
Foreign Trade of Horticulture Products in Poland and Ukraine in Light of the Association Agreement

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Abstract:

Purpose: The aim of the article was to assess the impact of Ukraine's accession to the EU on the horticultural sector in Poland. What was also important it was to select products that could pose a threat to the growth of Polish product exports to the EU.

Design/Methodology/Approach: The main tool for analyzing trade trends and changes between Ukraine, Poland, and the EU is a static and dynamic turnover analysis using comparative methods. To assess trade liberalization effects in horticulture, trend analysis and qualitative methods examine political, economic, and legal impacts. The materials for research were data from Comtrade, Eurostat, FAO, the Statistics Poland and the Ministry of Finance.

Findings: The research shows that after signing of the Association Agreement, the increase in exports from Ukraine to the EU concerned mainly products that are also of significant importance in Polish exports to the Common Market. The increase in exports from Ukraine to the EU was of primary importance in reducing the meaning of Polish supplies of frozen raspberries. Once Ukraine becomes a full member of the EU, the competition for Polish supplies will continue to be concentrated juices and frozen fruits. Due to the high demand on Ukraine's domestic market, exports from Ukraine to the EU will not generally increase exports from this country to the EU of fresh vegetables and their preserves.

Practical Implications: The results of the research shall be of interest for scientists, politicians and decision makers. The obtained conclusions may be helpful in formulating a national strategy regarding support for the horticultural sector in the context of EU enlargement.

Originality/Value: The analysis of changes in trade and the assessment of the influence of supply offer from Ukraine is of great importance for horticultural producers and processors in the context of making strategic decisions.

Keywords: Fruits, vegetables and their preserves, EU Association Agreement with Ukraine, imports, exports, Poland, Ukraine.

JEL codes: F51, F55, Q17.

Paper type: Research article.

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1. Introduction

Striving to expand the borders of the European Union results from the need to reinforce the economic strength of this group, especially in the context of the unstable geopolitical situation in the eastern part of Europe. One of the important candidate, which is contemporary taken into consideration seriously is Ukraine.

However, the enlargement of the European Union involves the need to undertake adjustment activities covering many economic and administrative aspects in both member and candidate countries. One of the problematic issues in the context of Ukraine's accession to the EU is the liberalization of trade in agri-food products, including horticultural products, and its impact on the condition of the agricultural sector in member states.

It should be noted that Poland, as one of the major producers of temperate zone fruit and vegetables in the EU, may be particularly exposed to the impact of the growing supply of horticultural products from Ukraine. This implies the need to analyze and assess the consequences for the horticultural market in Poland related to the signing of the Association Agreement between the EU and Ukraine.

The basic tool used to determine trends and assess changes taking place in trade exchange is a static and dynamic analysis of turnovers between Ukraine, Poland and other EU countries, taken from comparative methods. In order to assess the effects of liberalization of trade in horticultural products, elements of trend analysis were used. An approach using qualitative methods, including the analysis of the impact of political, economic and legal factors on the markets of the discussed products is performed.

The main research task is to analyse the production potential and concerning foreign trade of fruits, vegetables and their preserves in Ukraine and Poland, and to determine the competitiveness of Ukrainian products for Polish articles on the EU market, after the signing of the EU Association Agreement with Ukraine.

The collected data will make possible to determine to a large extent the volume and structure of exports from Ukraine and imports to this country after the end of the war period and Ukraine's full membership in the EU. The purpose is also to assess the impact on the volume and structure of turnover in Ukraine of Russia's full-scale assault on that country.

2. Literature Review

What seems to be important it is the fact, that Ukraine has been started accession process before being invaded by Russian Federation in 2014. The EU-Ukraine Association Agreement was initialed on March 30, 2012, and on July 19, 2012, Deep and Comprehensive Free Trade Agreement (DCFTA) was signed (European

Commission 2013, Communication from the Commission 2022, 2014/295/EU 2014).

The association agreement in its economic part was endorsed on September 16, 2014. As part of this agreement, as of January 1, 2016 The EU abolished tariffs on imports of most agri-food products from Ukraine. This applied to fruits, vegetables and their preserves, as well. Regarding tomatoes and cucumbers, the so-called entry prices were also abolished.

Moreover, duty-free tariff quotas on imports to the EU from Ukraine of tomato concentrate (10,000 tons per year), apple and grape juice (10-20,000 tons) and garlic (500 tons) was established. For the period from June 2022 to June 2025 the EU abolished the duty on all products imported from Ukraine (Regulation (EU) 2022/870, 2022, Regulation (EU) 2024/1392, 2024), as well as the duty-free tariff quotas set for imports of apple and grape juices, garlic, and tomato concentrate.

