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## ANALYSIS OF THE COSTS AND REVENUES OF AGRICULTURAL PRODUCTS IN THE SELECTED COUNTRIES OF CENTRAL EUROPE

Проведено порівняння і оцінка загальних витрат виробництва, пов'язаних з виробництвом окремих сільськогосподарських культур, і отриманих доходів в чотирьох країнах Центральної Європи. Також зроблена оцінка частки накладних витрат, понесених для власного виробництва сільськогосподарських культур. Частковою метою роботи є також оцінка витрат і доходів для тваринництва і рослинництва. При оцінці сільськогосподарських підприємств як і раніше використовуються традиційні методи розрахунку.

**Ключові слова:** загальні витрати виробництва, накладні витрати, рентабельність витрат, управління витратами, країни Центральної Європи, сільськогосподарські продукти.

### 1. Introduction

Agriculture is one of the most important and very sensitive sectors in the economy at the same time. Comparing costs and benefits of agricultural products between the countries allows us to define their position in the international competition, and it also helps to identify reasons for various economic results in the agricultural production. Tracking and collecting information on costs, yields, and net income of agricultural enterprises is methodically and organizationally very demanding. Many business entities do not closely monitor product costs for time reasons. Agricultural enterprises do not usually have detailed analytical accounting of costs. Some cost items (e. g. fuel, energy, etc.) cannot be identified for individual commodities. In the paper, we evaluate the final (actual) costs calculation of the selected crops, as well as the data on their yield and net income. Monitoring, planning and cost management are justified in reducing costs, they provide the basis for cost planning and pricing. To achieve production efficiency it is appropriate to use cost management tools.

### 2. The object of research and its technological audit

A foreign innovation in the area of quality improvement and computation is the creation and implementation of the Activity Based Costing (ABC) model. Activity Based Costing is an approach to solving the problems of traditional cost management systems. These traditional costing systems are often unable to accurately determine the actual costs of production and the cost of related services. The success of enterprises depends not only on existing processes but also through innovation.

The ABC model, supported by a high-quality software solution, will enable businesses to achieve the desired goals, in particular: profit growth, identifying real process costs, products, targeted pricing, reasonable cost reductions.

### 3. The aim and objectives of research

*The aim of the research* is assessing the development of the total production costs incurred for the cultivation of selected agricultural crops in Central European countries.

To achieve this aim the following tasks were set:

1. To compare the amount of costs incurred by the countries.
2. To assess the proportion of overhead costs to total own costs incurred for crops cultivation and compare these proportions between countries.
3. To assess the development of revenues generated by each selected crop in these selected countries, and consequently evaluate the amount of attributable profit.
4. To calculate and evaluate profitability of the costs incurred for the production of selected agricultural crops.

Other partial aims are:

1. To assess the development of the total production costs incurred for the whole agricultural production as well as to evaluate cost development separately for crop production and livestock production.
2. To assess the proportion of overhead costs to total own costs in agricultural production, and also specifically in plant production and animal production.
3. To assess the development of revenues generated by the whole agricultural production, subsequently separately by crop and livestock production; assess the amount of profit or loss in these partial manufactures and also in agricultural production as a whole.

*Our aim is also to* highlight modern cost management opportunities that are increasingly penetrating into traditional enterprises.

Two selected agricultural products, wheat and oilseed rape, served as *a basis for the analysis*. Data on costs and revenues of these selected products were acquired from research institutes dealing with agricultural economy of Central European countries. The research included four countries – Slovak Republic, Czech Republic, Poland and Hungary. For Poland we do not evaluate costs and revenues of oilseed rape. Data on the total costs and revenues of

the entire agricultural production together with data on crop and livestock production were available only for two countries. Therefore, the second part of the analysis deals with the Slovak Republic and Poland. In both cases we assess data on the amount of costs and revenues in Euro per ton of manufactured product. The assessed period was the period 2009–2013. In the case of Poland it was the period 2009–2012, while in the case of Hungary it was the period 2009–2014. The development of indicators is assessed in the tables complemented by graphs. Analysis and cost-benefit comparison were based on the statistical and sectoral data of the individual national agricultural economic institutes, which observe the data on actual costs and other economic indicators of agricultural commodities in the agricultural enterprises set in individual years. We have also drawn the data about net income  $n$  individual years and according to the cost structure, we have calculated shares of overheads in total costs.

