

Review Article

Defining and labelling 'healthy' and 'unhealthy' food

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Abstract

Objective: To consider the use of systematic methods for categorising foods according to their nutritional quality ('nutrient profiling') as a strategy for promoting public health through better dietary choices.

Methods: We describe and discuss several well-developed approaches for categorising foods using nutrient profiling, primarily in the area of food labelling and also with respect to advertising controls. The best approach should be able to summarise and synthesise key nutritional dimensions (such as sugar, fat and salt content, energy density and portion size) in a manner that is easily applied across a variety of products, is understandable to users and can be strictly defined for regulatory purposes.

Results: Schemes that provide relative comparisons within food categories may have limited use, especially for foods that are not easily categorised. Most nutrient-profiling schemes do not clearly identify less-healthy foods, but are used to attract consumers towards products with supposedly better profiles. The scheme used in the UK to underpin the colour-coded 'traffic light' signalling on food labels, and the one used by the UK broadcasting regulator Ofcom to limit advertising to children, together represent the most developed use of nutrient profiling in government policy-making, and may have wider utility.

Conclusion: Nutrient profiling as a method for categorising foods according to nutritional quality is both feasible and practical and can support a number of public health-related initiatives. The development of nutrient profiling is a desirable step in support of strategies to tackle obesity and other non-communicable diseases. A uniform approach to nutrient profiling will help consumers, manufacturers and retailers in Europe.

Keywords
Nutrient profiling
Food labelling
Advertising
Nutrition policy
Consumer information
Market regulation

For much of the 1980s and 1990s, the common refrain 'there is no such thing as good and bad foods, only good and bad diets' was used to deflect attempts by health educators and policy makers to define specific foods as being unhealthy. Government policy to combat diet-related disease during those decades was primarily devoted to health education; urging people to make healthier food choices and using food-based dietary guidelines to illustrate general categories of foods of which consumers should 'eat less', such as sugary and fatty foods, or 'eat more', such as fruit and vegetables, lean meats, fish and wholegrain cereal foods.

Based on such broad guidelines, the advice did not relate to individual foods or the choices that consumers face on a daily basis, particularly given an increasing reliance on processed foods such as ready meals, which combine ingredients from different food categories. When questioned, consumers will usually claim to understand what is or is not healthy, but they acknowledge confusion about how to put generalised dietary advice into practice. The focus in recent

years has therefore shifted towards providing consumers with practical tools that make healthy dietary choices easier. Among these tools is a clearer definition of the nutritional quality – the nutrient profile – of a food product both in absolute terms and in relation to other food products.

Nutrient-profiling models

Attempts to provide consumers with summary information on the levels of nutrients in individual foods are not new. Proposals were developed and trialled in the 1980s: examples include the UK Coronary Prevention Group's labelling scheme, which banded the nutrient levels in packaged foods^(1,2) and the London Food Commission's rating system for menu items in catering outlets⁽³⁾. However, the importance of distinguishing between different foods is now receiving much greater attention in the context of government strategies to tackle obesity and

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diet-related disease, and more sophisticated schemes are now available.

A discussion on nutrient-profiling methods at a WHO forum and technical meeting on marketing in 2006 recognised the contextual nature of the task, namely that nutrient-profiling systems should aim 'to categorize foods according to their nutritional composition while taking into account current objectives of nutrition policies'⁽⁴⁾. The objective in most cases is to increase the proportion of the population adhering to national food-based dietary guidelines. The meeting also recognised that, when developing a nutrient-profiling system, a series of practical questions arise. These include:

- Which nutrients should be examined?
- Should the profiling criteria differ according to the type of food being profiled, or should all foods be assessed using the same criteria?
- What is the reference amount: e.g. should foods be compared per 100 g, per portion/serving or per 100 kcal?
- Which mathematical model should be followed – a single threshold, a set of thresholds or a continuous scale?
- How should the results of a nutrient-profiling system be tested for their performance in support of current nutritional policies?
- How should the final result be presented?

