

Analysis of Market Development and Prices of Selected Oilseeds in Slovak Republic

Zuzana Bajusová, Dominika Čeryová, Jana Ladvenicová, Ľubomír Gurčík,
Pavol Findura, Miroslav Prístavka, Ján Jobbágy

Abstract: Agriculture plays an important role in ensuring human nutrition. Agricultural products are among the most valuable commodities and the basic material for the production of various foods. Agrarian productivity is important not only in terms of the country's trade balance, but also for the safety and health of its population. The aim of the paper is to monitor the development of supply, demand, prices and foreign trade of selected oilseeds within the Slovak Republic in the period 2012-2021. The commodities of plant production under the analysis are oilseed rape and sunflower. As part of the description of the current state of the problem, the main terms in the field of the market, prices, the country's foreign trade, the functioning of the market mechanism and also the basic tasks and functions of the market are defined. Within our research we deal with the concept of competitiveness, using the appropriate indicators. The development of society and the opening of borders between individual states caused the development of foreign trade. Individual economies began to gradually specialize and complement each other. They did not only produce for their own needs, but also for the needs of others. Their self-sufficiency began to decline and the dependence on individual producers, respectively the necessity of exchange, grew.

Key words: agriculture, market, oilseeds, oilseed rape, sunflower

INTRODUCTION

The market was created by the development of commodity production and the social division of labor. The development of the division of labor led to the fact that individual economies began to gradually specialize and mutually to supplement. They did not only produce for their own needs, but also for the needs of the others. Their self-sufficiency began to decline and the dependence on individual producers, respectively the necessity of exchange, grew. In today's economy and society, the market has several meanings and there are also several divisions of it. From an economic point of view, the market represents a mechanism that realizes the interests of individual market entities. Through the market, buyers and sellers interact to determine prices and also quantities of goods or services. (Lisý, J. et al., 2016)

In the economy, markets also represent an important structure that serves to guide many economic activities. Economic language has at least three different uses of the word "market", ranging from the very concrete to the very abstract. The appropriate meaning must be judged from the context in which it is found. (Godwin, N. et al., 2020)

The market mechanism is a system of several elements that act on the market, interact with each other, and their result is a certain order and proper functioning of the system. We include market subjects, market competition, demand, supply and market price among the main elements. (Táncošová, J. et al., 2013)

The market mechanism works effectively only in conditions of competition. In order for a competitive environment to exist, there must be two interdependent entities on the market. Manufacturers want to sell manufactured goods as cheaply as possible, and consumers, in turn, try to buy goods as cheaply as possible. Their interests are opposite, but on both sides there is an effort to achieve maximum advantage. (Piteková, J. - Ubrežiová, I., 2022)

As a result of the action of several factors, there is a significant increase in the prices of agricultural commodities in the world. We can divide these factors into short-term factors and fundamental factors, which are those that affect price growth in the long term. Oil and agricultural commodities form an important component of commodity markets. Much of the literature confirms that oil prices and prices in various agricultural markets are highly correlated. You are suggesting that the increase in food prices can be attributed to a surge in the consumption of biofuels that are replacing petroleum-based products. In addition, oil price changes can affect prices of agricultural products through input costs. (Zaghum, U. et al., 2021)

We consider short-term factors to be those which influence the prices of agricultural commodities, but do not have a long-term nature. They cause faster dynamics of price growth and

also higher volatility and volatility. Such short-term factors are climatic factors, the course of weather conditions, including natural disasters, which cause crop failures. We include various types of export restrictions, export taxes and customs duties among such restrictions. On the contrary, on the side of importing countries, some import duties were abolished. (Árendáš, M., 2008)

The literature on factors influencing prices in agriculture is really extensive. We can also include political factors among the investigated factors. Exports of world grains and oilseeds are concentrated in a few countries with fertile soil and developed agricultural productivity, while imports are widespread in most countries around the world. Among the world's largest exporters of cereals and oilseeds are Russia and Ukraine. The Russian invasion of Ukraine, which began on February 24, 2022, has sharply increased the prices of agricultural commodities and the rate of price fluctuations, which poses a threat to food security. (Just, M. et al., 2022)

