

JOANNA SMOLUK-SIKORSKA

Poznań University of Life Sciences, Poland

SUPPLY SOURCES OF ORGANIC FOOD PROCESSING COMPANIES IN POLAND

Key words: organic food market, organic food processing, providers, weaknesses, collaboration

ABSTRACT. The paper's objective was to define the main supply sources of organic food processing companies and the barriers occurring in the process of raw produce acquisition. Therefore, in 2019, a survey on organic food processing enterprises was carried out. The survey among 55 processing companies concerned supply in raw organic produce, sales channels, and collaboration within the organic food supply chain. The research results show that the providers of organic food processors are mostly farmers and, to a lesser extent – intermediaries. In the process of provider selection, what is most important for processors are the quality and availability of agricultural products as well as the trust and credibility of a producer. In their opinion, the most important problems occurring in organic food processing are irregularity of deliveries and an inadequate amount of raw produce supplied. Consequently, a number of processors import part of the raw material needed for their production. Therefore, in order to improve the functioning of the processing sphere, measures in the area of farmer and processor collaboration and the improvement of the distribution system need to be introduced or intensified.

INTRODUCTION

The organic food market in Poland has been developing very dynamically in the recent decade. However, on the one hand, there is an increasing demand for organic food but, on the other, it is not followed by a respective supply volume growth, especially for products of the highest consumer interest [Wojciechowska-Solis, Soroka 2017]. One of the weakest links of the organic food market's supply side is the processing sphere, which is relatively significant, considering its share in total organic sales. It requires much more effort and the fulfillment of specific requirements throughout the entire production process than non-organic food processing does.

First of all, sustainability, including all three pillars (the environment, society and economy), seems to be a principle in organic food processing. Within processing, one may distinguish the transformation of substances in production technology into three fundamental principles: physical, e.g. mechanical, thermal, electric, etc., chemical, e.g. oxidization, polymerization, etc., and biological, e.g. fermentation, biotechnological, genetic, etc. In general, processing is a method including technology, additives, aids, a recipe, and packaging, so they should be taken into account while defining and regulating organic food processing [Schmid, Beck 2004]. These steps occur within the whole production chain and, therefore, need special requirements concerning raw material and should also include packaging, storage and transportation. Food processing is always linked to the primary goal of production. Yet, in the processing of organic food, there are different specific goals, such as e.g., preservation of the raw material, forming a new product from raw materials, and finally, the overall goal is to increase the product's quality and safety [Kahl et al. 2012].

According to Codex Alimentarius [FAO 1999], IFOAM standards [IFOAM 2019] and EU regulations [Council Regulation No 834/2007, Commission Regulation No 889/2008], organic food processing acquires raw material from natural rather than from synthetic sources and, moreover, minimal processing is applied to fresh food and appropriate and careful methods are used for further processing. Johannes Kahl et al. [2014] state that "careful processing refers to care taken with the raw materials used during the act of processing, in such a way that they maintain their integrity as far as possible, that all vital substances (all known nutrients) are protected and maintained where they are deemed beneficial to human health, and/or enhanced by the process, improved upon". In a broader meaning, careful processing also refers to other aspects such as inputs and outputs, people involved in the processing, as well as any biotic and abiotic factors [Kahl et al. 2014].

Considering the processing itself, processing companies are obliged to continuously identify the critical stages of processing and introduce adequate procedures to ensure processed food safety. Organic processors are obliged to apply adequate precautions in order to avoid contamination with prohibited substances. Suppose in a given organic food processing company, non-organic products are also processed or stored, in that case, they must be timely or spatially separated, and the production line must be carefully cleaned [Średnicka et al. 2009].

Since organic food processing is very complex and requires a number of specific treatments and is, therefore, cost-consuming, it is not very often undertaken by entrepreneurs. The other problem is that the quality of products is of most significant concern throughout the process, and raw material should be of top quality as well. Moreover, in order to ensure constant deliveries of processed products to wholesale and retail, a continuous supply of the required quantity and quality has to be provided. Searching for providers of adequate capacities among Polish small organic farms that are

not sufficiently organized requires a lot of time and effort. However, on the other hand, consumer behavior (more and more focused on higher quality) and their willingness to pay more and purchase organic food can be identified as potential for organic agriculture processing development in the future [Bostan et al. 2019].

