SOCIETY. INTEGRATION. EDUCATION
Proceedings of the International Scientific Conference. Volume VI, May 24th -25th, 2019. 477-487

PRODUCTION POTENTIAL OF AN ENTERPRISE OPERATING AS A GROUP OF AGRICULTURAL PRODUCERS

Jakub Sikora
University of Agriculture in Krakow, Poland

Monika Komorowska
University of Agriculture in Krakow, Poland

Oleg Ovcharuk
State Agrarian and Engineering University in Podilya, Ukraine

Marcin Niemiec
University of Agriculture in Krakow, Poland

Zofia Gródek-Szostak
Cracow University of Economics, Poland

Joanna Stuglik
The Witold Pilecki University of Applied Sciences in Oswiecim, Poland

Abstract. *The research study describes an analysis of the management efficiency of an enterprise focused on egg production. The enterprise runs market cooperation as a group of agricultural producers. The aim of the work was to analyse the functioning of agricultural producers groups in Poland in terms of formal, legal and production conditions. A detailed analysis included a group focused on the production of table eggs, based in the Malopolskie province.*
Keywords: *group of agricultural producers, market*

Introduction

Agricultural enterprises face difficult development conditions these days. Producers must take action to modernize management and implement innovative solutions in the area of agricultural production technology. From the perspective of strengthening the production potential of individual farming and possible forms of cooperation, it would be advisable to treat an agricultural holding as a company which needs to compete in the market as any other business. Stimulating entrepreneurship of agricultural holdings is a prerequisite for the development of rural areas. The form of the agricultural holding has changed over the centuries, but the farm is surely the oldest production unit formed in

http://dx.doi.org/10.17770/sie2019vol6.3956

agriculture (Downey, 1996; Kocira, Kuboń, & Sporysz, 2017; Latawiec et al., 2017).

Poland's accession to the European Union in 2004 introduced a new market reality for agricultural producers. On the one hand, it is an opportunity for them to appear not only in the domestic market, but also in foreign ones. On the other hand, however, it imposes competition. Increased competitiveness in the European market of agricultural products forces the producers to have more efficient and productive management. Competition is one of the basic economic mechanisms that accompany the market economy (Kuboń, Sikora, Olech, & Szeląg-Sikora, 2018; Niemiec, Szeląg-Sikora, Kuzminova, & Komorowska 2018; Szeląg-Sikora, Niemiec, Sikora, & Chowaniak, 2017). It is a growing challenge for Polish agriculture to face competition from large and efficient agricultural producers operating in the EU. Higher productivity means greater efficiency, which in turn is a necessary condition to achieve a competitive advantage (Gródek-Szostak, Szeląg-Sikora, Sikora, & Korenko, 2017; Restuccia, Yang, & Zhu, 2008). All these factors determine the agricultural holding's production potential. As mentioned, production engages specific resources involved in the process, called the factors of production. In the case of agricultural production, the term includes labour, land and capital. Therefore, the holding's production potential depends not only on the number of resources, but also on their interaction (Szeląg-Sikora & Rorat, 2018; Niemiec, Mudryk, Sikora, Szeląg-Sikora, & Komorowska, 2018).

The aim of the work was to analyse the functioning of agricultural producers groups in Poland in terms of formal, legal and production conditions. A detailed analysis included a group focused on the production of table eggs, based in the Malopolskie province. The production potential of the above-mentioned producers group was presented, demonstrating its position in the constantly changing poultry market. In recent years there has been a significant variation in the profitability of large-scale table eggs production. The increase in feed costs largely impacts such a state of affairs. On the other hand, excess egg production results in low prices. In addition, a constant problem is financial liquidity, which remains at a rather low level. The production efficiency of agricultural producers groups, and thus the production potential of holdings, indicates that production costs are decreasing and the profitability of holdings that form the group increases. The main connecting factor is shared technical equipment as well as common supply of raw materials and sale of products. An unfavourable agrarian structure contributes to low productivity and slows down the implementation of technological innovations. As a result, crop cultivation and breeding of animals is deconcentrated; the holdings are not specialized enough, although their competitive position depends on it. An agricultural holding is considered to be fully competitive when it increases both its market

share and income from agricultural production (Szeląg-Sikora, Niemiec, Sikora, 2016; Sikora, Niemiec, & Szeląg-Sikora, 2018; Udry, Hoddinott, Alderman, & Haddad, 1995).