International trade is the buying and selling of goods and services to companies in different countries. It allows countries to expand their markets and gain access to goods and services that might not otherwise be available domestically. As a result of the international community to more competitive prices and thus brings home a cheaper product to the consumer. (Heakal, R., 2022)

Agricultural trade involves the buying and selling of products that have been produced through the forestry and agricultural industries. Thanks to it, European countries can obtain cocoa or tropical fruits. Agricultural trade is vast and involves more than just the import and export of food. Other commodities that can be traded include livestock, raw materials, fiber, etc. As a result of advances in technology and trade agreements, agricultural trade is becoming more global. Monitoring fluctuations in the market and also knowledge of applicable regulations is a demanding but important task for both buyers and sellers in this industry. Individual countries thus take steps to support policies, fair trade and sustainable agricultural practices (Delich, Ch., 2022)

MATERIALS AND METHODS

To define object of research, paper is focused on the analysis and investigation of market development and prices of selected oilseeds for the period 2012-2021 namely in Slovakia. The subject of the analysis are the two main components of plant production, which as agricultural commodities have a significant place on the Slovak and foreign markets. 2 specific agricultural commodities are analyzed in more detail, namely oilseed rape and sunflower. The material for the processing of the scientific contribution are the available data obtained from the statistical databases: Eurostat. The analysis resulted in determining the competitive advantage of the monitored agricultural commodities grown in the conditions of Slovak Republic based on price and other selected indicators for determining competitiveness. To provide a deep analysis and thus meet the aim of the paper, the method of analysis was used to closely examine the market for agricultural commodities and its development over time. Comparison method was used to compare the market and prices. Graphic representation method, which was used to create graphs and tables using Microsoft Excel and Microsoft Word programs. Mathematical-statistical methods and formulas used for the analysis of market development and prices and the calculation of competitiveness of the country and agri-food trade, such as:

- absolute changes to determine the differences between individual years
- base index, chain index
- arithmetic averages to express average values
- Revealed Comparative Advantage (RCA)

$$\ln[(x/m)/(X/M)] \tag{1}$$

Where:

- x – commodity export value,
- m – value of commodity import,
- X – the value of the country's total agro-food exports,
- M – the value of the country's total agro-food imports.

If:

$RCA > 0$ indicates that the country has revealed comparative advantages in exporting the given commodity group.

RCA < 0 the country has a comparative disadvantage in the given commodity group.
 RCA = 0 is neither a comparative advantage nor a disadvantage.

RESULTS AND DISCUSSION

Together with cereals, oilseeds belong to the basic strategic crops in plant production. This is mainly because of their irreplaceability in human nutrition, the importance of pomace in animal feed, but also because of the growing share of oils in the production of biodiesel. The most important oil crops in the world are: soybean, oilseed rape, sunflower, cotton, linseed and others. A total of 58 types of oilseeds are grown in Europe. However, oilseed rape and sunflower are the most represented. Year-to-year changes in the production of oilseeds have a fluctuating nature. The highest level of production was recorded in 2015 at 32.96 million. tons. On the contrary, the EU produced the least oilseeds in 2013, when it amounted to 24.85 million. tons. Insufficient production, which is unable to cover domestic consumption, forces the EU to import oilseeds. Oilseeds are used for food, fodder, fuel and industrial purposes. The highest domestic consumption was in the economic year 2021, i.e. j 50.62 million tons. The least amount of oilseeds was consumed in the economic year 2012. The development of final stocks of oilseeds has a long-term downward trend. In terms of production self-sufficiency, the European Union as a whole is not able to fully cover the domestic consumption of oilseeds. The degree of self-sufficiency measured by the share of domestic production and consumption ranges from 55% to 71% for oilseeds. The EU achieved the highest level of production self-sufficiency in the economic year 2015 at the level of 71.16%.

