body is more important than money or anything else in life. Hence, people have aimed to achieve a better quality of life by eating more fruits and vegetables, taking dietary supplements or nutraceuticals or using nutritional therapy or phytotherapy to replace chemotherapy or radiotherapy. Scientific studies also have expanded to these areas and have given support to many of nutraceutical foods. Furthermore, plant biotechnologists have put lots of effort to engineer plants and crops in order to improve their nutritional value.

Various terms have been used interchangeably to designate foods for disease deterrence and health enhancement. 'designer foods', coined in 1989, is used to describe foods that are present naturally or enriched with nonnutritive and biologically active chemical components of plants that are effective in reducing cancer risk. 'Nutraceuticals' was introduced in 1989 by the U.S. Foundation for Innovation in Medicine to refer to "any substance that is a food or a part of a food which provides medical or health benefits, including the prevention and treatment of disease" (Brower 1998, p. 728). The U.S. Institute of Medicine's Food and Nutrition Board defined *functional foods* in 1994 as 'any food or food ingredient that may possibly provide a health benefit beyond the traditional nutrients it contains' (Hasler 2002, p. 3773).

Phytonutrients literally mean 'plant nutrients'. These phytonutrients are a large group of plant-derived compounds with particular biological activities in supporting human health, hypothesized to be responsible for much of the disease protection conferred from diets high in fruits and vegetables. Scientists have identified thousands of different phytonutrients, found in vegetables, fruits, beans, whole grains, nuts and seeds. This concept primarily refers to the phytonutrients which act as modifiers of physiological function. When compared with concepts like functional foods, dietary supplements and nutraceuticals, phytonutrients emphasise the natural bioactive compounds from plants that provide general health benefits to humans more specifically, which become closer to or even overlap with phytomedicines. The wide application of phytonutrients indicates that nutrition science has advanced beyond the treatment of deficiency syndromes to reduce disease risk. No longer are food nutrients evaluated only in terms of macronutrient and micronutrient levels, as contents of some biologically active compounds are becoming more essential.

Several factors – scientific advances, consumer demand, increasing health care expenditure, an aging population, technical advances in the food industry and changing regulatory norms – have inspired the field of functional foods. Scientific investigations have resulted in the accretion of scientific substantiation supporting the vital role of diet in overall health and well-being. For instance, six of the ten leading causes of death in world – cancer, coronary heart disease, stroke, diabetes, atherosclerosis and liver disease – have been increasingly revealed to be related to diet.

2.2 CLASSIFICATION OF PHYTONUTRIENTS

Hundreds of Phytonutrients, with several different biological functions, have been identified in plant-based foods in the last decade. The evidence from epidemiological studies, biological, experimental studies and clinical intervention trials have demonstrated that a plant-based diet can reduce the risk of degenerative diseases, especially cardiovascular disease and cancer (Block et al. 1992; Ames et al. 1993; Steinmetz