Research material and methods

The formation of agricultural producers groups is based on the concept of cooperation, which allows meeting the challenges of the market economy based on the principle of competition. Through proper organization and adjusting the production to the needs of the buyer, producers ensure a better market position, which is related to higher income (Bielski, 2004; Glasbergen, 2018; Sikora et al., 2017).

In Poland, an agricultural producers group can choose among four forms of business activity; a cooperative, a limited liability company, an association and a union.

In addition, groups of agricultural producers run business as legal persons, provided that:

- they were formed by producers of a single agricultural product, or a group of products;
- they operate on the basis of a statute or contract (a founding act);
- they consist of members or shareholders (none of them may have more than 20% of votes at a general meeting or shareholders' meeting);
- revenues from the sale of products, or groups of products grown in the holdings of the group members constitute more than half of the group's revenue from the sales of products or groups of products for which the group was established;
- they define for the group's members the rules regarding the quality and quantity of products or groups of products delivered to the group, as well as methods of preparing products for sale, in the form of an act of incorporation (Agricultural producers groups…)

Two economic and social goals have been distinguished, under which producers cooperate in the form of a producers group. The first type of goals involves running various forms of joint economic activity. It is possible to sell agricultural products coming from the group members' holdings. As part of the group's functioning, it is possible to adjust agricultural production to market conditions. Agricultural producers associated in a group increase their income by reducing costs, thus improving the efficiency of management, which is the main goal of the group's activity (Agricultural producers groups…). Producers cooperate frequently in production and providing various types of services

within the organization. Through such group activities, the profits of a group member increase, and not that of the organization.

The second group of implemented objectives includes activities such as: joint representation of interests or running and organizing support activities such as marketing, i.e. joint promotion of products (Agricultural producers groups…)

That said, cooperation of producers associated in the group brings a number of benefits, including:

- joint purchase of means of production - the possibility to buy cheaper fertilizers, plant protection products, transport, etc., at wholesale prices,
- offering a large and homogeneous batch of high quality goods,
- strong and ongoing relationship with buyers who are willing to sign long-term contracts, thanks to the possibility of ensuring continuous deliveries of a given batch size,
- joint preparation of appropriate batches of products (storage, packaging, labelling),
- joint investments (capital, loans, machines, warehouses, etc.) and introduction of new technologies,
- distribution of risk among all group members, and joint problem solving.

According to the National Network of Rural Areas (as at 18/06/2016), 1,258 agricultural producers' groups were registered in Marshal Offices, 65% of which operated as limited companies, 30% in the form of co-operatives, 4% in the form of unions and 1% in the form of an association.

In 2016, the number of producers groups specializing in the production of bird eggs was 15. In July 2016, the largest number of registered egg producers groups (PG) was in the Mazowieckie Voivodeship (3 PG), and in Silesia (2 PG). A single group of egg producers was registered in the following provinces: Wielkopolskie, Opolskie, Warmińsko-Mazurskie, Zachodniopomorskie, Podlaskie, Podkarpackie, Lubelskie, Śląskie, Łódzkie i Małopolskie. In the other provinces there was no group specializing in egg production (Newsletter of the Ministry of Agriculture …,; Agricultural producers groups…).

According to Kuboń and Olech (2018), proper market competitiveness is possible only in the case of large agricultural holdings, which include agri-food processing, as well as wholesale and retail units in their organizational structures.

The research object was a producers group consisting of five holdings specializing in the production of table eggs, located in the Limanowski and Nowosądecki districts. The research was carried out in the form of a targeted interview using a previously developed questionnaire.

In the EU, the classification of agricultural holdings according to economic parameters is based on the concept of direct surplus which determines the efficiency of their resources management.

Direct surplus (DS) is expressed by the formula:

$$DS = GFP - DC \text{ (thou. PLN holding}^{-1}) \quad (1)$$

where GDP - the annual gross value of total crop and animal production. The value of specific animal production included: the value of the main product, the value of internal consumption, subsidies.
DC - direct costs incurred for production.

