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Consumption and Internationalization: Determinants for the Development of the Dairy Market in Poland

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Abstract:

Purpose: *The aim of this study is to evaluate selected factors determining the development of the dairy sector production in Poland in view of integration with the European Union.*
Design/Methodology/Approach: *This explanatory research uses secondary data obtained from Statistics Poland (GUS) and materials from the Institute of Agricultural and Food Economics (IERiGŻ) in Warsaw. The research covers the years 2004-2018. Data analysis techniques include dynamic indices, correlation analysis and internationalisation index.*
Findings: *The results demonstrate that for the development of the analysed sector in recent years export sales proved more important than the level and dynamics of domestic consumption. In terms of the internationalisation structure of the dairy sector, a high position of cheeses and cottage cheese can be observed as the main, in terms of value, product group in exports. Among negative tendencies, there are high dynamics of foreign sales of unprocessed products, poor promotion of Polish brands on foreign markets, and accepting sales without own brand. This area exhibits a clear potential for further development of the sector.*
Practical Implications: *The findings give us an interesting signal for building strategies for the internationalisation of the Polish dairy sector, both in terms of institutional support and business decisions.*
Originality/Value: *The study provides recommendations for the dairy sector in Poland needed to boost the quality of export-oriented product groups. Dairy sector companies must attentively observe the market and boost internal demand to better compete with imported products.*

Keywords: *Export, globalisation, domestic market, demand, dairy products.*

JEL codes: *Q17, E21, E23, F15.*

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1. Introduction

EU integration and fluctuations in market conditions worldwide cause significant changes in the dairy sector market. This concern, in particular, the adoption of the EU market regulation system and the required veterinary standards (Szajner, 2011). Export of dairy products is of significant importance in the agri-food products trade in all EU countries and the worldwide dairy products trade (Bouamra *et al.*, 2008). However, the comparative advantage varies among EU countries and individual product groups (Bojnec and Fertö, 2013). The dairy sector is facing numerous challenges, one of the most important being those of an institutional nature (including the Luxembourg reform of the common agricultural policy, EU enlargement and World Trade Organisation negotiations) (Bouamra *et al.*, 2008).

Those are the western European Union countries that are the centre of milk production. Milk production itself is diversified across individual EU countries. The four countries with the largest milk production are Germany, France, Great Britain, and Poland. Variation in the economic situation of dairy farms in the EU mostly results from location and production efficiency (Bórawski and Dunn 2015; Gołaś, 2017).

Milk production constitutes an important issue in both the European Union and in Poland. Despite the fact that Poland is among the most important producers of this basic food product, it faces various challenges (Suchoń, 2016). One of the main problems that Polish dairy farming faces, however, is low yield output, although this has increased since Poland joined the EU, but it is still lower than in the EU-15. The downward trend in milk purchase prices, lasting from mid-2008 to mid-2010, resulted in a reduction in dairy cow headage. The number of milk suppliers and farms rearing cows has decreased even faster. The drop in profitability of production in the aforementioned period caused production concentration, which was accompanied by an increase in its output yield. For comparison, before Poland's accession to the European Union, 60% of the produced milk was sold for industry, while in the years 2009-2010 80% of the produced milk was allocated for sale, 73% of which was purchased by the dairy industry. In 2019 it reached 85%. The concentration of production also had an impact on increasing the productivity of dairy cows. It should be noted that it still remains much lower than the EU average productivity (Olkowska, 2012). Improving the competitiveness of dairy production in Poland and in other countries with low production output per cow requires improvements in both genetics and management. Genetic progress and better management can increase milk production, reduce costs, and improve the competitiveness of milk production in the EU and on world markets (Bórawski and Dunn, 2015).

