

## THE SUNFLOWER OIL MARKET IN ROMANIA: TRENDS AND PERSPECTIVES FROM THE PROCESSING INDUSTRY

Mariana CHIVU<sup>1,2</sup>, Silviu STANCIU<sup>3,4</sup>

<sup>1</sup>Ministry of Education, 28-30 General Berthelot Street, Sector 1, Bucharest, Romania, E-mail:mariana.chivu@edu.gov.ro

<sup>2</sup>National Polytechnic University of Science and Technology Bucharest, Faculty of Entrepreneurship, Business Engineering and Management, Romania, E-mail:mariana.chivu0608@upb.ro

<sup>3</sup>"Dunărea de Jos" University of Galati, Romania, E-mail: sstanciu@ugal.ro

<sup>4</sup>Romanian Academy, "Costin C. Kiritescu" National Institute for Economic Researches, E-mail: sstanciu@ugal.ro

**Corresponding author:** sstanciu@ugal.ro

### Abstract

*The paper provides an analysis of Romania's sunflower oil market from the perspective of sunflower seed agricultural production and oil processors. Romania is a key player in the European sunflower market, covering approximately 29% of the European Union's production and playing a significant role in seed exports. However, a substantial share of the agricultural output is exported as raw material, leading to considerable economic losses for the national economy. The oil processing sector generates a turnover of approximately €1.7 billion and employs over 2,500 people. The industry is dominated by a few major players, with a high market concentration that limits the entry of new competitors. Reduced processing capacities and a lack of diversification in value-added products are the main challenges facing the sector. To capitalize on the country's agricultural potential, it is essential to expand processing capacities, adopt modern technologies, and promote exports of finished products. Integration into European value chains and effective management of economic and geopolitical risks could enhance competitiveness on the international market. Furthermore, increasing the area of organic cultivation and meeting consumer demand for sustainable products represent crucial opportunities for the sector's growth.*

**Key words:** Romania, sunflower, oil, market

### INTRODUCTION

Sunflower (*Helianthus annuus*), a plant native to North America from the Asteraceae (Compositae) family, was initially cultivated in Europe as an ornamental plant starting in the 16th century. Later, it became an essential agricultural crop used for oil production. Today, sunflower crops are found on nearly all continents and rank as the second most important technical plant globally for oil production. In the last ten years, the worldwide area dedicated to sunflower cultivation has expanded at an average yearly rate of 2.7% [1].

In Romania, the first sunflower crops were established in the 19th century for ornamental purposes and oil production. The cultivated areas expanded significantly due to the increasing demand for vegetable oil. During

the interwar period, Romania emerged as an important sunflower producer in Europe. Under the communist regime, sunflower cultivation was incorporated into national economic development plans, with substantial growth in cultivated areas and output. Agricultural research, primarily conducted at the Fundulea Institute, led to the development of plant varieties adapted to local conditions and the implementation of modern cultivation technologies [1].

Sunflower seeds are highly nutritious, containing 8.6% dietary fiber, 21.0% protein, and 47.5% crude fat. They are also rich in minerals, B vitamins, essential amino acids, and antioxidants, making them a valuable food ingredient. Recent research has highlighted sunflower seeds as one of the most valuable sources of plant-based protein and micronutrients, which may reduce the risk

of certain cancers. Additionally, sunflower seeds are well-received by consumers for their sensory qualities and can be processed into various culinary products [22].

Processing sunflower seeds produces sunflower oil, widely consumed globally, and protein-rich meal, effectively used as animal feed. Commercial sunflower oil features a high caloric value (884 kcal/100 mL), low saturated fat content (10%), high unsaturated fat content (90%), and no cholesterol. It also contains vitamins E (41 mg), K (5.4 µg), and B8 (0.2 mg), as well as iron (0.03 mg/100 mL). The high unsaturated fat content, supplying omega-6 fatty acids, is vital for metabolism regulation, LDL cholesterol reduction, and promoting heart, skin, hair, and bone health [11].

