

Characterising the nutritional value of foods, using nutrient profiling

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Nutrient (or nutritional) profiling of foods, described as the science of characterising foods based on their nutrient content, is fast becoming the basis for regulating health claims on foods, fortification, and marketing and advertising to children. Accordingly, several health authorities and regulatory bodies are assessing the nutritional profiles of food items, to implement guidelines aimed at improving the diet of the general population. Nevertheless, it is widely accepted that the complete diet over a period of time is important when considering overall nutrition and health, rather than isolating individual nutrients.

A new EU regulation on nutrition and health claims made on foods entered into force in January 2007. The regulation provides for the use of nutrient profiles to determine which foods may bear claims but does not specify what the profiles should be or how they should be developed. [EFSA \(European Food Safety Authority\) have published a scientific opinion on which foods may carry nutrition and health claims, to assist policy makers.](#) The next stage of the process is the definition of the nutrient profiling scheme.

Recently, several research groups have investigated different nutrient profiling systems. These studies have looked at comparing systems already in existence or developing different systems. Some of these systems have focused on nutrients to limit (total fat, saturated fat, trans fatty acids, sugar and sodium), others have incorporated nutrients known to be beneficial to health into their system, and others take into account the portion size and the pattern of food consumption, i.e. during or between the main meals, and the different food cultures in Europe. This latter approach has been proposed by researchers at the University Pierre and Marie Curie in Paris, and Scientific Institutions and Foundations in Italy, and was published in 2007.¹

Earlier this year, researchers from the US at the University of Washington in Seattle described the steps needed to develop and validate nutrient profile models.² In their report they recommend that index nutrients should be relevant to dietary needs and limited in number and the reference daily values used should be based on an authoritative source and linked to food labelling. Furthermore, the profiling schemes should be simple and transparent and validated against independent measures of a healthy diet. The researchers also stressed the need for the models to be weighed against food cost and food enjoyment.

A study compared 23 existing nutrient profiling schemes, doing a more in-depth analysis to 5 of them.³ This study stressed the difficulty of finding schemes combining qualities such as simplicity, scientific relevance and ability to cope with changes in nutrient recommendations and concluded that current proposed profiling schemes exhibit a wide range of differences both in terms of approaches and “performance”.

Another group of researchers, representing several food institutes and universities across Europe, tried to identify “indicator” foods that are positively or negatively associated with a healthy diet, so that they can be used for the evaluation of nutrient profiling schemes.⁴ To do so, they used data on food and nutrient intakes of adults participating in national dietary surveys in five EU countries: Belgium, Denmark, France, Ireland, and Italy. First, “healthy diets” of individuals were identified in the five national dietary surveys by

comparison to the Eurodiet reference intakes and then indicator foods associated positively or negatively to the “healthy diets” were determined.⁵ The researchers could identify 294 “indicators” out of 1669 foods, suggesting that it is possible to identify indicator foods for the validation of nutrient profiles but it is necessary that dietary surveys and food composition databases across Europe are harmonised.

In light of this, another study tested how effective three profiling schemes are in classifying these indicator foods.⁶ The profiling schemes under investigation are used in the UK, the Netherlands and the USA. The study showed that the sensitivity and the specificity ratios of the three profiling schemes tested were relatively good. There were only small differences of performance between the three systems. A significant negative correlation between sensitivity and specificity was observed. The level of concordance between the classification of the “indicator foods” that have been selected because of being positively or negatively associated with a healthy diet and the classification by each of the three profiling methods tested, was quite good.

References

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