Investigation of juices with pulp obtained from stone fruit

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Abstract: *This article is that juices occupy the leading place in the human diet. Along with the increase in the volume of juice production and the expansion of their range, the technology of their production is improved, with the purpose of preserving the biologically active substances of raw materials, improving the quality and nutritional value of the finished product. Current and necessary introduction of standards for methods of determining the indicators that allow establishing the naturalness of juices provide a regulatory framework for eliminating the sale of counterfeit products to consumers and create priority conditions for responsible manufacturers.*

This work is devoted to the examination of the chemical composition and nutritional value of juices with pulp obtained from stone fruits, to the conformity with the standard DSTU 4150: 2003 Juices, juice drinks, fruit nectars, vegetables and melons. General technical conditions.

Keywords: *apricot, peach juice, minerals, vitamins, falsification*

I. Introduction

Emulsions The juices contain vitamins and minerals, without which human life is impossible. They are not synthesized in the human body, but come into the body exclusively with food. Minerals play an extremely important role in the metabolic processes of the human body. They are necessary for the formation of the supporting tissues - bones, cartilage, teeth (calcium, phosphorus, magnesium, fluorine) involved in blood (iron, cobalt, copper, manganese, never), affect water metabolism, determining the osmotic pressure of blood plasma is The main parts of a number of hormones, vitamins, enzymes [1, 2].

Depending on the content in the body and its requirements, all the mineral elements are divided into macro- and microelements. By macro elements are elements, the daily need in which the human body is more than 100 mg. The macronutrients include sodium, potassium, calcium, magnesium, phosphorus, sulfur and chlorine. Body's need for micronutrients is milligrams or even micrograms per day (Iron, cobalt, iodine, fluorine, copper, manganese, zinc, selenium, etc.). The total content of all mineral substances is 3-5% of the mass of the human body. Their content in food is insignificant - 0.03-1.9%.

A deficiency in an organism of one or another microelement can arise for various reasons. Play macronutrient and micronutrient deficiency can be traditional (linked to food raw materials and food) and alternative sources of food and biologically active substances.

Types of juices:

- restored;
- direct spin.

Recycled juice - the juice obtained by reduction of concentrated juice or concentrated puree or paste prepared drinking water in a ratio that ensures the preservation of the organoleptic, physical and chemical properties and nutritional value of juice from the same fruit, berries or vegetables, with the addition or without addition Direct spinning juices, purees, concentrated natural aromatic substances obtained during the production of concentrated juice. Recovered juices

prepared as follows: concentrate is heated to a temperature of 100 degrees is maintained for several seconds, and then for a split second cooled to room temperature. Subsequently pour so much pure water as evaporated. Usually in such a drink is added vitamins, sugar.

It is also worth to say that the juices are lighted, unlit and juices with pulp. Juice with pulp is useful, because it has flavoring properties that are most suitable for fresh fruit and berries. But unliterated juice is saturated with vitamins more than illuminated [3].

Directly expressed juice - the juice obtained directly from fruits, berries or vegetables spin or centrifugation or wiping or other physical way to remove it.

Juices, depending on the type of raw material and the technology used, are made:

- illuminated;
- unclear;
- with pulp.

Requirements for the quality of raw materials. In juice production, different types of fruits and vegetables are used. The following groups of fruits are most significant: grain (apples, pears, etc.); Bone (apricots, peach, cherry, plum, etc.); Berries (black and red currants, gooseberries, raspberries, blueberries, etc.). Among vegetables, tomatoes should be distinguished, since tomato juice is the leader in the volume of production. Other vegetable juices, as a rule, contain several components: it may be carrots, pumpkin, beets and other vegetables. Requirements for raw materials intended for processing differ from requirements for fruits and vegetables for consumption in fresh form. So, for processing on the juice, fruit and berries with damaged skin (spots, burns) can be used, the size and shape of the fruit usually do not matter. However, it is unacceptable that the raw material is decayed - a small amount of rotten fruits or berries that have got into the processing can give an unpleasant smack of the whole batch of juice produced. In addition, such females may contain mycotoxin patulin [4].

Fruits and berries for making juices should be mature. Outstanding fruits have a faint color, high acidity, dense pulp. Juices from immature and underdeveloped fruits contain a smaller amount of aromatic substances, much lower than their quality and quantity when obtaining a concentrate of aromatic substances.

It is better to use autumn / winter autumn / winter varieties with juicy and sour - sweet flesh for the production of juices, as the fruits of summer maturity tend to produce less juice, less dry matter. Grapes with colored peel and unpolluted juice are not suitable for the production of natural juices. The mass fraction of sugars and acids determines the taste of juices. With high acidity and low sugar content juice turns out to be unhealthy. Some types of fruit and berry raw materials impose additional requirements. For example, grenades should have acidity within the range of 0.9-2.8%; It is better to use gooseberries with yellow color, as the red berry juice changes in color during processing and storage.

