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RESEARCH ON SUGAR BEET PRODUCTION AND TRADE - WORLDWIDE OVERVIEW

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Abstract

The research highlights aspects of the production and commercialization of sugar beet at the worldwide level. The analysis is considering 2012-2019 based on specific indicators relating production and commercialization of sugar beet. The statistical data used in this research were taken from the FAO. The most representative indicators analyzed in the study refers to the areas cultivated with sugar beet worldwide, total sugar beet production, average production per hectare of sugar beet and imports and exports of sugar beet. According to the data, Europe is the largest producer of sugar beet in the world. In this context, Europe obtained over 60% of the sugar beet production registered worldwide with different uses. Globally, sugar made from sugar beet has only 20% of sugar production. The difference in production obtained worldwide is made from sugar cane.

Key words**:** *sugar beet, average production, sale, export, import*

INTRODUCTION

The present research is based on the statistical analysis of the production and marketing of sugar beet, an approach that has been achieved worldwide. The interest in sugar beet is given by the fact that it is a crop with great territorial spread, used in the processing activities of the food industry. Sugar beet also generates significant income for producers and is part of the national agri - food chain. In addition, sugar beet contributes of trade between countries, through import and export. Besides the economic particularities generating high profitability, sugar beet has certain biological and technological characteristics that determine a good correlation with other crops, being a very good precursor in crop rotation. Sugar beets are one of those crops that capitalize well on organic and mineral fertilization [10].

It should be noted that the chemical composition of sugar beet is influenced by several factors such as technology, various pedoclimatic conditions [12].

Sugar beet (*Beta vulgaris var. Saccharifera*) is a biennial crop from the Mediterranean Sea, cultivated mainly for sugar [3, 14].

From sugar beet obtains Molasses as a processing result used in the food industry, but also in the alcohol industry .The sugar beet is a biennial. In the first year of vegetation forms the body, and in the second year it forms the fruiting flowering branches [4, 13].

Sugar beet consumes many nutrients from the soil. To obtain a ton of roots and leaves of sugar beet are necessary 4.0-5.0 kg of nitrogen; 5.5-6.0 kg of potassium; 1.5-2.0 kg phosphorus; 2.5 kg of calcium and 1.5 kg of manganese. This crop requires organic fertilization for the entire area cultivated with manure, well fermented, in a dose of 40-50 tons per hectare. This dose is necessary, especially to obtain sugar beet products larger than 50 tons per hectare [1].

Europe is the highest producer of sugar beet in the world, achieving over 60% of total production worldwide. Statistics show that the European Union is the world's largest producer of beet sugar, covering about half of

world production. The most important areas cultivated with sugar beet found in the northern half of Europe, because of the climate favors. Significant sugar beet production is obtained in Germany, Belgium, Lower Countries, Northern France, and Poland. The great exporters of sugar beet are also countries in the European Union as Germany, Belgium, Hungary, Slovakia, Letonia [5].

The sugar beet is a great crop for production of bioethanol used in car industry. Due of this, increased demand for sugar beet in Europe, as important producer [2, 11].

Using the most appropriate technology, sugar beet increases substantial income to farmers.

Photo 1. Sugar beet culture
Source: [8].

Photo 2. Sugar beet
Source: [8].

MATERIALS AND METHODS

The study is an economic analysis of sugar beet producing and its commercialization starting from relevance as a particular crop in agri-food field. The research on producing and sugar beet commercialization consider specific indicators which provide a realistic overview about the total cultivated area at the worldwide level, total production, and the commercial balance means import and sugar beet export, quantitative and value, too. In the period 2012-2019, the results obtained from FAOSTAT are debate as plain text and graphical one to explain the value correlation between indicators results.

To carry out this research, a series of specialized materials were studied, and the research results were presented using economic influences factors.

RESULTS AND DISCUSSIONS

The FAOSTAT data on the total area cultivated with sugar beet worldwide, registered changes during the analyzed period. (Figure 1). The largest cultivated area with sugar beet worldwide was in 2017 (4,989,641 ha), and the smallest cultivated area was in 2015 (4,215,084 ha). In 2019, the area cultivated with sugar beet worldwide decreased by 4.67%, compared to 2012.

