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Article

Competitive Position of Polish and Ukrainian Food Producers in the EU Market

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Abstract: The war in Ukraine and the related disruptions in supply chains shook global markets for agricultural and energy commodities, causing their prices to increase to unprecedented levels. At the same time, this situation highlighted the fact that Ukraine is an important global producer and exporter of certain agricultural products. The complete opening of the EU market to duty-free imports from Ukraine showed that Ukrainian products constitute competition for both EU and Polish food producers. This, in turn, caused further disruptions in food supply chains within the EU. The aim of the article is to assess the competitive position of Polish and Ukrainian food producers in the EU market and the prospects for the evolution of their competitive advantages. The analysis was carried out using selected quantitative indicators of competitive position, namely Balassa's Revealed Comparative Advantage Index (RCA) and the Trade Coverage Index (TC). The calculations were made using statistical data from the World Bank WITS-Comtrade database. The research covered the period from 2018 to 2023 inclusive. The research shows that between 2018 and 2023, the share of products in Polish exports to the EU, in which both countries compete, increased to 37.5%; that is, both countries had comparative advantages in these products on this market. The current competition includes, among others, poultry meat, bakery products, wafers and cookies, chocolate, corn, fruit juices, frozen fruit, water and other non-alcoholic drinks, and wheat. At the same time, more than half of Polish exports consisted of products that may become the subject of such competition in the future (currently, only Poland has comparative advantages in the export of these products). These may include, among others, cigarettes, animal feed, fresh or chilled beef, other food products, smoked fish, canned meat, fish fillets, pork, canned fish, and liquid milk and cream. Therefore, Polish food producers face big challenges; the process of post-war reconstruction of Ukraine and its potential integration with the single European market will strengthen the competitive position of Ukrainian food producers in the EU market. The current competitive strategy of Polish producers, based on cost and price advantages, may turn out to be ineffective under these conditions. Therefore, they must look for new sources of competitive advantage that will distinguish Polish products from cheaper Ukrainian ones. Therefore, a strategy of competing on quality may prove effective.

Keywords: international competitive position; European Union market; foreign trade in agri-food products of Poland and Ukraine; war in Ukraine

1. Introduction

The recovery observed in the global economy since mid-2021 as a result of the gradual overcoming of the COVID-19 pandemic has resulted in an increase in agricultural and energy commodity prices. In January 2022, the Food and Agriculture Organization (FAO) Food Price Index reached 135.8 points. This means that food was 35.8% more expensive than on average in 2014–2016 (the reference period). The war in Ukraine destabilized the already unstable agricultural and energy commodity markets, resulting in a rise in commodity prices not seen in a long time. In March 2022, the FAO Food Price Index reached a record high of 160.2 points [1]. This means that food was 60.2% more expensive than on average in 2014–2016. Compared to January 2021, the value of the index increased by as much as 46.7 points or more than 40%.

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The marked increase in prices during the war in Ukraine was only partially justified by rising production costs. In large part, it was the result of market forces, in particular, supply shocks [2]. Several factors contributed to this. First, Ukraine was – and still is – highly integrated with global agricultural markets spatially [3]. In turn, this means that these markets are highly sensitive to demand and supply shocks [4, 5]. Ukraine is the most important or one of the most important producers of many agricultural commodities, including grains and oilseeds. As of 2021, it was the world's largest exporter of sunflower oil, the third-largest exporter of corn, barley, rapeseed, oilseed cake, and sunflower meal, and the sixth-largest exporter of wheat and poultry [6]. Second, the hostilities resulted in the closure of the Black Sea to shipping, which was the main transportation route for Ukrainian exports, and through whose ports some 90% of Ukraine's agricultural exports went to foreign markets [7]. Third, Ukraine is the most important or one of the most important suppliers of basic agricultural commodities (including grains) to many countries in the Middle East, Asia, and Africa. In 2020, Ukraine's share of wheat imports to Lebanon exceeded 80%, to Pakistan – 46%, and to Ethiopia, Egypt, Kenya, and Malaysia – 25% [8]. In addition, the increase in the price of agricultural commodities on world markets was further exacerbated by speculative activities, which usually intensify during periods of market turmoil.

To minimize the consequences of disruptions in global food supply chains, the international community has taken a number of measures. They focused on two levels, i.e., improving access to Ukrainian goods in foreign markets and helping to transport Ukrainian bulk goods to foreign customers [9]. Among the most important of these was the agreement on the launch of the so-called grain corridor across the Black Sea, which Russia, Ukraine, and Turkey concluded in July 2022 under the auspices of the United Nations. It enabled the transportation of Ukrainian cargoes to countries in Africa, the Middle East, and Asia. Another important initiative was the European Commission's Action Plan, presented in May 2022, which aimed to create "Solidarity Lanes" to enable the export of Ukrainian grains [10]. However, the effectiveness of this instrument was limited.

From the point of view of the agri-food sector of EU countries, the most important initiative was the European Commission's suspension in June 2022 of the application of tariff quotas and the entry price system for imports from Ukraine to the EU market, resulting from the implementation of the EU-Ukraine Deep and Comprehensive Free Trade Area (DCFTA) Agreement [11][1]. The application of autonomous trade measures (ATMs) meant, in principle, duty-free imports of Ukrainian agri-food products into the EU after meeting rules of origin and sanitary and phytosanitary standards. This was one of the factors behind the surge in imports of agri-food products to the EU, including Poland[2]. In 2022, agri-food products from Ukraine worth 13.1 billion euros (90% more than in 2021) were imported to EU countries, including Poland – 2.7 billion euros (three times more than in 2021) [12].

The complete opening of the EU market to duty-free imports from Ukraine has shown that Ukrainian products are in competition with EU food producers. Polish producers, who have so far based their strategy of competing on the EU market mainly on cost-price advantages, are particularly exposed to this competition [13]. Thanks to lower labor and energy costs, Ukrainian products could be imported into the EU at lower prices than Polish products [14].

The competitive position of Ukraine and Poland separately in the export of agri-food products in foreign markets has been analyzed more than once. The competitive position of Ukrainian producers in foreign markets was studied by Stepasyuk and Titenko [15], Senyshyn, Kundytskyj, Klepanchuk [16], and Patyka [17], among others. Analyses have focused on the markets of particular product groups, such as confectionery [18] or dairy products [19, 20]. The competitive position of Polish food producers on the world market was studied by Szczepaniak, Ambroziak, and Szajner [21, 22], Szczepaniak and Juchniewicz [23], Pawlak and Poczta [24], and Łukiewska [25], among others.

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[1] The regulation [11] was subsequently extended each year and is expected to remain in effect until June 2025. However, starting in June 2024, it will be possible to impose duties if the volume of imports of certain products (i.e., poultry, eggs, sugar, oats, corn, groats, and honey) exceeds the average volume recorded in the second half of 2021 and throughout 2022 and 2023.

[2] As a result of the war, imports from Ukraine of products that already had duty-free access to the EU market also increased. These included corn, oilseed cake, soybeans, and rapeseed.

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Sometimes, the studies isolated the EU market (such an analysis was made by Pawlak [26], Ambroziak [27], and Szczepaniak [28], among others). The subjects of research also included particular groups of products, such as beef [29], dairy products [30], and fish products [31].

