

THE INTRA-EUROPEAN UNION TRADE OF MILK AND DAIRY PRODUCTS

Piotr Bórawski¹✉, Adam Pawlewicz¹, Jayson K. Harper², James W. Dunn²

¹University of Warmia and Mazury in Olsztyn

²Pennsylvania State University

ABSTRACT

The study analyzed the intra-European Union trade of milk and dairy products in 1998–2017. The volume of intra-EU imports and exports, the balance of trade and the share of imports and exports of milk and dairy products in total EU trade in the EU in 2000–2017 were analyzed. In addition, the price of 1 kg of milk and dairy products imported and exported in the EU's internal market in 2015–2017 was presented in the EU countries (EUR). Tabular, graphical and descriptive statistics were used in the work. In 2004–2014, the volume of intra-EU exports exceeded imports. In turn, in 2015–2017 a strong downward trend and an increase in the surplus of imports over the exports of milk and dairy products on the EU's internal markets is noticeable.

Key words: milk, milk product, imports, exports, balance

JEL codes: F10, F13, F17

INTRODUCTION

Milk is the most important European Union agricultural product in terms of value, accounting for around 22% of the EU's agricultural output [EDA 2018]. Annual average consumption per capita in the EU corresponds to around 300 kg of milk [Westhoek et al. 2011, Benedek et al. 2017]. The dairy sector, subjected to intensive adaptation processes by the current requirements regarding both production and consumer preferences, is systematically transforming into one of the most modern food industry sectors, capable of competing not only in the enlarged EU, but also in the world [Stańko 2006, Parzonko 2009]. Dairy products are the second most important source of animal protein for humans [Benedek et al. 2017].

The milk market is subject to regulations resulting from the Common Agricultural Policy. Until April

2015, milk production was regulated under the quota system and a price support system for butter and milk powder was in force [Bórawski and Dunn 2015].

In 2004 and 2007 12 New Member States (NMS) joined the EU. This process created many changes in the Common Market. First, the EU-15 has increased food trade in the NMS and second the deficit in agri-food products on the NMS level was observed [Pawlak 2013, Török and Jāmbor 2013]. The enlargement of NMS caused changes not only in milk markets but also whole food sector because of various economic and non-economic conditions, including lifestyle, consumption growth, decreasing area of land for production and other [Gołębiewski 2018, Pietrzak and Roman 2018].

With the growth of the EU, new member states gained access to the Common Market [Szajner 2018]. On the other hand, the elimination of trade barriers, such as customs duties, made it possible for the coun-

tries that already belong to the Community to access these new markets in the internal market. This resulted in increased competitiveness in the Common Market, although many processing enterprises and agricultural producers gained development opportunities. The particular benefits of European integration were recorded in the milk market, where milk overproduction could have been sold.

MATERIAL AND METHODS

The main objective of the research was to analyze the size and value of intra-EU trade of milk and dairy products.

The research material were Eurostat data including the size and value of aggregated imports and exports, as well as the trade balance within the EU for milk and milk products. The horizontal analysis concerned the years 2000–2017 in terms of the entire EU, and the vertical ones of individual EU countries in the years 2015–2017. According to the terms of the United Nations Commodity Trade Statistics Database (comtrade.un.org), the data aggregation concerned:

- milk and cream and products other than butter or cheese;
- butter and other fats and oils derived from milk;
- cheese and curd.

The data was presented in the form of a value (EUR) and the harmonized indices of consumer prices (HICP) published by Eurostat comparability have been adjusted.

RESULTS

Trade of milk and dairy products on the intra-EU market has been developing dynamically for many years. In 2000, aggregate imports accounted for over 13 million t and were lower than the aggregated exports, which amounted to nearly 14 million t. The constant increase in international trade resulted in the fact that in 2017, imports between EU countries increased in relation to 2000 by nearly 77% to over 23 million t and were higher than exports, which increased by almost 58% to 22 million t. It should be noted that the systematic growth of these indicators indicates an

increase in the importance of this agri-food industry in the EU market. This is evidenced by the share in intra-EU imports and exports, which also show a growing tendency. In 2000, the first indicator was less than 0.97% and the second 0.96%. In turn, in 2017, the import of milk and dairy products on the intra-EU market increased to around 1.2% of the total import volume, and exports to 1.15% of total exports. This is the result of integration to the European Union of new member states which created the export and import increases [Braja and Sawicka 2017] – Figure 1.

