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ECONOMIC RESULTS OF SHEEP FARMS IN POLAND

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Abstract. The aim of this paper was to present economic performance of farms engaged in sheep production. The research was conducted at 11 farms in the Province of Lublin in 2012. The detailed aim of this study was to compare the productivity per 1 ha of AL and per PLN 1 direct costs on farms. Area of the farm did not affect the generated incomes. The performed analyses confirm close relationship between the economic performance, the value of the farm buildings and the value of machinery and equipment. The farm income was negative in two farms with a loss of PLN 164 and PLN 306 per 1 ha of AL; whereas, the top farm generated PLN 3717 income per 1 ha of AL.

Key words: sheep production, gross margin, breeding profitability
JEL code: D-24

Introduction

Historical records highlighted the importance of sheep farming which provided meat, wool, milk and skins. In Poland, only in the 1980s, the sheep population was 5 million (Niznikowski R., 1994). Lowering demand for sheep-farming products in the second half of 1980s and in the first half of 1990s of the twentieth century was the reason for a drastic sheep livestock population drop. Such changes resulted in lowering sheep-farming production profitability. Wool prices fell down and overproduction of this product was a worldwide phenomenon (Klepacki B., 2005). However, the economic reforms that took place in Poland influenced the sheep husbandry sector (Nowoczesny …, 2005). Polish wool had no chance to compete with the cheaper and better quality raw material from countries where production conditions were much more advantageous. Inflation and rising costs of production resources, as well as lack of financial liquidity resulted in liquidation of many sheep herds (Poradnik …, 2005).

Due to interrelations between the farming sector and the national economy, the development of farms is influenced by social and economic conditions of an area. Unfortunately, the free market mechanisms supporting flow of capital to the most efficient areas of economy gave rise to developmental problems in the agricultural sector, including farms. Therefore, both the government and local authorities need to take some action (Wozniak M., 2008). The rules of market economy introduced to the agricultural farm sector displayed negative effects on the market which was totally unprepared for competition (Goraj

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L., 2005, Baran J., Zak J., 2014). In accordance with the concept of Pareto efficiency, the sheep product market functions properly (Gołasa P., Lenort R., Wysokinski M., Baran J., Bienkowska-Gołasa W., 2014). At that time, we could observe a dominant trend in meat production, while wool lost its importance (Rokicki T., 2005). Upon joining the EU structures, Poland became part of the single European market. The opportunity to reach a greater number of consumers was accompanied by fears related to increased competition. All entities operating on the market were forced to adopt EU requirements and legal regulations (Gorna J., 2009). The farming sector requires state intervention. In highly developed countries, agricultural producers are subsidised and domestic markets are protected against import. Yet, governments are abandoning market support to farmers, in favour of direct subventions (Poczta-Wajda A., 2009). Poland's accession to the European Union changed farming conditions. The Biological Progress Fund ceased to provide support to sheep-farming production. Instead, farmers could take advantage of direct payments or agricultural and environmental payments. Incomes and costs generated in sheep-farming production were subject to change. Therefore, factors which affected sheep-farming production profitability in Poland at the beginning of the twenty-first century need to be determined (Rokicki T., 2007). At the beginning of the 21st century, sheep production in Poland is commonly regarded as a branch complementary to other agricultural activities, and the production scale depends primarily on resources of bulky feeds (Rokicki T., 2008).

The studies on sheep farming profitability conducted at the beginning of the 21st century showed its dependence on the lamb sale and the level of subsidy granted. The total cost was dominated by feed costs (Klepacki B., Rokicki T., 2006). Besides, researchers established that in order to reach profitability in sheep farming, farmers had to maintain breeding herds of definitely larger sizes than those in the 1980s and in the first half of the 1990s. Economic effectiveness in sheep farming depended on a number of factors (Klepacki B., 2005, Rokicki T., 2004b). The activity of agribusiness companies is influenced by a number of macroeconomic and microeconomic factors (Rokicki T., 2013).