#### **4. Research of existing solutions of the problem**

No business today can afford to lose track over its costs. Earlier rationalization projects focused more on short-term cost reductions and did not provide any lasting success. All rational businesses need to ensure their long-term existence through operational and nowadays also strategic view of cost management. Net income of agricultural enterprises is affected annually by cost and production-economic impacts, i. e., on the one hand, by a level of costs (material and labour inputs) to the achieved mass production of plant and livestock production and, on the other hand, the realization of output through prices, which is reflected in sales [1]. In addition to the macroeconomic aspects of sectoral evaluation, the measure of corporate success is the net income – that is profit or loss. The actual usability of capital, in the form of profit, is dependent on the rate of transformation of the produced profit or loss to cash, which is related to costs, returns and cash flows. Net income determines the possibilities of its use as own internal source of self-financing [2]. One of the reasons for the loss of agricultural enterprises is, in addition to high costs, a lower input level, measured by a value of production consumption per 1 hectare, lower creation of value added, but also higher numbers of livestock, which due to low prices of products contribute to the loss [3]. Effort of businesses to improve the efficiency of entrepreneurial activity is inevitably linked to the application of effectiveness. We understand the intention of evaluating the costs with an aim of their constant reduction per unit of performance. Achievement of favourable net income in primary agricultural production enterprises can be influenced in two ways: by ensuring unbiased inputs into production and by increasing yields from production using different varieties appropriate to the conditions of the particular region, by scientific agrotechnical arrangements, by breeding, by increasing utility parameters and by other factors influencing their growth. Inputs into production – costs represent an important characteristic of the quality of the activities performed by enterprise. They fundamentally affect the healthy functioning of the business. Economic cost management makes it possible to increase their cost-effectiveness [4]. The global competitiveness of the enterprise cannot be ensured without establishing

quality budgeting system meeting the requirements of developed market economy. The enterprise must use the calculations correctly to increase its inputs' effectiveness. Process view of the company is considered as innovation in this area. Using of innovation is essential for achieving the objectives and the integration of transition economies into the highly competitive global context. Present challenges for all post-communist countries are: innovation, education, information society, climate, competitiveness, labour market [5]. The economic efficiency of enterprises lies in the lowest cost of agricultural commodity production. From this point of view, the production structure is important for each enterprise – what to produce, the economic efficiency of production – how to produce, funding and sales – for whom to produce. Measurement of the economic efficiency of agricultural production is based on the tracking of own costs through efficiency indicators, which basically represents the derived cost-effectiveness dimension [6]. Information provided by enterprises' costing systems is essential to ensure rational management of domestic resources. The enterprise thus ensures production efficiency comparable to competitors at internationalized and globalized markets. In order to properly use calculations in the context of the globalized economy, enterprises will need to compare themselves with global standards and then meet them [7]. Traditional financial indicators (calculated from accounting data) are still used to evaluate performance level. This approach to evaluation and comparison of performance has been considered to be the most appropriate approach over a long period of time in spite of different accounting and financial indicators. Management of the agricultural company can compare its performance with performance of other companies in the market and can identify its weaknesses [8]. Calculations are an issue that is probably the most burdensome and at the same time interesting for inspectors and managers. The problem is that without proper calculation it is difficult to arrive at the right decision. Cost calculation methods represent different ways to quantify the cost items attributable to a calculating unit. The choice of method of cost calculation depends on the nature of activities and conditions in which activities take place (type of activity, technology and production type) [9]. There are two approaches to the full cost calculation, namely traditional and modern. The modern view on costing and cost management is becoming more and more popular and companies abandon the traditional internal management and choose modern approach. The traditional cost calculation is usually unsatisfactory because of its imprecision and static nature. Process calculations are clearly the most accurate, the most complete and best describes the formation and allocation of costs [10]. Today's companies are having a myriad of strategic cost management tools to choose from according to their needs. The traditional management accounting was transformed to strategic management accounting which supports the strategic approaches [11]. For these purposes it is necessary to have accurately calculated production costs of products. Only after that an enterprise can work with such costs and constantly evaluate them. In ensuring the controlling of production and products a method Activity Based Costing is a suitable choice since it reveals the real causes of costs and «driving forces of activities» laying down the requirements that lead to the specific use of shared resources associated with that activity [12–14].

