Impact of the COVID-19 pandemic on food processing and Polish agri-food exports

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Abstract

The SARS-CoV-2 virus began to spread worldwide just weeks after its detection. Everyone is concerned about the effects of the COVID-19 pandemic caused by this virus. This article aims to assess the impact of the pandemic on the food processing sector and Polish agri-food exports. The article outlines the determinants of the situation in which the Polish food sector found itself at the eve of the pandemic, analyzes some production, financial and commercial data gathered during several months of its duration, and indicates possible consequences of the pandemic and potential directions of changes in the sector. The analysis shows that the sector is coping fairly well with the crisis caused by the COVID-19 pandemic. The pandemic should not result in a massive wave of business insolvencies and bankruptcies, and the only negative consequence may be a temporary slowdown in the sector's development, mainly due to fluctuations in the growth dynamics of Polish agri-food exports. The growing demand in Poland and abroad and the still lower production costs in Poland compared to other countries allow for the maintenance of the upward trend in the production and export of agri-food products, and thus the continued favorable condition of the sector. Appropriate economic policy and the involvement of entrepreneurs may also help maintain the current level of development of the Polish food sector.

Keywords: agri-food exports, COVID-19 pandemic, food industry, SARS-CoV-2 virus.

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Introduction

For several months now, the whole world has been anxiously watching the spread of SARS-CoV-2. Everyone is afraid of its immediate and long-term health effects. And although human health and life are perceived as the highest commodities, from an economic point of view, the effects of the COVID-19 pandemic on the economy also deserve attention[1]. Meanwhile, a credible assessment of these effects, inter alia, for the food industry and foreign trade in agri-food products, is currently not fully possible. This is mainly due to the advancement of the pandemic, the scale and direction of its spread, and insufficient knowledge about the value and scope of support for the food market, both on the part of the state and EU institutions. The latest reports indicate that the pandemic has not yet entered its downward phase. Moreover, there is talk of further waves of the pandemic, which may turn out to be a big challenge for the economy. It is therefore impossible to precisely estimate the effects of a phenomenon that is continuously developing.

The study aims to assess the impact of the COVID-19 pandemic on the food industry and Polish agri-food exports. The determinants of the situation in which the Polish food sector found itself at the eve of the pandemic were presented, some production, financial and trade data for several months of its duration were analyzed and the possible consequences of the pandemic or potential directions of changes in the sector were indicated. In their deliberations, the authors used unpublished data from the Central Statistical Office (GUS) and the Ministry of Finance, as well as press reports and information from economic practice.

Conditions of the food industry

One of the most important factors determining the food market supply is the state and condition of the food industry. In the period after the systemic transformation, and then after Poland's accession to the European Union, the production potential of the food industry was significantly expanded and modernized. As a result, food industry enterprises were adjusted to EU sanitary, veterinary, phytosanitary, animal welfare and environmental standards. As a result, the Polish food industry is currently among the European leaders in terms of modernity, and Polish producers

1. T. Herzfeld, *Komentarz w sprawie SARS-COV-2 i polityki rolnej*, "Zagadnienia Ekonomiki Rolnej" 2020, nr 2, p. 3–6.

can compete on equal terms with food producers from other EU Member States. It is all the more crucial considering the production potential of the Polish food industry significantly exceeds the needs of the domestic market. This is indicated by the sector's value share of exports in sold production, which in 2019 amounted to approx. 44%, with a simultaneous significant inter-industry differentiation. It was particularly high (over 60%) in the poultry, fish, confectionery, fruit and vegetable industries, and high (approx. 50%) also in the meat industry (mainly in the beef sector), oil and juices and beverages. The level of utilization of production capacity in the Polish food industry before the crisis caused by the SARS-CoV-2 virus could be estimated at approx. 80%, also with significant differences between individual sectors. For example, in the meat industry it was 70–80%, poultry – 80–90%, fish – 75–80%, dairy – 90–92%, fruit and vegetables – approx. 80%, sugar – 84–92%, mill and feed – approx. 70% each[2].

It can be expected that enterprises belonging to the industries with the most unused production capacity and those most export-oriented (e.g. the beef sector), in a situation of continued pandemic threat and difficulties in international trade, will be the first to experience problems with selling their products. They will try to redirect their production to the domestic market, which will improve supply, but it will only be partially possible. The entirety or most of the supply directed for exports thus far will certainly not be able to be allocated on the domestic market, which will first result in a decrease in prices, and then – a decrease in production.

Another equally important phenomenon characterizing the situation of the food industry is the relatively low level of production concentration. It results mainly from the lower level of technical development of this sector and the variability of processed agricultural products. Among the important features of food processing, it is also necessary to point out its high connection with local and regional markets, assortment diversity, typically short shelf life of products and short production series of some products. These features of food production create opportunities not only for large entities, but also for micro, small and medium-sized enterprises operating in this sector.

According to GUS data[3] in 2018, 16.9 thousand people conducted production activities in the food industry entities, including:

– 11.4 thous. micro-companies, constituting 67.6% of all food companies, whose share in sales was only 5.3%;

2. I. Szczepaniak et al., *Przemysł spożywczy w obliczu pandemii COVID-19*, "Przemysł Spożywczy" 2020, nr 5, p. 2–7.
3. GUS, *Rocznik Statystyczny Przemysłu*, Warszawa 2020.

– 4.1 thous. small industrial companies, which accounted for 24.2% of all food companies, and their share in sales reached 11.5%;
– 1.1 thous. medium-sized enterprises, i.e. 6.5% of all food companies, with a 26.4% share in sales;
– 295 large companies which accounted for only 1.7% of the entire group, but their share in sales was as high as 56.8%.