However, there is a research gap in the literature regarding the comparison of the competitive position of Ukraine and Poland in the export of agri-food products to the EU market. However, there are two studies that deal with the competitive position of Ukraine and Poland from ten or more years ago. Rytko's study [32] shows that at the beginning of the second decade of the 21st century, Poland was a significant supplier to the EU of certain commodities, particularly meat and processed meat, as well as tobacco products and products of the grain industry. Ukraine, on the other hand, supplied relatively little to the EU market – these were mainly goods for industrial use, such as cereals, rapeseed, soybeans, and their unpurified oils. Similar conclusions were drawn in a study by Ambroziak [33]. Therefore, the purpose of the article is to assess the current competitive position of Polish and Ukrainian food producers in the EU market and to indicate the prospects for the evolution of this position under dynamically changing external conditions.

The structure of the article is as follows. The first part presents selected theoretical aspects related to the competitive position in trade and the method of the study. Then, the results of the study are discussed. The production and trade potential of Ukraine's agri-food sector was characterized by the potential of Poland. Indeed, the production and trade potential have a significant impact on the formation of mutual competitiveness between the two countries. The following part of the article assesses Poland's and Ukraine's competitive position in the EU's agri-food exports before the war in Ukraine and during the war. The study concludes with an attempt to assess the formation of competitive advantages of both countries in the EU market, taking into account the fact of Ukraine's progressive integration into the single European market.

2. Competitive Position in Trade: Selected Theoretical Aspects

In the past few decades, due to changes in the global market, competition has altered in nature, intensity, and scope. Simultaneously, its importance has increased in the context of the ongoing processes of internationalization and globalization of the world economy. Indeed, globalization is changing the environment of economic activity, causing a shift from territorially defined national economies to the open space of global economies [34] (p. 34). Under these conditions, the paradigm of open economic development is spreading in economics, and the comparative (relative) benefits achieved by individual countries from participation in international trade are becoming of particular interest to researchers.

Thus, when defining the competitiveness of an economy today, it is necessary to use the concept of international competitiveness. The origins of competitiveness research can be found in the theories of international exchange. Competitiveness in the trade stream is treated as a clear reference to a country's position in the world economy or the economy of a particular region, as well as its performance in foreign trade [35] (pp. 23–36), [36]. Aligning with the commercial approach to competitiveness research, especially in analyses of the agri-food sector, competitiveness should be referred to as the ability of domestic food producers to enter foreign markets and develop effective exports [37] (p. 9) or the ability to meet international competition, which is manifested in the acceptance of a country's products by customers in foreign markets and is tantamount to the ability to maintain or expand market shares [38]. The analyses and considerations undertaken in this study also fall within this sphere of research.

The multifaceted nature and complexity of the concept of competitiveness cause difficulties in developing an unambiguous and universally accepted definition, leading to numerous attempts to present the term based on other concepts with a lower degree of generality. According to Gorynia [39] (pp. 49, 60–61), competitiveness is a theoretical and relative concept, and its measurement in relation to other entities requires decomposition into concepts subject to operationalization. The purpose and perspective of the research should influence the choice and application of a specific model of competitiveness.

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There are various models in the literature that treat competitiveness as a peculiar system consisting of specific subsystems between which there are strong cause-and-effect links. For example, they make direct references to factor competitiveness and outcome competitiveness [39] (pp. 68–69). Factor competitiveness, also known as competitive potential, competitive capability, or sources of competitive advantage, determines the competitiveness that can be realized in the future. Resultant competitiveness, usually referred to as competitive position, is shaped by factor competitiveness and refers to the competitiveness actually achieved. Both approaches point to equally important, complementary dimensions of competitiveness. Considering both dimensions allows for a fairly complete and broad analysis of the competitiveness issue at a given level of economic analysis. Some discrepancies in the models presented relate to the nomenclature of the various elements of competitiveness, the way to transition from factors to results, and the nature of the relationships between them. Sometimes unidirectional relationships are indicated, treating competitive position as the result of competing, while at other times, it is assumed that competitive position is simultaneously the starting point for determining factor competitiveness (bidirectional relationships) [37] (pp. 13–20).

As indicated by various researchers [37] (pp. 9–24), [39] (p. 68), [40] (p. 27), [41], the competitive potential possessed by a given economy, sector, or entity determines the application of a certain competitive strategy. This strategy provides the basis for the choice of instruments of competition and the undertaking of specific actions – for example, in the area of economic policy or management – which in turn allow the achievement of a certain competitive position. Thus, the competitive position is the result of competing, but at the same time, it can serve as the basis for competing at the level resulting from this position. Setting the goal of achieving a certain competitive position, in turn, requires the formulation of a competitive strategy, the selection of effective instruments for competition, the planning of processes, and, prior to that, a thorough analysis of competitive potential. It is also significant to maintain appropriate relations with the external environment, which, on the one hand, affects competing entities and, on the other, changes under their influence.

Breaking down the concept of competitiveness into more specific elements should also be the starting point for selecting measures for measuring and, as a result, evaluating the competitiveness of companies, sectors, or economies [39] (pp. 60–61), [42] (p. 134). To assess the competitive position, outcome measures are used to evaluate the formation of various characteristics of foreign trade in the past. The basic outcome measures for assessing the international competitive position are various types of indicators based on foreign trade performance (including indicators of revealed comparative advantages and import-export relations) and additionally on production performance (including the level of import penetration, export orientation index), as well as cost-price indicators. There are also a number of synthetic measures constructed using quantitative methods [43] (pp. 135, 144). In this approach, the assessment of the achieved competitive position is most often based on ex-post indicators. Each indicator has its own advantages and disadvantages, so to meaningfully analyze the competitive position, one should not be limited to using only one indicator. The future feasible competitive position, determined by the entity's ability to compete in the future – i.e., its competitive potential, which is a factor category – is based on ex-ante indicators [44] (p. 54). The results of measuring competitive position can provide valuable guidance for forecasting development and shaping economic policy, including foreign and international policy. This approach was also used in selecting benchmarks and assessing the competitive position of Poland and Ukraine in the foreign trade of agri-food products in the European Union market.

In the systemic view, the competitive position is additionally shaped by a number of socio-economic factors and phenomena, which are rooted in processes occurring both domestically and in the external international environment [42] (p. 134). To better understand this approach, various causal factors are analyzed at four levels of systemic competitiveness, defined as meta, macro, meso, and micro [45, 46, 47]. At the same time, in view of the developing processes of globalization, liberalization, and integration of economies, it is necessary to take into account changes in the international environment, which not only affect the general conditions of competition but also determine the importance of individual factors located at the aforementioned levels of

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competitiveness. The goal of actions in such a complex domestic and international environment should be to transform comparative advantages into competitive advantages based on specific actions – for example, leading to an increase in factor productivity or export efficiency [47]. The external determinants of competitiveness are mainly due to the processes of globalization, which affect the need to make allocative decisions in accordance with the transformation of the world market and increasingly frequent emergencies (pandemics, wars). Due to the ongoing process of globalization and the increasing degree of integration of national economies, external (international) conditions affecting competitiveness are becoming increasingly important. It should be noted that internal (domestic) factors and external conditions often overlap, creating a synergistic effect.

3. Method and Data Sources

The study used two indicators to assess the competitive position of Polish and Ukrainian food producers in the EU market: (1) Revealed Comparative Advantage in Exports according to B. Balassa (RCA) and (2) Trade Coverage of Imports with Exports (TC). The choice of these indicators was supported by the fact that they are commonly used in competitive position studies [48, 49, 50]. These two measures are included in the group of indicators indicating inter-industry specialization in trade. This type of exchange is usually equated with a country's possession of comparative advantages in trade in a particular group of products in a particular market. The possession of comparative advantages and specialization in the production and export of products are expressed, among other things, in a growing trade surplus in these products [23].

