

# Nutritional Research and Health Benefits of Tea Polyphenols

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## **Nutritional Research and Health Benefits of Tea**

### **Polyphenols**

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# INTRODUCTION

The Nutrition Research and Health Function of Tea polyphenols is a comprehensive scientific work of tea polyphenols, and aims to reveal the nutritional characteristics of tea polyphenols and their application in health care. The book is divided into three chapters: basic knowledge, nutrition research, and health care function.

The first article explores the definition, classification, chemical structure, extraction and analysis methods of tea polyphenols, and provides readers with comprehensive basic knowledge. The second paper focuses on the latest research results on the absorption, metabolic mechanism and antioxidant, cardiovascular health and cancer prevention of tea polyphenols in the human body. The third paper focuses on the role and application potential of tea polyphenols in the health care fields such as immune function, diabetes management and intestinal health.

Through systematic theoretical analysis and rich scientific research examples, this book provides important reference materials for researchers, nutritionists and professionals who are interested in tea polyphenols, and also provides a scientific basis for ordinary readers to understand the health care efficacy of tea polyphenol.

# PREFACE

In today's era of increasing health awareness, people's attention to nutrition and health care is increasing. Tea polyphenols are one of the most prominent natural ingredients for their potential health benefits. The birth of the book "Nutrition Research and Health Function of Tea Polyphenols" aims to analyze the mystery of tea polyphenols deeply, and reveal its unique nutrition characteristics and its wide application in the field of health care.

As a class of natural compounds widely found in tea leaves, tea polyphenols have rich chemical diversity and unique biological activities. Its existence not only gives the tea a unique flavor and color, but also contains the vital value to human health.

The first chapter of this book, "Basic Knowledge", builds a comprehensive knowledge framework of tea polyphenols for readers. The definition of tea polyphenols is explained in detail, so that the reader can clearly understand its essence and category. Through the elaboration of the classification of tea polyphenols, it shows its rich species and their own characteristics. The thorough analysis of the chemical structure lays a solid foundation for understanding its biological activity. The discussion of the extraction and analysis methods provides technical support for the research and application of tea polyphenols. This chapter lays a solid foundation for subsequent in-depth research and application, where both professional researchers and ordinary readers can gain a preliminary but comprehensive understanding of tea polyphenols.

The second chapter, "Nutrition research", focuses on the absorption and metabolism mechanism of tea polyphenols in the human body. This part of the study is crucial because only an understanding of how tea polyphenols work in vivo can better assess their effects on health. The elaboration of the absorption pathways and metabolic processes gives the reader an insight into the journey of tea polyphenols in vivo. The discussion of its antioxidant effect is one of the focuses of this chapter. Oxidative stress is an important factor leading to many chronic diseases, and the strong antioxidant capacity of tea polyphenols makes them a powerful weapon against oxidative damage. In addition, the most recent findings in the field of cardiovascular health and cancer prevention are well presented in this chapter. Cardiovascular disease and cancer are the major health challenges facing today's society, and the potential role of tea polyphenols in these aspects provides new ideas and possibilities for prevention and treatment.

The third chapter, "health care function", further expands the application field of tea polyphenols. Immune function is an important line of defense for human health, and the role of tea polyphenols in immune regulation provides a new way to enhance immunity. For patients with diabetes, managing blood glucose levels is crucial, and the potential of tea polyphenols in diabetes management brings new hope for the patients. Intestinal health is a field of attention in recent years, and tea polyphenols are of great practical significance in the maintenance and improvement of intestinal health. This chapter not only focuses on the theoretical role of tea polyphenols in these fields, but also through rich scientific research examples, presenting the practical application effect of tea polyphenols in the field of health care.

This book provides valuable information and knowledge to readers at different levels through systematic theoretical analysis and rich scientific research examples. For researchers and nutritionists, it is an indispensable reference material, covering the cutting-edge research results and in-depth theoretical discussion in the field of tea polyphenols. These professionals can get inspiration for further in-depth research and exploration. For the general reader, this book is a scientific basis for understanding the health efficacy of tea polyphenols. In the face of a wide range of tea polyphenols related products on the market, we can make more sensible choices with the knowledge in the book, and make better use of tea polyphenols to maintain their own health.

In the process of writing this book, we strive to make the content accurate, scientific and practical. Reference to a large number of authoritative domestic and foreign research literature, to ensure that the information provided has a reliable scientific basis. At the same time, through the plain language and intuitive charts, the complex scientific knowledge is easy to understand and master.

The nutritional study of tea polyphenols with health care function is an area of vitality and potential. With the continuous progress of science and technology and the further development of research, we believe that the understanding of tea polyphenols will continue to deepen, and its application in the field of health care will be more extensive. The publication of this book is only a starting point. I hope it can inspire more peoples attention and research enthusiasm for tea polyphenols, and contribute to the development of nutrition and health care.

Both the general public who pursue a healthy life and the professionals who are committed to nutrition and health research can gain useful knowledge and inspiration from this book. Lets walk into the magical world of tea polyphenols together, explore the mysteries of nutrition and health care functions, and bring more benefits to our health and life. It is believed that through the study of this book, readers will have a deeper understanding and understanding of tea polyphenols, and will pay

more attention to its application in daily life. I hope this book will become a mentor in exploring the field of tea polyphenols and lead you to start a healthy journey full of surprises and gains.

# The First Basic Knowledge of Tea Polyphenols

### 1.1 The Concept of Tea Polyphenols

#### 1.1.1 The Basic Connotation of Tea Polyphenols

Tea polyphenols are the general term of polyphenols in tea leaves, and they are a class of natural compounds with various biological activities. It is widely found in a variety of tea leaves, including green tea, black tea, oolong tea and so on.

In terms of chemical structure, tea polyphenols are mainly composed of catechins, flavonoids, anthocyanins, phenolic acids and other components. These components interact to confer rich and unique properties to tea polyphenols.

Catechins are one of the most important components of tea polyphenols, including epicatechin, epicatechin, gallate, etc. They have strong antioxidant capacity to scavenge free radicals in the body and reduce cell damage by oxidative stress. Flavonoids have certain anti-inflammatory and antibacterial effects, helping to maintain the healthy state of the body. Anthocyanins have good antioxidant and coloring performance, which are not only beneficial to human health, but also affect the color and appearance of tea leaves. Phenolic acids also have certain biological activities, such as antioxidant, antibacterial, etc.

The basic connotation of tea polyphenols is reflected in its numerous physiological functions. First, its prominent antioxidant effect is crucial. Excessive accumulation of free radicals in the body leads to cell damage, aging, and the occurrence of many diseases, and tea polyphenols are able to effectively neutralize these free radicals and protect cells from oxidative damage. This makes tea polyphenols have potential applications in the prevention of chronic diseases such as cardiovascular disease and cancer.

In cardiovascular health, tea polyphenols can exert a positive effect through multiple pathways. It reduces lipid levels and reduces cholesterol deposition on the vessel wall, thereby reducing the risk of atherosclerosis. At the same time, tea polyphenols can also inhibit the aggregation of platelets, reduce the possibility of thrombosis, and help to maintain the patency of blood vessels.