For many years, the influence of large enterprises in the Polish food industry has been increasing, albeit, at the expense of micro, small, and medium-sized companies. This is evidenced by the increase in the sector's share value of the largest units of sold production, the weakening of the position of small and medium-sized enterprises, and the decreasing share of micro-enterprises. The final effect of the changes in the subjective structure of the Polish food industry, which took place during the period of integration with the EU and in the conditions of globalization of the world economy, turned out to be beneficial, as the position of the entities in this sector on the EU and world markets was strengthened.

Data on the subjective structures of individual divisions producing food and beverages confirm a large cross-industry differentiation, which is also important for the functioning of food producers during the pandemic. The individual branches of the food industry can be divided into[4]: very fragmented, in which 20–40% of production is produced by small companies (bakery, milling, pasta production); fragmented, in which 10–20% of production is produced by small industrial companies (meat, fruit and vegetables, feed); with a high degree of concentration – sugar (where 100% of production is produced by large companies), tobacco (98%), brewing (90%), soft drinks (78%), sweets (76%), dairy (72%), fish (70%) and persistent confectionery, oil, food concentrates, spirits, in which over 60% of sold production is produced by large companies.

The business structure of the food industry in Poland is therefore quite diverse, which during a pandemic can be considered both favorable and unfavorable. It is advantageous because the suspension of production in one enterprise should not disturb the entire market, even the local one. On the other hand, micro and small entities are generally economically weaker and during a crisis, they will be the first to experience problems with maintaining financial liquidity and staying on the market. Large companies have a much better chance of survival. The longer the economy remains closed (even only partially), resulting in impediments in the international transport and the closing of the HoReCa sector, the longer these enterprises will have problems with sales and financial liquidity and cases of smaller companies

4. Own study based on unpublished data from the Central Statistical Office.

going bankrupt will become more prevalent. Such a situation may, however, induce the strongest entities in the sector to become active in the area of mergers and acquisitions, which will result in the acceleration of concentration and consolidation processes in the Polish food industry.

The impact of the pandemic on the production and financial situation of the food industry

Food producers were less affected by the COVID-19 pandemic than other sectors of industrial processing, as the products produced in this sector are essential goods, and therefore have a lower income elasticity of demand. Market observations and reports from economic practice confirm that the food sector has been doing well during the course of the pandemic. Food and beverage producers are putting in a lot of effort to ensure that the food production process proceeds without major disruptions, and by minimizing the impact of difficulties related to the SARS-CoV-2 virus on work efficiency, they have done everything to maintain the continuity of supply of their products so that consumers do not experience price fluctuations or production shortages. In food-producing enterprises, the priority is to implement solutions to ensure production safety and greater care for the health of the staff, which affects the maintenance of production continuity in plants. Manufacturers faced the challenges of reorganizing work, adapting to new legal standards and the additional costs associated with it, in other words minimizing the risk, while maintaining business stability in the long term. Maintaining production in the event of SARS-CoV-2 infection has become the biggest problem for each enterprise. Such incidents have already occurred, but food companies have dealt with them and there was no need to stop production altogether. The measures taken were related to the reorganization of activities in departments in which infections appeared among the crew.

Preventive measures taken by food businesses have undoubtedly helped to alleviate potential supply problems, but nevertheless, some market segments experienced declines in production. In other areas, there were opportunities for the development of new production lines.

The currently available GUS data on the production volume for January – August 2020 from medium and large industrial companies (Table 1) shows that the production dynamics of major industrial products, by basic product groups, varied in this period, and 42 of the analyzed product groups was higher than in the corresponding period of the previous year, while in the remaining groups it did

not reach the level from the previous year. The studied groups of products can be divided into four categories depending on the dynamics of their development:

1. High growth rate (increase by over 10%) was recorded in the production of pet food, groats and buckwheat meals, vegetable marinades, ready-made meals and dishes based on meat and vegetables, wheat and barley groats and meals, canned fish, pasta and canned poultry.
2. Moderate development (increase by 2–7%) occurred in beef and veal products, as well as in the production of butter, margarine and liquid milk, poultry meat, wheat flour, feed for farm animals, cigarettes, fresh cheese and chocolate.
3. A stabilization or a slight decrease (no more than 10%) can be seen in the production of yoghurts, standardized cream, powdered milk and cream, ripened cheeses, mineral waters, carbonated, unsweetened and non-flavored, beer, soups and broths, frozen, frozen vegetables sea fish, waters with added sugar, pork products, rye flour, fruit wines, pure vodka, cold meats, chocolate candies; a deeper decline in the production of fresh bread, fruit and vegetable juices, frozen fruit.
4. A large drop (by several dozen percent) took place in the production of canned beef and veal, canned pork and frozen sea fish.

Table 1. Dynamics of production of major industrial products* (in %)

Description	I–III 2020	VIII 2020	I–VIII 2020
	I–III 2019 = 100	VIII 2019 = 100	I–VIII 2019 = 100
Beef and veal products	97,4	119,4	106,8
Pork products	85,9	92,3	94,9
Poultry meat	97,7	100,9	104,3
Cold cuts	91,7	94,9	92,4
Canned poultry	118,7	96,4	110,5
Canned pork	70,4	66,6	72,4
Canned beef and veal	34,3	36,2	35,1
Frozen sea fish	71,8	63,7	75,4
Frozen sea fish fillets	94,9	87,4	96,1
Canned fish	110,9	100,6	113,1
Fruit and vegetable juices	73,8	117,0	86,6
Frozen vegetables	106,5	88,7	96,4
Vegetable marinades	122,2	103,9	127,2
Frozen fruit	69,7	160,6	86,1

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Table 1. Dynamics of production of major industrial products* in % (cont.)