Activity Based Costing is an approach to solve the problems of traditional cost management systems. These traditional costing systems are often unable to determine accurately the actual costs of production and of the costs of related services. Instead of using broad arbitrary percentages to allocate costs, ABC seeks to identify cause and affect relationships to objectively assign costs. Once costs of the activities have been identified, the cost of each activity is attributed to each product to the extent that the product uses the activity. In this way ABC often identifies areas of high overhead costs per unit and so directs attention to finding ways to reduce the costs or to charge more for costly products [15, 16]. By applying process management analysis methods it is possible to identify temporal and spatial structure shortages of the production process, thus creating preconditions for increasing the overall business performance [17]. Currently, at a time of global economic and financial crisis, it appears that the success of enterprises depends not only on existing processes optimization, but it is achieved also through innovation [18]. One of the biggest benefits of ABC is that accounting costs, product and customer processes, and product and customer costs are under one system [10, 19].

## 5. Methods of research

Standard *methods of research work* were applied to carry on analysis, such as analysis and synthesis, comparison, classification of enterprise sets and graphical representation of the development of selected indicators over the explored period.

## 6. Research results

### 6.1. Development and comparison of own costs and revenues of selected agricultural crops in the Central Europe.

The economic development of agriculture is a reflection of changes in the development of industry management, in the dynamic processes of production, investment, trade and consumption. The business environment of agricultural enterprises is influenced by institutional decisions with a significant impact on decision-making and economic behaviour of enterprises in order to achieve maximum economic efficiency. The economic efficiency of businesses lies in the lowest cost of agricultural commodity production [6]. Comparison of costs and revenues of selected crops production between the countries is still a hot topic. Such comparison defines the position of domestic producers to international competition and tries to find out reasons for different economic outputs of agricultural production. Such information is useful not only for the makers of agricultural policy in the country, but also for the representatives of agricultural practice. When comparing the competitiveness of plant commodities it is necessary to take into account economic results of individual farms, and the fact that they are affected by different production technology, enterprise size (farm), property forms, the amount of support provided in different countries, development on world and domestic markets [20]. The natural and climatic conditions have a dominant influence on the achievable productivity and economic efficiency of the agricultural entities in ensuring the sustainability of the economic performance of agriculture in different regions, concludes [21] on the basis of the completed analysis.

6.1.1. *Development and comparison of own costs and revenues of wheat.* Table 1 presents the figures for the total cost of wheat in EUR per 1 ton of a product manufactured, shares of overhead costs on total own costs in per cent, revenues per 1 ton of wheat in EUR and the profit or loss statement for 1 ton of a product.

The highest overall costs of 1 ton of wheat in 2009 were recorded in the Slovak Republic, the lowest in Hungary. All countries that cultivated wheat at that year generated loss, only Hungary made profit. In 2010 the highest costs of 1 ton of wheat were again reported by the Slovak Republic that as the only country generated loss. In 2011 all four countries generated profit. The most profitable was again Hungary, despite the fact that 2011 meant the highest production costs. The Slovak Republic had the lowest profit from them all.

**Table 1**

Costs, revenues, profit or loss statement for the cultivation of wheat in €/t

Agri-cultural crop	Year	Indicator	Slovakia	Czech Republic	Poland	Hungary
Wheat	2009	Total cost/t	154.8	112.08	104.08	97.64
		Proportion of overhead costs	15.89 %	16.49 %	24.90 %	*
		Revenues/t	137.19	94.64	84.52	151.28
		Profit or loss/t	-17.61	-17.44	-19.56	53.64
	2010	Total cost/t	157.27	110.12	105.58	129.23
		Proportion of overhead costs	19.84 %	17.35 %	26.70 %	*
		Revenues/t	152.97	125.29	140.81	187.49
		Profit or loss/t	-4.3	15.17	35.23	58.26
	2011	Total cost/t	143.7	110.19	112.06	166.35
		Proportion of overhead costs	17.15 %	18.30 %	27.07 %	*
		Revenues/t	161.61	159.19	165.06	237.91
		Profit or loss/t	17.91	49	53	71.56
	2012	Total cost/t	199.47	151.66	155.12	195.52
		Proportion of overhead costs	19.21 %	17.77 %	26.70 %	*
		Revenues/t	261.3	179.32	200.24	269.12
		Profit or loss/t	61.83	27.66	45.12	73.6
	2013	Total cost/t	164.14	127.51	*	156.63
		Proportion of overhead costs	17.18 %	14.56 %	*	*
		Revenues/t	193.27	167.1	*	240.79
		Profit or loss/t	29.13	39.59	*	84.16
	2014	Total cost/t	*	*	*	154.01
		Proportion of overhead costs	*	*	*	*
		Revenues/t	*	*	*	269.93
		Profit or loss/t	*	*	*	115.92