Studies on the Polish organic food market generally focus on consumption, mainly on determining frequency and reasons for purchase, about organic products or willingness to pay more for organic food [Łuczka-Bakuła 2007, Żakowska-Biemans 2011, Bryła 2016, Koreleska, Ziaja 2016, Soroka 2017, Wojciechowska-Solis, Witek 2017], on the other hand, less research concentrated on the supply side. They mostly covered the functioning and efficiency of organic farms [Komorowska 2013, Brodzińska 2014, Nachtman 2015, Gil 2016]. Considering organic food processing and its relationships with the market environment, there is a research gap. Apart from a few papers on the state of organic food processing and sales from processing companies [Łuczka 2016, Smoluk-Sikorska et al. 2017, Smoluk-Sikorska 2019], there is hardly any research concerning this market sphere. In order to fill the mentioned gap, a study on supply sources of organic food processing companies has been undertaken.

MATERIAL AND RESEARCH METHODS

The article's main objective is to define the main supply sources of organic food processing companies and the barriers occurring in the process of raw produce acquisition. In order to realize this objective, in 2019, a survey on organic food processing enterprises was performed. It concerned relationships between organic food processing and other market participants. The survey covered such areas as the amount and structure of organic food processing, supply in raw organic produce, sales channels, and collaboration within the organic food supply chain. The survey covered the obstacles and evaluation of the functioning of the organic food processing sphere. The inquiry questionnaires were sent to all active organic food processing enterprises according to 2016 data (483 units). Their address data were delivered by the Main Agricultural and Food Quality Inspection. A total of 55 correctly filled questionnaires were considered, which was over 11% of all active companies in the database. The acquired data were coded, processed, and analysed using MS Excel.

RESEARCH RESULTS

The conducted research shows that microenterprises had the largest share among the investigated processing companies (41.8%). They were followed by small enterprises (34.5%) and medium companies (21.8%). Over half of the inquired (almost 57%) started organic food processing in 2011-2018, about 25% in 2004-2010, and nearly 16% before

Poland joined the European Union. Almost 58% of the considered companies claimed they sold their products on the international market (directly and indirectly), and over 2/3 of the inquired that at least on the domestic market.

Simultaneous organic and conventional processing was run by closely 3/4 of the inquired processors. For nearly 70% of them, organic products totalled up to 20% of the whole company's food production and about 12% – above 50%. Considering the structure of the production, the surveyed enterprises mostly dealt with fruit (38%), cereals (29%) and vegetables (21%). Almost 11% processed milk, 9% vegetable oils (oil plants), and 7% meat. Above 16% processed other products, mostly eggs (into egg powder), sugar beets, mushrooms and herbs. The most important products of the surveyed processors were fruit and vegetable products, dairy products and, to a lesser extent – meat, oils, herbs, vinegar as well as egg powder. These products were offered through several different sales channels. The majority inquired (almost 42%) indicated short distribution channels such as sales to small retail outlets (specialists and groceries) and wholesalers (36%). Every third sold products to retail chains and online stores and 20% to intermediaries.

The performed investigation demonstrated that organic food processing is mostly a supplement to the processing enterprise's main activity. The introduction of organic food processing supports them in improving competitiveness, acquiring additional markets, or new consumers; nevertheless, it barely modifies the primary production profile. It should be noted that all the considered enterprises that dealt with organic food exclusively (every fourth inquired company) are micro and small firms. It allows to conclude that organic food processing only is not sufficiently profitable to allow for further investment in the company's development.

When it comes to supply sources, one of the most engaging tasks is to find an appropriate number of providers offering raw materials of required quality and quantity. It is a challenging task in Polish conditions because, although the number and area of Polish organic farms is relatively large (respectively 18,637 farmers and over 507.6 thousand ha in 2019), the agrarian structure is somewhat fragmented, and a large part of agricultural holdings does not deliver products to the market or the sold quantities are very small. The performed research showed that over half of the inquired companies had up to 9 different providers (Table 1). Considering the fact that most of the farms are rather small, it proves that the quantities acquired are also insignificant. This translates into small production volumes and a less diversified product structure in processing companies. Only a small percentage of processors purchase

Table 1. Number of company providers (n = 55)

Number of providers	Share of enterprises [%]
0-9	52.4
10-40	41.8
300 and more	5.8

