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Carbohydrate Analysis and Its Importance in Food Science

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Abstract

Carbohydrate analysis is a fundamental aspect of food science that focuses on the identification, quantification, and characterization of carbohydrates in food systems. Carbohydrates play essential roles in nutrition, energy supply, texture formation, and food structure. Accurate carbohydrate analysis supports nutritional labeling, quality control, and product development. This article discusses the significance of carbohydrate analysis in understanding food composition and improving food quality. This article discusses the role of protein characterization in modern food science and food product development. This article discusses the role of food fortification in promoting nutrition security and public health. 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.

Keywords: Carbohydrate analysis, Sugars, Starch, Food composition, Nutritional quality

Introduction

Carbohydrates are one of the primary macronutrients in foods and include sugars, starches, and dietary fibers. They serve as the main source of energy for the human body and play important structural and functional roles in food systems [1]. Understanding carbohydrate composition is essential for evaluating nutritional value and technological performance of foods.Analytical methods such as chromatography, spectroscopy, and enzymatic assays are widely used to determine carbohydrate content and structure in complex food matrices [3]. Their presence in natural foods highlights the importance of dietary diversity and plant-based nutrition.In food science, bioactive compounds are increasingly used in the development of functional and fortified foods [4]. Advances in extraction, stabilization, and delivery technologies have improved their bioavailability and effectiveness [5]. Therefore, bioactive compounds represent a vital intersection between nutrition, food science, and preventive healthcare. Bioactive compounds are non-nutrient components in foods that influence physiological processes and promote health. These substances include polyphenols, flavonoids, carotenoids, peptides, and phytosterols, which exert protective effects

against various diseases. Their biological activity makes them valuable components of functional foods. Therefore, bioactive compounds represent a vital intersection between nutrition, food science, and preventive healthcare.

Conclusion

Carbohydrate analysis is essential for understanding food composition, nutritional quality, and functional properties. By providing accurate and reliable data, it supports food labeling, product development, and quality assurance. Continued advancements in analytical techniques will further enhance carbohydrate research and innovation in food science. Continued scientific research and regulatory oversight will strengthen the credibility and impact of nutraceuticals in global health 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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