Profiling to fulfil specific tasks

The answers to the questions noted above depend on the task required from the profiling procedure. If the requirement is to define the presence of 'high' or 'low' levels of nutrients, then the methodological questions are fairly easily answered, and indeed nutrient profiling in this sense has been widely accepted for national and international legislation. The Codex guidance on nutrition claims⁽⁵⁾ and the recently adopted EU regulation on health and nutrition claims⁽⁶⁾ (which came into effect in July 2007) give threshold values for making 'high' and 'low' claims for nutrients in food products, per unit of food, and include specific requirements for presenting information on which the claim is made.

A similar approach is used to make comparisons between foods from the same category of products where one version has a greater quantity of a given nutrient than another. Statements referring to a 'higher' or 'lower' level of a nutrient are relative to a standard quantity in similar foods, but the product may not necessarily have a high or low absolute amount of that nutrient. For example, a reduced-fat spread may have significantly less fat content than butter or margarine yet still remains a high-fat product. Again, the procedures for these comparisons have been largely accepted, and the EU regulation on health and nutrition claims specifies a set of criteria for allowing

enhanced and reduced claims, and sets limits on the use of comparative claims.

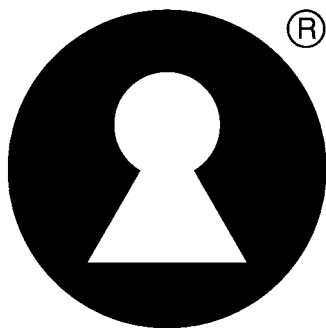
An extension of these principles is to combine several different nutrients into a single score that can be used to show that a product is nutritionally better than another, similar one. For example, a manufacturer or retailer may promote a 'healthy eating' range, or a government or public health body may endorse a labelling scheme to identify 'better for you' products. Several schemes are already on the market, of which perhaps the best known in Europe is the Swedish Keyhole labelling logo (see Box 1), which is designed to identify healthier options within classes of foods.

There is a potential conflict between systems designed to encourage consumption of *healthier* products and those designed to encourage consumption of *healthy* products. A reduced-salt snack is better than a fully salted snack, but it may still remain a salty product. A drawback with an approval mark, such as a Keyhole logo, is that it might be misunderstood by consumers to mean that the product is recommended as an important and valuable part of a healthy diet, which in some cases it is not. Healthier does not necessarily mean healthy per se, and notions of 'better than' may mislead consumers away from what is best.

The EU nutrition and health claims regulation has recognised the importance of ensuring that labels which indicate that a product is beneficial, e.g. 'low' in a particular nutrient such as fat, should not confuse consumers into inadvertently eating more of another nutrient, such as sugar or salt. In the case of health claims, the European Commission is expected to propose a system by January 2009, which defines whether or not products are healthy enough to be allowed to carry claims, and this will require some form of nutrient-profiling system for classifying foods. Nutrition claims will be allowed where a single nutrient exceeds the profile provided this is pointed out as prominently as the claim itself, for example, 'high fat content'.

A second drawback with relative labelling schemes, such as the Keyhole scheme, is that they may not be uniformly applied to the identification of foods of which consumers should eat more, e.g. some schemes do not include loose fresh fruit or vegetables. Similarly, these schemes rarely draw attention to foods that should be consumed less frequently: there are no logos to indicate 'eat less of' or 'eat only occasionally' in any such scheme. It can also be argued that these schemes are primarily aimed at, and of use to, a limited number of consumers who are already motivated to seek out healthy choices.

To satisfy these issues requires a set of criteria that can be used on any given food or beverage product, and that can be incorporated into regulatory controls for labelling, marketing and for other health promotion purposes.

Box 1 The Swedish Keyhole mark

The Keyhole symbol was introduced by manufacturers during the 1980s as part of a regional intervention project in northern Sweden to reduce the prevalence of CHD⁽³⁵⁾. The scheme is now used nationally on a voluntary basis, and the criteria for labelling are set by the National Food Administration, a Swedish government agency that owns the logo, in line with current nutrition policies for population dietary goals.

When the symbol appears on a package, it guarantees that the product has a reduced amount of one or more of the following: total fat; saturated and *trans* fatty acids; added sugar; salt (sodium); and/or a high amount of fibre⁽³⁶⁾. It is mostly calculated on a per-100 g basis, although for some products and nutrients the criteria are calculated on per 100 kcal or per cent energy basis. 'Sugar' refers in some foods to the added sugar content and in other foods to the total sugar content.