It should be stressed out that the condition for duty-free imports is compliance with the rules of origin of the product and presentation of proof of origin of the products for customs clearance. The abolition of tariffs was prompted by the EU response to the 2022 Russia's invasion of Ukraine. On the other hand, Ukraine has also reduced tariff restrictions on imports of many agri-food products from the EU. For most fruits, vegetables and their preserves, tariffs have been eliminated since 2016.

However, for 23 product groups (including frozen vegetables, onions, tomatoes, grapes, peaches, peppers, plums, cabbage, cauliflower, dried onions, canned peas) there was a gradual reduction in tariffs on imports from the EU (from 20% to 50%) in period of 2014-2022 (Rozporządzenie Ministra Rozwoju i Technologii, 2023).

Before the reduction process started, these duties had ranged from 5% (peaches, plums) to 20% of the customs value of imported products (eggplants, peppers, cabbage) (Ambroziak 2017). Taking into consideration above mentioned facts, it is important to conduct the analysis of the development of exports of fruits, vegetables and their preserves from Ukraine to the EU, but also from the EU to Ukraine after the signing of the Association Agreement in 2014.

Due to the significant reduction in exports of most products, including horticulture products, after Russia's aggression against Ukraine, research conclusions will be constructed mainly on the basis of the development of mutual turnover between the EU and this country until 2021. Exports from Ukraine to the EU will be studied in the context of its impact on the position of individual fruits and vegetables and their preserves exported to EU countries by Poland.

Ukraine was granted candidate status in June 2022. In November 2023, European Council President proposed 2030 as a potential membership date. Eventually the

official accession talks with Ukraine began in December 2023. It is worth to be noted, that Ukraine as a future EU Member shall be covered by EU Common policies, i.a. the Common Agricultural Policy. On the one hand, the applicant has to adopt “*acquis communautaire*”, build relevant institutions, but on the other hand, as a full member will gain some benefits. First of all Ukrainian agriculture might be subject to direct payments, which definitely empower this branch (Krzyżanowski, 2024).

3. Research Methodology

The analysis used data from FAO, and Eurostat data concerned the production of fruits and vegetables in Ukraine, Comtrade data the information on the foreign trade turnover and Eurostat - the scale and structure of Poland's and Ukraine's turnover with the EU. Poland's production level and foreign trade turnover were taken from the database of the CSO and the Ministry of Finance.

The research methods consisted primarily of comparative analysis of the presented data in Poland and Ukraine mainly in the direction of assessing the competitiveness of products that are the basis of Polish and Ukrainian exports. An analysis of changes in the share of EU imports of these products imported from Poland and Ukraine and the prices of selected products in EU imports from both countries was presented.

4. Research Results and Discussion

In Ukraine, the primary importance in agricultural area and crop production are cereals and oilseed crops. The share of fruits and vegetables does not exceed 2% of agricultural land and 10% of crop production. According to FAO data, Ukraine's fruit harvest average in 2014-2017 amounted to 2.9 million tons, 3.2 million tons in 2018-2021, and in 2022, 2.6 million tons. With regard to vegetables, these volumes amounted to respectively: 9.0, 9.3 and 7.4 million tons.

A decrease harvest in 2022 (exacerbated in 2023) was due to a reduction in the area of crops following the occupation of part of the territory by Russia and the mined fields by Russian troops. Apples dominate in the fruit production structure, with the share of these fruits in the harvest is steadily increasing - from 37.8% in 2014-2017 to 39.4% in 2018-2021 and 43.4% in 2022 (Table 1). Watermelons and grapes take second and third place. Production also counts nuts - mainly walnuts, cherries, plums and pears. A relatively small is the share of berries (blueberries, gooseberries, raspberries, strawberries and currants).

In vegetable production, cabbage, tomatoes and cucurbit vegetables are of primary importance. Their combined share in vegetable production in Ukraine in 2014-2017, 2018-2021 and 2022 amounted to 56.0, 57.6 and 52.9%, respectively (Table 2). Also counted in production are, cucumbers, carrots and onions. In 2022, only the onion

harvest exceeded the level of previous eight years. This was largely due to increased demand for these vegetables of struggling Ukraine.

Table 1. Structure of fruit harvest in Ukraine in %.

Species	2014–2017	2018–2021	2022
Apples	37.8	39.4	43.4
Grapes and watermelons	29.3	23.8	17.8
Nuts	7.6	7.8	8.7
Pears	5.5	5.2	5.6
Plums	6.2	5.8	6.5
Cherries	8.4	8.1	9.1
Berries	4.4	3.3	4.6
Other	0.8	6.6	4.3

Source: Based on FAO.

Table 2. Structure of vegetable harvest in Ukraine in %.

Species	2014–2017	2018–2021	2022
Cabbages	18.9	18.5	20.8
Pumpkins and gourds	12.5	14.2	14.9
Tomatoes	24.6	24.9	17.1
Cucumbers	10.3	11.1	11.2
Onion	7.0	6.4	8.9
Carrot	9.5	9.3	10.2
Other	17.2	15.6	16.9

Source: Based on FAO.