In the analyzed period of time, large fluctuations can be observed in the relation of exports to imports. In the years 2000–2001, exports were higher than imports by 4.7% and nearly 8%. In the next two years, imports exceeded exports. The change from 2001 to 2002 is particularly noticeable from 7.7% to -4.7% and in 2003 to -2.26%. However, since 2002, a growing trend in the relation of exports and imports has been observed. In the period from 2004 to 2014, the volume of intra-EU exports over imports was observed. In turn, in 2015–2017 a strong downward trend and an increase in the surplus of imports over exports of milk and dairy products on the EU's internal markets is noticeable (Fig. 1).

Intra-EU trade in milk and its products in terms of space is characterized by high heterogeneity. This is indicated by the coefficient of variation, which in 2015 amounted to (136.4%), for imports (138%) in 2016 and in 2017 the rate increased to 141.7%. In turn, for exports, an increase in concentration is observed (with a large variation) because the analyzed ratio drops. In 2015 it was 140.6%, in 2016 – 145%, to fall to 130.3% in 2017.

For many years, the largest importer of milk in the EU internal market was Germany (in 2017 – 5,280.00 thousand t of milk and milk products), despite the fact that this country is the largest producer of milk in the EU. In Italy, imports (2,688.51 thousand t) account for only 50% of Germany's level. Similarly, Belgium (2,607.02 thousand t) and the Netherlands (2,541.74 thousand t) are major buyers. In turn, France (1,615.42 thousand t) and the United Kingdom (1,451.71 thousand t) imported about 70% less than Germany. On the other hand, the smallest imports in 2017 were recorded in Cyprus (31.57 thousand t), Malta (33.48 thousand t)