The concentration process in milk processing is slower than in production. Due to the dominant form of ownership being dairy cooperatives, consolidation in dairy processing is less rapid than in other industries (Bober, 2013). Despite the reduction

in the number of milk processing plants, Polish plants do not fully exploit the processing capacity of the dairy industry which, due to overcapacity, causes high costs and makes it difficult to benefit from economies of scale. The increase in world demand for dairy products and trade turnover observed since mid-2009, which grew faster than milk production, resulting in a favourable economic situation and thus in an increase in the prices of dairy products (Zmiany na rynku mleka, 2011). The Polish dairy sector is burdened by low internal demand and a high dependence on the economic situation on world markets. The fact that supply outgrows demand has for many years made Poland into an exporter of milk and dairy products (Rynek mleka, 2019).

In this context, it would be interesting to investigate to what extent the production volume of milk and its products is affected by the level of domestic consumption of these products, and to what extent by the internationalisation of the sector expressed in terms of export volume. Accordingly, this paper aims to examine selected factors determining the development of the dairy production sector in Poland in view of integration with the European Union. The results obtained will constitute an important guide for enterprises and state institutions creating policies related to this sector and concerning strategic solutions for the further development of Polish dairy farming.

The paper is structured as follows: the first part briefly discusses the main growth determinants of the dairy market and reviews the relevant literature. The research method and the results of the empirical studies are then presented. Finally, certain concluding remarks and further research suggestions are provided in the final section.

2. Conditions for the Dairy Product Market Development

Important processes influencing both the dynamics and quality of consumption and production include the integration and globalisation of economies and markets. They cause changes not only in the functioning of economies in individual countries but also in societies and households (Włodarczyk, 2015). In the consumption sphere, these processes determine the direction of changes in contemporary societies standardizing consumption, consumer purchase patterns and behaviours (Sobczyk, 2017). The expansion of global brands and the intense development of retail chains, as well as the popularization of the Internet and the associated virtualization of consumption, have made it increasingly homogeneous. This results in new shopping and consumption habits of consumers, also affecting the dairy market.

Globalisation is the main factor in homogenising consumption, which manifests itself in the similarity of lifestyles across various age and social groups, as well as a departure from traditions in terms of consumer behaviour. Distribution processes using international sales networks of products offered by global manufacturers boost consumption unification resulting from the standardization of goods and services

and mass production (Kłosiewicz-Górecka, 2015). Globalization in the sphere of consumption is associated with the uniformity of the buyers' needs in most countries, and, consequently, the unification of consumption patterns, levels, and structure. This caused the transformation of domestic consumers into global consumers with an internationalist attitude (Wierzejski and Jakubowska, 2017). Initially, imported food attracted consumers by both quality and attractive packaging, whereas the domestic assortment was perceived as inferior to the prestigious Western goods. However, it should be noted that the unification of consumption patterns under globalized conditions encounters some barriers, which are particularly significant for food. Some consumer groups reacted to the internationalization of consumption patterns with a need to emphasize and maintain national distinctiveness (the so-called consumer ethnocentrism) (Bianchi and Mortimer, 2015). Many consumers consciously seek to make their purchases, preferences, and lifestyle more individual.

The demand for dairy products can be deemed relatively inflexible on an aggregate level. However, changes in demand for different dairy products are far from uniform. While demand for cheese and fresh dairy products is increasing, the demand for liquid milk or butter is stagnating or declining. Thus, the total demand for milk fat is growing less than the total demand for milk protein (Baumra *et al.*, 2008). However, as Rimkus and Karlaitė (2011) emphasise, the role of dairy production in the export of agricultural and food products will become more important in the future, among others, due to the growing recognition and demand for natural and organic production. Although de Graaf *et al.* (2016) stress that consumers who declare their willingness to purchase such products (in their study of milk produced with respect to animal welfare), only in a few cases do they actually implement this intention. However, as Palupi *et al.* (2012) emphasise, the organic food market is among the fastest-growing markets. Market participants, including consumers, are becoming increasingly interested in this sector.

Thus, especially for smaller enterprises, their operation exclusively on the domestic market would constitute a factor limiting its development opportunities and improvement of its competitive position. Global competition forces companies to seek new sources of competitive advantage. Traditional strategic concepts, such as strategic matching of resources and capacities (Ansoff) or traditional competitive strategies (Porter), are losing their importance under global market conditions.

