



STUDYING METHODS OF IMPROVING THE PROCESS OF APPLE JUICE PRODUCTION

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ANNOTATION

Today, the world population's demand for quality food products is increasing day by day, and many scientific researches are being conducted to solve this problem. Processing of fruits and vegetables, berry products and extracting ready-to-eat food juices from them, bringing the level of consumption to the level of the necessary norms are among the urgent problems of our time. The article shows that in the technological processes in the production of juices from fruits, we first of all take into production we should pay attention to the quality of our products. As a sample, we used autumn and winter varieties of apples. Secondly, we worked on the efficiency of the equipment brought to the enterprise and the correct sequence of them. Currently, accelerating the implementation of network plans for modernization, technical and technological restructuring of production, the issue of transition to international quality standards is being raised in the domestic and foreign markets.

Key words: screw separator, Bogatyr, carotene, pulp, pressing, pasteurizer, fermentation, crusher, suspension, collector, pump, vacuum.

АННОТАЦИЯ

Сегодня потребность населения мира в качественных продуктах питания увеличивается день ото дня, и для решения этой проблемы проводится множество научных исследований. Переработка плодоовощной, ягодной продукции и извлечение из них готовых пищевых соков, доведение уровня потребления до уровня необходимых норм относятся к числу актуальных проблем современности. В статье показано, что в технологических процессах при производстве соков из фруктов мы в первую очередь принимаем в производство мы должны обратить внимание на качество нашей продукции. В качестве образца использовали осенние и зимние сорта яблок. Во-вторых, мы работали над эффективностью завозимого на предприятие оборудования и правильной их последовательностью. В настоящее время, ускоряя реализацию сетевых планов по модернизации, технической и технологической перестройке производства, на внутреннем и внешнем рынках поднимается вопрос о переходе на международные стандарты качества.

Ключевые слова: шнековый сепаратор, Богатырь, каротин, мезга, прессование, пастеризатор, ферментация, дробилка, суспензия, сборник, насос, вакуум.

INTRODUCTION

Today, the Republic of Uzbekistan is an integral part of the world financial and economic market. Our relations with the outside world are getting stronger and stronger, the economy that the programs of modernization of networks, development of technical and

technological re-equipment are implemented with the support of leading developed countries, Uzbekistan's integration into the international arena is a clear proof of this. growth of trade, import and export of products and goods Decree of the President of the Republic of Uzbekistan "On measures for the rapid development of the food industry of the Republic and the full supply of quality food products to the population".

In order to ensure the implementation of the decision No. PQ-4821 of September 9, 2020 and to further support the newly established prospective projects on the production of food industry products, a number of scientific researches are being conducted Implementation of the Food Industry Development Program in order to ensure the implementation of the Decree of the President of the Republic of Uzbekistan No. 60 of 28.01.2022 on the development strategy of Uzbekistan for the years 2022-2026. Growing exportable products and developing fruit and vegetable growing, increasing the area of intensive gardens by 3 times and greenhouses by 2 times, further increasing the export potential.

Apple juice production is one of the profitable businesses that can generate quick profits by making investments, selecting equipment and establishing close relationships with raw material suppliers. Step-by-step development and expansion of production as a result of promotion of products in the market. Currently, juice production is one of the most profitable types of business. The most commonly used drinks are made from ripe fruits or vegetables, fresh or dried. The world juice market is divided into 4 categories of juices: freshly squeezed, directly pressed, concentrated and processed, that is, made from concentrated juice. 98% of all juices are from concentrated juices, only 2% are direct pressing juice.

The most popular concentrated juice is apple juice. A large-scale work is being carried out for the production of juices. Their assortment is diverse. Apples are harvested from the end of July to late autumn. At the same time, not only fruits plucked from trees, but also apples that have fallen to the ground are used, but rotten, unripe and damaged fruits are destroyed, they spoil the taste of the juice, make it cloudy and sour. Processing of selected raw materials should begin within a day, because apples actively lose moisture.

Chemical composition: Apple juice has a very interesting chemical composition. Amino contains up to 60-80% of the total nitrogen content. In addition, the concentrates contain amino acids such as valine, leucine, threonine, aminobutyric acid, lysine, arginine, aspartic acid, serine, asparagin, glutamic acid, phenylalanine, alanine, tyrosine.

