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CREATION OF PRODUCER GROUPS AS A FORM OF EFFICIENT DEVELOPMENT OF THE AGRICULTURAL MARKET ORGANIZATION IN POLAND

The leading type of farming in world agriculture is a family farm. After attempting unsuccessful activities related to the construction of agricultural production cooperatives and the growth of state enterprises in Poland, the revival of family farms is observed [8, s. 63].

This type of farms is currently predominant in Poland and they provide 70% of food for Poland [16, s.75]. One of the methods of cooperation between agricultural producers is membership in producer groups. Thus, the aim of this work is to show the benefits and specifics of the development of a farm by way of membership in the group of agricultural producers.

Key words: *producer groups, efficiency, development, agricultural market.*

1 Motives for establishing cooperation between agricultural producers.

A competitive market requires constant growth of the production scale. Smallholder agriculture is often subject to inefficient allocation of goods and services and unable to capitalize on the benefits of economies of scale and have lower market access and bargaining power, especially in rural areas. A single producer, who manages a low-scale production, and has no access to technical equipment and modern technologies, is usually unable to react to changes in his environment [13, s.572]. This type of farms is currently predominant in Poland and they provide 70% of food for Poland[16, s.75] .

Enlargement of some farms may take place as a result of the collapse of others, which is difficult due to the existing bond between families and their farms as well as due to deficiencies observed on the land market and due to the limited, as a rule to a minimum, demand for labour [4, s.9-10]. As to Polish agricultural producers, recent changes concern the necessity of satisfying needs of consumers, who expect products of high quality and of reasonable price, delivered in consumption adjusted and attractive way, throughout the whole year

[3, s. 978]. The key stage in this process is recognising and reflecting on opportunities and threats that the farm will have to face [18, s. 67]. The crucial problems to hinder the smooth operation and development of agriculture in Poland are as follows [12, s. 45], [18, s. 70-72], [19, s. 37]:

- poor equipment and poor condition of rural infrastructure,
- low yield and low profitability, perceived by many farmers as the main barrier to farm development,
- low income affecting the financial situation of families living on agriculture,
- small scale of production,
- excess or shortage of labour,
- obsolete technical equipment or lack of it, lack of ability to apply new technologies either,
- little ability to invest or accumulate assets,
- socio-sociological drawbacks related to the lack of free time, the nature of employment, primitive living conditions, and limited educational opportunities.

Methods of cooperation of agricultural producers may differ in terms of size and scope of activities as well as the adopted structure thereof. According to the International Union of Agricultural Producers, when referring to the formal cooperation of agricultural producers, we mean federations, associations, marketing groups of agricultural producers, cooperatives and agricultural chambers as well as farmers' associations. Farmers undertake cooperation for the purposes of: defending their own interests (lobbying, representation functions), collective implementation of technical and economic initiatives, such as the purchase of production means, production planning, cooperative sales [2, s.31-42]. Smallholder agricultural producers are unable to capitalize on the benefits of economies of scale and have lower market access and bargaining power [17, s. 1415]. Therefore, they face higher transaction costs, such as the purchasing of inputs, capital access, or the selling of output [9, s.249]. The policy support for promoting cooperative behaviour is based on the assumption that acting collectively should allow farmers to cope more effectively with these market challenges than when acting individually [15, s. 80]. Members of these groups were aware of the weakness of an individual player on the market and that he had no chance to confront the organized strength of the processing and purchasing businesses. Producer groups make service providers, manufacturing plants, producers of means of production, to recognise a group of agricultural producers, as a large and strong market entity, willing to buy a large number of goods or services and provide a homogeneous and huge batch of products. Another important motive for cooperation in the group is the fear of losing the

guarantee for the sale of agricultural products [10, s. 37-43].

Thus, the aim of this work is to show the benefits and specifics of the development of a farm by way of membership in the group of agricultural producers.

