

Investigation of enzymatic hydrolysis of pea and wheat starch-containing substrates

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Abstract

Certain functional properties of starches are required when manufacturing a wide range of products. High solubility of starch-containing ingredients is important when used to make baby food, instant food, etc. Increasing the solubility and content of soluble sugars can be achieved by enzymatic hydrolysis. Varying the degree of hydrolysis and conditions of the process, it is possible to obtain products with specified functional properties and the required physicochemical composition.

In the present article, the physicochemical properties of starch products obtained by treating native and extruded starch fractions of wheat and pea flour by individual enzyme preparations including preparations with amylase, hemicellulase, protease activities and their complexes are studied. The functional properties of the soluble and non-hydrolysed fractions were studied individually or in a non-fractionated suspension after exposure to the enzyme preparation or preparations.

It has been found that wheat substrates are subject to deeper hydrolysis with bacterial amylase Veron BA compared to pea, in both cases extrusion intensifies fermentolysis, which is expressed in a reduction of starch content in the unhydrolyzed fraction by 33% for native form and 47% for the extruded form. Due to the complex composition of substrates containing starch, protein and non-starch polysaccharides, hydrolysis of pea and wheat starch-containing substrates with a mixture of enzyme preparations with proteolytic, amylase and hemicellulase activities is recommended. It is shown that the use of a complex of enzyme preparations leads to an increase in the degree of hydrolysis up to 75% compared to 55% when using enzyme preparations with activity only against polysaccharides.

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