Poland's fruit production exceeds Ukraine's harvest, and there is less production of vegetables. In 2018-2021, fruit harvests in Poland were higher than those recorded in Ukraine by 46%, while vegetable harvests were 44% lower at 4.6 and 5.2 million tons.

The structure of fruit production, as in Ukraine, is dominated by apples (79.0%) on average in 2018-2021. Like apples, the share of berries is higher in Poland than in Ukraine (12%), and the share of other fruits is lower. The structure of vegetable production in Poland is similar to that taking place in Ukraine with a dominance in production of: cabbage, onions, carrots, tomatoes and cucumbers. Only the share of cucurbit vegetables is significantly smaller in Poland.

Ukraine's share of global fruit production in 2018-2021 was 0.3%, and vegetables 0.4%. In Poland, these rates were 0.5 and 0.4%, respectively. The largest Ukraine's share in world production of cucurbit vegetables amounted to 5.8% in 2018-2021.

Ukraine also counts in world production of currants (4.0%), cherries (12.6%), nuts (3.7%), raspberries (3.9%), cabbage (2.4%) and carrots (2.1%). Larger than Ukraine's is the share of Poland in world production of apples, blueberries,

raspberries, currants and strawberries, as well as lettuce vegetables, leeks, parsley and cauliflower and broccoli.

On average, the 2018-2021 harvest of fruit in Ukraine accounted for 7.3% of the EU's average production, and Poland's for 11.5%. With regard to vegetables, these ratios were 15.4 and 8.6%, respectively. The largest Ukraine's share in EU regards cabbage production (54.3%), carrots (17.8%), cucumbers (36.7%) as well as walnuts (51.5%) and cherries (29.3%).

Poland's share for all these products is smaller than that of Ukraine. In contrast, Poland dominates the EU's production of apples. Ukraine therefore has a larger share than Poland in the world and EU production of most vegetables, and with regard to temperate zone fruits, this applies to cherries, plums, pears and walnuts.

4.1 Foreign Trade of Fruits, Vegetables and their Preserves in Ukraine and Poland

As far as the value of world exports of fruits, vegetables and their preserves is concerned, Ukraine's share does not exceed 2.6%, and Poland's 3%. The share of horticultural products and their preserves is also small, about 2% of horticultural products and their preserves in Ukrainian exports of agri-food products.

In Poland, the share of fruits and vegetables and their products in agri-food exports amounts to about 10%. In the volume and value of exports of fruits, vegetables and their preserves from Ukraine dominate: nuts, frozen fruits and concentrated fruit juices, mainly concentrated apple juice. In 2014-2017, the total share of these products in the value of exports of horticultural products amounted to 59.0%, in 2018-2021 to 61.8%, in 2022 and 2023 79.2% and 73.9%, respectively.

In the 2022-2023 period, a larger share than in the previous eight years was the export share of frozen fruits and concentrated juices, while it decreased significantly in nuts. The increase in volume and value, as well as in the share of exports of frozen fruits and concentrated juices is primarily due to the location in Ukraine of foreign-invested companies with foreign capital using relatively cheap raw material produced by Ukrainian producers (Piotrowski, 2016; Matsybora, 2023; Matuszak, 2024; Ministry of Economy of Ukraine 2024).

The location of foreign companies in these sectors of processing indicate an established structure of demand from the markets for products originating in Ukraine. According to the Centre for Eastern Studies in Poland (Matuszak, 2024) investment activity of Polish companies operating in Ukraine did not decrease after the onslaught of Russia into Ukraine. With regard to fruit and vegetable processing, this mainly concerns companies operating in Poland with foreign capital. Ukrainian tax authorities and services do not interfere in the activities of Polish companies located in Ukraine.

Among the products of lesser importance in Ukraine's export offerings in the 2018-2021 compared to the previous four-year period, foreign sales of most vegetables and apples (directed mainly to processing) increased and canned fruit and vegetable pickles declined. In 2022-2023, exports of all of these products (except apples) was significantly lower than in the previous eight years.

Russia's aggression against Ukraine as a result of the exclusion of part of that country's territory from cultivation, labour shortage and transportation difficulties, has resulted in a significant reduction in exports of most fruits, vegetables and their preserves (Ukhanova *et al.*, 2023; PKO Bank Polski, 2023).

However, the material structure of foreign sales of this product group with a clear priority in the export of frozen fruit and concentrated apple juice has not changed. It should be added that the strong decline in exports of some vegetable species – mainly onions, carrots, cabbage was largely the result of an increase in demand in Ukraine's domestic market. The total value of exports in 2023 amounted USD 483.5 million, as compared to USD 516.7 million on average in 2008-2021 and USD 426.8 million in 2014-2017 (Table 3).

