

UDC 633.34:635.076:006.83:339.1

**RESEARCH OF SOYBEAN SEED QUALITY INDICATORS**<https://doi.org/10.15673/fst.v17i2.2596>

**L. Valevskaya**, PhD, Associate Professor Associate professor  
**O. Sokolovskaya**, PhD, Associate Professor  
 Department of Grain and Feed technology  
 Odesa National University of Technology  
 112, Kanatna Str., Odessa, Ukraine, 65039

**Correspondence:**

**L. Valevskaya**  
 E-mail: ludmila\_valev@ukr.net

**Cite as Vancouver style citation**

Valevskaya L, Sokolovskaya O. Research of soybean seed quality indicators. Food science and technology. 2023;17(2):25-31.  
<https://doi.org/10.15673/fst.v17i2.2596>

**Цитування згідно ДСТУ 8302:2015**

Valevskaya L., Sokolovskaya O. Research of soybean seed quality indicators // Food science and technology. 2023. Vol. 17, Issue 2. P.25-31.  
<https://doi.org/10.15673/fst.v17i2.2596>

Copyright © 2015 by author and the journal  
 "Food Science and Technology".

This work is licensed under the Creative Commons  
 Attribution International License (CC BY).  
<http://creativecommons.org/licenses/by/4.0>

**Introduction. Formulation of the problem**

In the domestic agricultural market, soybean has for many years, along with grain crops, taken the leading positions in export and processing for food and fodder purposes, and also has a strategically important role in ensuring the country's food and economic security. Changes in the nutrition structure of the population of developed countries, associated with the transition from the use of animal fats to vegetable and oil, as well as the increase in its number in Asian countries and the rapid development of the animal husbandry industry in the EU, led to the growth of global demand for soybeans and the reorientation of many countries to its cultivation, including our country [1].

**Abstract.** The article provides a study of the current state of global soybean production, the dynamics of sown areas, yield and gross harvest of soybeans in Ukraine over the past five years. World soybean production is almost 352 million tons, and the leaders are always the USA, Brazil, and Argentina, which in 2017 collected a record 286 million tons of soybeans, which is 82% of world production. China (12.3 million tons), India (11.5 million tons) and Paraguay (10.3 million tons) are also among the leading producers. Ukraine was ranked 8th among the leading countries in soybean production. Also, soybeans have been in the leading positions in the domestic agricultural market for many years, along with grain crops, in export and processing for food and fodder purposes, and also have a strategically important role in ensuring the country's food and economic security. Soybean seeds contain 38–42% protein, 18–23% fat, 25–30% carbohydrates, as well as enzymes, vitamins, and minerals. Due to its rich and diverse chemical composition, soybean has no equal in terms of production growth rates, and it has long been widely used as a universal food, fodder and oil crop. The regions of the country with the largest sown areas of soybeans are given, and the place of Ukraine in the world market, both in terms of production and trade of soybeans, is clarified. Factors that should be taken into account when planning to increase the area under soybeans are given. Grain quality control is a complex process that includes a combination of various factors. However, this is a very important stage, as it makes it possible to make Ukrainian grain competitive on the world market. Studies of organoleptic and physicochemical quality indicators of soybean samples of the 2022 harvest are presented. It is shown that the test samples have the color and shape characteristic of normal soybean seeds, without musty, moldy and extraneous smell. The mass fraction of moisture, oil, the content of garbage and grain impurities do not exceed the normative values. Pest infestation was not detected in any of the studied samples. The mass fraction of protein in terms of dry matter in the experimental samples was 32.1–33.9, which does not correspond to DSTU 4964:2008. "Soy. Technical conditions" (the value should be at least 35%) and USDA requirements.

**Key words:** soybean, quality indicators, regulatory documentation, volume of production, grain market, nutritional value.

Soy is the basis of the world pyramid of vegetable protein and oil, an important food component. Full-fat extruded soybeans and soybean meal in many countries now act as mandatory high-protein ingredients for the production of compound feed, which are fed in the most intensive industries – livestock and poultry farming [2,3].

