

COMPETITIVENESS OF BULGARIAN OILSEED PRODUCTION IN THE WORLD MARKET

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Abstract

The competitiveness is a significant and crucial concept in the economy and the economic science, seen and explored by numerous definitions and understandings of its scope and content. In general terms, competitiveness can be comprehended in a static aspect as an outcome on one hand or either as conditions and factors (dynamics) determining that outcome or competitive performance. In the current study, the competitiveness is defined as the capability of the agricultural industries and the production of oilseed crops in Bulgaria to sustain and expand their market share and to maintain and increase the added value of their production in terms of national and global scene. In this regard, competitiveness is perceived as the performance of the national industry within world consumption of oilseeds, indicated as a share out of world production, equalized for consumption and production value.

The purpose of the analysis is to assess the competitiveness of the oilseeds industry in Bulgaria compared to the outcomes and development of the same industry globally. This evaluation should show, both in time and in a comparative aspect, what is the evolution of the production of oilseed crops in the country compared to the trends in a global context, with competitiveness understanding and envisage as a outcome in production and value prospect. The findings illustrate that the oilseeds industry has levels of competitiveness scored as very high per capita compared to the global indicators. Altogether, the production and the value components of the competitiveness index are at scale throughout the reviewed period (2007-2021), significantly exceeding and surpassing the world average levels, which implies that the competitiveness of this industry is very high revealing a significant market achievements and generated outcome value within national agriculture per capita. In this context, it can be added that the very high and strong competitiveness of the oilseed production in Bulgaria is quite much explicated to the good and successful functioning of the individual producers and farming. It turns out that producers tackled in this production manage to benefit from the significant support that is delivered under the Common Agricultural Policy, both as subsidies and as well investment support. Farmers are in advantage to get free access and partake in the common market and trade of such production, capitalizing on the favorable soil and climatic conditions to make this production in the national land, managing to achieve the reported competitiveness outcomes.

Keywords: oilseed production, competitiveness, total index of competitiveness.

Introduction

Oilseed crops occupy a serious place in Bulgarian agriculture, both in terms of the land area and of the gross output that is obtained. The highest value and share of oil crops in the structure of the gross production from agriculture was obtained in 2022 – BGN 2.75 billion, which represented 21% of GP. According to preliminary data of the National Statistic Institute, in 2023 this value may fall to BGN 1.5 billion, which constitutes about 14% of GP. Usually, in recent years, a stable level in terms of value of the oilseeds produced in the country has been reported, in the range between BGN 1.3-1.5 billion, which represented between 15-18% of the total agricultural production.

In terms of area, oil crops permanently occupy about 1 million ha, almost 85% of which are for the sunflower. The sunflower is the second most widespread crop in the country after the wheat, and in the last 10 years it has been one of the few crops in the country which areas have been grown between 10-15% since 2013. At the same time, the rapeseed, which in certain years, especially at the beginning after the EU accession, when a large increase in the demand and production of biofuels was observed, managed to reach levels of up to 180 thousand ha, in the last 7-8 years its share in the size of arable land in the country decreased to 120-130 thousand ha. On the other hand, the soybean cultivation in the country is very minimal and it is a poorly represented crop, regardless of the fact that it is a major oilseed plant in world agriculture, providing both soybean oil and soy protein for livestock breeding.

From the point of view of consumption and demand in the country, the competitiveness in the oilseed sector has been analyzed on the basis of these three crops - sunflower, rapeseed and soybean. According to Popescu (2012), "their high fat content (sunflower 50%, rapeseed 34% and soybean 20%) makes them useful for the oil and biofuel industry". The soy is characterized by the greatest variety and variability in processing, both for the production of goods for human consumption such as: soybean oil flour, milk, tofu, vegetable protein (for meat and dairy preparations), soy sauce, fermented bean paste, and soybean flour used as an excellent low-cost source of protein for animals (Popescu 2012).