Table 3. Foreign trade of fruits, vegetables and their products in Ukraine.

Specification	2014–2017 average	2018–2021 average	2022	2023
Export	426.8	516.7	567.1	483.5
• fresh fruit	109.3	147.2	114.5	119.2
• fresh vegetables	44.3	42.0	9.1	10.4
• fruit preserves	185.2	228.9	393.7	308.1
• vegetable preserves	88.0	98.6	49.8	45.8
Import	796.0	1079.2	1220.9	1458.2
• fresh fruit	542.6	685.1	650.9	792.6
• fresh vegetables	74.9	143.4	315.8	337.2
• fruit preserves	94.2	143.9	112.9	146.9
• vegetable preserves	84.3	106.8	141.3	181.5
Balance	-369.2	-562.5	-653.8	-974.7

Source: Calculations based on Comtrade data.

The material structure of Ukrainian imports of fruits, vegetables and their preserves is much more diversified than the exports of this group of products as a whole. However, in the value structure of imports, the basic importance is, as in most countries located in the temperate climate zone, southern fruits (mainly bananas, citrus fruits) and their preserves.

In 2014-2017, the total share of southern fruit in the value of imports of horticultural products and their preparations in Ukraine amounted to 53.7%, in 2018-2021 – to 49.0%, and in 2022 and 2023 – 43.3% and 42.0%, respectively. Among other products in all years of the analyzed period, only canned fruit and vegetable products

accounted for about 5% of import fruit and vegetables, including mainly those produced from southern fruits and thermophilic vegetables - primarily from corn, as well as tomatoes. Among the products of the temperate zone products, onions accounted for the bulk of Ukraine's imports (share above 1%), brassica, root and salad vegetables.

The value and volume of imports of almost all fruits, vegetables and their preparations showed an upward trend from 2014 to 2023. Among the products that count in imports in 2018-2021 as compared to the previous four-year period, imports of tomatoes, onions and cucumbers more than doubled. Imports of bananas increased by more than 50%, as well as frozen vegetables for direct consumption, fruit purees and fruit preserves.

Also in 2022 and 2023, imports of almost all products exceeded the level of 2018-2021, with vegetable imports increasing the most. The total level of their imports in 2022-2023 exceeded the average level of 2018-2021 by 80.2% and amounted to 344.7 thousand tons.

The upward trend of vegetable imports clearly indicates the low self-sufficiency of Ukraine in the market for these products. The rate of self-sufficiency of the country with regard to temperate zone fruits. Imports of these fruits, including apples, do not show an upward trend.

As a result of higher growth in imports than exports, the negative balance of foreign trade turnover deepened from USD 369.2 million on average in 2014-2017 to USD 562.5 million on average in 2018-2021. The very strong growth in imports and decline in exports of most products caused the negative trade balance to deepen to USD 653.8 million in 2022 and USD 974.7 million in 2023. Only the balance of foreign trade in processed fruit remained positive.

As in Ukraine, Polish exports of fruits and vegetables and their processed products count frozen fruits and fruit juices (Nosecka 2017-2024). The total share of these products in the export value of this entire commodity group in 2018-2021 was 37.0%, in 2022 39.7%, and in 2023 – 34.5%. Apples also account for a large share of Poland's exports – 11.0%, 7.6% and 9.7%, walnuts and hazelnuts do not count (Table 4).

The share of Polish exports of fresh vegetables – including mainly tomatoes, onions, brassica and root vegetables (primarily carrots), as well as berry fruits - including especially strawberries, blueberries and currants is larger than the one of Ukraine. The importance in Polish exports of canned fruit and vegetables produced primarily from domestic raw material of canned fruit and vegetables is significantly larger. The structure of exports of products of horticulture and their preserves is fairly stable in Poland.

Table 4. Structure of export value of fruits, vegetables and their preserves in Poland and in Ukraine in %.

Country	Specification	2014–2017	2018–2021	2022	2023
Poland	Apples	13.1	11.0	7.6	9.7
	Other fruits	10.6	11.2	10.7	10.7
	Fresh vegetables	10.3	10.4	11.5	12.5
	Fruit juices	20.2	20.0	22.1	20.2
	Frozen fruits	17.8	17.0	17.6	14.3
	Frozen vegetables	9.2	9.6	9.3	10.2
	Other fruit preserves	8.6	10.0	10.3	10.5
	Other vegetable preserves	10.2	10.8	10.9	11.9
Ukraine	Nuts	21.6	22.7	14.2	16.0
	Other fruits	4.0	5.6	6.0	8.7
	Fresh vegetables	10.4	8.1	1.6	2.2
	Fruit juices	25.6	17.0	31.2	30.6
	Frozen fruits	11.8	22.1	33.8	27.3
	Tomato preserves	7.5	9.9	2.8	2.5
	Other fruit preserves	6.0	5.2	4.4	5.8
	Other vegetable preserves	13.1	9.4	6.0	6.9

Source: Calculations based on Comtrade data.

