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**INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH
TECHNOLOGY****USAGE OF PUMPKIN PUREE IN THE PRODUCTION OF NATIONAL BAKERY
PRODUCTS****Sh.M.Karimova*, Kh.F.Juraev, M.Karimov**

Samarkand Institute of Economics and Service, Uzbekistan

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ABSTRACT

The paper presents the developed recipe and evaluation of consumer properties of a bakery product for functional purpose with the addition of pumpkin puree. The developed recipe is characterized by the following physico-chemical and consumer properties: a high content of physiologically functional ingredients, such as dietary fiber, vitamins causes a high nutritional value and functional properties of the developed products, and also confirms the possibility of their use in the dietary eating of people, prone to various diseases in order to normalize nutritional status.

KEYWORDS: pumpkin, pumpkin puree, dietary fiber, pectin, solids compounds, sugars, vitamin C, titrated acidity, β -carotene, functional products.

1. INTRODUCTION

The current state of the processing industry of the Republic of Uzbekistan necessitates the formation of a national innovation system consisting in the promotion and expansion of the range of competitive functional products, taking into account the real demand of the population and the consumer market. This is primarily due to the demographic changes and the widespread deterioration of the ecological situation, which requires not only radical improvement of the technology of traditional products, but also the creation of new generations of products that meet today's realities. It is known that adverse environmental factors and harmful production conditions have a significant impact on the human body [1-9]. Therefore, the problem of preserving the health of the population of Uzbekistan is currently associated with the need to create functional products, the systematic reception of which not only improves the flow of physiological processes in the body, but also its state as a whole. The development of functional products is especially important for those groups of consumers, whose health state needs correction in their daily diet. In the near future, such groups of consumers can become persons engaged mainly in physical or mental labor, elderly people, including those with various diseases, in particular the digestive tract, the cardiovascular system, the obesity of varying severity [1-9].

In this regard, there is the problem of supplying the population with the products of a high biological value and it is very important to expand the range of products from non-traditional and low-traditional types of raw materials of plant origin.

The aim of the work was to develop a recipe and value the consumer properties of a bakery product of a functional purpose with the addition of pumpkin puree. It is known that special requirements are imposed on functional ingredients: the lack of ability to reduce the nutritional value of the food, safety in terms of a balanced diet and naturalness [1-9].

2. MATERIALS AND METHODS

Due to the fact that the pumpkin is one of the types of plant raw materials that have a sufficiently high content of pectic substances rather significant background of the vitamin complex (in particular, carotenoids). Therefore, the research was based on the study of various species and varieties of pumpkin and the possibility of their use for the enrichment of national bakery products with pectin substances, vitamins, in particular β - carotene.



The following varieties of pumpkin grown in the conditions of Samarkand region of Uzbekistan were taken for the research: A winter canteen A-5 - large-fruited species, Vitamin - muscat variety, Golosemyannaya - a variety of hard root.

The work was carried out in the Accredited Testing Laboratory "Food Safety" in Bukhara Institute of Technology, where were identified the following indicators of pumpkin varieties winter canteen A-5 - large-fruited species, Vitamin - muscat variety, Golosemyannaya - a variety of hard root: mass fraction of dry substances, mass fraction of pectic substances, vitamin C, carotenoids, titratable acidity using modern standard methods of research.

The mass fraction of dry substances was determined using a refractometer. The mass fraction of pectic substances in the pumpkin was determined according to GOST 29059-91. Products of processing fruits and vegetables. Titrimetric method for the determination of pectic substances [10]. Vitamin C in pumpkins was determined according to GOST 341 SI -2017. Food products. Determination of vitamin C using high performance liquid chromatography [11]. Carotenoids were determined according to GOST R 54058-2010. Functional food products. Methods for the determination of carotenoids [12]. Determination of sugar content was made according to GOST 34232-2017. Methods for determining the activity of sucrose, diastatic number, insoluble substances [13].

From the lot of fruits of these varieties, average samples were selected, in which, according to the methods, the analysis was carried out on the content: mass fraction of dry substances; sugars; titrated acidity; vitamin C; β - carotene; pectin substances (PS).

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3. RESULTS AND DISCUSSION

Data analysis of physico-chemical parameters of the objects of study are shown in Table 1.

Table 1. Pumpkin Fruit Quality Indicators

Variety / variety	Mass fraction of dry substances, g / 100g	Mass fraction of sugars, g / 100g	Mass fraction of vitamin C, mg%	Titratable acidity, hail	Mass fraction of pectic substances, g / 100g	Mass fraction of β -carotene, mg%
Vitamin /nutmeg	7,80	6,30	10,50	0,067	1,00	15,00
Gymnastics/meddled	7,40	5,90	12,10	0,10	0,60	5,60
Dining room winter F-5 / large-fruited	8,90	8,70	11,50	0,067	1,04	7,00

The research results showed that, by the set of indicators, the most valuable in terms of the content of biologically active substances are the nutmeg and large-fruited species, which contained, respectively, 1.00 and 1.04% pectin and 15.0 and 7.0 mg% β -carotene.

Considering that the muscat variety significantly exceeds other varieties in β - carotene content, contains a sufficient amount of pectin substances, and also has a stable high yield in the conditions of the Samarkand region of Uzbekistan, it was selected for further research.

The next task of the research was to find a way to produce pumpkin puree, which allows to preserve as much biologically active substances as possible.

As a control, the standard method of cooking boiled pumpkin puree was adopted, according to which the pumpkin is washed and inspected, rinsed under a shower, cleaned and crushed. The prepared raw material is boiled down to such a state that it can be passed through a wiper. Diluted raw materials are immediately fed to a dual wiper. To homogenize the mashed potatoes, a mass is fed to the homogenizer. This method has several disadvantages:

- nitrate content significantly exceeds the MPC value;
- there are losses of nutrients, vitamin C and β - carotene.