Table 1 Total balance of oilseeds in the EU (in million tons)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Production	26,27	24,85	29,34	32,96	29,52	29,54	32,93	30,81	28,37	28,31
Consumption	41,03	41,22	44,93	46,32	46,86	45,96	48,29	49,24	49,80	50,62
Import	15,97	15,91	16,93	15,27	18,25	18,33	18,18	19,29	21,68	21,64
Export	0,98	0,75	1,19	1,36	1,00	1,14	1,34	1,10	1,13	1,04
Rate of production self-sufficiency (%)	64,03	60,28	65,29	71,16	63,00	64,27	68,19	62,56	56,96	55,94

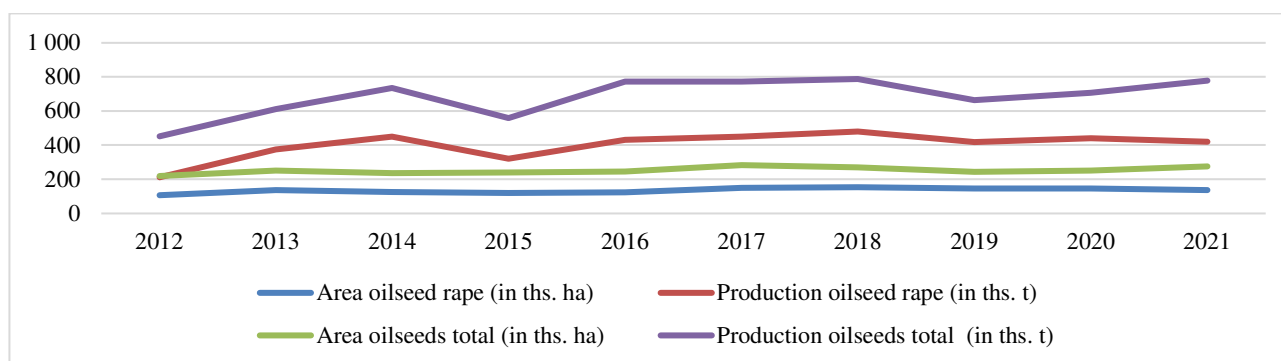
Source: Own processing based on data from Eurostat

Oilseeds have a dominant position after cereals in the crop structure in Slovakia. Interest in them is growing not only from the fat industry, but also from other technical industries. This is, for example, the production of biodiesel, in cosmetics, pharmaceuticals, the production of varnishes, cleaning agents, the textile and engineering industries, etc.

During the period 2012 - 2021, oil crops were grown in Slovakia on an average of 260,007 hectares. The highest production of oilseeds in the monitored period was recorded in Slovakia in 2018, namely 787,370 tons. In the long term, production in Slovakia has a growing character. In 2021, compared to 2012, almost 342,382 more tons were produced.

Year-to-year production develops in a fluctuating trend, caused by changes in input prices, costs and also changes in the weather. Because growing crops requires suitable soil, water, sunlight and heat. For example, a decrease in the amount of precipitation and extreme heat reduce their productivity. Higher temperatures and longer growing seasons allow new crops to be grown, affect the spread of certain types of pests, and so on.

The following results were achieved in the field of oilseed rape cultivation. In Slovakia, the gross production of oilseed rape had a clear growing character in the long term. In 2021, gross production was 100% higher than in 2012. We can see the biggest increase right at the beginning of the monitored period. In 2013, the gross production of oilseed rape increased year-on-year by up to 161,328 tons or by 75.9%. The second significant increase in rape production occurred in 2016, when compared to 2015 it increased by 109,923 tons. respectively 34.3%. The largest decrease occurred in 2015, when gross production fell by more than half.