Description	I–III 2020	VIII 2020	I–VIII 2020
	I–III 2019 = 100	VIII 2019 = 100	I–VIII 2019 = 100
Margarine	111,3	95,9	105,9
Liquid milk	106,4	104,7	105,5
Standardized cream	105,4	95,9	99,4
Powdered milk and cream	89,0	89,7	99,1
Butter	101,3	97,8	106,1
Maturing cheeses	105,7	91,0	99,1
Fresh cheese	105,2	100,2	102,5
Yoghurt	104,4	94,3	100,3
Wheat flour	108,3	98,7	104,1
Rye flour	100,7	81,5	94,1
Wheat groats and meal	118,8	76,2	123,1
Barley groats and meal	136,7	84,4	116,6
Buckwheat groats and meal	139,4	50,3	130,9
Fresh bread	97,8	79,8	88,5
Pasta	123,0	99,3	112,6
Chocolate	101,8	99,1	101,6
Chocolate candies	101,5	78,9	92,2
Ready-made meals and meat-based dishes	127,0	109,8	125,0
Ready-made meals and vegetable dishes	112,2	135,8	124,4
Soups and broths	98,4	73,3	96,6
Livestock feed	103,4	99,2	103,4
Pet food	130,8	127,3	135,5
Pure vodka	91,7	90,2	92,6
Fruit wines	96,7	73,3	93,1
Beer	105,3	94,4	96,9
Mineral and carbonated unsweetened and unflavoured waters	109,1	130,3	98,3
Water with added sugar	104,7	101,1	95,6
Cigarettes	94,1	105,1	103,1

* Applies to entities employing over 49 people.

Source: Own study based on unpublished data from the Central Statistical Office.

Moreover, it should be emphasized that there was a very large increase in the production of certain products with a long shelf-life (in smaller product groups), which took place in the first month of the epidemic and was the producer's response to a sharp increase in demand[5]. The earliest and fastest-growing demand was for products such as groats, rice, pasta, flour, canned poultry and fish, frozen and ready-made food. Manufacturers immediately responded to this signal, increasing their production by up to several dozen percent. However, this demand was short-lived, and therefore the production of some products returned to levels from previous months.

The trends in the production of individual products of the food industry were the result of many phenomena not only on the demand side (increased demand for shelf-stable products, export limitations and a decrease in demand from the HoReCa sector), but also on supply (staff constraints, broken supply chains of raw materials) and a decline in consumer purchasing power and exchange rate fluctuations.

Changing purchasing habits and the emergence of new consumer trends are changing the structure of the demand for food, to which producers have to adapt. Nowadays, after a period of buying in bulk, consumers have entered the phase of purchasing less frequently but in larger quantities. Ecological, traditional and big-brand products are popular because their health and nutritional values are appreciated to a greater extent. For food safety, packaging is also important – products that are hermetically sealed and those sold in bulk packaging have an advantage. The opportunity for the development and growth of production of food companies is not only to adjust the structure of supply to the changing structure of domestic demand, but also to acquire and recognize new markets where food shortages have become apparent.

Economic and financial results of food companies for the first half of 2020[6] indicate that the food industry has handled the business challenges posed by the first wave of the pandemic crisis. In the group of food industry enterprises employing over 9 permanent staff members, which submitted financial reports F-01/I-01 to the Central Statistical Office, there was an increase in sales revenues (by 2.6% compared to the previous year's level). The increase in these revenues was recorded in the production of food products (by 3.4%), and in the production of beverages there was a decrease in turnover (by 3.1%). Net revenues (from sales, other operating and financial revenues, less indirect taxes) of both these sectors in the first half of 2020 were 2.9% higher than a year ago. Due to the relatively lower increase in total

5. See. J. Drożdż, R. Mroczek, *Przemysł spożywczy – rozwój w warunkach zmian otoczenia zewnętrznego*, "Przemysł Spożywczy" 2020, nr 8, p. 6–13.
6. Own study based on unpublished data from the Central Statistical Office.

operating costs, the financial result of food producers in the first half of 2020 was higher than in the previous year, and the achieved profitability ratios exceeded the level of 2019. The net profit ratio increased by 0.6 percentage points, i.e. to 4.4%, including an improvement in the production of food products by 0.8 percentage points. (to 4.1%), and beverages decreased by 1.1 percentage points. (up to 8.4%).

The relatively high dynamics of the food industry development and the favorable economic and financial situation of companies in the first half of 2020 allow us to conclude that this sector – producers of essential goods – turned out to be quite resistant to the crisis caused by the COVID-19 pandemic. However, it should be noted that in the production of food products, the increase in sales was supported by higher profits, and in the production of beverages, the attempt to maintain sales at a relatively stable level took place at the expense of margins, but their level remained high.

The possible impact of the pandemic on selected sectors of the food industry

The situation is so dynamic that possible future transformations of the sector's entity structure and changes in the production and economic situation in food processing will depend on many factors, such as[7]:

- the rate and scale of the development of the COVID-19 pandemic and its duration;
- introduced restrictions related to people gathering and traveling;
- the economic stability of the country (maintaining jobs and the level of income of the population, resulting largely from the effectiveness of tools and protective mechanisms provided by the state);
- maintaining a high level of agri-food exports;
- an efficient food chain, including the supply of raw materials for processing (also imported) and distribution of food for consumption (also to the HoReCa sector);
- the specifics of production in individual sectors.