Reception, storage and intra-factory transportation of raw materials. Crystal sugar comes to enterprises, usually in bags by road. From cars, bags of sugar with the help of an electric car are transferred to the weight and after the determination of the mass stored in storage. The ladle bag is fed to the bunker with bags of sugar. Sugar is poured out of sacks into a bunker, from where it is fed to the preparation of sugar syrup and colander.

Essences, flavors, concentrates of beverages, concentrated juices, dyes and organic acids enter the plant, usually in a container of polymeric materials and, after proper recording, are kept in stock. To prepare working solutions, they raise the loader to collectors. After weighing these

products on their scales, using flexible hoses, the pump is pumped into collections for storage. Small batches are stored in transport containers. The juices and infusions are filtered on a lamellar filter, from which they are fed into pressure collections.

Preparation of water for technological purposes. As a rule, drinking water entering the production requires additional training and, above all, reduction of stiffness. At non-alcoholic drinks factories, biological water purification can be carried out by chlorination. Chlorination - a widespread method of biological water purification. The biological effect of chlorine consists in suppressing the metabolism and oxidation of the components of microorganism cells, which, as a result, they perish. This action is conditioned by the presence in chlorinated water of chlorinated acid and chlorine ion, directly interacting with the substances of the cell. Complete sterility of water during chlorination can not be achieved, since some microorganisms exhibit resistance to chlorine. The bactericidal effect of chlorine depends to a large extent on its initial dose and duration of contact with water. At a dose of chlorine 1 mg / l and the duration of contact for 1 hour, the number of bacteria decreases from 232000 in 1 cm3 of water to 180,000. Chlorine is readily soluble in water. At normal pressure and temperature of 10 ° C, its solubility is 9,75 g / l. Dissolving chlorine interacts with water and forms chlorine water, which is a strong oxidizer. The degree of hydrolysis of chlorine is determined by the pH of the medium. At pH 5, active chlorine is in water in molecular form, in the range of pH 5 ... 9.2 in water, chlorine oxalic acid predominates, and at pH> 9.2 - only ions C1.

In order to improve the biological state, water is chlorinated after filtration. Due to the oxidative action of chlorine, the degree of water color decreases, smells and odors disappear. Chlorination also helps to remove iron and manganese from the water. Organic compounds of iron under the influence of chlorine are destroyed, divalent iron passes into trivalent and as a result of hydrolysis and precipitates in the form of hydroxide iron. Manganese oxidizes and falls into sediment. In the production of soft drinks, chlorination of water should be accompanied by dechlorination, since residual chlorine gives it an unpleasant taste and smell. in addition

II. Materials and methods

Analytical research methods conducted an examination of the chemical composition and nutritional value of juices with pulp obtained from stone fruits, to the compliance with the standard DSTU 4150: 2003 juices, juice drinks, fruit and berry nectars, vegetables and melons. General specifications [7,11,14,15].

Dry matter and mass fraction were measured by physicochemical drying method in a drying cabinet; Mono- and disaccharides - a sugar meter (pic. 1)

Pic. 2 Sugar meter

Sugar meter could have measured Brix:

★ Material & Structure & Range: Copper construction, main prism + daylight plate + calibration screw + rubber grip + focus

adjustment + eyepiece. Adjust prism when can't see scale clearly, get accurate scale. Soft rubber eye piece for comfortable viewing. Measures brix is 0-32%, minimum scale is 0.2

★ Features: High quality and accurate testing result. Heavy-duty and light weight, portable and compact, small volume, convenient to carry. ATC (Automatic Temperature Compensation, 10 ℃~30℃ for accurate readings, without having to re-calibrate after changes in ambient working temperature

★ Utilities: Designed for testing the amount of sugars in fruits, vegetables and grasses and quality control in production, very helpful in agriculture, food manufacturing and field operation. For measuring brix, a refractometer is easier and more accurate than a hydrometer

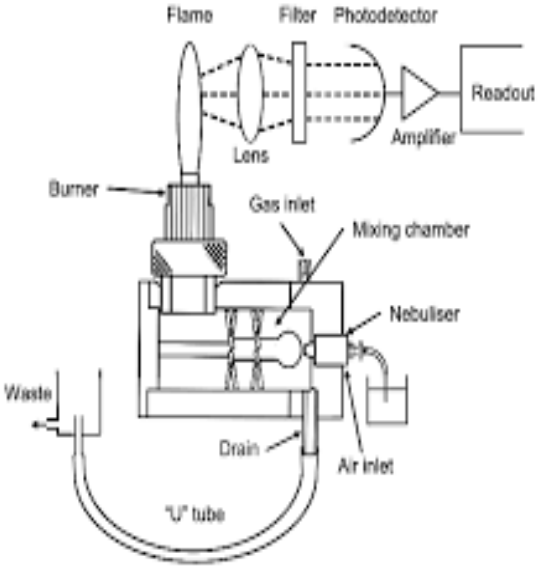
★ High quality, sturdy design, compact in size and light in weight, packed with a plastic case, convenient to keep up and carry around. Zero-line adjustable visual sharpness setting at the eyepiece. Uses ambient light only which means battery or power source is not required

★ Full kit: Storage case, include refractometer, mini screwdriver (to calibrate to "0") for adjusting, pipette, cleaning cloth, and English manual.