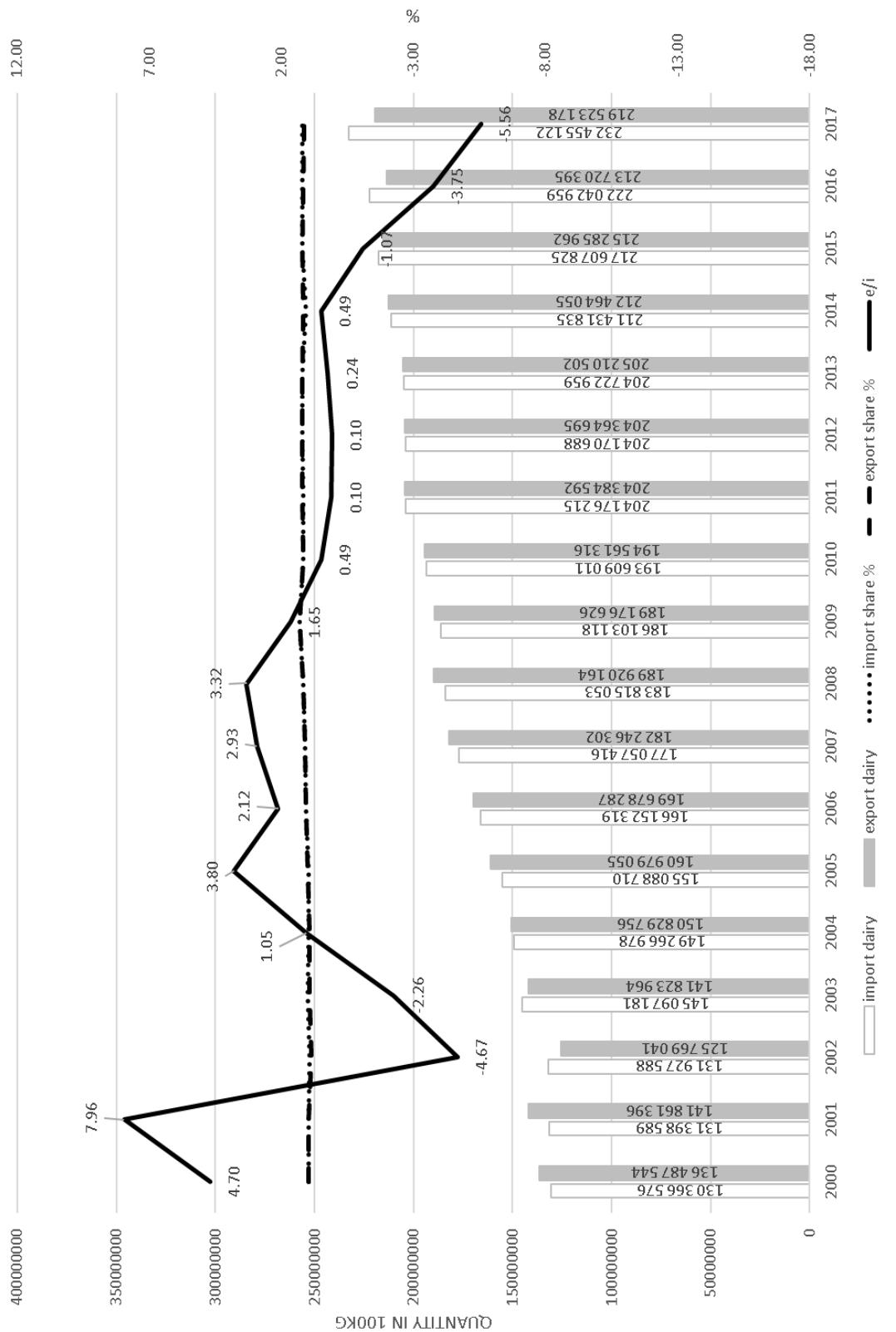


Fig. 1. Intra-EU volume of imports and exports, balance of trade and share of imports and exports of milk and dairy products in total EU intra-EU trade in 2000–2017 (100 kg)

Source: Own elaboration on the basis of Eurostat data.

and Estonia (47.74 thousand t) – Table 1. These are very small countries.

According to Eurostat data, the largest increase in imports of milk and milk products between EU countries in 2016–2017 was recorded in Estonia, which grew 83%. In the next three countries, the imports increased less and fluctuated around 20%. They were Slovakia (21.48%), Ireland (21.20%), and Malta (19.88%). In turn, such countries as the Czech Republic (-13.96), Luxembourg (-13.47%), Portugal (-9.82%) and Italy (-9.12%) showed a significant decrease in imports in the discussed period (Table 1).

When analyzing the intra-EU exports of milk and dairy products, it should be noted that Germany dominates with 4,826.10 thousand t in 2017. France is the second country (2,262.76 thousand t), with approximately 47% of Germany's export volume. It was similar to the Netherlands, where the export volume was 2,219.77 thousand t. In Belgium the level was 1,827.64 thousand t, which was equal to approximately 38% of the largest exporter level. On the other hand, the smallest volume of exports of milk and its products was recorded in Malta (2.12 thousand t), Cyprus (22.26 thousand t) and Croatia (27.40 thousand t) – Table 1.

The largest increase in intra-EU exports in 2016–2017 can be observed on Malta (302,071.43%) which is puzzling and may result from erroneous data rather than from actual increase. Another country where a significant overgrowth of this indicator was noted was Bulgaria with an increase of 312.28% in sales of milk and processed products to other EU countries. In subsequent countries, the growth of exports is less spectacular. In Greece, exports increased in 2017 compared to 2016 by almost 50%. In turn, in Poland, the increase in this indicator was around 37%, in Italy 35%, and in Portugal over 31%.

When analyzing the data, it can be noticed that the countries with decreases in exports of milk and its products during the discussed period were Finland (-15.81%), Ireland (-15.36%), France (-10.01%) and Germany (-9.78%). This group shows countries that dominate in the production and volume of trade in milk and milk products within the EU.

Trade balance is a very important indicator, which makes it possible to monitor competitiveness in a given

industry, which is important for entities operating on a given market [Begg et al. 2014]. The highest positive balance of trade in intra-EU milk and its products in 2017 has been achieved by Poland (765.596 thousand t in 2017), the Czech Republic (732.9 thousand t), France (647.3 thousand t), Austria (603.6 thousand t) and Denmark (505.7 thousand t). In turn, the largest deficit in the trade balance in 2017 has been achieved by Italy (-1,649.9 thousand t). The next country with the highest negative balance in the intra-EU trade is Belgium, where the value of this measure was almost 53% lower than in Italy and amounted to -779.38 thousand t. In Ireland, exports of milk and milk products were lower than imports by 489.08 thousand t. The leader in intra-EU trade is Germany, and it has also a deficit of 453.25 thousand t. A country where it is possible to observe an equally high loss in intra-EU trade was Spain, where imports were higher than exports by 439.96 thousand t (Table 1).

Intensive adaptation by the dairy sector to the production requirements and consumer preferences affects the growth of competitiveness in international markets. That is why for many years the value of intra-EU trade in milk and its products has been characterized by dynamic growth. In the period from 2000 to 2017 revenues from imports and exports in the EU market increased threefold. At the beginning of the discussed period, the value of imported milk and dairy products in the EU accounted for almost EUR 12.5 billion, and exports only EUR 12.3 billion. In turn, in 2017, the revenues from imports amounted to almost EUR 37 billion, however, they were lower than the value of exports of products by EUR 55.7 million. In the analyzed period negative changes have been observed. The drop in the value of intra-EU trade in the products is noticeable in 2009, 2015 and 2016, which may result from the release of the milk quota and the increase in the supply of raw material and its products. It resulted in a decline in prices and lowering revenues (Fig. 2).

