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Nutrition and health labelling

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For the food or drink manufacturer, product labelling represents an excellent opportunity to convey the composition of the product, the relevance of the product composition to daily nutrient requirements, and the potential benefits to health. Getting nutrition labelling right requires forethought and planning as early as the product brief stage, and must consider factors such as the baseline of consumer understanding of nutrition, methods of collecting nutritional data, how best to communicate the nutritional content of a product to the consumer and, of course, the regulatory requirements. This paper summarises the steps that should be taken to achieve this, and outlines the benefits of so doing.

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Introduction

Adequate human nutrition requires the regular intake of around fifty different components of foods, split between the macronutrients, the micronutrients and water. Our requirements for these nutrients vary considerably by gender, age, lifestyle, physical activity, environment and genotype, meaning that the appropriate dietary choices throughout life are really important for normal physiological function and the maintenance of a healthy lifestyle. On the other hand, the physiological consequences of making poor dietary choices can be severe, leading to an increased risk of nutrient deficiency and chronic disease. For the food or drink manufacturer, the issue of labelling food and drink products is therefore not one simply of compliance with regulations, but can be viewed as the best (and in some cases only) opportunity to convey the composition of the product, the relevance of the product composition to daily nutrient requirements, and (in some cases) the benefits to health that are associated with consuming a particular component of the food or drink. This paper considers how nutritional information conveyed on pack fits into the context of the nutritional knowledge and requirements of the consumer, how nutritional information is selected and gathered for a declaration, and ultimately how best to communicate the nutritional content of a product to the consumer.

What does the consumer need to know?

When choosing what messages to communicate to the consumer, it's important to consider the baseline of nutritional understanding. Particular elements of the link between dietary choices and health are becoming increasingly familiar to the European consumer, a generalism that is typified by the popular trends of 'calorie-counting' and 'superfoods'. Despite this, it is fair to suggest that a balanced, evidence-led understanding of basic nutritional requirements is still far from being universal amongst European consumers. To correct for this, various tools have been designed to guide satisfactory food choices without the need for detailed nutritional knowledge, the foremost of which are the visual food-based dietary guidelines (FBDGs) in Europe. In the UK, this takes the form of a round 'eat-well plate' in the UK, visually divided into broad food groups (such as 'milk and dairy foods') and sized according to their advised proportion of the diet. The common use of this approach is testament to its ability to build on the existing food knowledge of the consumer (i.e. a basic knowledge of food groups) to guide food choice. One negative aspect of this approach is that using food groups also deliberately but perhaps counter-productively simplifies the detail of dietary choices when it comes to nutritional requirements.

Even the minimum level of food labelling required by law in the EU provides greater detail to the consumer about the nutritional content of a food product than can be learnt from FBDGs. This information is also provided in a very different format. It is numerical rather than pictographic, and is defined by nutrient, not by food group. This represents a significant consideration when deciding how to present nutritional information. It is not always appreciated by the food and drink industry that a range of options are available when presenting both composition data and the types of nutrients declared. No real consensus exists between retailers or manufacturers as to how best to use the options available within the labelling legislation to effectively communicate nutritional information to the consumer, perhaps because nutrition labelling is often seen as an opportunity to generate competitive advantage. This has contributed to significant variations in the level of on-pack nutritional detail communicated to the consumer in the EU food supply chain, which in itself may present a confusing, inconsistent picture to the consumer. This situation is complicated further by questionable consumer understanding of nutritional values on-pack, with some uncertainty as to how the nutritional values will be interpreted or even trusted by the consumer. What is well understood is that informed

purchase decisions (from a dietary perspective) are made where the consumer understands the nutritional information provided *and* has an interest in adopting a healthy diet. As such, the right information needs to be communicated in the most appropriate manner to suit the product type or category.

Selecting and gathering nutrition data

The process of labelling nutrition values invariably starts with the collection of data on which all nutrition information communicated to the consumer is finally based. The type of data that is to be collected is dependent on the proposed method of nutrition label generation, which itself varies by the nature of product (including preparation methods), the nutrients that are required to be included on the declaration, and the budget available. Three methods of producing a nutrition label exist: empirical analysis of the finished product, calculation using known values for the ingredients used (e.g. suitably detailed ingredient specifications), or calculation using 'generally established and accepted data' (i.e. food composition tables).