The structure, but also the volume and value of exports clearly indicate the advantage of Ukraine over Poland in terms of foreign sales of frozen fruits (mainly frozen raspberries) and juices, including primarily concentrated apple juice. In Polish imports, as in Ukraine, the primary importance is given to southern fruits and their preserves - mainly canned goods and concentrated and drinkable juices.

When it comes to imports, fresh vegetables are also important, mainly tomatoes, cucumbers, peppers and lettuce, as well as tomato concentrate, and concentrated apple juice, used primarily for blending with juice made from domestic fruit. The importance of temperate zone fruits is small. It is worth mentioning that most of the temperate zone fruits and vegetables are imported to Poland during periods of shortages or low supply from domestic harvests.

Both the volume and value of exports and imports show a clear upward trend. Imports of products, mainly those not in direct competition for those produced domestically, are growing faster than exports, resulting in a deepening of the negative balance of trade in fruits and vegetables and their products.

On average in 2014-2017 the negative balance of trade amounted to USD 183.3 million, in 2018-2021 USD 679.7 million, in 2022 and 2023 – USD 715.1 million and USD 969.2 million, respectively (Table 5).

Poland is a net exporter of both processed fruit and vegetables. The balance of trade in fresh fruits and vegetables is negative. Fresh horticultural products are directed primarily to direct consumption. In contrast, a significant portion of imported

preserves are semi-finished products used in the production of final products, destined for export or internal market consumption.

Table 5. *Foreign trade turnover of fruits, vegetables and their preserves in Poland in million USD*

Specification	2014–2017	2018–2021	2022	2023
Export	2954.3	3501.9	4163.3	4439.6
• fresh fruit	703.1	777.0	759.0	905.1
• fresh vegetables	305.0	363.9	474.8	557.1
• fruit preserves	1373.9	1645.3	2078.3	1997.3
• vegetable preserves	572.3	715.7	851.2	980.1
Import	3137.6	4181.6	4878.4	5408.8
• fresh fruit	1532.9	1944.1	2150.9	2434.0
• fresh vegetables	592.0	872.3	1067.3	1357.3
• fruit preserves	711.5	957.2	1134.5	1041.6
• vegetable preserves	301.2	408.0	525.7	575.9
Balance	-183.3	-679.7	-715.1	-969.2

Source: Calculations based on Comtrade data.

4.2 Trade of Ukraine with the European Union

Largely as a result of concessions in mutual trade, there has been an increase in the scale of imports of horticultural products from Ukraine to the EU and exports from the EU to Ukraine. In 2018-2021 total imports of this group of products from Ukraine increased as compared to the 2014-2017 on average by about 63.2% to EUR 320.9 million, exports from the EU to the country increased by about 44.7% to EUR 257.6 million.

Due to the higher growth of imports than exports, the negative balance of EU trade with Ukraine increased from EUR 19.9 million to EUR 63.3 million. In 2022, as a result of strong growth in imports of processed fruit products from Ukraine – primarily concentrated apple juice and frozen raspberries, the negative balance of EU trade with Ukraine deepened to EUR 104.3 million (Table 6).

The boost in sales of these products was largely due to their sale immediately after production in the fear of possible attacks by Russian troops (Ruzhynskas, 2022; Belinska *et al.*, 2023). The decline in imports from Ukraine and maintenance of an upward trend in exports from the EU to this country resulted in a positive balance in trade with the EU in 2023.

The main products in Ukraine's exports to the EU are concentrated apple juice, frozen fruits (mainly frozen raspberries), nuts and tomato paste. In 2018-2021 the total share of these products in the value of imports from Ukraine to the EU amounted to 82.7%, as compared to 82.3% in the previous four years. In 2022 and 2023 the ratio amounted to 86.0% and 81.2%, respectively (Table 7).

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Source: Calculations based on Comtrade data.

Thus, since the beginning of the functioning of the Association Agreement has not changed the commodity structure of EU imports from Ukraine. This clearly indicates an established structure of demand for Ukrainian-originated products on the EU market - mainly for semi-processed products (this does not apply to nuts).

In the first years of the agreement, significantly faster increases in imports from Ukraine of frozen fruits, concentrated juice, but also tomato concentrate than other products can be observed. In 2018-2021, as compared to 2014-2017, total imports to the EU from Ukraine – juices, frozen foods, tomato concentrate, and nuts increased by about 63% to EUR 265.4 million and all other products by 59% to EUR 55.5 million. The strong growth of imports of frozen raspberries from Ukraine, also occurring after Russia's attack, also should be highlighted.