The high energy value and digestibility of sunflower oil, comparable to butter, and its longer shelf life make it a staple in human nutrition. Being of plant origin, sunflower oil attracts a wider range of consumers than butter or lard. Within the food industry, it is utilized as a key ingredient in margarine production and various canned products. Additionally, specific types of sunflower oil are well-suited for soap manufacturing. The increasing global demand for sunflower oil further underscores its versatility and significance [7].

The increasing of global demand for sunflower oil and the industrial potential of sunflower seeds have driven an increasing number of Romanian farmers to focus on this crop [19]. A study by Soare and Chiurciu (2023) indicates that enhancing the competitiveness of the domestic sunflower seed production and marketing sector requires expanding cultivated areas, increasing yields per hectare, developing processing and marketing capacities, attracting investments, and accessing European funds for production and industrialization [20].

Research made by Brumă et al. (2021) highlights organic sunflower oil production. Sunflower remains one of the most valuable oilseeds globally, with Romania being a European leader in both production and cultivated area. In organic agriculture, the national sunflower crop area grew by 37.8%

between 2017 and 2019, with Tulcea County accounting for approximately 30% of Romania's total organic sunflower crops, ranking first nationally [4].

Pânzaru et al. (2023) report that, from 2007 to 2019, Romania cultivated an average of 3.81% of the global sunflower area and 5.39% of the European total, amounting to 966,840 hectares. During this period, Romania's sunflower production contributed 4.62% to the global output and 6.79% to the European total. Additionally, the country's exports represented 22.52% of the global sunflower trade volume and 26.97% of the European market.. Despite relatively low imports (3.96% of the global total), Romania does not hold a dominant position in this market. Effectively leveraging its natural potential for sunflower production, increasing oil processing capacity, and exporting finished products could generate significant revenue for Romania, helping to reduce the external trade balance deficit [16].

In this context, the paper analyzed Romania's sunflower oil market from the perspective of sunflower seed agricultural production and oil processors.

## MATERIALS AND METHODS

Clarivate, Google Scholar, and ResearchGate databases were utilized for sourcing references. Additionally, the research documentation incorporated articles from specialized journals available in online media. Data obtained from the Ministry of Agriculture and Rural Development, the National Institute of Statistics, and TopFirme.com were analysed. The gathered information was subsequently processed, visually represented, and interpreted. The collected information underwent processing, graphical representation, and interpretation. To evaluate market concentration, the Gini-Struck Index method was applied. To ensure validity, the findings were cross-referenced with insights from relevant specialized literature.

## RESULTS AND DISCUSSIONS

### Sunflower seed production in Romania

Romania benefits from favorable natural conditions for sunflower cultivation, a specialized workforce, and a geographic location that facilitates the export of agricultural products.

Figure 1 illustrates the evolution of agricultural land cultivated with sunflower (thousand hectares) and the corresponding production (thousand tons) from 1990 to 2023.

According to data provided by the National Institute of Statistics (2024), the cultivated area has consistently increased, from approximately 400,000 hectares in 1990 to over 1,200,000 hectares during its peak (around 2017-2018).

Following this period of sustained growth, a relative stabilization of cultivated areas can be observed, with a slight decrease noted after 2020.

The increase in cultivated areas may indicate that local farmers are adapting to trends observed on the domestic or European markets, likely influenced by the rising demand for vegetable oil and other derivative products [17].

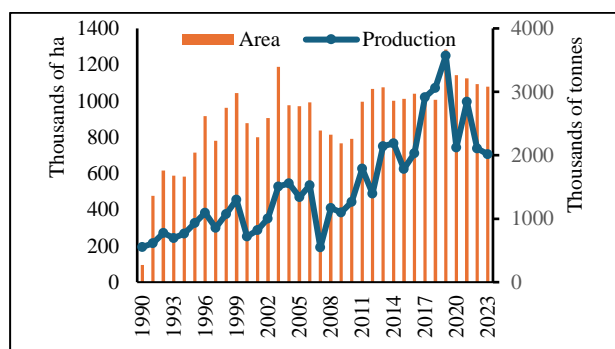


Fig. 1. Area cultivated and sunflower production in Romania, 1990–2023

Source: Authors' design using the data from [13].

The quantity of sunflower harvested from these cultivated areas shows annual fluctuations, influenced by climatic factors, technology, or productivity levels.