Chang *et al.* (2009) argue that economic development is impossible without good export performance and thus confirms the validity of drafting a policy promoting exports. Rodrik (2009) presents a number of theoretical arguments in favour of stimulating certain economic activities necessary to promote structural changes. Discussions on economics in a crisis period also indicate some shortcomings and errors in establishing a growth and development model for economies in the transition period. The growth model for economies in the transition period should be reoriented towards exports. Export-oriented companies engage in more innovative

activities and exhibit better capacities in implementing innovations compared to other companies. Differences in the productivity export companies may open new development paths and facilitate the necessary structural changes towards the desired growth model in transition economies. Research shows that the best effects in company modernisation can be achieved if companies export to more developed and demanding markets and this is due to the size and level of competitiveness of these markets (Oleszczuk, 2019).

Solomon *et al.* (2005) analysed the omnipresent view that exports and domestic sales are independent of each other and showed that in reality domestic and export sales complement each other. For domestic companies, export sales appear to be driven by existing strengths in the domestic market. In the case of FIEs, domestic and export sales are substitutes, which means that domestic sales negatively affect export sales. It seems that when managing domestic sales in the wider context of an international network, foreign companies tend to make a trade-off between domestic and export sales. Simultaneously to the growth of foreign economies which affect exports, the growth of the domestic economy affects domestic sales.

However, the growing import intensity of global exports, which accompanies the development of globalisation processes, constitutes an important phenomenon in the global market. Together with the global growth in the export value of industrial production, the share of the global added value of export is decreasing. Regardless of the level of economic development, a decrease in the share of the national added value of industrial production exports among total industrial production exports is observed due to the progressing fragmentation of production processes. In Poland, exports are characterised by high import intensity. This may be indicative of underdeveloped enterprises which cannot compete with other global brands and thus concentrate on the central links of the value chain (Oleszczuk, 2019). In the case of dairy products, the simultaneous import and export of milk and dairy products may result from price variation across the markets, the industry willingness to fully exploit the production potential, or the desire to provide a diversified market offer.

As scientific research shows, the premise most frequently mentioned by Polish companies as decisive for their engagement in export activities was the size of the foreign market (understood as the number of potential customers) and the possibility of increasing the scale of production or making fuller use of domestic production capacities (Żbikowska, 2012).

The motives behind internationalisation all involve achieving company business objectives and may also be a response to the chances and opportunities of the market. Internationalization can take both proactive and reactive forms (Pluta-Olearnik, 2014). The proactive form involves searching for markets abroad, whereas reactive forms are rather about following clients into foreign markets. Reactive internationalisation is the main strategy of companies that serve large international corporations (Puto, 2016).

Economic integration within the European Union, including the creation of the internal common market, the unification of business activities and processes of de-monopolisation and liberalisation of the Euro-zone by eliminating the remaining barriers, regulations and licenses in individual economic sectors have largely contributed to an increase in the internationalisation of enterprises.

Especially in the last dozen or so years, changes in the market conditions in Poland related to EU accession have significantly contributed to the emergence of Polish enterprises implementing the concept of early and rapid internationalisation on foreign markets (Komor, 2014). The domestic supply and demand situation, in particular, low demand, pushed companies from the dairy sector to actively search for external sales markets. Foreign trade results and an assessment of competitiveness clearly indicate that the dairy industry enjoyed great success in external markets. Positive modernisation changes are evidenced by changes in the structure of exported goods and an improvement in the competitiveness of cheese and butter exports. Companies in this sector were well prepared to introduce their products to the EU market (Szajner, 2011).