At present, Keyhole logos can be attached to:

- Pre-packaged foods, fresh or frozen fish, fresh fruit, vegetables and potatoes sold loose.
- Menus and recipes for restaurants and fast food outlets.
- Food recipe leaflets targeted at consumers.

The Keyhole label is a relative, not an absolute, scheme, and is used to indicate nutritionally better options within a category. It can be used, e.g. on reduced fat spreads containing up to 41% fat, of which up to one-third may be saturated and *trans* fatty acids, and on breakfast cereals up to 13% sugar. Manufacturers can use the scheme without prior notification but must be able to show that products showing the Keyhole symbol properly fulfil the criteria, and should be aware that these criteria are subject to review. From the public health perspective, one of the main purposes is to 'serve as an incentive to the food industry' to reformulate products in order to earn the Keyhole symbol⁽³⁷⁾.

Profiling to assist front-of-pack labelling

Several schemes have been promoted by sections of the food industry across Europe⁽⁷⁾. An early model based on energy density encouraged consumption of foods such as skimmed milk and fruit and vegetables by giving a high score for low density of energy per unit weight⁽⁸⁾. The drawback inherent in using a single nutritional component is that it does not take account of other relevant nutrients and components, such as fat, sugar and salt. Energy density criteria are also open to abuse if manufacturers increase water levels to lower the energy density per unit weight.

Health promoters and food companies alike are aware that consumers need more sophisticated support in making dietary choices and have difficulty using nutrition information given on back-of-pack labelling. However, front-of-pack signalling has become a fiercely contested arena.

The main debate centres around the most useful way to explain to consumers how the nutrient content of an individual food product relates to government dietary guidelines. Some manufacturers and retailers, particularly

in the UK market, have been using 'guideline daily amounts' (GDA) on back-of-pack labelling for some time. These guideline amounts were derived by a team led by the Institute of Grocery Distributors (IGD) in the UK^(9,10) on the basis of population dietary guidelines issued by various expert committees in the last two decades.

Several of the larger food manufacturers, working together with the Confederation of European Food and Drink Industries (CIAA), subsequently proposed that GDA should be used as the basis for a front-of-pack labelling scheme. In this scheme, nutrient levels are described as a percentage of the GDA for an average woman, based on the amount of the nutrient present in a manufacturer's recommended portion. Separate GDA values can be used for children of different ages, where appropriate. This type of approach, but described as percentage reference intake, has also been proposed by the European Commission in its proposal for a regulation on food information.

An alternative 'traffic light' scheme has been proposed, which has been shown to be effective in enabling consumers to assess the significance of nutrient levels within a single product and in comparison between

Box 2 Front-of-pack traffic light labelling scheme

The UK Food Standards Agency has adopted the following criteria for defining front-of-pack signalling of the nutritional value of foods and beverages⁽¹⁸⁾. Two sets of threshold are given for the 'red' category according to the 'per 100 g' and 'per portion' content of foods. If the nutrient content per portion of a product exceeds 21.0 g fat, 6.0 g saturated fat, 15.0 g added sugars or 2.40 g salt, then the product is classified as 'red' for that nutrient regardless of the per 100 g value. Otherwise the following obtains:

Foods, per 100 g

	Low, green	Medium, amber	High, red
Fat	≤3 g	>3 to ≤20 g	>20 g
Saturates	≤1.5 g	>1.5 to ≤5 g	>5 g
Sugar	≤5 g total sugars	>5 to ≤12.5 g added sugars	>12.5 g added sugars
Salt	≤0.3 g	>0.3 to ≤1.5 g	>1.5 g

Drinks, per 100 ml

	Low, green	Medium, amber	High, red
Fat	≤1.5 g	>1.5 to ≤10 g	>10 g
Saturates	≤0.75 g	>0.75 to ≤2.5 g	>2.5 g
Sugar	≤2.5 g	>2.5 to ≤6.3 g	>6.3 g
Salt	≤0.3 g	>0.3 to ≤1.5 g	>1.5 g

Further details and worked examples are available from the FSA⁽¹⁸⁾.

products. In March 2006, after several years of preparatory research and consultation with stakeholders in the food industry, the UK Food Standards Agency (FSA) announced a scheme for front-of-pack labelling using colour-coded signals⁽¹¹⁾. While allowing supermarkets and manufacturers to develop their own label designs with an individual look and feel, the FSA recommended that the schemes should comply with four core principles:

1. Provide separate information on fat, saturated fat, sugars and salt.
2. Use red, amber or green colour coding (traffic lights) to indicate whether levels of these nutrients are high, medium or low per 100 g (or per 100 ml).
3. Use nutritional criteria developed by the FSA to determine the colour code.
4. Supplement the signalling with information on the levels of nutrients per portion of product.