It should be noted that the market of oilseeds has its own specificity, expressed in a high degree of interchangeability of products, dependence on other agricultural and food markets (the market of grain, meat, animal fats, etc.) (Vinnichek et al. 2019). According to the same authors, "the main factor for the growth of the demand for sunflower oil is the decline in the income of the population" (Vinnichek et al. 2019). They are trying to defend the thesis that in countries with a low standard of living, sunflower seeds are used as a cheap food product. This assumption can only be valid if it was assumed that consumers prefer animal fats or certain vegetable fats and that sunflower oil is among the cheapest oils. Both judgments cannot be accepted as relevant and sufficient to explain the large increase in the production of sunflower seed, which together with palm oil are among the fastest growing crops in the oil complex and their expanding share is due to the improvement in nutritional quality in global aspect, as well as the sunflower is characterized by higher unpretentiousness and relatively low production costs. Another important factor in favor of oilseed crops is that they are cultivated with tillage, suitable for crop rotation and cereal rotation, cleaning the soil of some weeds that develop when

growing cereals, but at the same time require more careful consideration of the mineral nutritional balance, especially regarding phosphorus, potassium, etc.

Globally, oilseeds were accounted for about 8% of the total agricultural production in 2019, according to FAO data, which in numerical terms equaled USD 328 billion. With the highest value, the world production of soybeans stands out, amounting to 102 billion USD, followed by the cotton - 67 billion USD. Of the three most widely cultivated and consumed oil crops in the country, the rapeseed forms a value of USD 32.5 billion, and sunflower is USD 21 billion. Over the years, there has been a steady increase, both in terms of quantity and value of the global production of oilseeds, for comparison, in 2010, the product output was estimated at 299 billion USD, while the gross agricultural output was estimated at 3.2 trillion USD. This shows that in the last decade there has been a certain contraction of the share of oilseed crops in the structure of agricultural production from about 9% in 2010 to approximately 8% in 2019.

In Bulgaria, the production of oilseed crops is of much greater importance, and according to Dimitrova (2020) this is due, on the one hand, to the growing production amount, as well as to "improved market conditions, as a result of the access to the single European market ". It is also noted that "the potential for extensive development of production, based on the expansion of areas, is almost exhausted, especially in the case of sunflower, and the reserves should be sought in the increased productivity and quality of the production" (Dimitrova 2020).

The purpose of the analysis is to assess the competitiveness of the oilseeds sector in the country compared to the performance and development of the sector in a global aspect. This assessment should show, both dynamically and in a comparative aspect, what is the development of the oilseed crops production in the country compared to the trends in a global context, with competitiveness understood as a result in production and value terms.

Methodological approach

Competitiveness is a complex and key concept in economic analyses, as usually it can be considered in a static aspect, as "the ability of the agricultural sectors and productions in Bulgaria to preserve and expand their local and national market share and to maintain and increase the added value of their output on a national and global scale" (Ivanov 2021). The market competitiveness research approach applied in the present study was developed by Ivanov (2016) and tested by Ivanov and Stoychev (2017) and Ivanov (2019). The calculation of the competitiveness index is by taking into account the production, consumption and production value of oilseed crops, represented by the 3 main ones covered - sunflower, rapeseed and soybean. The competitiveness has been assessed on the national sector in the country towards the global development of this sector and in order to achieve comparability and comeasurability, this is done per person of the population. The introduction of a per capita criterion enables relative comparability and to take in consideration both the different market sizes and the resource provision (Ivanov 2021).

Different authors working on the topic of competitiveness take different approaches to analyze and measure competitiveness in agriculture, which can be done both on sectoral and on farm level. Bashev (2022) assumes that farm competitiveness represents "the ability of a given farm

to compete in a certain market or for a dominant buyer in the area, the supply chain, etc." From such a perspective, Bashev (2022) considers that the competitiveness of the farm "has four equally important pillars: economic efficiency, financial security, adaptability and sustainability". Although in this work the author formulates competitiveness as the farm's ability to compete with other market participants, he sets specific indicators that are not only a result of competition (production expedience, profitability, productivity), but also a prerequisite for the observed result (level of sustainability and adaptability). A number of authors working on the topic of assessing competitiveness in agriculture express this through the price of production, assuming that the lower this price is in the market, the better is the position of the respective sector (Ball et al 2010).