Soy is a unique plant, a miracle of living nature. Today, it is the leading crop of world agriculture, the pinnacle of perfection and versatility in the entire plant world. Soy occupies a central place in solving the protein problem and is quite profitable [4]. Soybean seeds contain 38–42% protein, 18–23% fat, 25–30% carbohydrates, as well as enzymes, vitamins, and minerals. Due to its rich and diverse chemical composition, soybean has no equal in terms of

production growth rates, and it has long been widely used as a universal food, fodder and oil crop. Soy has no analogues in the arsenal of plant resources in terms of productivity and qualitative composition [4].

The main factors that should be taken into account when planning to increase the area under it:

- The total cost of cultivation technology, taking into account the protection system, the possibility of irrigation, the need for fertilizers based on agrochemical analysis.

- The suitability of the soil and climatic conditions of the region specifically for the cultivation of soybeans, the duration and time of onset of dry periods – based on observations over the last 3 years.

- Soybean crop price and yields that can be obtained.

- How difficult and expensive will be the logistics during crop harvesting.

Demand for soybeans and soy products continues to grow in the world. Despite its relatively short history of soybean cultivation, Ukraine has managed to make a significant breakthrough over the past 10 years. Ukraine is among the leaders in the ranking of world soybean producers. In the current season, there is an increase in the rate of soybean exports from Ukraine. At the same time, soybeans were almost the only crop of the oil industry whose average monthly export rates increased slightly during the war compared to the previous period. Therefore, in the conditions of the development of international trade, the issues of ensuring the quality of grain become urgent. Product quality indicators, as components of its competitiveness, provide the manufacturer with competitive advantages and are the main criterion for the buyer.

#### **Analysis of recent research and publications**

The issue of global soybean production, its importance for the food security of countries and the role of Ukraine in this is the subject of many studies by various scientists [3,8] who have contributed to the study of the issue, and it should be renewed and reviewed every year, taking into account new global and national trends

Soy began to gain great global popularity only in the second half of the 20th century, although it has been a traditional crop for East and South Asia since the thirteenth century, where it was used not only as a leguminous crop, but also as an effective substitute for dairy and meat products. Over the past 50 years, world soybean production has increased ninefold. Another reason was the development of infrastructure, which led to the intensification of world trade, and this gave manufacturers the opportunity to sell finished products to new markets [6]. Soy is grown in more than 90 countries of the world. According to the volume of seed production, it ranks fourth in the world after corn, wheat and rice, and oil is the first [5]. To date, the world soybean production is almost 352 million tons,

and the leaders are always the USA, Brazil and Argentina, which in 2017 collected a record 286 million tons of soybeans, which is 82% of the world production. China (12.3 million tons), India (11.5 million tons) and Paraguay (10.3 million tons) are also among the leading producers [6]. The United States grows 33% of the world's soybeans. The sale of soybeans to foreign markets amounted to 46.675 million tons and reached half of all world exports [6]. Ukraine was ranked 8th in the world in soybean production (Table 1).

**Table 1 – Countries-leaders in the production of soybeans in the world, million tons**

№ in order	Country	2019	2020	2021
1	Brazil	119.70	126.0	133.0
2	USA	120.52	96.67	116.15
3	Argentina	53.30	49.0	53.50
4	China	15.97	18.10	17.50
5	India	10.93	9.30	10.25
6	Paraguay	8.51	9.90	6.0
7	Canada	7.42	6.05	3.50
8	Ukraine	4.46	4.50	3.30
9	Others	20.25	17.07	25.27

The active use of soybean meal for feed forces producers of livestock products to buy soybeans and products of its processing and contributes to the growth of the overall global demand for soybeans.

The processing of soybeans into biodiesel fuel is also a significant factor in increasing interest in it. If we talk about world imports, those who want to buy soybeans lined up in the following order: China is in the lead – 63.51% of world demand and this share will grow, second place in the European Union – 10.81%, Mexico, Japan and Taiwan – 3.20%, 2.29% and 1.85%, respectively [7].

