

Preface

Food and nutrition are vital keys to controlling morbidity and mortality from many chronic diseases affecting humankind. For millennia the relationship between famine and subsequent death due to disease has been known. Clearly food can be a key preventative agent for such dietary insufficiency-induced diseases. In the past decade, simple and very cheap vitamin A supplements not only prevented ocular damage but extended lifespan in children in developing countries. Documentation of the economic benefits of such dietary remedies is vital to their use in countries where there are insufficient health facilities and where adult diseases may take priority. In industrialized countries the cost to treat one person with a chronic disease like AIDS would pay for nutritional supplements preventing growth and development problems in thousands of children. Both are worthwhile but not always economically possible. Thus this book is crucial as it helps to document for health care agencies and individuals whether various *dietary supplements, nutrients and/or bioactive extracts promote health in a cost-effective manner or not.*

Biomolecules in dietary fruits and vegetables play crucial roles in health maintenance as well as in dietary supplements. They certainly could have different actions beyond their nutrient value in health promotion. For decades, it has been appreciated that oxidative pathways can lead to tissue damage and contribute to pathology. Fortunately, nature has provided us the mechanisms found predominately in plants to defend against such injury. Antioxidant nutritional agents have consequently attracted major attention and rightfully deserve to be studied carefully for possible beneficial roles. One of the main reasons for the interest in antioxidant agents in dietary vegetables, and their products, is their virtually complete lack of harmful side effects. This stands in stark contrast to many drugs that are promoted and studied for possible disease-preventive activity. However, are such bioactive molecules potent enough with an appropriate cost to be economically viable in health promotion? This book documents the potential cost-benefit relationship between major diseases and significant dietary supplements.

The US National Cancer Institute reports that only 18% of adults have the recommended intake of vegetables. Increasingly, Americans, Japanese, and Europeans are turning to the use of dietary vegetables, medicinal herbs, and their extracts or components to prevent or treat cancer. It has been known for decades that those populations with high vegetable consumption have reduced

risks of cancer and other diseases. However, which extracts or components are best to prevent disease or promote health? Some may be useful in experimental studies but the expenses of the supplements may outweigh the benefits. The goal of this book is to examine key ones for which health benefits are known to estimate their economic efficacy or lack thereof.

This book brings together experts working on the different aspects of supplementation, foods, economics and plant extracts and their potential for health promotion and disease prevention. Their expertise and experience provide the most current knowledge to promote future research. The conclusions and recommendations from the various chapters will provide a basis for using dietary supplements for which there is an economic rationale. By using vegetable extracts people can dramatically expand their exposure to protective dietary components and thus readily reduce their risk of multiple diseases. Specific foods, individual fruits or vegetables and their by products are reviewed in order to expand understanding and appropriate use. Yet are the benefits worth the increased costs of vegetables and their extracts? If so for which diseases? Which supplements are economically beneficial in treatment and/or prevention?

Plant extracts as dietary supplements are now a multi-billion-dollar business, built upon moderate research data. The bioactive extracts constitute many non-traditional medicines. In many cases these materials have been largely unregulated with limited requirements to show efficacy let alone economic efficiency compared to pharmaceutical drugs. Recently the US Food and Drug Administration has pushed this industry, with the support of Congress, to base its claims and products on scientific research. Therefore, the key area of dietary herbal medicine in this book will focus on efficacy or lack thereof in health promotion with emphasis on their economic benefits. Since common dietary vegetables and over-the-counter extracts are readily available, this book will be useful to health providers who treat clients and modify their lifestyles, as well as to the growing nutrition, food science, and natural product community. Increasingly, the lay public is requesting advice and is using more bioactive natural products in treatment and prevention of certain diseases including cancer, encouraging the medical community to become more knowledgeable. This book focuses on the growing body of knowledge on the role of diet, supplements and various dietary plants in reducing disease and whether the cost of such dietary changes equals or exceeds their economic benefits. As such the book will be essential reading for nutritionists, pharmacologist, health care professionals, research scientists, cancer workers, pathologists, molecular or cellular biochemists, physicians, general practitioners as well as those interested in diet and nutrition.

Our overall goal is to provide the most current, concise, scientific appraisal of the cost-benefits of nutritional supplements and bioactive components (nutriceuticals) of foods in improving the quality of life. The *basic outline* of the book involves concise chapters in sections: (A) *Introduction and Overview* which focuses on economics design in nutrition policy and value of dietary supplements; (B) *Influences on Preventive Nutrition Strategies* which focuses on benefits of fruits and vegetables versus costs; (C) *Cost-benefits of Food Interventions* which range from dental caries to malnourished children;

(D) *Nutrients and Bioactive Food Components and Interactions: Economic Benefits* which focuses on items such as natural antioxidants and zinc relative to their costs; (E) *Economic Effects of Dietary Components in Disease and Prevention Therapy* which focuses on cost benefits of citrus and vegetables on cancer and viruses; and (F) *Cost Effectiveness of Dietary Intervention in Cardiovascular Disease and Diabetes* which is the major section and shows the importance of dietary supplements relative to their costs. The excellent volunteer work of a wide variety of experts is greatly appreciated as it made this book possible.

Nutrients, Dietary Supplements, and Nutraceuticals

Cost Analysis Versus Clinical Benefits

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