Optimistic global export indicators may prove both the growing competitiveness of Polish enterprises and their great adaptability to the dynamically changing international economic environment. At the same time, many companies are struggling with searching for new sales markets that would allow them to increase their productivity and boost their further development. The motivation behind engaging in export can be well explained with various economic theories (foreign trade theory) and empirical research. However, the dynamically changing global political and economic situation makes it necessary to constantly engage in new, up-to-date research on the determinants of export destinations, as the export destinations preferred by companies and the hierarchy of their motives may change over time. This is particularly true for many agri-food companies which, due to the unstable situation in trade with Russia, are forced to look for new markets (Salamaga, 2015).

As the research conducted by Bojnec and Fertö (2013) shows, two main groups of countries can be distinguished in the EU with respect to comparative advantage on the global market of dairy products. They concluded that the majority of countries with such an advantage enjoy this very advantage simultaneously in all or almost all links of the processing chain. At the same time, countries enjoying a relative advantage in exports do not enjoy it in all or almost all links of the production and export chain. For the management of dairy supply chain it is thus important to ensure and strengthen synergies in improving the efficiency of the export supply chain at each of the vertical stages of milk production, milk processing and marketing of dairy products and to fully exploit the technologies and other effects resulting from economies of scale and organisational advantages. Strategies aimed at improving competitiveness and processing capacities should also be geared towards diversification of the dairy product chain, starting with differentiation of both

products and their quality, and ending with the development of brands and other marketing activities on the dairy market.

Since dairy products are intended for human consumption and cannot be easily substituted, aggregate demand for dairy products is generally considered to be inflexible in terms of price. In the case of production restricted by milk quotas, any change in aggregate demand for milk has a strong impact on its price, since the change in quantities was regulated by the production quota (Bouamra *et al.,* 2008).

One of the most widely discussed issues relating to the milk market in the European Union includes the abolition of milk production quotas and its potential impact on changes in the geographical structure of milk production in EU countries (Irz and Jansik 2015). Several years before the announced liquidation milk quotas, the EU had already been introducing legal instruments intended to ensure market stability. One of the basic solutions would include associations of farmers. However, such organizations had only established in some countries. The EU allowed the recognition of producer organisations, associations and inter-branch organisations in the milk and milk processing sector to enter into voluntary collective agreements and to make joint decisions on planning milk production. These rules were also extended to include milk cooperatives. Positive economic forecasts of an increase in the consumption of milk and dairy products allow an optimistic prognosis for the dairy market as well. Moreover, changes in public intervention timing and subsidies for private storage also merit positive assessment. The activity of the European Union and Poland in acquiring milk outlet markets is also important. New possibilities of selling dairy products outside Europe, e.g. to Asia or Africa will allow for greater stabilization and exploiting the milk production potential of European farmers (Suchoń, 2016).

On the basis of diary market analysis, it was shown that with milk quotas in force, Poland may increase its exports only if the demand on the internal market drops or imports and intra-industry trade intensity increases at the same time. The planned abolition of milk quotas in 2015 may contribute to an increase in the processing (scale effect) and will have a positive impact on marginal costs and efficiency. Improved efficiency is an essential condition for building sustainable competitive advantages (Szajner, 2011). According to forecasts concerning changes in the dairy market, the abolition of the production quotas would result in a decrease in milk purchase prices in Poland in 2020 on average by 10% when compared to the status quo with respect to production limits. Such a situation would be a consequence of an increase in milk production, but milk purchase prices in EU-15 countries and in Poland will not become equal (Baer-Nawrocka and Kiryluk-Dryjska, 2010; Golik and Żmija, 2014). As Świtłyk and Wilczyński (2012) pointed out, between 2014 and 2020 farm profitability will decrease. The largest drop will be observed in farms with the smallest dairy cow herds, whereas the remaining farms may experience in 2020 a drop in profitability by 20 to 30% when compared to 2014.

As it can be inferred from the report (Rynek mleka, 2019), an increase in milk production was recorded in 2019 (by 3.3% in relation to 2018). The world prices of durable dairy products were comparable to those of 2018. Retail prices of dairy products in Poland in 2019 increased by 1.4% and retail prices of butter decreased by 2.9%. Because food prices generally increased by 4.4%, it can be concluded that dairy products became cheaper in Poland in relation to food in general. In foreign trade, the main factors behind the improvement of results included high demand and relatively high prices of durable dairy products on the world market and growing production and supply of milk to the dairy industry. Factors adversely affecting trade included the Russian embargo maintained since 2014 and the appreciation of the zloty against the US dollar.

