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**ROLE OF IMPORTS IN THE SUPPLY OF RAW MATERIALS
IN THE FOOD PROCESSING SECTOR IN POLAND**

Key words: raw materials, food industry, agriculture, foreign trade, imports

ABSTRACT. The aim of the article is to assess the significance of imports in the supply of raw materials to the food processing sector in Poland. Production of food products in Poland shows high development dynamics. Mainly products from domestic agriculture are the raw material base for it. The progressing internationalization processes of the Polish food sector, resulting from globalization and economic integration, mean that the significance of imported agricultural raw materials is gradually increasing. In the analysis of the structure of the value of total raw material resources, mainly statistical data from the Central Statistical Office and the Ministry of Finance were used. The study covered the years 2003-2021. The analysis shows that during Poland's membership in the European Union, the share of imported products in the total raw material resources of the food sector almost doubled to approx. 40%. The products are mainly raw materials imported from other climatic zones. This does not change the fact that food production in Poland is still based primarily on the domestic raw material base. Individual branches of the domestic food industry apply diversified strategies related to raw material supply and production and commercial risk management, which results from different conditions of their operation, including a different ownership structure.

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INTRODUCTION

The current position of the Polish food industry results from thirty years of activities of agricultural producers and entrepreneurs who want to actively participate in food production with modern organization, and is also the result of Poland's accession to the European Union (EU) and its inclusion in the processes of economic globalization. The latter period is a time of intensive development of the sector in the conditions of access to the open market, when food industry entities in Poland proved their significance not only in the country, but also on the EU and global markets. The food industry has become an extremely important sector of the Polish economy, and its enterprises can serve as an example for other entities in the field of transformation, restructuring and adaptation to EU requirements related to quality, sanitary and veterinary standards. Polish food producers have strengthened their competitive position both on the domestic and international market, and Polish food products have gained the recognition of foreign consumers.

In the conditions of globalization and regional integration, the process of internationalization of Polish agri-food sector entities is particularly dynamic. Despite the complexity and changeability of the changes taking place in the global economy, as well as the growing competition, entrepreneurs more and more often decide to run a business also on the international market. They establish contacts with foreign partners and create various types of business relationships with them. It is estimated that it is in internationalization and the possibility of building links with global economy entities that many domestic enterprises see opportunities for development and improvement of their competitive position on the market. Internationalization creates additional opportunities to increase competitiveness [Bednarz 2013]. In the literature on the subject, the term internationalization is most often understood as any type of economic activity undertaken by an enterprise abroad [Rymarczyk 2004]. According to Eberhard Dülfer and Bernd Jostingmeier [2008] the term "international" does not, however, fit companies that only carry out export activities or related forms (e.g., selling licenses, franchising). International companies should operate on a global scale, have numerous subsidiaries – even in a hundred countries, and be managed by an international managerial staff. Generally, according to individual researchers, there is no agreement in this matter. For example, Werner Borrmann [1970] believes that a company can be considered "international" when the structure of its activities changes due to its involvement abroad, and Eugen Herrmann Sieber [1966] considers a company international when the center of activity of the company's activities shifts abroad.

Literature on the internationalization and globalization of enterprises also presents various stages and forms of expansion of companies to foreign markets [Gorynia 2007, Skawińska et al. 2018]. The most popular model, defining the forms of involvement of enterprises in international business, seems to be the so-called the Uppsala model of

internationalization of enterprises, according to which the internationalization process is sequential (gradual). It is perceived as an interaction between the development of knowledge about foreign markets and activities on the one hand, and the growing involvement of resources in foreign markets on the other [Daszkiewicz 2008]. The basic regularity of this model is that enterprises begin their foreign expansion with exports, and only later do they move to forms that require greater involvement.

International companies take advantage of the comparative advantages of locating their operations in other countries. They may, for example, result from different prices and production factors (labor, capital), different labor productivity or more or less favorable climatic conditions. Processes of information flow and processing (know-how) are also of great importance for internationalization processes. Enterprises can also take advantage of the special skills of the workforce present abroad, scientific and research achievements (production and technological cooperation) and sources of financing available abroad, as well as from the exceptional resources of mineral and agricultural raw materials found there [Rymarczyk 2004, Bednarz 2013]. Jan Rymarczyk [2012] points out, moreover, that companies from developed countries, order to ensure a stable source of supply and the certainty of uninterrupted supplies of raw materials, sometimes become co-owners of coffee, cocoa, tea and tobacco plantations, or acquire concessions for felling precious tree species in overseas countries.

