

METHODS OF PROCESSING FRUITS AND GRAPES TO INCREASE JUICE YIELD

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Annotation: We all know that fruits are of great importance in providing the human body with valuable biologically active substances. Fruits not only provide a person with various organic substances, but also are one of the main factors in its longevity. The human body receives more than 50% of the vitamins and minerals necessary for it from fruits. Providing the population with juice products is an urgent problem in the world. The demand for juice is high among young children, middle-aged people and the elderly.

Keywords: agriculture, fruit, grapes, juice, heating, pressing, active substances, melon products.

Today, special attention is paid to the cultivation of fruit and grape products in the world, and especially to the expansion of their export-oriented types. "In 2017, 83.14 million tons of apples, 74.28 million tons of tons of grapes and 4.26 million tons of apricot products were grown", the processing of these products is an urgent task. At the same time, special attention is paid to the use of energy-saving technologies in the processing of cultivated fruit, melon and grape products. Providing the world's population with wet, dried, canned types of fruits, vegetables and melon products throughout the year, as well as their juices, which are considered necessary for normal human life and are rich in physiologically active substances, is an urgent problem of social and economic importance. Scientific research is being conducted in the world to reduce the amount of energy consumed in the processing

of fruit and grape products and the final product obtained from them. In this regard, increasing the amount of juice obtained and reducing the energy consumption of technology are important tasks. In our republic, comprehensive measures are being taken to apply small-scale equipment and technologies in the field of processing agricultural products. The Strategy of Actions for the Further Development of the Republic of Uzbekistan for 2017-2021, including the tasks of “3.3. Construction of new processing enterprises equipped with the most modern high-tech equipment for the deep processing of agricultural products, the production of semi-finished and finished food and packaging products, implementation of investment projects for the reconstruction and modernization of existing ones” are set. Although mechanical processing does not ensure complete squeezing of juice by pressing, this method is widely used in juice production due to its simplicity. Since the structure and strength of different fruit tissues are different, the design of the crusher and the degree of grinding are selected depending on the product being processed. When grinding too coarsely, the juice yield decreases. It is also impossible to grind too much, because during pressing, small particles of raw materials enter the juice outlet holes and clog them.

The crushed mass of fruits and berries is called pulp. The pulp must be quickly processed, otherwise oxidation and microbiological changes will occur.

Analyzing the results of studies on mechanical crushing of raw materials before pressing, we can draw the following conclusions:

- The yield of juice and its quality depend not only on the biological and anatomical characteristics of the fruit, but also on the structure of the pulp, pressing pressure and a number of other factors.
- The introduction of the process of mechanical crushing of raw materials as a preliminary processing method into the pressing scheme increases the juice yield

from easily pressed raw materials, but is ineffective against difficult-to-press raw materials.

- For different types of raw materials, it is necessary to choose the optimal level of pulping that ensures maximum juice yield.

- Mechanical crushing of raw materials before pressing contributes to a certain increase in juice yield, without affecting the quality of the finished product. The color, transparency, taste, chemical composition, and aroma of the juice obtained by pressing without preliminary processing of the raw material are preserved in their original form.

- An important advantage of the process of mechanical crushing of fruit and berry raw materials is the ability to turn the fruits into a homogeneous pulp-like mass, which significantly facilitates mechanization and automation in juice production, especially in its continuous flow schemes.

Heating. The method is based on increasing cell permeability by coagulating the cell protoplasm protein under the influence of high temperature. As a result of heating, aromatic and coloring substances contained in the flesh and peel pass into the juice. As a result of heating, enzymes are inactivated [61] The speed and degree of coagulation of the protoplasm protein depend on the heating temperature. The fruit is heated to 65-85 0C using hot water, steam, or heated air. Processing with the addition of 10-15% hot water is used for plums, raspberries, blackcurrants, cranberries, gooseberries

The processed fruit is pressed, and the remaining water is used to blanch two or three more portions of raw materials. The water is gradually enriched with extractive and coloring substances. Such an extract is added to the pressed juice.

This mixed method used to obtain plum juice is called the extraction-pressing method. Using this method, up to 90-95% of the juice is extracted from the raw materials. However, due to the addition of water to the juice, its quality is poor.

The fruit is processed with steam on a belt conveyor. In this method, water is not added to the juice, there is no need to sweeten the juice, and a natural, beautiful, tasty juice is obtained.

In the production of juice, it is impossible to use steamers (a device for processing with steam), since most of the product settles in the steamer in the form of a thick layer, as in the production of puree. In such devices, the fruit overheats, crushes, and less juice is released from it.

Heat treatment of fruits when pressing is a simple and effective way to increase the yield of juice. However, in some cases, when heated, the juice acquires an unpleasant (“ripe”) taste, and the pulp becomes viscous and has a slimy consistency. This, in turn, complicates and slows down the pressing.

Objectively assessing the method of heat treatment of fruits and berries before pressing, the following conclusions can be drawn:

- Any heating of plant tissue coagulates protein substances, disrupts the natural structure of the cell, increases the permeability of the plasma membrane, which facilitates and speeds up the pressing process.

- Heat treatment of fruit tissue accelerates the process of converting semi-permeable cells into permeable cells, which ensures increased juice yield for raw materials that are easy to extract juice, and especially for all fruits and berries that are difficult to press.

- Heat treatment of fruits and grapes before pressing is carried out with a large energy consumption, which significantly affects the cost of the final product.

- Heat treatment with an increase in temperature and a slight deviation from the optimal thermal regime leads to a deterioration in the quality indicators of natural juice.

- Heat treatment in some cases leads to the loss of carotene and lycopene in juices, and in addition, it increases the pectin content in them, which makes filtration difficult.

Currently, this method is not used on an industrial basis due to the difficulty of implementation and low economic efficiency.

Conclusion. Currently, juice production is one of the most important areas of industry. And how to produce juice in cheap and effective ways is one of the most urgent issues. I have already told you about the technology of juice production by heating and pressing.

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