2 Benefits from the producer group

Although the support provided for producer organization within the CAP has a relatively long history; there is little empirical evidence on its effects on the EU farming sector [6], especially in Poland. When creating producer groups, first of all, the appropriate forms must be chosen so they not constitute any obstacle to the planned activity to be carried out and allow to achieve the group's goals to a maximum extent [22, s. 16]. Polish legislation indicates the purposes for which the registered entities may cooperate in groups, e.g.: joint marketing of goods, adjusting the production process and manufactured agricultural products to market requirements, concentrating delivery and sales on wholesale customers, establishing common rules to exchange information regarding production, paying special attention to agricultural product crops and availability thereof, development of marketing and business skills as well as facilitation of the innovation processes and implementation thereof, including environment protection processes [14]. The Act also requires that [20, s.983]:

- each year, each member of the group sells to the group not less than 80% of their products,
- annual revenues from the sale of products or groups thereof, generated in special agricultural subdivisions or on farms, account for at least half of the entire group's income,
- the production rules for the group members are set up, inter alia regarding the quantity and the quality of manufactured products and methods of preparing them for sale,
- a member of the group may not belong to another group incorporating producers of the same product.

Most of the available studies assess a producer group as a whole. In general, these studies analyse the impact of size or organisational structure on the performance or efficiency of the Producer Groups [21]. Among the benefits of farm membership in the producer group, there is possibility of obtaining subsidies designed specifically for these groups. Rural Development Programme for 2014-2020 (hereinafter referred to as RDP).

The advantage that a producer organization has on the market over a small individual producer results from the specifics of the group's operations. The results of Duvaleix-Treguer and Gaigne [5] suggest that large farms are in better position to benefit from POs as they may better benefit from the economies of scale generated by POs. Other benefits that an agricultural producer associated

with a group can obtain include [1, s. 299]:

- achieving higher sales prices than a single individual farmer could negotiate alone, by means of jointly organized marketing of goods produced by farms as the group members,
- increased guarantee for the sale of products when there is a situation of demand shrinkage during a period of time,
- increase in the profitability of production by increasing the total income derived from the production of goods by one member of the group,
- introducing higher-quality agricultural products to the market and moreover, at lower production costs,
- reduction of some costs incurred by the farmer as a result of spreading those costs on a larger scale of production,
- reduction of the jointly incurred costs of promotion, sales and distribution, and
- the opportunity to purchase production resources at more favourable prices.

Despite the many benefits derived from group actions, there is still mistrust and unwillingness to cooperate in form of the producer groups among Polish farmers, which is due to administrative issues resulting from the bureaucratic procedures for financing their activities. In October 2017, there were 1,100 agricultural producer groups in Poland, which is a small number as compared to 1.4 million of all farms [11]. In the past 2017, only 52 groups of agricultural producers submitted their applications for EU RDP support. This number is a very small for the entire country, where in 2016, 132 groups applied for financial support for the newly formed producer groups [7, s.28].

3 Group of agricultural producers as the farm development method – case study

Although the market for agricultural products in Poland is being organized increasingly well, many examples show that producers are not present on it [1, s. 297]. This situation puts Polish farmers in a difficult position in terms of their profitability and competitiveness. At present, only the dairy cooperative movement retains its market share at the level of around 70% and so it proves the feasibility of a modern and competitive form of cooperative activity. The research, whose practical goal was to examine the effectiveness of the method of farm development consisting in participation in a group of agricultural producers was carried out in 2017-2018 by the research team of Agnieszka Parkitna and Michał Skop.

The subject of the research is the phenomenon of shaping economic efficiency by way of an increase in the profit of the farm and, as a consequence,

its development resulting from its membership in the producer group. As part of the diagnosis, a real simulation has been made consisting in comparison of the profit of the farm that could be achieved when participating in the producer group with the profit achieved in reality during the production cycle.

4 The Polish individual farm

The object of research is an individual (average) farm (owned by a natural person) specializing in breeding pigs for production of pork. Moreover, the farm produces the animal feed for pigs, but apart from cereal sowing (72% of the total arable land area, which is 23.6 hectares), there are also sugar beet and pea crop cultivations. All cereals produced on the farm are intended for the production of animal feed, however, its amount is not enough to meet the farm needs throughout the year. Thus, in the analysed period, the value of cereals, as components of the feedstuff produced for the production cycle, was calculated on the basis of average purchase prices of cereals from external entities, which are usually local farmers.

During the year, the farm was able to complete 3-4 production cycles, depending on the average weight of the piglets being delivered to the farm, or depending on other variables, which most often include the health condition of the herd. The maximum capacity of livestock buildings in which the breeding is carried out is 500. However, in order to reduce the risk of diseases, often resulting from too large concentration, the farm populates its buildings with 480 pieces of weaners.

