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The Main Directions Of Development Of Technology, Technology And Integrated Processing Of Soybean Seeds In The Republic Of Uzbekistan.

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ANNOTATION. At present, the oil and fat industry of Uzbekistan is one of the leading enterprises in the food industry, mainly processing cotton seeds. Further introduction of new equipment and progressive technology, mechanization and automation of production processes, modernization of existing equipment was carried out, enterprises specialized in processing two main types of raw materials: cotton seeds and sunflower seeds. Uzbekistan began processing other types of local raw materials (soybean seeds, safflower seeds, etc.). The expansion of sowings of high-oleaginous varieties of sunflower, soybean, safflower continued and the oil content of seeds increased. For 3 years of the current five-year plan, the oil content of seeds increased by 2% against 4.2% over the period of the previous five-year plan.

KEYWORD: sunflower, seed oil content, processing, integrated use, dehulling, protein products, seed husk thickness, major axis.

1. INTRODUCTION:

In our republic, comprehensive measures have been developed to fully meet the needs of the population for grown bread and grain products, special attention has been paid to their introduction, special attention has been paid to scientific research on planting new varieties of soybeans. Theoretical and practical results have been achieved to improve the quality and expand the range of fat and oil products in particular for the processing of soybean seeds. The strategy of the movement for the further development of the Republic of Uzbekistan defines the task of accelerating the development of production based on high technologies and aimed at the production of highly liquid finished products of deep processing based on local raw materials.

The fat-and-oil industry of Uzbekistan justifies certain work to improve the quality of oilseeds, [1] by the decree of the President of the Republic of Uzbekistan, the Ministry of Agriculture to provide methodological assistance to farmers and entrepreneurs engaged in sowing and processing of soybean seeds [2].

Currently, Uzbekistan is intensively developing the cultivation and processing of soybean seeds as an oilseed crop and raw material to obtain high-quality edible oil.

2. MATERIALS AND METHODS:

In the practical implementation of the research, the physiological processes of the amount of soy flour added to bakery products were used, modern methods of physical and chemical analysis were also used in the modernized device PMS-1.

3. DISCUSSION.

Soybean seed production is one of the most valuable types of agricultural raw materials, the production of which, especially in the regions of the republic, is constantly increasing. [3].

Soy seeds contain high quality edible fat up to 20%, valuable vegetable protein up to 40%, phosphatides, vitamins and other components. Indicators of productivity of soybean varieties in the Republic of Providen in Table 1

Table 1
Indicators of productivity of soybean varieties in the Republic of Uzbekistan (Bukhara, Kashkadara, Surkhandara and other regions).

Soybean varieties	Oil content,% dry matter	Grain yield dt / ha	1000 seed weight, gram	Stem height,%
Tashkent	20,2	34,6±	148 ±0,7	121±0,5
Ukrainian	20,1	30,4±0,5	142±0,5	128±0,8
Nafis	21	34,5±0,3	138±0,5	130±0,4
Slavnya	20	24,5±0,2	130±0,4	117±0,4
Olympia	20,4	28,8±0,2	125±0,4	110±0,3
Krasnodar	20,5	28,6±0,1	130±0,2	112±0,2

The complex use of valuable natural substances of soybean seeds is the main task in their processing, as studies have shown, carried out by us in laboratory conditions. Only the sequential extraction of individual narrow fractions of substances makes it possible to maximize the use of all potential resources inherent in soybean seeds and to obtain the entire variety of food and feed products, such a complex processing of soybean seeds should be carried out in oil and fat enterprises of Uzbekistan.

Soybean seeds in Uzbekistan are cultivated on rainfed (not irrigated) and irrigated lands, where, in addition to irrigation, the state and content of the soil differ significantly [3]. This, of course, is reflected in the size and content of soybean seeds cultivated in various field conditions in Uzbekistan. Therefore, a comparative study of the physical, chemical and technological properties of local varieties of soybean seeds is considered necessary [3].

4. RESULTS.

We investigated the physical, chemical and technological parameters of soybean seeds growing on the rainfed lands of the Tashkent region. For comparison, we studied soybean seeds grown on the irrigated lands of the Bukhara region.

table-2.
Indicators of soybean seeds growing on irrigated (1) and rainfed (II) lands.

Seed variety	Weight of 1000 pieces of	Mass fraction of seed fat,%,	Mass fraction of husk in seeds,% on dry matter	Botanical oil content of husk,% on dry	Bulk weight, g / l

	seeds, on dry matter	on dry matter.		matter	
Seeds (I)					
Tashkent	56,1	30,2	42,1	1,68	296
Russian	50,2	28,8	39,2	1,46	298
Krasnodar	50,6	30,1	37,6	1,69	321
Ukrainian	49,8	31,6	38,6	1,49	306
Seeds (II)					
Tashkent	53,4	28,2	48,3	1,46	278
Russian	50,1	24,6	45,4	1,40	262
Krasnodar	48,6	25,7	42,5	1,41	280
Ukrainian	49,2	27,9	44,2	1,48	284

It has been found that soybean seeds (II) have a lower mass and oil content compared to seeds (I). The same picture is observed in the indicators of botanical oil content of soybean husks. The husk content of soybean seeds (II) is higher than that of seeds (I).

