

Секція 1 **ПРОБЛЕМИ ТА ПЕРСПЕКТИВИ РОЗВИТКУ ОБЛАДНАННЯ ХАРЧОВИХ ВИРОБНИЦТВ**

DEVELOPMENT OF EQUIPMENT FOR THE PRODUCTION LINE OF PECTIN PRODUCTS FROM CITRUS RESIDUES

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Statistical data concerning the development of the world economic activity give grounds for making the conclusion that the study the technological processes of obtaining pectic products will give the best results if you choose abroad citrus residues as raw material for the production of pectin. This is primarily due to high content of in these types of plant material, the degree of esterification (the use of pectin in food industry), as well as a large number of juice producing plants. However, the main advantage of the research is tropical citrus, in particular oranges and lemons.

In accordance with the chosen pectin-containing plant material for the development of hardware equipment of the line for the production of pectin products, it is necessary to select a scheme of technological process.

The basic processes of pectin production technology can be presented in the form of two schemes:

1. Preparation of raw materials → primary extraction (removal) of substances → purification → concentration → deposition → crushing → washing of the resulting substance → separation of fractions → buffering → re-grinding → drying → pectin powder → further use.

2. Preparation of raw materials → chemical extraction (extraction) of substances → separation of fractions → concentration (ultrafiltration) → purification (diafiltration) → drying or preservation of liquid pectin → further use.

In our opinion, the second scheme of obtaining pectin is preferable, because it is less energy-intensive and more productive than the previous one. In addition, this scheme reduces the duration of obtaining pectin, and has a minimum number of equipment involved in the production of high-performance products.

A great interest in considering the process of obtaining pectin products is the way of extraction. Extraction today is the most effective

method of obtaining pectin extract, which allows shorten the process time and completely provides extraction of pectic substances.

To obtain high-quality low cost pectic products, we need not only modern technological processes and formulations, but also modern machines and devices that meet all technological requirements, in terms of economy, convenience in maintenance, reliability.

The analysis of modern equipment for the implementation of the extraction process of plant raw materials makes it possible to state that the currently well-known extraction equipment has large dimensions or a very complicated structure. Consequently, there is a necessity to create extraction equipment that can be used in small and medium-sized enterprises to extract pectic substances from different types of tropical citrus.

In the process of seeking new technical solutions, the task was to create an installation to intensify the extraction process by combining known and new elements at the expense of mutual arrangement, rapid discharge of the spent solid phase, and a significant simplification of the design.

Within the framework of this problem in the Laboratory "Nanotechnology of Food Products" of Kharkov State University of Food Technology and Trade, an industrial device for the extraction of pectin containing vegetable raw material was developed, its productivity at the output of the extract is 450–480 dm³/h.

The problem is solved in such a way that in a device for extraction of plant material including a working tank, a heating casing, a cover, a drive mechanism, an inlet and outlet branch, while the shaft equipped with the mixing element is designed in the form of a beater, additionally equipped with two disks or propellers for Creation of fluid counteraction, but as a filter element, a tissue partition is used that is placed on a perforated working capacity substrate and secured by means of a clamping ring, with this on the lid attached to the cylinder via bolting mounted nozzle and pressure sensor to measure the pH.

In the proposed device, the extraction process can take place with prior mixing of fluid with vegetable raw material.

Thus, the proposed useful model ensures the process of extraction of the necessary substances with high productivity by turbulent mixing with the counteraction of the process environment and the involvement of the whole mass of raw materials in the process, as well as the efficient unloading of the waste plant material from the apparatus.