Source: own research

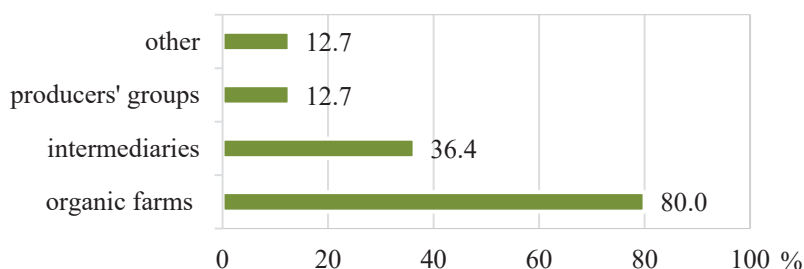


Figure 1. Providers of processing companies (n = 55)

Source: own research

raw material from at least 300 suppliers, and they are medium-sized companies producing and offering different groups of products.

The vast majority of inquired processors (4/5) purchases raw material from organic farms, and 36% through intermediaries (Figure 1). The problem is that most organic farms are small, family holdings, often struggling with economic scale. This is particularly evident in dairy, pigs, fruit and vegetables, where scale and linkage with primary processing are critical [Aggarwal 2014]. Producer groups delivering appropriate amounts of high-quality raw material can be a solution reducing the effects of the fragmented agrarian structure. However, organic farmers are not willing to collaborate in this way. Currently, in Poland, only 4 producer groups in the area of organic farming operate, which is extremely small, considering the number of organic food processing companies and annual market sales (250 million euros in 2015) [IMAS 2017].

The deliveries of organic food, transportation, storage, and finally, processing require the fulfilment of specific conditions, e.g., during storage and transportation, organic products have to be separated and labeled to avoid mixing. Each package should be closed and labeled so that the product can easily be identified. In the case of bulk raw material, it should be stored in separate storage rooms. The transportation of organic products should be performed so that the change of content is not possible, i.e., proper package, containers, and closed vehicles. Also, adequate documentation concerning the delivered products should be ensured [Średnicka et al. 2009].

The fulfilment of so many different requirements causes that the choice of providers is more difficult. Therefore, the most important criteria in the process of provider selection are product quality and availability, which – as earlier mentioned – have a fundamental meaning in organic food production, followed by trust in the supplier and credibility, ensuring that the terms of the contract are met and the possibility of fraud avoided (Figure 2). Even price and criteria related to transportation are less important in the opinion of the surveyed.



Figure 2. Criteria for provider selection (the surveyed processors assessed the criteria from the most significant (5) to the least significant – 1), n = 55

Source: own research

In order to guarantee the regular deliveries of high quality and credible organic products, processing companies very often operate on large organic farms (or in their neighbourhood) that provide sufficient volume of organic produce and give a farmer the possibility of taking the greater part of the value-added generated by the production of organic food.

The most significant weaknesses of the supply sources are the insufficient amount of produce and delivery irregularity (Figure 3). They impact the possibilities of developing organic farming processing since there are no proper conditions for improving this sphere. However, on the other hand, there is an unsatisfied growing market demand, which creates developmental opportunities. Therefore, measures are aimed at the growth of collaboration, both horizontal and vertical, between farmers and other market participants.

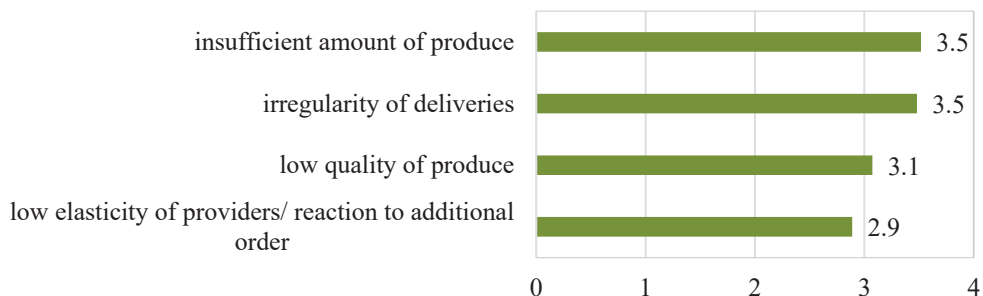


Figure 3. Weaknesses of domestic supply sources in organic food (surveyed processors assessed the criteria from the most significant (5) to the least significant – 1), n = 55

Source: own research

In order to reduce these weaknesses and increase developmental opportunities, the investigated enterprises initiated collaboration with suppliers, mostly (2/3) in the form of contracts for deliveries and contracting agreements (Figure 4), however, the vast majority of contracts lasted one year and only 1/4 had contracts lasting more than four years. In addition, only a few processors launched training for farmers and ensured the transportation of agricultural products (7.3% and 5.5%, respectively). This is an unfavourable occurrence because closer collaboration between market participants contributes to improving delivery quality. However, to some extent, it can be explained by low levels of public confidence and a historical aversion to collective forms of collaboration [Łuczka, Kalinowski 2020].

