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Technology of Preparation of Composition from Spinach Pumpkin

Zaripov Gulmurot Tokhirovich [1], Razzakov Zavkiddin Zohid ugli [2]

Аннотация: Мазкур мақолада испан қовоғининг истеъмол қисмидан экстрактив моддаларнинг экстрактга чиқишини гидромодул билан боғлиқлиги, экстракция қилинишининг ҳароратга боғлиқлиги. Қовоқ этидаги қуруқ моддаларни экстракциялашнинг лимон кислотаси концентрацияси билан боғлиқлиги тажрибада ўрганилган.

Ключевые слова: тыква, лимонная кислота, гидромодуль, экстрагенты, сухое вещество, экстракция, температура, экстрагент, аминокислота, состав, вакуум.

The quality and environmental safety of raw materials in the preparation of composites for soft drinks from fruits and vegetables is of great importance. The quality of the product depends on the quality of the raw material, its chemical composition and the selected technological scheme. The chosen technological scheme should be such that it should allow the extraction of biologically active substances and microelements, which are necessary for the human body, mainly from the composition of raw materials.

There are several ways to accelerate the extraction process. In the preparation of the composition, we studied two (extraction using organic acids and hololitic ferments) methods of accelerating the extraction process. The results obtained were analyzed on the following gas.

The physico-chemical composition of pumpkin meat was studied. As can be seen from Table 1, the meat of the Spanish pumpkin mono - and is rich in polysaccharides, organic acids, minerals and vitamins. [1] usually the core of the pumpkin is consumed after heat treatment is given. At a temperature of 100^0C and above, vitamins and some other biologically active substances in the pumpkin lose their properties, and the nutritional value of the consumed product decreases. Therefore, it is of great importance to process the meat of zucchini at a low temperature.

When preparing a composition from red carrots, citric acid is best chosen as a houlizate. For these, too, citric acid was selected as a houlizate, since carrots and zucchini are considered to be extremely close to each other as a field plant and differ little in chemical indicators. [2]

Table 1. Physico-chemical composition of Spanish pumpkin

Indicators	Unit of measurement	Quantity
Dry matter	%	12,6
Monosaccharides	%	2,7
Polysaccharides	%	4,8
Including: cellulose	%	4,1
Pectin substances	%	0,7
Protein	g/kg	13,2
Uchiglycerides	g/kg	1,7
Organic acids	g/kg	2,54
Mineral substances	mg/ kg	4250
Including: phosphor	mg/ kg	1827

[1] Professor of Bukhara state university
[2] Master of Bukhara state university

Calcium	mg/ kg	656
Sodium	mg/ kg	781
Magnesium	mg/ kg	592
Potassium	mg/ kg	2455
Iron	mg/ kg	149
Vitamins	mg/ kg	67,85
Including: «C»	mg/ kg	32,0
«B» group	mg/ kg	8,20
«PP»	mg/ kg	7,95
B- carotene	mg/ kg	19,7

In order to prepare the compote from the spinach pumpkin, it is necessary to initially establish the optimal proportion (rhizome) of citric acid in the crushed pumpkin chops as an extract.

It was assumed that the concentration of citric acid was C=0,5% , the extraction temperature t=70^{0}C, and the duration of the process t=25 minutes unchanged, that is, C, t, t = Const. Considering that pumpkin meat differs from Carrot meat in its hardness, a number of experiments were initially conducted to find the optimal rhizome. The results of the experiments are presented in Figure 1.

