

Possibilities and Prospects of Recycling Trophy Bulbs

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Abstract

The article contains information about the possibilities and prospects of juice production by processing artichoke tubers, and the results of scientific research on this topic are expressed.

Keywords: *Jerusalem artichoke, tuganak, chemical composition, regime, dry matter, juice preparation method, quality.*

Introduction Jerusalem artichoke bulbs juice contains inulin, glucose, fructose, oligofructosan and others. The resulting juice is used in the medicine and food industry for the prevention and treatment of diabetes, as well as as an addition to dietary products. Therefore, in order to increase the assortment of low-cost products with guaranteed quality, it is important to introduce effective technologies and high-intensity technological equipment to food industry enterprises that allow saving material and energy resources. The research consists in the development and improvement of the technological scheme for the preparation of juice from Jerusalem artichokes recycled for dietary food. As an object of research, the marketable tubers of 3 types of Jerusalem artichoke "Fayz-baraka", "Mozhiza" and "I'tyrof" were chosen, as well as the technology of production of dietary food products. The subject of research is the indicators representing the properties of Jerusalem artichoke as raw material, their evaluation criteria, changes in biochemical composition, pre-treatment and packaging processes of Jerusalem artichoke tubers before storage [1,2,3,7].

Research materials and method. As a result of our research, Jerusalem artichoke tubers grown in the farm "Jongeldi zamini" of Jomboy district of Samarkand region had high indicators both in terms of productivity and in the content of inulin (S6N10O5)n. In particular, "Fayz-baraka" variety had superior features compared to other varieties. This variety of Jerusalem artichoke was created at the Scientific Research Institute of Plant Science, and in 2006 it was included in the "State Register" of varieties recommended for cultivation in the territory of the Republic of Uzbekistan. The basis of the reforms in the development of the economy of Uzbekistan is to supply the population with a wide range of high-quality and cheap products, using more local raw materials in production. For this reason, growing and processing Jerusalem artichoke in large quantities in our country is one of the urgent issues[4,5].

The main value of Jerusalem artichokes is the presence of a large amount of inulin. Inulin (S6N10O5)n is an organic substance belonging to the group of polysaccharides and is a polymer of D-fructose. White inulin powder dissolves easily in hot water and is difficult to dissolve in cold water. In industry, it is mainly obtained from artichoke or Jerusalem artichoke tubers. Therefore, it is a valuable raw material in the medical and pharmaceutical industries. It is also important to process artichoke tubers and produce juice. A number of scientists from Uzbekistan conducted research in this field, a group of scientists led by Professor S.A. Salikhov developed the technology for the production of artichoke juice and registered the normative document TSh-40-02072446-

02:2009. The technological scheme of obtaining juice by processing Jerusalem artichokes is shown in Fig. 1 [1,6].

