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Food Rheology and Its Role in Texture and Processing Behavior

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Abstract

Food rheology is the study of the flow and deformation behavior of food materials. It plays a critical role in determining texture, processing performance, and consumer perception of food products. Rheological properties influence mixing, pumping, extrusion, and sensory attributes of foods. This article discusses the importance of food rheology in food processing, quality control, and product development. 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:** Food rheology, Texture, Viscosity, Flow behavior, Food processing*

Introduction

Food rheology focuses on understanding how food materials flow and deform under applied forces. These properties are essential for describing texture, consistency, and mouthfeel, which directly influence consumer acceptance [1]. Rheological behavior is determined by food composition, structure, and processing conditions In food processing, rheological properties control operations such as mixing, pumping, extrusion, and fillin [3]. Their presence in natural foods highlights the importance of dietary diversity and plant-based nutritio 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[2]. 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

Food rheology plays a vital role in determining texture, processing performance, and consumer perception of food products. By understanding flow and deformation behavior, food scientists can design better products and more efficient processing systems. Continued research in food rheology will further strengthen innovation and quality improvement in the food industry. 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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