

Invited commentary

Functional foods or functionally marketed foods? A critique of, and alternatives to, the category of 'functional foods'

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The term 'functional foods' is a relatively new food category or concept, originating in the 1980s and becoming more widely used over the past decade⁽¹⁾. The 'functional foods' concept has been notoriously hard to define. Discussions of functional foods often begin by acknowledging that there are no generally accepted definitions of 'functional foods' and note the 'ambiguity of definition and interpretation'⁽¹⁾. But the term continues to be used as if it does have a clear meaning.

The term 'functional foods' is generally understood to refer to foods with especially healthful qualities, but there is little clarity as to what types of foods they are, what types of healthful qualities they possess and how they differ from other foods. While there is much debate over the nutritional or public health merits of 'functional foods', there has been little rigorous interrogation of the definitions of 'functional foods' nor of the usefulness and accuracy of the term itself, even from critics of 'functional foods'.

This commentary proposes that most definitions of 'functional foods' are inadequate – indeed that the term itself is inappropriate and misleading – and instead suggests alternative ways of categorising these foods.

The examples of 'functional foods' commonly put forward include relatively novel food products (e.g. cholesterol-lowering margarines), whole foods that have been nutritionally modified (e.g. reduced-fat milk and genetically engineered 'Golden Rice'), unmodified whole foods (e.g. nuts and fruit), and nutrient-fortified highly processed foods (e.g. sugar-laden breakfast cereals and 'energy' drinks)⁽²⁾.

The diverse range of foods included in the 'functional foods' category is reflected in the diverse, confused and often self-contradictory definitions that are commonly espoused. Most definitions of 'functional foods' – and even the very term itself – suggest that these foods contain some intrinsic, health-giving, 'functional' components and qualities that distinguish them from other, 'non-functional' foods. However, I argue that there are no credible definitions of 'functional foods' that establish criteria for distinguishing between these and other foods (i.e. 'non-functional foods') in terms of any intrinsic, health-enhancing characteristics.

Instead, the main distinguishing features of foods defined as 'functional foods' appear to be either that they have been 'nutritionally engineered' and/or that they are promoted with nutrient-content claims or health claims. The heavily loaded term 'functional foods' should therefore

be rejected, in favour of other categories that more accurately describe the types of foods being referred to.

The three more precise and appropriate terms I suggest are 'functionally marketed foods', 'nutritionally marketed foods' and 'nutritionally engineered foods'⁽³⁾. *Nutritionally engineered foods* are defined as foods that have had their nutrient profiles deliberately modified. *Nutritionally marketed foods* are defined as foods that are marketed with nutrient-content claims, and which therefore only imply particular health benefits. *Functionally marketed foods* are defined as foods that are explicitly promoted with health claims or as having a beneficial effect on particular bodily functions. Some foods may of course be represented in all three food categories. Other food categories that will be introduced here are *transnutric foods* and *nutrigenomically marketed foods*.

Definitions of 'functional foods'

The following are some of the most widely referenced definitions of functional foods. The American Dietetic Association defines the term broadly to include⁽⁴⁾:

...any potentially healthful food that may provide a health benefit beyond the traditional nutrients it contains.

The 'European Consensus Document' prepared by the International Life Sciences Institute similarly includes any 'targeted' health benefits 'beyond adequate nutritional effects'⁽⁵⁾:

A food can be regarded as 'functional' if it is satisfactorily demonstrated to affect beneficially one or more target functions in the body, beyond adequate nutritional effects, in a way that is relevant to either an improved state of health and well-being and/or reduction of risk of disease... A functional food can be a natural food, a food to which a component has been added, or a food from which a component has been removed by technological or biotechnological means. It can also be a food where the nature of one or more components has been modified, or a food in which the bioavailability of one or more components has been modified, or any combination of these possibilities.