In the research literature, there are various methodologies that calculate coefficients or indices of competitiveness. International institutions, such as the World Bank, the Organization for Economic Cooperation and Development (OECD), the World Economic Forum (WEF 2014) have such methodologies, as they are built on the indicator principle, including N number of indicators, and due to the heterogeneity of the indicators, they use the normalization approach, which allows the coverage of heterogeneous indicator values. According to the OECD, competitiveness is the ability of companies, industries, regions, nations or supranational entities to cope with international competition and generate good returns while maintaining a relatively high level of employment on a sustainable basis (Hatzichronoglou 1996). In turn, Latruffe (2010) classified the dimensions of agricultural competitiveness into those related to strategic management (production costs, profitability, productivity) and characteristics manifested in trade. The European Commission (2009) emphasizes that productivity is the most reliable indicator of competitiveness in a long term prospect. One of the most widespread methods of measuring productivity, which can be perceived as an expression of competitiveness, is Total Factor Productivity. When calculating TFP, the total inputs and costs in the production process are taken into account, which are compared to the output (Melfou et al 2007).

Nowak and Rózanska-Boczula (2022) apply the competitiveness pyramid model, where two groups of factors have been distinguished. The first group covers the factors that can be defined as sources of competitiveness, including human resources (HR), farming conditions (FC), production methods and capital costs (CO). In contrast, the second group of factors refers to direct results on competitiveness. In addition, one of the widespread methods for evaluating competitiveness, including a synthetic set of indicators, is VTOPSIS (technique of arrangement for proximity to ideal solution) developed by Hwang and Yoon (1981). It is a method that uses standardization and normalization through the mini-max method and in which the remoteness of the indicator for each country is estimated compared to the observed extremes.

In the applied methodology (Ivanov 2019, 2021), the competitiveness is considered in two components - production and value, which is calculated per person of the population, where local production is related to domestic consumption and to world production, and value takes into account the levels per person of population to those on a world scale. It is assumed that the as much greater is this value, so better the result is for the competitiveness because it brings better income and return and limits the overestimation of production results when they are not backed by economic rationality.

The PIC_{DC} component reveals the share of local production of the respective product in domestic and world consumption. This component has two variants depending on whether the country's level of self-sufficiency is secured or the country is non-self-sufficient. In case the country is self-sufficient for the specific product, then the formula for calculating PIC_{DC} , presents:

$$PIC_{DC} = \frac{MP_{BG}}{MC_{BG} + MC_{WR} + ME_{BG}}, \quad (1), \text{ where}$$

MP_{BG} - Bulgarian production of respective product per person of population, expressed in quantity;

MC_{BG} - local consumption of respective product per person of population;

MC_{WR} - consumption of the product in the world per capita in quantity, while ME_{BG} is the net export, when the country is a net exporter

When the country is fully self-sufficient, then production is higher than consumption and then the difference between production and consumption is destined for export. In the second variant PIC_{DC} has the following expression:

$$PIC_{DC} = \frac{MP_{BG}}{MC_{BG} + MC_{WR}}, \quad (2)$$

The denominator of the equation is without ME_{BG} - export of the relevant product from Bulgaria because in cases where consumption is higher than production, the denominator will always be greater than the numerator and the coefficient will be in the indicated range from 0 to 1. In these cases, the calculation of ME_{BG} , represents:

$$ME_{BG} = MP_{BG} - MC_{BG}, \quad (3)$$

Ivanov (2021) proposes to combine equations (1) and (2), thereby eliminating the need to consider the state in net exports, in which case the local consumption (MC_{BG}) is expressed as follows:

$$MC_{BG} = MP_{BG} - (ME_{BG} - MI_{BG}) + \frac{(ME_{BG} - MI_{BG})}{ABS(ME_{BG} - MI_{BG})} * MI_{BG} \quad (4)$$

The meaning of the production index PIC_{DC} depends on the measured result, with a value of 0 being interpreted as the absence of local production, and the other extreme 1 can be reached when national production is the only one in the world. The VIC_{DC} component represents the change in the gross value of Bulgarian production in the studied sector, and is expressed by the equation:

$$VIC_{DC} = \frac{MV_{BG}}{MV_{BG}+MV_{WR}} \quad (5), \text{where}$$

MV_{BG} – share of production gross value in the national industry, per capita, and MV_{WR} - share of production gross value of the corresponding product in the world, per capita. The calculation is based on the export prices of the products in Bulgaria and the world, which reflects not only the production, but also the added value along the value chain.

The composite index of competitiveness was calculated according to formula (6). The production component and the value result obtained on the basis of the international trade price of each of the crops included in the group have equal importance and weight, and the formula has been expressed as a sum between the two components, divided by their number:

$$IC_{DC} = \frac{PIC_{DC}+VIC_{DC}}{2} \quad (6)$$

The composite index can take values in the range from 0 to 1. Usually, in considered application cases where one production was examined and not the sectoral level, the system of equations is sufficient, but what is specific about the sectoral calculation of the competitiveness index is the need of equating the crops involved to a single basis. The way adopted is through weighting, which is done in several places in the calculation system, the weighting factor being the average unit value obtained of each of the three crops - sunflower, rapeseed and soybeans in the gross production worldwide.

$$WF_n = \sum_{k=3}^n \frac{GO_n}{PO_n} \quad (7)$$

The weighting factor (WF_n) is calculated for each of the three crops, as their sum must not exceed 1, and it is obtained by dividing the gross production by the harvested quantities (PO_n). When this weighting factor is obtained, the production, the consumption per capita in the country and the world, and the unit value of exports, which are used to obtain the value component, are multiplied by WF.

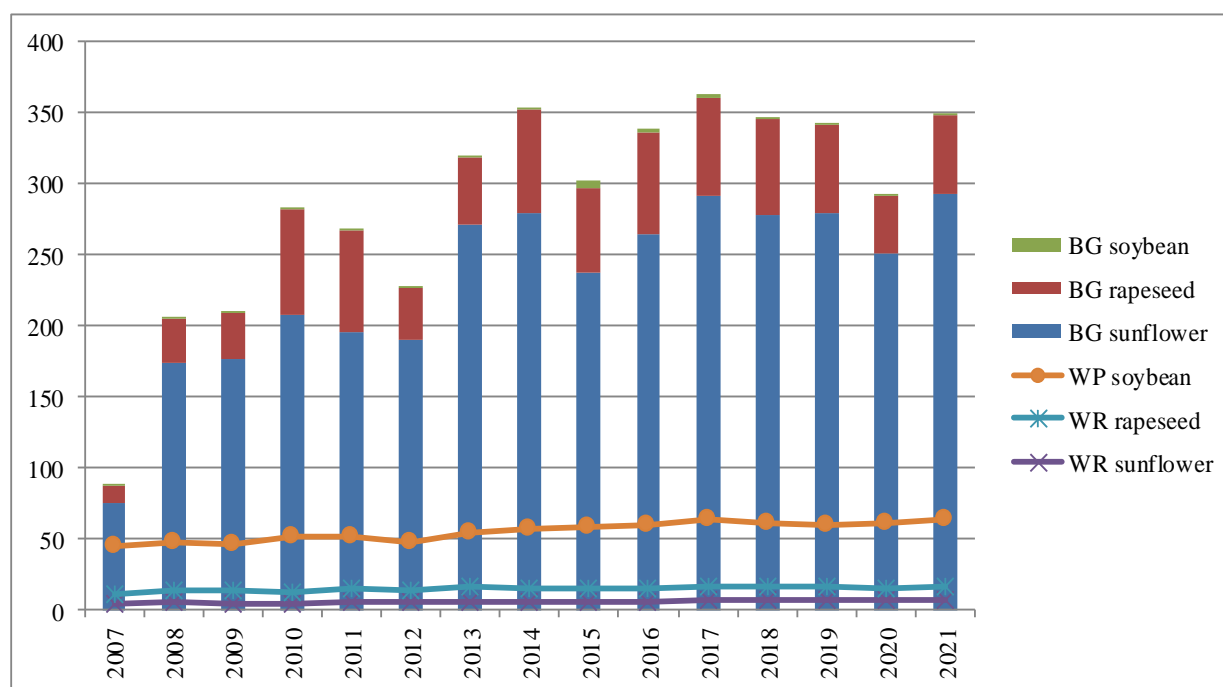
$$MP_{BG}/MP_{WR}/MC_{BG} = \frac{(MP_{n1}*WF_{n1}+MP_{n2}*WF_{n2}+MP_{n3}*WF_{n3})}{P} \quad (8)$$