LU is an arbitrary unit of abundance of farm animals on a holding (Szeląg-Sikora et al., 2017) A holding's LU is calculated by multiplying the average annual number of its animals, according to the keeping system, by an appropriate conversion factor of individual animals. In the case of hens, it is 0.004.

Results and discussion

The production potential of the studied producers group

Table 1 shows the number of livestock on the surveyed holdings converted into LU holding^{-1}. The average livestock population was 97.65 LUholding^{-1}. The largest stocking density was 146.25 LU holding^{-1} on holding no.1, and was equally high on farm no. 3. The lowest LU was on holding no. 5 -67.50 LU holding^{-1}. On the other two holdings, the poultry density was 78.75 LU holding^{1}.

Table 1 ***Number of livestock on the surveyed holdings*** *(own study)*

No.	Specification	Holdings					
		Average	1	2	3	4	5
	(LU holding^{-1})						
1	Poultry	97.65	146.25	78.75	117.00	78.75	67.50

For the researched holdings, the average value of animal production amounted to PLN 3231.44 thou. holding^{-1} (Table 2).

Table 2 ***Total animal production*** *(own study)*

No.	Specification	Holdings					
		Average	1	2	3	4	5
	(thou. PLN holding^{-1})						
1	Poultry	3,231.44	5,070.00	2,610.00	3,672.00	2,530.00	2275.20

Across individual holdings, there is a large variation in the total gross value of obtained production. The results range from PLN 5070.00 thou. holding^{-1} on holding no. 1 to PLN 2,277.20 thou. holding^{-1} on holding no. 5. Due to the above, the difference between the holding with the highest gross production and the holding with the lowest was PLN 2794.80 thou. holding^{-1}.

Table 3 ***Direct purchase expenditures on animal production*** *(own study)*

No.	Specification	Holdings					
		Average	1	2	3	4	5
	(thou. PLN holding^{-1})						
1	Total	1499.34	2297.12	1161.42	1808.02	1218.41	1011.75
2	Purchased feed	964.99	1468.80	735.84	1184.35	800.00	635.98
3	Purchased inventory - chicks	91.14	136.50	73.50	109.20	73.50	63.00
4	Other	443.21	691.82	352.08	514.47	344.91	312.78

Average purchase expenditures on animal production amounted to PLN 1499.34 thou. holding^{-1} - the highest was PLN 2,297.12 thou. holding^{-1} on holding no.1, while the lowest was on holding no. 5, where the expenditures were over 50% lower (Tab. 3). The highest purchase expenditures by the researched holdings related to the purchase of feed, PLN 964.99 thou. holding^{-1} on average, which accounted for 64.3% of total expenditures. The highest feed purchase expenditures in relation to total expenditure were incurred by holding no. 3, in which the ratio amounted to 65.5%, and by holding no. 1, with the ratio 63.9%. Feed purchase expenditures were similar on holdings no. 2 and 5. The lowest feed purchase expenditure was recorded on holding no. 4, with 62.4% of total expenditure.

Table 4 ***Direct surplus (DS)*** *(own study)*

No	Specification	Holdings					
		Average	1	2	3	4	5
	(thou. PLN holding^{-1})						
1	Poultry	1,732.10	2,772.88	1,448.59	1,863.98	1,311.59	1,263.45

The average value of direct surplus in the case of poultry production was PLN 1732.10 thou. holding^{-1} (Tab. 4). The highest value was achieved by holding no. 1, amounting to PLN 2772.88 thou. holding^{-1}. Another farm for which the direct surplus value was above the average was holding no. 3.

Market position of the researched producers group

The market position of the surveyed group is constantly challenged by competition or the technological race. It can be measured by market share and the ability to maintain or increase this share. The researched producers group was the only one operating in the poultry industry in the Małopolskie and Podkarpackie provinces. A small share of imports, just 3%, allowed the group to reach a significant position in the local and regional markets. The share of the analysed producers group amounted to as much as 23% in the egg market in the above-mentioned region (Figure 1). This illustrates the group's high position in the local market.