Regardless of the adopted classifications, it seems that any enterprise that conducts at least one type of economic activity with at least one foreign partner can be considered international.

The article pays special attention to the raw material aspect of internationalization, i.e. the use of imported raw materials in the production of food products manufactured in Poland. It was pointed out that the progressing process of internationalization of the Polish agri-food sector, expressed, inter alia, in lively trade and the influx of large foreign direct investments [Szajner, Szczepaniak 2020], affects not only the development of the domestic market and the food industry, but also changes in the supply of raw materials.

The agricultural sector is the traditional source of raw material supply for food production plants in Poland, it consists of farms supplying their own products to processing plants. It is estimated that up to 90% of raw materials for the food industry are domestic and imported agricultural raw materials. The distribution of particular types of agricultural production in the country and other features of the raw material base for food production are closely related to the formation of ties between the agriculture and food processing sectors (including spatial, organizational, production and economic ties). In addition to the basic agricultural raw materials of plant and animal origin, as well as the so-called refined raw materials, various types of auxiliary materials are used in processing plants [Kapusta 2015].

The food production sector in Poland, apart from agricultural products produced by domestic agriculture, also processes imported raw materials. The role of this source of supply is systematically increasing. The aim of the analysis is to assess changes in the significance of imports in the supply of raw materials to the food processing sector in Poland.

MATERIAL AND METHODOLOGY OF STUDIES

Achieving the goal set in the study, it was assumed that the total value of raw material resources in this sector consists of the value of agricultural market output and the value of imports of agricultural products and semi-finished products used in the food industry (converted at the average PLN/EUR exchange rate). The analysis of the structure of the value of raw material resources determined in this way enables assessing whether the progressing process of internationalization of the food processing sector has also marked itself in the sphere of raw materials. The study covered the years 2003-2021, i.e., the entire period of Poland's membership in the EU. The analysis mainly used statistical data from Central Statistical Office and the Ministry of Finance.

The issue of raw material supply, including, the use of domestic and imported agricultural raw materials in production is different in individual food production industries, which results from different conditions and strategies of their functioning. For this reason, the study carried out considerations aimed at assessing the significance of domestic and imported raw materials in the production of basic food processing industries, indicated the reasons for the implementation of supply imports, as well as tried to present whether the phenomena are of a structural or incidental nature. In this part of the work, the results of research and publications of the Institute of Agricultural and Food Economics National Research Institute were used.

RESULTS OF THE STUDIES

The food industry during Poland's membership in the European Union is characterized by high dynamics of development. This is evidenced by the rapidly growing production and foreign trade turnover, as well as the progressing modernization of the production potential. Increased production is a consequence of both high domestic and foreign demand as well as high international competitiveness of Polish food producers [Pawlak, Poczta 2020, Szajner, Szczepaniak 2020]. The growing production of food industry products forces an increase in demand for agricultural raw materials used in processing. On the other hand, the ongoing integration of the domestic market with external markets increases

the demand not only for agricultural raw materials produced by domestic agriculture, but also for those imported. After the accession to the EU, the Polish food industry did not encounter major difficulties with the supply of raw materials. Temporary shortages of raw materials in the country were caused only by smaller harvests of certain plant raw materials or random events on some markets of animal raw materials. Enterprises developed the raw material base in the country and at the same time ensured themselves sources of raw material supply abroad, in particular in agricultural products imported from other climatic zones.

In the years 2003-2021, the global production of Polish agriculture expressed in current prices increased by 139.4% to PLN 134.8 billion [GUS 2021a, 2021b]. Increased of production was a consequence of both its greater volume and higher prices obtained by farmers. In this period, the increased of agricultural market output in nominal terms amounted to 168.2% (Table 1). As a result, share of market agricultural output in gross output increased from 64.8% to 74.5%. The relatively high dynamics of agricultural market output was primarily a consequence of the dynamically developing food processing [Szczepaniak, Drożdż 2022]. Promotion and development of short supply chains, including direct and market sales, was also an important factor influencing the increase in the agricultural market output. Small-scale farms often carried out production intended for self-supply or its distribution with the use of short supply chains [Szczepaniak 2019].