The FSA also identified the priority categories of foods to which the scheme should be applied and urged food manufacturers and retailers to adopt the scheme voluntarily. By 2007 a number of companies in the UK had decided to follow these recommendations and have adopted the FSA's recommended scheme.

The FSA's scheme is based on a set of criteria for the four key nutrients and the establishment of threshold amounts of each nutrient that trigger a change of colour for the front-of-pack signal (see Box 2). The figures relate to GDA, but the crucial difference between the FSA scheme and GDA signalling is that the 'traffic light'

colours interpret what the levels mean for consumers. Low or 'green' signals are based on the definitions within the EU health and nutrition claims regulation. They are also consistent with international trade requirements for nutrient-related claims specified by the Codex Alimentarius Commission⁽⁵⁾. High or 'red' signals indicate levels of a nutrient above 25% of the GDA for that nutrient. However, in the case of sugar, the FSA took the advice of an independent expert group convened to review the industry GDA⁽¹²⁾, and concluded that a lower figure (60 g rather than 90 g per day) was a more appropriate level. The criteria were subsequently revised so that they apply to added rather than total sugars. The medium or 'amber' figure is the level that falls in between the green and red. These high, medium and low levels are now used in more general UK government health education literature, replacing the previous advice on what counts as 'a lot' or 'a little'.

Traffic lights or guideline daily amounts?

The use of traffic light signals on foods has been supported by consumer organisations in Europe. A multi-stakeholder discussion group, chaired by the Bureau Européen des Unions de Consommateurs as part of the European Commission's Platform for Action on Diet, Physical Activity and Health, reviewed the available evidence from across Europe and concluded that an interpretative element such as colour coding was most promising⁽¹³⁾. Research from the French consumer

organisation, Consommation Logement de Cadre et de Vie, concluded that a multiple traffic light approach was most useful for consumers, while a single traffic light, giving an overall indication of the healthiness of a product on the label, was judged to be too simplistic⁽¹⁴⁾. This reinforces research findings by the UK FSA.

Several food companies, however, have rejected the interpretative approach and have instead preferred to place summary GDA information on front-of-pack labels. In February 2006, a consortium of food companies announced its determination to proceed with a labelling scheme in the UK showing percentage GDA values⁽¹⁵⁾. This has led to two competing labelling schemes being presented to shoppers, with both schemes supported by advertising campaigns broadcast from early 2007. A survey carried out by the consumer organisation *Which?* in 2006 found that 73% of consumers felt that having a variety of different labelling schemes was confusing⁽¹⁶⁾. The research also tested the performance of the different labelling schemes using examples of food products. It found that the traffic light scheme worked best for consumers, both to assess nutrient levels accurately in a given product and to compare between products.

The FSA recommends that the colour coding is applied per 100 g but many manufacturers argue that consumers think in terms of portions. A review of the use of GDAs in the UK⁽¹⁷⁾ showed a wide variety of portion sizes being used by manufacturers, which could make it difficult for consumers to assess products or compare them reliably. The FSA guidance⁽¹⁸⁾ currently states that colour coding applies per 100 g or 100 ml for all foods unless a portion exceeds specified criteria, in which case a different set of values operates for the 'red' or high criteria (see Box 2).

Evidence is accumulating that front-of-pack colour-coded signalling can have an effect on shopper's choices. Sainsbury's traffic light labelling system – the *Wheel of Health* – is reportedly not only driving customer demand towards healthier products but also stimulating the retailer's product technologists to reformulate products to achieve a healthier profile, and hence a better colour code, to meet this demand. For example, the product profile of Sainsbury's Chicken and Bacon Pasta Bake changed from three 'red' signals to only one such signal after reformulation that increased the amount of chicken and reduced the amount of sauce, which in turn reduced the amount of fat and salt in the product⁽¹⁷⁾. More detailed evaluation is needed to show whether the scheme results in long-term behaviour change and sustained improvements in product formulation.

