

PREFACE

In this high-tech era of molecular biology and designer drug therapies, it remains a basic fact that good nutrition is the single most cost-effective way to improve the health and well-being of the greatest number of individuals on our planet (1,2). *Beverages in Nutrition and Health* is the first book dedicated to helping us discover how different beverages impact our basic nutrition and the risk of disease. This book also helps explain the potential value of these beverages for the promotion of optimal human health and well-being. In addition, it discusses developments in the formulation of beverages and the likely implications on human health.

During the last century, we have vastly improved the palatability and variety of beverage choices available to a population that is expanding in size, demands, and affluence. We have also seen many changes in the state of our health, sometimes for the better and sometimes for the worse. It has only been in the last 100 years that the Western diseases have become prominent in the cultures that have embraced the new diet of affluence (3), and beverages are very much a part of that diet of affluence.

Beverages have been an integral part of life since animals left the sea and moved onto dry land. The first period of human life occurs bathed in a sea of fluids; indeed as a fetus we begin to drink even before birth has occurred. Beverage consumption starts for most of us immediately after we are born with breast milk. For the rest of our lives, we will continue to require approx 1.2 mL of water per dietary calorie spent per day.

Until modern times, our choices of beverages were fairly limited and included water, alcoholic drinks, milk, and a few fermented milk products. The history of the human use of these drinks is discussed in Chapter 1 by Grivetti and Wilson. However, in recent years, there has been an explosion in the number of beverage choices available for acquiring our daily fluid requirements. This has been made possible by using such industrial processes as carbonation, processing to add ingredients, such as high-fructose corn syrup, vitamins, and minerals, and the development of new processing and preservation methods. But what has the impact of these changes been on our ability to obtain proper nutrition and maintain health? These impacts are the focus of *Beverages in Nutrition and Health*.

Alcohol has been a part of our diet for thousands of years. In recent years, we have come to a new understanding of how alcohol affects our health, and how the amounts and types of alcoholic beverages that increase or decrease mortality rates. This is discussed in Chapter 2 by Rimm and Temple. Research has revealed mechanisms by which substances in wine may have specific health benefits, a topic reviewed in Chapter 3 by Walzem and German.

Recent advances in ideas and methods for investigation available to researchers in the food sciences and medicine have provided new insights into how fruit and vegetable juices affect disease outcomes in both beneficial and potentially deleterious ways. Wilson, in Chapter 4, discusses how cranberry juice has been clinically determined to prevent

urinary tract infections and possibly other diseases. McGill, Wilson, and Papanikolaou, in Chapter 5, review how citrus juice consumption affords protection against various diseases, whereas Johnston, in Chapter 6, discusses how processing methods and storage may actually limit the availability of vitamin C and flavonoids from these same juices. The observation that some citrus juices may actually create harmful interactions with prescription drugs is another possibly important ancillary issue and is discussed in Chapter 7 by Kane. In addition, the intriguing associative link between tomato juice consumption and reduced risks of prostate and other cancers is explored by Hadley, Schwartz, and Clinton in Chapter 8.

How do coffee and tea and the caffeine and other substances they contain affect our health? The health effects of green and black teas are discussed in Chapter 10 by Afaq, Adhami, Ahmad, and Mukhtar. In Chapter 9, Tavani and La Vecchia discuss the general lack of associations between coffee intake and cancer. They also discuss the complex relation between coffee and heart disease. Chocolate was originally consumed in the form of a drink and its consumption in a liquid form remains popular. In Chapter 11, Schmitz, Kelm, and Hammerstone investigate this topic from a historical and health-related point of view. In Chapter 12, Weinberg and Bealer discuss the health effects of the caffeine that is a ubiquitous component of these and numerous other beverages. Finally, in Chapter 13, Craig discusses the health risks and some of the benefits that may be obtained from the increasing number of herbal teas that are available.