In the years 2003-2021, agricultural market output at constant prices increased by 33.9%, which means that it was growing at a rate of about 2% per year, with high volatility in individual years. During this period, imports of agricultural products and semi-finished products to Poland increased nominally six times to PLN 67.2 billion (Table 1). The factor strengthening the increase in the value of imports were rising transaction prices and the depreciation of the zloty against the euro, as the average exchange rate of the euro increased from PLN 4.3978 to PLN 4.5674 [NBP 2022]. Increased imports of agricultural raw materials was accompanied by a deepening of the negative balance of trade in these products from EUR 0.6 to EUR 2.9 billion [GUS 2022]. When analyzing the import of agricultural products, it should be borne in mind that not all products were direct raw materials in the food industry. For example, products constituting breeding (genetic) material in plant and animal production or products intended for consumption in households (e.g., fruit, vegetables) could be imported. In turn, also various semi-finished products used in processing (e.g., concentrates, meals) were the subject of import, apart from agricultural products.

The import of agricultural raw materials in individual branches of the food industry is carried out for various reasons. It can supplement the supply of domestic products in periods of shortages (e.g., lower harvests) or in industries characterized by low competitiveness of the raw material base (e.g., production of live pigs). The import of agricultural products

Table 1. The supply of raw materials for food production in Poland in the years 2003-2021

| The supply of raw materials | | | | | | | | | | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| Changes of market agricultural output in PLN, constant prices [%], year/year | | | | | | | | | | | | | | | | | | |
| 5.2 | 3.3 | -4.6 | 4.2 | 1.5 | 6.1 | 3.1 | -1.6 | 3.8 | 1.2 | 4.7 | 2.1 | -0.7 | 5.7 | 2.9 | 3.3 | -4.3 | 1.7 | -2.1 |
| Changes of agricultural products imports in EUR [%], year/year | | | | | | | | | | | | | | | | | | |
| 68.5 | 25.2 | 21.2 | 16.0 | 31.1 | 19.7 | -6.7 | 16.1 | 18.2 | 6.1 | 6.1 | 5.3 | 3.3 | 8.5 | 10.0 | 1.9 | 5.7 | 2.6 | 9.9 |
| Changes of market agricultural output in PLN, constant prices, 2003 = 100% | | | | | | | | | | | | | | | | | | |
| 100.0 | 103.3 | 98.5 | 102.7 | 104.2 | 110.6 | 114.0 | 112.2 | 116.5 | 117.8 | 123.4 | 126.0 | 125.1 | 132.2 | 136.1 | 140.6 | 134.5 | 136.8 | 133.9 |
| Changes of agricultural products imports in EUR, 2003 = 100% | | | | | | | | | | | | | | | | | | |
| 100.0 | 125.2 | 151.7 | 176.0 | 230.8 | 276.2 | 257.7 | 299.2 | 353.7 | 375.2 | 398.1 | 419.2 | 433.1 | 469.9 | 516.9 | 526.7 | 556.7 | 571.2 | 627.7 |
| Market agricultural output [billion PLN], current prices | | | | | | | | | | | | | | | | | | |
| 36.5 | 46.2 | 42.9 | 45.9 | 52.5 | 56.3 | 56.4 | 59.4 | 71.3 | 75.0 | 80.0 | 76.7 | 74.2 | 76.5 | 85.1 | 85.9 | 89.3 | 92.5 | 100.4 |
| Value of agricultural products imports [million EUR] | | | | | | | | | | | | | | | | | | |
| 1,222 | 1,467 | 1,729 | 1,987 | 2,602 | 3,025 | 2,644 | 3,112 | 3,737 | 3,983 | 4,176 | 4,400 | 4,699 | 5,016 | 5,794 | 5,830 | 6,225 | 6,498 | 6,892 |

Table 1. Cont.