Most recently, in the UK some retailers and manufacturers have opted for a combination of both schemes, in which traffic lights, based on the FSA criteria, are used to colour-code the percentages provided in the GDA-based scheme. During 2008, the FSA is undertaking a review of the various schemes proposed and has publicly committed to adopt the scheme or scheme elements that

are shown to work best for consumers. Consumers and health organisations⁽¹⁷⁾ have expressed their concerns that multiple schemes should not coexist, and that competing schemes should be evaluated against the following criteria:

1. The scheme should be easy to use within the 4–10 s in which consumers normally make decisions about food products in shops and supermarkets.
2. It should be easily used by all social and ethnic groups and by children, to help them make healthy choices within and between food categories.
3. It should not be likely to cause any widening of dietary health inequalities.
4. The nutrient values expressed or embedded in the scheme should be based on the FSA's or health department's expert advisory groups' dietary guidelines.

Single-score profiling

A disadvantage of both the traffic light and the GDA schemes is that they show multiple signals (at least four, one for each of the key nutrients), making it unsuitable in cases where a simple 'threshold' is required, e.g. when regulating a product's promotion on television advertising. Several approaches have emerged that aim to give a single score to indicate how healthy a particular product is. The energy density model mentioned above may be too simplistic and open to abuse, and other schemes have been proposed. The food manufacturer Kraft for example has launched its 'Sensible Solutions' approach, which requires foods to be examined on the basis of several criteria, including energy density, the presence of beneficial nutrients and/or whether the product meets regulatory criteria for 'low' or 'reduced' claims⁽¹⁹⁾. This has potential drawbacks: it mixes absolute and relative criteria, it is based on the manufacturer's 'per portion' figure, and it is tolerant of energy-dense foods, so that foods with fat levels as high as 12% by weight to bear a Sensible Solution logo.

Unilever has also developed a single-score system that combines points according to six factors: *trans* fat as percentage energy, saturated fat as percentage energy, fat quality as a ratio of saturated to non-saturated fat, salt per unit energy, total sugars per unit energy and added sugar as percentage weight⁽²⁰⁾. No positive points are given for beneficial components, such as dietary fibre or fruit and vegetable content. The model is applied differently to certain food categories, providing a mixture of absolute and relative scores, and this means that although direct comparisons can be made between products within a category (e.g. vegetable soup *v.* chicken soup), comparisons cannot easily be made across different categories (e.g. vegetable soup *v.* vegetable ratatouille) and some foods may not be easily categorised (e.g. vegetable, chicken and rice ready-meal).

Other single-score schemes have also been proposed, such as the Belgian supermarket company Delhaize Guiding Stars rating scheme^(21,22) and others, examined by Scarborough *et al.*⁽²³⁾, such as the Australian-developed Nutritious Food Index, the Ratio of Recommended to Restricted nutrients, the US-based Naturally Nutrient Rich score, the Australian Heart Foundation's Tick scheme, the American Heart Association's heart-check mark and the Netherlands tripartite model defining 'preferable', 'middle course' and 'exceptional' foods within food groups.

The UK advertising model

Perhaps the most advanced work to date has been undertaken in the UK to underpin the development of restrictions on advertising to children on broadcast media (a statutory control introduced in 2007). This nutrient-profiling model went through several stages of detailed development in 2004 and 2005 under the auspices of the UK FSA, and its development has been well-documented elsewhere^(24,25). A review of nutrient profile models concluded that this approach gave the most consistent results out of four comparable models⁽²⁶⁾. The model was formally passed to the UK's broadcasting regulator, Ofcom, at the end of 2005 as a contribution to the regulator's consultation on controls on food and drink advertising to children. The model has subsequently been incorporated into a regulation that prohibits advertising of products high in fat, sugar and salt during programmes for which children form a large proportion of the audience⁽²⁷⁾.