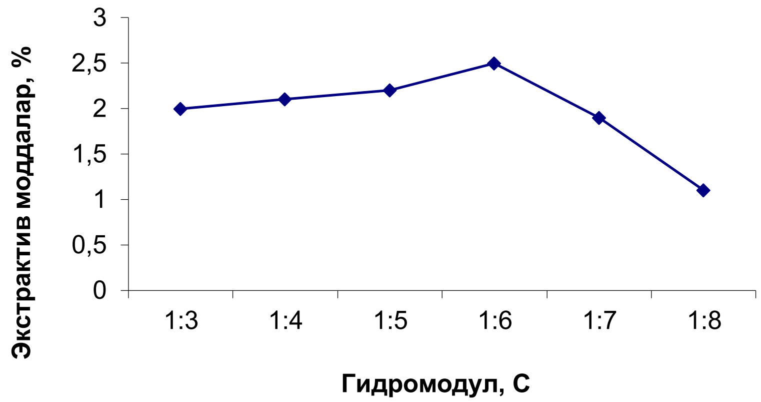

Figure 1. Connection of the release of substances into the extract with honomodul

As can be seen from the change line, the relative percentage of dry substances in the extract increases with the increase in the volume of the solution, but when the solution is g=1:6, the relative percentage of dry substances in the extract reaches a high level. After this, an increase in the content of honadol leads to the dilution of dry substances in the extract. The relative share of dry matter extracted from pumpkin flesh in various cereals:

Km = g x (E-0,5) / (100 - W)

1. When G = 1:3. Km = 3 x (2,0 – 0,5)/(100 – 87,4) = 35,7%

2. When G = 1:4. Km = 4x (2,1 – 0,5)/(100 – 87,4) = 50,7%

3. When G = 1:5. Km = 5 x (2,2 – 0,5)/(100 – 87,4) = 67,4%

4. When G = 1:6. Km = 6 x (2,4 – 0,5)/(100 – 87,4) = 90,5%

5. When G = 1:7. Km = 7 x (1,9 – 0,5)/(100 – 87,4) = 77,7%

6. When G = 1:8. Km = 8 x (1,2 – 0,5)/(100 – 87,4) = 44,4%

Initially, the dry substances in the pumpkin kernels begin to be more extreme in the extract, and when the gum becomes g = 1:6, at most, more than 90 percent of dry substances go to the extract. When the humodule is further increased, as a result of excessive dilution, part of the dry matter is decomposed, and as a result, the percentage of extruded dry matter is reduced. The results of the study show that it is possible to indicate that the optimal solution for the transfer of dry substances from the consumed portion of the Spanish pumpkin to a high degree of extract is honomodul g = 1:6.

To determine the optimum temperature for the extraction of dry substances of pumpkin, a number of experiments were conducted at different temperatures with g, τ, C = Const. The temperature was increased from 55oS to every 5oS from 85oS. At the end of the extraction process, the mixture was cooled and the extract was separated, and the amount of dry matter contained in it was determined by a refractometric method. The results of the study are presented in Figure 2.

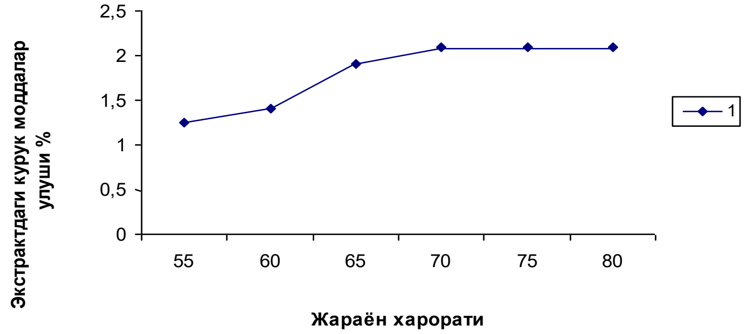

Figure 2. The dependence of the extraction of pumpkin dry matter (%) on temperature under the action of citric acid

As can be seen from the variation line, most dry matter extraction process takes place at 75^0 C. The fact that the heat of extraction increased by $5\ ^0$ C compared to the extraction of carrot flesh can be explained by the fact that the product contains a lot of dry substances in its core and is somewhat more rigid.

