Improvement of the Technology of Obtaining Pectin from Local Raw Materials

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ABSTRACT

Modernization of processing and production in our country, technical re-equipment and production of finished products from raw materials, as well as the production of pectin, as well as filling the domestic market through the widespread introduction of waste-free equipment and innovative technologies, are considered important to be urgent issues of today.

Keywords: Confectionery, ready-made pectin, semi-finished product, vitamin and mineral nutrition, energy drink, secondary raw materials, micro and macro products, technological scheme of the finished product.

Non-destructive processing of fruits and vegetables and extending their seasonality is one of the untapped opportunities. A large assortment of freshly preserved wet fruits prevents the annual artificial increase in prices for this type of product in the markets in the winter-spring season, positively affects the social protection of the population, making it unnecessary to import agricultural products and products in the winter.

One of the most important factors in the development of the production of competitive products and the expansion of its range is the introduction of waste-free technologies based on the processing of natural resources of raw materials and the introduction together with the introduction of small technological units. For example, the main part of food additives in sweet drinks is made using artificial raw materials (vinegar, extracts), which are imported for foreign currency.

However, the potential of raw materials available in our republic, competitive, natural pure food additives that can be obtained on the basis of processing wet fruits, allows us to reveal dozens of new aspects of the range of non-alcoholic beverages based on raw materials. At the same time, processed fruits allow the formation of additional lines by extracting pectin from vegetable juice.

According to the analysis, the annual growth in the volume of fruit and vegetable products requires the elimination of a number of problems and shortcomings in the storage and processing network, the widespread use of modern innovative technologies in the reform of the industry, and the widespread use of resource-saving digital technologies.

In particular: - industrial enterprises process 18.9% of fruits, 5.6% of vegetables and fruit and berry products, 9.5% of grapes in relation to the total production in our republic;

- the level of provision with refrigerating chambers for storing grown fruits and vegetables in the regions is 3.7% (refrigerated warehouses are supplied with products by 20-22% during the year);

- requires an innovative approach to the issue of training qualified personnel for the industry. Training of specialists in the field of processing and storage, who have the opportunity to work on advanced modern equipment, is being carried out;

- a systematic approach is being taken to the issues of adequate provision of storage and processing enterprises with products of modern technological requirements and sizes;

- in recent years, the processing of fruit and vegetable products is carried out according to intensive technology.

Therefore, according to the analyzes and data of the Food and Agriculture Organization of the United Nations (FAO), the amount of losses during the collection, transportation and storage of fruits and vegetables is 22-45%, and waste - 12-18%.

The main export markets for fruit and vegetable products were made by Kyrgyzstan, Russia and Turkey. According to the data, at the end of 2019, more than 19.2 million tons of fruits and vegetables produced in the republic were exported to 69 foreign countries (1.4 million tons) in pure or processed form, more than 1.2 billion tons. (close to the dollar) shows how important the issue is.

The increase in the volume of exports of fruits and vegetables was significantly affected by the fact that barra and processed vegetables increased by 1.8 and 1.6 times, respectively, compared to 2018 and accounted for 46.5% of the total content of fruits and vegetables. These products account for more than 60 percent of exports of greens, tomatoes, cucumbers, cherries and apricots in our country in April-May.

In the conditions of modern economic globalization, the development of entrepreneurship is in the center of attention of the leadership of our country. Topical topics are the creation of waste-free technologies for processing agricultural products grown in local conditions, and the commercialization of entrepreneurship through innovative technologies. The use of a mixture of organic and mineral acids in the process of extracting pectin from sunflower baskets and grape juice grown in our country by the hydrolysis-extraction method, analysis of the main physical and chemical properties of the finished product - pectin at the stage of technological processes, correcting its acidity, bringing the mechanical properties to the required level, therefore, research is underway to improve existing technologies.

Advanced technologies for deep processing of agricultural products, obtaining semi-finished and finished food products from them, extracting pectin, starch, phenolic compounds from secondary raw materials, obtaining the necessary materials for the food, pharmaceutical, textile, printing, medical, and geological industries. is created.

Cardinal reforms are being carried out in the field of fruit and vegetable processing, as in all sectors of our country.

As a result of a systematic analysis, the improvement of production, as well as the processing of secondary raw materials of fruit and vegetable products using existing devices and equipment for these processes. The efficiency of production is further enhanced by the creation of technologies for the production of confectionery products, the addition and combination of local raw materials, the production of high-quality confectionery products and semi-finished products for confectionery products.

Today's requirement is the effective use of non-waste technologies for the production of agricultural and fruit and vegetable crops, equipping them with modern, quickly adjustable small-sized equipment and technologies, rapid processing of local raw materials, and obtaining highly productive raw materials. high-quality pectin semi-finished products, as well as to create waste-free technologies.

The fruits are prepared by adding the following amount (60-70%) of added sugar and other raw materials in the production of pectin and confectionery products from vegetables and secondary raw materials obtained during their processing. Pectin and confectionery products prepared in this way differ from other confectionery products in their high biological index, richness in vitamins and minerals, and other properties.

The above important challenges also pose a number of challenges for the food and agricultural processing industries. The main ones are such tasks as increasing production volumes, improving product quality, obtaining pectin in the preparation of export products with high nutritional value.

It is found in products such as pumpkin and sunflower from 2% to 3-3.5%. Some varieties of apples, quinces and pears contain up to 1.5% pectin, while apricots, apricots and plums contain pectin.

Throughout the world, pectin is widely used in food, pharmaceutical, textile, printing, medical, geological and other industries. Pectin is used in the food industry to create a strong structure in the production of a number of products.

Particular attention is paid to the improvement of pectin production technology, the creation of a new type of raw material, the expansion of the main area of use of pectins obtained, the production of environmentally friendly products, and the creation of efficient technologies without wasting waste.

Table 1

The amount of pectin obtained depends on the degree of grinding of raw materials and its physical and chemical parameters

№	Indicators	Raw material grinding level, mm						
		0,2	0,4	0,6	0,8	1,0	1,5	2,0
1	pectin amount, %	9,8	8,3	8,2	8,0	7,8	7,6	7,4
2	Humidity, %	8,1	8,2	8,0	7,9	8,1	8,0	7,8
3	Brightness produce peculiarity, mm.sim.set	510	530	530	525	525	530	530
4	Broadcasting level, %	50,0	51,0	51,0	50.0	49,0	49,0	48,0
5	Molecular mass, thousand BC	35,0	38,0	38,0	37,0	36,0	35,0	35,0
6	1% solution pN-i	4,6	4,8	4,8	4,5	4,3	4,2	3,9
7	Ash content, %	1,40	1,25	1,22	1,0	0,8	1,2	1,7
8	Pure pectin amount, %	78,7	81,8	82,0	79,2	79,2	79,1	79,0

The following pectin production technology has been adopted: hydrolysis of protopectin, extraction of soluble pectins, acid precipitation of pectin from a purified extract. The molecular weight of pectin increases as the sunflower grows, the rest of the physico-chemical properties reach a maximum level until the ripening of the plant grain, the stimulating properties of pectin increase.

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