For the purposes of the study, the RCA index measures the share of a given group of goods in the total exports of Poland and Ukraine to the EU in relation to the share of this group of goods in total world exports to the EU market. The indicator is expressed by the formula [51]:

$$RCA_{iEU} = \frac{X_{iEU}}{\sum_{i=1}^{N} X_{iEU}} : \frac{X_{iEUw}}{\sum_{i=1}^{N} X_{iEUw}} \quad (1)$$

where:

RCA_{iEU} – index of Revealed Comparative Advantages in Polish/Ukrainian exports of the *i*-th group of goods to the EU market,

X_{iEU} – Polish/Ukrainian exports of the *i*-th product group to the EU market,

X_{iEUw} – world exports of the *i*-th product group to the EU market,

N – the number of product groups (here: all exports).

The indicator takes values from 0 to infinity. A value of the RCA index above 1 means that a country has revealed comparative advantages (vis-à-vis global competitors) in exporting a given group of products to the EU market, and an RCA index below 1 means that it does not have such advantages [43] (pp. 164–165), [52] (pp. 50–51). Thus, the possession or absence of revealed comparative advantages is determined by whether the share of a given group of products in the exports of the studied country to the EU market is higher or lower than the share of these products in the exports of all countries of the world to this market.

The import-export coverage ratio (TC) determines the extent to which export receipts from a given group of agri-food products cover import expenditures for that group of products. TC ratios were calculated according to the formula [53] (p. 27):

$$TC_{iEU} = \frac{X_{iEU}}{M_{iEU}} \quad (2)$$

where:

TC_{iEU} – the import-export coverage ratio of Polish/Ukrainian trade in the *i*-th group of goods with EU countries,

X_{iEU} – Polish/Ukrainian exports of the *i*-th group of goods to the EU,

M_{iEU} – Polish/Ukrainian imports of the *i*-th group of goods from the EU.

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A TC index value above 1 means that a country generates a surplus in trade in agri-food products and, as a result, has a competitive advantage in the exchange of products in this group. A value of the index below 1 means a deficit in trade, which indicates a weak competitive position in the EU market [54] (p. 33).

The identification of sensitive products in both countries' exports to the EU market was carried out in stages. In the first stage, products were positioned according to the level of comparative advantages (RCA), which made it possible to distinguish four groups of products (Figure 1). **Group A** included products in the exports, of which both Poland and Ukraine had comparative advantages in the EU market. **Group B** included products in the exports for which Poland had comparative advantages in the EU market, while no such advantages were noted for Ukraine. **Group C** included products in the exports for which Poland did not have comparative advantages in the EU market, while Ukraine showed such advantages. Finally, **Group D** included products in the exports, of which neither Poland nor Ukraine had comparative advantages in the EU market.

		RCA of Poland	
		RCA < 1	RCA > 1
RCA of Ukraine	RCA > 1	**Group C** Poland lacks comparative advantages and Ukraine has comparative advantages	**Group A** Poland has comparative advantages and Ukraine has comparative advantages
	RCA < 1	**Group D** Poland lacks comparative advantages and Ukraine lacks comparative advantages	**Group B** Poland has comparative advantages and Ukraine lacks comparative advantages

Figure 1. Product positioning by index of Revealed Comparative Advantages in the agri-food export of Ukraine and Poland. Source: Own elaborations.

In the next stage, only products from Groups A and B were considered, i.e., those for which both countries are already competing in the EU market (Group A) and those in the export of which both countries could potentially compete in the future (Group B). Subsequently, products belonging to the selected two groups were subjected to positioning according to the level of export-import relations (TC). This made it possible to distinguish another two subgroups of products in each of the two groups, depending on whether Poland records a surplus (Groups A1 and B3) or a deficit (Groups A2 and B4) in their trade on the EU market—see Figure 2. The combined comparison of the index of relative advantages in trade (RCA) with the index of export-import relations (TC) allowed us to synthesize the areas of current rivalry (Groups A1 and A2) and areas of potential rivalry (Groups B3 and B4) between Polish and Ukrainian food producers and exporters on the EU market. This is because the first area included products in which both countries had comparative advantages on the EU market and, depending on the volume of trade, Poland had a surplus or deficit. The second area contained products for which only Poland had comparative advantages on the EU market, and, depending on the volume of trade, Poland recorded a surplus or deficit. The product positioning matrix used in the study according to the level of comparative advantages and the level of export-import relations was partly modeled on the matrix constructed by Widodo [55].

Specification	Poland's surplus (TC>1)	Poland's deficit (TC<1)
Group A Current Competition	**Group A1** Poland has comparative advantages, is currently competing and has appositive trade balance	**Group A2** Poland has comparative advantages, is currently competing and has a negative trade balance
Group B	**Group B1**	**Group B2**

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Potential Competition	Poland has comparative advantages and a positive trade balance, but is not currently competing	Poland has comparative advantages and a negative trade balance, but is not currently competing

Figure 2. Product positioning by balance in agri-food trade of Poland with the EU. Source: Own elaborations.

The analysis uses statistical data from the WITS Comtrade trade database [70]. The term "agri-food products" is understood as products from chapters 01–24 of the Harmonized Commodity Description and Coding System (the so-called HS system). The study covers 2018–2023, i.e., the period before the war in Ukraine and during the war.

4. Survey Results and Discussion

4.1. Production and Trade Potential of the Agri-Food Sector of Ukraine and Poland

In absolute terms, Poland's agri-food sector is larger than Ukraine's. Input-output tables published in November 2023 by the OECD show that in 2020, the value of the agri-food sector's output in Ukraine was $62.2 billion (Chart 1), which accounted for 55% of the sector's output in Poland. The gross value added of the agri-food sector in Ukraine was $21.0 billion, and the value of exports was $15.7 billion. This represents 64% and 72% of the sector's gross value added and exports in Poland, respectively. However, the agri-food sector is clearly more important to the Ukrainian economy than to Poland's. In 2020, the sector's output accounted for 19% of Ukraine's total economic output, nearly 15% of the gross value added generated, and as much as one-third of Ukraine's exports of goods and services (calculations based on [56]). Ukraine's agri-food sector is dominated by agriculture, while in Poland, the sector's leading segment is the food industry (Chart 1).

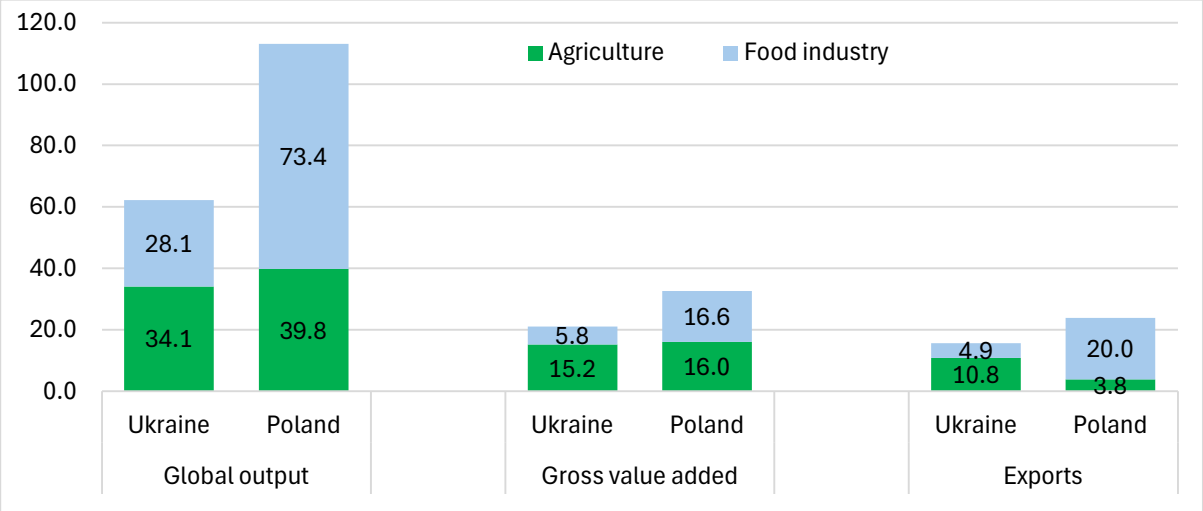

Chart 1. Comparison of the agri-food sector of Ukraine and Poland in 2020, in USD billion. Source: Own elaborations based on OECD TiVA, 2023 [56].