Maintaining the developed competitive advantage, and what is even more desirable, strengthening it, will require a very considerable organizational effort. The process of industry restructuring is far from being completed. Entities in this sector dispose of a vast margin for improvement in managing their efficiency. Subsequent stages in restructuring should lead to an increase in the productivity of labour and capital.

3. Research Methodology

The basic empirical material used for this study includes data obtained from Statistics Poland (GUS) and materials from the Institute of Agricultural and Food Economics (IERiGŻ) in Warsaw. To assess the consumption of milk and dairy products, this study used the results of household budget surveys prepared by Statistics Poland. These surveys are carried out with a representative method, which makes it possible to generalise the results obtained to all households in Poland. The research covers the years 2004-2018. The period was selected to show the trends observed after Poland's accession to the EU with uniform EU conditions for conducting business activity in the dairy sector and duty-free access to the EU market.

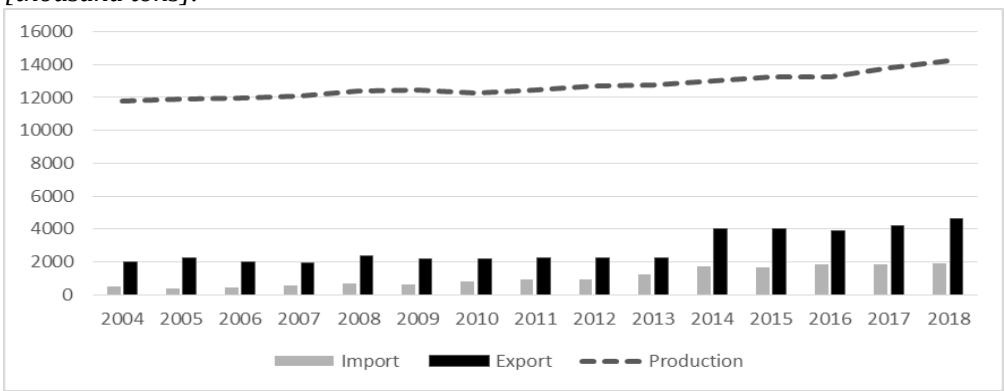
To assess the value of production and export of milk and dairy products over time this study used dynamic indices and correlation analysis to examine correlations between the variables and to determine their strength, direction, and significance. An internationalisation index (w_i), expressed as a percentage of export volume to the total production of the sector and within selected product groups, was also employed (Wierzejski, 2010). The article also uses descriptive analysis with a tabular and graphical presentation of data and the research results.

4. Results

In the analysed period, high dynamics of activity of business entities in the Polish dairy industry was observed. This concerned both the production volume of dairy products and foreign trade (expressed in tons). In 2018, over 14 tons of dairy products were produced in Poland in total, which is 20% more than at the beginning

of the research period. In the same period, exports increased almost 2.5 times and imports as much as 8 times (Figure 1). It should be emphasized that in the entire research period, the foreign trade balance for dairy products assumed positive values, both in terms of quantity and value. In 2018, a positive balance of EUR 1 247.6 million was recorded, which translated into 13% of the total surplus of the Polish agricultural and food trade. As a result of the strengthening of exports, the internationalisation index (w_i) of the dairy industry, calculated as the ratio of export volume to production volume, increased from 14.4% to 32.7%. It should be emphasized that the greatest increase in w_i was observed after 2014, which was certainly related to the liberalization of the EU milk market resulting from abandoning quotas.