The share of the value of both imports and exports of milk and dairy products as compared to the aggregate revenues in intra-EU trade has fluctuated around 1% for years. However, the share of income from imports of dairy products in a given EU country is higher than the value of exports. In 2000, imports accounted for 0.96% of total imports, and exports 0.91%. In the

Table 1. Intra-EU exports and imports of milk and dairy products in the years 2015–2017 and growth

EU Countries	Total imports (thousand t)				Total exports (thousand t)				balance 2016	balance 2017
	2015	2016	2017	changes 2017/2016 (%)	2015	2016	2017	changes 2017/2016 (%)		
Austria	395.18	448.65	453.67	1.12	1 173.42	1 044.08	1 057.23	1.26	595.42	603.56
Belgium	2 238.25	2 388.57	2 607.02	9.15	1 926.24	1 826.21	1 827.64	0.08	-562.36	-779.38
Bulgaria	131.90	153.43	148.49	-3.22	42.51	40.03	165.02	312.28	-113.40	16.53
Croatia	211.35	237.99	243.10	2.15	16.34	22.59	27.40	21.27	-215.40	-215.70
Cyprus	29.79	32.14	31.57	-1.76	13.58	17.71	22.26	25.68	-14.43	-9.31
Czech Republic	301.83	321.63	276.74	-13.96	1 025.46	1 002.87	1 009.59	0.67	681.24	732.86
Denmark	280.25	276.03	314.45	13.92	634.00	637.98	820.16	28.56	361.95	505.71
Estonia	33.54	26.00	47.74	83.60	239.13	274.20	311.71	13.68	248.20	263.97
Finland	154.30	143.52	136.29	-5.04	140.55	136.09	114.57	-15.81	-7.43	-21.72
France	1 742.95	1 642.27	1 615.42	-1.63	2 715.09	2 514.52	2 262.76	-10.01	872.25	647.34
Germany	4 375.22	4 652.32	5 279.35	13.48	5 218.04	5 349.03	4 826.10	-9.78	696.71	-453.25
Greece	440.14	446.21	464.19	4.03	130.15	134.92	202.01	49.73	-311.30	-262.18
Hungary	248.18	237.35	245.02	3.23	484.15	406.32	430.60	5.98	168.97	185.58
Ireland	779.54	769.92	933.18	21.20	556.82	524.69	444.10	-15.36	-245.23	-489.08
Italy	3 226.09	2 958.46	2 688.51	-9.12	812.96	770.67	1 038.65	34.77	-2 187.80	-1 649.85
Latvia	115.17	154.75	157.04	1.48	343.32	347.53	376.46	8.32	192.78	219.41
Lithuania	433.50	434.66	506.75	16.58	317.23	314.93	300.33	-4.64	-119.73	-206.41
Luxembourg	162.02	123.82	107.14	-13.47	340.60	343.67	359.73	4.67	219.85	252.59
Malta	30.77	27.93	33.48	19.88	—	0.00	2.12	302 071.43	-27.93	-31.36
Netherlands	2 138.54	2 489.24	2 541.74	2.11	1 774.61	2 143.26	2 219.77	3.57	-345.98	-321.97
Poland	536.84	619.09	602.66	-2.65	988.65	999.59	1 368.25	36.88	380.50	765.59
Portugal	375.10	356.75	321.71	-9.82	237.33	160.75	211.31	31.46	-196.01	-110.39
Romania	275.70	343.34	381.21	11.03	74.92	80.37	104.09	29.51	-262.97	-277.12
Slovakia	259.19	243.19	295.43	21.48	331.18	277.66	269.04	-3.10	34.47	-26.39
Slovenia	105.01	98.41	97.11	-1.32	309.39	329.99	324.82	-1.57	231.58	227.71
Spain	1 005.75	868.45	900.35	3.67	481.52	490.63	460.39	-6.16	-377.82	-439.96
Sweden	387.03	375.56	364.46	-2.96	142.41	160.11	153.94	-3.86	-215.44	-210.52
United Kingdom	1 347.65	1 334.62	1 451.71	8.77	1 059.01	1 021.67	1 242.30	21.60	-312.96	-209.41

Source: Own elaboration on the basis of Eurostat.