Until approximately 2014, the growth in domestic production was based on an extensive cultivation system. After this period, production exhibited significant fluctuations, despite cultivated areas remaining relatively high (Figure 1).

Following a production peak in 2018, output dropped considerably by 2023. This decline can likely be attributed to the effects of drought and climate change (exacerbated by the lack of irrigation systems), as well as other constraints such as reduced yields or logistical challenges.

Unlike other crops, sunflower cultivation in Romania has not been subject to European production quotas.

This lack of restrictions has provided significant opportunities, allowing Romania to become one of the leading sunflower producers in the European Union.

Figure 2 presents the trend in the average purchase price of sunflower seeds (RON/kg) in Romania from 2015 to 2023.

This graph, derived from the latest data provided by the Ministry of Agriculture and Rural Development, highlights price dynamics over the period. Between 2015 and 2020, sunflower seed prices in Romania showed relative stability with minor fluctuations.

However, beginning in 2021, prices experienced an upward trend driven by decreased production levels.

In 2022, prices increased significantly, by over 44% compared to the previous year. Potential factors behind this sharp rise include adverse weather conditions (drought and extreme climate events that impacted production in key producing countries, reducing available market supply), the conflict in Ukraine (Russia's aggression against the neighbouring country disrupted supply chains and sunflower seed exports as Ukraine ranks among the world's leading sunflower producers, the situation was further compounded by increasing production costs associated with the COVID-19 pandemic (higher prices for energy, fuel, and agricultural inputs increased farmers' costs, which were reflected in the final seed price), and increased global demand (the easing of pandemic restrictions led to a rise in demand for vegetable oils, including sunflower oil, further pressuring raw material prices).

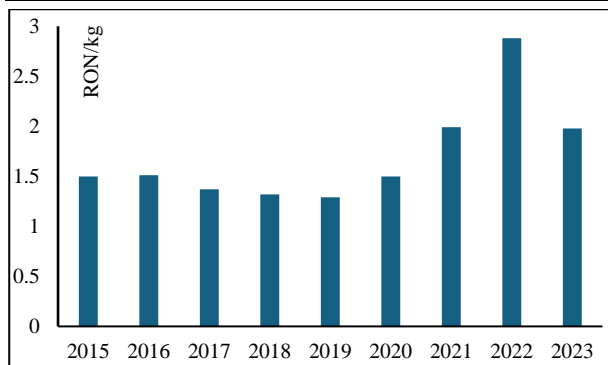


Fig. 2. Sunflower seeds price in Romania  
 Source: Authors' design using the data from [12].

The combined effect of these factors contributed to the spike in sunflower seed prices in 2022, affecting both producers and consumers [2].

In 2023, prices dropped compared to 2022 but remained higher than pre-pandemic levels. Influencing factors include oversupply and large stockpiles (in 2023, high harvests were recorded in major producing countries, leading to a surplus on the market and lower prices), significant imports from Ukraine until the situation stabilized (the availability of a large volume of lower-priced sunflower seeds from Ukraine directly influenced domestic prices), falling prices for other vegetable oils as alternatives to sunflower oil (soybean and palm oil prices declined globally, negatively affecting sunflower oil and seed prices), and favourable weather conditions contributing to high yields and lower prices. A similar situation was reported in the Republic of Moldova [3].

Against the backdrop of a reduced agricultural harvest caused by severe drought this year, by October 2024, sunflower seed prices reached 2.8 RON/kg (approximately 560 EUR/ton), one of the highest levels in recent years. Local processors bid up to \$525/ton for sunflower seeds, with offers in Bulgarian ports reaching around \$550/ton. Although by October harvesting was nearly complete in Ukraine, high transaction prices in the neighbouring country (\$500-\$530/ton) led domestic farmers to hold off selling their crops [10]. Price differences can be attributed to factors such as logistical costs, product quality, and local economic conditions. This increase is further influenced by growing demand on the international market and the tendency of

farmers to delay sales in anticipation of further price developments.

Romania remains an important player in the European sunflower market, but price volatility highlights the need for a strategy to manage economic and geopolitical risks to ensure the stability of local producers and competitiveness on the international market.