The impact of the COVID-19 pandemic may be more or less noticeable and varied depending on the specificity of production and the operating conditions of individual sectors of the food industry. Table 2 shows the possible impact of a pandemic in the short and long term on selected industries in this sector.

7. I. Szczepaniak et al., *Przemysł spożywczy…*, op. cit.

Table 2. Possible impact of the COVID-19 pandemic on selected sectors of the food industry

Food industry sectors	Changes	
	in the short term (1–3 months)	in the long term (3 months or longer)
Meat	– turbulence in the export of meat may increase its supply to the domestic market, especially beef – partial change of the production range (higher production of canned goods and packaged products) – some small companies may suspend production due to lack of employees, which will make it difficult to maintain financial liquidity	– possible bankruptcies of economically weakest entities (especially micro and small companies) – activity of economically stronger entities in the area of mergers and acquisitions, and as a result, an increase in industry consolidation – change in the assortment structure of production (if possible, in line with market requirements), which will also change the scale of revenues of individual companies – persistent problems with the export of meat may increase its supply to the domestic market, especially beef, or reduce production and sales – limiting exports and directing more supply to the domestic market may cause a drop in the prices of some products
Poultry	– turbulences in the export of poultry meat may increase its supply to the domestic market, which may cause its prices to fall – limited possibilities of managing poultry meat in the country may lead to a temporary limitation of production in plants	– in the event of a deterioration in household income, the consumption of poultry meat may increase, as it is cheaper than pork and beef – persistent problems with the export of poultry meat may, with the limited capacity of the internal market and limited storage options, result in a permanent reduction in production and sales
Fish	– possible turbulences in the export of fish products and in the import of fish for processing, which will translate into a decrease in the production level – partial change of the production range (higher production of canned fish)	– limiting exports and changing the range of production will change not only the structure, but also the scale of revenues of individual companies

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Table 2. Possible impact of the COVID-19 pandemic on selected sectors of the food industry (cont.)

Food industry sectors	Changes	
	in the short term (1–3 months)	in the long term (3 months or longer)
Dairy	– turbulence in the export of milk and its products (e.g. powdered milk), which cannot always be absorbed by the domestic market – problems with the export of dairy products may increase their supply to the domestic market and, as a result, cause a drop in prices and a temporary reduction in companies' revenues – in some market segments, due to the lack of orders from the HoReCa sector, production may collapse	– persistent problems with the export of milk and its products may increase their supply to the domestic market and, as a result, cause a drop in prices and a long-term reduction of companies' revenues – due to the high connection of the Polish dairy sector with the world market, a decline in the revenues of dairy companies is possible if the prices of milk and its products fell on global markets
Beer	– drop in beer sales due to the ban on mass events, closing restaurants, pubs and hotels, small regional breweries are the most exposed to losses – the inability to sell beer over the Internet does not allow companies to at least partially compensate for the lost revenues – trying to sell beer directly to recipients (consumers) with home delivery, but this does not allow to fully compensate for the decreasing revenues	– decreasing sales on the domestic market, with little exports, will consequently lead to reduced production – possible temporary limitation of employment – real closures and bankruptcies of the weakest entities and an increase in industry consolidation through mergers and acquisitions of weaker companies by economically stronger entities
Confectionery	– decline in sales due to the ban on mass meetings and restrictions in the sphere of entertainment – limiting the range of production – attempts to sell confectionery products directly to home delivery recipients, but the inability to fully compensate for the declining revenues – temporary closures of confectioneries – restriction of employment	– decline in demand for pastries as a result of lower household incomes – a drop in sales that may result in a reduction in employment – decline of the economically weakest entities that will lose their financial liquidity
Bakeries	– possible reduction of the production volume and bread assortment (higher production of toasted bread, some people started baking bread at home) – decline in the production of fresh pastry goods, i.e. products with high added value – a significant reduction in the revenues of many bakeries	– possible change in the production assortment, resulting from a decline in demand for confectionery products (as a result of lower household incomes) – the fall of the weakest economic entities, especially from the group of micro companies

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Table 2. Possible impact of the COVID-19 pandemic on selected sectors of the food industry (cont.)

Food industry sectors	Changes	
	in the short term (1–3 months)	in the long term (3 months or longer)
Juices and drinks	– possible problems with the export of apple concentrate – possible difficult import of southern fruit concentrates for the production of drinking juices – decline in companies' revenues	– the threat of selling Polish products abroad as a consequence of the unstable European and world markets – due to the high connection of the Polish juice industry with the world market, revenues of domestic companies dependent on the prices of concentrates on world markets (in export and import) – a greater impact on the production, sales and revenues of companies will have a possible sugar levy, which was to be introduced in mid-2020 (it is frozen for now)
Sweets	– no major changes in production	– possible difficulties in exporting, and as a result lower sales revenues – decline in domestic demand, especially for premium products (due to lower household incomes)
Fruit and vegetable	– high demand for fruit, vegetables and their preserves, as they are considered the basis of a balanced diet in a pandemic period (as recommended by experts and the Ministry of Health) – possible difficult import of citrus and other southern fruits and their preserves	– the threat of selling Polish fruit and vegetable products abroad due to the unstable European and world markets – due to the strong connection of the fruit and vegetable industry with the world market, revenues of domestic companies partly dependent on prices on world markets
Flour mills	– rather no major changes – possible slightly higher demand for pasta, cereals and cereals	– increase in domestic demand for products with a long use-by date (pasta, groats), which will change the future structure of production and the scale of revenues
Tobacco	– rather no major changes	– there may be problems with the supply of imported raw materials, and consequently difficulties with the implementation of trade agreements concluded – possible increase in the shadow economy if the income of the population (smokers) decreased significantly

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Table 2. Possible impact of the COVID-19 pandemic on selected sectors of the food industry (cont.)