In the domestic agricultural market, soybean has for many years, along with grain crops, held a leading position in export and processing for food and fodder purposes, and also has a strategically important role in ensuring the country's food and economic security [8]. The main prerequisites for the change in the position of this culture in the world over the past 20 years were shifts in the nutrition structure of the population of developed countries associated with the transition from animal fats to vegetable fats, as well as an increase in the population in Asian countries and the rapid development of the livestock industry in the EU. All in all, this caused the growth of global demand for soybeans and the reorientation of many countries to its cultivation, including our country.

In Ukraine, since the 2000s, there has been a high rate of increase in the sown area and gross harvest of soybeans [8]. The cultivation of soybeans, in contrast to the excessive increase in sunflower acreage, has a positive effect on the entire agriculture, since this culture is an ideal precursor for almost all grain crops [8]. Its special feature is the presence of nodule

bacteria, thanks to which nitrogen is fixed from the air and accumulates in the soil during the growing season in the range of 80–100 kg/ha [8]. This is very important from an economic point of view, with insufficient application of mineral and organic fertilizers, which leads to a negative balance of nutrients in the soil, which, according to scientists' calculations, is approximately 200 kg/ha, which violates the basic rule of agriculture, which obliges the producer to return to the soil the equivalent amount of nutrients that was spent on the formation of the crop.

The significant growth of the sown area and gross harvest of soybeans testifies to its extremely important role in the agrarian complex of Ukraine. If you follow the recommended growing technologies, you can achieve a yield of 2.5 t/ha and above. Taking into account the costs per 1 ha and the average selling price, the profitability of soybean production is more than 50%. Therefore, taking into account the stable demand for this crop in the world and in Ukraine, soybean producers can get a great economic effect from its cultivation. The only problem remains insufficient growth of its yield. Currently, the Ministry of Economic Development, Trade and Agriculture of Ukraine promotes the introduction of high-yielding soybean varieties into production.

Soy is an extremely useful product [9] 1 kg of soybeans replaces 2 kg of meat or fish, 4 kg of wheat or 12 liters of milk in terms of protein [9]. Today, Ukraine ranks first in soybean cultivation in Europe and the former CIS countries [8].

In general, the geography of Ukrainian soybean supplies is quite broad. Today, exports are carried out to 36 countries of the world, and, for example, in 2004 there were 8. The largest importers of domestic soybeans in 2019 were: Turkey (36.73%), Egypt (20.01%), Belarus (12.13%), Italy (5.33%), Greece (4.58%) [8]. The export direction of soybean consumption, like rapeseed, is partly due to the lack of a protective mechanism in the form of an export duty. So, for example, it is 10% for sunflower and at one time contributed to the "reorientation" of sunflower consumption from the pure export of seeds to a processing product with added value [9].

Soy is one of the best precursors for grain crops, besides, it is a highly profitable crop that helps increase soil fertility [9-13].

Grain quality is a set of properties and characteristics (biological, physico-chemical, technological, consumer) that determine the suitability of grain for its intended use. Grain quality indicators mean the characteristics of its properties that shape quality.

The main criteria used to determine the quality of soybeans are protein and oil content. Thus, the mass share of protein in terms of dry matter should be at least 35%, and the share of oil should be more than 12%.

No less important indicators are humidity and clogging. Soybean seeds with a moisture content of up to 12% are considered dry, with a moisture content of 14.1–16% – moist, and with a moisture content of 16% or more – raw.

Clogging of soybeans is affected by the presence of oil and garbage impurities. The seed is considered clean, in which oil impurities do not exceed 6%, and garbage – 2%. For indicators above 10 and 3%, respectively, the seed is considered clogged.

Infestation with soybean pests is not allowed, except for tick infestation no higher than the 1st degree.

When the products arrive at the elevators or the manufacturers' own warehouses, these indicators must be monitored. Soybean seeds for export must be healthy, free of pests, have a normal smell and color; meet the requirements documented by the supplier and the buyer.