Source: Own processing based on data from Eurostat

Fig. 1 Production of oilseed rape in Slovakia 2012 - 2021

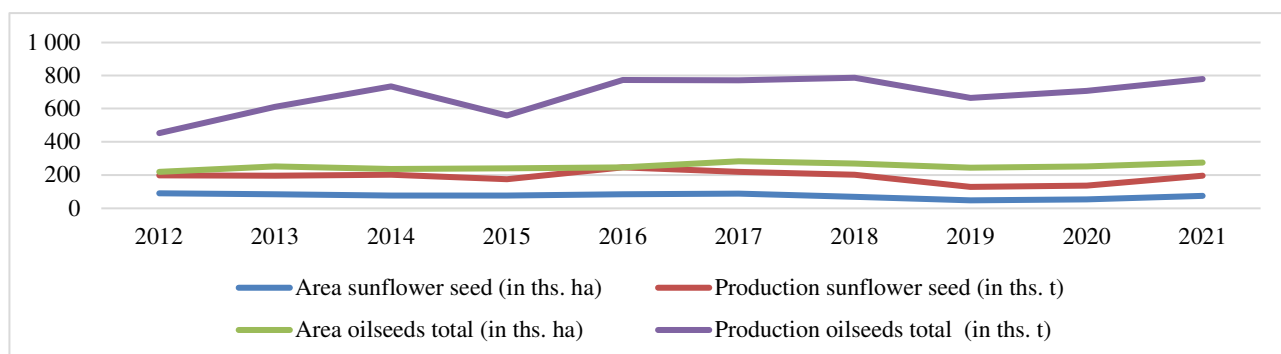
In 2021, most of the oilseed rape was processed for FAME (fatty acid methyl ester) and only a small part was used in the food industry. FAME is a substance that has similar properties to diesel fuel. It is used as a bio component for compulsory mixing in diesel fuel. The total value of consumption in the last monitored year was 244.6 thousand. t. Compared to 2012, this represents an increase of 4.60 thousand. tones.

Table 2 Consumption of oilseed rape in Slovakia 2012-2021

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Consumption (in ths. t)	240,0	207,8	205,3	213,0	216,7	242,8	234,9	249,7	239,1	244,6
Consumption per inhabitant	0,044	0,038	0,038	0,039	0,040	0,045	0,043	0,046	0,044	0,045

Source: Own processing based on data from Eurostat

Sunflower is grown on smaller areas and in smaller quantities in Slovakia. Its use consists mainly in the provision of high-quality oil. The gross production of sunflower developed has a fluctuating trend, but in the last two years it has increased again, thanks to which the change of the last monitored year 2021 compared to the base year 2012 is also a growth. However, the value is only minimal t. j growth by 0.05% or 93 tons. The most quantity of sunflower were produced in Slovakia in 2016. j. 246,496 tons. On the contrary, in 2019, the smallest area was set aside for sowing sunflowers, therefore the gross production also reaches a minimum. Slovak oilseed growers harvested sunflower production in 2012 from an area of 90,121 hectares, when it reached the highest acreage. In other monitored periods, it decreased and reached the value of 73,360 hectares, which is a decrease of 19% compared to 2012, or 16,761 hectares.



Source: Own processing based on data from Eurostat

Fig. 2 Production of sunflower in Slovakia 2012 - 2021

It occupied approximately 5.5% of the arable land and 4% of the total used agricultural land in Slovakia in 2021. In addition to the yield per hectare, all other essential factors simultaneously

contribute to the profitability of sunflower cultivation: own costs, realization prices and subsidies.

The development of sunflower consumption in the Slovak Republic was fluctuating. In 2021, compared to 2012, the value of consumption decreased by 14.20 thousand. tons and reached a value of 10.8 thousand. tones or 0.002 t per inhabitant. Year 2015 is the year, when the highest quantity of sunflower was consumed on the territory of Slovakia.

Table 3 Consumption of sunflower in Slovakia 2012-2021

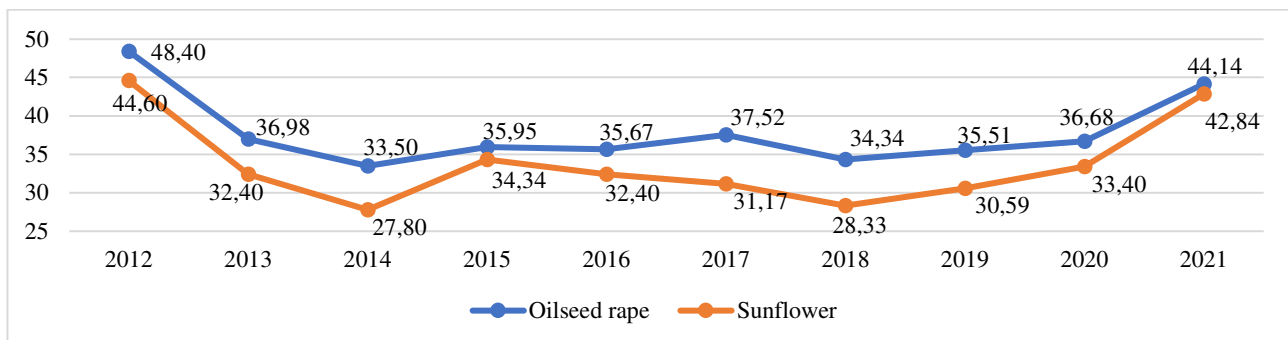
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Consumption (in ths. t)	25,0	15,0	10,0	25,9	16,4	10,0	10,0	10,0	2,8	10,8
Consumption per inhabitant	0,005	0,003	0,002	0,005	0,003	0,002	0,002	0,002	0,001	0,002