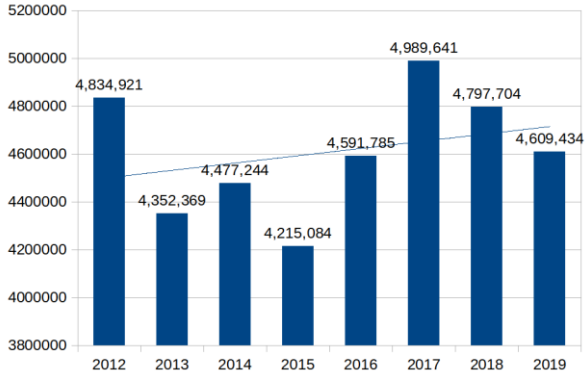

Fig. 1. Sugar beet worldwide area, period 2012-2019 (hectares)
Source: Own design based on FAOSTAT database 2021 [6].

World sugar beet production changed in 2012-2019 (Figure 2). It found out that the production of sugar beet in the analyzed period was influenced on the one hand by the cultivated area and on the other hand by the average production per hectare achieved.

The data presented shows that the most significant production of sugar beet worldwide was achieved in 2017 (313,989,402 tons).

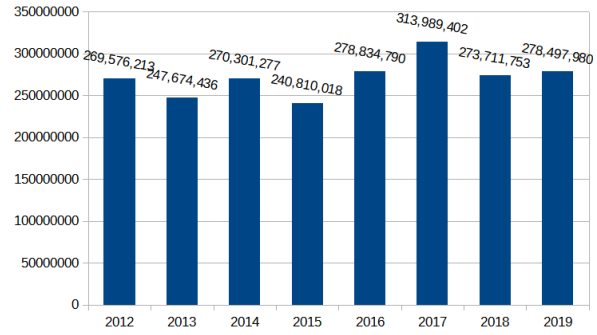

Fig. 2. Worldwide sugar beet production, period 2012-2019 (tons)
Source: Own design based on FAOSTAT database 2021 [6].

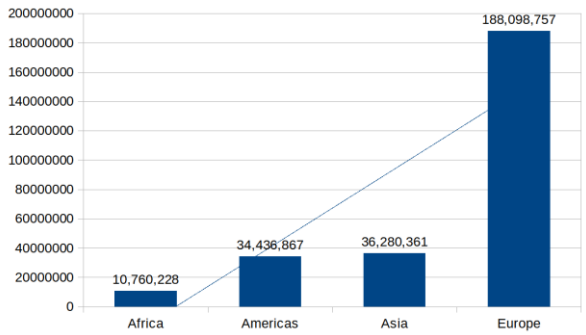

Fig. 3. Worldwide sugar beet production, 2012 (tons)
Source: Own design based on FAOSTAT database 2021 [6].

Also in 2017, the largest area with sugar beet was cultivated worldwide, which shows a strong correlation between area and production. In 2015, the world's lowest sugar beet production was 240,810,018 tons as an influence of cultivated area [7].
In 2017, the production of sugar beet achieved at the world level increased by 30.38%, compared to 2015, when a minimum was registered to produce sugar beet obtained worldwide. In 2019, the production of sugar beet increased by 3.30%, compared to 2012, but decreased by 11.31%, compared to 2017.
At continental level, from the data analyzed it is found that are differences from one region to another one (Figure 3). The difference in sugar beet production was due to several factors such as: cultivated area, farmers' interest, production technology, average production per hectare, level of profitability. From instance, Europe is the first producer of sugar beet compared with America, Asia, or Africa. It is a real gap between the regions of these continents, as seen in the graph. The explanation consists in the influencing factors that act at the level of each region, the main being cultivated area, technology used, average production, profitability. Beyond these economic factors, the level of sugar beet production on continents is influenced by macroeconomic factors specific to each region, more relevant being agricultural policy to support this crop, demand, the level of development of farmers, sell price, expenditures, especially variables ones, tradition.

Globally, there are gaps of the sugar beet area. For instance, in Oceania is a lack of the sugar beet area due to inadequate climatic conditions. Europe achieved the largest production of sugar beet on the continental level, of 188,098,757 tons (69.7% of world production in 2012 year), being the leader of the ranking. On the following positions, but at a great distance, the realized productions are the following: Asia (36,280,361 tons, respectively 13.5% of the realized world production); America (34,436,867 tons, respectively 12.8% of the world sugar beet production) and Africa (10,760,228 tons, respectively 4% of the world sugar beet production (Figure 4).

