Journal of Food Science Research

Editorial | Vol 9 Iss 2

Antioxidant Activity in Foods and Its Role in Health Promotion

Renata B. Kowalczyk*

Department of Nutrition and Food Chemistry, Charles University, Czech Republic,

***Corresponding author:** Renata B. Kowalczyk, Department of Nutrition and Food Chemistry, Charles University, Czech Republic,

Email: renata.kowalczyk.antiox@nutriscience.cz

Received: jan 04, 2024; **Accepted:** jan 18, 2024; **Published:** jan 27, 2024

Abstract

Antioxidant activity in foods plays a vital role in protecting the human body against oxidative stress caused by free radicals. Natural antioxidants present in foods contribute to disease prevention and overall health maintenance. In food systems, antioxidants also improve stability and shelf life by preventing oxidative deterioration. This article discusses the importance of antioxidant activity in foods and its implications for health and food quality. This article discusses the role of food biotechnology in modern food science and its contribution to sustainable food production. Improper post-harvest practices can lead to significant food losses, reduced nutritional value, and economic challenges. The application of appropriate post-harvest technologies enhances food safety, extends shelf life, and ensures year-round availability of food products. This article discusses the role of post-harvest technology in improving food quality and reducing post-harvest losses.

***Keywords:** Antioxidant activity, Free radicals, Oxidative stress, Bioactive compounds, Food stability*

Introduction

Antioxidants are compounds that neutralize free radicals and reduce oxidative stress in biological systems. Free radicals are highly reactive molecules that can damage cells, proteins, and DNA, contributing to chronic diseases and aging processes [1]. Dietary antioxidants play an essential role in protecting the body from oxidative damage.Natural antioxidants such as polyphenols, flavonoids, vitamins, and carotenoids are widely distributed in fruits, vegetables, and plant-based foods [2]. These compounds contribute to health promotion by reducing inflammation and supporting immune function [3]. In food systems, antioxidants also prevent lipid oxidation, which leads to rancidity and quality deterioration [2]. Chemical indicators such as lipid oxidation and enzymatic activity also play a significant role in determining shelf stability, particularly in fat-rich and processed foods [3]. Sensory evaluation complements analytical methods by assessing consumer acceptability in terms of taste, odor, color, and texture [4]. Shelf-life studies are also important for regulatory compliance, as food manufacturers must provide accurate

expiration dates and storage instructions based on scientific evidence [5]. Together, these approaches ensure that shelf-life evaluation supports food safety, quality control, and consumer trust.

Conclusion

Antioxidant activity in foods is essential for protecting human health and maintaining food quality. By reducing oxidative stress and preventing food deterioration, antioxidants contribute to both nutritional and technological benefits. Continued research into antioxidant compounds will further enhance their applications in food science and public health. Food additives play a significant role in improving food quality, safety, and shelf life in modern food systems. When used responsibly and regulated effectively, they contribute to product stability and consumer satisfaction. Ongoing research and regulatory oversight are essential to ensure the safe and beneficial use of food additives in the global food industry.

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