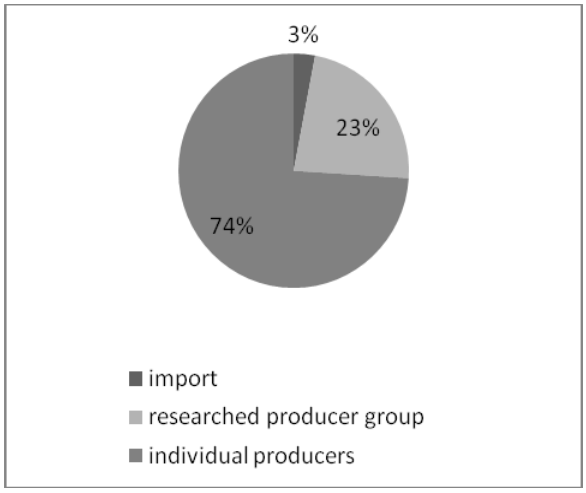

Figure 1 ***The share of researched egg production holdings in the Małopolskie and Podkarpackie provinces, as compared with other producers*** *(own study)*

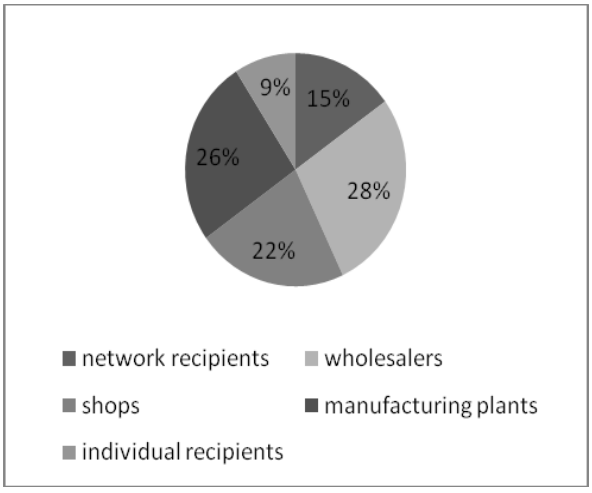

Figure 2 ***Buyer structure*** *(own study)*

As demonstrated in Figure 2, the main buyers were the chain customers, stores and wholesalers with which the producers group had long-term contracts. Only 26% were individual recipients. The purpose of long-term contracts is to keep buyers for a longer period. It is a way to realize competition policy in sales markets. This situation allows developing long-term strategies.

As in every branch of the market, interest in a particular product might decrease, and such was the case for the poultry market. Therefore, the entire poultry sector has faced a major challenge, i.e. the decline in the demand for eggs, which has been on a consistent and steady decline for several years (Figure 3). Maintaining the volume of production and sales depends on the continuous improvement of the distribution chain, focusing on the needs of customers, as well as on adjusting to the changes in price and quantity. All these functions, as well as broadly understood marketing, are currently realized jointly within the

producers group. Such activities are necessary to maintain the competitive edge in the face of overall decline in demand.