Another way of coping with this kind of market failure is importing lacking raw material – 40% of investigated processing companies decide to import raw materials (Figure 5). Almost 1/3 of these enterprises import more than 50% of total raw material used for processing. On the other hand, more than 36% imports up to 10% of the required organic agricultural products, but they are rather small companies offering a relatively narrow product range.

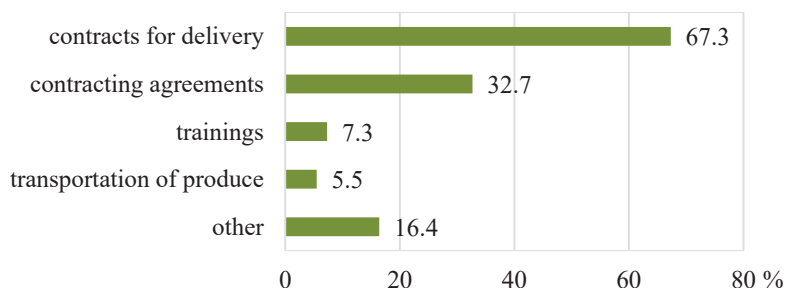


Figure 4. Forms of collaboration with providers (n = 55)

Source: own research

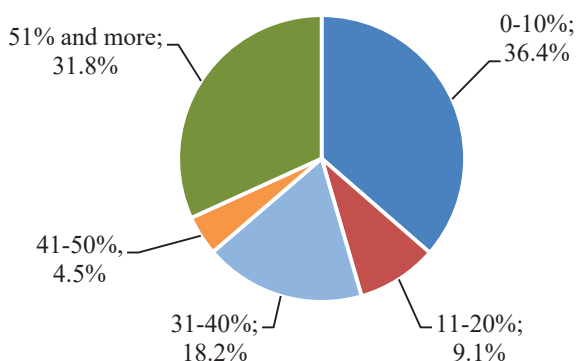


Figure 5. Share of imported products in the surveyed companies (n = 55)

Source: own research

According to Maria Zuba [2011], the most important problems in organic farming development in Poland, resulting from weaknesses of specific links of the market are: lack of organizational structures integrating organic market participants, lack of competent, developed agricultural advisory service, difficulties acquiring bulks of raw material of similar parameters for processing resulting from a lack of farmer organization. The conducted research proves that the indicated problems are still significant on the supply side of the market.

Therefore, it should be advisable to undertake measures aimed at the organization of the regional system of trade in agricultural produce, the system of storage, crediting producers and introducing instruments enabling the creation of mechanisms favouring the stable development of agriculture in the region and the development of regional collaboration between processors and farmers. Creating a feedback system between processors and agricultural producers, creating a training and advisory business support for the agricultural sector, creating logistic chains, marketing agricultural products, financial security etc., education on farmer entrepreneurship, creating a system of market information and creating a broader system of producer groups could also contribute to the improvement of the supply sphere of the organic food market in Poland.

CONCLUSIONS

In Poland, the organic food market has been increasing very dynamically recently and still demonstrates huge potential to further grow. However, the supply side of the market is not functioning effectively. One of the most significant problems of this sphere is not enough developed processing, which struggles with an insufficient and inadequate supply of raw material on the domestic market. The majority of the processors purchase raw produce directly on farms and, to a lesser extent – from intermediaries. The most important criteria for provider choice are quality and availability of raw products as well as supplier trust and credibility. According to processors, the domestic supply side's most significant weaknesses are irregularity of deliveries and insufficient amount of raw produce. Therefore, a number of processors have to import raw material.

The research results indicate that undertaking activities aiming at a better organization of agricultural products trade is essential. They should cover the development of logistics in the distribution sphere and collaboration between farmers and processors as well as between farmers in the form of producer groups. It would be reasonable to wider support producer groups, strengthen advisory services in the area of organic farming, which would influence the quantity and quality of the produce supplied as well as continuity and regularity of deliveries. Measures aimed at enhancing vertical relationships between processors and farmers are also needed. Long-term collaboration supported by public institutions would be stronger and more profitable for both sides.

