organization

PDO: Protected Designation of Origin

PGI: Protected Geographical Indication

PRIME: Preventable Risk Integrated Model

RI: Reference Intake

SENS: Simplified Nutritional Labelling System

TL: Traffic Lights

MTL: Multiple Traffic Lights

WHO: World Health Organization

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