Medical Edibles

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Among the neologisms in the field of nutrition that have entered the lay vocabulary are the synonyms "designer food," "functional food," and "nutraceutical." These expressions, as well as "pharmafood," refer to foods whose constituents include naturally occurring compounds that (a) are customarily considered neither nutrients nor toxins and (b) may contribute to preventing or curing disease. Related expressions include "medical food," "nutrichemical," "optimum food," "phytochemical," "phytomin," "phytonutrient," and "therapeutic food." But common usage has created a definitional morass:

* The Food and Nutrition Board of the American Institute of Medicine defined "functional food" in 1994, as "any modified food or food ingredient that may provide a health benefit beyond the traditional nutrients it contains." But "functional food" sometimes also refers to foods and parts of food in their natural state that may have health-related utility beyond that attributable to substances categorized conventionally as nutrients. Moreover, the expression sometimes refers to medical foods products that, traditionally, are designed exclusively, excepting any fiber ingredients, for health benefits associated with substances categorized according to custom as nutrients. Indeed, "functional food" has become a catchall whose meaning is in flux, and the items to which it may refer include processed foods, products of recombinant DNA technology, processed extracts of food, unprocessed foods, and unprocessed food components.

* Stephen L. DeFelice, M.D., founder of the Foundation for Innovation in Medicine, coined the word "nutraceutical" for "a food or parts of food that offer medical health benefits, including prevention and/or treatment of disease." According to this definition, "nutraceutical" may refer to a food in its natural state (e.g., broccoli or raspberries), a processed and/or bioengineered food (e.g., a vegetable genetically engineered to produce a vaccinelike substance), or a food constituent or extract. But, as the word suggests, it may also refer to a dietary supplement: The July 20, 1998, issue of Drug Store News quoted DeFelice: "'Dietary supplement' is a legal term; there is no scientific definition for it. . . . The difference between a nutraceutical and a nutritional supplement is that the nutraceutical will have the clinical data behind it to permit disease claims. . . ."

* A related catchword, "phytochemical," has an even more expansive meaning.
The prefix "phyto-" means "plant," and, technically, "phytochemical" means "a chemical produced by a plant." But "phytochemical" usually denotes only certain plant chemicals that researchers regard as having preventive and/or therapeutic potential. Moreover, sometimes the word denotes only those plant chemicals that (a) are constituents of fruits and vegetables and (b) may have anticancer potential (in which case the phytochemicals are sometimes termed "chemopreventive agents").

"Medical food" primarily denotes prepackaged nutritional preparations that (a) are used preventively or therapeutically (typically adjunctively) and (b) have been neither tableted nor encapsulated (e.g., the beverage Ensure). The U.S. Food and Drug Administration, in brief, has defined medical foods as food products (a) formulated for the management of a condition for which distinctive nutritional requirements have been established, and (b) intended for use only under a physician's monitoring and only by patients receiving regular medical attention. But the definition of "medical food" has been expanding, and consumers may obtain some products traditionally categorized as medical foods directly from drugstores and supermarkets.

In 1995 the first international conference on functional foods was held, in Singapore. Alimentary items that were foci of presentations there included cranberry juice, dietary fiber, fermented dairy products, fish oils, garlic, green and black tea, mushrooms, oligosaccharides (small sugar-containing compounds), Panax ginseng, "protective" micronutrients, rice bran oil, tempeh (a fermented-soybean product), and turmeric (a spice). Representatives of China's Institute of Food Safety Control and Inspection stated that "an estimated 3000 varieties of so-called functional food products (referred to as health food in China)" were on the market in their country.

Should One Take Broccoli with a Dash of Sulfurophane?

Despite definitional chaos, functional foods and the like have elicited considerable interest among consumers, manufacturers, marketers, clinicians, and scientists. Research on which food constituents are potentially preventive and on how to optimize their dietary presence can, theoretically, yield substantial public health benefits. In theory, proper eating habits, proper exercising, and maintaining an appropriate weight can together prevent at least 30 percent of cancers. Most of the evidence concerning the relationship between human nutrition and carcinogenesis concerns whole foods rather than food constituents or dietary supplements. If consuming at least five servings each of fruits and vegetables daily became the rule in the U.S., cancer incidence might drop by more than 20 percent. Comprehensive healthful dietary practices plus avoidance of smoking could without functional foods reduce cancer risk by as much as 60 to 70 percent. Evidence concerning the relationship between common food constituents and other diseases for example, various lipids and atherosclerosis, potassium and hypertension, and fiber and diabetes has also been accumulating encouragingly. The numerous phytochemicals getting
scientific attention as potential medicines and preventives include the food constituents listed below.

