ANALYSIS OF THE CHEMICAL COMPOSITION AND THE MAIN INDICATORS OF THE QUALITY OF THE MASS OF APRICOT SEEDS

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We live in a world of information technology and scientific and technological progress, where the basis of a healthy lifestyle and proper nutrition plays an important role. Large-scale measures are being carried out in Uzbekistan aimed at implementing one of the most important tasks of the state in the field of social policy, namely, protecting and strengthening the health of the population. The share of functional products in the domestic market is currently not large, but this segment is developing dynamically and is very promising as a means for the correction and prevention of various diseases. In recent years, consistent reforms on the rational use of natural resources have been implemented in the republic. The search for additional sources of raw materials is also actively underway; platforms for their cultivation are being created. Particular attention is paid to plants that are most adapted to cultivation on marginal lands that tolerate drought well and begin to bear fruit quickly.

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One of the most promising ways to solve these global problems is the use of unconventional plant raw materials, both cultivated and wild, containing ingredients valuable from the point of view of nutrition physiology, containing macro and microelements, the study of the influence of which on the human body is currently being given special attention by specialized researchers and food manufacturers, especially those in high demand among population.

These products primarily include grain products. Recently, in the production of functionally oriented products, processing products of fruit and berry and vegetable raw materials, as well as herbal supplements from medicinal plants, especially in the form of powdered semi-finished products (powders), have become increasingly important. This will enrich the products with essential nutrients and reduce the risk of developing alimentary-dependent diseases, the so-called "diseases of civilization", and the use of additives in the form of powders will solve the problem of seasonality of raw materials.

These studies are especially relevant in connection with the resolutions of the President of the Republic of Uzbekistan No. UP-60 of 28.01.2022 "On the development strategy of New Uzbekistan for 2022-2026", No. PP-4406 of July 29, 2019 "On additional measures for deep processing of agricultural products and further development of the food industry", PP No.-4821 of September 9 2020 "On measures to accelerate the development of the food industry of the Republic and the full provision of high-quality food products to the population", as well as in other regulatory

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documents, operating in the agri-food sector.[1,2]

Standard generally accepted biochemical, physico-chemical, rheological, microbiological and organoleptic methods of investigation of the object of study were used in the work. The scientific and theoretical justification of the expediency of the use of apricot seed cake (ZHAK) is given; the results of the study of the chemical composition, food safety and functional and technological properties are presented.

The use of natural additives in the food industry is an effective, affordable and safe way to increase the physiological significance of bakery products. Fundamental studies of the properties of raw materials and food products have practical and scientific significance. It has been established that the studied apricot cake - obtained as a result of extraction of oil from apricot seeds comply with the requirements of TS 64.18310089-01:2002, SanPiN No. 0283-10, O'zDSt ISO 6635:2013 and TR CU 021/2011 "On food safety". Thus, the expediency of using this raw material for enriching basic food products, in particular bakery products, with physiologically functional ingredients to the recommended level of adequate consumption has been scientifically and practically proven. [4,7,8,9]

The paper used apricot seed cake obtained from apricot seeds grown on farms in Tashkent and Namangan regions.

Apricot cake is obtained as a result of squeezing oil from the apricot kernel. Edible oilcake fibers are a sorbent and contribute to the elimination of carcinogens and toxins. A wide range of useful substances of the apricot kernel makes infusions and decoctions of apricot cake useful in the prevention of many disorders associated with the digestive and cardiovascular system, liver and gallbladder. Apricot cake is capable of destroying pathogenic and damaged cells. Also, it is an excellent tool for restoring intestinal motility and cancer prevention. It has an external antibacterial effect, eliminates rashes and prevents their reappearance, helps to completely get rid of gums. It starts the processes of renewal and regeneration of skin cells, cleanses it and narrows the pores.

Processing of apricots in the industry produces various types of finished goods: dried apricots, dried apricots, juices, jams, jams, etc. At the same time, apricot pits remain in the form of waste. Fruit waste – this is the definition most often obtained by apricot pits, the benefits and harms of which are not taken into account. Many people do not even realize how widely apricot kernels are used in medicine, cosmetology and cooking. The apricot kernel, which is hidden behind the shell, contains a whole complex of valuable substances and has a peculiar, but not repulsive taste.

Uzbekistan produces over 662,123 tons of apricots per year. Of this amount, waste, i.e. bones, make up 40%. At the moment, processing and obtaining the finished product from this waste material is an urgent task. Apricots are processed by canneries and private companies producing dried fruits in the republic.

Apricot kernels contain a large amount of fatty acids, compounds of several minerals, organic acids and a number of both interchangeable and essential amino acids.

The presence of various fatty acids determines the energy value of the product. Organic acids and minerals provide a positive effect on the work of internal organs and metabolism.