### Sunflower oil market in Romania

The estimated European sunflower oil production for 2024 is 10.9 million tons, representing approximately 20% of global production. The EU is the third-largest global producer, following Russia, with an estimated production of 17.0 million tons (31% of the total), and Ukraine, with 14.7 million tons (27% of global production). Romania, with an estimated production of 3.161 million tons, accounts for about 29% of EU production.

Other positions in the global Top 10 are occupied by Argentina (3.8 million tons), Turkey (1.675 million tons), China (1.6 million tons), Kazakhstan (1.3 million tons), Moldova (0.9 million tons), Serbia (0.75 million tons), and the United States (0.736 million tons) [9].

Between 1991 and 2023, Romania's trade balance in international transactions involving "Animal or vegetable fats" (III.15 according to CN sections and chapters) showed a positive evolution. Currently, Romania records a trade surplus in this category of goods (Figure 3). Until 2006, Romania's imports of edible fats significantly exceeded exports, highlighting a major dependency on external suppliers. Transaction volumes were low, and the trade balance was negative.

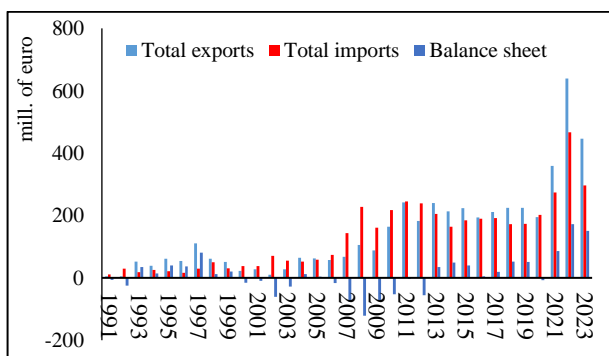


Fig. 3. Total Romanian trade in edible fats CN III.15 (1991-2023)

Source: Authors' design using the data from [14].

After Romania's accession to the EU, external trade transactions increased, although imports remained dominant. Exports began to grow due to increased sunflower seed production and likely efforts to modernize the local industry through foreign capital investments. Between 2017 and 2023, exports saw a significant rise, peaking in the 2020-2022 period, driven by high demand in external markets and geopolitical context. During this time, the domestic sector became a net exporter, marking a significant improvement in the trade balance. Romania has thus evolved from a net importer to a competitive exporter in the edible fats sector, maintaining a stable trade surplus since 2017. This performance underscores the growing competitiveness of Romania's food fats industry, primarily sunflower oil, in the European market. Most transactions occurred with EU member states, except in 2022, when imports from Ukraine increased significantly due to the war initiated by Russia. More than 50% of Romania's fat exports were directed to EU member states. Figure 4 illustrates the evolution of Romania's trade transactions with the European Union in the edible fats sector, including exports, imports, and the trade balance, over the period 1991-2023. Romania's accession to the EU improved access for domestic products to European markets, positively impacting the trade balance through increased exports. Foreign investments in processing facilities and the growth in domestic production of raw materials supported this upward trend in exports.

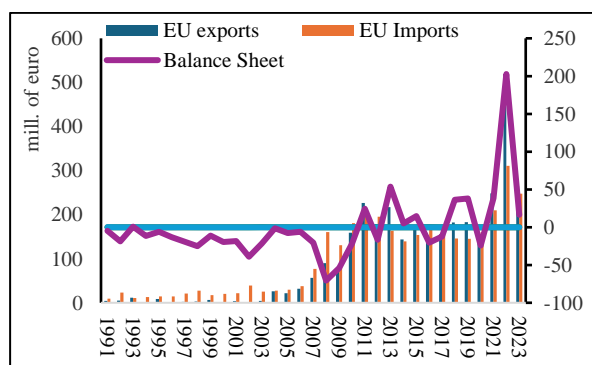


Fig. 4. Romania's Trade with EU in edible fats CN III.15 (1991-2023)  
 Source: Authors' design using the data from [14].

From a geopolitical perspective, the outbreak of the war in Ukraine created commercial opportunities for local companies, as traditional global trade flows for sunflower and sunflower oil were disrupted.