Food industry sectors	Changes	
	in the short term (1–3 months)	in the long term (3 months or longer)
Spirits	– increasing demand for ethyl alcohol, which is used as a disinfectant – the possibility of greater export of ethyl alcohol – high prices of raw spirit in the country and imported (expensive raw material), which negatively affects the profitability of the production of spirits – decline in retail sales in some segments of the spirit drinks market, e.g. monkeys, in lockdown – lower consumption of spirit drinks by gastronomy, resulting from the closure of the HoReCa sector, and as a result, a periodic decline in sales in the industry and a decline in state budget revenues	– decline in vodka sales in the so-called monkeys resulting from imposing an additional fee on their sale from January 1, 2021 – the long-term persistence of high demand for ethyl alcohol for the production of disinfectants may pose a threat to the continuity of the supply chain for entities producing spirit drinks

Source: Updated table 1 from: I. Szczepaniak et al., Ocena wpływu pandemii COVID-19 na przetwórstwo spożywcze i eksport rolno-spożywczy, unpublished study prepared for the Ministry of Agriculture and Rural Development, Warsaw, IERiGŻ – PIB, 3.06.2020.

Food distribution channels underwent significant changes during the pandemic. Previously, it was estimated that no more than 15–16% of consumers regularly shop online for home delivery. During the lockdown, the situation changed rapidly due to isolation and an increased need to feel safe. Food e-commerce leaders recorded even several hundred percent increase in orders, and delivery times ranged from a week to even a month. While brick-and-mortar stores saw the largest increase in stock-taking in the first week of the government announcement of the restrictions, online stores saw steady increases in orders and revenues throughout the lockdown period. It is not known whether this trend will continue beyond the pandemic. This is quite possible as customers who will have a positive experience can stay with this form of purchasing. The second observed phenomenon in the sphere of trade was the increased sale in small retail stores (local and other). In view of the restrictions in movement and the fear of spending time in large groups of people, residents often bought food products as close to their home as possible.

In this difficult time of the COVID-19 pandemic, it is also particularly important that Polish society understands the importance of its personal, consciously-made everyday purchasing decisions for supporting the domestic agri-food sector and the functioning of the entire economy. This peculiar consumer patriotism of Poles, manifested when

making purchases in choosing food produced in the country, is the support of Polish farmers and food industry enterprises[8]. Increased sales on the domestic market may partially compensate food producers for a possible decline in exports in future periods.

Currently, no major difficulties in the functioning of food chains are observed. In the food industry, there are segments for which the COVID-19 pandemic has created opportunities for an increase in the production volume (e.g. products with a longer use-by date), as well as those whose sales have partially or completely collapsed (e.g. products manufactured for the HoReCa sector). During the rapidly developing pandemic, a part of the spirits industry, namely ethyl alcohol producers, has also gained ground, as demand – both domestic and foreign – for spirit as a disinfectant has increased sharply. With the periodic shortages of specialized disinfectants on the market, spirit will still be a valuable replacement.

The impact of the COVID-19 pandemic on Polish agri-food exports

In 2019, the value of Polish agri-food exports amounted to almost EUR 31.5 billion (5.8% more than in the previous year), which accounted for 13.3% of all Polish exports of goods. Importantly, since 2003, Poland has recorded a surplus in trade in agri-food products, the value of which is systematically increasing (EUR 10.4 billion in 2019). The outbreak of the COVID-19 pandemic – first in Asia, then in Europe and North America – raised numerous concerns about the development prospects of Polish agri-food exports in 2020. The first effects of the pandemic could be observed in deliveries to China, South Korea, Japan and Taiwan already visible in February of this year. Problems appeared in exports to European countries in March 2020.

At the beginning of April 2020, the mechanisms of the impact of the spread of the pandemic on the sale of Polish food abroad and the difficulties that exporters may encounter were recognized. On the demand side, the following problems with agri-food exports were identified[9]:

1. Restrictions on foreign food orders for consumption. The restrictions on the movement of residents introduced in many countries who are consumers of Polish food may result in changes in the assortment structure of purchases and an increased share of staple food products at the expense of other products,

8. Ogólnopolska kampania informacyjna "Kupuj świadomie – Produkt polski", 2020, https://www.gov.pl/web/produktpolski/ruszyla-kampania-kupuj-swiadomie-produkt-polski, access 30.09.2020.
9. I. Szczepaniak et al., *Przemysł spożywczy…*, op. cit.

e.g. sweets, snacks, alcoholic products. During the crisis, consumers are also more inclined to purchase domestic products. In the longer term, protectionist tendencies may intensify and the protection of domestic markets against imported food may increase.

2. Restrictions on foreign orders for raw materials and semi-finished products.
   As a result of the pandemic, some factories producing food abroad and using Polish raw materials and semi-finished products may suspend their operations. It will be associated with a reduced demand for these raw materials and semi-finished products. Due to the fact that the products of the food industry account for over 80% of Polish exports, this channel of influence may, fortunately, have a relatively small impact on Polish agri-food exports.
3. Problems with the transport of goods.
   Most of the goods for European recipients are transported by road. The reintroduction of border controls to a greater or lesser extent delays transport and generates additional costs. Also, the increased risk of drivers becoming infected causes the prices of transport services to rise. The drastic reduction of passenger flights (also carrying commercial cargo) meant that difficulties in deliveries also apply to products shipped to distant countries. In addition, there are growing problems related to sea transport as a result of the increase in sea freight prices (even several dozen percent in just 2–3 months). Taking into account the fact that exports were based on low margins, this phenomenon basically rules out the profitability of sales.
4. Polish consumers abroad also have logistical problems. The closure of Chinese ports as a result of the pandemic practically made it impossible to transport Polish products from the dairy industry. However, restrictions apply not only to ports, but also to the receipt of goods transported by road.