| The supply of raw materials | | | | | | | | | | | | | | | | | | | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| Value of semi-finished products imports [million EUR] | | | | | | | | | | | | | | | | | | | |
| 1,124 | 1,471 | 1,833 | 2,145 | 2,817 | 3,461 | 3,410 | 3,917 | 4,573 | 4,838 | 5,182 | 5,458 | 5,484 | 6,034 | 6,356 | 6,545 | 6,861 | 6,935 | 7,873 | |
| Total value of agricultural raw material resources* [billion PLN], current prices | | | | | | | | | | | | | | | | | | | |
| 46.8 | 59.5 | 57.2 | 62.0 | 73.0 | 79.1 | 82.6 | 87.5 | 105.5 | 111.9 | 119.3 | 118.0 | 117.8 | 124.7 | 136.8 | 138.7 | 145.6 | 152.2 | 167.6 | |
| Share of market agricultural output in total value of agricultural raw material resources [%] | | | | | | | | | | | | | | | | | | | |
| 78.0 | 77.6 | 74.9 | 74.0 | 71.9 | 71.2 | 68.3 | 67.9 | 67.6 | 67.0 | 67.1 | 65.0 | 63.0 | 61.3 | 62.2 | 62.0 | 61.4 | 60.8 | 59.9 | |
| Share of agricultural products and semi-finished products imports in total value of agricultural raw material resources [%] | | | | | | | | | | | | | | | | | | | |
| 22.0 | 22.4 | 25.1 | 26.0 | 28.1 | 28.8 | 31.7 | 32.1 | 32.4 | 33.0 | 32.9 | 35.0 | 37.0 | 38.7 | 37.8 | 38.0 | 38.6 | 39.2 | 40.1 | |

* The total value of agricultural raw material resources consists of the value of market agricultural output and the value of imports of agricultural products and semi-finished products used in the food industry (converted at the average PLN/EUR exchange rate) [NBP 2022]

Source: own study based on the Central Statistical Office (CSO) and Ministry of Finance data

from other climatic zones usually enriches the assortment offer, including processed food products and semi-finished products. Imports may also be of a processing nature, when agricultural raw materials, after being processed in domestic plants, are then largely re-exported. Profitability of re-export is determined by relatively lower production costs (e.g., labor and material fees) and margins, which is confirmed by the existence of cost and price competitive advantages in Poland [Szczepaniak 2019].

In the years 2003-2021, the total value of agricultural raw material resources in the Polish food industry nominally increased three and a half times to PLN 167.6 billion. At the same time, the structure of supply sources changed. The share of market production of agriculture in the raw material resources fell in this period from 78.0% to 59.9%, and the share of imported products increased from 22.0% to 40.1%. At the same time, in the last few years, the phenomenon of relative equalization of the share of imports in the total supply of raw materials in the domestic food processing sector has been observed (at the level of 38-40%), which proves that the situation in the use of domestic and imported raw materials in food production is stabilizing (Table 1, Figure 1). The growing share of imported products in the total raw material resources is part of the general trend of internationalization and globalization of food production, which is confirmed by the development of trade and the great importance of transnational corporations in the food industry in Poland [Szajner, Szczepaniak 2020]. It also points to the progressive adaptation

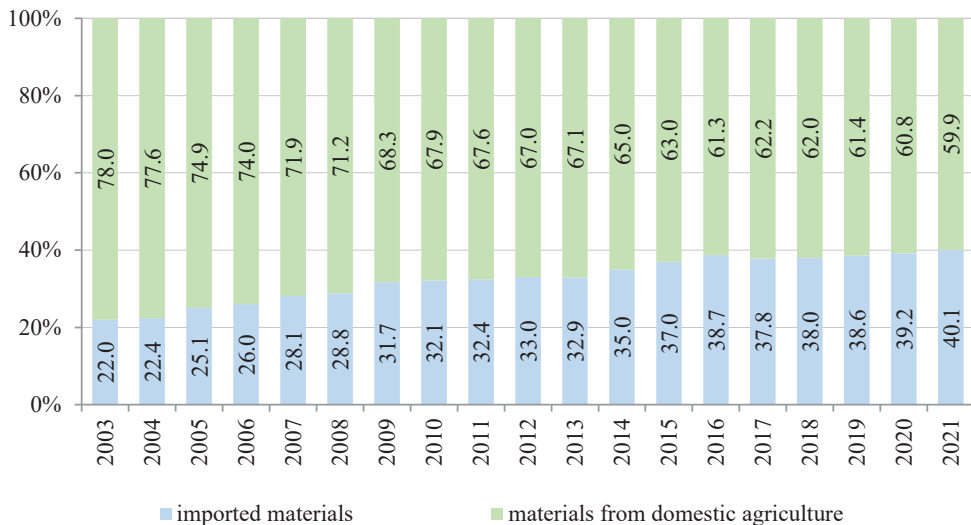


Figure 1. The raw materials supply structure of food sector in Poland in 2003-2021

Source: own study based on the CSO and Ministry of Finance data

processes of enterprises to the changing demand conditions on the domestic and foreign markets. The growing dependence of the food industry on imported raw materials does not, however, change the fact that the production of food products in Poland is still based primarily on products produced by domestic agriculture