BIBLIOGRAPHY

- Aggarwal Priyanka. 2014. *Supply chain management of locally-grown organic food: a leap toward sustainable development*. New York, US: Cognizant, <https://www.cognizant.com/InsightsWhitepapers/Supply-Chain-Management-of-Locally-Grown-Organic-Food-A-Leap-Toward-Sustainable-Development-codex928.pdf>, access: 12.11.2020.
- Bostan Ionel, Mihaela Onofrei, Anca Florentina Gavriluta (Vatamanu), Carmen Toderascu, Cristina Mihaela Lazar. 2019. An integrated approach to current trends in organic food in the EU. *Foods* 8 (5): 144. DOI: 10.3390/foods8050144.
- Brodzińska Katarzyna. 2014. Rolnictwo ekologiczne – tendencje i kierunki zmian (Organic farming – tendencies and directions of changes). *Zeszyty Naukowe SGGW w Warszawie. Problemy Rolnictwa Światowego* 14 (3): 27-36.
- Bryła Paweł. 2016. Organic food consumption in Poland: motives and barriers. *Appetite* 105: 737-746.
- Commission Regulation (EC) No 889/2008 of 5 September 2008, laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control. Official Journal of the European Union, L 250/1.
- Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91. Official Journal of the European Union, L 189.
- FAO. 1999. *Guidelines for the production, processing, labelling and marketing of organically produced foods*, Codex Alimentarius, http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXG%2B32-1999%252Fcxg_032e.pdf, access: 25.05.2020.
- Gil Agnieszka. 2016. Stan i przyszłość gospodarstw ekologicznych w drobnoobszarowym rolnictwie województwa Małopolskiego (State and future of organic farms in small area agriculture of Małopolskie Voivodship). *Studia Obszarów Wiejskich* 42: 197-208.
- IFOAM. 2019. *The IFOAM norms for organic production and processing*. <https://www.ifoam.bio/sites/default/files/2020-09/IFOAM%20Norms%20July%202014%20Edits%202019.pdf>, access: 12.11.2020.
- IMAS. 2017. Żywność ekologiczna w Polsce (Organic Food in Poland), http://imas.pl/wp-content/uploads/2017/12/Zywnosc_ekologiczna_w_Polsce_2017_IMAS_International.pdf, access 23.01.2020.
- Kahl Johannes, Ton Baars, Sussane Bügel, et al. 2012. Organic food quality: A framework for concept, definition and evaluation from the European perspective. *Journal of the Science of Food and Agriculture* 92 (14): 2760-2765. DOI: 10.1002/jsfa.5640.
- Kahl Johannes, Farnaz Alborzi, Alexander Beck et al. 2014. Organic food processing: a framework for concept, starting definitions and evaluation. *Journal of the Science of Food and Agriculture* 94 (13): 2582-2594. DOI: 10.1002/jsfa.6542.
- Komorowska Dorota. 2013. Czynniki kształtujące efektywność gospodarstw ekologicznych o różnej wielkości (Factors forming efficiency of organic farms of different size). *Zeszyty Naukowe SGGW w Warszawie. Ekonomika i Organizacja Gospodarki Żywnościowej* 104: 125-142.