Source: Own processing based on data from Eurostat

The development of oilseed rape sales prices in the Slovak Republic fluctuated. Selling prices fell down for the first 3 years, increased slightly for the next 3 years, fell down again a bit, and increased significantly at the end of the period. In 2021, the sales price was by 7.46 euros higher than in 2020, which is also the highest year-on-year increase. In the long term, however, we can state that the selling price of oilseed rape in the Slovak Republic in 2021 compared to 2012 decreased by 4.26 euros or 8.8%. Selling prices of sunflowers also had a fluctuating nature. The available data show that the selling price of sunflower in the Slovak Republic in 2021 compared to the base year decreased by 3.9% or by 1.76 euros per 100 kg.

To assess the competitiveness of agrarian trade or of a selected commodity of one country against another, the RCA index is particularly suitable, which is easily and unambiguously interpretable with good explanatory power. On the basis of this index, we can evaluate whether individual commodities of agrarian trade achieve comparative advantages or, on the contrary, disadvantages.

In the commodity group of oilseeds, Slovakia clearly has a comparative advantage. The value of the RCA indicator was higher than 0 throughout the monitored period.



Source: Own processing based on data from Eurostat

Fig. 3 Selling prices in Eur/100 kg

Table 4 Competitiveness of oilseeds in SR according to the RCA index

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Oilseeds	1.25	2.01	1.06	1.16	1.10	1.19	1.39	1.43	1.21	1.36
Oilseed rape	1.55	3.04	1.44	1.74	1.18	1.11	1.75	2.18	2.32	1.87
Sunflower	1.44	2.69	2.46	2.20	1.98	2.34	2.23	2.21	1.49	2.59

Source: Own processing based on data from Eurostat

CONCLUSION

Oilseeds are lucrative commodities in the agricultural market, especially in recent years. Together with cereals, they belong to the basic strategic crops in plant production. This is mainly because of their

irreplaceability in human nutrition, the importance of pomace in animal feed, but also because of the growing share of oils in the production of biodiesel. From the analysis of the data we can conclude, that during the period under analysis all indicators had a fluctuating character. At the end it is clear, that Slovakia has revealed comparative advantages in exporting the oilseeds namely oilseed rape and sunflower. Slovakia is one of the highly open economies due to its strong dependence on foreign trade. Slovakia's export performance indicator has been high for a long time, exceeding 80%.

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CONTACTS

Zuzana Bajusová, Institute of Economics and Management, Faculty of Economics and Management, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovakia, e-mail: zuzana.bajusova@uniag.sk

Dominika Čeryová, Institute of Economics and Management, Faculty of Economics and Management, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovakia, e-mail: dominika.ceryova@uniag.sk

Jana Ladvenicová, Institute of Economics and Management, Faculty of Economics and Management, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovakia, e-mail: jana.ladvenicova@uniag.sk

Lubomír Gurčík, Institute of Economics and Management, Faculty of Economics and Management, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovakia, e-mail: lubomir.gurcik@uniag.sk

Pavol Findura, Institute of Agricultural Engineering, Transport and Bioenergetics, Faculty of Engineering, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovakia, e-mail: pavol.findura@uniag.sk

Miroslav Prístavka, Institute of Design and Engineering Technologies, Faculty of Engineering, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovakia, e-mail: miroslav.pristavka@uniag.sk

Ján Jobbágy, Institute of Agricultural Engineering, Transport and Bioenergetics, Faculty of Engineering, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovakia, e-mail: jan.jobbagy@uniag.sk