4.1 Actual circumstances

The revenues and deductible costs for breeding one animal lot within a given timeframe have been considered as source data characterizing the events that took place in the research facility, (1).

1. Revenues from the sale of fattening pigs

No.	Date	Q-ty [pigs]	The amount of meat [kg]	Average price [PLN/kg]	Net value [PLN]	Gross value (incl. VAT) [PLN]
1	26.02.2017	100	10 075.300	5.97	60 178.82	64 993.13
2	12.03.2018	175	18 788.000	6.05	113 642.73	122 734.15
3	19.03.2018	175	18 220.700	5.71	104 082.66	112 409.27
4	26.03.2018	19	2 255.000	4.20	9 471.00	10 228.68
Total		469	49 339.000	-	287 375.21	310 365.23
Weighted average		-	-	5.82	-	-

Source: own study

The analysis shows that the sales of pigs on the farm lasted less than a month (29 days). The first three stages of sales of fattening pigs were bought by the same entity. During the sale of animals, the average sales price ranged between 4.20 PLN/kg, and 6.05 PLN/kg of meat. The low sales price in the last stage was due to the fact that pigs were sold to another entity buying livestock, because the meat factory, which received the first three transports, refuses to accept fattening pigs in the number smaller than 90 animals (which is common practice on the Polish market to large slaughterhouses of cattle and pigs). Hence, there is a huge difference in the average price obtained for the third and the last delivery – the fourth sale was completed at the price lower by PLN 1.51/kg of meat, i.e. price decreased by 26%.

In the next step, the analysis of the data regarding purchase of weaners has been made (Table 2) – considered as the basic production factor on the farm and at the same time the highest cost factor in relation to the income from sales, as we shall discuss it later in this chapter.

2. The cost of buying a weaner

Q-ty [pigs]	Weight [kg]	Av. weight [kg/each]	Average price [PLN/each]	Net value [PLN]	Gross value [PLN]
480	14 976.00	31.2	267.46	128 380.80	138 651.26

Source: own study

Then, the analysis of a unit cost of production of 1 ton of feedstuff to be consumed by the livestock has been carried out (3). The values of individual feed ingredients were determined based on the source data.

3. The cost of buying 1 ton of feed ingredient

No.	Ingredient	Price [PLN/t]
1 *	Barley	620
2 *	Wheat	650
3 *	Triticale	560
4 *	Soybean meal	1520

Source: own study

The feedstuff produced on the farm, which is the only food for live animals raised on the farm, is the main cost of rearing the purchased weavers, as the weight gain of the porker is depending on this productive factor. The costs juxtaposed this way made it possible to calculate the unit cost of producing 1 ton of feedstuff (4), which is at the level of PLN 857.10/t.

4. The evolution of the unit cost of feed for the livestock

No.	Ingredient	Portion [kg]	Value [PLN]
1 *	Barley	450	279.00
2 *	Wheat	210	136.50
3 *	Triticale	150	84.00
4 *	Soybean meal	130	197.60
5	Premix	25	97.00
6	Oil	5	16.00
7	Other additives (including mycotoxin preparation. garlic extract. souring agent)	30	47.00
	TOTAL	1 000	857.10

Source: own study

During the fattening period 126 630 kg of feedstuff has been used. Subsequent calculation per unit of bred porkers, shall give us the cost distributed according to the number of live pigs sold, which means that the following amount of feedstuff has been used per one unit of production:

$$\text{Feed consumption per unit} = \frac{126\,630\text{ kg}}{469\text{ pigs}} = 270 \frac{\text{kg}}{\text{each}}$$

Other costs that affect the profit from the sale of a given batch of fattening pigs are the costs incurred by the farm owner during the batch's breeding period. On the farm, this period lasts from the day the piglets are purchased to the last day of the sale of the raised pigs for slaughter in a meat factory. These costs include (5):

- the fee for providing veterinary services (including the value of medicines purchased, antibiotics),
- the price of purchased means for disinfecting the pigsty before getting a new batch of piglets to the farm and disinfectants for the water supplied to the pigsty for consumption by animals,
- the cost of water supplied for consumption by animals by the municipal waterworks,
- the cost of electricity used during the breeding cycle,
- insurance of pigs against extraordinary events (e.g. burning of a livestock building in case of fire or in case of a storm),
- the cost of exporting slurry with own farm equipment,