The aim of this paper was to present economic performance of farms engaged in sheep production. The research was conducted at farms in the Province of Lublin. The detailed aim of this study was to compare productivity per 1 ha of AL and PLN 1 direct costs on farms. The objective of the author was to confirm the relationship between the area of the farm and its productivity. Farm owners were interviewed (a structured interview) in order to obtain information on farm resources. Economic performance was determined on the basis of the crop calendar. Sheep farm owners maintained financial records relevant to their payments and payouts throughout 2012, i.e. from 1st January to 31st December. In these agricultural enterprises, the data were presented in the form of tables, graphic representation, and descriptive or economic calculation. The results calculated on the basis of the data refer to 2012. The studies involved 11 farms − sheep enterprises. The farm with the best income had 15.66 ha of AL, the worst only 7.45 ha of AL, and the "standard" farm 19.07 ha of AL. The

data were presented using descriptive, tabular and graphic methods, as well as correlation coefficient methods.

Research results

In the study, the following profit and loss categories were applied: sales revenues, gross margin, gross value added, net value added, net farm income, family farm income, rural family income (personal income). Positive economic effects were obtained in most sheep breeding enterprises (Table 1). Only two farms made a loss.

Besides, the farms earned their income from other off-farm sources as the personal income amounted to PLN 25 400. The sheep farm with the best results had an income of PLN 58 210, and notably, the sheep farm household was its sole source of income. The farm with the poorest performance made a loss of PLN 2 280. Two farms, of a total of 11 farms subject to the study, made a loss. The negative effects were attributable to deduction of cost of annual depreciation from the revenues obtained. The farm with the best income received PLN 16.9 thousand of direct payment, and the farm with the lowest income - only PLN 3.7 thousand.

Table 1.

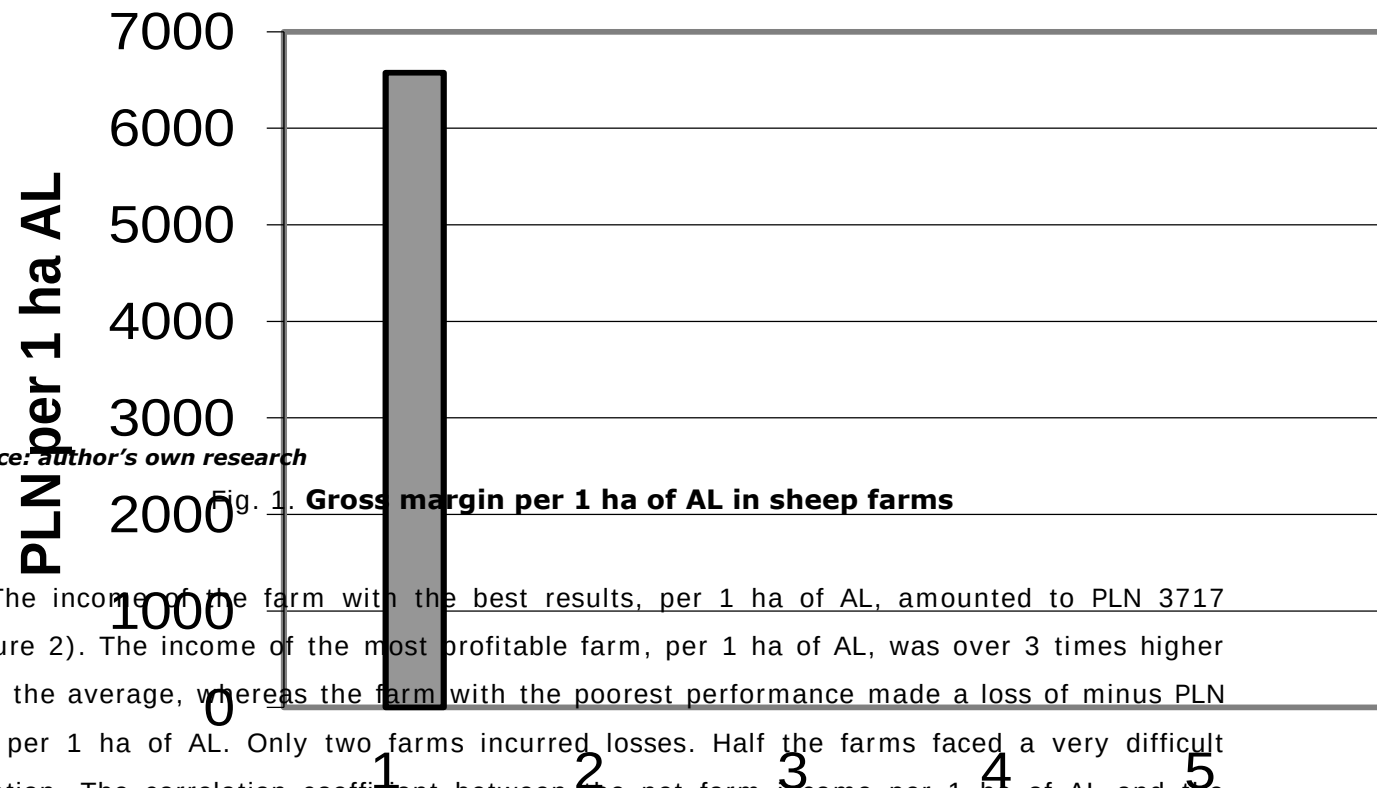
Economic results of sheep enterprises subject to the study

