



## CHEMICAL COMPOSITION OF SOY PLANT AND IMPROVING TECHNOLOGY OF OIL PROCESSING IN INDUSTRY

<sup>1</sup>Jankorazov Abror Mamrajab o'g'li

Gulistan State University Teacher. [abrorbek9306@gmail.com](mailto:abrorbek9306@gmail.com)

<sup>2</sup>Saydjanova Dildora Madalxon qizi

Gulistan State University Teacher. [misisdi93@gmail.com](mailto:misisdi93@gmail.com)

<sup>3</sup>Navro'zova Iroda shodmon qizi

Gulistan State University Academic lyceum Teacher  
[navruzovairoda5@gmail.com](mailto:navruzovairoda5@gmail.com)

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### ABSTRACT

*To ensure further increase in the volume of planting and cultivation of soy crops, which are part of leguminous plants in our republic, to satisfy the population's need for vegetable oil. Oil industry in Uzbekistan. is considered one of the leading branches of the food industry. The role and importance of the agricultural sector in ensuring the food security of the population is increasing day by day. In exchange for the wide introduction of scientific and technical achievements and advanced experience in the production of raising the farming culture in our country, great measures are being taken to increase the productivity of crops, improve their quality, especially in the country, to provide oil and oil products. It is an important task to fulfill the task of providing the population of the republic with food, primarily oil products. The expansion of the areas of soybean oil crops in our country and the increase of the products made from them will fully satisfy the population's need for oil and oil products.*

**Introduction:** ORegarding the economic issues being conducted in the Republic of Uzbekistan these years. The strengthening of our relations with the outside world, the modernization of economic sectors,

the development programs of technical and technological re-equipment are implemented with the support of leading developed countries, the integration of Uzbekistan into the international arena is a clear proof of this. growth of trade, import and export of products and goods

The implementation of the decision of the President of the Republic of Uzbekistan "On measures to rapidly develop the food industry of the Republic and fully provide the population with quality food products" dated September 9, 2020 No. PQ-4821 to provide and A number of scientific researches are being carried out in order to further support the newly established promising projects for the production of food industry products. Implementation



of the Food Industry Development Program in order to ensure the implementation of the Decree of the President of the Republic of Uzbekistan No. 60 of 28.01.2022 on the development strategy of Uzbekistan for the years 2022-2026.

Soybean is an annual plant belonging to the family of leguminous crops, native to Central Asia. Soybeans play an important role in the preparation of food, fodder and soil fertility. Soybean contains 38-52% protein, 22-25% fat, oil contains various vitamins, and husk contains 4-5% protein and up to 5% fat. Soybean grain has 2.5 times more protein than wheat grain and 3.5 times more than corn grain, and soybean protein contains more than 10 amino acids.

Blue mass is food for livestock. Soybean roots, like the roots of all legumes, develop nodules that can use nitrogen from the air. Thanks to the nodules formed by rhizobial bacteria in the roots of the soybean plant, it collects up to 150-250 kilograms of pure nitrogen per hectare. Soy is a very old plant that loves light, heat and moisture. Soy improves the soil structure, which has gained great importance nowadays due to increased environmental pollution.

Soy products are widely used to increase the productivity of livestock. Soybean hay contains 22% protein. Soybean meal, flour, greens are used as fodder.

Soybean pulp contains 38.7% protein and 5.5% oil. Soy greens are a valuable food.

Its high nutritional value corresponds to the period of flowering and grain maturity. Today, the most widely produced and consumed oil in the world is soybean oil, and the most widely used raw material in the fodder industry is soybean oil. Soybean roots contain the bacterium *Rhizobium Japonicum*, which supplies the soil with free nitrogen from the air.

Soybeans are leguminous crops that provide nitrogen to the soil, but due to the presence of oil in the grain, it belongs to the group of oil crops.

As a "miracle plant", soybean is of great importance in human and animal nutrition and in industry.

The most important feature of soy is that you can get more and cheaper protein from it than other plant and animal feed sources

Soy protein is the protein most similar to animal protein, and it is biologically very important.

For this reason, defatted soybean meal is mainly used as a source of protein in the diet of poultry and small domestic animals (sheep, goats), dairy and beef cattle. At the same time, soybean meal and whole soybeans are mainly used for human consumption

In the countries of the Far East, it has been an important food crop for hundreds of years. It has been an important food crop

The optimal period for sowing soybeans as a main crop in Uzbekistan is from March 25 to April 5 in the southern regions, from April 1 to April 15 in the central regions, The time of planting as a repeat crop is carried out in June after the harvest of autumn grain crops. In addition, the development and supply of vegetable protein is one of the biggest problems in agriculture today.