**Note:** own elaboration from the National Agricultural and Food Centre – Research Institute of Agriculture and Food in Slovakia, Institute of Agricultural Economics and Information in Czech Republic, Institute of Agricultural and Food Economics – National Research Institute, Agricultural Accountancy Department in Poland, Research Institute of Agricultural Economics in Hungary [22–25].

The Czech Republic had almost the same profit as Poland and the two countries had also similar amount of costs. In 2012, all countries were profitable. The highest profit was recorded by Hungary, followed by the Slovak Republic. Costs of production were at a comparable level in these two countries.

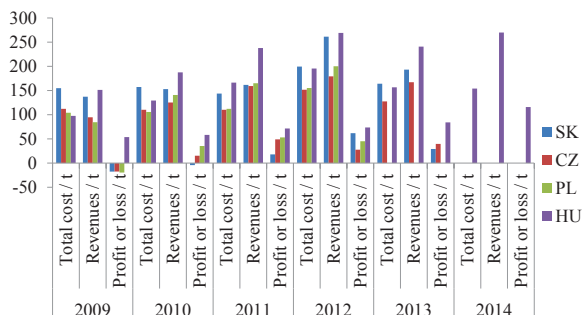


Fig. 1. Costs, revenues, profit or loss statement for the cultivation of wheat in €/t (own graph of data from Table 1)

In 2013 the most profitable country was again Hungary, the Slovak Republic generated much lower profit than in the previous year. The lowest costs for the crop production were reported by the Czech Republic. Hungary is a country that shows a growing trend of making a profit in the cultivation of wheat. In other countries the profit development has fluctuating character. Shares of overhead costs on the total own production costs were assessed only for the Slovak Republic, the Czech Republic and Poland. Of these countries the highest proportion of overhead costs was found in Poland.

6.1.2. *Development and comparison of own costs and revenues of oilseed rape.* Table 2 presents data on the amount of the total cost of oilseed rape in EUR per 1 ton of product manufactured, shares of overhead costs on total own costs in percent, revenues per 1 ton of oilseed in EUR as well as the profit or loss statement for 1 ton of product. We left out Poland since we were unable to obtain separate data for oilseed rape. We only obtained data for the whole production of oil crops, and such data would then distort our comparison. In 2009 oilseed rape cultivation was unprofitable for the Czech Republic, and the Slovak Republic made a little profit. Significant profit was generated by Hungary together with the lowest oilseed rape cultivation costs of all assessed countries. In 2010 the Slovak Republic and the Czech Republic generated loss, and Hungary once again made profit, although it was significantly lower than in the previous year. Hungary reported the lowest costs, but their height is comparable to the costs of the Czech Republic. Slovakia had significantly higher costs.

In 2011 all three countries incurred a comparable amount of costs for 1 ton of oilseed rape, and all of them generated profit. The lowest profit was generated by the Czech Republic while having the lowest amount of costs. The year 2012 can be compared to 2011, Hungary had the highest profits, the Czech Republic had the lowest costs. In 2013 all countries had comparable amount of costs, and the lowest cost amount was again reported by the Czech Republic.

All countries made profit, Hungary generated the highest profit. In case of Hungary we have data for 2014 from which we found that its profits almost doubled when compared

to 2013. In the monitored period we found a comparable level of costs in different countries, but Hungary generated significantly higher profits in all years. This success is largely influenced by high revenues. The share of overhead costs on the total own costs is assessed only for the Slovak Republic and the Czech Republic because their costs are similar. The share of overhead costs has fluctuating character.