4.1.1. Production Potential

The production potential of a country's agri-food sector is determined by a number of factors, among which the most important are [57]:

1. Climatic conditions, including temperature distribution and the amount and distribution of precipitation, which determine the length of the growing season and hydrological conditions.
2. The area and structure and the qualitative quality of agricultural land.
3. The structure of agricultural production, including the production of primary crop products and livestock populations.

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4. The demographic situation in rural areas, which determines the labor pool.
5. Ownership and area structure of farms.

Ukraine is located in a temperate continental climate zone, which is favorable for agricultural production [58]. The Black Sea and the Sea of Azov regions have a Mediterranean climate [59]. The growing season is long and allows the cultivation of most plant species. Poland, on the other hand, is located in the warm temperate climate zone, and its characteristic feature is transitional. This means it experiences both oceanic and continental influences [60]. Despite the low amount of precipitation in Ukraine (ranging from 400 to 1,000 mm), water resources are about 4,000 m^3 per capita, twice as much as in Poland [61].

The main factor determining the production potential of Ukrainian agriculture is the area of agricultural land, which is about 41.3 million hectares – three times larger than in Poland (14.6 million hectares) [61]. Under wartime conditions, about 22% of agricultural land was taken out of production [6]. The structure of agricultural land in Ukraine is characteristic of Central and Eastern Europe. The largest share is arable land (79.7%), slightly higher than in Poland (76.1%). Ukrainian agriculture, however, shows a relatively small share of permanent grassland and permanent crops in the structure of agricultural land. An element that determines the production potential of Ukraine's agricultural land is the large share of soils of the highest quality classes [61]. About half of Ukraine's territory is covered by chernozem with a humus content of up to 9%, with a humus layer thickness of 0.4 to 1.0 m. Another 14% are chernozem soils with a humus content of 3–4% and a layer thickness of about 0.5 m. Only in the northern regions are flat and podzolic soils found, which are characterized by much lower fertility [7]. In Poland, brown and flat soils (about 30% of the country's territory) and podzolic soils (25%) are the most important [60].

Ukraine's farmland is described as some of the most fertile in the world, but a serious problem is its progressive degradation, determined by unfavorable climate change and crop production technology based on simplified crop rotation with a dominant share of cereals and oilseeds. This leads to soil exhaustion and reduces overall biodiversity. Soil degradation is also compounded by warfare and the difficulty of implementing rational management under crisis conditions. A major challenge for Ukrainian agriculture is the implementation of sustainable farming technology, including appropriate crop rotation and the use of mineral fertilizers [12]. In the 2019/2020 marketing year, Poland used 130.5 kg of mineral fertilizers per hectare of agricultural land, while in Ukraine in 2019 – 119 kg, and in 2020 – 140 kg per hectare [62, 63].

Plant products dominate Ukraine's agricultural production structure. Their share increased from 73.7% to 81.4% between 2018 and 2021, while animal products decreased from 26.3% to 18.6% (Table 1). In 2022, the importance of crop production in Ukraine's agricultural production decreased to 78.2%, while animal production increased to 21.8%. These changes were caused by the war and a reduction in the area of crops. A constraint on the development of livestock production in Ukraine is that farms make little use of their own feed resources. The low share of livestock production also does not provide an adequate supply of natural fertilizers, which positively affects soil fertility. In Poland, the share of crop production in agricultural production increased steadily between 2018 and 2022 – from 46.6% to 53.0%. Still, in 2022 it was more than 25 percentage points lower than in Ukraine.

Table 1. Structure of agricultural production of Ukraine and Poland, in percent.

Product groups	Ukraine					Poland				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Crop production	**73.7**	**79.1**	**77.3**	**81.4**	**78.2**	**46.6**	**47.5**	**51.1**	**52.3**	**53.0**
Cereals and legumes	27.5	35.2	33.9	38.5	32.3	15.3	16.0	17.9	21.5	24.1
Industrial plants	23.8	28.6	26.5	28.0	30.0	5.7	5.3	6.7	6.3	8.1
Potatoes, vegetables and cucurbits	16.9	11.4	12.9	11.3	13.0	3.5	4.3	3.4	3.2	2.2
Fruits, berries, grapes	3.5	2.1	2.2	2.0	2.4	5.4	5.1	8.8	6.1	5.1
Fodder plants	1.3	1.3	1.3	1.1	1.3	1.4	1.4	1.4	1.3	0.9

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Other crop production	0.7	0.5	0.5	0.5	0.8	6.1	5.4	3.8	5.5	5.8
Animal production	**26.3**	**20.9**	**22.7**	**18.6**	**21.8**	**53.4**	**52.5**	**48.9**	**47.7**	**47.0**
Livestock	13.0	10.9	12.0	10.1	11.9	29.3	29.8	26.8	26.1	24.4
Milk	9.5	6.3	6.7	5.4	6.5	16.4	16.0	15.8	16.8	17.0
Eggs	2.8	2.8	3.1	2.3	2.6	5.6	5.3	5.0	4.4	4.4
Other animal production	1.0	0.9	0.9	0.8	0.8	1.0	0.4	0.4	0.5	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Own elaborations based on UkrStat [62], GUS [64].

During the period under review, Ukraine's production of basic crop commodities showed greater variability than that of Poland. The record year in terms of harvest was 2021, when 86 million tons of cereals were harvested – nearly two and a half times more than in Poland (Table 2). The good results were due to both favorable weather conditions and the use of appropriate crop rotation depending on soil type and agro-climatic conditions. The year 2022 brought a decrease in the harvest of staple cereals by as much as 37%, to 53.9 million tons (Poland harvested 35.7 million tons then). This was caused primarily by warfare, which led to a decrease in both the total area of land and the area suitable for growing agricultural crops.

Table 2. Basic crops and livestock production of Ukraine and Poland, in million tons.

Products	**Ukraine**					**Poland**				
	2018	**2019**	**2020**	**2021**	**2022**	**2018**	**2019**	**2020**	**2021**	**2022**
Cereals, total	70.1	75.1	64.9	86.0	53.9	26.8	29.0	35.7	34.6	35.7
of which: wheat	24.6	28.3	24.9	32.2	20.7	9.8	11.0	12.8	12.1	13.4
barley	7.3	8.9	7.6	9.4	5.6	3.0	3.4	3.0	3.0	2.8
corn	35.8	35.9	30.3	42.1	26.2	3.9	3.7	6.8	7.5	8.5
rye	0.4	0.3	0.5	0.6	0.3	2.2	2.5	3.0	2.5	2.4
Rape	2.8	3.3	2.8	3.0	3.5	2.2	2.4	3.1	3.2	3.6
Soya	4.4	4.5	3.0	3.8	4.1	0.0	0.0	0.0	0.0	0.0
Sunflower	14.2	15.3	13.1	16.4	11.3	0.0	0.0	0.0	0.0	0.1
Sugar	1.8	1.5	1.2	1.5	1.3	2.2	2.1	2.0	2.3	2.0
Live cattle*	0.4	0.4	0.3	0.3	0.3	0.6	0.6	0.6	0.6	0.6
Live pigs*	0.7	0.7	0.7	0.7	0.7	2.0	1.9	1.9	1.9	1.7
Poultry*	1.3	1.4	1.4	1.4	1.3	2.6	2.7	2.8	2.6	2.6
Milk	10.1	9.7	9.3	8.7	7.8	13.8	14.5	14.8	14.9	15.2

* production in carcass weight. Source: Own elaborations based on UkrStat [62], GUS [64], ERS USDA [65], FAO [66].

