

Survey on the worldwide barley production and trade

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Abstract

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The conducted study captures a series of aspects regarding the production and trade of barley worldwide, in the period 2015-2021. In order to achieve the objective of this study, the main indicators related to the barley production and marketing sector were analyzed, such as: the area cultivated with barley worldwide; barley production obtained at the global level; average production per hectare of barley; consumption of barley; global imports and exports of barley. Barley culture can be found on all continents, but the cultivated area differs greatly from one region to another. In 2021, the largest area cultivated with barley at the continental level was in Europe, of 22,525,713 ha. In the period 2015–2021, Europe achieved 60.7% of the barley production obtained worldwide. Europe is the leader both in terms of the area cultivated with barley, as well as the production achieved in the interval under analysis. Barley is particularly important, because it has multiple uses, such as: for human food; for animal feed and an important source of raw materials for industry. At the present time, on a global level, barley culture is in the attention of agricultural specialists. The statistical data used in the paper were provided by the Faostat website.

Keywords: area cultivated with barley; total production of barley; consumption of barley; imports and exports of barley worldwide

Introduction

According to specialists in the field, barley belongs to the species *Hordeum sativum* Jessen and is cultivated on all continents, in order to obtain barley grains, because they have many uses such as: in feeding the population; for feeding different categories of animals, as well as raw material for different industries [8, 11].

According to studies carried out worldwide, barley production is distributed as follows: 55–60% is used as fodder; between 30–40% for malt [9]; 2–3% for human consumption; and approximately 5% of the production is used as seed for replanting crops.

Barley is particularly important, because it is part of the category of the oldest cultivated plants that assisted and supported the development of: human civilization; agronomic sciences; genetics; physiological; of plant improvement [12].

In terms of feeding the population, it is necessary to specify the fact that, in different areas of the globe, barley flour is used to obtain bread, but according to specialists, this is of lower quality compared to that made from wheat. Barley grains are also used for animal feed in the population's farms, as well as in intensive and extensive animal farms. Barley grains are widely used, because they have a higher nutritional value, which can be compared to corn.

Barley grains are used in many sectors of activity such as: to obtain beer; in the alcohol industry; glucose etc.

Barley grains have the following chemical composition: 55–60% carbohydrates; 9.5–14% protein; between 2–3% fat; 4–7% cellulose and 2–3% ash [8].

Another aspect, which must be mentioned, is that although the barley culture is very similar to the wheat culture, there are still a number of visible differences, as follows: the barley culture is much more resistant to high temperatures compared to the wheat. The temperature that the barley crop needs in order to germinate is 20°C; barley culture is much more demanding regarding soil conditions; the vegetation period is shorter; the root system related to barley has a lower absorption capacity.

Regarding the nutrients needed by the barley crop, they are comparable to those for wheat. For example, for 500 kg of barley, the following are required: 12–14.5 kg of nitrogen; 10.5–14 kg potassium; 5.5–6.5 kg phosphorus [6]. Barley harvesting is done mechanized, with the help of specialized machines, contributing to obtaining a safe production from several points of view [10, 11].



Photo 1. Barley field.

Source: [1]

Materials and Methods

The current study presents the main aspects regarding the production and trade of barley worldwide in the period 2015–2021. The paper analyzed the specific indicators for the production and marketing sector, such as: the total area cultivated with barley worldwide; world-wide barley production; average production per hectare of barley; total consumption of barley; global imports and exports of barley. The main statistical data that were the basis for the creation of the present were taken over by the Faostat website. Also, in order to capture as realistically as possible, the production and marketing sector related to barley, it was necessary to

consult several specialized materials. The results of the study have been highlighted, especially in graphic form.

Results and Discussion

In the period 2015–2021, several changes were identified worldwide in the barley production and marketing sector. The area cultivated with barley worldwide in the period under analysis recorded numerous variations as follows: in the period 2015–2017 the cultivated area fell on a downward slope from 49 to 47.8 million hectares; in the 2018–2020 interval, the cultivated area began to grow from 48 to 51.9 million hectares; starting with the year 2021, a new decrease of the area cultivated with barley was witnessed to 48.9 million hectares. From the data presented, the largest area cultivated with barley worldwide was 51.9 million hectares in 2020. In 2021, the area cultivated with barley worldwide decreased by 5.8% compared to 2020 and by 0.3% compared to the year 2015 (Figure 1).