Table 2

Costs, revenues, profit or loss statement for the cultivation of oilseed rape in €/t

Agricultural crop	Year	Indicator	Slovakia	Czech Republic	Poland	Hungary
Oilseed rape	2009	Total cost/t	337.79	271.12	*	245.14
		Proportion of overhead costs	13.93 %	15.01 %	*	*
		Revenues/t	342.74	246.02	*	363.99
		Profit or loss/t	4.95	-25.1	*	118.85
	2010	Total cost/t	349.85	288.7	*	271.4
		Proportion of overhead costs	17.52 %	16.48 %	*	*
		Revenues/t	329.02	283.02	*	353.6
		Profit or loss/t	-20.83	-5.68	*	82.2
	2011	Total cost/t	373.75	345.46	*	386.73
		Proportion of overhead costs	16.24 %	17.72 %	*	*
		Revenues/t	469.78	375.32	*	511.74
		Profit or loss/t	96.03	29.86	*	125.01
	2012	Total cost/t	465.44	371.09	*	451.3
		Proportion of overhead costs	16.12 %	16.73 %	*	*
		Revenues/t	628.97	431.98	*	718.43
		Profit or loss/t	163.53	60.89	*	267.13
	2013	Total cost/t	353.9	318.57	*	359.45
		Proportion of overhead costs	17.24 %	15.02 %	*	*
		Revenues/t	452.86	380.47	*	470.39
		Profit or loss/t	98.96	61.9	*	110.94
	2014	Total cost/t	*	*	*	328.1
		Proportion of overhead costs	*	*	*	*
		Revenues/t	*	*	*	534.96
		Profit or loss/t	*	*	*	206.86

Note: own elaboration from the National Agricultural and Food Centre – Research Institute of Agriculture and Food in Slovakia, Institute of Agricultural Economics and Information in Czech Republic, Institute of Agricultural and Food Economics – National Research Institute, Agricultural Accountancy Department in Poland, Research Institute of Agricultural Economics in Hungary [22–25].

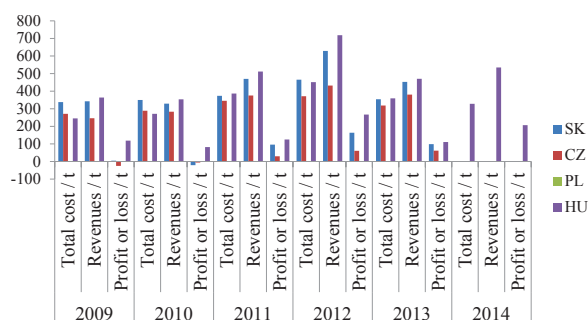


Fig. 2. Costs, revenues, profit or loss statement for the cultivation of oilseed rape in €/t (own graph of data from Table 2)



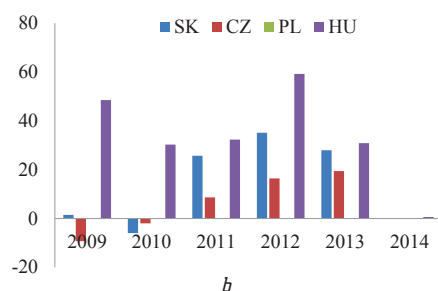
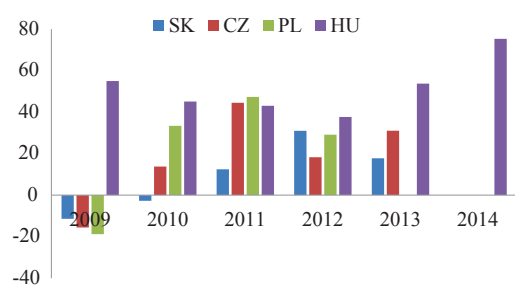
6.1.3. *Return on investment on wheat and oilseed rape cultivation.* Return on investment reflects the profitability of invested funds. A farm thus knows its resource recovery rate and how much profit each invested euro generates. In conjunction with other indicators a company is able to assess the efficiency of financial management and cost management. Table 3 shows return on investment of both analysed agricultural products in all countries. It was found that with regard to wheat in 2009 only Hungary reached positive numbers, and all other countries recorded negative numbers. In 2010 the negative indicator value was reported only by the Slovak Republic. In 2011 all countries reported positive indicator values – Poland had the highest value, followed by the Czech Republic, Hungary and Slovakia.