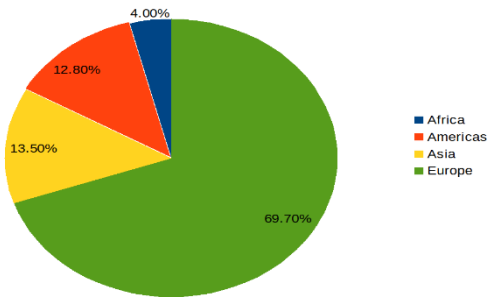

Fig. 4. Continental sugar beet production, 2012 (%)
Source: Own design based on FAOSTAT database 2021 [6].

At the continental level, production of sugar beet changed in the period 2012-2019. Europe maintained its first position in the top of sugar beet production (194,460,403 tons, Figure 5). In Europe, production increased in 2019 by 3.38% compared to 2012. A second place is occupied by Asia, with a sugar beet production of 41,507, 477 tons (2019). In Asia, in 2019, compared to 2012, the production of sugar beet increased 14.40%.

America ranks third in this ranking with a production of 28,225,847 tons (2019). In America, sugar beet production decreased by 18.6% in 2019 compared to 2012 and Africa achieved the lowest sugar beet production in the region, by 14,304,253 tons.

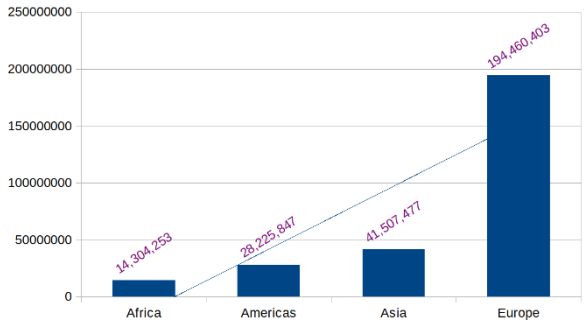

Fig. 5. Continental sugar beet production, 2019 (tons)
Source: Own design based on FAOSTAT database 2021 [6].

Referring Africa, the analysis done in the mentioned period increased by 32.93%. This increase in production is due primarily to the increase in cultivated area from 207,229 ha (2012) to 266,863 ha (2019). The area cultivated with sugar beet increased by 28.77%, in 2019 compared to 2012. There is a direct correlation between the area cultivated with sugar beet and the production obtained.
According to the data provided by FAOSTAT for 2019, Europe accounted for 69.8% of world production (Figure 6). This share changed insignificantly in 2019.

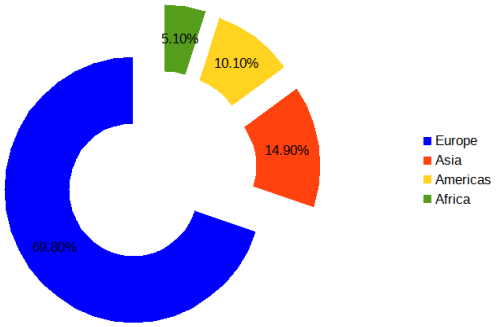

Fig. 6. Continental sugar beet production, 2019 (%)
Source: Own design based on FAOSTAT database 2021 [6].

On continents, the level of sugar beet production in the world production is shared between Asia (14.9%), America (10.1%) and Africa (5.1%).

The production of sugar beet, which was achieved worldwide in 2012-2019, was determined by several factors. Among them mention the average production, total cultivated area, degree of fertilization, ecological factors.
The average production of sugar beet achieved worldwide, in the period 2012-2019, varies (Figure 7).
The highest level of average sugar beet production achieved worldwide was 62.9 tons/ha (2017), and the lowest was 55.7 tons/ha (2012). In 2019, the average production per hectare of sugar beet increased by 8.43%, compared to 2012. Also, in 2019, the average production per hectare of sugar beet decreased by 3.98%, compared to 2017, when a maximum was recorded for the average production in the analyzed range.

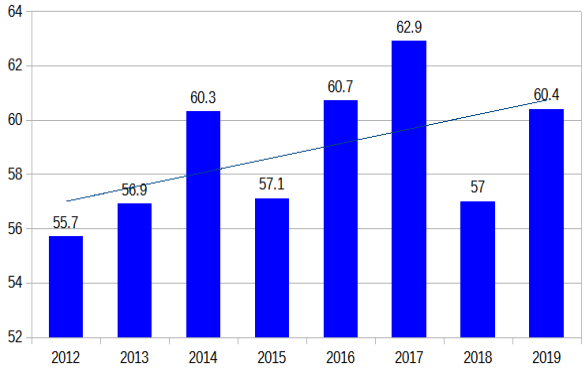

Fig. 7. Worldwide sugar beet average production, period 2012-2019 (Tons/ha)
Source: Own design based on FAOSTAT database 2021 [6].