The bones contain:

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• vitamins (B17, PP); calories — 520 kCal; fats — 45.4 g; proteins — 25 g; carbohydrates — 2.8 g; ash substances — 2.6 g; water — 5.4 g; magnesium - 196 mg; potassium - 802 mg; phosphorus — 461 mg; sodium - 90 mg; calcium — 93 mg; iron — 7 mg.

• fatty acids (linoleic, palmitic, oleic);

phospholipids;

tocopherols.

About 29% of the composition is oleic acid, which is one of the basic energy sources, and also supports the assimilation of other lipids, About 11% of the composition is linoleic acid. It plays an important role in maintaining healthy cholesterol levels, heart function, and has antioxidant qualities.

The chemical composition and physico-chemical quality indicators of the mass obtained from apricot seed cake after cold pressing were studied (see JACQUES).

Table 1.shows the results of the study of the chemical composition and energy value (caloric content) of JACQUES.

An analysis of the data on the chemical composition of the studied JAC, presented in Table 1., showed that in the composition of this product, the bulk of CB is represented by fats (on average 45.4%), containing mainly mono- and polyunsaturated fatty acids, and proteins (on average 25.0%). This product also has an unbalanced composition of proteins, fats and carbohydrates. The advantage of the flour under study is the increased content of vitamins PP and B17, averaging 27.7 and 16.2%, respectively, of the normal physiological needs of an adult.

Table 1 - Chemical composition and energy value of JACQUES

Nutrient	The amount of nutrient in g / 100 g of the product		
	product	ANPN*	EA**, v %
Water	5,40	-	-
Proteins (B)	25,00	76,00	32,24
Fats (W)	45,40	56,00	16,07
Carbohydrates (Y)	2,80	219,00	7,00
Ratio B:W:Y	1,0:2,0: 0,1	1,0:1,0:4,0	-
Fiber	2,20	20,00	11,00
Ash	2,60	-	-
Vitamins, mg: vitamin PP (nicotinic acid) vitamin B17 (amygdalin)	 4,15 2,43	 15,00 1,50	 35,00 28,70
Minerals, mg: iron (Fe)	7,00	18,00	9,72

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calcium (Ca)	93,00	1000,00	5,60
magnesium (Mg)	196,00	400,00	30,00
phosphorus (P)	461,00	800,00	52,81
potassium (K)	802,00	4,00	15,83
sodium (Na)	90,00	3,10	33,20
Calories, kcal	608	1684	36,10

ANPN*- the average norm of the physiological need of the nutrient

EA-** estimatedaverage

It should be noted that the apricot kernel is a source of a number of nutrients with antioxidant properties, including amygdalin. However, scientists warn that a certain compound — amygdalin contained in apricot pits — can be converted into cyanide in the body in such an amount that can adversely affect human health. With excessive consumption of apricot seeds, there is a high risk of cyanide poisoning. The bones themselves are considered natural "chemotherapy". But it is important to know how to take apricot pits for cancer. Cyanide, which is contained in the nuclei, destroys cancer cells in small doses, but healthy cells begin to suffer from a large amount.

Since relatively high protein content has been established in the studied JAC, it is necessary to determine its biological value (abbreviated BC). The amino acid composition of the studied additive was determined by ion exchange chromatography. Amino acid score (socr. AKS) of essential amino acids, the coefficient of difference of amino acid score (CRA) and BC was calculated according to the method proposed by N.N. Lipatov and I.A. Rogov. The reference protein according to WHO served as a comparison sample. [3]

TheresultsofthestudyareshowninTable 2.

Table 2 - The content of essential amino acids and the biological value of JACQUES

Amino Acid	Protein (IB) according to FAO/WHO, in g/100 g of protein	Massfraction of amino acid, g/100 g		%
		product	squirrel	
Valin	5,00	1,360	5,55	111
Leucine	7,00	1,680	6,86	98
Isoleucine	4,00	0,828	3,38	84
Lysine	5,50	0,934	3,81	69
Methionine+ Cysteine	3,50	0,624	2,55	73
Threonine	4,00	0,720	2,94	73
Phenylalanine + Tyrosine	6,00	1,843	7,52	125
Tryptophan	1,00	0,272	1,11	111
Total INVOICES	36,00	8,261	33,72	94
KRASUS	0,00	-	24,0	-
, %	100,00	-	76,0	-

It follows from the data in Table 2 that the protein of apricot seed cake has a relatively low

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nutritional value (76.0%). The main limiting amino acid is lysine. The AKS of amino acids such as valine, phenylalanine and tyrosine, tryptophan is higher than in an ideal (reference) protein. The values of ACS close to IB were leucine and isoleucine.

The results of the study of the main indicators of the quality of JACQUES are shown in Table 3.