Figure 1. *Production, import, and export of dairy products in the years 2004-2018 [thousand tons].*



Source: *Own data analysis based on Rynek mleka 2019; Handel zagraniczny 2005-2019.*

Detailed analysis of various product groups in the dairy industry revealed significant differences. On the supply side, a dynamic increase in the production of low-processed products was observed; liquid milk and cream (166.7), as well as whey (195.5), and also cheeses and curds (159.6) characterized by more added value. Yoghurt (145.1) and ice cream (145.8) were characterised by a relatively lower growth rate. The smallest increase was observed for butter production (125.5). In comparison with production, the high dynamic of export growth mostly relates to low-processed goods. Foreign sales of liquid milk and cream from Poland increased more than 12 times, and whey sales increased 4.5 times. Among highly processed products, the high growth of ice cream exports (904.9) is definitely worth noting, but in relative terms, this group still makes up just a small percentage in the assortment of foreign sales of the sector under analysis. The internationalisation index for each dairy product group also adopted extremely varied values. Milk powder production proved to be the most dependent on export (79.3%). High w_i values were also observed for: "cheese and curd" (31.7%), "butter" (30.8%) and "yoghurt" (28.4%). Low-processed products, whey (13.4%) and liquid milk and cream (17.7%) were the least internationalised at the end of the analysed period.

Table 1. *Dynamics of changes in production and export volumes and the internationalisation index for selected dairy products in the years 2004-2018*

Product group	*Production [2004=100]*	*Export [2004=100]*	w_i *in 2018 [%]*
Liquid milk and cream	166.7	1,282.6	17.7
Cheese and curd	159.6	320.7	31.7
Yoghurt	145.1	241.9	28.4
Butter	125.5	247.8	30.8
Ice cream	145.8	904.9	26.1
Powdered milk	150.6	128.4	79.3
Whey	195.5	458.2	13.4

Source: *Own calculations based on Rynek mleka 2019; Handel zagraniczny 2005-2019.*

Table 2. *Production and export volumes for selected dairy products in 2004 and 2018.*

Product group	*Production [thousand tons]*		*Export [thousand tons]*	
	2004	*2018*	*2004*	*2018*
Liquid milk and cream	2,305.6	3,842.2	52.9	678.5
Cheese and curd	515.0	821.8	81.3	260.7
Yoghurt	256.6	372.1	43.7	105.7
Butter	177.2	222.4	27.6	68.4
Ice cream	194.9	284.2	8.2	74.2
Powdered milk	138.6	208.7	129.0	165.6
Whey	835.1	1632.5	47.8	219.0

Source: *Own calculations based on Rynek mleka 2019; Handel zagraniczny 2005-2019.*

In nominal terms, liquid milk, cream, and whey dominate the production structure of dairy products (Table 2). Cheese and curds also play an important role. Butter, ice cream and powdered milk play a relatively less significant role in production. For export, the disproportions in the structure and position of particular product groups vary. Similarly, as in production, liquid milk and cream dominate, whereas cheese and curd come second. Whey, milk powder, and yoghurt also play an important role in foreign sales. However, with export value (expressed in euro) as a criterion, "cheeses and curds" play the most important role. In 2018, EUR 785mn worth cheese and curd were exported from Poland, compared to EUR 191mn in 2004. This translates into an over 4-fold increase in value and a 32% share in total Polish dairy exports. The second-largest group of goods includes liquid milk and cream (EUR 397 million), whereas butter is the third-largest group (EUR 322.4 million).

Poland's integration with the European Union and access to the single market with its customs union translated into an intensification of trade with Western European countries. Currently, as much as 78.3% of the value of Polish dairy exports goes to

the EU market. The second most important recipient consists of a group of developing countries, with their market share of 17.5%. For many years, major trade partners on the EU market have been Germany (22.1% share), Czech Republic (8.1%), Netherlands (8.0%) and United Kingdom (4.7%). Among the developing countries, there are three that dominate: Algeria (4.2%), China (2.3%) and Saudi Arabia (1.7%). Thus, the applicability of regional economic integration theory (the position of the EU market) and the gravitational trade model (the role of Germany) can be fully confirmed in this case.