Soybean oil is used as a universal product for food, feed and technical purposes, as a base for paints, drying oils and varnishes, soaps, plastics, glues, as a protein medium for the cultivation of antibiotics in medicine. The Chinese call soybeans the "Great Bean". is called

The process of making soy sauce can last from 6 months to 2 years. In China, soy sauce replaces salt and preservatives. In ancient China, soy was considered the food of the poor.



Modern people have a great opportunity to eat not only tasty and diverse, but also healthy, because now there is a large assortment of products. Soybean deserves special attention.

Many delicious dishes are prepared from the fruits of this high-protein plant. Milk, butter, flour and many other edible items are also made from soy. It has many useful properties and almost does not harm anyone.

The homeland of soy plant is China. It is grown on plantations in the Pacific and Indian Ocean islands in Asia, North and South America, Europe, Argentina, Australia.

Cultivation in Russia, as a rule, is used in the Far East. 60% of all internal reserves are provided by the Amur region. The rest are grown in Primorsky and Khabarovsk regions, Krasnodar and Stavropol

In addition to being high in protein, B1, iron, zinc, phosphorus and magnesium are effective in preventing heart disease. Studies have shown that regular consumption of 25 grams of soy per day reduces the risk of heart disease.

Soybean is a food that can be used in many ways, since other food products are available from it, such as tofu. In addition, it is included in food and beverages.

Keep in mind that it is better to eat it naturally, without being so processed, although in Western countries it is consumed in processed foods, which reduces its value.

One of the main characteristics of soy is its source of vegetable proteins is of great importance. Many say that it can replace meat consumption, so it has become an important food for vegetarians.

Soy is one of the richest legumes in protein, amino acids, and has an absorption rate similar to meat, but without the disadvantages of saturated fat and cholesterol.

Therefore, it is a highly recommended food for all types of diets, especially vegetarians, who may be low in protein due to the lack of meat.

Other properties of soy Soy contains a large amount of folic acid, as well as vitamins B1 and B2. In addition, a significant amount of fiber in its composition,

therefore beneficial for intestinal transit. They also offer iron, phosphorus and magnesium. Soy has become a food product used to fight cancer, although its effectiveness in this area is somewhat controversial and has not yet been proven.

Food enzymes, particularly phytic acid, which is abundant in soybeans, help break down and absorb proteins. Lecithin and choline from soybeans accelerate metabolism, reduce "bad" cholesterol levels, restore the nervous system and brain cells.

Such valuable properties give nutritionists a reason to include soy products in the menu of patients with overweight or abnormal metabolism.

Soybean oil is a very useful product containing a large amount of vitamins, minerals and biologically active substances.

It was used in the countries of Indochina for about 6 thousand years, and in Europe it was known only in the 20th century. Soybean oil is produced by pressing and extracting soybeans.

It is cleaned and deodorized, giving consumer qualities. Soybean oil has a straw-yellow color and a slight pleasant smell.



It is used for the production of lecithin - a component of food, soap, medicines, dyes, fried in soybean oil, added to salads, baked goods.

The calorie content of 100 g of this product is 889 kcal. Compared to olive and sunflower oil, it is the champion in the content of tocopherols and trace elements. Useful properties of soybean oil:

Vitamins and trace elements help prevent cancer, cardiovascular diseases; Choline, organic acids improve the functioning of the liver and heart muscles, regulate the level of cholesterol in the blood;

When using oil, diseases of the digestive tract are prevented, metabolism is regulated;

The number of immune disorders decreases. It is enough to use 1-2 tablespoons of soybean oil to show its beneficial properties. l. per day. In addition to internal use, soybean oil is widely used in cosmetology to nourish the skin of the hands and face, to slow down its aging.

Oil can smooth wrinkles, moisturize weathered and rough skin, and slow down the aging process. Industrial soybean lecithin is a product belonging to the group of emulsifiers used to mix substances with different physical and chemical properties (density, consistency, etc.).

Soy lecithin is a food additive known in Russia under the code E322.

Industrial soy lecithin is found in bread, margarine and spreads, chocolate, sausages, semi-finished products (cutlets, spring rolls), fast food, dairy products and baby food.

- Taking soy grains.

- Cleaning and decortication - the film is mechanically removed from the grains in order to get rid of the astringent effect of the shade and to avoid contamination of the product.