Table 7. Material structure of EU imports of fruits, vegetables and their preparations from Ukraine

Specification	2014–2017	2018–2021	2022	2023
Frozen fruits	27.6	38.0	49.9	42.1
Concentrated apple juice	19.4	11.7	18.2	20.9
Nuts	25.6	22.5	14.3	13.9
Other fruits	3.2	4.1	3.2	6.1
Vegetables	4.5	5.0	1.5	4.9
Tomato concentrated	9.7	10.5	3.6	4.3
Other fruit and vegetable preserves	10.0	8.2	9.3	7.8

Source: Based on Eurostat data.

There was also no significant change in the structure of exports of fruits, vegetables and their preserves from the EU to Ukraine with a clear dominance in sales of southern fruits, including citrus and canned vegetables made from warm-season

vegetables. The importance in exports to Ukraine of temperate zone products and their processed products remained small. Despite the increase in the scale of mutual trade, Ukraine remained an insignificant EU trade partner.

On average in 2014-2017 exports to Ukraine accounted for 1.1% of the total value of exports of fruits, vegetables and their preserves from the EU, in 2018-2021 this indicator amounted to 2.1%, in 2022 and 2023 to 1.8%. Imports from Ukraine carried out by the EU accounted for respectively: 0.2, 0.4, 0.5 and 0.3%. and non-EU imports: 0.7, 1.1, 1.6 and 1.1%.

4.3 Poland's Foreign Trade with Ukraine

Exports of fruits, vegetables and their products from Poland to Ukraine show a systematic upward trend and in 2023 it exceeded the average level from 2014-2017 by 140% and amounted to EUR 191.6 million. By 2022 Polish imports from this country were also increasing compared to the 2014-2017 on average by 185% to EUR 209.0 million (Table 8).

In 2023 due to a fundamental decline in exports from Ukraine imports were 42% lower than in the previous year. Ukraine is still an insignificant partner in Polish trade in this entire group of products. In 2023 shipments to Ukraine accounted for 4.7% of total Polish exports of these articles against 3.2% in 2014-2017. In total imports, importation from Ukraine in 2023 amounted to 2.4%, as compared to 2.7% in 2014-2017.

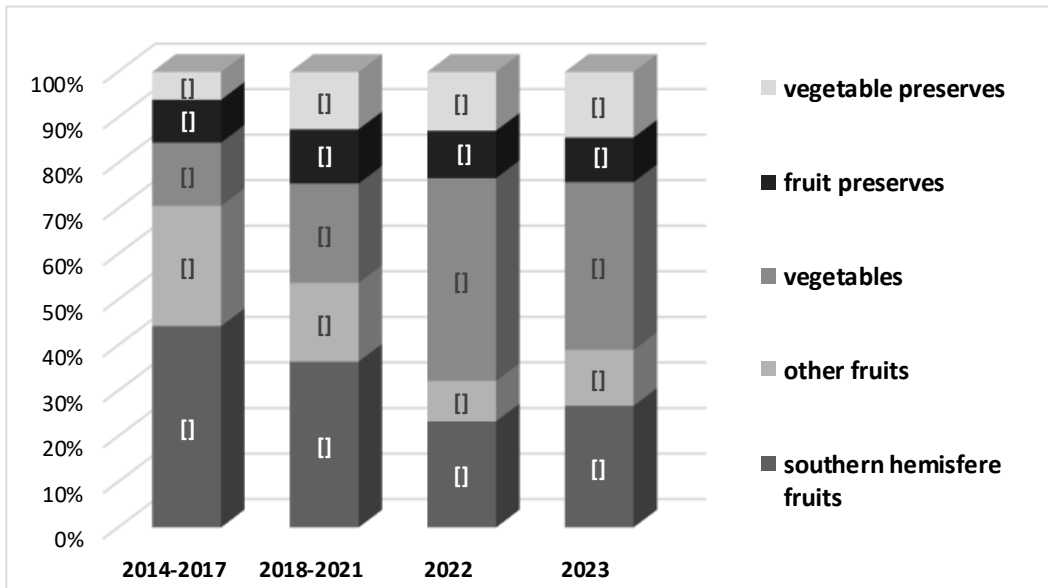
Table 8. *Foreign trade of fruits, vegetables and their preserves of Poland with Ukraine (million EUR)*

Specification	2014–2017	2018–2021	2022	2023
Export total	79.9	100.9	184.8	191.6
The share of Ukraine in total export (%)	3.2	4.2	4.7	4.7
Import total	73.4	109.0	209.0	121.9
The share of Ukraine in total import (%)	2.7	3.0	4.5	2.4
Balance	6.5	-8.1	-24.2	69.7