In addition, it contains a large number of monosaccharides, which are broken down into components with the formation of 5-hydroxymethylfurfural under the influence of high temperature and low pH.

Summer-ripening apple varieties produce less juice than autumn and winter varieties. It also holds less dry matter. To get quality juices, it is better to use juicy and sweet autumn and autumn-winter varieties. A healthy apple contains: water - 78-89%; fiber - 0.5%; sugar - 6-15%; carotene; pectin - 0.26%; starch - 0.9%; folic and organic acids; A, B1, B2, B3, C, E, P, PP, K; vitamins. Sodium, phosphorus, potassium, copper, zinc, calcium, aluminum, fluorine, chromium, iron, magnesium, trace elements are found. Most apples or other fruits contain pectin, which makes it difficult to extract juice and reduces its yield. Pectin substances in fruits are in the form of water-insoluble protopectin and soluble pectin.

When crushed winter apple varieties with dense texture, the yield of juice is 80% or more. After crushing, the pulp should go immediately for pressing, because when crushed, the integrity of the cell walls is broken and polyphenolic enzymes are released.

At the same time, in the presence of atmospheric oxygen, polyphenols and other easily oxidizable compounds are oxidized, which causes the taste and smell of the juice to darken and deteriorate. The possibility of producing different juices in one production line. All equipment for the production of apple juice is made of food-grade stainless steel, which excludes the occurrence of corrosion, which excludes the oxidation of raw apple materials during the day. Apple juice has a wide range of uses. Nectars, reconstituted juices and juice drinks are made from it. In addition, the concentrate is used to prepare various plates and any fillings. Nevertheless, it should be remembered that apple concentrate in its pure form cannot be used for food. Researching the technology of processing apples into juices and concentrates, studying the stages of processing the chemical composition of raw materials and finished products, determining the composition of juices using experimental models to study and research the production technology of "Fruit juice" preserves, to determine the total acidity in juices and concentrates, to determine the amount of radicals and vitamins formed during the fermentation of raw juices Feasibility calculations from implementation and development of recommendations for the juice processing industry.

Concentrated apple juice is made by direct pressing of raw materials. The resulting juice is sent to centrifuges, where the suspensions are cleaned and then heated and sent to a special installation. Here, the aromatics are trapped, then concentrated and packaged in bottles. At the same stage, up to 15% of the total volume of water evaporates. The remaining liquid, except for the aromatic components, is sent to the step of purifying the raw material with gelatin with pectolytic enzymes for 4 hours, and then it is passed through lamellae and kieselguhr filters located next to each other. As a result, a thin film is obtained in the "steam chambers" where the determined juice "evaporates" to a solid content of 70%. Usually, before starting the aromatic chase, freshly squeezed juice is heated to 92-96 ° C and immediately cooled to 40 ° C.

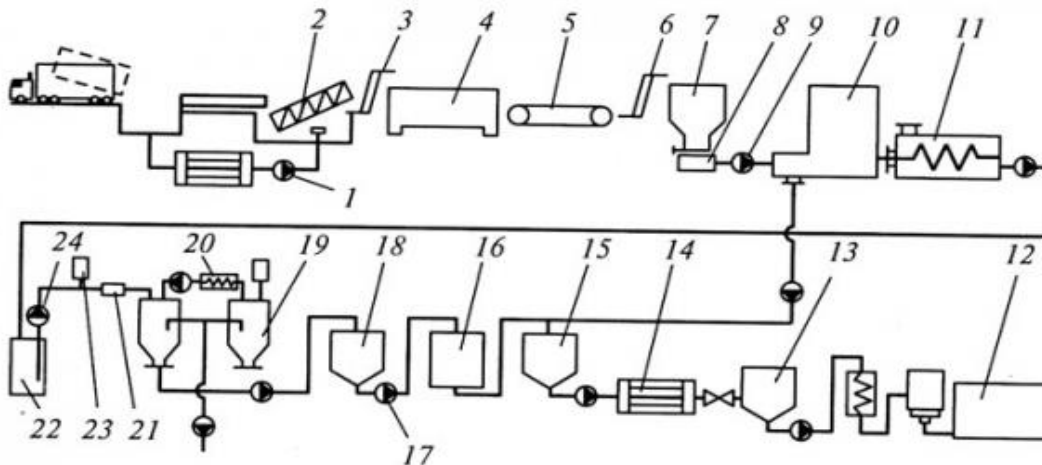
Thus, there is coagulation of colloidal particles and purification of juice from various microorganisms.

