

The Super Food Solution?

“Let food be thy medicine and medicine be thy food.” - Hippocrates.

We have long known that foods contain the nutrients we need to sustain life. But nutrition and food scientists are continually finding new beneficial components in food that help keep us healthy and prevent the development of diseases. Today, nutritionists describe foods that are rich in certain "ingredients" that may provide a health benefit beyond the traditional nutrients it contains as "functional foods".(1 These functional food ingredients are sometimes described as "quasi nutrients" and are best exemplified by two main groups, the *phytonutrients* and the *zoonutrients*.

Indeed, the concept of what benefits foods can provide is changing. The previous emphasis on health maintenance through recommended nutrient allowances and dietary guidelines has evolved into a focus on the promising use of foods to promote optimal health and reduce the risk of chronic diseases, (2

The Phytonutrients

A significant direction of the effort to understand the health benefits of plant foods and the basis for the creation of functional foods, sometimes called nutraceuticals and designer foods, is the characterization of their physiologically active constituents, phytonutrients. It has long been appreciated that food plants contain significant levels of low molecular weight, secondary metabolites with important roles for plant protection.(3 Only recently has their role in optimizing human health been appreciated.(4

Phytonutrients have been demonstrated to provide the following physiological effects:

- facilitate cell-to-cell communication,(5
- modify cellular receptor uptake of hormones,(6
- convert to vitamin A,(7
- repair DNA damage from toxic exposure, (8
- detoxify carcinogens through the activation of the cytochrome P450 and Phase II liver enzyme systems, (9
- serve as antioxidants to help prevent various forms of cancer, (10
- cause apoptosis (cell death) in cancer cells, (11
- enhance immune response, (12
- help prevent cardiovascular disease, (13
- help prevent osteoporosis, (14
- help prevent macular degeneration and cataracts. (15

To demonstrate how strongly consideration for the physiological importance of phytonutrients has become, consider the following from the [Pennington Biomedical Research Center](#):

The “Dietary Approaches to Stop Hypertension “(DASH) diet substantially lowers blood pressure and reduces blood lipid levels. The DASH diet menus were designed to reach beneficial levels of fiber, potassium, magnesium, and calcium, and therefore contain more fruits, vegetables, and whole grains relative to the control menus, and indecently more phytochemicals. Using the [USDA](#) food composition databases, the polyphenol,

carotenoid, and phytosterol contents of the diets used in the DASH study were estimated. When compared with the control diet, the DASH diet is higher in flavonols, flavanones, flavan-3-ols, beta-carotene, beta-cryptoxanthin, lycopene, lutein+zeaxanthin, and phytosterols. Flavone levels are similar, whereas isoflavones are present in a small amount in the DASH diet. The roles of these compounds in disease risk reduction are becoming recognized. *It therefore is possible that the health benefits of the DASH diet are partially attributable to the phytochemicals and might extend beyond cardiovascular disease risk reduction.*(italics mine)(16)

The Zoonutrients

Just as plant foods may provide phytonutrients, animal foods may also contain protective substances called zoonutrients. Zoonutrients are food molecules that have been shown to modify multiple physiological functions including anti-inflammatory, anti-hypertension and antimicrobial actions, stimulation of beneficial bacteria, the maturation of intestinal cells, and the education of the immune system.(17)

The now somewhat familiar anti-inflammatory, anti-clotting and triglyceride lowering effects of the oils of cold water fish is an attribution of the zoonutrient EPA/DHA.

In Chicago Oct., 1997, the International Whey Conference reported the following 7 findings concerning the zoonutrients in whey:

1. Very low molecular-weight whey peptides help prevent cancer and heart disease.
2. Three whey peptides (BSA, alpha-lactalbumin and lactoferrin) boost immune status by increasing the body's main cellular protector: glutathione.
3. Whey protein, by increasing thymus development, reduces colon cancer in rats.
4. One powdered whey supplement in conjunction with photodynamic therapy reduced tumor size by 60% in rats.
5. Whey peptides (lactoproteins) aid dieting by dramatically increasing the release of cholecystokinin (CCK), an appetite suppressant.
6. Three whey peptides (lactoferrin, lactoperoxidase and immunoglobulin) act as antibacterial preservatives and free radical scavengers.
7. Whey contains growth factors (IGF-I and II) proven to assist in gut and wound healing, inside and out. (Note: colostrum is even more powerful in this aspect.)

The ADA on the Value of a Varied Functional Food Rich Diet

In its 1995 report on functional foods the American Dietetic Association concluded the following:

The weight of scientific evidence indicates that the optimal approach for achieving a health benefit from the intake of nutrients and other physiologically active constituents is through the consumption of a varied diet that is rich in plant foods. In reality, each vegetable contains numerous different nutrients and phytochemicals—a biologic circumstance that is not currently replicated in pill form.

Nutrients and other bioactive food components that occur naturally in foods act synergistically with other dietary elements...dietetics professionals have a unique opportunity to promote whole foods.... In addition...functional food products can be developed that further enhance the health benefits of food... *a combined functional food and food supplement approach may afford the greatest protection (italics mine)...*

The strongest scientific evidence of clinical efficacy is for... foods naturally rich in soluble fiber...associated with reduced incidence of coronary heart disease ... fruits and vegetables and the association (with) reduced risk for cancer or coronary heart disease . Soy protein and the (phyto)sterol and stanol esters are additional examples for...health claims regarding cholesterol reduction or cardiovascular disease risk reduction...

