

TAL 797 – Seminário

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GELATION PROPERTIES OF PLANT PROTEINS: MECHANISMS AND EFFECT OF MODIFICATIONS AND INTERACTIONS

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Proteins play a crucial role in food systems due to their diverse functionalities. Recently, there has been increasing interest in alternatives to animal proteins, with plant proteins emerging as a prominent option. Gelation, a key property of proteins, can significantly influence the texture of food products and is beneficial for various technological applications, including the formulation of fat substitutes and the encapsulation of bioactive compounds. To successfully form gels, proteins molecular interactions must occur to establish a network structure. This gelation process can be induced through different methods, such as heating and cooling a protein dispersion (resulting in heat-set gels) or by adjusting the salt concentration or pH of the dispersion after denaturation induced by a pre-heating and cooling treatment (producing cold-set gels). Plant proteins, however, may not always exhibit the desired gelation properties. To enhance these functionalities, several modification strategies can be employed. For instance, atmospheric cold plasma and sonication treatments have demonstrated the ability to increase the storage modulus (G') and enhance the transparency of the resultant gels, respectively. Additionally, enzymatic hydrolysis can generate lower molecular weight peptides, altering their tertiary structures and potentially increasing the storage modulus at low degrees of hydrolysis. Furthermore, combining plant proteins with other biopolymers, such as dairy proteins, may provide a viable strategy for creating stronger gels. It is essential to carefully select the concentrations of the various proteins and the pH of the solution, as certain pH values and concentrations may adversely affect gelation. In conclusion, while the utilization of plant proteins for gel formation presents challenges, employing diverse gelation methods, modification techniques, and environmental conditions can facilitate the achievement of desired gel properties.

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