**The purpose** of the article is to conduct a study of the dynamics of sown areas, productivity and volume of soybean production in Ukraine over the past five years. To conduct a study of the quality indicators of experimental soybean samples of the 2022 harvest in accordance with DSTU 4964:2008 "Soy. Technical conditions" and the requirements of the US Department of Agriculture (USDA), which is important for the formation of export lots and participation in the international market.

The tasks of the **research** were:

- Conduct a study of sown areas, productivity and volume of soybean production in Ukraine for the last five years;
- Conduct a study of the quality indicators of experimental soybean samples of the 2022 harvest.

---

### **Research materials and methods**

---

Soybean samples of the 2022 harvest, grown in the Western region of Ukraine (Lviv region, Chervonograd district), soybean sample variety (sample No. 1-4) – EC Mentor, with reproduction with 2,550 hit units (CHU) were used for the research.

Determination of the quality of soybean grain was carried out according to the following main indicators: organoleptic indicators, infestation by pests, mass fraction of moisture, mass fraction of protein in terms of dry matter, mass fraction of oil, content of garbage and grain impurities.

The organoleptic evaluation of soybean samples was determined in accordance with DSTU 4964:2008 "Soy. Specifications"

The mass fraction of moisture in experimental soybean samples was determined in accordance with DSTU 4117:2007 "Grain and its processing products. Determination of quality indicators by the method of infrared spectroscopy", mass fraction of oil, mass fraction of protein and grain and waste impurities – according to DSTU 4964:2008 "Soy. Technical conditions, pest infestation – according to

DSTU ISO 6639-1:2007 "Grains and legumes. Detection of hidden insect habitation".

During the research, the experiments were carried out in triplicate. Patterns were reproduced in each of the parallel studies. To determine the true values of experimental indicators of measured values and conduct correlation analysis, mathematical and statistical processing of experimental data was carried out, which was processed according to the Fisher-Student method with a reliability level of at least 0.95. Results were processed using standard and developed methods at the Odesa National University of Technology [9].

### Results of the research and their discussion

The yield of agricultural crops is formed under the influence of a complex set of natural and agrotechnical factors. The leading role in this belongs to soil and climatic conditions.

The yield of grain crops is influenced by the intensive management of grain farming, which is conditioned and determined by the action of a complex of factors. The main indicator that characterizes the efficiency of the use of land resources is data on the value of the invested means of production per unit of land area, since they are the basis of production and have a decisive influence on the output of products.

In Ukraine, over the past five years (from 2017 to 2021), there has been an increase in the yield of soybeans (Table 2) [10].

Table 2 – Soybean yield in Ukraine

Year	Productivity, ts from 1 ha
2017	19.8
2018	26.4
2019	23.2
2020	20.9
2021	26.8

Figure 1 shows the dynamics of soybean production in Ukraine in 2017-2021. In the period from 2017 to 2019, the sown area of soybean crops in Ukraine changed almost insignificantly and gradually decreased in 2019. It should be noted that about 85%