The Institute of Food Technologists (IFT) defines these foods as⁽⁶⁾:

...foods and food components that provide a health benefit beyond basic nutrition (for the intended population). Examples may include conventional foods; fortified, enriched or enhanced foods; and dietary supplements. Functional foods provide essential nutrients beyond quantities necessary for normal maintenance, growth, and development, and/or provide other biologically active components that impart health benefits or desirable physiological effects.

The Australian and New Zealand food standards authority defines 'functional foods' as⁽⁷⁾:

...similar in appearance to conventional foods and are intended to be consumed as part of a normal diet but modified to serve physiological roles beyond the provision of simple nutrients.

The Australian National Excellence Centre for Functional Foods (NECFF) – a university-based research centre – has defined them broadly to include any food containing 'known bioactives', promoting 'general health and well-being' or promoted on a 'health platform', as long as these are underpinned by 'good scientific evidence'⁽⁸⁾:

Functional foods are defined as foods that meet consumer needs for general health and wellbeing, and the prevention and management of compromised health conditions. Functional foods include 'minimally and substantially transformed' foods containing known bioactives and 'substantially and elaborately transformed' food products, beverages or food ingredients containing known or added bioactives. Any food promoted on a health platform, where the health benefits are supported by good scientific evidence, is a functional food. The strong underpinning of science is what differentiates functional foods from other food categories.

In their book *The Functional Foods Revolution*, Heasman and Mellentin suggest that 'functional foods' deliver an enhanced health status beyond just 'maintaining well-being'⁽⁹⁾:

Functional foods are about manipulating and constructing foods and diets not to just maintain well-being or a balanced diet, but to actively participate in shaping health status... [The] scientific challenge is all about identifying the individual components of plants and other foods that can prevent disease and illness and also enhance and prolong healthy and active life.

Can any food be 'functional'?

Many discussions of 'functional foods' include the observation that just about all foods – both processed and

unprocessed – are potentially 'functional' in some way if they contain nutrients which can be linked to specific beneficial health outcomes. The most general definitions of 'functional foods', such as the NECFF definition above, imply that the term can refer to *any* foods which confer *specific* health benefits. As Patch *et al.*⁽¹⁾ note: 'In some sense many ordinary foods might be considered to have "functional" properties'.

But if so, what is the difference between a 'functional food' and, say, an orange, cornflakes or a jam sandwich, all of which contain micronutrients that are considered to have specific benefits? Given that probably all foods contain at least some nutrients or ingredients that have been linked by nutrition scientists to some health benefit, then all foods could potentially be included in the 'functional foods' category. If so, then such a broad definition renders the 'functional foods' category meaningless, since there would be no criteria for distinguishing between functional and non-functional foods.

An important point of difference between some definitions relates to whether they include or exclude unmodified and unprocessed foods, which are sometimes referred to as 'conventional' or 'natural' foods. That there is no general agreement on this basic point already indicates great uncertainty and confusion over the nature and very purpose of the 'functional foods' category. Some definitions explicitly *exclude* unmodified or non-engineered foods from the 'functional foods' category. However most definitions do include unmodified/unprocessed foods, such as fruits or nuts, and these foods tend to be characterised as being 'naturally functional'.

But the inclusion of unmodified/unprocessed foods seems to conflict with definitions that suggest that 'functional foods' provide health benefits 'beyond basic nutrients', since such unmodified foods would presumably only provide 'basic nutrients' or 'traditional nutrients'. The IFT definition above is an example of such seemingly self-contradictory definitions⁽⁶⁾, yet these fairly obvious tensions and inconsistencies within definitions are rarely if ever acknowledged or examined. The inclusion of unmodified whole foods in these definitions may in fact be intended to simply extend the aura of healthfulness attached to whole foods across to 'functional' processed foods, and is therefore merely a means of lending legitimacy to the 'functional foods' category.

Nutritionally engineered foods

Most definitions of 'functional foods' do not distinguish between whether it is the entire food product or just the presence or absence of specific nutrients or ingredients that defines whether a food is considered to be 'functional'. This means that even the most highly processed and poor-quality foods which have had functionally marketable nutrients added or subtracted from them would qualify as 'functional foods' under most

definitions, such as vitamin-fortified and fat-reduced processed foods. If this is the case, then such broad definitions undermine and conflict with the attempt to define and position 'functional foods' as a restricted category of premium, health-enhancing foods.