The development of the FSA's nutrient-profiling model was overseen by an expert working group including independent nutritionists and dietitians, members of the UK Scientific Advisory Committee on Nutrition (SACN) and representatives from the food industry and from consumer groups. Two public consultations were held with responses received from a wide range of stakeholders including food manufacturers, retailers, public health bodies and consumer organisations. An international workshop was also held to review the model.

Various prototype models were compared with 'expert opinion' using a panel of 850 professional nutritionists, with each assessing up to 120 different food products. The professionals' ratings were compared with the ratings obtained from the prototype models⁽²⁸⁾. The best prototype model showed a close correlation with the professional ratings of $r \leq 0.80$ (95% CI 0.73, 0.86). This model provided a single score derived from the energy, saturated fat, sugars and sodium on the one hand and the amount of protein, fruit, vegetables and nuts on the other. A threshold value for the combined score was set, which determined whether the food should be subject to the advertising restrictions. Public consultation and SACN advice led to further refinements, including treating nuts

as fruit, and disallowing the protein score if the energy, fat, sugar and salt scores were higher than a threshold level (see Box 3 for the final model). The protein score was found to be a good indicator of a range of micronutrients that would otherwise merit inclusion in the model.

The model uses a 100 g measure rather than actual portion size. This is justified on the basis that 100 g is the approach legally required for nutritional labelling and is generally recognised (e.g. in the EU Regulation on health and nutrition claims) to compare products on a like-for-like basis. Using a 'per portion' approach can introduce several difficulties, not least of which is the fact that serving sizes and consumption patterns are an individual matter and cannot be standardised, especially across different age groups.

The model highlights a clear secondary benefit of nutrient profiling as a driver for product reformulation. Processed foods that may fail to meet the criteria permitting their advertising to children might benefit from reformulation, enabling the manufacturer to continue to advertise them. For example, most breakfast cereals promoted on children's television are high in sugar, and some are also high in fat and saturated fat. It is hoped that the controls in marketing may stimulate manufacturers to produce products that are lower in sugar and fat, thereby avoiding the advertising restrictions.

The expert group that oversaw the model's development initially gave a score for added sugars (technically non-milk extrinsic sugars), but this was later replaced with a score for total sugar, a move that received substantial support from food manufacturers who said they faced technical difficulties in analysing added sugars and that information on total sugars is a requirement of EU food labelling legislation. The contribution of foods high in natural sugars to a balanced diet is addressed through the inclusion of criteria for protein (in which dairy products usually score well) and for fruit and vegetables. A review of the use of the model is scheduled to be undertaken after 1 year of use, i.e. in the first half of 2008.

Although developed for restrictions on marketing through broadcast media, the model also has the potential to be used as the basis for developing more responsible non-broadcast advertising and promotion, e.g. for product placements in films or for sponsorship promotions. The model needs to be tested on a wider variety of food products if it is to be applied to food cultures outside the UK.

Further advantages of nutrient profiling

The development of nutrient-profiling schemes is clearly beneficial in a wide range of applications, both commercial and health-related. Front-of-pack labelling has been discussed, and the use of nutrient profiling to support the European health claims regulations is under

Box 3 Nutrient profiling used for advertising controls in the UK

The nutrient-profiling model developed by the UK Food Standards Agency⁽³⁸⁾ has now been incorporated into UK broadcasting regulations pertaining to advertising to children. The model provides a single score for any given food product, based on calculating the number of points for ‘negative’ nutrients that can be offset by points for ‘positive’ nutrients. Points are allocated on the basis of the nutritional content in 100 g of a food or drink.

There are three steps to working out the overall score for the food or drink.

1. Calculate the total ‘A’ points

A maximum of 10 points can be awarded for each ingredient (energy, saturated fat, sugar and sodium). The total ‘A’ points are the sum of the points scored for each ingredient.

Total ‘A’ points = [points for energy] + [points for saturated fat] + [points for sugars] + [points for sodium].

Points	Energy (kJ)	Sat. fat (g)	Total sugar (g)	Sodium (mg)
0	≤335	≤1	≤4.5	≤90
1	>335	>1	>4.5	>90
2	>670	>2	>9	>180
3	>1005	>3	>13.5	>270
4	>1340	>4	>18	>360
5	>1675	>5	>22.5	>450
6	>2010	>6	>27	>540
7	>2345	>7	>31	>630
8	>2680	>8	>36	>720
9	>3015	>9	>40	>810
10	>3350	>10	>45	>900

If a food or drink scores 11 or more ‘A’ points then it cannot score points for protein unless it also scores 5 points for fruit, vegetables and nuts.