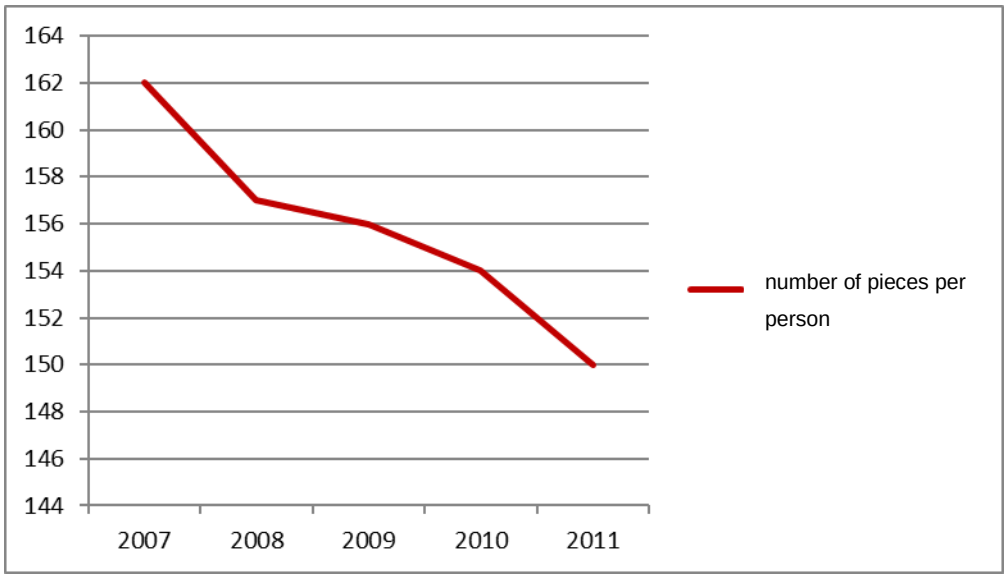

Figure 3 ***Demand for eggs in Poland in 2007-2011 - average domestic consumption of eggs per person*** *(own study)*

Table 5 ***Comparison of prices of table eggs in the wholesale market and in the surveyed group in 2016*** *(own study)*

Month	Average price of egg (PLN pcs^{-1})		Difference
	Market price	Price in the researched producers group	
January	0.29	0.32	0.03
February	0.35	0.38	0.03
March	0.52	0.50	- 0.02
April	0.42	0.50	0.08
May	0.26	0.37	0.11
June	0.27	0.37	0.10
July	0.27	0.30	0.03
August	0.30	0.30	-
September	0.32	0.34	0.02
October	0.33	0.34	0.01
November	0.34	0.35	0.01
December	0.33	0.35	0.02
		Total	0.42
		Average	0.04

The data included in Table 5 illustrates the market prices of table eggs, and offered by the researched group, in 2016. According to the data, producers associated in the studied group obtained a higher price, PLN 0.04 on average, than they would in the market. The greatest difference was recorded in May, with the market price being lower by as much as PLN 0.11. In one month the market price was higher than the price offered by the group, however, this was due to the overall strong increase in the price of eggs.

Conclusions

The need of improving the competitiveness of agricultural holdings have led to the formation of new forms of collective management in Poland. The integration of agricultural producers and forming producers groups creates new opportunities to rank high in the agricultural market. By operating in groups, producers benefit more than when operating individually. Producers with low production potential, operating on their own, are losing to a much stronger commercial and production environment.

1. A diversified value of gross total production can be observed in the researched holdings of the egg producers group. The value of this production category ranged from PLN 5070.00 thou. holding^{-1} to PLN 2275,20 thou. holding^{-1}. This discrepancy is related to the amount of livestock.
2. Upon analysing the market position of the producers group, it was demonstrated that the researched producers group accounted for as much as 23% of the egg production market in the Małopolskie and Podkarpackie provinces. This illustrates the group's high position in the regional market.
3. According to the analysis of the results, 74% of the group's buyers were chain customers, stores and wholesalers with whom the group had long-term contracts. Only 26% were individual buyers.

References

Agricultural producers groups (n.d.). Retrieved from www.arimr.gov.pl

Bielski, W. (2004). You want to increase your income join the producer group. *Agroserwis,* 22-23.

Downey, D.W. (1996). The challenge of food and agri-products supply chains. *Procedings of the 2nd international Conference on Chains Management in Agri and Food Business, Wageningen Agricultural University, 3.*

Glasbergen, P. (2018). Smallholders do not Eat Certificates, Reliability. *Ecological Economics, 147,* 243-252. DOI: 10.1016/j.ecolecon.2018.01.023.

Gródek-Szostak, Z., Szeląg-Sikora, A., Sikora, J., & Korenko, M. (2017). Prerequisites for the cooperation between enterprises and business support institutions for technological development In A. Ujwary, A. Nalepka (Ed.) *Business and Non-profit Organizations Facing Increased Competition and Growing Customers' Demands, 16,* 427-439.

Kocira, S., Kuboń, M., & Sporysz, M. (2017). Impact of information on organic product packagings on the consumers decision concerning their purchase. *17th International Multidisciplinary Scientific GeoConference SGEM 2017. Conference Proceedings, 17*(52), 499-506.

Kuboń, M., Sikora, J., Olech, E., & Szeląg-Sikora, A. (2018). Energy Islands as a Potential Source of Securing the Energy Supply of Bio-Feedstock for Biogas Plants. In. K. Mudryk, S. Werle(Ed) *Renewable Energy Sources: Engineering, Technology, Innovation. Springer Proceedings in Energy.* Springer, Cham. DOI: org/10.1007/978-3-319-72371-6_70.

