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Nutritional And Biological Value Of National Breads With The Use Of Vegetable Extracts

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ABSTRACT

The problem of the nutritional and biological value of food products, including bakery products, shows the feasibility of improving their chemical composition, eliminating the deficiency of individual components, enrichment with high-grade proteins, vitamins, minerals and dietary fiber. An effective way to solve this problem is to use as additives high-protein products of plant origin, in particular, obtained by extracting the ground parts of certain species of non-traditional plant species.

KEYWORDS

National bakery products, development of the food industry, products contribute.

INTRODUCTION

A promising direction for the further development of the food industry is the

development of new high-quality domestic food products that meet the physiological

requirements of specific population groups and have a therapeutic and prophylactic effect.

MATERIALS AND METHODS

Due to the fact that national bakery products in Uzbekistan are affordable, traditional, everyday food, improving their quality and nutritional value, developing preventive, functional and enriched products contribute to the implementation of the modern concept of healthy nutrition.

Improving recipes for bakery products using regional herbal ingredients is of great theoretical and practical interest and creates prerequisites for expanding the range, improving the quality, nutritional and biological value of the finished product.

A significant contribution to the development of scientific foundations for the production of bakery products for preventive purposes was made by domestic and foreign scientists [7-9]. Analysis and evaluation of existing studies indicate that the most appropriate and effective from a physiological, technological and economic point of view, the way to expand the range of bakery products, increase the vitamin and mineral value, is to enrich them with plant ingredients, which are a

natural, balanced source of vitamins, food fibers, macro and microelements.

As enriching plant ingredients, it is promising to use local raw materials that are affordable, ecological and widespread in the region.

Therefore, research on improving the technology and production process of national flat cakes enriched with extracts of non-traditional plants, allowing to obtain new varieties of high-quality products of increased nutritional and biological value, are relevant.

The solution to these problems is possible through the use of a new technology for processing and using plant extracts.

The aim of the work is to study the nutritional and biological value of certain types of national flat cakes using plant extracts obtained by processing non-traditional plants.

DISCUSSIONS AND RESULTS

The objects of the study were plant extracts of seeds "Unabi" (ziziphus), "Carolina" (kaspiyskaya) and sesame powders [10-11], as well as national Uzbek flat cakes (Table 1) [12-13].

Table 1

Recipe for Uzbek flatbread

Raw	Raw materials consumption				
	Kashgar non	Obi non	Pulati non	Locura non	Oh non
Wheat flour,kg	95	95	95	95	95
Plant extract					
Unabi	5	5			
Carolina			5	5	5
Pressed	1.5	1.5	1.5	1.5	1.5

yeast,kg					
Salt, kg	1.5	1.5	1.5	1.5	1.5
Cottonseed oil for lubrication of the leaves and cutting, kg	0.15	0.15	0.15	0.15	0.15
Cream, kg	-	-	1.0	-	-
Poppy seeds for topping, kg	-	0.38	-	-	-
Results	103.15	103.45	104.15	103.15	103.15

National Uzbek flatbreads were prepared using various samples of wheat flour (Table 2)

Table 2

Characteristics of the used wheat flour.

Sample	Grade Flour	Humidity	Acidity, Hail.	Gas-forming ability, Cm2	Gluten content, %	Properties of raw gluten, IDC Not.et. reception
1	1	12,0	3,0	1438	30,2	64
2	1	13,4	3,2,8	1450	30,6	70
3	2	11,8	3,4	1437	26	70
4	Premium	13,4	2,6	1454	28,8	75
5	Premium	13,2	2,8	1460	28,0	80

RESEARCH METHODS

The quality, physicochemical characteristics of raw materials and finished products were analyzed and evaluated by modern and methods of physicochemical research [14].

Samples of used wheat flour were analyzed according to the following indicators: moisture, acidity, gas-forming ability, "strength" of flour.

The moisture content in flour was determined according to GOST 944-88.

The acidity of flour was determined according to GOST 27493-87.

The gas-forming ability of flour was determined using a Yago-Ostrovsky device and expressed in cm³ of CO₂ released during 5 hours of dough fermentation [14].

The "strength" of flour was assessed by the content and properties of gluten.

The content of wet gluten in flour was determined by the standard method [14].

The physical properties of gluten were determined by its ability to resist the deforming compressive load (N), by its extensibility over the ruler [14].

Autolytic activity was determined by the content of water-soluble substances. Formed when the water-flour mash is heated using a refractometer in accordance with GOST 27495-87.

The pressed yeast was evaluated according to GOST 171-81 by the time of dough rise and organoleptic indicators (color, taste, smell, consistency). Salt, sugar, margarine, vegetable oil, egg melange and other types of additional raw materials were evaluated organoleptic.