The second method of making mashed potatoes is recommended as a method for the more complete preservation of biologically active substances when preparing mashed pumpkin. The method involves washing the pumpkin, cleaning it from the skin and seeds, chopping straw, preparing pouring (water with citric acid in the ratio, wt.%: 98.8–99, 6: 0.1–0.3), bringing it to a boil ; cooling the pouring, filtering it, keeping crushed pumpkin for 0.5-1 h at a temperature of 80–85 ° C, removing the liquid fraction, grinding the solid fraction 3-5 mm in size, boiling it with water in a 1: 0 ratio, 4 until softened.

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The yield of mashed potatoes in the first case was 75%, in the second –83%. In both cases, mashed potatoes were obtained from the Vitamin pumpkin variety, a variety of nutmeg.

The chemical composition of pumpkin puree, obtained in two variants of the experiments are given in table 2.

Table 2. The quality of pumpkin puree variety "Vitamin"

Ways to get puree	Mass fraction of dry substances, g / 100g	Mass fraction of sugars, g / 100g	Mass fraction of vitamin C, mg%	Titrateable acidity, hail	Mass fraction of pectic substances, g / 100g	Mass fraction of β -carotene, mg%
Standard way - control	7,0	5,3	6,3	0,017	0,74	9,1
A way to study	7,1	5,5	8,6	0,13	0,77	12,6

These tables allow us to conclude that the proposed method for the study of the production of pumpkin puree allows you to save the maximum number of biologically active substances. The maximum preservation of biologically active substances in the puree, which was obtained for the study according to the proposed method, makes it possible to recommend it as a dresser of bakery products β - carotene and pectin substances.

When choosing the dosage of pumpkin puree in bakery products, a number of factors were taken into account: the need for maximum enrichment of products with pectins, vitamins and other biologically valuable components, the achievement of optimal concentration in terms of their therapeutic and prophylactic effects on the human body; obtaining finished products with high organoleptic properties (color, taste, smell); social expediency.

To determine the effect of pumpkin puree on the quality, nutritional and biological value of bakery products, laboratory baking was carried out. To determine the recipe buns with the addition of pumpkin puree as the original was chosen recipe buns.

The experiment is conducted in three directions:

1. Control - according to the standard recipe for a sweet bun;
2. The introduction of 10% pumpkin puree by weight of the flour when kneading dough (Pumpkin-1);
3. Additive 15% pumpkin puree by weight of flour when kneading dough (Pumpkin-2).

Technology of cooking dough for pumpkin buns.

The dough was prepared straight way. Fermentation time 2-2.5 hours. The fermented dough was cut into pieces with a mass of 115 g, the products were rounded, they were done in the center. The proofing was carried out for 20 minutes, baking at 220 ° C for 15 minutes.

Table 3 lists the recipes for buns with the addition of pumpkin puree.

Table 3. Pumpkin rolls recipes

Raw material	Raw material consumption, kg		
	Control	Pumpkin -1	Pumpkin -2
Premium wheat flour	100	90	85
Sugar	15	15	15
Margarine	5	5	5
Pressed yeast	2,5	2,5	2,5
Egg	4	4	4
Pumpkin puree	-	10	15
Salt	1	1	1
Water	By calculation	By calculation	By calculation

Data on organoleptic and physico-chemical indicators of the quality of the finished product are shown in Tables 4 and 5.

Table 4. Organoleptic indicators of quality pumpkin "buns"

Indicator	Control	Pumpkin -1	Pumpkin -2
Surface condition	Smooth	Smooth	Smooth
Surface color	Light golden	Golden	Brown
Taste	Sweet, typical of this type of product	Sweet, pumpkin-flavored	Sweet, harmonious with a pumpkin flavor

Smell	Typical for this type of product	Faint smell of pumpkin	Faint smell of pumpkin
The color of the crumb	White	Yellowish white	Yellow with a whitish tint

Table 5. Physical and chemical indicators of the quality of the pumpkin roll

Indicator	Control	Pumpkin -1	Pumpkin -2
Specific volume of finished products, cm ³ /100g	360	380	420
Form stability (N:D)	0,47	0,53	0,53
Output of finished products, %	135	142	145
The moisture content of the crumb, %	32,5	33,6	34,4
The acidity of the crumb, H	2,0	2,1	2,2

Analysis of the data showed that the addition of pumpkin puree to the dough leads to an improvement in organoleptic characteristics, namely: the color of the buns, the porosity, crumb elasticity, the shape of the finished products are improved.

Thus, the conducted studies allow us to conclude that when selecting pumpkin varieties for the processing industry, attention should be paid to the variety of varieties used, since the content of biologically active substances in the raw materials is a varietal feature.

In the technology of pumpkin processing it is necessary to use the methods of teaching mashed potatoes, which most fully preserve the beneficial properties of pumpkin. The most optimal in the production of bakery products should be considered a dosage of 15% by weight of flour, which allows to obtain products enriched with pectins and carotenes, without losing quality and even improving it. The developed recipe for the «Pumpkin» bun and technological solutions for enriching bakery products with pumpkin processing products will be recommended for production.

It is shown that a high content of physiologically functional ingredients, such as dietary fiber, vitamins, macro and micronutrients, leads to a high nutritional value and functional properties of the developed products, and also confirms the possibility of their use in the dietary diet of people prone to various diseases status.

4. CONCLUSION

1. Proved the possibility of using pumpkin in the development of functional bakery products.
2. It is shown that the obtained products are characterized by a high content of physiologically functional ingredients, such as dietary fiber, vitamins, which causes a high nutritional value and functional properties of the developed products.

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