

Title: Enzymatic Modification of Starch: Amylases and Pullulanase

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Abstract: Starch-modifying enzymes are crucial biocatalysts with unique properties, versatile modes of action, and wide-ranging applications. These enzymes, often sourced from microorganisms, plants, or animals, operate under mild conditions, demonstrating high catalytic efficiency, substrate specificity, and eco-friendliness. In terms of mode of action, amylases (α -amylase and β -amylase) hydrolyze starch by cleaving α -1,4-glycosidic bonds or removing maltose units. Glucoamylase converts maltose and isomaltose into glucose. Starch phosphorylases introduce phosphate groups, yielding phosphorylated products, while debranching enzymes like pullulanase facilitate access to branched starch regions. Unlike non-food applications span numerous industries, modified starch is now employed in several food application such as bakery products, snacks, soups, sauces and gravies, batters and coatings, and meat products due to their numeral functional properties. However, starch-modifying enzymes, characterized by their properties, mode of action, and applications, are indispensable biocatalysts that continue to drive innovation across diverse sectors and sustainable industrial practices. This chapter focused on the major properties, mechanisms of action, and industrial applications of starch-modified enzymes.

Keywords: Starch, Starch-modifying enzyme, Functional properties, Amylase Glucoamylase

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