Other functional foods may (now) have a qualified health claim such as nuts. Examples include n-3 fatty acids found in fish, which have been shown in clinical trials to reduce serum cholesterol levels in subjects with elevated levels. Garlic may also reduce cholesterol levels...

Clearly, dietetics professionals can no longer evaluate foods solely in terms of macro- and micronutrient content. Consideration of other physiologically active components...will be necessary...*In the future, a wide range of select foods may be "prescribed" to enhance the health of an individual (italics mine)*. This is a shift from our earlier employed nutrition education approach that focused on limiting intake of foods high in "unhealthful" components such as fat and cholesterol. (18

In the ADA summary concludes:

Never before has the focus on the health benefits of food or food components been so strong. The philosophy that food can have health-promoting properties that go beyond its traditional nutritional value is well known among scientists and health professionals. *Dietetics professionals are uniquely qualified and positioned to translate scientific evidence into practical dietary applications for consumers...*Increasing the availability of health-promoting foods in the US diet will help to ensure a healthier population. Dietetics professionals must be leaders in this evolving area of food and nutrition (*italics mine*).

The Super Food Solution?

Parallel with the scientific evidence for and professional interest in functional foods, consumer interest in and awareness of functional foods and the associated health benefits is high. (19, 20, 21). *Unfortunately such interest does not necessarily readily translate into compliance*. Perhaps the greatest current potential is in "dietary supplementation" via good tasting meal replacements, bars, and drinks requiring no or minimal preparation, formulated from functional meal foods. These "designer food" ingredients would be macronutrient, micronutrient, phytonutrient, and/or zoonutrient dense whole food based functional foods, recommended by a trusted and informed source, namely health professionals, and based on both present clinical needs and life long wellness goals. For the public, such nutrient dense snacks, meals and drinks might be rightly dubbed "super foods".

1) http://www.arcommunities.org/volunteers/Volunteer_Leader_Training_Guide/2002/Functional_Foods.asp , University of Arkansas, Div of Agriculture)

2) http://www.eatright.org/Public/GovernmentAffairs/92_adap1099.cfm

3) Clare M. Hasler² and Jeffrey B. Blumberg* Functional Foods for Health Program, Department of Food Science and Human Nutrition, University of Illinois, Urbana, IL and * Jean Mayer USDA Human Nutrition Research Center on Aging, Tufts University, Boston, MA

4) Maher, J Scientific Phytonutrition and the Standard American Diet: A Proposed Realistic Solution, Part I, Dynamic Chiropractic, June 3, 2002, Volume 20, Issue 12

5.) Kelly GS. Larch arabinogalactan: clinical relevance of a novel immune-enhancing polysaccharide. *Altern Med Rev* 1999;4(2):96-103.

6.) Potter SM. Overview of proposed mechanisms for the hypo-cholesterolemic effect of soy. *J Nutr* 1995 Mar;125(3 Suppl):606S-11S.

7.) Shiels ME, et al. *Modern nutrition in health and disease*: 8th ed. Philadelphia: Lea & Febiger 1994. p 290.

8.) Jenkinson AM, et al. The effect of increased intakes of polyunsaturated fatty acids and vitamin E on DNA damage in human lymphocytes. *FASEB* 1999 Dec;13(15):2138-42.

9.) Persky V, Van Horn L. Epidemiology of soy and cancer: perspectives and directions. *J Nutr* 1995;125(3 Suppl):709S-12S.

10.) Steinmetz KA, Potter JD. Vegetables, fruit and cancer prevention: a review. *J Am Diet Assoc* 1996 Dec;96(10):1027-39.

11.) Mo H, Elson CE. Apoptosis and cell-cycle arrest in human and murine tumor cells are initiated by isoprenoids. *J Nutr* 1999 Apr;129(4):804-13.

12.) Zhang R, et al. Enhancement of immune function in mice fed with high doses of soy daidzein. *Nutr Cancer* 1997;29:24-8.

13.) Gaziano JM, et al. A prospective study of consumption of carotenoids in fruits and vegetables and decreased cardiovascular mortality in the elderly. *Ann Epidemiol* 1995 Jul;5(4):255-60.

14.) Head KA. Ipriflavone: an important bone-building isoflavone. *Altern Med Rev* 1999 Feb;4(1):10-22.

15.) Seddon JM, et al. Dietary carotenoids, vitamin A, C, and E, and advanced age-related macular degeneration: eye disease case-control study group. *JAMA* 1994 Nov 9;272(18):1413-20.

16) Most MM., Estimated phytochemical content of the dietary approaches to stop hypertension (DASH) diet is higher than in the Control Study Diet. FADA, Pennington Biomedical Research Center, 6400 Perkins Rd, Baton Rouge, LA 70808-4124, USA.

17) J. B. GERMAN, Dept. of Food Science & Technology, Univ. of California, Davis, 1 Shields Ave., Davis, CA 95616

18) http://www.eatright.org/Public/GovernmentAffairs/92_adap1099.cfm

19) Americans' Food and Nutrition Attitudes and Behaviors—American Dietetic Association's Nutrition and You: Trends 2002, 2004. Press Release. Available at: http://www.eatright.com/Public/Media/PublicMedia_10240.cfm. Accessed January 8.

20) The consumer view on functional foods: Yesterday and today. *Food Insight* 2002; 5-6. May/June

21) International Food Information Council (IFIC) Foundation. Food for Thought IV Reporting of Diet, Nutrition and Food Safety Executive. 2001 vs. 1999 vs. 1997 vs. 1995, IFIC Foundation, Washington, DC 2002.