Assessment of the quality of finished products. They were carried out as follows: samples of products baked in laboratory and industrial conditions were analyzed after baking for organoleptic and physicochemical indicators.

The sensory evaluation included the determination of the appearance of the products, the color and character of the crust, the structure and porosity and elasticity of the crumb, taste and odor.

The determination of the mass of finished products was carried out in accordance with GOST 5667-65.

Specific volume (cm³ / g) was obtained as a quotient from dividing the measured volume of products by their weight.

The moisture content in finished products was determined according to GOST 2194-75.

The acidity of the crumb was determined according to GOST 5670-51 and was expressed in degrees of acidity.

The mass fraction of total ash was determined by the method of GOST 5901-87 and expressed as a percentage.

The degree of freshness of products after 12-24 hours of storage was judged by the change in the structural and mechanical properties of the crumb [14].

The calculation of the chemical composition and energy value of products was carried out according to the method described in the work.

RESULTS AND DISCUSSION

The nutritional value of national flat cakes is determined by their calorie content, digestibility and the content of additional nutritional factors in them: vitamins, minerals and essential amino acids.

The feasibility of using plant extracts to increase the nutritional and biological value of products is confirmed by the research results, which are given in table. 3 - 4.

Table 3

Characteristics of simple Uzbek flat breads

Indicator	Kashgar-non bread, kg		Obi-non bread, kg		Pulati-non bread, kg		Lochira-non bread, kg		Uy-non bread, kg		
	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2		
Appearance: surface	Patterned, densely sprinkled with sesame seeds, with a slight thickening of the edge, not wrinkled		Smooth, with a slight edge thickening, the edge of the thickened part of the flat bread is pinned with a chekich in the form of a pattern along the entire circumference of the bread. In the center, it is punctured with a chekich once, not wrinkled		Patterned, with thickened steep or ribbed edges, not wrinkled		Smooth, with thickened edges. The middle is pricked in 3 places, not wrinkled		Smooth, with a slight thickening of the edge, the edge of the thickened part of the cake is pricked with a chekich		
Shape and size, cm	Round, without imprints, no dark bulges				Round or curly, without dark spots		Round, without prints and dark bulges				
Outer diameter	16–17	20–21	18–19	22–23	16–17	21–22	14–16	18–20	16–17	18–20	15–16
Inner diameter			14–15		19–20						
Middle thickness	1.5–2.0	1.0–1.5	0.8–1.0		1.0–1.2	1.0	1.5	1.5	2.0		1.0

Edge thickness	3.0–3.5	2.0–2.5	1.5–2.0			2.0–2.5	2.5	3.0	3.0	3.0	2.5–3.0
	3.0–3.5	2.5–3.0									
Coloration	Uniform, from yellow to light brown, slight stains off the surface					Pale, not burnt, without contamination of crusts, light brown in color					
Crumb condition:	Well baked, no temper										
Baked											
Knead	No lumps and traces of no-knead										
Porosity	Uniform, finely porous										
Freshness	Fresh, non-stale, not crumbly										
Taste and smell	Typical of this type of flat bread, with light onion aroma and taste	Typical of this type of flat bread,					With no side tastes and smell				
Crumb moisture,% no more	40	42	30	32	39	39	33	35	40	40	35
Acidity, degree, no more	3.0	3.0	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Fat content in terms of weight, %	2.2	2.2	2.0	2.0	-	-	2.0	2.0	-	-	7.0
Sugar content in terms of weight, %	-	-	-	-	-	-	4.0	1.0	-	-	-
Point score											
Control	16		18		16		18		20		
Experiment	20		22		20		22		22		

Table 4

Characteristics and quality indicators of Uzbek simple obi non flat cakes.

Indicator	Obi non, kg			Pulati non, kg
	0.2	0.3	0.4	0.2
Appearance: the surface	Smooth, glossy with a sprinkle, without tears, cracks and dark swellings, with indentations in the form of a pattern			Patterned, with slightly thickened edges. The middle is pinned, the edges are patterned and punctured in five places
Shape and size, cm	Regular, round, without mischief, the middle in the form of a recess, not crumpled			Round, without mischief, not crumpled
Diameter	15–17	18–20	22–24	20–21
Diameter of the recess	8–9	9–10	12–13	1,0–1,2
The thickness of the middle	1,0	1,0	1,0	
Edge thickness	2,5–3,0	3,0–3,5	3,0–3,5	3,0–3,2
Color	From yellow to light brown, not pale, not burnt, without contamination of crusts. The lower crust is light brown with small areas less intense in color			Uniform, with a Shine of the upper crust, Golden yellow, not pale, not burnt, without contamination of the crusts
The crumbs: Baked goods	Well-baked, without tempering			
Promess	Well-baked, not wet or sticky to			

	the touch			
Porosity	Without lumps and traces of nephromas			
Elasticity	Well-developed, fine-pored			
Freshness	Elastic, after light pressure with your fingers, the crumb should have its original shape			
Taste and smell	Fresh, not stale, not crumbly, without taste and smell			
Humidity, % no more than	42	42	43	32
Acidity, degrees, not more	3,0	3,5	3,5	3,0

Table 5 shows the chemical composition and nutritional value of the national flatbread enriched with plant extract.