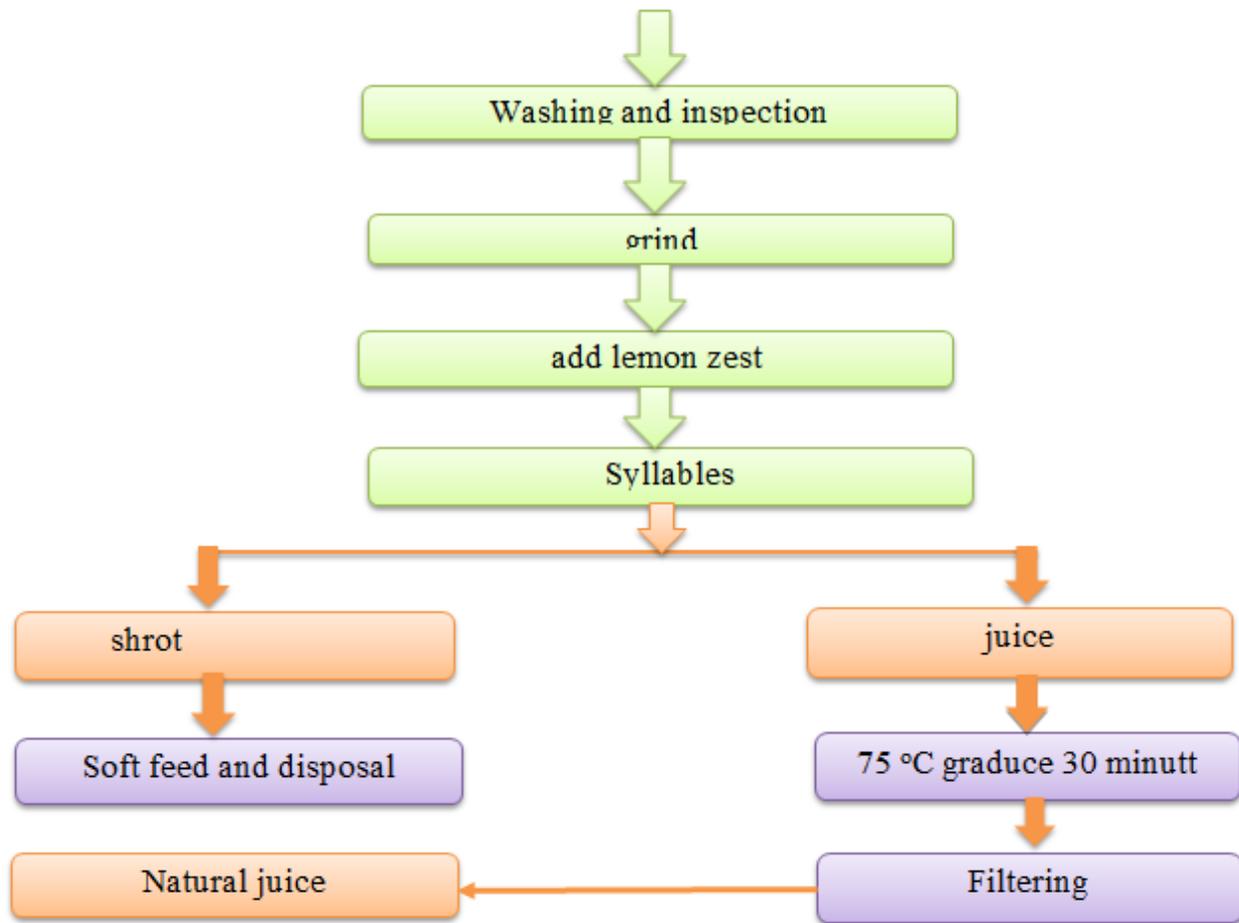


Figure 1. Juice Jerusalem artichokes technological scheme of obtaining

The essence of this scheme is as follows: Jerusalem artichoke tubers intended for juice are brought for processing fresh, chilled or frozen. The pods are washed in a washing machine until they are completely clean, and after several stages of washing, they are sorted, the pods that are unsuitable for processing are removed and sent for grinding.

Results and their analysis. Citric acid is added to the crushed tubers and pressed in a screw press. The purpose of adding citric acid is to prevent darkening of the buttered pods and to improve the flavor of the juice. As a result of sieving, the pulp and juice are separated. If Jerusalem artichoke balls are used as raw material for mixed fodder, it will be a quality food. It can also be used as an organic fertilizer.

In order to coagulate (precipitate) the proteins contained in the separated juice, it is heated to a temperature of $75 \pm 2^\circ\text{C}$ for 30 minutes, and the precipitates formed are separated by centrifugal force. As a result, a natural juice rich in inulin, glucose, fructose and fructooligosaccharides is formed. As a result of the conducted experiments, an average of 27% juice was observed from Jerusalem artichoke tubers.

The addition of 0.03% aspartame, 0.1% sorbic acid or sodium benzoate in order to optimize the organoleptic properties of the strained Jerusalem artichoke juices before packaging them in bottles gave a positive result and allowed for long-term storage. Jerusalem artichoke juice is acceptable by all indicators, which increases its marketability. Table 1 shows the organoleptic and biochemical parameters of Jerusalem artichoke juice.

Organoleptic and physico-chemical description of Jerusalem artichoke juice 1-table

№		Тавсифи
1.	indicator	As in raw material
2.	delisiouc	As in raw material
3.	Amount of dry matter	Brown color
4.	The coler	21-24
5.	inulin	1-1,5

These indicators were analyzed in the researched varieties. An expert group consisting of 7 people was formed to determine the taste and smell of the juice. Prepared juices were evaluated for smell, color and taste. During the experiments, we analyzed the quality of juices obtained from buds of selected varieties. The color was the same in all varieties, and the difference was imperceptible. Table 2 shows the organoleptic evaluation and biochemical composition of Jerusalem artichoke juice by varieties.

2-table. Organoleptic evaluation of Jerusalem artichoke juice and biochemical composition

№	Display name	Indicator value for new items		
		“Fayz-baraka”	“Mo‘jiza”	“E’tirof”
1.	It's delicious(1-5 балл)	4,7±0,5	4,6±0,5	4,4±0,5
2.	The smell(1-5 балл)	4,9±0,6	4,5±0,4	4,3±0,5
3.	The color	Brown coluor	Brown colour	Brown colour
4.	The size of the cross-section of the trunk, mm	45±2	42±2	41±2
5.	Amount of dry matter,%	24±1,5	23±1,4	21±1,6
6.	Inulin,%	1,5±0,1	1,4±0,1	1,4±0,1
7.	Extraction of juice	27±2,2	25±2,5	24±2,3

Taste and smell were evaluated on a 5-point system. The evaluations of all experts were summarized and the average was calculated. As a result, the best indicator in terms of taste was observed in the «Fayz-baraka» variety, which received an average rating of 4.7. In «Miracle» and «Recognition» varieties, the overall result was positive and received 4.6 and 4.4 points, respectively.

In terms of smell, the juice obtained from the buds of the «Fayz-baraka» variety was deemed worthy of the highest evaluation and was rated 4.9 points. According to the amount of dissolved dry matter content of the juice, 24% was recorded in «Fayz-baraka», 23% in «Mo'jiza» variety and 21% in «I'tirof» variety. Table 3 shows the dry matter content and juice yield of Jerusalem artichoke tubers.

3-table. Dry substance in Jerusalem artichokes amount and yield of juice

№	Varieties	Amount of dry matter, %	Juice yield, %
1	“Fayz-baraka”	24	27
2	“Mo‘jiza”	23	25
3	“E’tirof”	21	24

Also, the amount of juice from buds is considered one of the important indicators, and it was clearly demonstrated that this indicator is superior in "Fayz-baraka" variety compared to other varieties.

Summary.

1. Jerusalem artichoke tubers can be processed to obtain high-quality, useful juices.
2. As a result of the introduction of the above-recognized technology into production, it will be possible to produce cheap, high-quality and healing products.
3. It is recommended to grow the "Fayz-baraka" variety created in our republic for food using cultivation technologies in the tuganak direction.
4. It is recommended to process artichoke tubers to make juice for the food industry, especially for diet and children's consumption.

Literature

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