The quantitative imports varied in 2012-2019.
In 2014, the most significant imports of sugar beet of 1,047,279 tons were registered worldwide. The lowest imports were 523,383 tons (2017). In 2019. In 2019, the quantitative imports of sugar beet decreased by 33.42%, compared to 2012.
According to the FAOSTAT data for 2012, the quantitative imports of sugar beet at continental level registered differences. There refers to Europe (662,822 tons), America (246,963 tons), Asia (35,523 tons), Africa (1,886 tons) and Oceania (4.0 tons).

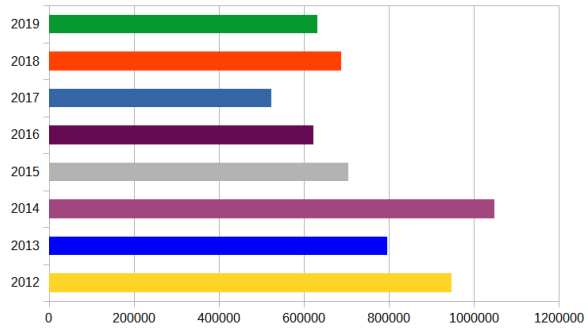

Fig. 8. Worldwide sugar beet imports and export period 2012-2019 (tons)
Source: Own design based on FAOSTAT database 2021 [6].

From the presented data observes there are large gaps at the continental level regarding the quantitative imports of sugar beet (Figure 9).

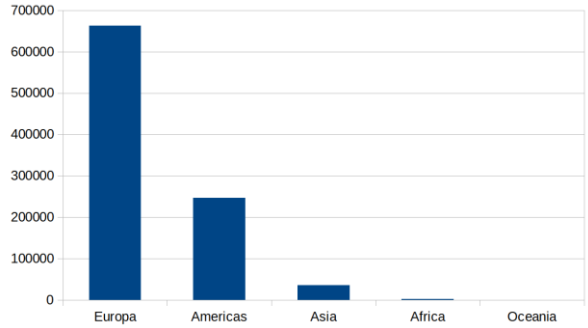

Fig. 9. Region's sugar beet quantitative imports period 2012 (tons)
Source: Own design based on FAOSTAT database 2021 [6].

In accordance with the FAOSTAT data, in 2019 the most significant importers of sugar beet were: Switzerland with 212,334 tons which means 33.6% of total imports of sugar beet, Czech Republic with 151,022 tons (23.9%), Croatia with 141,965 tons (22.5%), Germany with 37,299 tons (5.9%) and Lithuania with 22,139 tons (3.5%) (Figure 10).
Regard the quantitative imports of sugar beet at regional level the data shows differences between Europe (625,574 tons), America (2,013 tons), Asia (1,793 tons), Oceania (1,335 tons) and Africa (9.0 tons).
The analysis of the data on quantitative imports at regional level reveals a substantial decrease in 2019, compared to 2012, in Europe (-37.248 tons), America (244,950 tons), Asia (33,730 tons) and Africa (-1,877 tons).

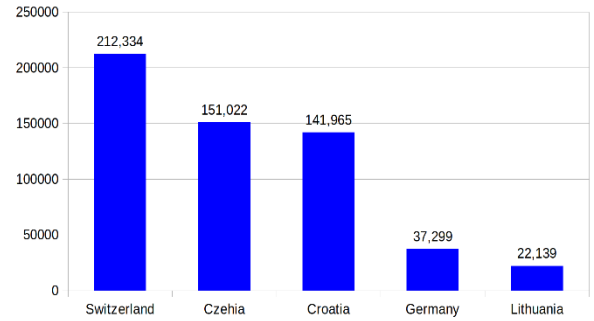

Fig. 10. Worldwide importers of sugar beet, 2019 (tons)
Source: Own design based on FAOSTAT database 2021 [6].

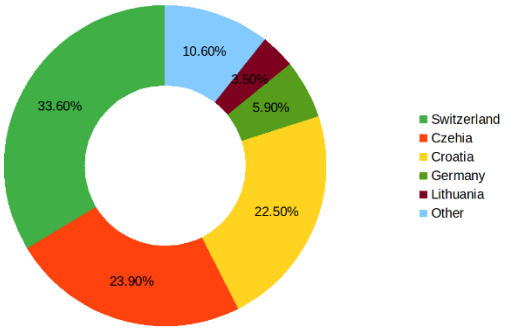

Fig. 11. Worldwide importers of sugar beet, 2019 (%)
Source: Own design based on FAOSTAT database 2021 [6].