Table 3

Return on investment for wheat and oilseed rape in %

Agricultural crop	Year	Slovakia	Czech Republic	Poland	Hungary
Wheat	2009	-11.376	-15.5603	-18.7932	54.9365
	2010	-2.73415	13.77588	33.36806	45.08241
	2011	12.46347	44.46865	47.29609	43.01773
	2012	30.99714	18.23816	29.08716	37.64321
	2013	17.74705	31.04855	*	53.73172
	2014	*	*	*	75.26784
Oilseed rape	2009	1.465408	-9.25789	*	48.4825
	2010	-5.95398	-1.96744	*	30.2874
	2011	25.69365	8.643548	*	32.32488
	2012	35.1345	16.40842	*	59.19123
	2013	27.9627	19.43058	*	30.86382
	2014	*	*	*	0.630479

**Note:** own elaboration from the National Agricultural and Food Centre – Research Institute of Agriculture and Food in Slovakia, Institute of Agricultural Economics and Information in Czech Republic, Institute of Agricultural and Food Economics – National Research Institute, Agricultural Accountancy Department in Poland, Research Institute of Agricultural Economics in Hungary [22–25].



**Fig. 3.** Return on investment for:  
a – wheat; b – oilseed rape (own graphs of data from Table 3)

Although Hungary had the highest profit and revenues, it also had the highest costs of all the countries. This was reflected in the return on investment indicator that ranked Hungary at the third place. In 2012, Hungary had the highest return on investment, followed by the Slovak Republic, Poland, and the Czech Republic. In 2013 Hungary had again the highest return on investment. At that year Slovakia ranked last. When evaluating the return on the investment of oilseed rape it was found that in 2009 Hungary had quiet high profitability, followed by the Slovak Republic. The Czech Republic had a negative indicator value. In 2010 Hungary had a positive value. In 2011 the highest value was reported by Hungary, followed by the Slovak. In 2012 the ranking of the countries did not change, the highest numbers were reported by Hungary and the same was true also in 2013.

**6.2. Development and comparison of costs and revenues of the agricultural production as a whole and broken down into crop and livestock production.** Table 4 assesses indicators of the agricultural production as a whole. It assesses the total costs of 1 ha of agricultural land in EUR, the share of total overhead costs on own costs, revenues per 1 ha for all agricultural production and also the profit and loss statement per one hectare in EUR. In this case the Slovak Republic and Poland were compared. In 2009 the Slovak Republic's costs were higher than that of Poland, but revenues were at a similar rate. The Slovak Republic in a given year generated loss in its agricultural production and Poland generated profit. In 2010 the Slovak Republic had again higher overall costs while lower revenues when compared to Poland. Although both countries generated profit. In 2011 the Slovak Republic had lower costs than Poland, but at the same time lower revenues. Both countries were profitable. In 2012 Poland achieved significantly higher revenues from agricultural production, resulting in high profits. The Slovak Republic's profit that year was 64.1 €/ha. With regard to overhead costs, Poland has a significantly higher proportion.

Table 4

Costs, revenues and the profit and loss statement for agricultural production in €/ha

Country	Costs, revenues	Agricultural production				
		2009	2010	2011	2012	2013
Slovakia	Total costs/1 ha	1177.14	1113.28	1193.27	1224.02	1302.30
	Proportion of overhead costs	16.60 %	19.00 %	17.29 %	18.36 %	17.47 %
	Revenues/1 ha	1089.7	1120.93	1296.46	1288.12	1319.08
	Profit or loss/1 ha	-87.44	7.65	103.19	64.1	16.78
Poland	Total costs/1 ha	1033.16	1070.6	1216.43	1301.93	*
	Proportion of overhead costs	21.61 %	24.71 %	23.67 %	23.60 %	*
	Revenues/1 ha	1077.18	1245.63	1435.89	1551.18	*
	Profit or loss/1 ha	44.02	175.03	219.46	249.25	*

**Note:** own elaboration from the National Agricultural and Food Centre – Research Institute of Agriculture and Food in Slovakia, Institute of Agricultural Economics and Information in Czech Republic, Institute of Agricultural and Food Economics – National Research Institute, Agricultural Accountancy Department in Poland, Research Institute of Agricultural Economics in Hungary [22–25].

