

Functional foods health claims

By Dr TEE E SIONG

The beneficial effects of functional foods must be scientifically substantiated.

A GREAT deal of attention is now given to the potential health significance of components other than nutrients that are found in foods. These bioactive components have been found to be able to serve physiological roles beyond provisions of simple nutrient requirements, and even reduce risk to chronic diseases.

Foods containing such components have been termed "functional foods".

Consumers are now more health conscious, especially in view of the increase in diet-related chronic diseases. There would certainly be a great deal of interest to see if some functional foods or ingredients can indeed help in reducing the risk of these diseases.

However, there must be adequate scientific proof that these functional foods do indeed provide beneficial health effects. All over the world, there are specific regulations that govern the types of health claims that are permitted to be made on functional foods.

I would like to share with readers two recent scientific meetings on functional foods that I participated in. The first was an International Life Sciences Institute (ILSI) Europe regional conference on functional foods. The second was a conference organised by Universiti Putra Malaysia.

In both meetings, I spoke on the global regulatory aspects of health claims on functional foods.

Other healthful components in food

Two main functions of food have conventionally been recognised. The primary function is to provide a variety of macro- and micro-nutrients to nourish the body. The secondary function is sensory functions, eg to provide tastes, flavours and texture to food.

There is now thought to be a third or tertiary function of food. This function pertains to regulating the physiological processes of the body, and even promoting health. In this new dimension in the relationship between food and health, this function is not performed by nutrients in foods, but rather by other components in food.

It is now generally recognised that foods do not merely provide nutrients. It has been shown that there is a large variety of bioactive or functional components in foods that are capable of promoting health. Many of these bioactive components have been shown to be able to serve physiological roles beyond those provided by "classical" nutrients such as protein, carbohydrate, fat, vitamins and minerals.

Characteristics of functional foods

To date, there is no unanimously accepted global definition of functional foods among the scientific community. Nevertheless, a generally accepted understanding is that functional foods are foods that provide health benefits beyond basic nutrition. This is by virtue of physiologically active (or bioactive) food components (functional ingredients) present in these foods.

Functional foods are similar in appearance to conventional foods and are intended to be consumed as part of a normal diet. They possess sensory characteristics including appearance, colour, texture, consistencies and flavours, and are not in the form of capsules and tablets. These are traditionally recognised as food, and are unlike herbs and other botanicals.

In recent years, the bioactive components in functional foods have been extracted, purified and added to various other food products. For example, plant sterol has been extracted from soya bean and added to milk powder. Another example is the addition of oligosaccharides such as inulin to various beverages.

In this way, the functional properties of these components are made available to the consumer through various vehicles that do not naturally possess such components.

The bioactive components have also been isolated and presented to the consumer in medicinal forms, eg capsules and tablets. In such forms, not associated with food, these products are appropriately known as nutraceuticals or health supplements.

Functional foods have featured prominently in food and nutrition scene internationally. The various regional branches of ILSI have been the main drivers of scientific activities in functional foods. There has been active research and development in function food products. Numerous conferences and other scientific meetings have been organised, and volumes have been published on the matter. Functional foods have been traded internationally and are huge businesses.

Common examples of functional foods

Soya beans contain a number of phytochemicals, and several of these have been studied for their anticarcinogenic activity. Isoflavones have been studied for their oestrogen properties and in relation to lowering blood cholesterol. Soya protein and phytosterols have been demonstrated to lower blood cholesterol.

High soya intake is associated with lowered risk for breast cancer and prostate cancer, whereas high soya and/or isoflavone intake has been reported to be positively associated with bone mineral density.

Flavonoids are a diverse group of polyphenol compounds found in various plant foods. The most important flavonoids in tea are flavanols and flavonols, eg catechins, many of which have been studied for their antioxidant properties.

The possible effects of these bioactive compounds in lowering risk for cardiovascular disease have been investigated, eg via lowering of blood cholesterol and blood pressure, protection against LDL cholesterol oxidation and reduction in platelet aggregation.

Broccoli and other cruciferous



Lycopene in tomatoes and papayas is an example of a carotenoid. It is not converted into vitamin A but may possess other physiological properties, eg as antioxidants.

vegetables (including cabbage, kailan and cauliflower) contain glucosinolates which are capable of being converted to a variety of hydrolysis products including isothiocyanates and indoles. These compounds have been studied for their capability in reducing risk to some cancers.

Another group of bioactive compounds found in many fruits and vegetables is carotenoids. Carotenoids give the bright orange colour to these plant foods. Lycopene in tomato and papaya is an example of a carotenoid. It is not converted into vitamin A but may possess other physiological properties, eg as antioxidants.

Several undigestible carbohydrates have been demonstrated to be able to impart beneficial effects on human health. As dietary fibre, these carbohydrates have lower energy value (< 4 kcal/g). Many of these can serve as prebiotics and bring about beneficial effects, including promoting the growth of beneficial bacteria and improving bowel health.

