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**ТЕХНОЛОГІЧНІ АСПЕКТИ ВИРОБНИЦТВА ХАРЧОВИХ
ПРОДУКТІВ ЛІКУВАЛЬНО-ОЗДОРОВЧОГО НАПРЯМКУ**

The immobilization is known to widen pH optimum of papain from 6 units pH to 5-7 and thermo optimum from 37 °C to 50 °C with activity saving to 100 %.

The increase of papain-glucan complex stability to thermal denaturation is proved to be of a great importance not only to production technology realization, but also to its introduction to food products for special needs.

The behavior of immobilized drug in the human organism was observed at 37 °C during 3 hours. Its activity in the digestive juices was determined and the stability of received complex proved to have better results than usage of native enzymes.

The method of gel-chromatography was used for confirmation of this complex in the received product. Soluble glucan is a heterogeneous mixture according to molecular mass. There are fragments with a high degree of polymerization with a wide interval of value. Papain is monomeric with its molecular mass about 25 kDa.

Gel-chromatography complex data showed absolute coincidence of peaks of polysaccharide and protein unit that proves to have this complex.

Thus, the combination of such complex with two physiological components let observe a received complex as a nutritional ingredient with a wide spectrum of its biological activity. It stipulates its usage in the products of medical-preventive course.

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OBTAINING OF THE SOLUBLE FORM OF WHEAT STRAW XYLAN

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Deficiency of dietary fiber in the diet of our population is a recognized fact. Enrichment of food products with them is a very urgent problem because they are essential for the normal functioning of the human body. Increasing the range of products enriched with dietary fiber prevents a number of factors. The most of the dietary fiber is the water-soluble polysaccharides. They are mainly used by the food industry as a gelatinization agent, for example, agar, alginic acid salts, carrageenan and others. But such properties limit the norms of their introduction to the food systems.

Insoluble dietary fibers are also used. However, their existence as solid substances requires careful grinding and significantly narrows the list of food systems, where they can be introduced without significant deterioration of the sensory characteristics of the resulting products.

The aim of this work was to obtain xylan that belongs to non-digestible polysaccharides and is not the gelatinization agent with its subsequent modification to produce a soluble form.

Xylan was extracted from wheat straw that is characterized by a high content of hemicellulose by 6 % solution of potassium hydroxide. The solution was neutralized with acetic acid, a polysaccharide precipitated with ethanol and dried.

It is determined that the mass fraction of carbohydrate in the resulting product is 94.5 %. Hydrolysis and further research of monosaccharide composition of the obtained hydrolyzate by means chromatography method allowed to identify uronic acid, xylose, arabinose and galactose in a weight ratio of 3:5:2:1. This means that study polysaccharide is almost pure arabinoglucuronoxylan.

However, it is alkali soluble biopolymer. Only 26.0 % of the sample weight dissolves in water. In order to increase its solubility in water, xylan was treated with a number of the widely used in industry enzymes that have endo-xylanase activity. It is determined that the maximum amount of reducing substances is 8.0 and 10.6 % with enzyme-substrate ratio of 1:50 and 1:100 respectively. In other words the average degree of polymerization of enzymatic hydrolysis products of xylan is about 12 and 10 respectively. This is accompanied by the formation of products that are almost completely soluble in water. Reducing the amount of enzyme in the reaction medium contributed to increasing the degree of polymerization of hydrolysis products in the same period of time. Reducing the hydromodulus to 10 also leads to decreasing the amount of reducing substances that is 28 – 35 %. And correspondingly the average degree of polymerization of obtained carbohydrates increases. But in these cases the clarity of the solution is significantly reduced. The solubility of the resulting products in water is 64 – 71 %. Among the considered enzymes the best result is obtained by using Vilzim preparation. Its activity is 90,000 U/g. Moreover, unlike most of the others this enzyme is completely water-soluble. The process of the limited hydrolysis lasts 1.5-5.0 hours depending on what amount of the reducing substances is needed.

The resulting product of the limited enzymatic hydrolysis of xylan can be added into the drinks, juices, instead of water in the manufacture of confectionery.

Supervisor – PhD in Chemistry S. Ozolina

THE DEVELOPMENT OF NEW BIOTECHNOLOGIES AND BIOPREPARATIONS IN FOOD PROCESSING INDUSTRY

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In the modern food industry a clear tendency appears to seek and develop innovative technological solutions for production, characterized by a high level of quality, environmental, biological security, and functionality. The main priorities are naturalness, health benefits, biological value and ecological purity of products. The main tasks for solving these problems is to minimize the use of synthetic food additives and ingredients for preservation of quality characteristics. Biotechnology is a branch of knowledge aimed at the development and implementation of methods to satisfy human needs through natural or genetically modified biological objects (viruses, microorganisms, animal and plant cells, animal organisms, etc.). An important branch of biotechnology is food biotechnology, aimed at solving the food shortages, improving quality and developing new food products using biotechnological methods and techniques, exploring biotechnological potential of animal raw materials and food additives.

Biotechnological approaches allow to develop innovative technologies of environmentally friendly, safe products. One of the tasks is the issue of control quality at various stages of production, from raw materials to finished products. The task of quality control services is to determine the presence of microbiological and chemical contaminants. The most relevant and promising for the food industry is the using of bacterial and enzyme preparations of different technological direction. An important task of the food industry is the development of complex processing of raw materials and waste products of food industry and improve the efficiency of processing. Using enzymes is possible to reduce consumption of raw materials of vegetable

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