It is known that the efficiency of the processes of crushing and crushing is largely due to the geometric dimensions and mechanical properties of the fruit shells of soybean seeds [4]. In order to determine the above-mentioned indicators of soybean seeds grown in different conditions, we carried out their comparative analyzes on a modernized device PMS-1 [five]. Table 3 presents data on the geometric dimensions of soybean seeds and the strength of their husks, obtained at a moisture content of 6.1%. The length of soybean seeds (I) is on average 1-2 mm longer than the length of soybean seeds (II).

A similar picture is observed for the dimensions of their width. The thickness of the seed husk (I) is greater than the seed husk (II). In addition, there are differences in husk strength in different directions relative to the major axis of the soybean seed.

The redistribution of husk strength during spill for all studied varieties of soybean seeds along the major axis is significantly higher than in the transverse direction, which is explained by the roll-like structure of the husk.

Table 3

Indicators of the size of local soybean seeds and the strength of their shell (husk).

Cultivation country	Dimensions, mm		Hull thickness, mm	Δ P. MPa along the axis		Subtract along the axis		E, MPa along the axis	
	length	Width		big	small	big	small	big	small
Seeds (I)									
Tashkent	9-11	3-4	0,52	54,6	3,4	0,15	0,06	201,3	11,4
Russian	8-10	2-4	0,47	52,1	3	0,14	0,04	200,4	70,5
Krasnodar	10-12	4-5	0,50	53,8	3,6	0,16	0,05	200,1	66,1
Ukrainian	9-16	2-4	0,48	51,6	3,2	0,17	0,03	218,1	64,6
Seeds (II)									
Tashkent	8-9	2-3	0,42	57,4	4,7	0,14	0,06	251,3	68,9
Russian	6-9	2-2	0,04	55,4	4,5	0,13	0,04	250,1	74,3
Krasnodar	8-11	3-4	0,39	56,2	4,6	0,12	0,03	262,2	70,1
Ukrainian	7-5	3-3	0,43	54,3	4,3	0,10	0,07	260,1	75,2

On the basis of the studies carried out, it was found that the value of the destructive loads when breaking the fruit shells of soybean seeds along the major axis of the seed is 10-14 times higher than along the minor axis.

Analysis of the physical and mechanical properties of husk shows that the ultimate strength of the husk at break along the minor axis of soybean seeds in the Krasnodarskaya variety is higher than in the Tashkent or Rossiyskiy varieties. The effort at breaking the hulls of soybeans in the direction of the large and small axes of the seed is less by 20-25%, but in comparison with the husk of soybeans (II).

It is known that soybean seeds are difficult to split and the husk is determined with difficulty from the kernel, as their specific gravity is practically the same. Therefore, soybean seeds are often processed without hulling, which is an urgent task to develop methods for hulling soybean seeds and separating the kernel from the husk. The results obtained by us confirm the correctness of the idea of developing a method of collapsing soybean seeds, which is based on the impact of the seed, with its strictly oriented position to the distance of the major axis. Moreover, at the impact of a bursting force, they are directed along the seed axis, where there is the least strength of the soybean husk.

The results are shown in Figures 1 and 2.

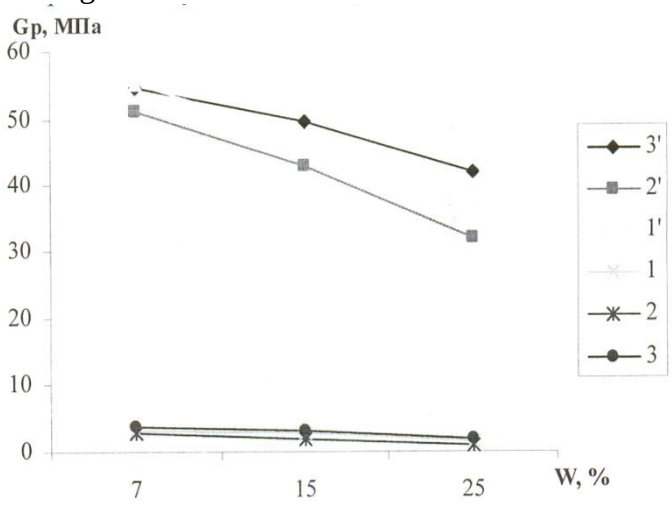

Fig-1. Dependences of the change in the ultimate strength of the soybean husk on its moisture content when breaking along the major axis (1,2 and 3) and along the minor axis (1`, 2` and 3`) 1-1` Krasnodar variety grown on irrigated lands, 2 and 2 `Tashkentskiy variety grown on irrigated lands: 3 and 3` Russian variety grown on irrigated lands