Preliminary trade data for January – July 2020[10] shows that – contrary to previous concerns and often disturbing press releases – Polish agri-food exports at that time continued to show an upward trend. Sales fell only in a limited number of foreign markets and for some goods.

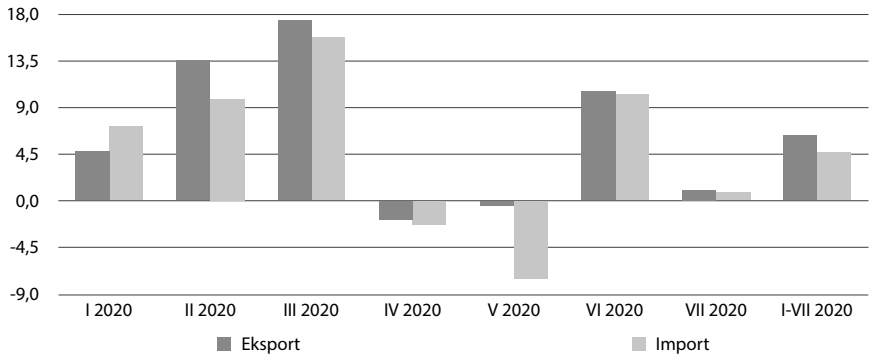
In the first quarter of 2020, trade of agri-food products was increasing, and its dynamics (calculated year by year) was increasing month to month. In March, agri-food exports (expressed in euro) were higher by 17.3% than the year before, and imports – by 15.7%. A clear deterioration was recorded in April and May 2020, when Polish food exports slightly decreased – by 1.7% and 0.4%, respectively, compared to the corresponding period of the previous year. Imports decreased to a greater extent.

10. The dataset on foreign trade turnover is open. The data published earlier are corrected as the customs documents and INTRASTAT declarations arrive.

On the other hand, June brought a clear rebound in trade and large, double-digit increases (year by year). In turn, in July there was a slowdown in agri-food trade.

The value of Polish agri-food exports in the period January – July 2020 amounted to EUR 19,188 million and was still 6.4% higher than in the corresponding period of the previous year (Figure 1). Thus, the share of agri-food products in total Polish exports increased to an unprecedented level of 14.8%. The value of Polish agri-food imports in the period January – July 2020 amounted to EUR 12,849 million and was 4.7% higher than in the previous year.

Figure 1. Changes in Polish agri-food exports and imports (expressed in euro) in the period January – July 2020, compared to the same period of the previous year (in %)



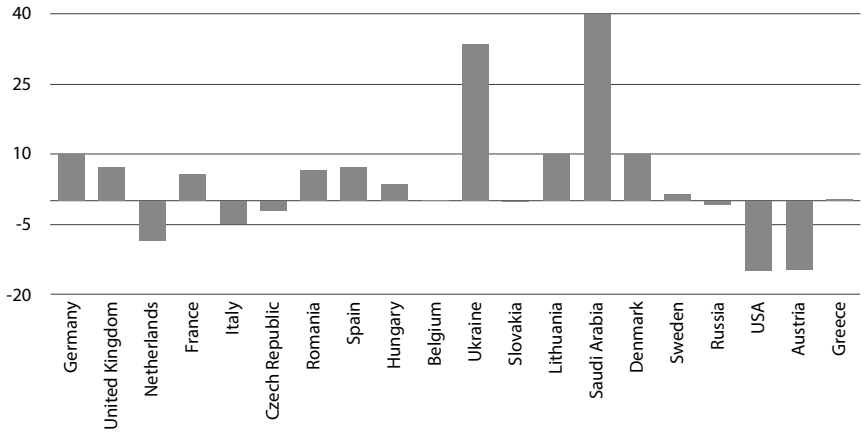
Source: Own study based on unpublished data from the Ministry of Finance.

Among the twenty largest recipients of Polish agri-food products (according to data for January – July 2020), clear declines in exports were basically only recorded in three – the United States (a decrease by 15%[11] compared to the same period of the previous year), Austria (by 14.5%) and the Netherlands (by 8.5%) – see Figure 2. The value of deliveries of agri-food products to Italy decreased by nearly 5%, and to the Czech Republic by 2%.

In turn, by over 10% (y/y), in the period January – July 2020, Polish agri-food exports to Germany – the largest recipient of Polish food, increased. It was, among others as a result of increased sales of cigarettes (their export in this period amounted to EUR 684 million and was as much as 62% higher than a year earlier), other processed tobacco, bread and chocolate products. Sales of Polish food to Saudi Arabia increased by 178% (due to, inter alia, increased exports of wheat and cigarettes), by 33.5% to Ukraine and by approx. 10% to Lithuania and Denmark.

11. The decrease was due to a reduction in the supply of pork, fruit juices and concentrates, which, however, was not directly related to the outbreak of the pandemic.