Farm Code	Farm area (ha of AL)	Economic results of farms (PLN)					
		Gross margin	Gross value added	Net value added	Net farm income	Family farm income	Rural family income
1	15.66	102964	69660	58210	58210	58210	58210
2	35.70	38980	25462	22050	22050	15350	15350
3	8.22	22016	11293	-1352	-1352	-1352	-1352
4	7.45	8552	1843	-2280	-2280	-2280	-2280
5	38.56	40280	12130	10430	3670	-4080	17924
6	13.82	35540	15050	11200	11200	11200	11200
7	12.75	15640	8980	2005	2005	2005	14305
8	25.64	61813	44970	40270	39470	58670	58670
9	23.53	58910	35800	34800	26960	45560	45560
10	9.21	17859	8099	8099	6844	6844	6844
11	19.23	66507	52826	52826	52826	55286	55286

Source: author's own research

The researched farms were differentiated in terms of potential, land resources and cost level. One of the modes of comparison of farms is to find a common reference. Gross margin was presented per 1 ha of AL (arable land). The farm with the best results earned nearly 3-fold higher direct surplus per 1 ha of AL as compared to the medium one (Figure 1). The farm with the lowest performance made a gross margin of PLN 1045 per 1 ha of AL. There were large differences between farms in the level of gross margin. The resulting correlation coefficient between the gross margin per 1 ha of AL and the farm building value was moderate and amounted to 0.62 ($p=0.00$). The correlation between gross margin per 1 ha of AL and the

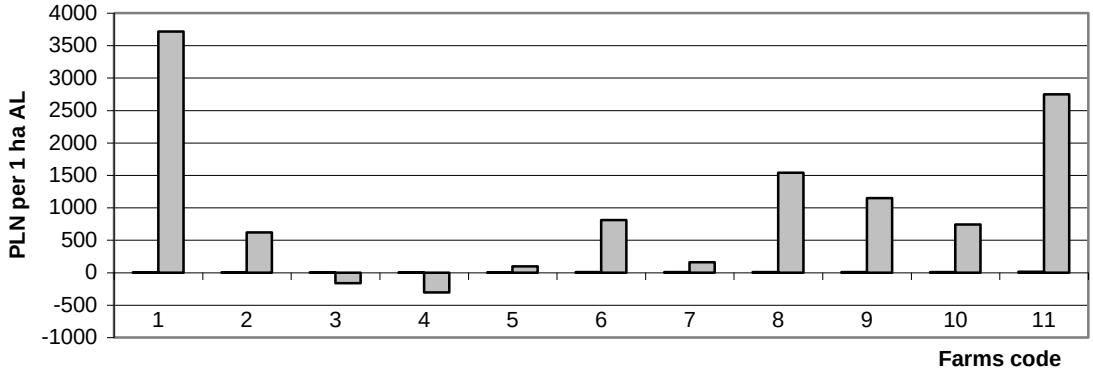
value of machinery and equipment (correlation r = 0.27, p=0.00) and the number of conversion hectares in farms (r = 0.24, p=0.00) was insignificant.



