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## "Let Food be Thy Medicine"

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### Current Health and Eating Trends



Americans are increasingly more health-conscious, and much of this attention is focused on what they eat. Some of the reasons for this trend are an aging population, increased access to knowledge through the Internet and other media, and the popularizing of results from numerous nutrition studies. "Baby-boomers," born between 1946 and 1964 (you can remember this by reversing the last two digits), are in their peak earning years and are benefiting from extraordinary economic growth. Another reason is that Americans are expanding their view of health care from "corrective" medicine (seeing doctors when a problem arises) to include "preventive medicine" and self-care through eating and exercise. Nine out of ten shoppers now believe that healthy eating plays a key role in disease prevention. One in three Americans is now more likely to treat him or herself through food purchases than a year ago. The desire to ensure overall good health, rather than balanced nutrition or even lower fat, is now the No. 1 factor that motivates healthy food purchase decisions. In addition, many Americans are realizing that health problems are widespread in the US: The World Health Organization reports that more than half the adult population is overweight, a quarter are clinically obese, 27 million Americans under age 19 are plagued by high cholesterol levels, 50 million Americans age 6 and older have high blood pressure, and there are 800,000 new cases of diabetes per year.

Nutrition plays a significant role in maintaining health and preventing chronic disease is supported by numerous studies. The National Cancer Institute lists possible cancer-preventive foods and ingredients in a pyramid (*Figure 1, below*). Generally, there is a multitude of phytochemicals ("phyto" means "plant") present, most of which are believed to have cancer-preventive properties. Many of the phytochemicals involved are antioxidative in nature, meaning they prevent deleterious effects of oxidation, as well as carotenoids, such as beta-carotene in carrots and sweet potatoes. A review of approximately 200 studies on the relationship between fruit and vegetable intake and various cancers concluded, "major public health benefits could be achieved by substantially increasing consumption of these foods". Diet is believed to play an important role in the four major health threats of our society-cardiovascular (heart and artery) diseases, cancer, hypertension, and obesity. The National Cancer Institute estimates that 35 percent of cancer deaths may be related to dietary factors, and that more cancer deaths are attributable to diet than to any other cause, including tobacco and alcohol. Since 1992, the National Cancer Institute and the Produce for Better Health Foundation, Inc. has been sponsoring the "5-A-Day" Program, which encourages consumers to consume at least 5 servings of fruits and vegetables daily. "5-A-Day" promotion stickers can be seen in the produce section of many grocery stores, including the local Meijer grocery stores. In 1992, the National Cancer Institute's (NCI) Diet and Cancer Branch assigned \$20 million for 5 years to study, assess, and develop experimental processed foods that are supplemented with food ingredients naturally rich in cancer-preventing substances, i.e., aged garlic extract, licorice extract, citrus juice, a mixed-vegetable beverage, and soybean meal.

### The Nutraceutical Market

For the above reasons, and many more, there is an explosion of consumer interest in the health-promoting and disease-preventive effects of foods. These foods have been given several names, such as "functional foods," "nutraceuticals," "healthy foods," "healthful foods," and "wellness

foods." The Institute of Medicine's Food and Nutrition Board defined functional foods as "any food or food ingredient that may provide a health benefit beyond the traditional nutrients it contains". Another working definition is that functional foods are foods or food components that provide a health benefit beyond basic nutrition. A shorter definition is a food that has medicinal effects. We should not assume that health benefits of foods are a new discovery--Hippocrates recommended 2,500 years ago, "Let food be thy medicine and medicine be thy food."

The term "nutraceutical" was coined by The Foundation for Innovation in Medicine in 1989, and is becoming a standard term in the medical and scientific industries. Following are examples of functional foods, or nutraceuticals.