When this weighting is done, the calculation of the competitiveness index becomes a calculation system equated to one product of the group of oilseed crops.

Analysis results

Calculating levels of competitiveness in the oilseeds sector is a function of domestic production and consumption and world production. Primary data on the production of sunflower, rapeseed and soybean in Bulgaria exceeds on average about 6 times the same levels in the world per person of the population. On average in the world per person of the population in recent years about 45 kg/person was produced, while in our country this production was less than 1 kg. Soybean has one of the best indicators, both because of its high protein and fat content, which makes it highly valued by both the food and feed industry. In the case of rapeseed, Bulgaria's superiority in production compared to world indicators is also noticeable, with the average for the period 2007-2021 being about 53 kg/person, while in the world it is about 8 kg/person. According to Tanaka et al (2002), the popularity of rapeseed has increased since the end of the twentieth century, when it began to enter Europe and Canada on a massive scale, which is due to the improvements and technologies of cultivated varieties with a reduction in the content of erucic acid and glucosinates. Due to the increased interest in biofuels in the common market, the EU countries in a very short period of time drastically increased the production of rapeseed and thus competed with Canada (Tanaka et al. 2002).

Figure 1. Total annual production of selected crops 2007-2021, kg/person

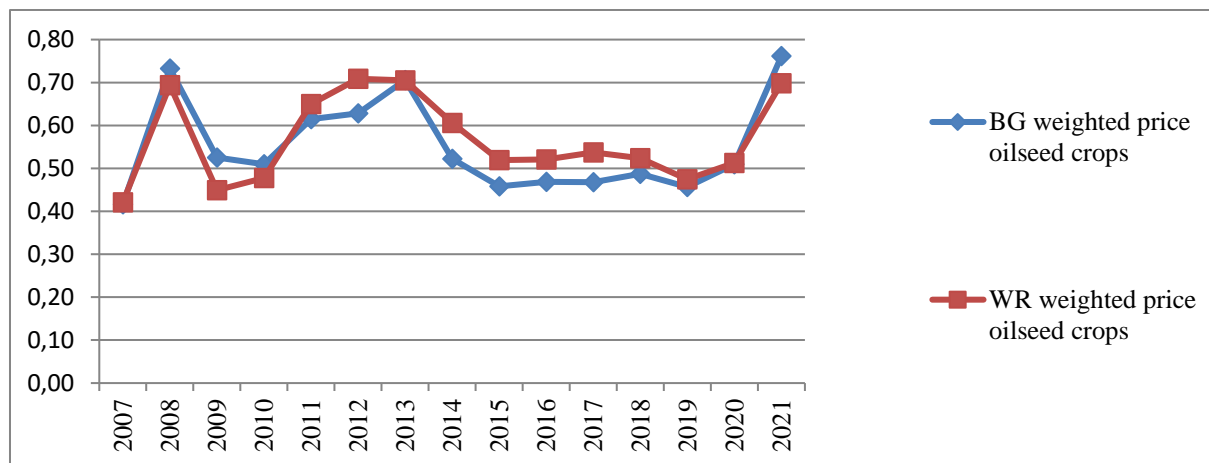


Source:FAO database and UN-Department of Economic and Social Affairs.