In practice, it seems that any foods that have had their nutrient profiles deliberately modified or engineered are included in the definition. Thus even vitamin-fortified sugary breakfast cereals would qualify as 'functional foods'. But if the act of nutritionally engineering a food is all that is required to be included in the 'functional foods' category, then why is the term 'functional foods' required at all? Why isn't a term such as 'nutritionally engineered foods' adequate and indeed a more accurate descriptive category, since it does not carry the added and highly contested assumption that all such nutritionally engineered foods are necessarily 'healthy' or that they confer some additional and noteworthy benefits?

A characteristic of some nutritionally engineered foods is that they involve introducing nutrients and food components that have not previously been associated with the types of foods or food groups they represent. Examples include the insertion of calcium in orange juice or plant sterols in margarines. I refer to such nutritionally engineered foods as *transnutric foods* (short for *trans-nutrient*), since they involve the insertion or transfer of nutrients across conventional ways of categorising or classifying foods. In cutting across these food categories – including across the food group categories associated with official dietary guidelines and food pyramids – transnutric foods may undermine dietary advice based on these food categories⁽¹⁰⁾.

'Beyond basic nutrition'?

The most baffling and problematic aspect of many definitions of 'functional foods' is the common reference to the way these foods supposedly provide health benefits that go 'beyond basic nutrition'⁽⁶⁾, 'beyond traditional nutrients'⁽⁴⁾ or 'beyond adequate nutritional effects'⁽⁵⁾. The meaning of these claims is far from clear, and it is often difficult to dissect such definitions and arguments when, typically, little further explanation is given.

First, there is the suggestion that 'functional foods' go 'beyond' the delivery of 'basic nutrients', 'simple nutrients' or 'traditional nutrients', and that this is the source of the enhanced health benefits they are claimed to offer. Many processed foods are often fortified with nutrients or components that are otherwise not found at all in common foods (such as the addition of psyllium husks) or else are added in higher concentrations than are contained in whole foods or 'conventional' versions of the same food (as in the case of margarines fortified with plant sterols). Such nutritionally engineered, processed foods that contain functional doses of nutrients may well improve the nutritional profile – and decrease the

potential harmfulness – of these processed foods, in comparison with pre-engineered versions of the same processed foods. However it is not clear why the 'functional nutrients' contained in such 'functional foods' are not equally attainable – or even more readily attainable in appropriate quantities and forms – from whole foods or from an appropriately balanced whole-foods diet. The plant sterols added to cholesterol-lowering margarines, for example, are readily available in many plant foods.

Second, there is the implication that 'basic nutrients' – presumably the nutrients found in 'conventional' quantities in unmodified foods – are only capable of conferring a 'basic' standard of health. 'Functional foods', on the other hand, supposedly offer specific health benefits and are said to not just keep one 'healthy', but to actually impart an 'optimised' or 'enhanced' state of health of a kind that is presumably not attainable by eating the basic nutrients found in conventional quantities in conventional foods⁽⁵⁾.

An obvious problem with such definitions is that the kinds of health benefits claimed for 'functional foods' – such as 'an improved state of health and well-being and/or reduction of risk of disease'⁽⁵⁾ – are precisely the sort of health benefits typically associated with eating balanced diets made up of 'conventional' foods and that contain 'basic nutrients'. For example, it is widely accepted that eating plenty of fruits and vegetables reduces the risk of various diseases. Many traditional diets around the world are recognised and celebrated as being exceptionally health-giving. So where is the evidence of any additional health benefits that 'functional foods' provide over and above those attained from 'basic nutrition' or 'basic nutrients'?