Figure 5 shows the evolution of sunflower oil production in Romania between 2009 and 2023, expressed in thousands of tons. The data was collected from the consultancy firm ReportLinker Consulting [18]. The domestic production of sunflower oil exhibits a relatively linear growth, with a positive trend throughout the analysed period.

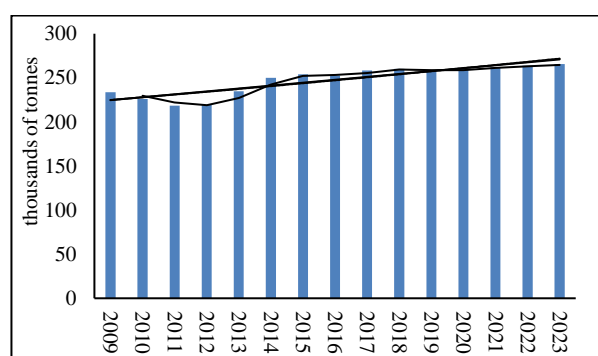


Fig. 5. Sunflower oil production in Romania, 2009-2023  
 Source: Authors' design using the data from [18].

Romania's domestic sunflower oil production showed gradual growth between 2009 and 2015, driven by improvements in the competitiveness of processing capacities and the availability of raw materials (sunflower seeds). From 2016 onwards, production levels stabilized between 250,000 and 270,000 tons annually. This stabilization can be attributed to factors such as the optimization of existing industrial capacities and consistent demand on both the domestic and European markets.

The stability of Romania's sunflower oil production reflects its strong position in the regional vegetable oil market, particularly amidst growing demand within the European Union. Approximately 30% of the sunflower oil consumed in the EU originates from Romanian factories. Constant production levels suggest a balance between increased cultivation areas and advancements in processing technologies. However, Romania continues to export significant amounts of raw materials, namely sunflower seeds. Between 2016 and 2020, Romania was the EU's largest



exporter of sunflower seeds, with around 60% of domestic production allocated for export. In 2020, Romanian sunflower seed exports totaled 1.544 million tons, valued at €606 million, while domestic consumption was estimated at 750,000 tons [6], [15]. Following the onset of Russia's aggression in Ukraine, Romania became the leading European importer of sunflower seeds from its neighboring country [8]. Figure 6 illustrates the evolution of Romania's sunflower oil market, according to ReportLinker Consulting [18]. Between 2010 and 2014, the sunflower oil market in Romania consistently retained a significant value, estimated at around €400 million per year.

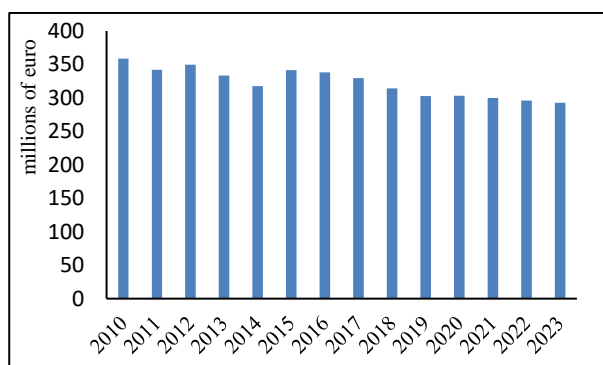


Fig. 6. Sunflower oil market size value in Romania, 2010–2023

Source: Authors' design using the data from [18].

Starting in 2015, the value of Romania's domestic sunflower oil market began to decline, reaching approximately €300 million in 2023. According to the cited report, this reduction may be linked to relatively stable domestic demand combined with increased competitive pressure from other European producers.

Additionally, the volatility of sunflower oil prices on the international market directly impacted the value of the domestic market.

The presented data suggests that Romania's sunflower oil market has reached a state of maturity, characterized by a period of growth until 2014, followed by a gradual decline and stabilization in recent years.