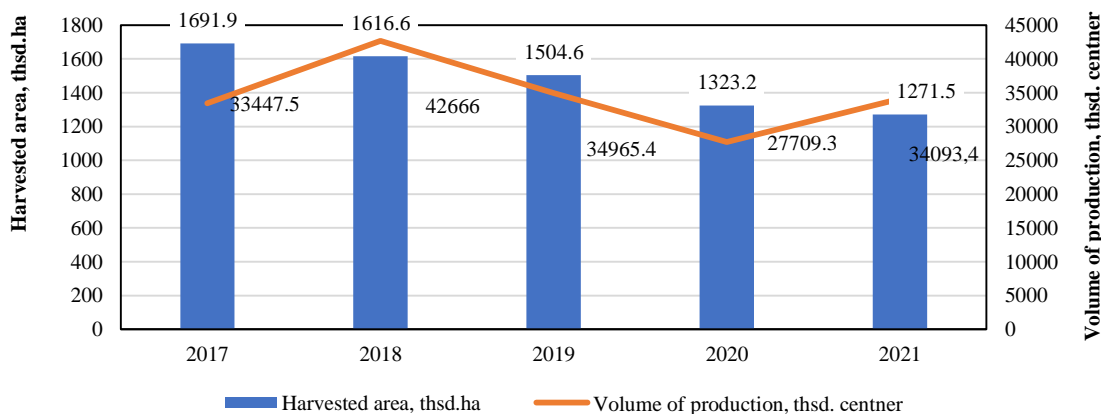


Fig. 1. Dynamics of soybean production in Ukraine in 2017-2021

of the sown area is concentrated in agricultural enterprises. The share of arable land owned by households has been growing in recent years. According to experts, in the coming years, the sown area under soybeans will increase to 1.6–1.7 million hectares. This trend will be observed in view of the price of products and the high cost of fertilizers, because soybeans require less nitrogen fertilizers than other crops and the increase in the total consumption of soybeans in the world. Considering that Ukraine is the first supplier of soybeans to the EU, the country also joins the integration of "green" goals by increasing the share of soybeans in crop rotation and increasing the organic production of this crop.

The most important factors that affect the amount of gross income and profit from the sale of commodity products and which can be managed by the enterprise are changes in the volume of production and sales of products. The volume of soybean production in Ukraine has changed according to the area sown and the yield of crops. In 2021, the volume of soybean production increased due to an increase in its productivity. This was facilitated by the breeding by Ukrainian breeders of high-yield varieties of different maturity groups that are adapted to the soil and climatic conditions of Ukraine, the development of varietal technology for growing this crop, economic efficiency of production, high market demand, available large resources and availability for wide use [12,13].

The largest soybean sowing areas in 2021 were recorded in Khmelnytskyi (133.1 thousand ha), Poltava (121.4 thousand ha), Zhytomyr (107.9 thousand ha), Kyiv (91.5 thousand ha), Lviv and Vinnytsia regions (85,000 ha) (Fig. 2).

Checking the quality of grain is a mandatory stage before sending the crop to storage or export. In the conditions of highly competitive international trade, the issue of ensuring the appropriate level of raw materials is particularly relevant. To determine the suitability of grain, organoleptic, physicochemical, and biological indicators are taken into account [14-19] (Table 3).