In the process of producing juice from fruits, stainless steel containers are used for storage to slow down the drying process. Elevators and conveyors for fruit sorting, crushers for crushing apples, equipment for water treatment and fruit washing, direct extraction belt presses, arc and vibrating screens for cleaning cake juice, separators for cleaning juice for sediment, tanks for mixing juice with additives, sterilizers, homogenizers and pasteurizers, juice packing and packaging machines, labeling machine.

Wash and sort the fruits. The first stage of processing is washing and cleaning. Apple brush is washed in bubble sinks - stainless steel food tubs with air channels in the bottom. First, the fruits are processed with brushes from the residues, then they are pushed over the active air bubbles in the cold water of the bath, after which they enter the conveyor belt, where they are sorted by hand.

Chop the apples by removing the cores and seeds. Cleaned and washed apples enter the crusher, where they are crushed into pulp, which is sent to the extraction presses.

Previously, the raw material passed through a rotating drum, where it was completely squeezed out of moisture.



Production of natural juice from apple fruit at the production enterprise we used the following drawing of the line.

1, 9, 17, 24 - pumps; 2- screw separator; 3.6 - elevators; 4- washing machine; 5 - inspection conveyor; 7, 13, 15, 18, 22 - sets; 8 - grinder; 10 - press; 11 - pasteurizer-cooler; 12 - pasteurizer; 14, 16 - filters; 19 - summary; 20 - cooler; 21 - tubular static mixer; 23 - pectolytic drug dispenser

Filter the juice. The juice obtained after pressing is suitable for consumption, but does not have a "market" appearance: cloudy, concentrated and sour. To clean it, strong mesh filters are used, where the juice is pumped with a pump.

After that, the second filtration is carried out in special filter tubes filled with many membranes and tubes. The juice is driven through them under pressure, it is completely cleaned of pulp particles and becomes transparent.

After clarification, the juice is filtered to separate coagulated colloids and precipitated particles. Filtration is a mechanical process of separating suspended particles from juice by passing them through a porous layer. There are 3 types of filtration: surface, deep and adsorption. Different types of filters are used to filter fruit juices:

The first stage of filtration is to form a layer of filter powder on the entire surface of the drum. For this, a powder suspension is poured into the bath. When the drum rotates, a layer of powder 4-8 cm thick is laid on its entire surface. After the filter layer is formed, the suspension is removed from the bath, the juice to be filtered is poured in - the second stage of filtration begins. The juice passing through the layer of diatomaceous earth under the influence of vacuum is collected in the collector and pumped out from there for further treatment. The sediment is layered on the surface of the diatomaceous earth from the outside and cut with a knife as the drum rotates.

The juice packaging process is simpler than it looks. However, one of the main processes in this process is the appearance of our product, the juice produced by the buyer, and the use of materials in order to preserve the necessary substances for humans until the juice inside reaches the consumer. At the same time, the cost of any error in packaging production is very high, because we are primarily talking about the quality of food products and their shelf life. After that, the juice is transported to the bottling plant through hermetic pipes. Here, automation sterilizes the packages and pours the drink into them.

The process of filling and sealing the juice is carried out in a sterile chamber, which prevents the ingress of bacteria from the environment. After filling, the bags are placed in

corrugated cardboard boxes and sent to the warehouse. After that, the production process is considered completed.

Laboratory analyzes of our apple juice show that technical standards were followed in our juice production process.

The obtained samples do not contain patulin mycotoxin, sulfur dioxide, ethyl alcohol and other preservatives that pose a health risk.

CONCLUSION

A large-scale work is being done to produce juices from apple fruits. Their range is very rich. The juice production facility was carried out at the enterprise. A complex of qualitative and quantitative (chemical composition) indicators and safety indicators was studied using standard and original methods that allow obtaining information about the chemical composition and properties of fruits.

Currently, juice production is one of the most profitable types of business. The most commonly used drinks are made from ripe fruits or vegetables, fresh or dried.

To meet consumer demand, we used the best varieties used to obtain quality natural juices: Bogatyr, Antonovka ordinary, Michurinskaya, Bessemyanka, , Zhigulevskoe, varieties.

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