Kuboń, M., & Olech, E. (2018). Marketing of organic products in southern Poland. In A. Szeląg-Sikora (Ed) *Contemporary research trends in agricultural engineering: proceedings of a meeting held 25-27 September 2017, Krakow, Poland), BIO Web of Conferences, 10, nr UNSP 01014, 2018, E D P SCIENCES*, DOI: 10.1051/bioconf/20181001014.

Latawiec, A.E., Krolczyk, J.B., & Kuboń, M., Szwedziak, K., Drosik, A., Polańczyk, E., Grotkiewicz, K., & Strassburg, B.B.N. (2017). Willingness to Adopt Biochar in Agriculture. *The Producer's Perspective. Sustainability, 9*(4), 655. https://doi.org/10.3390/su9040655

Newsletter of the Ministry of Agriculture and Rural Development "Promoting the creation of agricultural producers groups" (n.d.). Retrieved from www.ksow.pl

Niemiec, M., Szeląg-Sikora, A., Kuzminova, N., & Komorowska, M. (2018). Content of Ni, Pb and Zn, in selected elements of ecosystem in three bays in the area of Sevastopol. In A. Szeląg-Sikora (Ed.) *Contemporary research trends in agricultural engineering: proceedings of a meeting held 25-27 September 2017, Krakow, BIO Web of Conferences, 10, nr UNSP 01015, 2018, E D P SCIENCES,* doi.org/10.1051/bioconf/20181001015.

Niemiec, M., Mudryk, K., Sikora, J., Szeląg-Sikora, A., & Komorowska, M. (2018). Possibility to Utilize Fish Processing By-Products in the Context of Management of Non-renewable Resources. *Renewable Energy Sources: Engineering, Technology, Innovation*, 639-649. DOI: 10.1007/978-3-319-72371-6_63.

Restuccia, D., Yang, D.T., & Zhu, X. (2008). Agriculture and aggregate productivity: A quantitative cross-country analysis. *Journal of Monetary Economics, 55*(2), 234-250. DOI:10.1016/j.jmoneco.2007.11.006

Sikora, J., Niemiec, M., & Szeląg-Sikora, A. (2018). Evaluation of the chemical composition of raw common duckweed (*Lemna minor* L.) and pulp after methane fermentation. *Journal of Elementology, 23*(2), 685-695. DOI: 10.5601/jelem.2017.22.2.1444

Sikora, J., Niemiec, M., Szeląg-Sikora, A., Kuboń, M., Olech, E., & Marczuk, A. (2017). Biogasification of wastes from industrial processing of carps. *Przemysł Chemiczny, 96*(11), 2275-2278. DOI:10.15199/62.2017.3.38.

Szeląg-Sikora, A., Niemiec, M., & Sikora, J. (2016). Assessment of the content of magnesium, potassium, phosphorus and calcium in water and algae from the black sea in selected bays near Sevastopol. *Journal of Elementology, 21*(3), 915-926. DOI:10.5601/jelem.2015.20.4.969.

Szeląg-Sikora, A., Niemiec, M., Sikora, J., & Chowaniak, M. (2017). Possibilities of Designating Swards of Grasses and Small-Seed Legumes From Selected Organic Farms in Poland for Feed. *IX International Scientific Symposium "Farm Machinery and Processes Management in Sustainable Agriculture", Lublin, Poland*, 365-370. DOI: 10.24326/fmpmsa.2017.65

Szeląg-Sikora, A., & Rorat, J. (2018). Spatial database for division of agricultural plots for the group of vegetable producers. In. A. Szeląg-Sikora (Ed.) *Contemporary research trends in agricultural engineering*: *proceedings of a meeting held 25-27 September 2017, Krakow, Poland BIO Web of Conferences, 10, nr UNSP 02001, 2018, E D P SCIENCES*. DOI:10.1051/bioconf/20181002033.

Udry, Ch., Hoddinott, J., Alderman, H., & Haddad, L. (1995). Gender differentials in farm productivity: implications for household efficiency and agricultural policy. *Food Policy, 20*(5) 407-423. DOI:/10.1016/0306-9192(95)00035-D