Table 3 – Organoleptic and physico-chemical quality indicators of JACQUES

Indicators	The value of indicators
Appearance	Homogeneous mass with fine light inclusions
Colour	Brown-brown
Smell	Mild, characteristic, odorless
Taste	Characteristic of this product, without extraneous taste
Humidity, %	6,00 ±0,50
Indicators of oxidative resistance of lipids isolated from samples:	
Acid number, mg KOH/g	1,00 ±0,30
Peroxide number, 1/2 mmol/kg	1,50 ± 0,50
Moisture-holding capacity, %	40,00 ± 1,00
Fat-holding capacity, %	98,00 ± 1,00

It has been established that according to organoleptic and physico-chemical parameters, the studied additive can be used as a prescription component in food products, in particular for flour. The values of acid and peroxide numbers characterize JACQUES as a fresh product. High moisture-retaining ability determines the expediency of increasing the moisture content of the dough by 1.0–2.0%, fat-retaining - partial replacement of solid fats (butter, margarine) in the recipe of pastry products.

Further, in order to study the changes in indicators during the storage of semi-finished products (to determine the shelf life), as well as to establish storage modes, they were packed in cardboard boxes with an internal package of a sub-foundation, weighing 400 g. Storage was carried out for 7 months (+15% of the stock for non-perishable products). During storage, an organoleptic assessment was carried out according to the following parameters: appearance, color, taste, smell.

Tables 4, 5 present data on the organoleptic parameters of the studied samples during storage.

Table 4 - Dynamics of organoleptic indicators of the quality of JACQUES during storage (n = 5)

Storageduration, month

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0	1	3	6	7
Appearance (min-max 0.25-1.25), point				
1,15 ± 0,2	1,15 ± 0,2	1,15 ± 0,1	1,10 ± 0,1	1,00 ± 0,2
Color (min-max 0.15-0.75), point				
1,70 ± 0,1	1,70 ± 0,1	1,70 ± 0,1	1,70 ± 0,1	1,70 ± 0,1
Taste and smell(min-max 0,5-2,5), point				
2,00 ± 0,2	2,00 ± 0,2	1,75 ± 0,2	1,50 ± 0,2	1,00 ± 0,2
Total points (min-max 1,0-5,0), point				
4,85 ± 0,2	4,85 ± 0,2	4,60 ± 0,1	4,30 ± 0,1	3,70 ± 0,2

An analysis of the data in Table 4 shows that during storage, there is a gradual decrease in the total amount of organoleptic evaluation points. The highest number of points was noted at the beginning of storage and in the first month - 4.85 points, then there is a gradual decrease to 4.30 points on the 6th month of storage. Further, there is a significant decrease in the organoleptic parameters of the mixtures, primarily associated with the burning of fat.

Table 5 - Dynamics of physico-chemical quality indicators of PSB C during storage*(n = 5)*

Storageduration, month				
0	1	3	6	7
Massfractionofmoisture, %				
1,20 ± 0,2	1,15 ± 0,2	1,10 ± 0,1	1,10 ± 0,1	1,00 ± 0,2
Massfractionoffat, %				
1,65 ± 0,1	1,65 ± 0,1	1,65 ± 0,15	1,70 ± 0,15	1,17 ± 0,2
Acidity, deg				
2,00 ± 0,1	2,00 ± 0,2	1,75 ± 0,2	1,05 ± 0,15	2,10 ± 0,2

Microbiological indicators of the quality of JACQUES are currently regulated by the requirements of TR CU 021/2011 [6].

The results of microbiological studies of JACQUES after 7 months of storage are presented in Table 6.

Table 6 - Microbiological indicators of JACQUES during storage

Shelflife, months.	KMAFAnM, CFU/g, no more	The mass of the product (g) in which it is not allowed		Yeast, CFU/g, no more	Mold, CFU/g, no more
		BGKP (coliforms)	pathogenic, includingsalmonella		
0	$0,5\text{-}10^2$	Notdetected	Not detected	2	Not detected
1	$1,0\text{-}10^2$	Notdetected	Not detected	2	2
2	$1,4\text{-}10^2$	Notdetected	Not detected	2	4
3	$2,2\text{-}10^2$	Notdetected	Not detected	2	6
4	$2,8\text{-}10^2$	Notdetected	Not detected	4	8
5	$3,4\text{-}10^2$	Notdetected	Not detected	4	14
6	$1,0\text{-}10^3$	Notdetected	Not detected	6	18

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7	$2,0\text{-}10^3$	Notdetected	Not detected	8	22

During storage, microbiological indicators of the quality of JACQUES were determined every month. The samples met the requirements of TR CU 021/2011 on microbiological safety indicators. The number of mesophilic aerobic and facultative anaerobic microorganisms did not exceed the established norm (no more than 5,104 CFU in 1 g (cm) of the product). The obtained data on changes in microbiological quality indicators allow us to conclude that, if the requirements and storage conditions are met, the microbiological quality indicators of the comply with the requirements of TR CU 021/2011. The content of toxic elements, mycotoxins and pesticides does not exceed the permissible levels established in the biomedical requirements and sanitary standards for the quality of food raw materials and foodstuffs SanPiN 2.3.2.1078-2001[5; 6].

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