Table 3. *Average monthly consumption of milk and selected dairy products in 2004-2018 [kg/litre per person]*

Item	*Product type*				
Year	*Milk [l]*	*Yoghurt [l]*	*Butter [kg]*	*Cheese & curd [kg]*	*Cream [l]*
2004	4.60	0.35	0.37	0.87	0.44
2005	4.43	0.34	0.35	0.87	0.43
2006	4.12	0.37	0.36	0.89	0.41
2007	3.84	0.44	0.36	0.88	0.40
2008	3.64	0.46	0.39	0.88	0.40
2009	3.51	0.47	0.36	0.92	0.40
2010	3.51	0.54	0.36	0.95	0.38
2011	3.42	0.54	0.33	0.94	0.37
2012	3.41	0.52	0.34	0.95	0.38
2013	3.35	0.51	0.34	0.83	0.37
2014	3.26	0.50	0.35	0.82	0.36
2015	3.16	0.50	0.38	0.83	0.35
2016	3.08	0.53	0.39	0.85	0.36
2017	2.99	0.52	0.38	0.86	0.36
2018	2.94	0.52	0.38	0.87	0.35

Source: *Own data analysis based on Statistics Poland - GUS (2004-2018).*

The milk and dairy product consumption profile in Poland changed over the years 2004-2018. In the analysed period, the average monthly consumption of milk reduced significantly, which mirrors the trend in developed countries over the last 20 years (Park *et al.*, 2019). Adults in developed countries tend to consume more milk than in developing countries (Petherick, 2016), whereas teenagers and young adults tend to consume less milk than older adults because they substitute milk with sweet drinks or fruit juices (Petherick, 2016; Singh *et al.*, 2015).

A slightly upward tendency was observed in the consumption of cheese and cottage cheese in Polish households until 2012. Yoghurt consumption remained stable since 2010 and the consumption of cream has been falling. According to data from Statistics Poland, in 2018 total balance milk[4] consumption in Poland was 2.8%

[4]*Milk consumption including milk intended for processing, without milk processed into butter.*

higher than in the previous year. Note that this increase occurred under favourable economic conditions on the international market and in the period of increase in the prices of dairy products in relation to food in general (Milk market...). It is estimated that the factors stimulating the increase in consumption included the continuing good income situation of the population thanks to the increase in salaries and the implementation of the "Family 500+" program, changing the consumption model in which animal proteins have a growing share. In Polish households, the level of milk and dairy product consumption correlates strongly with their economic characteristics. The relatively high price of dairy products, compared to the price of meat, results in lower consumption of, for example, ripened cheese in low-income households (Grzybowska-Brzezińska and Grzywińska-Rąpca 2016).

***Table 4**. Correlation coefficient between production volume, consumption, and export of selected dairy product in the 2004-2018 period*

Product group	*Correlation coefficient production - consumption*	*Correlation coefficient production - export*	*Correlation coefficient consumption - export*
Dairy products in general	0.6846	0.9193	0.4235
Liquid milk and cream	-0.9325	0.9238	-0.8369
Cheese and curd	-0.2744	0.9836	-0.4447
Yoghurt	0.8636	0.8738	0.8137
Butter	0.4612	0.8481	0.4248

***Source:** Own calculations based on Rynek mleka 2019; Handel zagraniczny 2005-2019.*

In order to assess the correlation between the increase in the production of the dairy sector in Poland and the volume of domestic consumption and exports, correlations were determined (Table 4). First, the relationship was assessed between production and consumption. The obtained correlation coefficient values did not allow clear conclusions to be drawn. An analysis of the whole sector revealed a positive correlation between the assessed values (0.6846). However, with respect to specific products, this relation also assumes negative values, which indicates that production growth took place simultaneously with a decline in domestic demand. Such a result was recorded for "liquid milk and cream" (-0.9325) and, to a lesser extent, for "cheese and curd" (-0.2744). The correlation coefficient for butter was 0.4612, which translates into a positive but not strong correlation between the variables. The yoghurt market was characterized by the greatest positive correlation and only in this case can we speak of a positive correlation between production and domestic consumption.