During the period under analysis, there was only one exception to the evolution of quantitative imports of sugar beet, namely Oceania (+1,331 tons).
World sugar beet exports varied from year to year during the analysed period (Figure 11).

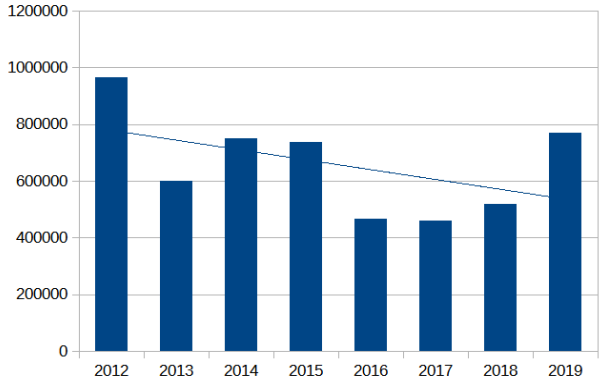

Fig. 12. Worldwide sugar beet exports, period 2012-2019 (tons)
Source: Own design based on FAOSTAT database 2021 [6].

Worldwide, the highest level of sugar beet represented 966,003 tons, in 2012, but the smallest were in 2017 (458,892 tons).

Also, the worldwide quantitative exports of sugar beet decreased in 2019 by 20.18%, compared to 2012.

At regional level, in 2012, the quantitative exports of sugar beet were as follows: Europe (678,647 tons, 70.25% of world sugar beet exports), Americas (248,599 tons, 25.73% of world sugar beet exports), (Asia 38,583 tons, 3.99% of world sugar beet exports), Africa (163 tons, 0.01% of world sugar beet exports) and Oceania (11.0 tons).

In 2019, Europe remained the leader in the ranking of world sugar beet exports (767,077 tons, 99.47% of world sugar beet exports). However, in 2019, the quantitative exports done by Europe decreased by 194,862 tons, compared to 2012. According to FAOSTAT, other regions registered exports such as Asia (2,122 tons), Africa (1,858 tons), America (84, 0 tons).

The ranking of the first sugar beet exporters highlighted worldwide for 2019 were: Germany (285,653 tons); Belgium (136,761 tons); Hungary (125,442 tons); Slovakia (96,360 tons) and Letonia (48,304 tons).

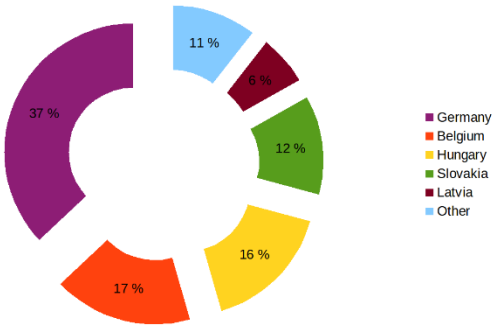

Fig. 13. Quantitative exports of sugar beet on main exporters, 2019 (%)
Source: Own design based on FAOSTAT database 2021 [6].

The data analysed shows that Europe is the largest exporter of sugar beet, because of cultivated area and production, too. At the same time, the European Union countries are the main importers.

CONCLUSIONS

The research showed relevant aspects of sugar beet crop from the economic point of view, at the worldwide level. The analysis of the indicators of sugar beet worldwide for the interval subject to analysis referred cultivated area, total production and average, exports and imports. The results highlighted the differences between regions and countries, some of them representative as results from data. An overview on the data showed that at the worldwide the largest area cultivated with sugar beet was registered in 2017, of 4,989,641 ha, also, the highest sugar beet production was 313,989,402 tons.

Referring production, in 2019, Europe achieved a sugar beet production of 194,460,403 tons. In 2017, there was a more representative average production per hectare of sugar beet of 62.9 tons / ha. Considering commercial exchanges, the largest quantitative imports of sugar beet were highlighted in 2014 (1,047,279 tons). In 2019, the most representative importer of sugar beet was Switzerland with 212,334 tons. In 2012, the largest exports of sugar beet were registered, of 966,003 tons.

Europe is the great in terms of quantitative exports of sugar beet, and in 2019, exported 767,077 tons.

The higher exporter of sugar beet in Europe is Germany with 285,653 tons (2019).

Sugar beet is one of the crops with several uses particularly food industry.

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