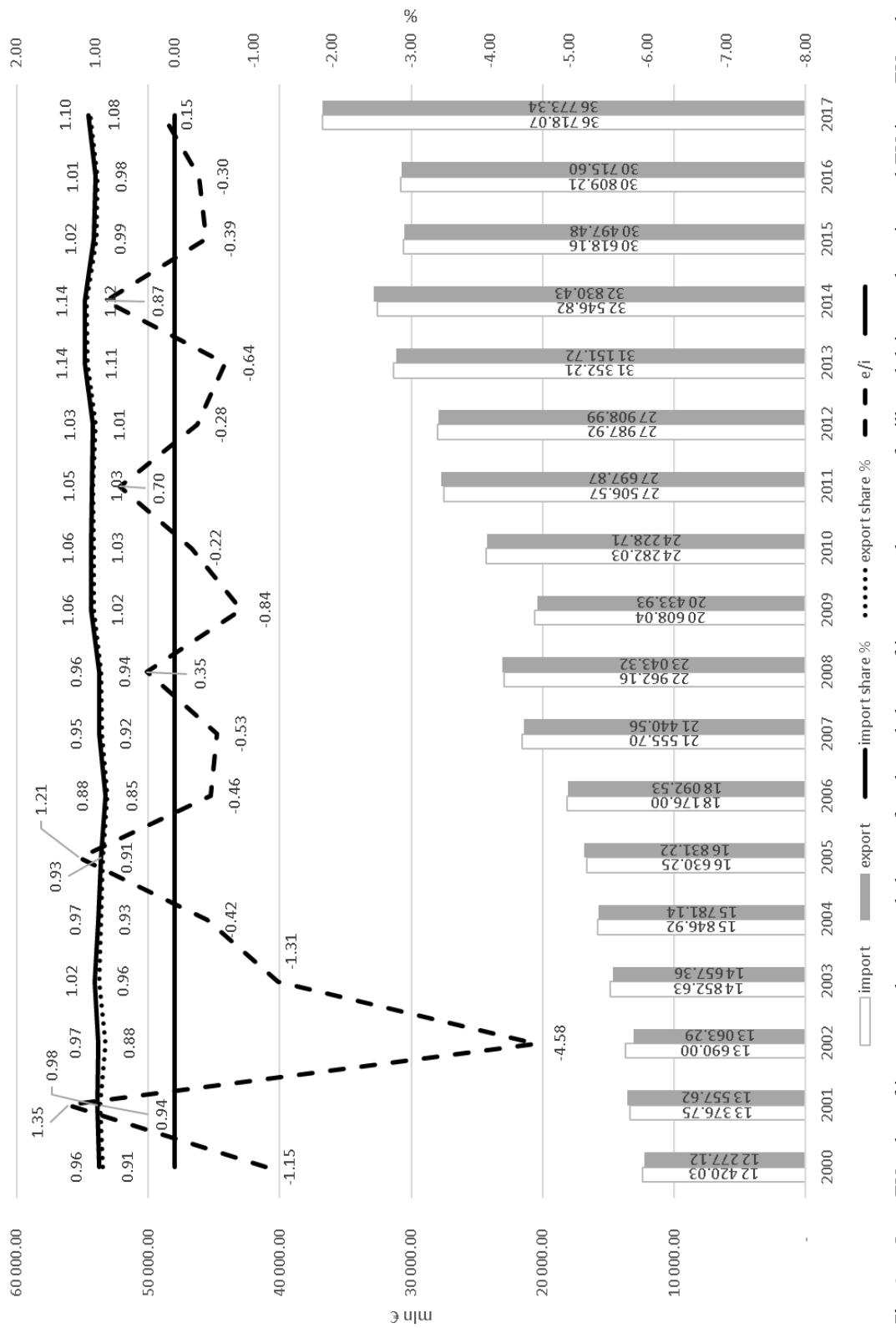


Fig. 2. Intra-EU value of imports and exports, balance of trade and share of imports and exports of milk and dairy products in total EU intra-EU trade in 2000–2017 (fixed prices 2015)

Source: Own elaboration on the basis of Eurostat.

period up to 2017 there were slight fluctuations resulting from various reasons (described earlier).

During the analyzed period, there is a large variation in the ratio of export revenues to the value of imports. In 2000, over a 1% deficit can be observed in intra-EU trade. But the next year there was a surplus of exports over imports. However, already in 2002, this index was the lowest and amounted to -4.58%. In the next three years, exports eradicated the negative difference in 2005 to reach a surplus of 1.21% (accession of new states). In subsequent years there were alternating periodic fluctuations in the level of the discussed indicator. At the end of the analyzed period, the value of exports in 2015 and 2016 was lower than imports, however, already in 2017 there was an increase and the surplus reached 0.15%.

Revenues from intra-EU trade in milk and its products, like the volume of turnover, are distinguished by spatial differentiation. The coefficients of import variation in the years 2015–2017 oscillate around 126% or 129%, which indicate very high heterogeneity. Exports are even more diversified ($VC = 147\%$ or 144%).