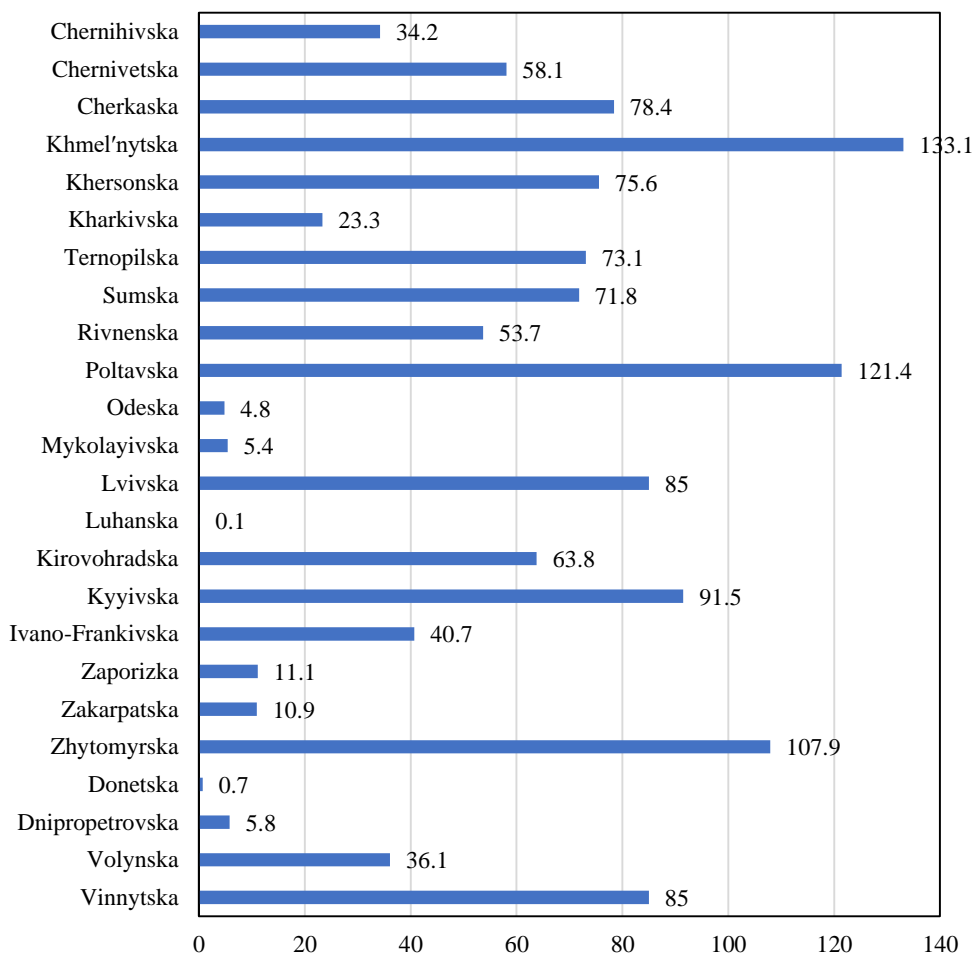


Fig. 2. Sowed areas of soybeans in 2021 by region, thousand hectares

Table 3 – Organoleptic, physical and chemical indicators of experimental soybean samples

Characteristic	Sample No. 1	Sample No. 2	Sample No. 3	Sample No. 4	DSTU 4964:2008	USDA requirements
Form	inherent				Properties of normal soybean seeds	
Color	inherent				Properties of normal soybean seeds	
Scent	inherent				Properties of normal soybean seeds	
Infestation by pests, specimens/kg	Not found				Not allowed, except tick infestation no higher than 1st degree	Is not allowed
Mass fraction of protein, in terms of dry matter, %	33.9	32.1	33.9	33.1	Not less than 35%	
Humidity, %	11.60	10.80	11.20	11.20	Not more than 12	Not more than 14.5
Mass fraction of oil, %	19.4	19.3	19.5	20.2	Not less than 12	Not less than 18.5
Garbage admixture, %	1.47	1.67	1.90	1.60	Not more than 3	
Grain admixture, %	7.0	6.03	9.60	7.10	Not more than 10	Not less than 8

Based on the results of the research, it was established that the experimental soybean samples have the color, smell, and shape characteristic of normal seeds.

Grain moisture is a factor that reflects the amount of nutrients and the possible duration of grain mass

storage and is one of the key indicators of quality. The mass fraction of moisture in the experimental soybean samples was in the range of 10.8–11.6%, which does not exceed the value of regulatory documentation and can be stored for a long time without quality deterioration.

The mass fraction of oil and its quality are one of the main indicators characterizing the value of soybeans. The mass fraction of oil in the experimental samples is 19.3–20.2%, which also meets the requirements of regulatory documentation and USDA requirements. This indicator of soybean quality is the most important parameter for determining market value, currently 60% of soybeans are processed into oil.

The presence of impurities negatively affects the efficiency of grain storage and its technological features, which leads to a decrease in the yield and quality of processing products. The content of garbage and grain impurities was in the range of 1.47–1.9% and 6.03–7.10%, respectively.

Clogging of soybeans is affected by the presence of oil and garbage impurities. The seed is considered clean, in which oil impurities do not exceed 6%, and garbage – 2%. For indicators above 10 and 3%, respectively, the seed is considered clogged. Sample No. 3 does not meet USDA requirements in terms of grain admixture content.

The high content of protein and its extremely valuable balance in terms of amino acid composition make soy an excellent substitute for products of animal origin in human nutrition and in processed products – meal, mackerel. Protein content is also an important price-forming indicator. The mass fraction of protein in terms of dry matter was 32.1–33.9%, which does not meet the requirements of the regulatory documentation DSTU 4964:2008.