Definitions that emphasise the superior nutrient profiles or enhanced health benefits offered by 'functional foods' are especially unconvincing where highly processed, nutrient-fortified foods are included as examples of 'functional foods'. As noted earlier, there is an apparent contradiction in definitions that refer to 'functional foods' as going 'beyond basic nutrients' yet also including unmodified/unprocessed foods in their definitions, given that such foods presumably only contain 'basic nutrients' in conventional quantities.

The suggestion that nutrition scientists and food technologists are able to identify and deliver the nutrients required for such enhanced health benefits also relies on an exaggerated claim as to the precision and accuracy of nutrition science and food engineering. I refer to this as the *myth of nutritional precision*, whereby the degree of precision of scientists' understanding of the relationship between nutrients, foods and the body at the biochemical level is greatly exaggerated, and the limitations and imprecisions of nutrition science are concealed or ignored. As Jacobs and Murtaugh have noted: 'We think it will be a long time before science unravels the complexity of nutrient interactions in the relation of foods to health'⁽¹¹⁾. The claim that nutrition scientists can define

the difference between some sort of ‘baseline’ or ‘adequate’ state of health on the one hand, and an ‘enhanced’ or ‘optimised’ state of health on the other, and that ‘functional foods’ can be designed to deliver such enhanced health benefits, relies upon and indeed promotes this myth of nutritional precision.

A related strategy used in an attempt to lend some rigour to the definition of ‘functional foods’ is to defer to the authority and precision of science as the ultimate arbiter of which foods qualify for inclusion in this category of food. The NCEFF definition, for example, focuses on the need for ‘good scientific evidence’ and the ‘strong underpinning of science’ for deciding which foods are defined as ‘functional’⁽⁸⁾. However, the emphasis on the scientific basis for identifying and defining ‘functional foods’ does nothing to further clarify or focus the definition. For the question remains, what particular types of health benefits is this scientific evidence being used to support? If the scientific substantiation relates to any nutrient or food component that may be present in or added to any type of food, then all foods could and probably do have ‘scientifically substantiated’ health benefits. This would once again render the term ‘functional foods’ essentially meaningless, since it provides no substantive way of distinguishing between functional and non-functional foods.

Functionally marketed foods

So are ‘functional foods’ simply those foods that are ‘promoted on a health platform’ and that are permitted to market health claims or at least nutrient-content claims? Most definitions tend to portray this functional marketing as a secondary aspect of these foods, in that they first assume that a ‘functional food’ exists in its own right – i.e. that its inherent characteristics can be identified and defined – prior to the act of marketing this food with health claims. The NCEFF definition, for example, includes ‘any food promoted on a health platform’ as one of a number of criteria, and they suggest that such health claims are based on ‘good scientific evidence’⁽⁸⁾.

It is the critics of ‘functional foods’ who tend to emphasise the centrality or primacy of marketing in the existence of ‘functional foods’. For example, Nestle argues that ‘functional foods are more about marketing than health’ and are ‘products created just so that they can be marketed using health claims’⁽¹²⁾. She provides a strong critique of ‘functional foods’ and the use of health claims in terms of the way they are used to promote processed foods of questionable nutritional value. However, she also relies on and repeats conventional definitions of the term⁽¹²⁾.

Less common are definitions that exclusively define ‘functional foods’ as those foods marketed with health claims. Katan and De Roos have suggested that: ‘A functional food is a branded food which claims explicitly or

implicitly to improve health or well-being’⁽¹³⁾. The US Congressional Committee report on ‘functional foods’ similarly defines them with reference to claimed – rather than actual – health benefits: ‘New, so-called functional foods are entering the market that provide the basic attributes of traditional foods – taste, aroma, or nutritive value – and that claim to provide an additional health benefit’⁽¹⁴⁾.

If ‘functional foods’ are to be defined as those foods permitted to carry health claims, then the use of this term would be dependent upon the particular food marketing regulations within a particular country or regulatory regime. Within the terms of this definition, what could be called a ‘functional food’ in one country may not be in another. There would therefore be no intrinsic criteria for identifying a ‘functional food’, as it would depend on the particular local regulations being applied. Whether or not such permitted health claims are based on ‘good’ and ‘strong’ scientific evidence would also depend upon local regulations and requirements for the substantiation of health claims.