Na, K, Ca and vitamin C content were measured by the method of flame photometry with a flame photometer PFP-7 (pic. 2) designed to determine the concentration of ions (Na, K,). The PFP7 is a low temperature, single channel flame photometer that is designed for the routine determination of sodium, potassium, calcium, barium and lithium concentrations. The flame failure safety system makes these products ideal for use in industrial and educational environments. The use of fine and coarse sensitivity controls allows for accurate measurements each and every time.

PFP7 Industrial Flame Photometer

• Designed for industrial analysis
• Supplied with Na, K, Li, Ba and Ca filters
• Low temperature, single channel
• Flame failure safety system
• Operates with propane, butane, natural gas or LPG



Pic. 2 Flame photometer PFP-7

The object of research is apricot and peach juice with pulp with the addition of emulsions. Organoleptic indicators of juices with pulp (apricot and peach):
appearance and consistency-homogeneity of the liquid with a uniformly distributed flesh; taste and aroma, characteristic of this type of juice; color - a homogeneous, characteristic of this kind of fruit from which the juice is made.

We will analyze the organoleptic, physico-chemical parameters of juices and the content of micro and micronutrients, vitamins for compliance with the standards.
Analyzing the quality indices of the juices studied, investigate whether there is a violation of the parameters of the technological process of making juices and their falsification.

Table 1 - Physico-chemical parameters of juices according to the standard

Fruit juices with pulp	Mass fraction,%		pH, not more than
	Soluble dry matter, not less than	Titrated acids per citric acid, not more than	
Apricot	11,2	1,10	4,0
Peachy	12,0	0,65	4,0

Table 2 Nutritional value of 100 g of juices according to the standard

Name of fruit juice with pulp	Proteins, g	Carbohydrates, g	Mineral substances, mg						Vitamins, mg				
			Na	K	Ca	Mg	P	Fe	β-каротин	B_1	B_2	PP	C
Apricot	0,9	11,0	1	153	14	4	13	0,3	1,3	0,01	0,02	0,15	12,0
Peachy	0,5	10,0	16	190	11	9	19	0,3	0,3	0,02	0,04	0,40	2,0

III. Results and discussion

As a result of the use of research methods, the chemical composition of juices, measured dry matter, pulp, mineral matter and vitamins were investigated.

The results of the research are presented in Table 3.

Table 3 Chemical composition and nutritional value of juices with pulp obtained from stone fruit

Indicator	Apricot juice	Peach juice
Chemical composition, g /100 g		
Dry matter, %	11,5	13,3
Mass fraction of pulp, %	35	35
Mono and disaccharides	13,70	11,12
Мінеральні речовини, мг/ Mineral substances, mg 100 g		
Na	*1,55*	*1,45*
K	160	180
Ca	12,5	14,0
Vitamins, β-carotene, mg /100 g	4,70	6,0
Vitamin C	***4,70***	***6,0***

From the studied quality indicators of apricot juice with pulp, does not meet the requirements of the standard content of vitamin C - decreased from 12 mg / 100 g to 4.7 mg / 100 g., peach juice does not meet the requirements of the standard content of Na – reduced from 16 mg / 100 g. To 1.55 mg / 100 g. When carrying out sensory analysis for organoleptic parameters, all the juices for color, aroma, consistency meet the standard. Physicochemical indicators also corresponded to normative documents. In the study of physico-chemical parameters in peach juice, the higher content of dry matter (12) but less acidity (0.65) compared with apricot juice (11.2 and 1.1), respectively.

IV. Conclusions

The analysis of organoleptic, physico-chemical parameters of juices and the content of micro and microelements, vitamins for compliance with the standards has been carried out.

Analyzing the quality indices of the juices studied, there is a violation of the

parameters of the technological process of making juices.

This is evidenced by:

• reduced vitamin C content in apricot juice. Therefore, in order to replenish the supply of vitamin C in the body, it is necessary to turn to plant products during their flowering. It is also known that vitamin C is lost during heat treatment.

• Reduced Na content in peach juice. Falsification of juices was discovered, using more complex imitation of natural product, using different types of forgings - apple puree added to peach juice, etc.

It is clear that the content of vitamin C and trace elements in various fruits depends on the soil they are grown from, the climate from the time of ripening, the amount of precipitation that falls, and, finally, on the time and method of storage. Even in different fruits of the same species, there is always a certain difference, and this is explained by different numbers of different laboratories. The technology of juicing is particularly influential, namely the temperature processing modes.

Consequently, the declared indicators of investigated juices from the trading network do not meet the requirements of the state standard [8, 9,10,12,13,].

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