To determine the optimal concentration of citric acid in the extract of dry substances contained in the kernels of the Spanish pumpkin, a number of experiments were conducted at different concentrations of the acid with g, t, t=Const. The acid concentration was prepared in the range from 0,3% to 0,8% to 0,1% and the dry matter of the pumpkin was extracted.

At the end of the extraction process, the mixture was cooled and the extract was separated, and the dry matter contained in it was determined by a refractometric method.

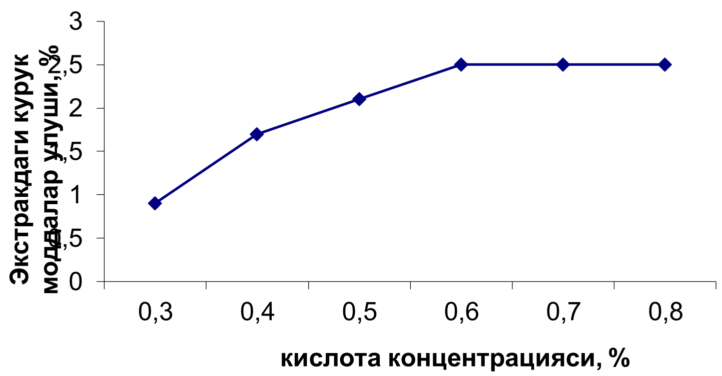

Figure 3. The connection of the extraction of dry substances from pumpkin meat with the concentration of citric acid

As can be seen from the change line, the relative percentage of dry substances that pass into the environment by increasing the concentration of citric acid solution increases, but after the concentration of acid reaches 0,6%, the maximum number of dry substances will be extraction, it is not desirable to increase the concentration of acid by 0,6%, since the content of

In order to determine the optimal duration of extraction of dry substances of the Spanish pumpkin t, C, g=Const, the extraction process was carried out separately for 75 minutes at 1:6 p.m., in 0,6% solution of citric acid, at $15\ ^{0\ C}$. The results of the study are presented in Figure 4.

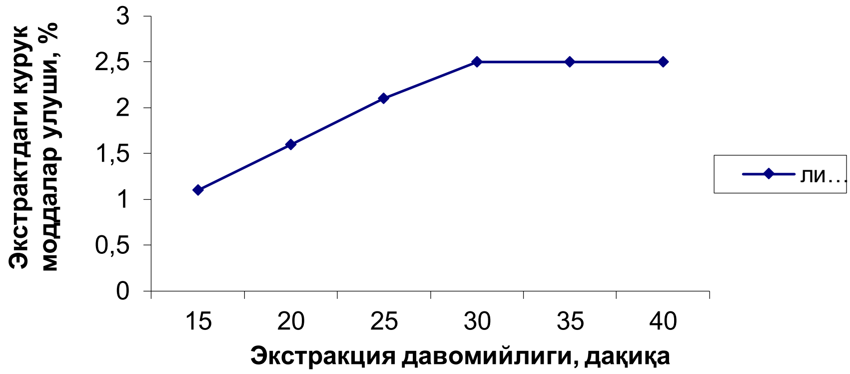

Figure 4. Extract of dry matter from pumpkin kernels connection with continuity

As can be seen from the variation line, it is desirable that the process should be carried out for 30 minutes in order to obtain a high degree of extraction of dry substances from the meat of the Spanish pumpkin.

Extractions of dry substances from the kernels of the Spanish pumpkin should be carried out at 1:6 g of the powder, at 75oS for 30 minutes, using 0,6% solution of citric acid as an extragent. It should be noted that the extract from the spinach zucchini is slightly different from the carrot extract. In the extract from this agricultural product, polysaccharides mono–and disaccharides are 2.5-3,0 times more, organic acids are less than 2 g/dm3. But just like the extract from carrots, the extract from pumpkin also contains a lot of biologically active and mineral substances. The results of the study are presented in Table 2.