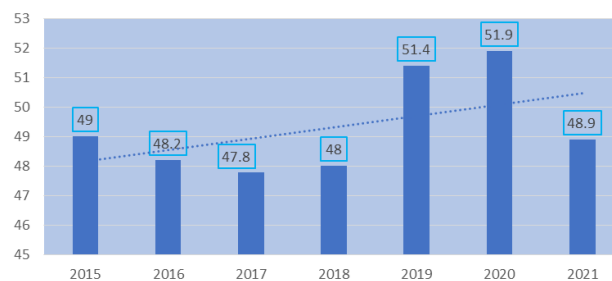


Fig. 1. The area with barley cultivated worldwide, in the period 2015–2021 (millions of hectares)

Source: Own design based on [3]

Barley production worldwide fluctuated from one year to another during the analyzed period. Regarding the total production of barley achieved worldwide, we must remember the main determining factors: the area cultivated with barley; cultivation technology; yield per hectare; pedoclimatic conditions.

From the data presented and analyzed, it was found that the highest production of barley worldwide was recorded in 2019 (158.8 million tons). It is obvious that the production achieved had a close connection with the cultivated area, but also with other factors mentioned previously. At the opposite pole, the lowest production of barley in 2018 was highlighted (141 million tons). The drought that affected part of Europe that year had a negative effect on world barley production [2].

In 2021, there is a decrease in production by 8.4%, compared to 2019, and by only 1.9% compared to 2015 (Figure 2).

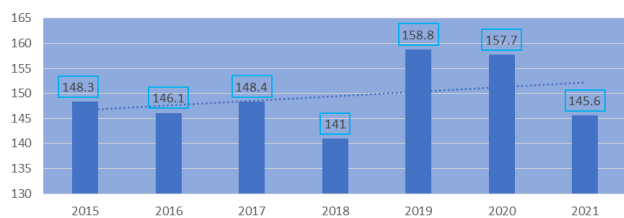


Fig. 2. The total production of barley obtained worldwide, in the period 2015-2021 (million tons)

Source: Own design based on [3]

For the next decade, a 2.9% increase in the value of barley production is estimated in 2033 compared to 2023 [5]. The barley market is influenced by the growing demand for malted barley for alcoholic beverages, for various types of food products and for natural ingredients [4, 14].

According to the data published by Faostat regarding the barley production at the continental level, it was found that there are big differences. The leader of the ranking at the continental level is Europe, which in the period 2015–2021, achieved on average 60.70% of the production achieved worldwide, respectively, 90.7 million tons. The second place in the ranking is occupied by Asia with 15% of the production obtained worldwide, respectively 22.4 million tons. The third place is occupied by the Americas with 12.60% of the worldwide production, 18.7 million tons. The fourth place is held by Oceania with 7.30%, respectively, 10.9 million tons, and the 5th place is occupied by Africa with a share of 4.40% of the worldwide production, respectively 6.5 million tons. From the data presented, it can be easily observed that, at the continental level, Europe stands out from the other continents, in terms of the barley production obtained. The significant production of barley in Europe is due to several factors such as: the increased fertility of the soils [13]; favourable climatic conditions; the existence and practice of modern technologies; the interest of the main operators in the barley production and marketing sector etc. (Figure 3).

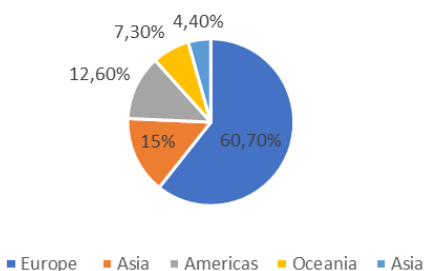


Fig. 3. The share of barley production at regional level, in the period 2015–2021 (%)

Source: Own design based on [3]

For the period 2015–2021, the top 5 registered barley producers worldwide were established. The first position of the top is occupied by the Russian Federation, which obtained an average of 18.9 million tons of barley. The following ranking positions are occupied as follows: France (11.6 million tons); Germany (10.7 million tons); Australia (10.5 million tons) and Canada (8.7 million tons) (Figure 4).