- Grinding with water (extraction) - allows to naturally dissolve all beneficial substances of soy.

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- Heat treatment (sterilization) at a very high temperature in a very short time - allows to save all nutrients, remove antitrypsin and ensure high nutritional value of the product.

- Taking protein suspension - soy milk.

Soybean oil extraction technology. Oilseed processing products are the most valuable food products for daily consumption, as well as raw materials for many sectors of the national economy. Export-import delivery, purchase of raw materials and materials, as well as regulation of customs duties on import of oil industry products are of particular importance.

In global practice, soybean processing uses the direct extraction method, which includes the following stages of preliminary preparation of the material for extraction,

-especially drying;

- rest;

- cleaning;

- grinding, caving if necessary;

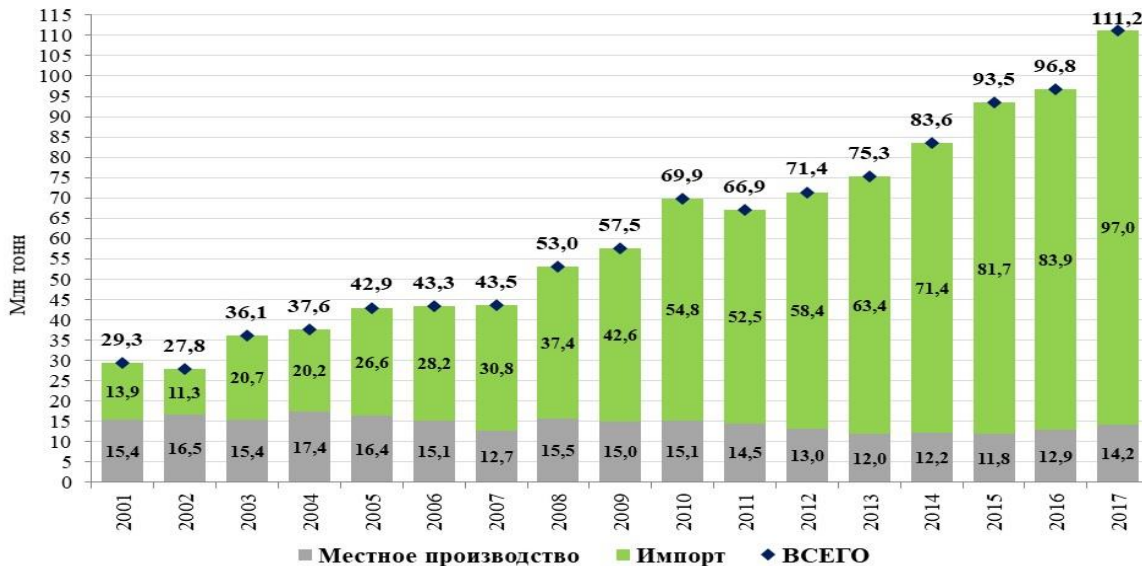
- alignment;

- expansion.



Now let's briefly touch on each of these processes. The moisture content of imported soybean seeds is usually 13-12%, which meets the conditions of storage and transportation. The moisture content of soybean seeds used in production depends on their processing technology. If in the process of processing feed flour with a protein content of 44% is obtained (that is, the processing is carried out without the hull), then additional drying of soybean seeds is not necessary, but if the processing is carried out in advance with the hull, then seeds should be dried to 10% moisture content.

Seed drying is a very energy-intensive process, requiring 830-890 Cal of heat to remove 1 kg of evaporated moisture. After drying, soybean seeds are aged for 25-72 hours to redistribute moisture and weaken the bond between the shell and the kernel. In addition to the cleaning of raw materials, the seeds entering the production must be subjected to industrial cleaning, which consists of separation of metal impurities, cleaning on the surface of the sieve and aspiration.



Studies have shown that 1-2 tablespoons per day can reduce the risk of developing heart and vascular diseases by six times. Due to the content of lecithin, soybean oil has a beneficial effect on brain activity.

It is possible to buy high-quality soybean oil from a soybean oil producer consumers, and production enterprises are given quality certificates.

Conclusions: Extensive work is being done to extract oil from soybeans. Their range is very rich.

Soybean oil production facility was carried out at the enterprise. A set of qualitative and quantitative (chemical composition) indicators and safety indicators were studied using standard and original methods that allow obtaining information about the chemical composition and properties of soybeans.

Currently, soybean oil production is one of the most profitable types of business.

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