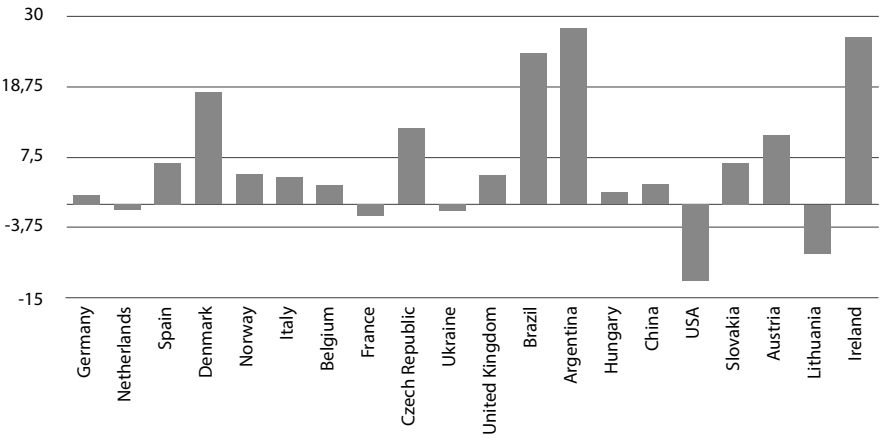
Figure 2. Changes in Polish agri-food exports (expressed in euro) to the most important recipients in the period January – July 2020, compared to the same period of the previous year (in %)



Source: Own study based on unpublished data of the Ministry of Finance.

Among the largest suppliers of agri-food products to Poland, imports from the United States (by 12.3% compared to the corresponding period of 2019), Lithuania (by 7.9%) and France (by nearly 2%) decreased – see Figure 3. Imports from Argentina and Brazil clearly increased – by 28% and 24% respectively (increased supplies of soybean meal), Ireland – by 26.7% (including fresh and chilled fish) and Denmark – by 18% (including live pigs).

Figure 3. Changes in Poland's agri-food imports (expressed in euro) from the most important suppliers in the period January – July 2020, compared to the same period of the previous year (in %)



Source: Own study based on unpublished data of the Ministry of Finance.

Among the twenty most important product groups (according to the CN position), in the period January – July 2020, exports of only five groups decreased – fruit juices (by 12.1% y/y), poultry meat (by 10.1%), pork meat (by 9.5%), other vegetables (by 5.1%) and other food preparations (by 2.3%) – see Table 3. Despite the slump in beef sales in March – April 2020, we managed to make up for losses in the export of fresh and chilled beef after seven months, achieving sales higher than a year earlier[12].

In the period from January to July 2020, wheat exports were more than three times higher than in the previous year, and the export of other processed tobacco increased by over 48%. Double-digit increases in exports were also recorded in such product groups as: flour, groats and starch preparations (by 15.8% y/y), cigarettes (by 14.7%) and animal food (by 13.7%).

Table 3. Main product groups (by CN position) in Polish agri-food exports in January – July 2020

CN position	Item description	Change of export value, year to year (in %)	Participation in exports agri-food (in %)
2402	Cigarettes	14,7	10,7
0207	Poultry meat	-10,1	7,0
1905	Bread (including confectionery)	2,6	5,2
1806	Chocolate and chocolate products	4,0	4,8
2309	Pet food	13,7	3,7
2106	Other food preparations	-2,3	3,2
0201	Beef, fresh or chilled	0,5	3,1
1602	Meat preparations	6,6	2,9
1001	Wheat	224,5	2,8
0305	Fish fillets, dried or salted	2,3	2,5
0406	Cheeses	1,1	2,5
0203	Pork meat	-9,5	2,4
0304	Fish fillets, fresh or frozen	2,1	2,1
1901	Preparations of flour, groats, starch, etc.	15,8	2,0
2403	Remaining processed tobacco	48,2	2,0

Continued on the next page.

12. The decline in beef exports was mainly due to the slump in demand in Italy related to the COVID-19 pandemic. In March 2020, the value of fresh or chilled beef exports to the Italian market was over EUR 8 million lower than in March 2019, which meant a decrease of 30% (y/y). As Italy is the largest (30.5% in 2019) recipient of Polish beef (fresh and chilled), this has disrupted the domestic beef market. However, some of the surpluses were sold in Great Britain, the Netherlands and Greece. The demand for beef started to grow again from June this year.

Table 3. Main product groups (by CN position) in Polish agri-food exports in January – July 2020 (cont.)

CN position	Item description	Change of export value, year to year (in %)	Participation in exports agri-food (in %)
1604	Fish products	8,7	1,8
2202	Alkohol free drinks	9,0	1,7
2009	Fruit juices	-12,1	1,6
0811	Fruit frozen foods	0,1	1,5
0709	Other vegetables	-5,1	1,3

Source: Own study based on unpublished data of the Ministry of Finance.

In imports, in the period January – July 2020, the value of imports of products of six groups decreased, with these decreases being at most a few percent. The deliveries of other food preparations, fish fillets, fish (fresh and frozen), bread and cheese decreased (Table 4). On the other hand, the import of other processed tobacco increased by 86%, and that of live pigs by 23%. Double-digit increases in imports were recorded in such product groups as animal feed, citrus fruits, bananas, and other vegetables.

Table 4. The main groups of products (by CN position) in Polish agri-food imports in January – July 2020

CN position	Item description	Chang in the import value, year to year (in %)	Import share agri-food (in %)
0203	Pork meat	3,2	6,7
2309	Pet food	18,1	5,1
0302	Fresh or chilled fish	-1,9	4,9
2304	Soybean cake	6,7	4,0
1806	Chocolate and chocolate products	3,3	3,2
2401	Tobacco	5,3	2,8
2106	Other food preparations	-5,2	2,8
0103	Live pigs	23,4	2,7
0304	Fish fillets, fresh or frozen	-4,5	2,6
0901	Coffee	3,4	2,4
0805	Citrus fruits	15,9	2,0
2403	Remaining processed tobacco	86,0	1,8
1905	Bread (including confectionery)	-4,4	1,7

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Table 4. The main groups of products (by CN position) in Polish agri-food imports in January – July 2020 (cont.)