Source: *Based on data from the Ministry of Finance.*

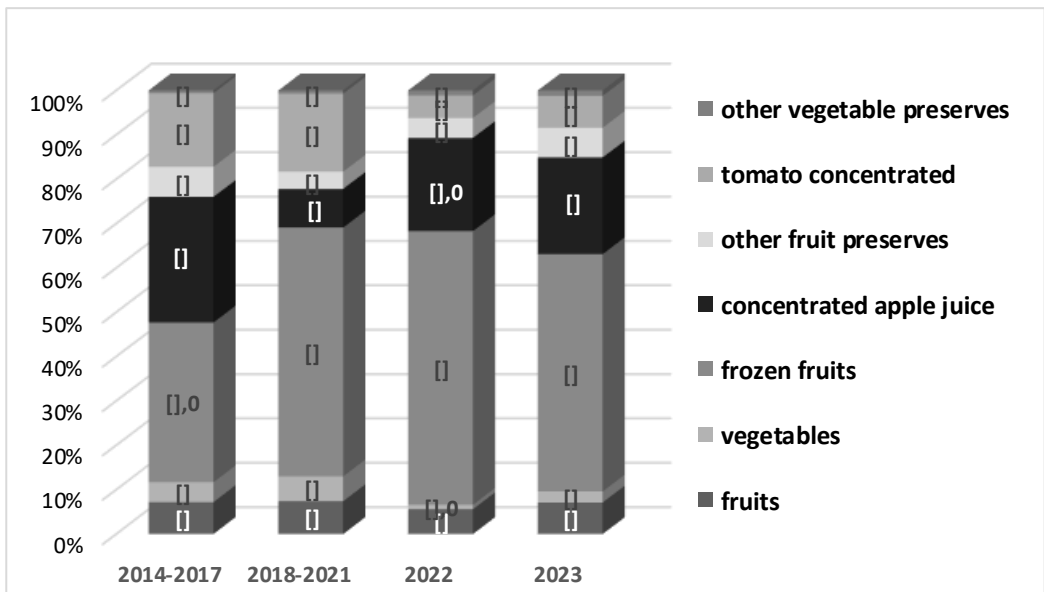
Southern fruits (mainly citrus fruits) and fresh vegetables are of primary importance in Polish exports to Ukraine (Figure 1). The share of vegetables in exports significantly increased in 2022 and 2023 due to the higher demand for these products of struggling Ukraine. Poland primarily imports frozen fruits from Ukraine (raspberries and blueberries) and concentrated apple juice (Figure 2). These products in 2014-2017 accounted for 64.3% of the value of imports of horticultural products and their preserves from Ukraine and in 2023 – 75.3%.

Figure 1. Structure of export of fruit, vegetables and their preserves from Poland to Ukraine in %



Source: Polish Ministry of Finance.

Figure 2. Structure of import of fruit, vegetables and their preserves from Ukraine to Poland in %



Source: Polish Ministry of Finance.

4.4 Position of Selected Polish and Ukrainian Products in the EU Market

In imports of horticultural products to the EU from Ukraine the main importance is given to concentrated apple juice and frozen raspberries. These products also count in EU imports from Poland. It is therefore important to study the changes in the position of these articles on the EU market imported from both countries.

Given Poland's growing production and export of tomato concentrate it is reasonable to expand the analysis to include this product. In addition, only with regard to tomato concentrate the share of EU imports from Ukraine exceeds 0.5%. Admittedly, this indicator also exceeds 0.5% for nuts, but these products are not significant in EU imports from Poland.

The primary measure for assessing the position and its changes of the analyzed products is their share in EU imports. Ukraine's share in the volume of concentrated juice imports to the EU on average in 2014-2017, in 2018-2021, as well as in 2022 and 2023 equalled 9.0, 6.0 and 14.3 and 13.0%. In the value of EU imports the rates amounted to: 6.0, 6.1, 14.0, 11.9% (Table 9). Poland's share in all years of the 2014-2023 period, in both volume and value of EU imports, was significantly higher than that of Ukraine, with the share showing an upward trend.

To a large extent this was due to the re-export from Poland to the EU of concentrate imported from Ukraine. However, the importance of supplies from Poland in EU imports of frozen raspberries is systematically decreasing. In the volume of EU imports this indicator decreased from 20.3% in 2014-2017 to 15.9% in 2023 and in the value of imports from 18.3 to 15.6%.

The share of supplies from Ukraine increased, respectively from 2.4 to 21.6% and from 1.6 to 11.6%. As a result of the increase in imports from Ukraine, Poland's share in the total volume of EU frozen fruit imports fell from 19.8 to 16.4% and Ukraine's share increased from 2.5 to 6.1%. However, there is a growing, though still insignificant importance in EU, imports of tomato concentrate imported from Poland.