Comparably as in the case of the turnover volume, the highest value of imports on the discussed market in 2017 was recorded in the countries that are leaders, i.e.: Germany (EUR 6.9 billion), France (EUR 3.8 billion), Belgium (EUR 3.7 billion), the Netherlands (EUR 3.7 billion), Italy (EUR 3.6 billion), and the United Kingdom (EUR 3.4 billion). On the other hand, Malta's revenues from imports of milk and dairy products (EUR 0.05 billion) were less than 1% of those of Germany. The next lowest importing countries were Estonia (EUR 0.07 billion), Cyprus (EUR 0.09 billion), Latvia (EUR 0.16 billion), and Slovenia (EUR 0.18 billion) – Table 2.

In most of the EU countries, the value of international turnover in the milk market increases year by year (the exception is Malta). The largest increase in imports in 2016–2017 was recorded by Lithuania (almost 52%), followed by Estonia (almost 32.7%), and the smallest Finland (4.7%) and Portugal (6.9%) – Table 2.

The situation was similar in the case of exports. The highest export revenues in intra-EU trade can be observed among the leaders of the milk and dairy products market – Germany (EUR 7.7 billion), the

Netherlands (EUR 6 billion), France (EUR 4.4 billion), Belgium (EUR 3.2 billion) and Italy (EUR 2.5 billion). In turn, the smallest value of sales to other EU countries, to the level of exports was in Malta, which amounted to only EUR 2,100. However, Croatia already recorded revenues from exports of milk and its products at the level of EUR 39 million. In Bulgaria, the value of exports was already more than twice as high and amounted to almost EUR 88 million. Among the countries with the lowest level of revenues from sales to other EU countries was Romania with a level of almost EUR 100 million – Table 2.

The largest increases in exports in 2016–2017 were recorded in Latvia (51.8%), Poland (43.7%), Lithuania (36.8%), Ireland (36.8%), Estonia (33.8%) and Hungary (31.1%). On the other hand, Malta stands out again because there was a significant drop in sales to other countries, by more than 65% in the described period. On the other hand, France reported an increase in sales revenue to other EU countries at a mere 4.6%. In countries such as Bulgaria and Greece, the level of this indicator was also small, 6.9% and 8.8% – Table 2.

When analyzing the value of the trade balance in the EU's internal market, the biggest surplus was in 2016–2017, the Netherlands (EUR 2.2 billion), Ireland (EUR 1 billion), Denmark (EUR 0.98 billion), Germany (EUR 0.8 billion) and Poland (EUR 0.75 billion). In turn, the largest deficit in the discussed market was achieved by the United Kingdom (nearly EUR 2 billion), Italy (EUR 1.2 billion), Spain (EUR 0.91 billion), Sweden (EUR 0.78 billion) – Table 2.

The most important economic factor of the market, apart from the demand and supply, is price per unit revenue. In the intra-EU trade of milk and dairy products in the analyzed period, the 1 kg export price was much less diversified in terms of space than imports (Fig. 3). The coefficient of variation for exports was about 35%, which indicates the average heterogeneity of prices of milk and its products. However, the value of the discussed index for imports oscillated around 76%, which indicates a large variation in prices (high level of index for exports in 2016 results from outlier observed values) on Malta, after exclusion of the Malta variable, the coefficient of variation amounted to 77.5%, which nevertheless indicates the high heterogeneity this year).

Table 2. The value of intra-EU exports and imports of milk and dairy products in the years 2015–2017 and growth