Individual branches of the domestic food industry show great diversity in terms of the structure of obtaining agricultural raw materials. This is determined by the type of food products produced, as well as the strategy for supply and distribution as well as production and commercial risk management. Food industry branches based on the processing of domestic products generally have the ability to create their own raw material base and business relations with suppliers (through capital links, contracting, support for modernization of farms). The activities of entities belonging to these industries are associated with a lower risk of volatility of supplies and prices paid to farmers. In industries that use large amounts of imported raw materials, enterprises are exposed to much greater production and commercial risks, which are the source of frequent price changes on the global market, exchange rate volatility and disruptions in logistics supply chains [Szczepaniak 2019].

Taking into account the above conditions, the paper refers to the situation in several selected industries, i.e.: meat and poultry, fish, dairy, fruit and vegetable and potato, grain, oil and fodder industries.

Domestic raw materials play a dominant role in the industrial processing of meat and poultry, but imports of live pigs (piglets and weaners) and pork meat also play a significant role. The reasons for this phenomenon are complex, but above all it is a decrease in the pig stock in Poland, a decrease in the domestic production of live pigs and a relatively small decrease in pork consumption. Large imports indicate deficiencies in the genetic progress of domestic breeds and its dissemination, which results in low technological parameters in livestock breeding and meat processing. Imports of live animals and meat are beneficial for both consumers and processors in the short term, but in the long term they limit changes in the industry. Meanwhile, without organizational changes, Poland will still be doomed to a decline in pork stock and production, as well as growing imports. Imports of live cattle and poultry as well as beef and poultry meat do not play a major role. Only a small part of the raw materials for the sectors is imported from abroad. Mainly breeding animals, including chicks used in breeding laying hens and slaughter poultry are the subject of imports [Zawadzka 2022, Pasińska 2022].

Imports are the main source of supply for the Polish fish industry. It is estimated that even approx. 85% of raw materials comes from abroad. The decreasing supply of fish from own catches (from the Baltic Sea and deep-sea catches), coupled with the poorly developing production and fish catches in inland waters, meant that the supply of consumption fish to the market actually comes from imports. The import of fish, constituting the raw material

base for the dynamically developing industrial fish processing industry, also contributed to the increase in its export orientation. In a short period of time, Poland has become not only a large importer of fish, but also an important processor and exporter of fish products in the EU [Hryszko 2022].

The share of import in the raw material supply of the domestic dairy industry is very diverse. Imports of raw milk plays a marginal role, as only a few plants in the north-eastern part of the country import this raw material from Lithuania. In milk processing, the use of semi-finished raw material and semi-finished products imported from abroad, including in particular liquid milk and cream, condensed skimmed milk and casein, is of greater economic significance. The share of import in the supply of the domestic market is systematically growing (estimated at approx. 15%), and products are also imported which, after being processed in domestic plants, can then be re-exported [Szajner 2022].

In the fruit and vegetable and potato industry, imports of raw materials include mainly products not produced in the country. They are fruits and vegetables from other climatic zones (e.g., southern fruits, peppers, olives) and their preserves as well as early potatoes, seed potatoes and potatoes of specific varieties (with strictly defined technological parameters), which complement and enrich the domestic market offer. Imports may also concern products from the temperate climate zone, which are periodically cheaper and supplement shortages of raw materials (in periods of smaller harvests and higher prices in Poland) or differ significantly from domestic products. The total share of imported raw materials in the supply of the fruit and vegetable and potato industry is estimated at no more than 10%. This sector therefore mainly processes domestic raw materials [Nosecka 2022, Dzwonkowski 2022b].

The grain industry mainly uses raw materials produced in domestic agriculture. The share of imports in the supply of grains in recent years can be estimated at only a few percent, and mainly corn, hard wheat and malting barley were imported from abroad. The import of corn resulted from the fact that its domestic harvest due to climatic conditions is delayed, as compared to the countries neighboring Poland to the south and east. Poland is characterized by structural shortages of hard wheat, which is not produced due to inappropriate climatic conditions, and which is used for the production of pasta and semolina flour. For this reason, it is necessary to import approx. 200-400 thousand t durum wheat per year and some semolina. The import of malting barley, used for the production of malt, supplements the shortage of domestic supply. In the group of products of primary processing of grains, Poland also imports certain amounts of malt, groats and flakes as well as pasta doughs [Łopaciuk 2022].