Instead of ‘functional foods’, a more appropriate and accurate term for those foods marketed with health claims is ‘functionally marketed foods’. The term functionally marketed foods could in fact directly replace the term ‘functional foods’ in the majority of instances where the latter term is used. In the case where a food is marketed with nutrient-content claims, the term ‘nutritionally marketed foods’ could be used to replace the term ‘functional foods’. All functionally marketed foods are invariably also nutritionally marketed foods, in that they tend to carry nutrient-content claims to which the health claim is associated. With the emergence of the field of nutrigenomics, it may not be long before we even see the first *nutrigenomically marketed foods* on the supermarket shelves, which would essentially be another type of functionally marketed food. The term ‘nutritionally engineered foods’ can also be used alongside or instead of these other terms, to refer to foods that have had their nutrient profile directly engineered or modified.

Nutritionism and the blurring of the processed/unprocessed and food/medicine distinctions

The emergence and commercial success of nutritionally engineered, nutritionally marketed and functionally marketed foods needs to be understood in the context of what I refer to as the ideology or paradigm of ‘nutritionism’. Nutritionism is defined as where food is predominantly understood in terms of its nutrient profile and at the expense of other ways of understanding and contextualising the relationship between food and the body^(15,16). In particular, nutritionism is where the nutrient level or biochemical level of engagement with food and the body becomes the dominant level of understanding, such that this nutri-biochemical level does not merely supplement but comes to replace and at times to

contradict other ways of understanding food and dietary health. It is the dominance of the nutritionism paradigm within everyday and popular food discourses that, in the first instance, renders the lay public susceptible to the nutritional and functional marketing claims of the food industry.

One of the characteristics of the nutritionism paradigm is that, by focusing on food at the level of its nutrient and biochemical composition, and on the quantification of nutrients as the primary means of evaluating the relationship between food and the body, it transcends and blurs other important qualitative distinctions, such as the distinction between processed and unprocessed foods. While many individual processed food products (such as margarine) have been promoted for their health-promoting qualities on the basis of their nutrient profiles over the past few decades, the term 'functional foods' is an attempt to create an actual category of these supposedly health-enhancing processed foods. This category is thereby intended to cut across and to undermine the processed/unprocessed food distinction as a basis for evaluating the healthfulness of foods.

The nutritionism paradigm and the category of 'functional foods' also reach out across and blur the boundary between food and medicine⁽¹⁷⁾. Terms like 'nutraceuticals' and 'pharmafoods' highlight the extent to which such foods are perceived as or are marketed as having drug-like qualities. Lawrence and Germov refer to this in terms of the 'medicalisation' of food, one which involves transferring across to food the 'magic bullet' approach to disease characteristic of the dominant medical paradigm: 'The medicalisation of food involves treating food like a drug with therapeutic properties that are able to prevent disease. Such a view represents a pathologised and reductionist approach to health promotion and food consumption'⁽¹⁸⁾.

The idea of 'food as medicine' is not new of course. However, the more traditional or pre-modern approaches to 'food as medicine' involved recognising the medicinal properties of whole foods and utilising them in their received, whole or unprocessed form. By contrast the modern era has been characterised by a fragmentation of food and medicine at the biochemical level, and the development of distinct industries producing processed industrial foods, on the one hand, and chemical medicines on the other. In the contemporary era, 'functional foods' can be understood as a post-modern food category that represents a re-integration of processed industrial foods and chemical medicines, in the sense that it largely involves inserting chemical compounds into processed reconstituted foods.

For critics of 'functional foods', it is important to question not only the healthfulness of these foods and their contributions to public health. It is also necessary to challenge the category of 'functional foods' itself and the ideological role this category plays, and to develop more precise ways of categorising the range of increasingly

processed and reconstituted foods that now fill the supermarket shelves.

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