In grain production in Ukraine, key roles are played by corn (with a harvest of 42.1 million tons in the record year 2021), wheat (32.2 million tons), and barley (9.4 million tons). In Poland, wheat and corn are the most important. In oilseed crop production in Ukraine, sunflower is the most significant, with the 2018–2022 harvest oscillating between 11.3 and 16.4 million tons. Rapeseed production in the same period fluctuated between 2.8 and 3.5 million tons and was comparable to that in Poland. Additionally, Ukraine produces significant amounts of soybeans (4.1–4.4 million tons), but its share in world production is small (0.8–1.1%), as larger quantities are produced in the United States, Brazil, and Argentina. Poland produces small amounts of soybeans and sunflowers. Less sugar is produced in Ukraine than in Poland. Ukraine is also failing to take advantage of its potential in livestock production despite its large area of agricultural land and substantial reserves of feed raw materials. This is confirmed by the fact that between 2018 and 2022, Ukraine's raw milk production was, on average, 42% lower than Poland's, beef livestock was half as much, and pork livestock was about 62%

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lower. In contrast, Ukraine has a large and competitive production of poultry livestock (about 1.3 million tons in slaughter weight) [12].

According to UkrStat data, in 2023 Ukraine harvested 59.8 million tons of cereals and legumes and 21.8 million tons of oilseeds [62]. According to the Central Statistical Office, Poland harvested a total of 35.8 million tons of cereals, including 26.5 million tons of staple cereals. The rapeseed harvest amounted to 3.7 million tons [67].

There are negative demographic trends in Ukraine. The decisive factor in the decline of the rural population was migration to cities or abroad, driven by structural changes in agriculture [68]. The war in Ukraine only accelerated the rural exodus. The concentration of grain and oilseed production in agroholdings generates less labor demand than the production of fruits, vegetables, and animal products on family farms. In 2020, employment in agriculture was 3.0 million people, with only 385,000 having permanent jobs [61]. In Poland, 1.1 million people were employed in agriculture [64].

In the process of ownership transformation, the structural makeup of Ukrainian agriculture evolved such that family farms play a minor role, using only about 25% of the land [69]. In Poland, family farms account for about 90% of crop acreage. The predominant form of farms in Ukraine is agribusinesses (agroholdings), which are based on leased land usually exceeding 500 hectares. They specialize in grain and oilseed crop production and, to a lesser extent, poultry and pork livestock production. Family farms account for a small share of production, as they produce mainly for self-supply and limited direct sales [61].

4.1.2. Foreign Trade Potential

The foreign trade potential of a country's agri-food sector is determined by the demand for its products and the country's ability to supply them. Supply, in turn, results from the volume of production and internal consumption. In Ukraine, the production of most basic agricultural commodities not only satisfies domestic demand but also allows for the export of surpluses. The value of Ukraine's agri-food exports has shown greater volatility than that of Polish exports, influenced by fluctuations in agricultural production and price changes. In the record harvest year of 2021, Ukraine exported agri-food products worth $26.7 billion, while the value of Polish agri-food exports amounted to $43.3 billion (Chart 2). In 2022–2023, declines in the value of Ukrainian exports were recorded – by 12% and 7%, respectively, compared to the previous year. However, the scale of these declines was smaller than the decrease in production volume would suggest, as prices were higher than in 2021. In contrast, Polish agri-food exports, benefiting from higher prices, recorded double-digit growth rates. The decline in Ukraine's agri-food exports resulted in a decreasing trade surplus in these products since 2021. In 2023, its value amounted to $15.1 billion, and for the first time, it was lower than the surplus achieved in the Polish agri-food trade, which reached a record $20.7 billion in 2023.

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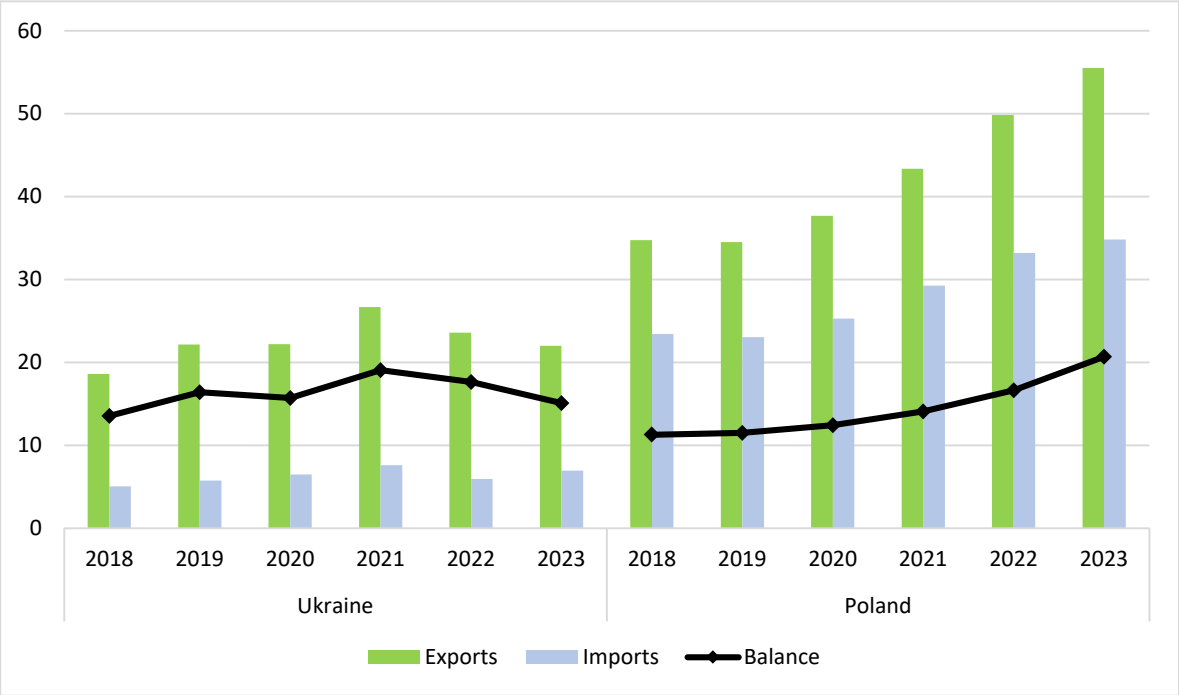

Chart 2. Agri-food trade of Ukraine and Poland, in USD billion. Source: Own elaborations based on WITS-Comtrade [70].

Significant changes have occurred in the geographic directions of Ukraine's agri-food exports during the war period. The share of non-EU countries declined from as much as 80% in 2021 to just over 40% in 2023. The importance of China, India, Saudi Arabia, Egypt, Indonesia, Iraq, Pakistan, Yemen, and Morocco decreased. Meanwhile, the share of Romania, Poland, Turkey, Italy, Bulgaria, Hungary, Spain, and Germany increased. These changes were due to the blockade of transportation across the Black Sea because of warfare and the search for alternative transportation routes. In Polish exports, nearly three-quarters of sales were concentrated in the EU market. The largest buyers were Germany, the United Kingdom, the Netherlands, France, Italy, and the Czech Republic.