Whilst the two calculation-based methods are very suitable for generation of a mandatory nutrition composition declaration (energy, fat, saturated fat, carbohydrate, sugars, protein and salt) because these particular nutrients are broadly very stable during manufacturing from raw materials, it is not always acceptable to assume that the nutritive content of a finished product is identical (or even similar in many cases) to the sum of its raw ingredient parts. Many of the chemical and biochemical processes that take place in a food product during preparation result in the modification of its final composition. These processes are most usually caused by the application of heat during thermal processing, release of enzymes when size reducing or homogenising (e.g. browning reactions during fruit juicing), and other non-enzymatic chemical interactions. Predicting changes in nutrient concentrations is challenging due to the vast number of controlling parameters that are unique to each product. These include pH, water activity (a_W) and the concentration of other matrix components such as transition metals. Besides losses due to processing and handling, the natural variation of raw materials should be considered where food composition tables are used as the primary source of data. Whilst useful, composition tables provide average values only and therefore cannot account for nutrient variation in natural materials due to agronomic, phenotypic and genetic factors.
This variation in the nutritional content of food and drink products is well established (if not fully understood), and therefore guidance has been published by the EU Commission as to the maximum acceptable level of variation in the actual nutrition content of any given food or drink product when compared to that declared to the consumer. As such, in selecting the type of data on which to base nutrition information, an overall specialist view must be taken as to the representative quality and relevance of the particular type of data proposed for use in relation to the ingredients used, the nature of the product, processing parameters and the overall handling of the product.

Choosing what to declare

Until recently, food and drink manufacturers have tended to make nutrition labelling decisions relatively late in the product development process, considering the exercise of gathering the information more as a necessary regulatory hurdle over which to jump prior to label artwork sign-off rather than as an opportunity to communicate product quality. This is changing considerably, in part due to the voluntary use of more prominent front-of-pack labelling methods, partly because of increased popular attention on the role of particular nutrients in human health, and also because of

the change in food labelling legislation. As such, many food and drink manufacturers are increasingly driving development projects from a nutrition perspective, designing products to meet selected windows of nutrient content. This is not an easy process as designing the correct declaration requires an understanding of the interaction between many nutritional, technical, regulatory and consumer forces. Questions of consumer acceptance, category fit, market activity, technical achievability and labelling regulations must all be answered during the development process. Of greatest consideration is the amount of room for flexibility in labelling within labelling law in the EU.

The minimum back-of-pack declaration includes a table of energy in two units (kJ and kcal), five macronutrients (fat, of which saturates, carbohydrates, of which sugars and protein) and one micronutrient (salt). These must be expressed as numerical values on a fixed mass per mass (e.g. g / 100 g) or mass per volume (e.g. g / 100 ml) basis. Fixing the units of expression is useful because it allows the consumer to compare values between food products, enabling choices to be made between similar products (the choice between a lower saturated fat ready meal and a higher saturated fat ready meal, for example), although these values can additionally be expressed per fixed portion.
Beyond this, there are many opportunities for voluntary numerical declarations, including a further breakdown of the fat composition (to mono and polyunsaturates), inclusion of polyols, starch and fibre, and the expression of a range of micronutrients (vitamins and minerals), permitted where each are present in threshold 'significant' amounts. It's also worth noting that all of these 'voluntary' declarations become mandatory where a claim about these nutrients is being made (e.g. 'contains a source of calcium').

For the nutrition conscious consumer, the detail of numerical values can be highly useful as it can provide information on which to base a healthy diet; however, evidence suggests that it can be confusing for the less nutritionally aware consumer. Methods to circumvent this within the scope of EU labelling law are discussed in the next section, 'Communicating dietary context'. A further limitation of only providing a table of numerical information is that weighing the totality of the data is potentially overwhelming for the consumer. For example, a product with a seemingly significant saturated fat content but apparently high potassium content may present a confusing dilemma to the consumer, raising questions such as 'is 10 g saturated fat per 100 g good or bad, and if I eat one portion, to what extent should I limit my saturated fat intake in the rest of my diet today?', 'I don't see potassium declared on most products; is this a warning?' or even 'can I eat lots of this product because potassium is good for me?'. The net effect of this confusing lack of context is to limit consumer understanding of the overall nutritional value of the product. It is therefore worth considering the nutrient declaration during the product development process to ensure that it best suits both the product category and consumer whilst meeting regulatory requirements.