EU countries	Total imports (million EUR)				Total exports (million EUR)				balance 2016	balance 2017
	2015	2016	2017	changes 2017/2016 (%)	2015	2016	2017	changes 2017/2016 (%)		
Austria	748	775	868	12.01	1 037	976	1 114	14.09	201	246
Belgium	2 880	3 045	3 780	24.17	2 523	2 663	3 226	21.13	-381	-555
Bulgaria	178	188	224	19.24	90	82	87	6.88	-106	-137
Croatia	163	180	226	25.75	24	32	39	21.65	-148	-187
Cyprus	77	77	86	11.71	87	112	137	22.63	35	52
Czech Republic	524	543	619	14.12	586	562	690	22.71	20	71
Denmark	555	536	619	15.53	1 317	1 376	1 599	16.22	840	980
Estonia	58	55	73	32.67	133	137	183	33.75	82	110
Finland	388	367	384	4.69	246	230	262	14.05	-137	-122
France	3 071	3 077	3 842	24.86	4 453	4 193	4 387	4.64	1 116	546
Germany	5 522	5 604	6 900	23.12	6 688	6 553	7 694	17.40	949	794
Greece	727	727	835	14.89	480	516	561	8.80	-211	-274
Hungary	321	344	410	19.14	276	267	350	31.13	-77	-60
Ireland	678	592	765	29.11	1 359	1 291	1 766	36.79	699	1 001
Italy	3 421	3 227	3 640	12.80	2 040	2 149	2 466	14.76	-1 078	-1 174
Latvia	117	128	157	22.55	142	146	221	51.81	18	64
Lithuania	185	184	279	51.96	319	347	475	36.83	163	195
Luxembourg	363	309	339	9.81	395	336	405	20.47	27	66
Malta	48	49	53	9.25	0.0003	0.0060	0.0021	-65.74	-49	-53
Netherlands	2 766	3 067	3 735	21.78	4 201	4 749	5 971	25.73	1 682	2 236
Poland	754	846	962	13.70	1 186	1 190	1 710	43.71	343	747
Portugal	541	528	565	6.92	199	179	207	15.36	-349	-358
Romania	304	383	479	25.15	81	82	99	21.39	-301	-380
Slovakia	320	327	404	23.43	250	227	267	18.05	-101	-137
Slovenia	152	152	181	18.89	139	143	177	24.04	-9	-3
Spain	1 685	1 631	1 879	15.26	836	847	965	13.92	-783	-914
Sweden	878	891	1 021	14.58	213	213	240	12.51	-678	-781
United Kingdom	3 195	3 019	3 438	13.87	1 197	1 147	1 463	27.63	-1 873	-1 975

Sources: Own elaboration on the basis of Eurostat.