Rapeseed is the only oilseed plant cultivated and processed on a large scale in the country. In years of good harvests, Poland is a large exporter of rapeseed seeds, rapeseed oil and meal, and margarines. Oil raw materials and products of their processing from

other climatic zones predominate in imports. It is estimated that the oil industry in the production of vegetable fats for food purposes uses approx. 200 thousand t of vegetable oils from other climatic zones, which expand the domestic offer of oils (e.g., sunflower, linseed, soybean) and are necessary for the production of high-quality margarines. The share of imports in the supply of raw materials in this production sector is estimated at approx. 30-35% [Rosiak 2022].

Imports of high-protein raw materials, in particular soybean meal, is in turn a necessary supplement to the missing supply of high-quality feed protein, without which animal production could not develop (e.g., the poultry and pork industries). Some of the imported meal is used for energy purposes, which in turn results from legal regulations on the production of renewable energy and biofuels. The share of imports in the supply of the feed industry is estimated at approx. 75%, and therefore the scale of dependence on imports is high. This is due to the limited possibilities of developing the production of oilseeds and high-protein crops in Poland, as well as the growing demand for vegetable oils and oilseed meals (e.g., soybean) [Dzwonkowski 2022a].

CONCLUSIONS

The rapidly progressing internationalization of the food sector in Poland, expressed, among others, in the development of trade in agri-food products, the influx of foreign direct investments and the development of transnational corporations not only has a direct impact on the development of the domestic food market, including the Polish food industry, but also has a clear impact on changes in the supply of raw materials to this sector.

In the food processing sector in Poland, raw materials from domestic agriculture and imported raw materials are used. In recent years, the importance of domestic and imported agricultural products in the total raw material resources of this sector has been changing. This resulted from both fluctuations in the level of agricultural production (caused by the instability of crops and yields, as well as prices obtained by farmers) and changes in the demand of the food processing sector for agricultural raw materials (conditioned, among others, by the changing economic situation in foreign trade, development of technology).

Globalization and economic integration, which resulted in the increased internationalization of the food processing sector during Poland's membership in the European Union, contributed to a significant increase in the sector's dependence on the supply of imported raw materials. In 2021, the share of imported raw materials in their total supply exceeded 40%, which means that it was more than 18 percentage points higher than in the year preceding Poland's accession to the EU (2003). All the time, however, food production in Poland is based primarily on the domestic raw material base, which confirms that native agriculture and the food industry are closely linked.

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ROLA IMPORTU W ZAOPATRZENIU SUROWCOWYM SEKTORA PRZETWÓRSTWA ŻYWNOŚCI W POLSCE

Słowa kluczowe: surowce, przemysł spożywczy, rolnictwo, handel zagraniczny, import

ABSTRAKT. Celem artykułu jest ocena znaczenia importu w zaopatrzeniu surowcowym sektora przetwórstwa żywności w Polsce. Produkcja artykułów żywnościowych w Polsce wykazuje wysoką dynamikę rozwoju. Bazę surowcową stanowią dla niej przede wszystkim produkty pochodzące z krajowego rolnictwa. Postępujące procesy internacjonalizacji polskiego sektora żywnościowego, będące efektem globalizacji i integracji gospodarczej, powodują, że stopniowo zwiększa się jednak znaczenie surowców rolnych pochodzących z importu. W analizie struktury wartości zasobów surowcowych ogółem wykorzystano głównie dane statystyczne Głównego Urzędu Statystycznego oraz Ministerstwa Finansów. Badaniem objęto dane za lata 2003-2021. Z przeprowadzonej analizy wynika, że w okresie członkostwa Polski w Unii Europejskiej udział produktów importowanych w łącznych zasobach surowcowych sektora żywnościowego zwiększył się prawie dwukrotnie, do około 40%. Produkty te stanowią głównie surowce sprowadzane z innych stref klimatycznych. Nie zmienia to faktu, że produkcja żywności w Polsce cały czas odbywa się przede wszystkim z wykorzystaniem krajowej bazy surowcowej. Poszczególne branże krajowego przemysłu spożywczego stosują zróżnicowane strategie w zakresie zaopatrzenia surowcowego oraz zarządzania ryzykiem produkcyjnym i handlowym, co wynika z różnych uwarunkowań ich funkcjonowania, a w tym, odmiennej struktury własnościowej.

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