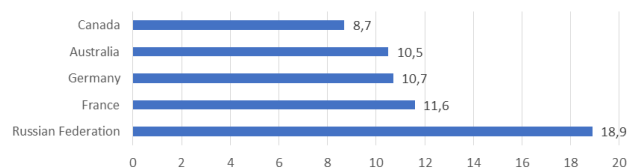


Fig. 4. The top 5 registered barley producers worldwide, in the period 2015-2021 (million tons)

Source: Own design based on [3]

According to the statistical data published for the year 2021, it can easily be seen that the top 5 barley producers highlighted at the global level have undergone changes, compared to the one related to the period 2015–2021, as follows: on the first place is Russian Federation (17.9 million tons); the second place is occupied by Australia (14.6 million tons); the third place is occupied by France (11.3 million tons); the fourth place is held by Germany (10.4 million tons) and the 5th place is occupied by Ukraine (9.4 million tons) (Figure 5).

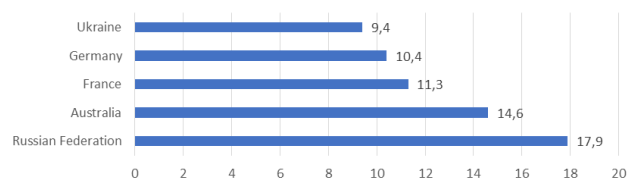


Fig. 5. Top 5 registered barley producers worldwide, in 2021 (million tons)

Source: Own design based on [3]

The average production of barley per hectare recorded worldwide fluctuated from one year to another in the presented interval. From the statistical data analyzed, it was found that the highest average production was achieved in 2017 (3,101.3 kg/ha), and the lowest was of 2,934.1 kg/ha (2018). In 2021, the average production of barley recorded worldwide decreased by 1.7%, compared to 2015, and by 4.1%, compared to 2017, when the maximum average production per hectare was reached (Figure 6).

Worldwide, the human consumption of barley and barley products varied from one year to another in the period un-

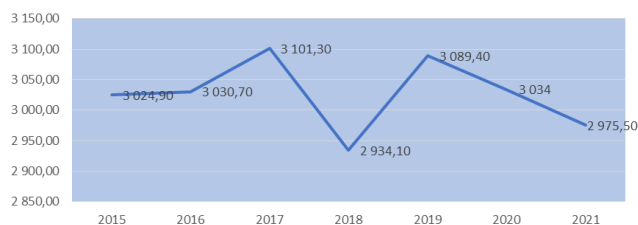


Fig. 6. Average production per hectare of barley worldwide, in the period 2015-2021 (kg/ha)

Source: Own design based on [3]

der analysis. The most significant consumption of barley and barley products was of 152,869 thousand tons (2019), and the lowest was of 136,128 thousand tons (2018). In 2020, human consumption of barley increased by 5.6% compared to 2015, but decreased by 4.7% compared to 2019 (Figure 7).

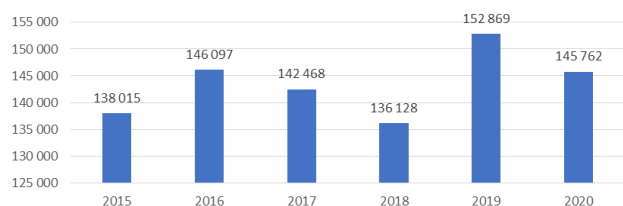


Fig. 7. Human consumption of barley and barley products worldwide, in the period 2015–2020 (thousand tons)

Source: Own design based on [3]

The average annual consumption of barley and barley products per inhabitant worldwide registered insignificant changes from one year to another. The highest average annual consumption per inhabitant was of 1.08 kg (2020), and the lowest was of 1.02 kg (2017). In 2020, the average annual consumption of barley and barley products per inhabitant worldwide increased by 1.8%, compared to 2015 (Figure 8). In 2018, the countries with the highest consumption of barley were Russia (12 million tons), China (9.7 million tons)

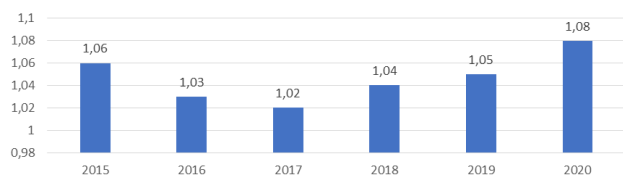


Fig. 8. Average annual consumption of barley and barley products per inhabitant worldwide, in the period 2015–2020 (kg)

Source: Own design based on [3]

and Spain (9.5 million tons), and together they represented 23% of the consumption global [7].