Large production with relatively small domestic demand makes Ukraine one of the largest exporters of many agricultural products (Chart 3). In 2023, it was the world's largest exporter of sunflower oil, accounting for nearly 35% of global exports of the product. It was also the second-largest supplier of oilcakes and other solid residues to the world market by value, with a share of 12% in 2023. Ukraine was the world's fourth-largest exporter of corn by value, with nearly 10% of world exports and fourth in rapeseed exports (8.2% of world exports). It ranked fifth globally in soybean seed exports (1.4%) and sixth in wheat exports (6%). It was also among the world's top ten exporters of barley (about 3.6%), rapeseed oil (almost 3%), and poultry meat and edible offal (2.5%). Thus, Ukraine has a significant share of global exports of plant products, while Poland has a significant share of exports of animal products and food industry products.

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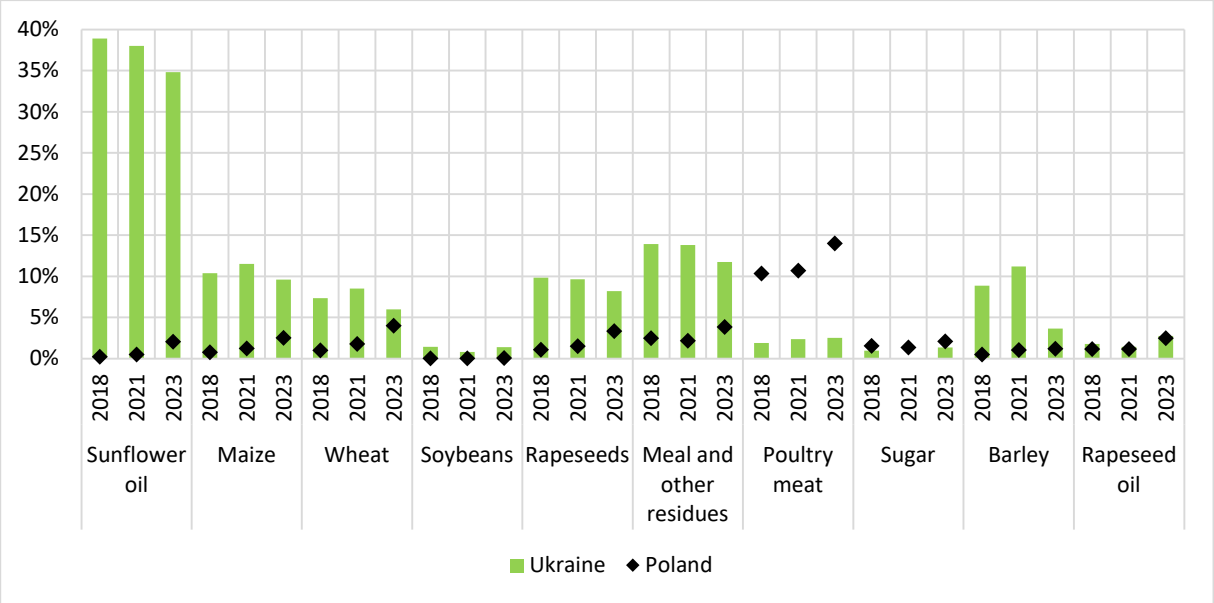

Chart 3. Shares of Ukraine and Poland in the global export of the 10 most important agri-food products for Ukraine*, in percent. * The 10 most important products in Ukraine's exports in 2023 have been taken into account. Source: Own elaborations based on WITS-Comtrade [70].

Between 2018 and 2023, Ukraine's share of world exports increased for only three of the top ten products: rapeseed oil, poultry meat, and sugar. Looking at changes from 2021 to 2023, Ukraine's share of world exports increased for four products: soybeans, poultry meat, sugar, and oil. The share of the remaining six products – sunflower oil, oil cake and other solid residues, corn, rapeseed, wheat, and barley – decreased. In comparison, Poland's share of products most important to Ukraine's exports increased in both 2018–2023 and 2021–2023.

4.2. Comparative Advantages of Poland and Ukraine Before and During the War

The survey showed that from 2018 to 2023, the largest share of Polish exports to the EU was held by products belonging to **Group B**, in which Poland had comparative advantages, while Ukraine did not. These were products for which both countries may compete in the EU market in the future. However, the importance of these products in Polish exports to the EU market was steadily declining. In 2023, the share of Group B products in Polish agri-food exports to the EU was 51.1%, 17.4 percentage points lower than in 2018. Conversely, there was a clear increase in the share of **Group A** products in Polish exports – from 16.5% to 37.5% – i.e., those for which both countries are already competing in the EU market (both countries had comparative advantages in exports to the EU). As a result, the combined share of products belonging to both groups included in the further analysis (i.e., Group A and Group B) increased by 3.5 percentage points between 2018 and 2023, from 85% to 88.5%. This means that products belonging to the other two groups – Group C (Poland has no advantage and Ukraine has one) and Group D (neither country has an advantage) – were and still are of little importance in Polish exports to the EU market (Chart 4).

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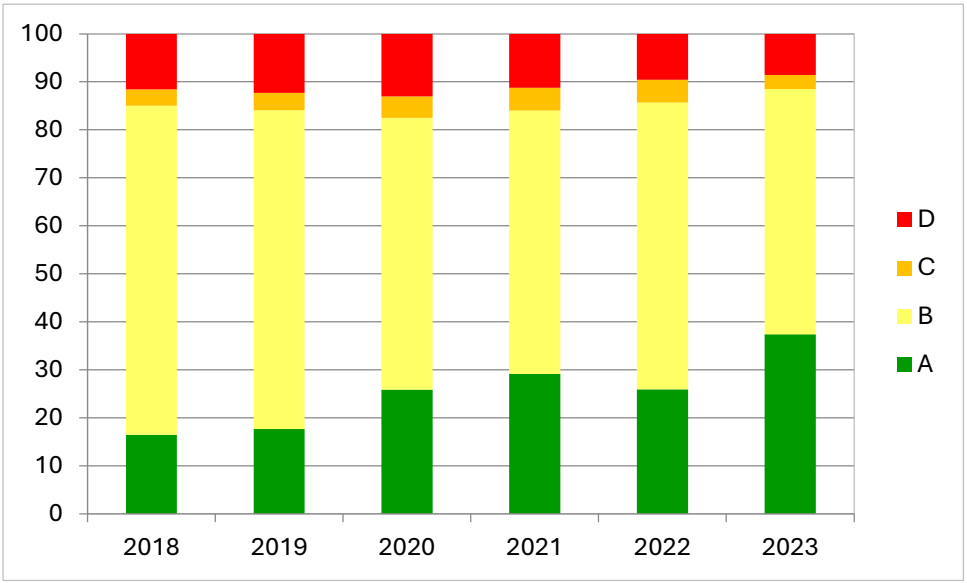

Chart 4. Structure of the Polish agri-food exports to the EU by revealed comparative advantages, in percent. Explanations: Group A (RCA PL > 1 i RCA UA > 1), Group B (RCA PL > 1 i RCA UA < 1), Group C (RCA PL < 1 i RCA UA > 1), Group D (RCA PL < 1 i RCA UA < 1). Source: Own elaborations based on WITS-Comtrade [70] and Figure 1.