Table 5

Chemical composition and nutritional value of national tortillas

Name of indicators	Value of indicator	
	Obi non	Oh non
Content, g/100g		
lipids	3.6	3.5
proteins	7,33	8,04
carbohydrates	47,12	51,49
Mineral content, mg/100 g:		
Potassium	126	144
calcium	20.4	22.5
phosphorus	82.16	91.65
sodium	394	395

magnesium	30.63	35.56
iron	1.5	1.64
B ₁	0,16	0,18
B ₂	0,05	0,06
B ₃	absent	0,7
B ₆	0,10	0,13
C	absent	1,7
PP	1,54	1,90
E	1,90	3,6
Energy value,100 g kcal/100 g	251	270

From the data in Table 5 it follows that the protein content in the Obinson cake with the addition of the plant extract increases. The optimal amount of plant extract (5%) gives an increase in protein in the cake by 9.7%.

Table 6 shows the estimated nutritional value of the national flatbread "Obi non". Table 6 shows the calculated data to assess the ability of the "Obi non" cake to normalize the nutritional value.

Table 6

Calculation of the nutritional value of the product.

Foodproducts	Dailyneed
Protein, g	85
Fat, g	102
Digestiblecarbohydrates, g	382
includingmono - anddisaccharides	50... 100
Non-digestiblecarbohydrates, g	30...50

Mineralsubstances, mg:	
Calcium	800
phosphorus	1200
Potassium	2500...5000
magnesium	400
Iron	14
Vitamins, mg:	
thiamine (B1)	1,7
Riboflavin (B2)	2,0
Niacin (PP)	19,0
Calories, kcal	2775

When taking into account the nutritional value of a cake, it is necessary to take into account not only the total protein content in it, but also its qualitative composition, i.e. content of essential amino acids in protein. An indicator of the quality of food protein, reflecting the degree to which its amino acid composition corresponds to the body's needs for amino acids for protein synthesis, is the biological value.

Analysis of the biological value of the lozenge shows that in relation to the amino acid composition of the lozenge "obinon" has a significant deficiency in three essential amino acids - lysine, threonine and tryptophan. Therefore, when assessing the amino acid usefulness, it is sufficient to take

into account three essential amino acids: lysine, tryptophan and threonine.

From those given in table. 7 data shows that when consuming the "obinon" lozenge, the body receives about 753 mg of lysine or 18.8% of the average need for the essential amino acid lysine, 319 mg of tryptophan or 36% of the average need for the essential amino acid tryptophan and about 851 mg of threonine or 34% average requirement for this essential amino acid.

Table 7

The norm of physiologically valuable ingredients when consuming Obi non flat cakes.

Basicfoodsubstances	Dailyneed	The contents in the cake "Obi non»	Provision of daily requirements, % of the norm
Fat, g	83	11,9	14,3
Protein, g	75	28,14	37,5
Amino acids, mg lysine	4000	725,5	18,8
Tryptophan	1000	318,5	31,9
Threonine	2500	850,5	34,0
Vitamins:			
B ₁ . Mg	1,5	0,63	42,0
B ₂ . Mg	1,8	0,21	11,7
B ₃ . Mg	10	2,45	2,45
B ₆ . Mg	2,0	0,46	23,0
S. mg	70	5,95	8,5
PP, mg	20	6,65	33,25
E, mg	30	12,6	42,0
Mineral substances, mg			
Iron	14	5,74	41,0
Magnesium	400	124,46	31,1
Calcium	1000	78,75	7,9
Phosphorus	1000	320,8	32,1
Sodium	2400	1382,5	57,6
Potassium	3500	504	14,4

The possibility of improving the composition of the cake in terms of minerals and vitamins has been experimentally proven due to the introduction of plant extracts into the formulation.

The Obinon flatbread enriched with plant extract plays a significant role in the coating in protein, the most important amino acids and many physiologically valuable ingredients by 8.0 - 57.6%, and it can be positioned as a food

product of increased nutritional and biological value.

CONCLUSION

Replacing part of the wheat flour with plant extracts in the recipe of Uzbek flatbreads improves the nutritional and biological value of products. The best results are achieved when adding 5% plant extracts based on the weight of the original flour.

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