5. Other costs incurred in the production cycle

No.	Name of the cost	The amount of costs incurred during the production cycle [PLN]	In relation to the number of sold pigs [PLN/each]
1	Veterinary services	5 394.00	11.50
2	Disinfectants	412.00	0.88
3	Water	1 487.00	3.17
4	Electricity	2 520.00	5.37
5	Inventory insurance	199.00	0.42
6	Export of organic waste	2 310.00	4.93
TOTAL		12 322.00	26.27

Source: own study

The juxtaposition of revenues from the sale of manufactured products, i.e. pork livestock and the deductible costs, allows us to calculate the individual profit for the farmer.

6. Calculation of profit on sales

REVENUES FROM SALES:	287 375.21
Sales of fattening pigs in the period 26/02/2018 - 26/03/2018	287 375.21
DEDUCTIBLE COSTS:	249 237.37
Purchase of weaners	128 380.80
The cost of used feed	108 534.57
Other costs. including:	12 322.00
- Veterinary services	5 394.00
- Disinfectants	412.00
- Water	1 487.00
- Electricity	2 520.00
- Inventory insurance	199.00
- Export of organic waste	2 310.00
PROFIT (LOSS) ON SALES	38 137.84

Source: own study

Thus, calculated (6) per unit of manufactured product, the farm achieved a profit in the amount of:

$$\text{Profit on sales per unit} = \frac{38\,137.84 \text{ zł}}{469 \text{ pigs}} = 81.32 \frac{\text{PLN}}{\text{each}}$$

From the point of view of market prices, a profit on sales was achieved in the amount of PLN 81.23/unit which is not high, but it is not extremely low either, because according to the threshold of profitability of the farm, the minimum profit per unit is 70,00 PLN/unit.

4.2 Simulated farm profit as a member of the producer group

In order to test economic efficiency, a financial result forecast was made supposing the farm which is the object of research would be a member of the group of agricultural producers producing pork pigs. To assure transparency of the calculations made to demonstrate the effectiveness, the following assumptions have been made:

- sales revenues for a total of 469 units of fattening pigs at the average price valid for contracts for this group in 2017 have been calculated as follows: (7)

7. Sales revenues achieved by a member of the Producer Group

-	Q-ty [each]	The amount of meat [kg]	Average price [PLN/kg]	Net value [PLN]	Gross value (incl. VAT) [PLN]
Total	469	49 339,000	5,92	292 086,88	315 453,83

Source: own study

- same costs have been adopted regarding feed production and additional costs borne by the farm in connection with pigs reared at a given time, so both the unit cost of animal feed production and the value of additional costs remain unchanged.

- the financial results refer to the same production batch, with the difference that, hypothetically, the unit belongs to a working producer group, which receives co-financing from the RDP to the value of porkers sold,

- the producer group negotiated with the slaughterhouse the price of selling pigs from the farm by 0.10 PLN higher than the market price that the farmer not being a member of the group was able to achieve

- the purchase price of a piglet does not change due to the large number of purchased pigs by the individual farmer (480 pigs),

After juxtaposition of revenues from sales and the deductible costs has been made, the achieved profit on sales is (8) by PLN 4,711.67 higher than the profit achieved at the same time by a farmer who is an individual player on the market of pig livestock.

In addition, there is a further assumption to receive financial assistance in connection with the access to the RDP aid program. A simplified assumption was made, according to which the producer group allocates the received amount of co-financing to group members in proportion to the sales performed by a given entity. The Polish Act sets a 10% subsidy to each PLN of income earned by a group of agricultural producers in the first year of the group's operation. Therefore, assuming that the group has been operating since January 1, 2017, the value of co-financing is (formula)

$$\text{The value of the production subsidy} = 292\,086.88 \text{ PLN} * 10\% = 29\,208.69 \text{ PLN}$$

8. Calculation of profit from sales achieved by a member of the Producer Group

REVENUES FROM SALES:	292 086.88
Sale of pigs	292 086.88
DEDUCTIBLE COSTS:	249 237.37
Purchase of weaners	128 380.80
The cost of used feed	108 534.57
Other costs. including:	12 322.00
- Veterinary services	5 394.00
- Disinfectants	412.00
- Water	1 487.00
- Electricity	2 520.00
- Inventory insurance	199.00
- Export of organic waste	2 310.00
PROFIT (LOSS) ON SALES	42 849.51

Source: own study

Furthermore, the obtained profit on sales per unit of production of the farm after receiving the subsidy for production has been calculated.