CN position	Item description	Chang in the import value, year to year (in %)	Import share agri-food (in %)
0406	Cheeses	-1,5	1,7
0803	Bananas	16,5	1,5
1901	Preparations of flour, groats, starch, etc.	5,2	1,5
0709	Other vegetables	12,0	1,4
2204	Wine	0,3	1,4
0303	Frozen fish	-1,9	1,3
0702	Tomatoes	6,9	1,2

Source: Own study based on unpublished data of the Ministry of Finance.

Preliminary trade data shows that Polish agri-food exporters coped well with the greatest restrictions related to the movement of people introduced by the COVID-19 pandemic. This can be explained in at least two ways.

Firstly, food is a basic commodity (similar to medicine, personal care products) and is characterized by lower income elasticity of demand. This means that a unit decline in consumer income causes a relatively small decline in demand for food as compared to, durable goods. Moreover, the mechanism of consumer reaction to the measures taken to counter the spread of the pandemic in most countries was similar to that in Poland. Information on impending restrictions on the movement of residents resulted in a sharp increase in demand for some shelf-stable products. This applied to groats, rice, pasta, canned food, soups, frozen and ready-made food, flour and yeast.

Secondly, Polish food producers and exporters compete in the foreign markets mainly with prices. In the period of reduced incomes of consumers, most of them are willing to replace more expensive products with cheaper, imported ones. Additionally, the improvement of the price competitiveness of Polish products abroad was caused by the marked weakening of the zloty against the main currencies in March 2020 (by nearly 7% against the US dollar and by nearly 6% against the euro).

The SARS-CoV-2 virus, causing strong perturbations on the food markets in East and South-East Asia and breaking the existing supply chains of many food products, has created the opportunity for Polish companies to fill these places. The information from the Polish Investment and Trade Agency (PAIiH), based on reports from foreign trade offices (ZBH), shows that at the beginning of April 2020,

Singapore was looking for additional sources of supply of many agri-food products, including dairy products, vegetables, frozen foods, pasta and ready-made meals. Interest in Polish food was also shown by importers from South Korea, Indonesia, Philippines, Vietnam, Japan and Morocco[13]. On March 27, 2020, the Ministry of Agriculture and Rural Development launched the "Export Opportunities" subpage on its website[14], which publishes information from foreign trade offices on the demand of certain countries for agri-food products.

The Polish agri-food exports could and may still be affected by supply disruptions[15]:

1. Compared to other sectors of industrial processing, supply chains in the agri-food sector are much shorter. Most sectors of the food industry, including those producing basic types of food (including bread, meat and its products, dairy products), have supply chains located in the country. Thus, there is a relatively small risk of they will break.
2. However, there are industries in which production is largely dependent on foreign supplies of agricultural raw materials and semi-finished products. Products manufactured in these industries are also largely exported (so-called re-export). Examples include fish processing, oil industry, coffee and tea processing, wine industry, the tobacco industry, partially the fruit and vegetable industry. These sectors may experience problems with the continuity of supply of raw materials and, consequently, reduced sales.

Although preliminary trade data for the seven months of 2020 (January – July period) indicate that Polish agri-food exports did well during the lockdown, a clear slowdown in the growth rate of foreign sales should not be ruled out in the coming months, and perhaps even its fall. The greatest threat now seems to be the possibility of re-introducing restrictions on the movement of people in connection with the growing number of infected people in many countries. From the point of view of the possibility of selling Polish products abroad, the phenomenon of economic patriotism may also be unfavorable, which will revive with every economic crisis, and this will undoubtedly be one of the deepest in decades.

13. PAIH, *Alert dla polskich eksporterów: które kraje Azji i Afryki potrzebują żywności?*, 2020, https://www.portalspozywczy.pl/technologie/wiadomosci/paih-alert-dla-polskich-eksporterow-ktore-kraje-azji-i-afryki-potrzebuja-zywnosci, 183603.html, access 2.06.2020.
14. *Możliwości eksportowe*, Ministerstwo Rolnictwa i Rozwoju Wsi, 2020, https://www.gov.pl/web/rolnictwo/mozliwosci-eksportowe2, access 30.09.2020.
15. I. Szczepaniak et al., *Przemysł spożywczy…*, op. cit.

Conclusion

History has proved that producers and exporters of processed food have repeatedly faced various difficulties. Therefore, it should be expected that this time the sector will also cope with the crisis caused by the COVID-19 pandemic and its effect will not be a large wave of insolvencies and bankruptcies, and the only negative consequence will be a temporary slowdown in the sector's development, mainly due to fluctuations in the growth dynamics of Polish food and agri-exports. The growing demand at home and abroad and the still lower production costs in Poland compared to other countries allow for the maintenance of the upward trend in the production and export of agri-food products, and thus the continued favorable condition of the sector.

In the current situation, food industry enterprises have taken a number of measures to adapt to functioning in the conditions of a pandemic, which was supported by the launch of various types of protective measures by the state. In the long run, however, food companies themselves should take care of planning and risk management strategies, investments in digitization and automation, and the integration of production management systems with distribution systems. These activities will help to ensure the continuity of supply chains in various crisis situations. Appropriate economic policy and the involvement of entrepreneurs may allow the current level of development of the Polish food sector to be maintained.

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