Source: author's own research

Fig. 1. **Gross margin per 1 ha of AL in sheep farms**

The income of the farm with the best results, per 1 ha of AL, amounted to PLN 3717 (Figure 2). The income of the most profitable farm, per 1 ha of AL, was over 3 times higher than the average, whereas the farm with the poorest performance made a loss of minus PLN 306 per 1 ha of AL. Only two farms incurred losses. Half the farms faced a very difficult situation. The correlation coefficient between the net farm income per 1 ha of AL and the number of conversion hectares in farms amounted to 0.55 (p=0.00). The strength of the impact was moderate. There was an insignificant relationship between income per 1 ha of AL and the farm building value (correlation r = 0.36, p=0.00), and the value of machinery and equipment in farms (r= 0.27, p=0.00).

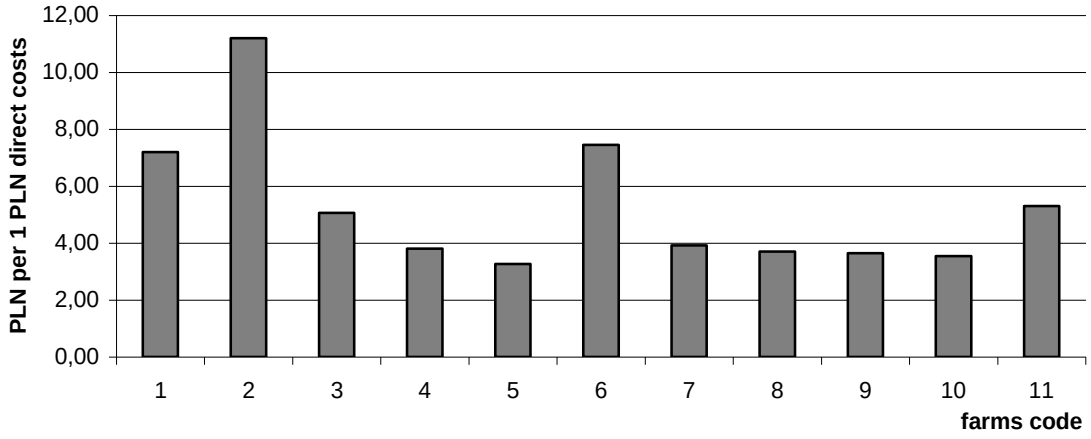


Source: author's own research

Fig. 2. **Net farm income per 1 ha of AL in sheep companies**

The microeconomic approach to efficiency is linked to the individual enterprise and defined as the relation between the effects obtained by a particular economic operator and its input (Lenort R., Baran J., Wysokinski M., 2014). The larger value of productivity indexes is