Several studies have also demonstrated the ability of several dietary fibres to lower blood cholesterol and blood sugar levels, and to improve calcium bioavailability and immune function. Several examples of these are the non-digestible oligosaccharides and polysaccharides, eg oligofructose, inulin, polydextrose, resistant starch.

Related to gut health is the role of another group of functional components, namely probiotics. Common examples of these beneficial bacteria are Lactobacillus and Bifidobacteria that have been demonstrated to improve gut health and possibly reduce the incidence of colon cancers. Probiotics are now added to yoghurt, fermented milk and milk drinks.

Health claims on functional foods

The term "functional foods" is currently not used in any of the relevant regulatory or legal systems. The approach by regulatory agencies towards these foods is there-

fore focused on health claims and their scientific substantiation.

There have been major worldwide regulatory developments in health claims, specifically "other function claims" and "disease risk reduction claims".

Other function claim describe specific beneficial effects of the consumption of a food bioactive or functional constituent in improving or modifying a physiological function, eg plant sterols help in lowering blood cholesterol.

Reduction of disease risk claims relate to the consumption of a food or food constituent to the reduced risk of developing a disease or health-related condition, eg soya protein reduces risk to heart disease.

In Malaysia, the term functional food is also not used. Nevertheless, other function claims for bioactive components are permitted in the current food regulations. A "positive list" approach is adopted by the authorities, meaning only claims on this list are permitted to be made by a food product. A total of 29 "other function claims" for food components (non-nutrients) are permitted (as of December 2010)*.

A large number of these bioactive components with approved function claims are non-digestible carbohydrates or dietary fibres. These include inulin, galactooligosaccharide (GOS), fructooligosaccharide (FOS), GOS:FOS (90:10) mixture, oligofructose-inulin mixture, beta-glucan, polydextrose, resistant dextrin and High Amylose Maize Resistant Starch.

Other components include sialic acid, isomaltulose, soya protein, plant sterols/sterol esters, a patented cooking oil blend, Bifidobacterium, lutein, docosahexaenoic acid/arachidonic acid.

Some of the permitted function claims include reducing or lowering cholesterol; maintaining a good intestinal environment; increasing intestinal bifidobacteria; lowering rise in blood glucose; improving intestinal immune system of babies; contributing to visual development.

For each of the approved function claims, specific conditions are required. One condition that is required for all claims is that a minimum amount of the relevant "food component" must be present. Additional labelling requirements may be required for some components, eg caution for some population groups. In some cases, the claim is restricted to selected foods.

It is to be noted that disease reduction claims are not permitted in Malaysia. A clear distinction is to be made between function claims and disease risk reduction claims. Two examples of function claims would be that beta-glucan from oat helps lower blood cholesterol and that calcium is important for bone and teeth formation.

Disease risk reduction claims for these two components, which are not permitted in Malaysia, would be: beta-glucan from oat helps reduce risk to heart disease and calcium reduces risk to osteoporosis.

All of the function claims related to bioactive food components have resulted from applications from the food industry. Indeed, there is continuing interest among the food industry to apply for new function claims. A framework has been established by the Food Safety and Quality Division of the Health Ministry to review applications.

More research on local functional ingredients

It can be noted that only a few of the permitted functional ingredients with health claims in Malaysia are of local origin. There is actually a rich flora and fauna in the country which are potential sources of a large variety of functional foods or bioactive components that may be beneficial in promoting health.

However, the safety and health benefits of these local ingredients should be clearly demonstrated before being marketed to the consumer.

Marketing of functional foods often runs ahead of scientific substantiation. There are various claims of beneficial effects of specific ingredients or foods without proper scientific proof. To be accepted in the world market, intended claims must be scientifically substantiated.

The local scientific community could carry out research on this topic, to gather the required scientific data to support efforts to develop and market these functional foods and ingredients. Collaborations between the industry and academia will be most essential for the future development and advancement of local functional foods.

Advice to consumers

Some functional foods and ingredients may indeed possess beneficial effects on health. Consumers should indeed consume a variety of foods (particularly plant foods) so as to obtain a variety of nutrients as well as functional ingredients.

It must, however, be emphasised that these foods alone are not going to prevent chronic diseases. Functional foods must be consumed as part of a daily diet. There is no such thing as a magic bullet or super food to prevent or cure chronic diseases; indeed, foods do not cure diseases.

The best advice for consumers is to:

- Enjoy a variety of foods;
- Eat balanced meals;
- Eat in moderation, and
- Be physically active!

*Details of all the health claims permitted by the Food Safety and Quality Division of the Ministry of Health Malaysia can be viewed from:

http://fsq.moh.gov.my/v3/index.php?option=com_k2&view=item&id=262:guide-to-nutrition-labelling-and-claims-2010&Itemid=134

■ Dr Tee E Siong pens his thoughts as a nutritionist with over 30 years of experience in the research and public health arena. For further information, e-mail starhealth@the-star.com.my.