Regarding the average prices, which form the value of the production obtained from the international trade of oilseeds for Bulgaria and in general for the world, it can be seen that there is a significant similarity. In the prevailing case of time, the international weighted prices are higher than the export prices from Bulgaria, which, however, cannot be explained by any objective circumstances and can largely be attributed to conjunctural and non-stationary changes in the market environment.

Both in Bulgaria and in the world, it is established that there is a fundamental similarity regarding the prices of traded exports, with sunflower usually having the highest FOB price, followed by rapeseed and soybeans. However, the differences are very minimal and it should be borne in mind that the calculated prices are annual averages. The weighted average price of the representative group of oilseed crops in Bulgaria for the period 2007-2021 is 0.55 USD/kg, and for the world – 0.57 USD/kg. Both in Bulgaria and in the world in the considered period, there is no price trend, as the lowest price levels were registered in the period 2015-2019.

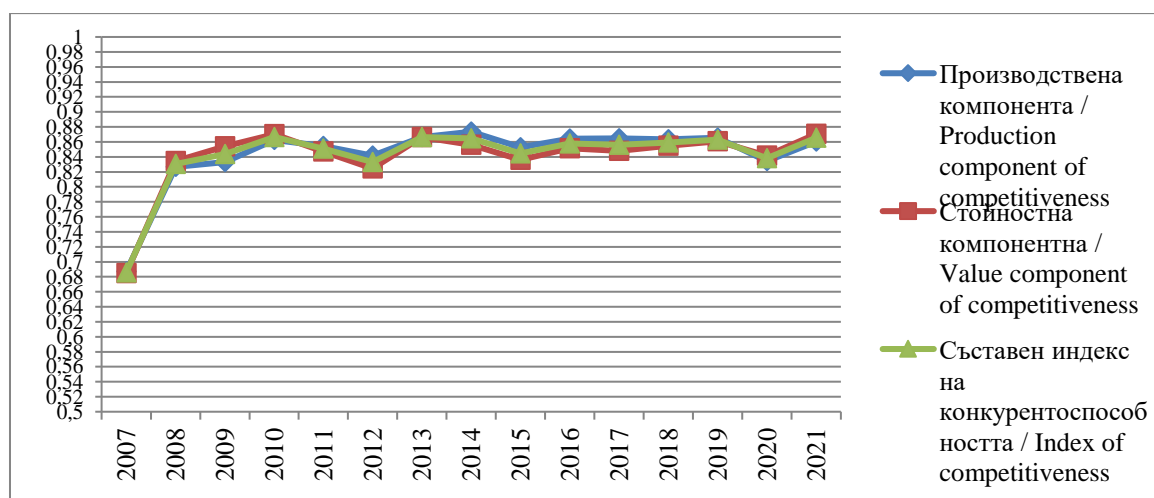
Figure 2. Average weighted price of sunflower, rapeseed and soybeans from international exports from Bulgaria and the world, USD/kg



Source: ITC Database.

The competitiveness index for oilseed crops shows very close values between the product and value components. With the exception of 2007, which is among the worst years in terms of production and yields for Bulgarian agriculture, the rest of the time, the composite index (IC) ranges between 0.82-0.88. According to the adopted methodology and criteria for interpreting the results of this index, in cases where the index is above 0.81, this corresponds to dominant competitiveness in the relevant market and means that the country itself has exceptional production and value results in the domestic and international market (Ivanov 2019).

Figure 3. Competitiveness index of the oilseeds sector



Source: Own assessments based on FAO database, UN and ITC Database.