#### Producers of Oils and Fats in Romania (CAEN Code 1041)

An analysis of processing units operating under CAEN Code 1041 (Manufacture of Oils and Fats), conducted using data from the

TopFirme.com platform [21], reveals several noteworthy insights. This sector includes 138 active companies, representing approximately 0.01% of all economic operators in the country. The cumulative turnover of these operators reaches 7.4 billion RON (approximately 1.7 billion EUR), equivalent to 0.30% of the national turnover. The sector employs 2,615 people, representing 0.06% of Romania's total workforce. The net profit reported by companies in this domain amounts to 76.4 million RON (around 17.4 million EUR), which is 0.02% of the total national net profit. The leading market players are: BUNGE ROMANIA SRL, Buzău (turnover of 3.1 billion RON/705.1 million EUR, 570 employees), EXPUR SA, Slobozia, Ialomița (turnover of 1.8 billion RON/417.8 million EUR, 462 employees), PRUTUL SA, Galați (turnover of 1 billion RON/235.8 million EUR, 488 employees).

The next four companies are significantly smaller, with turnovers between 100 and 400 million RON: Global Grain International SA, Bucharest (439.6 million RON), Ardealul SA, Satu Mare (427.8 million RON), Argus Constanța SA (246.6 million RON), Sarapac Impex SRL, Slobozia (105.8 million RON).

The distribution of key companies in the sector across counties is shown in Figure 7. Ten counties account for 72 companies, representing approximately 52% of the total firms in the sector.

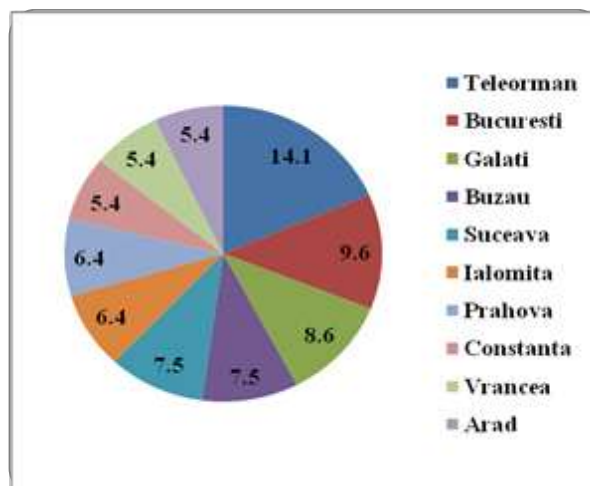


Fig. 7. Sunflower oil market size value in Romania, 2010–2023 (%)

Source: Authors' design using the data from [18].

This geographic distribution, concentrated in a few counties, likely reflects favorable economic and logistical factors in these regions. The most important agricultural areas for sunflower cultivation are located in the south (Teleorman, Ialomița, Buzău, Călărași, and Giurgiu), southeast (Brăila, Galați, Tulcea, and Constanța), and east (Vaslui and Iași). In counties with extensive sunflower cultivation, the main production units (Bunge, Expur, Prutul) are situated, suggesting a correlation between the availability of raw materials and the location of processors. The presence of well-developed logistical structures further supports the localization of processors in these regions, aiming to minimize logistical costs and optimize access to raw materials.

The top three companies generate 79.73% of the sector's turnover and employ 58.13% of the total workforce in the industry. To assess market concentration among oil and fat producers (CAEN 1041), the Gini-Struck Index is a suitable tool. This indicator evaluates economic concentration by analysing the share of total market turnover attributed to each company. The authors have previously utilized this method in other specialized studies [22]. The calculated Gini-Struck Index (GSI) for Romania's oils and fats production market is 0.50, indicating a high level of market concentration. This value reflects the fact that the majority of the market's turnover is generated by a small number of companies, particularly the top three firms (BUNGE, EXPUR, and PRUTUL).

The high degree of market concentration can have significant implications for competitiveness and create barriers to entry for new players in the industry.

## CONCLUSIONS

Romania possesses significant agricultural potential in sunflower production, being the leader in the European Union in terms of cultivated area and output.

However, the sector's performance is constrained by the predominant export of raw

materials, resulting in substantial economic losses.

The fluctuations in Romania's sunflower production, even amidst an increase in cultivated areas, indicate variability in agricultural yields influenced by factors such as weather conditions, agricultural technology, and soil fertilization. The decline in sunflower production after 2028 is likely linked to adverse climatic conditions, with the period marked by frequent droughts in Romania. The absence of a national irrigation system has exacerbated the effects of insufficient rainfall.