Table 2. Chemical composition of pumpkin extract

Indicators	Unit of measurement	Quantity
Dry matter	%	2,5
Monosaccharides (According to Bertran)	%	0,50
Polysaccharides	%	0,18
Including: cellulose	%	0,11
Pectin substances	%	0,07
Protein	g/dm^3	6,8
Uchiglycerides	g/dm^3	3,3
Organic acids	g/dm^3	1,6
Mineral substances	mg/dm^3	650
Including: phosphor	mg/dm^3	95,5
Calcium	mg/dm^3	91,9
Sodium	mg/dm^3	34,4
Magnesium	mg/dm^3	82,4
Potassium	mg/dm^3	331,7
Iron	mg/dm^3	14,1
Vitamins	mg/dm^3	4,8
Including: «C»	mg/dm^3	2,1
«B» group	mg/dm^3	0,4
«PP»	mg/dm^3	0,3
B- carotene	mg/dm^3	2,0

The amino acid composition of the composition from the spinach pumpkin was determined. Even in the extract from the spinach pumpkin contains mainly free amino acids, since when heat treatment is given to the pumpkin crushed with 0,6% solution of citric acid, the available proteins are hydrolyzed and the relative share of amino acids in the environment increases. It is presented in Table 3.

Table 3. Amino acid composition of dark extract from pumpkin

Name of amino acids	Unit of measurement	Quantity
Lysine	mg/dm^3	42
Treanin	mg/dm^3	35
Tsarist	mg/dm^3	31
Protector	mg/dm^3	29
Izalsinsin	mg/dm^3	33
Lesin	mg/dm^3	21
Trampoline	mg/dm^3	46
Phenylalanine	mg/dm^3	75
Methianine	mg/dm^3	22
From the bottom of one's nose	mg/dm^3	-
Arginine	mg/dm^3	41
Asparagic acid	mg/dm^3	27
Glutamic acid	mg/dm^3	44
Proline	mg/dm^3	-
Alanine	mg/dm^3	66

The process of thickening the extract from the Spanish pumpkin was carried out in the same way as the process of thickening the extract from the carrots. The vacuum was thickened in a thickener. In the dark extract, the dry matter was 52,5%.

The dark extract is dark amber in color, slightly sour-sweet reminiscent of the taste of dried apricots, the consistency of which is similar to the homogenized liquid sumalak.

Table 4. Chemical composition of the composition from pumpkin

Indicators	Unit of measurement	Quantity
Dry matter	%	52,5
Monosaccharides (According to Bertran)	%	40,3
Polysaccharides	%	9,37
Including: cellulose	%	8,06
Pectin substances	%	1,31
Protein	g/dm^3	1,1
Uchiglycerides	g/dm^3	0,8
Organic acids	g/dm^3	5,10
Mineral substances	mg/dm^3	14100
Including: phosphor	mg/dm^3	6101,2
Calcium	mg/dm^3	2080,4
Sodium	mg/dm^3	1839,0
Magnesium	mg/dm^3	1900,4
Potassium	mg/dm^3	1200,6
Iron	mg/dm^3	978,4
Vitamins	mg/dm^3	176,8
Including: «C»	mg/dm^3	131,0
«B» group	mg/dm^3	20,3
«PP»	mg/dm^3	10,9
B- carotene	mg/dm^3	14,6

As can be seen from the table, the composition made of spinach zucchini is rich in monosaccharides, organic acids, polysaccharides and mineral and biologically active substances.

When part of the proteins is converted into amino acids, which in the process of thickening are hydrolyzed, part is spent on the formation of organic acids, ethers.

It can be concluded that the application in the food industry of the preparation of various compositions and extracts from agricultural products, the physico-chemical composition, properties and output of composites and extracts depends on the technological conditions, including temperature, duration, activity, proportion and extraction process. Taking these into account, it is worthwhile to create a technology for the production of new types of products in the food industry on the basis of the introduced compositions and extracts.

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