Differences in the share of supplies from Poland and Ukraine in EU imports of these products (but also of most other articles) significant in the volume of imports are greater than in the value of imports. This is due to lower export offer prices in Ukraine than in Poland. On average in 2014-2017, prices of concentrated apple juice imported from Ukraine accounted for 47.2% of Polish prices.

On average in 2018-2021, this ratio equalled 95.6%, and in 2022 and 2023, dropped to 95.0 % and 88.0%. respectively. With regard to frozen raspberries. the volumes were 75.7, 114.4, 78.7 and 54.5%. respectively, and for tomato paste: 76.0, 87.2, 82.1, 107.6%.

Table 9. Share of Poland and Ukraine in EU imports of selected products

Specification	2014–17	2018–21	2022	2023	2014–17	2018–21	2022	2023
	by volume (thousand tons)				by value (EUR million)			
Concentrated apple juice								
- UE import total	667.8	583.7	550.1	420.2	636.3	616.9	639.1	605.9
- The share of Ukraine (%)	9.0	6.0	14.3	13.0	6.0	6.1	14.0	11.9
- The share of Poland (%)	26.7	27.8	32.4	32.8	27.7	28.4	33.4	34.1
Frozen raspberries								
- UE import total	208.1	220.6	194.9	196.0	496.7	502.0	874.3	597.4
- The share of Ukraine (%)	2.4	7.9	16.7	21.6	1.6	8.6	13.1	11.6
- The share of Poland (%)	20.3	16.7	16.1	15.9	18.3	15.9	16.2	15.6
Tomato concentrated								
- UE import total	1157.7	1191.6	1254.1	1230.4	1014.7	1021.4	1478.7	1884.8
- The share of Ukraine (%)	2.2	3.8	1.6	0.8	1.9	3.3	1.2	0.8
- The share of Poland (%)	0.5	0.7	0.9	1.0	0.6	0.7	0.9	1.0

Source: Calculations based on Eurostat data.

Higher import prices for products imported from Ukraine than in Poland in some years are the result of changes in market conditions. Lower prices than those of Polish products in Ukraine's export offerings to the EU and world markets did not significantly increase the share of products manufactured in Ukraine in EU imports as compared to the majority of articles manufactured in Poland.

With regard to semi-processed products, which are concentrated apple juice, but also to a given extent frozen raspberries and tomato concentrate, non-price factors, including primarily product quality, but also conditions of location including Ukraine of domestic and foreign capital are also of great importance (Szymanik 2017, Ruzhynskas 2022, Foreign Trade Barriers 2022).

5. Conclusions, Proposals, Recommendations

Russia's invasion of Ukraine has halted the upward trend of exports of most horticultural products from Ukraine to the EU. The war has made it impossible for Ukraine to use virtually duty-free exports to the countries of the Common Market. Despite the upward trend in sales to the EU from Ukraine in 2014-2021 the country remained a minor supplier of almost all fruits and vegetables and their preserves to the EU.

As before the signing of the Association Agreement, Ukraine remained a significant exporter to the EU only of concentrated apple juice, frozen raspberries, nuts and tomato concentrate. This clearly indicates the entrenched structure of the demand of EU countries for horticultural products from Ukraine.

Poland like Ukraine exports to the EU mainly concentrated apple juice and frozen fruits, but also concentrated juices made from soft fruit and unconcentrated apple juice. These are products of no importance in exports from Ukraine to the EU.

Increased imports from Ukraine have only caused a marked decline in the importance of EU imports of frozen raspberries produced in Poland. However, it did not affect significant decrease in the share of concentrated apple juice in EU imports. It was due to a significant extent by re-exports of this product imported from Ukraine.

Maintaining the upward trend observed in 2014-2021 in exports from Ukraine to the EU, including Poland and the full utilization of Ukraine's price advantages may take place after the end of the war. The experience of past trade contacts trade relations with Ukraine, however, do not indicate an increase in the level of exports from this country to Poland and other EU countries to a level that constitutes significant competition on the EU market for products manufactured by member countries, including Poland.

This applies primarily to vegetables (Ukraine is a significant producer in the EU). Vegetables and their processed products are mainly placed on the internal market of Ukraine. This is due to the smaller than in with regard to temperate zone fruits, the country's self-sufficiency in the market for vegetables, but also of their processed products. Moreover, presumably the basis of crop production in Ukraine will remain cereals and oil crops.

It should be noted that the volume of production of fruits, vegetables and their preserves and their exports from Ukraine under conditions of the country's full membership in the European Union may significantly increase, among other things, as a result of the EU support system.

In the first years after accession, Ukraine is likely to be, to a large extent a supplier of raw material to fruit processing enterprises located in the country, and to a lesser extent vegetables. Ukraine's attainment of EU member status, given the current degree of adaptation of products to EU norms and standards or reducing the scale of corruption will require a long period of time.

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