The development of the local processing industry is crucial to fully capitalize on domestic production potential. Currently, the sunflower oil processing market in Romania is dominated by a few major players, reflecting a high degree of market concentration that limits the entry of new competitors.

Expanding processing capacities, promoting value-added products, and diversifying the product portfolio are essential strategies to reduce the trade deficit and enhance competitiveness.

Adopting modern technologies, expanding organic farming, and aligning with global sustainability trends are necessary steps to meet international market demands and strengthen Romania's position in the global vegetable oil market.

## REFERENCES

- [1] Agrimanet, 2020 (April. 21). The technology of sunflower cropping (Tehnologia de cultură a florii soarelui), <https://agrimanet.ro/tehnologia-de-cultura-a-florii-soarelui>, Accessed on 21.07.2024.
- [2] Agrimanet, 2024 (April 29), Sunflower 2022-estimates, prices (Floarea soarelui 2022 – estimări, prețuri), <https://agrimanet.ro/floarea-soarelui-2022-estimari-preturi>, Accessed on 01.08.2024.
- [3] Balamatiuc, E., 2023 (Sept. 19), the reduction of the price of sunflower seeds on the local market-causes (Scăderea prețului semințelor de floarea-soarelui pe piața locală – cauze), In Agrobiznes.md., <https://agrobiznes.md/scaderea-pretului-semintelor-de-floarea-soarelui-pe-piata-locala.html>, Accessed on 25.09.2024.
- [4] Brumă, I.S., Rodino, S., Petcu, V., Micu, M.M., 2021, An overview of organic sunflower production in Romania, Romanian Agricultural Research, 38, 495-