With index values falling within the range of 0.56-0.80, this is also a reason to speak of very good competitiveness in the respective components, and at 0.46-0.55, the country has a competitiveness comparable to other competitors in the respective market, and between 0.21-0.45 – competitiveness is low, not only the country is not a factor, but is also at a level lower than the average for the compared community. An index below 0.2 means that the country is completely uncompetitive for the relevant product, poorly positioned and significantly lagging behind and underdeveloped in the specific production direction. In the majority of years, the production component of competitiveness has exceeded the value component, which is important from the point of view of making market positions more sustainable. When the value component of competitiveness exceeds the production component, it means that the country achieves higher export prices of the production, which in a highly competitive market such as the agricultural one, this can hardly be sustained in the long term.

Discussion

Obtaining such results regarding the competitiveness of the country's oilseeds sector is not unexpected and has been confirmed by various analyses. In a report prepared by IAE for the development of the Strategic Plan under the CAP 2023-2027, Ivanov (2020) stated that "the production of grain and oil crops has always been strongly represented in Bulgarian agriculture and this will continue in the future. It is believed that in the future work should be done in the direction of increasing intensification, which will lead to improving the efficiency of production, by continuing the consolidation in the sector, introducing more practices from precise agriculture and reducing the risks of price fluctuations and natural cataclysms (Ivanov 2020). A study by Bojinov et al. (2018) concluded that through the use of a kind of drones, a direct and indirect financial result of at least 30 EUR/ha can be achieved when they are used in winter cereals and rapeseed, indicating that the potential to improve competitiveness in oilseed crops is promising.

It is impressive that in recent years more sunflower seeds have been imported into the country than exported, which means that the country is also specializing in the extraction of sunflower oil, where processing facilities are being built even exceeding the volume of domestic sunflower production. Although the quantities of rapeseed harvested have decreased compared to the quantities harvested in previous years, this production will remain a significant niche of the oilseed sector, as long as the demand in the EU remains strong. Although the country is not in the most favorable conditions for growing rapeseed due to the dangers of winter frosts and frequent droughts, especially during early and mid-autumn, when it is the sowing period, production will remain high per capita because profitability is higher than that of sunflower. In the future, the prospects for the competitiveness of oil crops will also be determined by the situation with the war in Ukraine, which is among the leading countries in the world, both in sunflower and rapeseed production. Uncertainties surrounding the conflict and its impact on the agriculture of Ukraine and Russia may lead to a continued decline in production, which implies the opening of new markets and better price conditions for the Bulgarian oil sector. This also helps to support the thesis of preserving and maintaining high competitiveness of this sector in the country.

Conclusions

The subject of the competitiveness of agriculture and in particular in the oilseed sector of Bulgaria is an essential and key issue, not only to assess and look for measures to improve the situation, but also from a cognitive perspective, to determine the understanding of this term.

Competitiveness is a key feature in a market economy, where market access is open, participants are many, and the allocation of resources and profits goes to the best, who can eliminate non-competitive entities by reducing the interest in demanding their goods.

Starting from competitiveness as a result, we should pass through the competitiveness of the entities and farms that shape this result at the macro level. The application of the used methodology for calculating competitiveness can be possible again with an understanding of this concept as a result for the economic entity to maintain and increase its production and value growth in the market. It is important in this case, which is also one of the advantages of the methodology, that the obtained competitiveness index be locked in the scale from 0 to 1. In this way, the results of the competitiveness index will be framed in the range from 0 to 1, where 1 means, that there is only one single producer in the relevant market and absolute competitiveness is achieved. In this context, it can be added that the very high and strong competitiveness of the oil production in Bulgaria is undoubtedly due to the good and successful functioning of the individual producers. They benefited from the significant support that comes under the CAP, both as subsidies and as investment support, they got free access and joined the common market of such production, they stepped on the good soil and climatic conditions to realize this production in the country and managed to produce the reported result.

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