## Conclusion

The soybean market can be safely considered one of the fastest growing agricultural markets of the last century. World experts predict only further growth of the soybean market. The profitability of soybean cultivation in Ukraine is quite high. There are opportunities to expand the sown areas. Prospects for the development of soy and soy products markets in Ukraine are determined by various factors: internal and external, economic and social.

Checking the quality of grain is a mandatory stage before sending the crop to storage or export. Grain quality control is a complex process that includes a combination of various factors. However, this is a very important stage, as it makes it possible to make Ukrainian grain competitive on the world market.

Based on the results of the conducted research, it was established that:

- according to organoleptic indicators, the experimental samples of soybeans were characterized by the shape, smell, and color characteristic of normal soybean seeds;
- pest infestation was not detected in any of the experimental samples;
- the mass fraction of moisture, the mass fraction of oil and the content of garbage and grain impurities – were within the permissible values of regulatory documentation and USDA requirements;
- the mass fraction of protein in terms of dry matter in the experimental samples was 32.1–33.9%, which did not correspond to the values of regulatory documentation and USDA requirements.

## References:

1. Berbenets O. Svitove vurobnytstvo soi yak nevucherpnogo dgerela bilkiv roslinnogo pohodgennya ta mistse ukrainu na svitovomy runky torgivli neu: Agrosvit. 2019; 10: 41–45 <https://doi.org/10.32702/2306-6792.2019.10.41>
2. Babich A. Soy for health and life on planet Earth. Agrarana nauka. 1998:272
3. Everitt B, Landau S, Leese M, Stahl D. Cluster Analysis 5th Edition. King's College London. 2020
4. Lin H, Chiu H, Shih Y. Detection of Genetically Modified Soybeans and Maize by the Polymerase Chain Reaction Method. Journal of Food and Drug Analysis. 2000;3:200-207.
5. Ukrainian Agrarian Confederation. An inexhaustible source of vegetable proteins - soy", available at: <http://agroconf.org/content/nevicherpne-dzherelo-roslinnih-bilkiv-soya>. 2019
6. Kernasyuk U. "Soybean Market: Development, Trends and Forecasts. 2017
7. Sharma S, Cheng SF, Bhattacharya B, Chakkaravarthi S. Efficacy of free and encapsulated natural antioxidants in oxidative stability of edible oil: Special emphasis on nanoemulsion-based encapsulation. Trends in Food Science & Technology. 2019;91:305-318. <https://doi.org/10.1016/j.tifs.2019.07.030>
8. Asnaashari M, Tajik R, Khodaparast M. Antioxidant activity of raspberry (*Rubus fruticosus*) leaves extract and its effect on oxidative stability of sunflower oil. Journal of Food Science and Technology. 2014;52(8):5180-5187. <https://doi.org/10.1007/s13197-014-1564-7>
9. Mittler R. ROS Are Good. Trends Plant Sci. 2017;22(1):11-19. <https://doi.org/10.1016/j.tplants.2016.08.002>
10. Ostapchuk M. Matematichne modeluvannya na EOM. Odessa: Druk; 2006
11. State Statistics Service of Ukraine (2021), [Internet] available at: <http://www.ukrstat.gov.ua/>
12. Babuch A. Svitovi i vitchuznyani tendentsii rozmishchennya virobnytstva i vikorustannya soi dlya rozvyazannya problemu bilka. Kormu I kormovurobnytstvo. 2012;71:12-26
13. Ryabuha S, Chernushenko P, Posulaeva O, Serukova L. Urozhainist ta biokhimichni yakosti selektsiinogo materialy soi. Seleksiya i nasinnnytstvo. 2014;105:188-193
14. Iqbal Z, Pasha I, Abrar M, Hanif MS, Arif AM, Masih S. Protein concentration, composition and distribution in wheat flour mill streams. Annals. Food Science and Technology. 2015;16(1):104-114.
15. Roshni A. Comparison of chemical characterises of crude and refined edible vegetable oils. AIP Conference Proceedings. 2019;2142. <https://doi.org/10.1063/1.5122391>
16. Baştürk A, Ceylan M, Çavuş M, Boran G, Javidipour I. Effects of some herbal extracts on oxidative stability of corn oil under accelerated oxidation conditions in comparison with some commonly used antioxidants. Lebensmittel Wissenschaft und - Technologie-Food Science and Technology. 2018;89:358-364. <https://doi.org/10.1016/j.lwt.2017.11.006>
17. Polka D, Podsedek A, Koziolkiewicz M. Comparison of Chemical Composition and Antioxidant Capacity of Fruit, Flower and Bark of *Viburnum opulus*. Plant Foods for Human Nutrition. 2019;74:436-442. <https://doi.org/10.1007/s11130-019-00759-1>