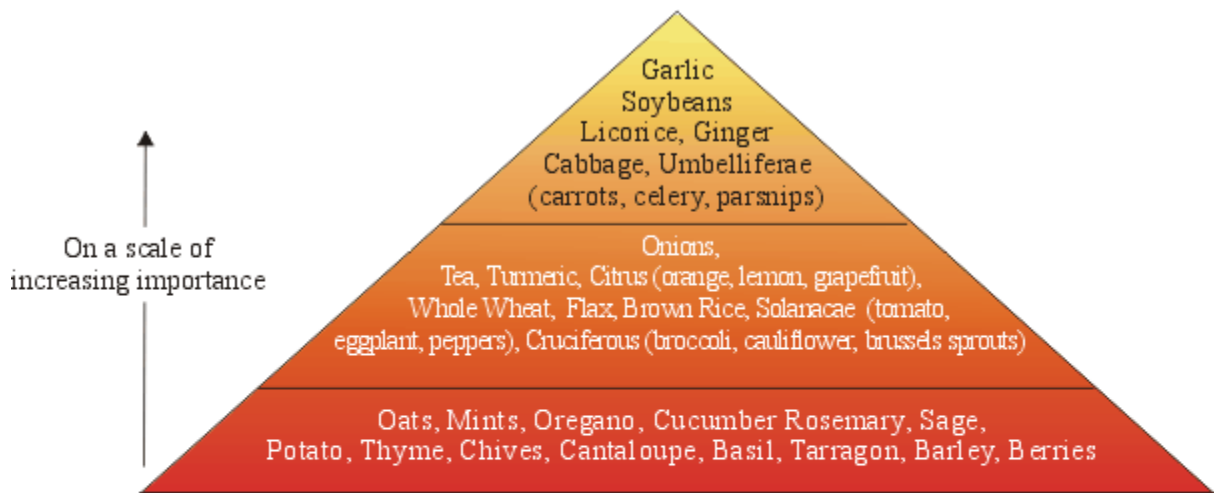
*Grains:* The US Food and Drug Administration awarded the first food-specific health claim in January 1997, in response to a petition submitted by the Quaker Oats Company. The claim relates consumption of oat bran to reduced risk of coronary heart disease (CHD).

*Fruits:* In a study at Tufts University, blueberries were shown to have an anti-aging and memory-improving effect in rats. Blueberries have the highest antioxidant activity of 42 fruits and vegetables. Blueberries and cranberries have been credited with preventing urinary tract infections. Orange juice fortified with calcium and vitamins C & E have significantly increased sales over the past year. Tart cherries have anti-inflammatory compounds, and contain antioxidants, which may slow aging processes.

*Vegetables:* Tomatoes contain lycopene, which becomes more available to the body after tomatoes are heated, such as in canned tomatoes and ketchup. Increased consumption of lycopene has been inversely associated with cancer of the prostate, breast, digestive tract, cervix, bladder, and skin. Lutein and zeaxanthin, found in spinach and other deep-green vegetables, are associated with a substantially reduced risk of developing macular degeneration. Lutein is being added to a variety of foods. Other nutraceuticals include tea, Bifidobacterium and/or Lactobacillus in yogurt, soy, ginseng, ginkgo biloba, omega-3 fatty acids from fish and flaxseed, garlic, wine, and conjugated linoleic acid from beef.

The US market for functional foods was \$19.6 billion in 1999; it is expected to triple by 2010, and constitute 10% of the total food market. Nearly two-thirds of grocery shoppers report that their purchase decisions are driven by their desire to either reduce the risk of, or manage, a specific health condition. The food industry has taken notice of the nutraceutical market. ConAgra, Kellogg, McNeil, ADM, Dupont, Cargill, and Campbell Soup have established nutraceutical divisions or full-scale research centers. Nor is the nutraceutical market only in the US. Quite the contrary, other countries are well ahead of the US in this area. Because of their longer history and cultural traditions, Japan and many European countries already have established their nutraceutical industry, while the US is just beginning. The Germans have studied many herbal products, for example, from a nutraceutical perspective. Some US companies buy raw materials from Europe because the US supply is insufficient to meet demand. Examples include the bilberry, chokeberry, and elderberry. Michigan is in a strategic position to benefit from the nutraceutical market. Michigan grows more than 100 different crops, second only to California. About half of the population of the United States and Canada lies within 500 miles of Michigan, providing convenient access to markets. Michigan's food and agriculture industry is second only to the automotive industry in economic importance, and employs over 500,000 citizens. The average yearly output from 1997 to 1999 of Michigan fruits was valued at \$235 million, and that of vegetables at \$177 million. In summary, Michigan has the raw material, the work force, and the nearness to markets to create a new nutraceutical industry.

Future articles with the need for process and product development research in the nutraceutical area, and discuss some of MSU's efforts in this area. If you have any questions or would like more information contact [Dr. Kirk Dolan](#) at Michigan State University.



**Figure 1. Possible Cancer-Preventive Foods and Ingredients**

Over the past decade, more than forty foods have been identified as having cancer preventative properties. The six foods at the top of this pyramid are at the center of the National Cancer Institute's Experimental Foods Program.

Ref: Food Technology, April, 1992