9. Profit achieved by the farm after receiving the subsidy to production for taking part in the activity of the Producer Group

REVENUES FROM SALE:	321 295.57
Sale of pigs	292 086.88
The production subsidy	29 208.69
DEDUCTIBLE COSTS:	249 237.37
Purchase of weaners	128 380.80
The cost of feed consumed	108 534.57
Other costs:	12 322.00
PROFIT (LOSS) ON SALES	72 058.20

Source: own study

5 Summary of the study

Considering the profit forecast for a farm which is a member of the producer group, one can notice a significant increase in the economic efficiency per 1 pig. Particularly noteworthy are the amount of profit achieved, which depended on two variables conditioning level thereof:

- the higher sale price for pigs negotiated by the group for the farm than that which the farm achieved not being a member of the group
- the subsidy to production received owing to RDP, related the value of pigs sold by the farmer

In the base case, the unit achieved a profit on sales in the amount of PLN

38 137.84. In a situation where the farm is a member of a producer group, the farmer would have reached the profit at a level of PLN 4,711.67 higher. However, after taking into account the subsidy to production, the profit would have amounted to PLN 72 058.20, so it would have been as much as 88.9% higher than that achieved in reality. Which is to prove high economic efficiency and speaks in favour of this form of consolidation of farmers in Poland.

Farmers participating in producer groups in Poland can, as demonstrated by the simulation, achieve a bigger benefit resulting from cooperation, which is related to, among others, obtaining higher revenues due to the elimination of intermediaries other than the producer group, unnecessary in the sales chain, as they intercept trade margins. In addition, using the economies of scale, they can buy means for production at cheaper prices, when carrying out joint investments in the course of preparations for production.

The article should be considered as a contribution to further discussions, but nevertheless, it is a simple but tangible proof that can speak in a way easy to understand in favour of agricultural producer groups on the Polish market.

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A. Паркітна, З. Вілімовська. Створення виробничих груп за формою ефективного розвитку організації сільськогосподарського ринку у Польщі. Домінуючим типом землеробства у світовому сільському господарстві є сімейне господарство. Після невдалої спроби діяльності, пов'язаної з будівництвом сільськогосподарських виробничих кооперативів та зростанням державних підприємств у Польщі, відбувається відродження сімейних господарств.

В даний час цей тип фермерських господарств є поширеним у Польщі, забезпечуючи 70% продуктів харчування, що виробляються для Польщі. Одним з методів співпраці сільськогосподарських товаровиробників є членство в групі виробників. Тому мета роботи - показати переваги та специфіку розвитку сільськогосподарської економіки через членство в групі сільськогосподарських товаровиробників.

Ключові слова: групи виробників, ефективність, розвиток, сільськогосподарський ринок.

A. Parkitna, Z. Wilimowska. Creation of groups of agricultural producers has been recommended as an effective form of organizational development of the agricultural market in Poland. The development of farmers' economic cooperation is desirable in every aspect due to the dispersion of agricultural producers and the low level of organization of agricultural markets. One of the methods of cooperation between agricultural producers is their membership in a producer group. The farmers' drive towards vertical and horizontal integration increase due to the common agricultural policy in Poland, which resulted in membership in the unified EU market and the requirement to increase the scale of production while reducing production costs.

This situation puts Polish farmers in a difficult position in terms of their profitability and competitiveness. The agricultural cooperative movement, despite excessive dependence on the State, purchased about 60 agricultural products from farmers. Therefore, we are currently looking for forms of cooperation that would increase efficiency on this market. World literature research shows that organizations of producer groups have higher economic efficiency.

The subject of the article's research is the stimulus to the profitability of an agricultural farm resulting from its membership in the producer group. In order to prove the phenomenon, a simulation has been made consisting in comparison of the profit of a farm that could be achieved when participating in the producer group with the profit achieved in reality during the production cycle.

The practical objective of the work is to confirm higher economic efficiency of the farm participating in the group of agricultural producers. Which is to prove the effectiveness of this method of developing an individual farm on the Polish market.

Key words: producer groups, efficiency, development, agricultural market.

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