* Allyl sulfides constituents of garlic, onions, and other plants of the genus Allium may contribute to preventing stomach and colon cancers.
* Capsaicin source of the hotness of jalapenos and other peppers of the genus Capsicum may be anticarcinogenic.
* Conjugated linoleic acid (CLA) a component of certain fats and oils [See Priorities, Vol. 8, No. 4, 1996, pp. 44–47] may contribute to preventing atherosclerosis and certain cancers.
* Ellagic acid a constituent of berries, grapes, and nuts may be anticarcinogenic.
* Indoles, isothiocyanates (which are responsible for the hotness of horseradish), and sulfurophanes (sulfur compounds) constituents of broccoli, cabbage, and other cruciferous vegetables may be anticarcinogenic.
* Isoflavones legume and soybean constituents that resemble human estrogen may contribute to preventing heart disease and some cancers.
* Lignin a noncarbohydrate dietary fiber that is a major component of the cell walls of certain plants may contribute to preventing breast and ovarian cancers.
* Lycopene a red pigment that occurs in pink grapefruit, tomatoes, and watermelon may contribute to preventing cardiovascular disease and prostate cancer.
* Probiotics substances conducive to the growth of microorganisms may contribute to improving digestion.

Although phytochemical research is promising, drawing conclusions is very tricky. That a food extract or purified food component exhibits, say, anticarcinogenic properties in vitro (outside organisms) or in animals does not entail that it has anticancer utility in humans. Moreover, humans ordinarily ingest very many compounds at the same time, and interactions among “functional components” can have unexpected health consequences. For example, taking a compound labeled as an antioxidant in large amounts or with other such compounds can render the "antioxidant" a pro-oxidant. Also, concentrations of phytochemicals in a given food can vary significantly; thus, standardization of extracts may be desirable.

The trouble is, information concerning what intakes of phytochemicals are optimal for healthy humans is almost nonexistent. Until and probably even long after such becomes adequate, one's phytochemical emphasis indeed, one's dietary emphasis should be on consuming whole foods in considerable variety.

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Medicinal Margarine?

A cholesterol-reducing canola-oil margarine developed (and popular) in Finland will soon become available from American groceries nationwide. Research on a small group of Finnish adults whose serum cholesterol levels were slightly above normal has suggested that using this special margarine as a partial replacement for the ordinary fats that one usually consumes can significantly reduce serum cholesterol. The subjects in this study did not know whether they were eating the special margarine, whose Finnish trade name is "Benecol," or a placebo (ordinary margarine). There was a reduction in both total blood cholesterol and LDL ("bad") cholesterol in those who consumed Benecol during this yearlong phase of the study. Most of the reduction occurred within the first three months. After this year the subjects resumed eating as they were accustomed, and their cholesterol returned to "pre-Benecol" levels.

What seems at least partly responsible for the cholesterol reduction is Benecol's distinguishing ingredient: a cholesterol relative technically known as "sitostanol ester." Sitostanol ester apparently works by preventing the absorption of some of the cholesterol in the intestinal tract. The conductors of the Finnish study stated that, according to scientific findings, sitostanol ester appears more effective at preventing the absorption of dietary cholesterol than at preventing the absorption of the cholesterol in bile.

Thus, ingesting sitostanol ester as an ingredient of certain foods may contribute to serum cholesterol reduction in persons whose cholesterol levels are above normal at least partly because of their cholesterol intakes. Whether ingesting sitostanol ester can lower cholesterol in hypercholesterolemic persons whose intake of cholesterol is inappreciable, or whose hypercholesterolemia is genetic, remains to be seen.

It is important to emphasize that Benecol was not simply added to the diets of the Finnish subjects but rather replaced part of fat they usually ate. Furthermore, although the decreases in total and LDL cholesterol were significant, they were not tremendous. For example, in one group total cholesterol dropped by about 10 percent from 234 to 210 milligrams per deciliter over one year.

Then there is the matter of price. In Finland, Benecol costs about six times as much as ordinary margarine.

Of course, just decreasing one's intake of saturated fat and cholesterol could do the trick.

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