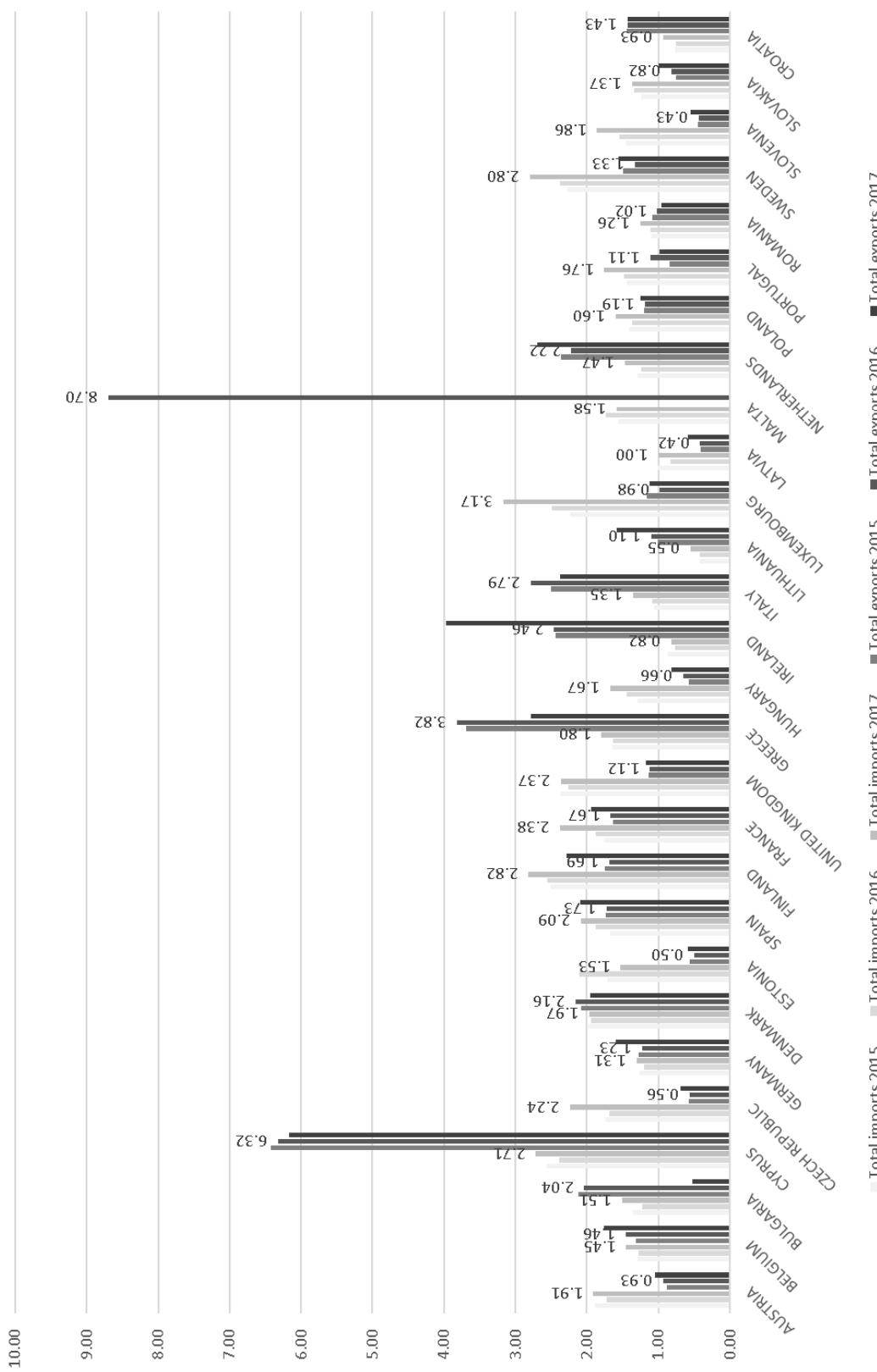


Fig. 3. Price of 1 kg of milk and milk products (EUR) imported and exported on the EU's internal market in 2015–2017 in EU countries and descriptive statistics

Source: Own elaboration based on Eurostat.

The highest import prices of 1 kg of milk and dairy products in 2017 were recorded in Luxembourg (EUR 3.2). The average price in the range of EUR 2–3 can be observed in such countries as Finland, Sweden, Cyprus, France, the United Kingdom, the Czech Republic. In turn, the lowest unit revenue (below EUR 1) was recorded in Latvia, Croatia, Ireland and Lithuania.

In the case of export prices in 2017, the highest values were obtained in Cyprus (over EUR 6) and Ireland (almost EUR 4). In countries such as Greece, the Netherlands, Italy, Finland and Spain, income per unit ranged from EUR 2 to EUR 3. Unit revenues from imports of milk and dairy products below EUR 1 were in Slovakia, Portugal, Romania, Hungary, the Czech Republic, Estonia, Latvia, Slovenia, Bulgaria, Malta.

CONCLUSIONS AND IMPLICATIONS FOR POLICY

In recent years, due to the emergence of various types of negative factors (even after the abolition of milk production quotas, the situation on the European market depends on global trends), the dairy sector faced a serious crisis. This was the result of a dramatic fall in prices in both EU Member States and in most other parts of the world. Therefore, the dynamics of change is diversified, and intra-EU trade becomes one of the most important elements of the milk and dairy products market. This is mainly due to the fact that most of the raw material and products are sold on the Community market, and only 10% goes outside the EU. This balances the demand for dairy products in domestic markets, although demand is already saturated in many Member States [Chatellier 2017].

Despite negative factors, intra-EU trade in milk and its products is characterized by constant growth. In 2017, the volume of imports between EU countries increased in relation to 2000 by nearly 77% to over 23 million t and was higher than exports, which increased by almost 58% to 22 million t. At the same time, the share in intra-EU aggregated imports and exports also shows an upward trend. Imports of milk and dairy products on the intra-EU market amount to around 1.2% of the total import volume, and exports to 1.15%. At the same time, in the period from 2000 to 2017, revenues from imports (EUR 36.71 billion)

and exports (EUR 36.77 billion) increased threefold despite large spatial variation.

For many years, Germany has been the largest importer and exporter of milk in the EU internal market. At the same time, Germany is the largest milk producer in the EU. However, this country in 2017 had a trade deficit in milk and dairy products. In addition to Germany, Italy, Belgium, the Netherlands, France, and the United Kingdom have a significant influence on intra-EU trade. Despite this, the largest deficits in international turnover can be observed among these countries. On the other hand, Malta, Cyprus, Croatia, Estonia, Latvia, Slovenia were among the smallest participants in the intra-EU market.

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HANDEL WEWNĄTRZUNEJNY MLEKIEM I PRODUKTAMI MLECZARSKIMI

STRESZCZENIE

W pracy analizie poddano handel wewnętrzny mlekiem i produktami mleczarskimi w latach 1998–2017. Analizie poddano wolumen wewnętrznego import i eksport, saldo bilansu handlowego oraz udział importu i eksportu mlekiem i produktami mleczarskimi w handlu wewnętrznym ogółem w Unii Europejskiej w latach 2000–2017. Ponadto podano cenę (EUR) 1 kg mleka i przetworów mlecznych importu i eksportu w obrocie wewnętrzny w latach 2015–2017 w krajach UE. W pracy zastosowano metody tabelaryczne, graficzne oraz statystykę opisową. W latach 2004–20014 roku wielkość eksportu wewnętrznego przeważała nad importem. Z kolei w latach 2015–2017 zauważalny jest wyraźny trend spadkowy oraz wzrost nadwyżki importu nad eksportem mleka i produktów mlecznych na rynkach wewnętrznych UE.

Słowa kluczowe: mleko, produkty mleczne, eksport, import, saldo