- 504, <https://orgprints.org/id/eprint/45450/1/2021%20-%20AN%20OVERVIEW%20OF%20ORGANIC%20SUNFLOWER%20PRODUCTION%20IN%20ROMANIA.pdf>, Accessed on 15.08.2024.
- [5] Chivu, M., Stanciu, S., 2024, Agritourism Market in Romania: Potential, Concentration, and Development Perspectives, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 24(1), 195-202, [https://managementjournal.usamv.ro/pdf/vol.24\\_1/volume\\_24\\_1\\_2024.pdf](https://managementjournal.usamv.ro/pdf/vol.24_1/volume_24_1_2024.pdf). Accessed on 30.08.2024.
- [6] Digi24, 2021, (May 4), Romania remains the first producer of sunflower seeds of the EU (România rămâne cel mai mare producător de floarea-soarelui din Uniunea Europeană), <https://www.digi24.ro/stiri/economie/agricultura/romania-ramane-cel-mai-mare-producator-de-floarea-soarelui-din-uniunea-europeana-1485333>. Accessed on 15.08.2024.
- [7] Dincă, A.D., Stanciu, S., Stoica (Dincă), C., 2024, Aspects regarding sunflowerseed crops in Braila County, Romania, *Research Journal of Agricultural Science*, 56,46-55, [https://www.rjas.ro/paper\\_detail/3989](https://www.rjas.ro/paper_detail/3989), Accessed on 30.08.2024.
- [8] G4Food.ro., 2023 (Dec. 01), Romania on the top position both for the export and import of sunflower seeds; a dramatic fall of the Ukrainina supply on the communitary market (România, pe primul loc atât la exportul, cât și la importul de semințe de floarea soarelui; scădere drastică a livrărilor ucrainene pe piața comunitară), <https://g4food.ro/romania-pe-primul-loc-atat-la-exportul-cat-si-la-importul-de-seminte-de-floarea-soarelui-scadere-drastica-a-livrarilor-ucrainene-pe-piata-comunitara>. Accessed on 15.08.2024.
- [9] Ghise, G., 2024, (May 16). Romania will produce over 3.16 million tons sunflower seeds (România va produce peste 3,16 milioane de tone de floarea soarelui), In *Ferma*, <https://revista-ferma.ro/romania-va-produce-pest-316-milioane-de-tone-de-floarea-soarelui>. Accessed on 20.08.2024.
- [10] Gorcinschi, V., 2024, (Oct. 21), Sunflower price has aboom! Demand is high, the farmers do not want yet to sell (Prețul la floarea-soarelui a bubuit! Cererea este mare, fermierii nu vor încă să vândă), In *Agrointeligenta*, <https://agrointel.ro/309744/pretul-la-floarea-soarelui-a-bubuit-cererea-este-mare-fermierii-nu-vor-inca-sa-vanda>. Accessed on 25.10.2024.
- [11] Kurre, S.K., Jitendra Yadav, J., 2023, A review on bio-based feedstock, synthesis, and chemical modification to enhance tribological properties of biolubricants, *Industrial Crops and Products*, 193, 116122, DOI: <https://doi.org/10.1016/j.indcrop.2022.116122>.
- [12] Ministry of Agriculture and Rural Development, 2024, Tehnical plant. Sunflower. <https://www.madr.ro/culturi-de-camp/plante-tehnice/floarea-soarelui.html>, Accessed on 15.09.2024.
- [13] National Institute of Statistics, 2024a, Agriculture. Sunflower, Tempo online, <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, Accessed on 01.08.2024.
- [14] National Institute of Statistics, 2024b, International trade, Tempo online, <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>, Accessed on 01.08.2024.
- [15] Nitu, F., 2022 (March 13), What chance has Romania, the largest producer of sunflower of the EU, to supplement the oil exports of Ukraine when the West started to rationalize oil ration. Processing is the only answer (Ce șanse are România, cel mai mare producător de floarea-soarelui din UE, să suplinească din exporturile de ulei ale Ucrainei, când vestul începe să dea ulei cu rația? „Procesarea este singurul răspuns“), In *Ziarul Finaciar*, <https://www.zf.ro/companii/ce-sanse-are-romania-cel-mai-mare-producator-de-floarea-soarelui-din-20598469>. Accessed on 01.08.2024.
- [16] Panzaru, R.L., Medelete, D.M., Ștefan, G., Balan, M., 2023, The integration of Romania into the European Unionmarket of sunflower seeds, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 23(4), 609-618, [https://managementjournal.usamv.ro/pdf/vol.23\\_4/Art61.pdf](https://managementjournal.usamv.ro/pdf/vol.23_4/Art61.pdf), Accessed on 15.08.2024.
- [17] Popescu, A., 2018, Romania's sunflower seeds production, export and import- analysis of the 2007-2017 period and forecast for 2018-2022 horizon, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 18 (4), 261-269, <https://managementjournal.usamv.ro/index.php/scientific-papers/1791-romania-s-sunflower-seeds-production-export-and-importanalysis-of-the-2007-2017-period-and-forecast-for-2018-2022-horizon-1727>. Accessed on 15.08.2024.
- [18] ReportLinker Consulting, 2024, Sunflower Oil Market Size Volume in Romania <https://www.reportlinker.com/dataset/ef6283bb13ea392e3c7e5fa4314af5969c25880a>. Accessed on 15.10.2024.
- [19] Soare, E., David, E., Bălan, A. E., 2014, Researches on oilseeds market in Romania, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 14(4), 265-271, <https://www.cabidigitallibrary.org/doi/pdf/10.5555/20153025812>, Accessed on 21.08.2024.
- [20] Soare, E., Chiurciu, I.A., 2023, Study on the sunflower seeds market in Romania, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 23 (1), 739-744, [https://managementjournal.usamv.ro/pdf/vol.23\\_1/Art77.pdf](https://managementjournal.usamv.ro/pdf/vol.23_1/Art77.pdf), Accessed on 25.08.2024.
- [21] TopFirme, 2024, NACE 1041 - Manufacturing oils and fats (Cod CAEN 1041 - Fabricarea uleiurilor si grasimilor), <https://www.topfirme.com/caen/1041>, Accessed on 15.10.2024.
- [22] Zhang, M., Wang, O., Cai, S., Zhao, L., Zhao, L., 2023, Composition, functional properties, health benefits and applications of oilseed proteins: A systematic review, *Food Research International*, 171, 113061, DOI:<https://doi.org/10.1016/j.foodres.2023.113061>.