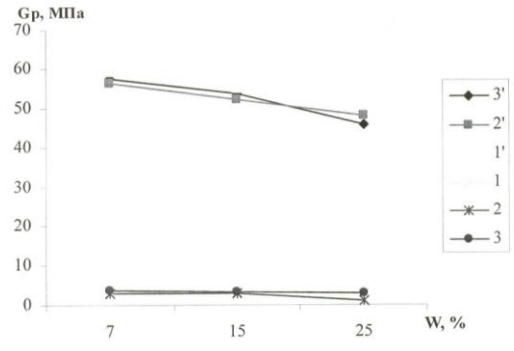

Fig-2: Dependences of the change in the ultimate strength of the soybean husk on its moisture content when breaking along the major axis (4, 5 and 6) and along the minor axis (4`, 5` and 6`) 4 and 4`-Krasnodarskiy cultivar grown on irrigated lands, 5 and 5` grade Tashkent, grown on irrigated lands: 6 and 6`-grade Russian grown on irrigated lands.

On the basis of the analyzes carried out, it was found that when the shell of the studied varieties of soybean seeds impacts along the major and minor axes, only elastic deformations and brittle rupture are observed.

Thus, it has been established that when organizing the processes of crushing and grinding, it is necessary to take into account the above-mentioned features of the physicochemical and technological parameters of soybean seeds grown on rainfed and irrigated lands of Uzbekistan.

Integrated processing of soybean seeds.

When processing soybean seeds, the following main products are obtained; edible soybean oil, edible soybean meal, concentrates, vitamins E, stearins and feed products. Judging by the level of complex use of raw materials in relation to the cost of all products, it is about 2.8 in the republic.

According to the available data, at foreign factories that feed isolated food proteins or traditional food protein products from soybean meal, the cost of raw materials reaches two to three units.

The low level of complex use of soybeans, which exists in the oil and fat enterprises of Uzbekistan, depends on a number of factors,

firstly, it is the high cost of raw materials,

secondly - low prices for soy protein products in the Republic,

thirdly, the most important reason for industry is the low level of combined production of the white part of soybean seeds, it is necessary to organize protein production on the basis of timely meal and produce high-quality protein products.

Soy protein, as noted above, in terms of its composition and nutritional value, is highly valued but has a bean taste and smell. Therefore, the main requirement for the technology for producing soy protein and products based on it is to eliminate the bean taste and odor.

Currently, there are two principal directions of obtaining protein products from soybean latitudes, the preparation of traditional methods and the production of refined protein products. In the first traditional method, the elimination of taste and odor is achieved by enzymatic treatment.

In developed countries, for example, in Brazil, about 500 thousand tons of skimmed soy flour are produced per year. There are certain possibilities of using skimmed soy flour in Uzbekistan.

Its main purpose is to use it in the bakery industry to enrich and strengthen grain proteins.

This task is very urgent:

Edible soy flour (about 50% of protein) contains a relatively large amount of essential amino acids that are not synthesized by the human body, the addition of soy flour from cereals increases the digestibility of the latter, since if the digestibility of milk proteins is taken as 100%, then the digestibility of monna cereal proteins is 50% , if you add 12.5% of soy flour to semolina, then the digestibility of proteins will increase to 82%, and with the addition of 25% soy flour to 93%.

5. CONCLUSION.

To study the protein complex in laboratory conditions of nama, the effect of a mixture of soy flour on the variability of the flour was kneaded in proportions of 90-10, 80-20, 75-25, from 1st grade wheat flour and semi-fat-free soy flour, and determined in laboratory conditions. , the effect of the amount of soy flour in the mixture is shown in Table 4.

Table 4.

Qualitative parameters and physical and chemical characteristics of a mixture of soy flour%, on the quality of bakery products.

Bread quality indicators	control	Form bread with flour added in the mixture		
		5 %	15 %	25 %
Oud volume% to control	375	376	378	380
Porosity st%	72	74	76	78
Kaleity with sire of peanuts	32,6	30,4	26,9	24,8
Amount of dry gluten%	11,68	10,6	11,0	11,2
Moisture% crumb%	44,6	43,7	43,6	43,8
Crumb acidity	2,2	2,1	2,2	2,1
Protein	7,6	10,2	10,0	10,6
Fats	5,0	3,4	3,2	3,6
Carbohydrates	56,8	70,2	70,4	70,2
The nutritional value	289,0	332,6	334,6	340,1

According to the laboratory results obtained, it is shown that the experimental samples of bread prepared in laboratory conditions fully meet the requirements of the virgin standards.

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