A variety of milks and milk products have been in the diet of many human cultures for millenia. Chapter 14 by McBean, Miller, and Heaney provides an optimistic view of how cow's milk can provide some degree of protection against osteoporosis, obesity, and heart disease, and discuss some of the claims and counterclaims that have emerged in regard to milk consumption. The potential of probiotic organisms in dairy and fermented dairy products to impact the health qualities of beverages is discussed by Heller in Chapter 17. Finally, because many persons avoid dairy products for health or religious reasons, substitutes are needed and Woodside and Morton, in Chapter 15, discuss the health qualities of the most commonly consumed substitute, soy milk.

Different beverages become more important as we pass from neonate to adult to elderly adult. Friel reviews the current state of affairs in the heated and continuing breast milk vs neonate/infant formula debate, fueled on one side by our traditional habits and on the other by commercial forces. As we enter middle age, weight management becomes a problem for many of us and Chapter 18 by Stubbs and Whybrow discusses how particular beverages can contribute to weight problems, whereas others may become part of the solution. Finally, Johnson and Glassman, in Chapter 19, look at what happens when an elderly person's diet is unable to meet his or her nutrient needs. They describe the often overrated value of nutritional support beverages for helping us achieve our required intake of vitamins and minerals.

Beverages have also evolved to meet specific physiological functions and needs for simple hydration. The topic of sports beverage content and effectiveness is reviewed in Chapter 20 by Maughan. Ramakrishna considers the factors that have helped oral electrolyte-carbohydrate rehydration therapies save more lives on our planet every year than any other medical treatment. In Chapter 21, our transition to living in an urbanized, and sometimes affluent, culture has created new opportunities for safe water and at the same

time created potential exposure to new water-borne pathogens, a topic discussed in Chapter 23 by Chauret. Our affluence and concern about water safety has led many to consume bottled water. In Chapter 20, Jamal and Eisenberg discuss some surprising facts regarding the quality and content of these products.

The consumption of soft drinks has recently been linked to a wide range of health problems, especially for children and young adults. This problem is discussed in Chapter 24 by Jacobson from the watchdog organization the Center for Science in the Public Interest. In that chapter, as well as in Chapter 25 by Balay-Karperien, Temple, and Nestle, the authors discuss marketing practices used to promote the consumption of these products.

Regulation of beverage content and marketing practice has been a part of American life for nearly a century since the establishment of the US Food and Drug Administration and the original “Snake Oil Laws” of the 1920s. These laws sought to limit the use of bogus health claims that manufacturers used to market their products. The fast growing popularity of “functional foods” (including beverages) has created a resurgence of concern and interest in the area of regulation. Chapter 27 by Krasny provides a current update of the status of these laws and regulations with regards to how beverages can be marketed in the United States. Other nations have similar laws, and in Chapter 26, Ohki, Nakamura, and Takano provide a review of the status of the recreational and tonic beverage industry in Japan and how the laws of Japan regulate beverage-health claims on products sold there.

In recent decades, researchers have made considerable progress in our understanding of possible associations between beverages and the Western diseases. This book provides an overview of the field. In that respect it continues from our previous books (2,3). Every one of us will undoubtedly (unless we want to die) continue to consume beverages and experience potentially beneficial or possibly detrimental effects related to our choices. Readers of this book will have a better understanding of how to optimize their beverage consumption for optimizing health. *Beverages in Nutrition and Health* is also intended to help the reader understand how current and probable future innovations in the beverage industry have the potential to affect our health in both positive and negative ways. At the risk of stating the obvious, beverage nutrition research is very much an ongoing activity. As a result, there are many contrasting views on aspects of the field, and the significance of some of these contrasts is discussed in the final chapter (28) by Jacobs, Temple, and Wilson. An important means of resolving these contentious areas is by debate. To some extent this debate can be found on the pages of this book. Accordingly, the editors make no apology if the reader finds that statements in one chapter may contradict those in another.

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REFERENCES

1. Wilson T. What types of nutrition research give the best results? *Nutrition* 2002;18:352.
2. Wilson T, Temple NJ, eds. *Nutritional health: Strategies for Disease Prevention*. Humana Press, Totowa, NJ, 2002.
3. Temple NJ, Burkitt DP, eds. *Western Diseases: Their Dietary Prevention and Reversibility*. Humana Press, Totowa, NJ, 1994.



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