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PROTEIN–POLYSACCHARIDE CONJUGATES
Structuring and Technological Potential in Food Applications

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Proteins have functional properties of considerable relevance to the food industry. However, when used individually, they exhibit limitations related to dispersibility, thermal stability, interfacial properties, and gelling properties, which restrict their performance in various formulations. In this context, conjugation with polysaccharides has emerged as a promising strategy, as these biopolymers act as thickeners, gelling agents, and stabilizers owing to their high hydration capacity and ability to interact with water, proteins, and lipids, thereby contributing to the physical stability, texture, and shelf life of foods. Interactions between proteins and polysaccharides depend on the structural characteristics of both components, such as molecular weight, electric charge distribution, conformation, chain flexibility, and hydration. When these interactions involve covalent bonds, stable hybrid conjugates are formed, often exhibiting greater oil-holding capacity, viscosity changes, and interfacial stability compared to the individual macromolecules or their simple mixtures (BABU et al., 2024). Despite this potential, the use of these conjugates in food structuring still requires further investigation, particularly because reaction conditions and the specific types of protein and polysaccharide used influence directly the conjugation process and its outcome. Therefore, this speech aims to present concisely i) functional groups and interactions/reactions relevant for protein-polysaccharide conjugation, ii) techniques usually employed to carry out protein-polysaccharide conjugation, with special attention to Maillard reaction, and, finally, iii) some application from recent literature of such conjugates in structuring oleogels, vehiculation of small bioactive molecules, and enhancement of sensory and preservation properties in breads and juices (to cite only a few examples).

Referências bibliográficas:

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