Different conclusions should be drawn when evaluating the correlation coefficients between production volume and the export of dairy products from Poland. In this case, both as a whole and within the assessed product groups, the values of correlation coefficients proved unambiguous with their high, positive values. This is

indicative of a strong correlation between the boost in production volume and foreign sales. Among the analysed products, the highest correlation coefficient was recorded for cheese and curd (0.9836), liquid milk and cream (0.9238), while it was slightly lower for butter (0.8481) and yoghurt (0.8738).

The values obtained for the correlation between domestic consumption and foreign sales confirm the results obtained earlier. The products most dependent on export include liquid milk and cream, as well as cheese and curd. In the case of yoghurt, however, it can be concluded that their production volume is correlated with domestic consumption and export to a similar extent.

5. Discussion and Conclusions

When assessing the impact of consumption and internationalization of the dairy sector in Poland, it can be concluded that it has significantly evolved over the last few decades. This sector is subject to constant adjustment processes due to significant events that Poland experienced over the last few decades. The political transformation of the 1980s was the first one, followed by Poland's accession to the European Union in 2004. This resulted in the necessity to significantly restructure the institutional environment for production and processing companies in the agri-food industry. Of all agricultural markets, it was the dairy sector that experienced the most dynamic changes. It was due to the use of extensive intervention mechanisms on the milk market in the European Union (EU), consisting, among others, in limiting production and applying a wide range of subsidies for farmers (Judzińska and Łopaciuk, 2012). In the EU, milk quotas were already introduced in the mid-1980s. In Poland, this mechanism was in operation from 2004 to 2015.

Export of milk and its products is important for the sector to achieve positive financial results. At the end of the analysed period, about 1/3 of dairy production in Poland ended in foreign markets. Moreover, the value of exports at the level of EUR 2 422 million in 2018 means that this sector generated 8.2% of the value of the Polish exports of agri-food products generated by this sector. This significance is even greater as the demand in the domestic market exhibited a downward trend. This situation made dairy plants actively seek outlets and, in view of declining domestic consumption, opportunities for investing their surpluses on external markets. This allowed major progress to be made in terms of veterinary standards in milk production and processing.

Statistics on household budgets by Statistics Poland (GUS) (2004-2018) shows that with an increase in the population's income, the level of food spending increased in real terms. Along with a simultaneous decrease in the consumption of many food products, this means that the Polish consumer often does consume less but prefers more expensive food of higher quality. Moreover, relatively low growth, and sometimes a decrease in food consumption in quantitative terms, partially results from the increase in demand for the so-called convenient, highly processed food.

This means that with increasing real expenditure levels, food processing benefits from an increasing proportion of these expenditures

This research allows several conclusions to be drawn and to formulate recommendations for state and non-governmental institutions involved in supporting the Polish dairy industry. First of all, it can be unequivocally stated that for the development of the analysed sector in recent years, export sales proved more important than the level and dynamics of domestic consumption. On the one hand, it is a positive signal indicative of the growing international competitiveness of Polish dairy products. On the other hand, it leads us to formulate another research question about what determinates relatively low domestic demand. In addition, the strong export concentration on the EU market, and particularly in Germany, may raise some concerns. Greater diversification of outlet markets would provide more protection against dependence on a single trade partner.

In terms of the internationalisation structure of the dairy sector, a high position of cheeses and cottage cheese can be observed as the main, in terms of value, product group in exports. High dynamics of foreign sales of unprocessed product such as liquid milk, cream and whey constitutes a less positive signal. Additionally, the weak promotion of Polish brands on foreign markets and accepting sales without branding definitely constitute a negative tendency. This area certainly exhibits clear potential for further development of the sector. The consumption on the domestic market can be perceived in a similar way. When evaluating consumption trends in the EU member states and the fast growth in household income in Poland, it is hard not to notice the opportunities for increasing sales on the domestic market.

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