2. Calculate the total ‘C’ points

A maximum of 5 points can be awarded for each ingredient. The total ‘C’ points are the sum of the points for each ingredient (note that you should choose one or other of the dietary fibre columns according to how the fibre content of the food or beverage was calculated).

Total ‘C’ points = [points for fruit, vegetables and nut content] + [points for fibre (either NSP or AOAC)] + [points for protein].

(NB: Guidance on scoring fruit, vegetables and nuts is available from the Food Standards Agency⁽³⁹⁾.)

Points	Fruit, vegetables and nuts (%)	NSP fibre (g)	Or AOAC fibre (g)	Protein (g)
0	≤40	≤0.7	≤0.9	≤1.6
1	>40	>0.7	>0.9	>1.6
2	>60	>1.4	>1.9	>3.2
3	-	>2.1	>2.8	>4.8
4	-	>2.8	>3.7	>6.4
5	>80	>3.5	>4.7	>8.0

3. Calculate the overall score

If a food scores less than 11 ‘A’ points then the overall score is calculated as follows:

Overall score = [total ‘A’ points] – [total ‘C’ points].

If a food scores 11 or more ‘A’ points but scores 5 points for fruit, vegetables and nuts then the overall score is calculated as follows:

Overall score = [total ‘A’ points] – [total ‘C’ points].

If a food scores 11 or more ‘A’ points but also scores less than 5 points for fruit, vegetables and nuts then the overall score is calculated without reference to the protein value, as follows:

Overall score = [total ‘A’ points] – [fibre points + fruit, vegetables and nuts points only].

The model can be adjusted to take account of changes in public health nutritional policy. Within the model, any threshold can be defined according to the judgement of the policy makers and their scientific advisers. For the purposes of the advertising controls being introduced in the UK in 2007:

a *food* is classified as ‘less healthy’ where it scores *4 points or more*, and a *drink* is classified as ‘less healthy’ where it scores *1 point or more*.

Box 4 Examples of the potential opportunities for the use of nutrient profile models

- Clear and consistent messages and advice to consumers
- A uniform approach equitable for all manufacturers and retailers
- Interpretative front-of-pack signalling
- Standards for broadcast advertising and other forms of food advertising and promotion to children
- Regulatory control of health claims to prevent misleading messages
- Standards for contracts for mass catering
- An evaluation tool for health policies and health impact assessment
- Defining food categories for relevant taxation and subsidy schemes
- Defining food categories for welfare support schemes
- Assisting evaluation of population dietary surveys and food consumption trends
- Investor evaluation of food company product lines and sales targets
- Marketing opportunities for reformulated foods and healthier product lines

consideration by the European Commission. Similar measures can be suggested for catering outlets, where a profiling scheme such as traffic light signalling could help customers select healthier items from menus in advance of ordering their food.

While some consumers may pay little attention to the nutrition panels available on food packaging or in leaflets in fast food stores, the presence of a red, amber or green signal is an easy prompt that requires little nutritional knowledge, can be comprehended readily even by people with poor numeracy skills and children. It also acts as an incentive for manufacturers to consider reformulation to improve the nutritional profile of their product. Improving the nutritional profiles of manufactured foods is a goal of many national food policies, and the strategy is less likely to increase health inequalities than relying on consumer choice alone.

Manufacturers are already reviewing the formulation of products and the overall range of products they market with respect to the nutritional quality of the food. Several reports from investment banks and stock advisors have indicated the exposure of some companies to the obesity problem^(29–31), either in terms of the potential for a company to be held legally liable for inducing unhealthy behaviour (triggered by the attempt to hold McDonald's liable for deceptive nutritional labelling⁽³²⁾) or for their dependence on a narrow product range that may suffer a sales decline if consumers switch to healthier choices. A method for measuring the nutritional quality of their products can help a company and the investment community to evaluate exposure and indicate opportunities for improvement.