- Koreleska Ewa, Paulina Ziaja. 2016. Preferencje zakupowe konsumentów owoców ekologicznych w regionie kujawsko-pomorskim (Purchase preferences of organic fruit consumers in Kujawsko-Pomorskie Region). *Marketing i Rynek* 10: 246-256.
- Łuczka-Bakuła Władysława. 2007. *Rynek żywności ekologicznej. Wyznaczniki i uwarunkowania rozwoju* (Organic food market. Determinants and conditions of development). Warszawa: PWE.
- Łuczka Władysława. 2016. Mocne i słabe strony przetwórstwa ekologicznego (Strengths and weaknesses of organic food processing). *Roczniki Naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu XVIII* (5): 143-148.
- Łuczka Władysława, Sławomir Kalinowski. 2020. Barriers to the development of organic farming: a Polish case study. *Agriculture* 10 (11): 536. DOI: 10.3390/agriculture10110536.
- Nachtman Grażyna. 2015. Efekty produkcyjno-ekonomiczne gospodarstw ekologicznych w 2013 roku (Economic and production effects of organic farms in 2013). *Roczniki Naukowe Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich* 102 (3): 78-90.
- Schmid Otto, Alexander Beck. 2004. Development of organic agriculture and organic food processing. [In] *Underlying principles in organic and, low-input food processing, literature survey. Report 1 of the sub-project 5 in the EU project No. 50635, "Quality of Low Input Food"*, eds. Otto Schmid, Alexander Beck, Ursula Kretschmar, 17-22. Frick: Research Institute of Organic Agriculture (FiBL).
- Smoluk-Sikorska Joanna, Władysława Łuczka, Sławomir Kalinowski. 2017. The state of organic food processing in Poland. [In] *Competitiveness of European agriculture and food sectors. Proceedings of the 26th International Scientific Conference Agrarian Perspectives*, 349-354. Prague: Czech University of Life Sciences Prague.
- Smoluk-Sikorska Joanna. 2019. Sales channels from organic food processing companies. *Annals of Polish Association of Agricultural and Agribusiness Economists XXI* (4): 436-445.
- Średnicka Dominika, Renata Kazimierczak, Ewa Rembiałkowska. 2009. Zasady przetwórstwa żywności ekologicznej (Rules for organic food processing). *Postępy Techniki Przetwórstwa Spożywczego* 2: 89-93.
- Witek Lucyna. 2017. Barriers to green products purchase – from Polish consumer Perspective. [In] *Innovation management, entrepreneurship and sustainability 2017*. Proceedings of the 5th International Conference in Prague, eds. Ondrej Lukeš Martin Dvouletý, Jan Mísař, 1119-1128. Prague: University of Economics.
- Wojciechowska-Solis Julia, Andrzej Soroka. 2017. Motives and barriers of organic food demand among Polish consumers. A profile of the purchasers. *British Food Journal* 119 (9): 2040-2048.
- Zuba Maria. 2011. Szanse i bariery w integracji łańcucha żywności ekologicznej w Polsce. 2011. Szanse i bariery w integracji łańcucha żywności ekologicznej w Polsce (Chances and barriers in the integration of the chain of the organic food in Poland). *Zeszyty Naukowe WSE. Ekonomia* 3 (1): 261-288.
- Żakowska-Biemans Sylwia. 2011. Polish consumer food choices and beliefs about organic food. *British Food Journal* 113 (1): 122-137.

ŹRÓDŁA ZAOPATRZENIA PRZETWÓRNI ŻYWNOSCI EKOLOGICZNYCH W POLSCE

Słowa kluczowe: rynek żywności ekologicznej, przetwórstwo żywności ekologicznej, dostawcy, słabości, współpraca

ABSTRAKT

Głównym celem badań było określenie najważniejszych źródeł zaopatrzenia przetwórnicy żywności ekologicznej, a także barier utrudniających proces pozyskiwania surowców niezbędnych do tego typu produkcji. Badania przetwórnicy żywności ekologicznej wykonano w 2019 roku i objęły one 55 podmiotów. Dotyczyły one zaopatrzenia w surowiec (produkty rolnictwa ekologicznego), kanałów sprzedaży i współpracy w łańcuchu dostaw żywności ekologicznej. Wyniki badania wskazują, że dostawcami przetwórnicy żywności ekologicznej byli głównie rolnicy i w mniejszym stopniu pośrednicy. W procesie wyboru odpowiednich dostawców najważniejszymi kryteriami dla przetwórców są jakość i dostępność ekologicznych produktów rolnych, a także zaufanie i wiarygodność producentów. W opinii przetwórców, najbardziej znaczącymi problemami przetwórstwa żywności ekologicznej są nieregularność dostaw i nieodpowiednia ilość dostarczanego surowca. W konsekwencji znaczna część przetwórnicy importuje produkty potrzebne do produkcji. W związku z tym, w celu poprawy funkcjonowania sfery przetwórstwa konieczne jest podjęcie działań w zakresie współpracy – zarówno poziomej, jak i pionowej – rolników z przetwórcami, a także w zakresie poprawy funkcjonowania systemu dystrybucji żywności ekologicznej.

AUTHOR

JOANNA SMOLUK-SIKORSKA, PHD

ORCID: 0000-0001-9599-0497

Poznań University of Life Sciences

Faculty of Economics, Department of Economics

28 Wojska Polskiego St., 60-637 Poznań, Poland

e-mail: smoluk@up.poznan.pl