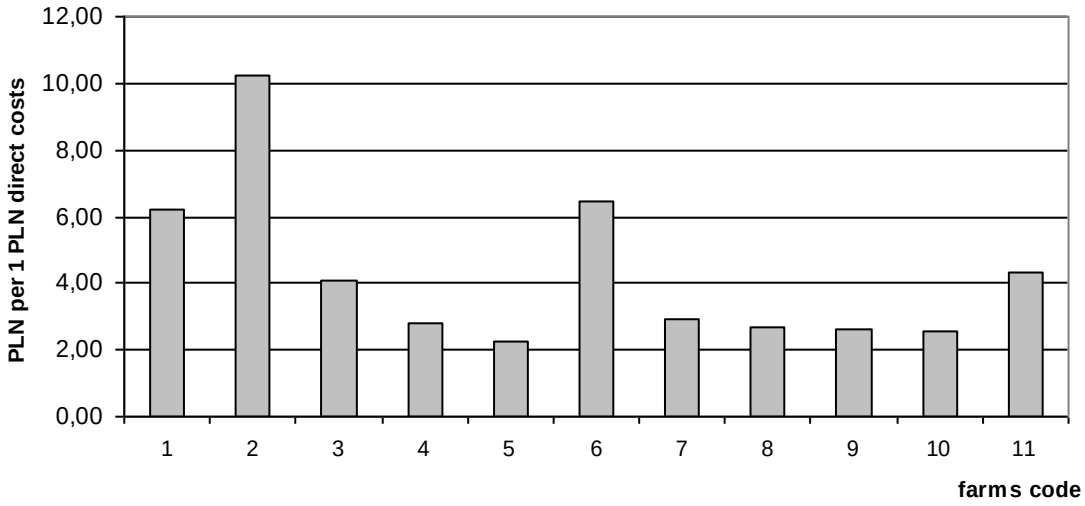
indicative of higher efficiency of a particular economic entity (Wysokinski M., Baran J., Gołasa P., Lenort R., 2014). The revenues and direct surplus related to direct costs determine productivity of the direct operating expenses incurred. On average, PLN 1 direct costs generated PLN 5.28 revenues (Figure 3). The best farm had revenues of PLN 11.20 per PLN 1 direct costs, and the worst - PLN 3.27 per PLN 1 direct costs. The differences in the results were significant. The resulting correlation coefficient between the revenues per PLN 1 direct costs and the value of machinery and equipment in farms was strong and amounted to 0.84 (p=0.00). There was an insignificant relationship between revenues per PLN 1 direct costs and the number of conversion hectares in farms (correlation 0.46, p=0.00), and the farm building value (0.37, p=0.00).



Source: author's own research

Fig. 3. **Revenues per** PLN **1 direct costs in sheep enterprises**

On average, PLN 1 direct costs generated PLN 4.24 gross margin (Figure 4). The most effective sheep farm obtained as much as 10.20 direct surplus from PLN 1 of direct operating expenses, while the most ineffective farm generated a gross margin of PLN 2.27 from PLN 1 of direct costs.



Source: results of own research.

Fig. 4. **Gross margin per PLN 1 of direct costs in sheep enterprises**

Correlation coefficients for gross margin per PLN 1 of direct costs were at a similar level as in the case of revenue per PLN 1 of direct costs. There was a weak link between the level of the gross margin per PLN 1 of direct costs and the land area of farms (correlation 0.26, p=0.00) and the value of the basic herd of sheep (-0.27, p=0.00).

Conclusions

1. The bigger the area of the farm, the better results were obtained per 1 ha of AL or PLN 1 of direct costs. This regularity has been confirmed in most of the farms subject to the study. The data presented in the graphic form demonstrated a disproportion in productivity of the studied farms. The productivity per 1 ha of AL and PLN 1 of direct costs depends on several factors.
2. The calculated correlation coefficients showed a strong interrelationship between economic performance and potential of farms, such as the value of the farm buildings and the value of machinery and equipment. The effect of the number of conversion hectares was moderate, and the effect of the land area of the farm and the value of the basic herd of sheep was quite insignificant.
3. The sheep farm with the best results earned an income of PLN 58 210 . The one with the poorest results made a loss of PLN 2 280. Two farms, of a total of 11 farms subject to the study, made a loss. Two farms incurred losses: PLN 164 and PLN 306 per 1 ha of AL respectively; whereas the top farm generated an income of PLN 3717 . The negative results were attributable to deduction of cost of annual depreciation from the revenues obtained. The farm with the highest income received direct payments in the amount of PLN 16.9 thousand, and the one with the poorest result − only PLN 3.7 thousand.

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