Of the 20 products dominating Polish exports to the EU market in 2023, eight belonged to Group A, eleven to Group B, and one to Group D (Table 3). For products in Group A (comparative advantages of both countries), the largest shares of Polish exports were held by poultry meat, bakery products, wafers and pastries, chocolate, corn, fruit juices, frozen fruit, waters and other non-alcoholic beverages, and wheat. Group B (Poland had an advantage and Ukraine did not) included cigarettes, animal feed, fresh or chilled beef, other processed foods, smoked fish, canned meat, fish fillets, pork, canned fish, tobacco and tobacco substitutes, and liquid milk and cream. Group D included cheese and cottage cheese.

Between 2018 and 2023, there were changes in the classification of products into particular groups. Compared to 2018, the number of products in Group A, where both countries had comparative advantages in the EU market, increased in Polish exports from three to eight. This included bakery products, pastries and wafers, chocolate, waters and other non-alcoholic beverages, which were previously in Group B (Poland had advantages and Ukraine did not), and corn and wheat, which were previously in Group C (Ukraine had advantages and Poland did not).

Table 3. Main products in the Polish agri-food export to the EU.

HS4	HS product groups	Group			Polish export to the EU, in USD million			Share in Polish export to the EU, in %		
		2018	2021	2023	2018	2021	2023	2018	2021	2023
2402	Cigarettes	B	B	B	2,998	3,526	4,250	11.8	11.2	10.4
0207	Poultry meat	A	A	A	2,131	2,399	3,390	8.4	7.6	8.3
1905	Bakery products, cakes, biscuits, wafers	B	A	A	1,239	1,212	2,270	4.9	3.8	5.5
2309	Preparations used in animal feeding	B	B	B	913	1,589	1,859	3.6	5.0	4.5
1806	Chocolate	B	A	A	1,008	1,521	1,839	4.0	4.8	4.5
0201	Meat of bovine animals, fresh or chilled	B	B	B	1,061	1,220	1,429	4.2	3.9	3.5
2106	Other food preparations	B	B	B	823	1,089	1,379	3.2	3.5	3.4
0305	Smoked fish	B	B	B	889	1,064	1,091	3.5	3.4	2.7
1602	Prepared or preserved meat	B	B	B	549	845	1,270	2.2	2.7	3.1
1005	Maize	C	A	A	252	553	1,137	1.0	1.8	2.8
0406	Cheese and curd	D	D	D	663	732	864	2.6	2.3	2.1
0304	Fish fillets	B	B	B	670	742	926	2.6	2.4	2.3
2009	Fruit juices	A	A	A	556	641	658	2.2	2.0	1.6

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0203	Meat of swine; fresh, chilled or frozen	B	B	B	696	563	684	2.7	1.8	1.7
1604	Prepared or preserved fish	B	B	B	510	566	665	2.0	1.8	1.6
0811	Frozen fruit	A	A	A	456	573	488	1.8	1.8	1.2
2403	Manufactured tobacco	B	B	B	375	529	557	1.5	1.7	1.4
2202	Waters and other non-alcoholic beverages	B	C	A	383	368	627	1.5	1.2	1.5
1001	Wheat	C	C	A	152	293	645	0.6	0.9	1.6
0401	Milk and cream, not concentrated	B	B	B	406	450	466	1.6	1.4	1.1
	Total				16,729	20,474	26,495	65.9	64.9	64.8

Remarks: the products have been organized according to the average value of Polish exports to the EU from 2021 to 2023. Source: Own elaborations based on WITS-Comtrade [70] and Figure 1.

The breakdown of products belonging to Groups A and B by the value of the trade balance showed that in trading these products, Poland recorded a surplus in nearly 95% of cases, i.e., had TC ratios greater than one. Between 2018 and 2023, the largest increase – nearly fourfold – in sales to EU member states was recorded for products belonging to **Group A1**, i.e., those in which both countries already compete with each other in the EU market. Exports of products belonging to **Group B3**, i.e., those that could potentially become the subject of mutual rivalry in the future, also increased but only by 20%. Nonetheless, the share of Group B products was still 15.5 percentage points higher than that of Group A products, at 57.7% compared to 42.3% for Group A (Table 4). A detailed list of the main products belonging to each group is provided in Table 5.

The more than doubling of the share of products in Polish exports to the EU between 2018 and 2023, for which our producers are already competing with Ukrainian producers in the EU market (Group A1), indicates the growing competitive pressure from Ukrainian agri-food producers and exporters in the EU internal market. This was particularly true for products such as corn and wheat but also for bakery products, pastries and wafers, chocolate, and rapeseed. Compared to 2021, the increase was significantly lower (by 7.2 percentage points) and was due, among other things, to growing exports of products such as birds' eggs, sugar, and rapeseed oil. It is worth noting that some of these products belonged in 2018 to Group B (Poland had advantages and Ukraine did not), e.g., bakery products, chocolate, birds' eggs, and sugar, or to Group C (Ukraine had advantages, Poland did not), e.g., corn, wheat, rapeseed, and rapeseed oil. This suggests that Polish producers have felt the greatest increases in competitive pressure on the EU market precisely in these products. Mutual competition remains high in exports to the EU market of poultry meat, fruit juices, frozen fruit products, and confectionery.

Table 4. Export of selected Polish agri-food products to the EU by trade balance.

Group	Value of export, in USD million			Share in export, in %			Change of value in years	
	2018	2021	2023	2018	2021	2023	2018–2023 (2018 = 100)	2021–2023 (2021 = 100)
A1	4,110	9,182	15,172	19.0	34.7	41.9	369	165
A2	76	0	132	0.4	0.0	0.4	174	.
Total A	**4,186**	**9,182**	**15,304**	**19.4**	**34.7**	**42.3**	**366**	**167**
B3	16,010	16,174	19,644	74.2	61.0	54.3	123	121
B4	1,395	1,137	1,258	6.5	4.3	3.5	90	111
Total B	**17,405**	**17,311**	**20,902**	**80.6**	**65.3**	**57.7**	**120**	**121**
Total A+B	**21,590**	**26,494**	**36,206**	**100.0**	**100.0**	**100.0**	**168**	**137**

Source: Own elaborations based on WITS-Comtrade [70] and Figure 2.

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Table 5. Main products in Polish agri-food export to the EU by category of competition with the Ukrainian products in 2023.

Category	List of selected products by HS4
A1	poultry meat (0207), pastry, biscuits, wafers (1905), chocolate (1806), maize (1005), fruit juices (2009), waters and other non-alcoholic beverages (2202), wheat (1001), confectionery (1704), birds' eggs (0407), rapeseed (1205), ice cream (2105), sugar (1701)
A2	other sugars (1702)
B3	cigarettes (2402), animal food (2309), fresh or chilled beef (0201), other food preparations (2106), smoked fish (0305), canned meat (1602), fish fillets (0304), canned fish (1604), tobacco and tobacco substitutes (2403), milk and cream (0401), vegetables (0709)
B4	pork (0203), onion, garlic (0703), flour other than wheat (1102), potato flakes and granules (1105), food preparations of flour and groats (1901)

Source: Own elaborations based on WITS-Comtrade [70] and Figures 1 i 2.

As mentioned earlier, the increase in the share of Group A products in Polish exports to the EU was accompanied by a decrease in the share of products that may be subject to potential competition in the future (Group B). However, it is worth noting that in trading this group of products, Ukraine not only does not have a comparative advantage in the EU market but also recorded a deficit in most cases in 2023. The exceptions were smoked fish and canned fish. In 2018, despite the lack of comparative advantages, Ukraine managed to achieve a surplus in the EU market in trading a larger group of products. In addition to the two mentioned, this included milk and liquid cream, butter, onions, apples, sugar, and ice cream. Therefore, it can be expected that in the future Ukraine may compete with Polish producers in trading these products in the EU market. On the other hand, a product that in 2018 and 2021 belonged to Group A but in 2023 was in Group C (Ukraine had an advantage and Poland did not) was natural honey. This means that Poland lost its comparative advantages in exporting natural honey to the EU market, while Ukraine maintained them.