18. Jung JY, Park HM, Yang JK. Optimization of ethanol extraction of antioxidative phenolic compounds from torrefied oak wood (*Quercus serrata*) using response surface methodology. *Wood Sci. Technol.* 2016;50:1037-1055. <https://doi.org/10.1007/s00226-016-0846-9>
19. Drózd P, Pyrzyńska K. Assessment of polyphenol content and antioxidant activity of oak bark extracts. *European Journal of Wood and Wood Products.* 2017;76(2):793-795. <https://doi.org/10.1007/s00107-017-1280-x>

## ДОСЛІДЖЕННЯ ПОКАЗНИКІВ ЯКОСТІ НАСІННЯ СОЇ

**Л.О. Валецька**, кандидат технічних наук, доцент, *E-mail*: ludmila\_valev@ukr.net

**О.Г. Соколовська**, кандидат технічних наук, доцент, *E-mail*: sokolovskaya\_alena@ukr.net

Кафедра технології зерна і комбикормів  
Одеський національний технологічний університет,  
вул. Канатна, 112, м. Одеса, Україна, 65039

**Анотація.** У статті наведено дослідження сучасного стану світового виробництва сої, динаміку посівних площ, урожайності та валових зборів сої в Україні за останні п'ять років. Світове виробництво сої становить майже 352 млн т і незмінно лідерами є США, Бразилія та Аргентина, які в 2017 році зібрали рекордні 286 млн т сої, що становить 82% світового виробництва. Також до провідних виробників відносять Китай (12,3 млн т), Індію (11,5 млн т) та Парагвай (10,3 млн т). Україна розташувалася на 8 місці серед країн-лідерів по виробництву сої. Також соя на вітчизняному аграрному ринку вже багато років поряд із зерновими культурами займає провідні позиції в експорті і переробці на харчові та кормові цілі, а також має стратегічно важливе значення у забезпеченні продовольчої і економічної безпеки країни. Насіння сої містить 38–42% білка, 18–23 – жиру, 25–30% вуглеводів, а також ферменти, вітаміни, мінеральні речовини. Завдяки багатому й різноманітному хімічному складу, соя не знає рівних собі за темпами росту виробництва, її здавна широко використовують як універсальну продовольчу, кормову й олійну культуру. Наведено регіони країни з найбільшими посівними площами сої, з'ясовано місце України на світовому ринку як за виробництвом, так і за торгівлею соєю. Наведено фактори, які слід враховувати, плануючи збільшувати площі під соєю. Контроль якості зерна – складний процес, який містить сукупність різних факторів. Проте це дуже важливий етап, оскільки він дає змогу зробити українське зерно конкурентоспроможним на світовому ринку. Представлені дослідження органолептичних та фізико-хімічних показників якості зразків сої урожаю 2022 року. Показано, що дослідні зразки мають властивий нормальному насінню сої колір та форму, без затхлого, пліснявого та стороннього запаху. Маса частка вологи, олії, вміст смітної та зернової домішок – не перевищують нормативні значення. Зараженість шкідниками не було виявлено в жодному із досліджуваних зразків. Масова частка білку в перерахунку на суху речовину в дослідних зразках становила 32,1–33,9, що не відповідає ДСТУ 4964:2008. «Соя. Технічні умови» (значення повинно бути не менше ніж 35%) та вимогам USDA.

**Ключові слова:** соя, показники якості, нормативна документація, обсяг виробництва, ринок зерна, поживна цінність.