Communicating dietary context

It is clear that the mandatory numerical declaration demands a basic understanding of the significance and scale of each nutrient in the context of a healthy diet (e.g. saturated fat should be limited to a maximum intake of around 20 g per day) which is not common amongst all consumers. Several ways exist to potentially overcome this limitation, including the use of voluntary front-of-pack (FOP) traffic lights which provide scale by means of colour-coding (relevant only to the UK at present), and the expression of absolute values as percentages of standardised Reference Intakes (RIs). Colour-coded 'traffic light' labelling in particular represents an opportunity to provide information on the 'public health nutrients' (total energy, fat, saturated fat, total sugars and salt), which are recommended for restriction in the diet. They achieve this via a simple but visual system of familiar traffic light colours,

with individual nutrients assigned green, amber or red status depending on their concentration in the product, allowing simple nutritional assessments to be made as the product is viewed on the shelf. The FOP declaration also contains information as to the % RI provided by the product which must be expressed per specified portion, allowing for the product contribution (as consumed) to daily maximum individual nutrient intakes to easily be assessed by the consumer. Assignment of the traffic light colours is determined via a mixture of thresholds per 100 g of product and per portion however, potentially adding confusion. A notable benefit of the traffic light system is that it is standardised in terms of colour coding thresholds between food categories and also across drinks categories, allowing for comparative choices to be made by the consumer.

Both of these options have utility in providing a degree of whole-diet context to the otherwise dimensionless nutritional values expressed on-pack, seemingly without particular requirement for prior consumer knowledge. It's important to note that consumer understanding of the meaning of both RI values and the traffic light system has been questioned, however. Both of these options are based on RI values; a standardised pan-EU estimation of the recommended daily amounts of nutrients recommended for an average female adult consuming 2000 kcal daily dietary energy in order to maintain an adequate diet. These values are therefore not relevant to children, and require scaling as a function of energy requirements for individual adults on the basis of age, gender and physical activity levels. Values may not therefore be appropriate for the absolute dietary requirements of all consumers, but do at least provide a physiologically appropriate scale.

Composition and health claims

Up until this point, this paper has generally only discussed numerical methods of communicating nutritional value to the consumer. However, one of the most significant recent changes to labelling legislation in the EU has been to allow the restricted use of claims; worded statements of product composition (a 'nutrition claim') or the health benefits associated with consuming the product owing to the presence of a certain concentration of a named component or nutrient (a 'health claim'). It is important to note that these statements are highly controlled in terms of their use, including the wording used, the components about which claims can be made, and the threshold concentrations of the named component or nutrient required to bear the claim. Conflicting evidence exists for their acceptance by consumers; however, the standardisation of nutrition claims in particular means that, if used correctly, their presence on food and drink packaging may well become a useful and familiar touchstone for the consumer. Health claims are maintained on an EU-wide register, composed of 'general function' claims and 'reduction in disease risk or to children's development or health' claims. Many of these are well-established ('textbook') functions of nutrients, however novel health claims can also be made following approval and addition to the health claim register. The process for this is usually highly involved, and often requires significant scientific and/or clinical activity prior to submission of a dossier of evidence to the European Food Safety Authority (EFSA), the body responsible for assessing the scientific validity of novel health claims. Once approved, these claims can be made either universally, or exclusively by the applicant for a fixed period of time.

Conclusions and next steps

Accepting that the primary function of a foodstuff is to provide nutritive value to the consumer, it therefore follows that food choices must be made with some sound compositional knowledge in order to allow appropriate choices to be made. Nutrition labelling plays a front-line role in the provision of

accurate nutritional information to the consumer, especially as the consumer encounters food packaging regularly. The accuracy of this information and the way in which it is provided is critical to aiding appropriate consumer choices. An understanding of how this information might be generated and provided in order that the consumer is best informed is therefore essential to enabling consumer choice and therefore creating demand, which in turn drives innovation in the nutrition and health space. At Campden BRI, we have the expertise and resources to help with every step of the nutrition labelling and innovation process, including:

- SWOT analysis of existing or planned nutrition declarations
- Regulatory support to ensure legal compliance
- Expert nutrition and food composition advice coupled to product development expertise
- Analytical facilities to determine routine and specialist compositional target concentrations
- Consumer assessment to predict acceptance of declarations or claims

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