4.3. Possible Directions of the Evolution of Ukraine's Competitive Advantages

The evolution of Ukrainian food producers' competitive advantages in the EU market will depend on several factors. First, it will hinge on how long the war lasts and how quickly it will be possible to restore arable land affected by the hostilities after the war. In addition to the mined portions of arable land in eastern Ukraine, Cherevko points out that the destruction of equipment, buildings, animal herds, processing plants, and energy infrastructure facilities is also a significant challenge [71].

Second, future comparative advantages will be influenced by Ukraine's post-war reconstruction process. There is no doubt that it will contribute to strengthening the comparative advantages of Ukrainian producers in foreign markets [72]. Indeed, foreign capital may flow not only into agriculture but also into food processing, which will enhance the potential of the entire agri-food sector. Thanks to investments, more capital-intensive agricultural production – such as horticulture, cover crops, and animal husbandry – may develop in Ukraine [7]. As mentioned earlier, Ukraine is already an important poultry producer and exporter. It also has the potential to develop other branches of animal production [73].

Third, the ongoing process of Ukraine's integration into the single European market will also contribute to strengthening the competitive advantages of Ukrainian food producers in the EU market. The question is only the scale of this strengthening. Some point out that since the EU granted Ukraine autonomous trade measures, the conditions of access for Ukrainian goods to the EU market were in some aspects more favorable than if it were an EU member [74]. Under membership conditions, Ukrainian producers would have to meet a number of standards that they do not currently have to fulfill (e.g., a ban on the use of certain plant protection products) before their products would be allowed to enter the market. As a result of protests from frontline countries, including Poland in particular, the European Commission decided to slightly reduce the

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liberalization of access to the EU market. The regulation, in effect since June 2024, provides for import quotas for particularly sensitive agricultural products – poultry, eggs, sugar, oats, corn, groats, and honey. If the volume of imports of these commodities exceeds the average annual volume recorded in the second half of 2021 and throughout 2022 and 2023, the European Commission may request the re-imposition of duties [75]. These mechanisms are designed to safeguard the interests of European farmers. However, wheat and corn will not be affected by the restrictions, as their imports have caused clear distortions in EU markets for these products.

Thus, the European Commission's actions to date indicate that in the lead-up to Ukraine's EU membership, no major liberalization restrictions should be expected on imports of Ukrainian agri-food products to the EU market. This means continued strong competitive pressure for Polish food producers exporting to the EU. They should already be focusing on finding comparative advantages for their products that will differentiate them from Ukrainian producers competing with lower prices. A consistently developed strategy of competing on quality in foreign markets should serve this purpose. Polish producers should leverage the strengths and assets that the domestic agri-food sector possesses. These include the high technological level of the food industry, achieved through restructuring, modernization, and investment processes. Also important is the fact that food produced in Poland meets the stringent standards of the single market and enjoys the trust of foreign consumers. However, further investments are needed to increase the potential of food processing, particularly in developing high-quality food production and building strong, globally recognized brands associated with greater added value and advancement within global supply chains. Ukrainian producers will also take steps to improve the competitiveness of their products in the EU market. Zosymenko and Rybchak point to the need to stimulate the production of niche food and beverage products [76].

5. Conclusions and Recommendations

The analysis showed that although the agri-food sector in Ukraine is clearly smaller than in Poland in value terms, it is of greater importance to the Ukrainian economy. In 2020, it accounted for more than 19% of the country's output, created 15% of gross value added, and generated nearly 30% of Ukraine's export receipts from goods and services. Ukraine's agri-food sector was dominated by agriculture, while in Poland, the food industry was the leading segment.

The war in Ukraine has demonstrated that the country is highly integrated into global agricultural markets and is of great importance to world food security. The decline in Ukrainian production and exports of most primary agricultural commodities in 2022–2023 contributed only to a slight decrease in Ukraine's share of its global production and exports. Still, in 2023, Ukraine was the world's largest exporter of sunflower oil, the second-largest exporter of other oilcakes by value, the fourth-largest exporter of corn and rapeseed, the fifth-largest exporter of soybeans, and the sixth-largest exporter of wheat. It was also among the world's top ten exporters of barley, rapeseed oil, and poultry meat. Ukraine thus has a larger share of global exports of plant products, while Poland has a larger share of exports of animal products and food industry products.

Ukrainian producers were already competing in the EU market with Polish producers of many agricultural commodities before the war. The European Commission's granting of autonomous trade measures on imports from Ukraine to the EU in June 2022 only intensified this competition. This is indicated by the results of the analysis of the comparative advantages and export-import relations of the two countries in the trade of agri-food products on the EU market. From 2018 to 2023, the share of products in Polish exports to the EU in which both countries compete increased from 16.5% to 37.5%; that is, both countries had comparative advantages in this market. The share of products in Polish exports to the EU in which both countries may compete in the future decreased, albeit still remains high; currently, only Poland has comparative advantages, while Ukraine does not. As a result, in 2023, as much as 88.5% of the value of Polish agri-food exports to the EU were products in which Polish producers are already competing or may compete in the future. The objects of current rivalry included poultry meat, bakery products, wafers and pastries, chocolate, corn, fruit juices, frozen fruit, waters and other non-alcoholic beverages, and wheat. Subjects of future competition

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may include cigarettes, animal feed, fresh or chilled beef, other processed foods, smoked fish, canned meat, fish fillets, pork, canned fish, tobacco and tobacco substitutes, and liquid milk and cream. The high share of agri-food products in which Poland and Ukraine can compete in the EU market means that the competitive pressure from Ukrainian food producers felt by Polish producers and exporters is steadily increasing.

The survey made it possible to identify product groups in which Polish producers should be prepared to compete with Ukrainian producers in the EU market. This will allow them to focus on finding sources of comparative advantages that will differentiate their products from those of Ukrainian producers competing with lower prices. Polish food producers should capitalize on the strengths of Poland's agri-food sector. These include, in particular, the high technological level of food processing, the adaptation of production standards to EU norms, and the reputation and recognition that Polish food enjoys among foreign consumers. Polish producers should develop a strategy to compete in terms of quality in foreign markets. Therefore, new investments are needed to develop the potential of the food industry, including the production of high-quality food and the construction of strong brands, which are associated with the possibility of realizing greater added value and advancement within global supply chains.

The process of Ukraine's integration into the single European market requires constant monitoring and assessment of the competitive position of Ukrainian producers in the EU market. Analyses prepared using the input-output model can be helpful in this assessment. They will allow for the analysis of the linkages of Ukraine's agri-food sector with other sectors of its economy, as well as the sector's ties with foreign countries. In particular, it would be possible to determine the import intensity of the agri-food sector's output in Ukraine and what portion of the resulting output goes to exports. Additionally, it would be possible to identify the directions of imported material inputs and export destinations. Indeed, analysis using traditional trade statistics shows that in 2022–2023 there was a reorientation of the export directions of Ukrainian agricultural and food industry products. The share of EU countries increased from about 40% in 2021 to more than 80% in 2023. Conversely, the importance of Asian, African, and Middle Eastern countries declined. This was due to severely hampered shipping on the Black Sea, which before the war served as the most important channel for transporting Ukrainian products.

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