Quantitative imports and exports of barley recorded worldwide fluctuated during the analyzed period. The largest quantitative imports of barley were made in 2021 (44.1 million tons), and the lowest were in 2019 (32.8 million tons). In 2021, quantitative imports increased by 23.5%, compared to 2015. Regarding the quantitative exports of barley made worldwide, they were similar to quantitative imports, with small differences. In 2021, quantitative exports increased by 15.1%, compared to 2015 (Figure 9). Another aspect that needs to be mentioned is that, at the level of 2021, only 30.2% of the world-wide barley production was exported.

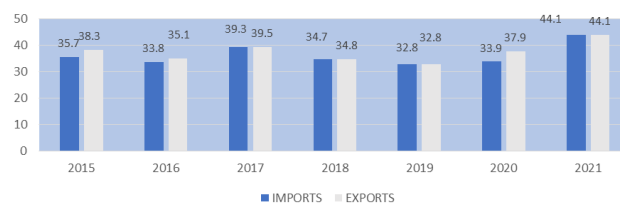


Fig. 9. Quantitative imports and exports of barley recorded worldwide, in the period 2015-2019 (million tons)

Source: Own design based on [3]

In the period 2015–2021, the top 5 registered barley exporters worldwide were: France exported an average of 6.5 million tons, respectively, 57.5% of the realized barley production; Australia exported 5.9 million tons (56.1% of the realized production); Ukraine exported 4.6 million tons (54.7% of the obtained production); The Russian Federation exported 4.4 million tons (23.2% of the achieved production) and Germany exported 2.4 million tons (22.4% of the obtained production) (Figure 10).

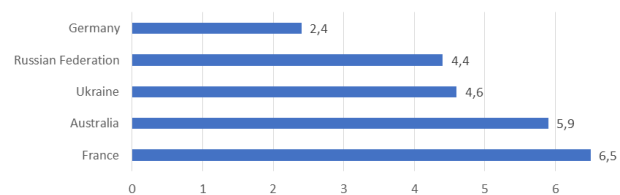


Fig. 10. The top 5 registered barley exporters worldwide, in the period 2015–2021 (million tons)

Source: Own design based on [3]

The top 5 barley importers registered worldwide in the period 2015–2021 include: China imported an average of 8.2 million tons; Saudi Arabia imported an average of 6.2

million tons; Iran imported an average of 2.4 million tons; The Netherlands imported an average of 2.1 million tons and Belgium imported an average of 1.8 million tons (Figure 11). China imports large quantities of barley because there is a high demand on the domestic market.

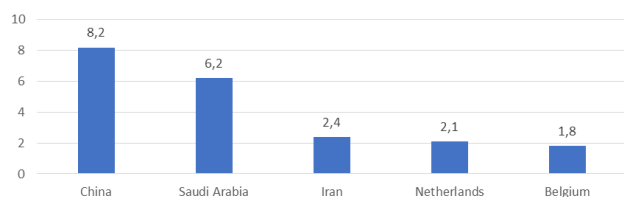


Fig. 11. The top 5 registered barley importers worldwide, in the period 2015–2021 (million tons)

Source: Own design based on [3]

Until 2030, the list of importers and exporters of barley may undergo a series of changes, depending on the interests of the producing countries and on the geopolitical climate.

Conclusions

According to the analysis of the most representative indicators of the barley production and marketing sector worldwide for the period 2015–2021, the following notable aspects resulted:

- In 2021, the maximum area cultivated with barley was reached, of 51.9 million hectares;
- The area cultivated with barley decreased by only 0.3% in 2021, compared to 2015;
- The most significant barley production achieved was of 158.8 million tons (2019);
- Europe obtained on average 60.70% of the worldwide barley production, respectively, 90.7 million tons;
- Africa had the lowest share of barley production obtained worldwide, of 4.40% (6.5 million tons);
- The largest producer of barley registered at the level is the Russian Federation, which produced an average of 18.9 million tons of barley;
- The highest average barley production per hectare was of 3,101.3 kg/ha (2017);
- In 2019, the highest human consumption of barley and barley products was of 152,869 thousand tons;
- In 2020, the most significant average annual consumption of barley and barley products per inhabitant of 1.08 kg was recorded;
- In 2021, the largest quantitative imports of barley were recorded, of 44.1 million tons;

- Quantitative barley exports worldwide in 2021 represented only 30.2% of the obtained production;
- The most significant exporter of barley recorded worldwide during the analyzed period is France with an average of 6.5 million tons;
- China is the largest importer of barley, recorded worldwide in the analyzed period. It imported an average of 8.2 million tons of barley.

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