

Phytochemicals and Functional Foods: Super Foods for Optimal Health

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That food is intimately linked to optimal health is not a novel concept. “Let food be your medicine and medicine be your food” was a tenet espoused by Hippocrates in approximately 400 B.C.¹ Almost 2,500 years later, this philosophy is once more of utmost importance, as it is the “food as medicine” philosophy that is the core of functional foods.

What are Phytochemicals and Functional Foods?

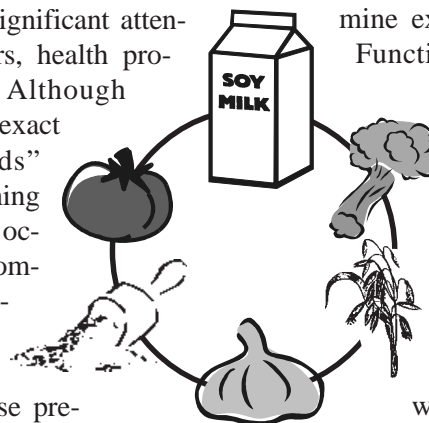
“Phytochemicals and functional foods” is a broad term that has attracted significant attention from scientific researchers, health professionals, and journalists. Although there is no consensus on an exact definition, “functional foods” usually refers to foods containing significant levels of naturally occurring, biologically active components that impart health benefits beyond the basic essential nutrients. These components may play a vital role in disease prevention and health promotion, but there is no Recommended Daily Allowance for them. Such substances may have a defined effect on a person’s physical, mental, or physiological well-being. They could impact people’s metabolism and immune systems, protecting them from disease. They

could also affect their risk of heart disease, cancer, or other illnesses,² as well as aging and mood.

Are Phytochemicals and Functional Foods New?

Functional components have always been present in foods. While functional foods are a relatively new phenomenon in Western cultures, traditional Chinese medicine recognized functional foods as early as 1000 B.C.³ What is new is that researchers are beginning to identify these components and they are now trying to determine exactly what benefits they may offer.

Functional attributes of many traditional foods are being discovered, while new food products are also in development to enhance or incorporate beneficial components. Health food stores already are filled with numerous foods that would meet the definition of functional foods, and grocery stores are now trying to compete. Many vegetables, fruits, whole grains, and soy foods have been recognized for their potential cancer prevention benefits in innumerable studies.^{4,5,6} Growing consumer interest in the relationship between diet and health has produced an increased demand for information. In the past, many of the perceptions about healthy eating



have focused on avoiding certain components in foods, such as fat and sugar. An important and gradual change toward more positive messages has occurred in the healthy eating market. In recent years, the focus of nutritional research has shifted from the prevention of nutritional deficiencies, such as vitamin C and scurvy, or niacin and pellagra, to prevention of chronic diseases. Among factors fueling U.S. interest in phytochemicals and functional foods are rapid advances in science and technology, rising healthcare costs, consumer frustration with health care delivery, an aging population, changes in food laws allowing expanded label claims, and a focus on attaining wellness through diet.

Credible scientific research already indicates potential health benefits from food components that would expand the benefits now allowed to be identified by the Food and Drug Administration's approved health claims permitted into labeling.

Phytochemicals and functional foods components have been associated with the prevention and/or treatment of at least four of the leading causes of death in this country, cancer, diabetes, cardiovascular disease, and hypertension, along with the prevention and/or treatment of other medical ailments including neural tube defects, osteoporosis, abnormal bowel function, and arthritis.⁷

There is an increasing recognition that people can help themselves and their families prevent future illness and maintain their state of health and well-being through informed, dietary practices.⁸ However, due to the complex mechanisms of cancer and cardiovascular disease, prevention will rely on more than a single compound. Researchers have just scratched the surface of the identification of various compounds, their disease preventive properties, and their efficacy against certain diseases. Many questions still remain. Although the mechanisms of action in a variety of phytochemicals have been uncovered, many more need to be investigated.⁹

The National Cancer Institute estimates that one in three cancer deaths are diet related and that 8 of 10 cancers have a nutrition/diet component.

These figures alone suggest that the potential impact of phytochemicals and functional foods on the health of Americans is worth examining.

What Specific Foods Might Have Functional Components?

Examples of Phytochemicals and Functional Foods:

Oats contain beta glucan, a soluble fiber which may help reduce the risk of cardiovascular disease via the lowering of blood cholesterol, a recognized risk factor for cardiovascular disease.



Garlic are rich in allicin and related compounds, it appears to lower cholesterol levels and blood pressure. These compounds may also stimulate immune function and slow the growth of cancer cells.



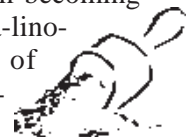
Tomatoes get their red color from lycopene, a carotenoid that fights the uncontrolled growth of cells into tumors. Consumption of tomatoes and tomato products such as sauce, catsup, and tomato paste may reduce risk for cancer of the colon, prostate, bladder, and pancreas.



Soy Products (tofu, tempeh, soy milk, miso, etc.) contain genistein and other cancer-fighting isoflavones. These compounds suppress formation of blood vessels that feed cancer cells and interfere with the body's synthesis of estrogen, possibly reducing the risk for breast, ovarian, and prostate cancer.



Flaxseed contains lignans, powerful antioxidants that are believed to stop cells from becoming cancerous. It also contains alpha-linolenic acid, the plant version of omega-3 fatty acids that may reduce the risk of heart disease.



Broccoli contains indoles that may protect cells from damage by carcinogens and help the liver inactivate estrogen-like compounds that may promote breast cancer.



At this point, scientific data is incomplete to argue that any one food prevents or cures disease. Experts agree that scientific evidence related to functional foods is still unfolding. The best dietary advice is to follow the recommendations of the food guide pyramid and consume at least the minimum of three vegetables and two fruits per day, whole grains, soy foods, and dairy foods that contain both known beneficial compounds and those still awaiting discovery.

PROMISING PHYTOCHEMICALS

These foods:	Contain:	May Help Prevent:
Cruciferous: broccoli, cauliflower, brussels sprouts, greens, cabbage, dark leafy greens, spinach, kale, etc.	organosulfur compounds glucosinolates	cancer
Broccoli	sulphorophane	breast cancer
Green tea	polyphenols	cancer
Celery	butylphtalide	high blood pressure
Soy foods: soybeans,	isoflavones	cancer
Tofu, soy milk, soy flour, veggie burgers	(phytoestrogens) saponins	heart disease
Tomatoes and watermelon	lycopene*	cancer (prostate cancer) heart disease
Allium vegetables: onions, garlic, scallions, leeks, chives	allium compounds	cancer heart disease
Grapes, strawberries, cranberries, nuts, blackberries, raspberries	ellagic acid*	cancer
Red grape juice, red wine	resveratrol*	heart disease cancer
Orange fruits, vegetables, and dark greens: carrots, sweet potatoes, wintersquash, pumpkin, mango, cantaloupe, spinach	beta-carotene*	cancer
Citrus fruits	monoterpenes	cancer
Flaxseed	lignans omega-3 fatty acids	cancer heart disease
Nuts, vitamin E	omega-3 fatty acids	heart disease
Onions, kale, broccoli, red grapes, cherries, apples, cereals	quercetin	cancer heart disease

*Several different classes of compounds are very potent antioxidant and free radical scavengers.

Source: Vegetables, fruit and cancer prevention/Amer. Diet Assoc. 1996; 96: 1027-1039, Phytochemicals. Amer. Diet Assoc. 1997;97(suppl 2): s199-s204. B. Clevidence, Ph.D., USDA Phytonutrient Laboratory

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