The use of nutrient profiling can be extended to contractual relationships: e.g. the quality criteria for products supplied for school meal services and institutional catering in the workplace, health sector, armed service, prisons and elderly care homes. Nutrient profiling standards could be used for contract compliance and for health impact assessments of meal service policies.

Fiscal policies designed to benefit public health may, if they are considered appropriate, also benefit from using nutrient profiling as an assessment tool. One criticism made of the suggestion to impose a tax on foods such as soft drinks and snack foods is the difficulty of administering the tax because of the problem of defining what constitutes a soft drink, a snack food, etc. Nutrient profiling provides a method for categorising foods for taxation or subsidy, and can help model the effects of a tax and subsidy regime on different sectors of the population (see Box 4). Similarly, manufacturers could be encouraged to reformulate to take best advantage of a tax and subsidy regime.

Promoting health

Foods are composed of combinations of many nutrients and ingredients, and attempts to summarise them quantitatively into a single score, a set of scores, or even a set of ranges of scores, is bound to lead to the loss of some valuable information. A scoring system is justified by its utility: e.g. the benefit of helping shoppers make rapid decisions on dietary choices, or the benefit of controlling the types of health-related messages received by children. The utility of the UK schemes appears to be supported by the early evidence from the use of traffic light labelling and from calculations undertaken by Ofcom on the costs and benefits of advertising controls⁽³³⁾.

The era when it was difficult to talk about 'good' and 'bad' foods has passed and we are now approaching the issue in a more sophisticated manner. The industry itself, in its promotion of functional food products and of individual food items labelled with logos declaring the products to be 'healthy' or 'good for you', has accepted that specific products can be categorised on a dimension relating to health benefit. The regular consumption of foods rich in fats, sugars and salt would make it hard for an individual to meet healthy eating guidelines, and it is essential that consumers

can clearly distinguish foods they should consume less frequently and those they should consume more frequently. Models are now available that enable this distinction to be made in a meaningful way.

Health ministers in the WHO European Region are committed to supporting the Second WHO European Action Plan for Food and Nutrition Policy⁽³⁴⁾, which includes a number of key actions where nutrient profiling (NP) can play a valuable role.

Action 1.3. School nutrition policies: NP for contracts, standards and evaluation and the provision of information and education to children.

Action 2.2. Promoting reformulation of food products: NP for comparing recipes and promoting reformulated products.

Action 2.4. Improved nutrition in the food supply in public institutions: NP for standards for contractors and for monitoring and evaluation.

Action 2.5. Commercial foods aligned with dietary targets: NP to assess planning permits, retail needs, award schemes, portion sizes and promotional marketing.

Action 2.6. Use of taxes and subsidies: Taxable categories classified using NP.

Action 2.7. Targeted programmes for vulnerable groups: Welfare programmes, subsidies, home meals standards assessed using NP.

Action 3.1. Food-based dietary guidelines: Define and describe foods with NP, support the guidelines with NP-defined promotion activity.

Action 3.2. Public campaigns: NP can assist healthy choices through labelling, school education, etc.

Action 3.3. Appropriate marketing: Use NP to define suitable marketing standards.

Action 3.4. Adequate labelling: NP with interpretation element, e.g. using traffic light colour signals.

Action 5.3. Nutrition services in hospitals: use NP for service standards, use NP labelling for patient's food choice.

Actions 6.1 and 6.3. Surveillance and evaluation: NP assists evaluation of dietary surveys, target setting and comparative health impact assessment.

Much has been achieved in the last decade. Nutrient profiling can achieve adequate objectivity and validity to be acceptable to policy-makers. Nutrient profiling can be simple enough to convey information to the target audience (consumer, caterer, etc.) in a manner that influences choice, and can be rigorous enough to be definable in statutory regulations.

As a result, the principle of defining healthy and unhealthy foods using nutrient profiling has now been formalised and applied in a number of settings and has the potential to be applied in many more. The challenge now is to agree on a consistent, industry-wide approach at the national and international levels and use this as the basis of a broad range of actions and initiatives to tackle obesity and diet-related disease.

Further research will help to elucidate the degree to which nutrient profiling can support dietary patterns that confer future protection from obesity or chronic disease and can validate the effect of the nutrient-profiling approach on public health.

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