**A Food Polymer Science Perspective on the Potential of Rare Sugars as Sucrose Replacers in Biscuits**

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Biscuits are frequently consumed snacks. Recently, reformulation of sucrose biscuits with healthier sugar alternatives is an area that worked on food manufacturers. D-allulose and tagatose are rare sugars, and having lower caloric values, negligible blood glucose effects and sweetness close to sucrose make them preferable sucrose alternatives. However, replacing sucrose with alternative sugars in biscuit is challenging due to sucrose’s functionalities in defining the product’s quality properties, such as colour, texture and taste. This study aimed to evaluate the technological functionality of rare sugars, such as D-allulose and tagatose in dough and biscuits’ properties. D-allulose and tagatose are fructose epimers, thus fructose biscuits were included in the study, and the results were compared with sucrose biscuits as a control group. Solubilisation and dissolution properties of sugars impacted starch gelatinisation and gluten development, through the antiplasticing effect (Slade and Levine, 1991; Slade *et al.*, 2021). D-allulose, tagatose and fructose were less efficient to delay starch gelatinisation than sucrose. Sucrose has a higher volumetric density of hydrogen bonds in solution, thus sucrose changed the melting temperature of the crystalline parts of starch by forming more hydrogen bonds with starch than other monosaccharide sugars (Van der Sman and Mauer, 2019; Allan et al., 2018). The higher antiplasticising properties of the rare sugars gave place to dough and biscuit that held more water and spread less, were thicker. Tagatose biscuits presented higher fracturability strength; while the distance to fracture decreases, it showed less resistance to be broken with little elastic response (Filipcev et al., 2015). In addition, the biscuits baked using monosaccharides (fructose, D-allulose and tagatose) were much darker in colour and had higher acrylamide content.

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