**Table 5**

Costs, revenues and the profit and loss statement for agricultural production and livestock production in €/ha

Country	Costs, revenues	Crop production					Livestock production				
		2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
Slovakia	Total costs/1 ha	560.32	504.32	590.73	604	636.72	616.81	608.96	602.54	620.02	665.58
	Proportion of overhead costs	16.98 %	20.21 %	17.68 %	19.94 %	21.49 %	16.36 %	18.01 %	16.91 %	16.82 %	16.85 %
	Revenues/1 ha	538.99	537.27	747.5	747.04	730.08	550.71	583.65	548.96	541.08	589
	Profit or loss/1 ha	-21.33	32.95	156.77	143.04	93.36	-66.1	-25.31	-53.58	-78.94	-76.58
Poland	Total costs/1 ha	498.73	602.32	678.54	694.72	*	534.43	468.28	537.89	607.21	*
	Proportion of overhead costs	28.40 %	28.52 %	28.36 %	*	*	18.27 %	21.54 %	20.07 %	20.18 %	*
	Revenues/1 ha	536.82	717.59	805.3	884.34	*	540.22	528.05	630.59	667.49	*
	Profit or loss/1 ha	38.09	115.27	126.76	189.62	*	5.79	59.77	92.7	60.28	*

**Note:** own elaboration from the National Agricultural and Food Centre – Research Institute of Agriculture and Food in Slovakia, Institute of Agricultural Economics and Information in Czech Republic, Institute of Agricultural and Food Economics – National Research Institute, Agricultural Accountancy Department in Poland, Research Institute of Agricultural Economics in Hungary) [22–25].

Table 5 assesses the same variables as Table 4, but now separately for crop production and for livestock production. In this case the Slovak Republic and Poland were compared. When regarding crop production in 2009, the Slovak Republic generated loss and Poland generated profit, despite the fact that revenues were higher in the Slovak Republic. In 2010 the Slovak Republic generated profit, although Poland's revenues were significantly higher. Although Poland's costs were higher, their revenues were higher too. In 2011 the profit of the Slovak Republic increased significantly over the previous year, and was higher than Poland's profit from the crop production. In 2012 both countries were again profitable. This time Poland generated more profit, and its overhead costs were also significantly higher. In the livestock production the Slovak Republic generated loss in all monitored years, and Poland generated profit in all monitored years. The Slovak Republic reported the highest loss in 2012. Poland's highest profit was reported in 2011. As in the crop production also Poland's livestock production reported higher proportions of overhead costs on total own costs.

## 7. SWOT analysis of research results

*Strengths.* A comparison of product costs between countries (including between businesses) allows to determine the level of competitiveness, the level in the sector, the assessment of own success or failure in the market.

*Weaknesses.* To obtain comparable data from more countries is difficult.

*Opportunities.* Prospects for further research are to analyze in more detail the positive aspects of the implementation of the ABC model in the agricultural enterprise and its particular impact on increasing the competitiveness of the companies.

*Threats.* Not exactly the same items of costs included in the calculation formula in each analyzed country.

## 8. Conclusion

We compared the costs and revenues of selected agricultural products between Central European countries.

Such information is important for defining the status of a particular country in international competition. Considering the stated goals of the paper, we state the following conclusions.

1. The highest overall costs of 1 ton of wheat in 2009 were recorded in the Slovak Republic, the lowest in Hungary. All countries that cultivated wheat at that year generated loss, only Hungary made profit. In 2010 the highest costs of 1 ton of wheat were again reported by the Slovak Republic. In 2011 the most profitable was again Hungary, despite the fact that 2011 meant the highest production costs. In 2013 the lowest costs for the crop production were reported by the Czech Republic. Hungary is a country that shows a growing trend of making a profit in the cultivation of wheat.

2. Hungary reported the lowest costs of oilseed rape in 2010, but their height is comparable to the costs of the Czech Republic. Slovakia had significantly higher costs. In 2011 all countries incurred a comparable amount of costs for 1 ton of oilseed rape, and all of them generated profit. The lowest profit was generated by the Czech Republic while having the lowest amount of costs. The year 2012 can be compared to 2011. In 2013 all countries had comparable amount of costs, and the lowest cost amount was again reported by the Czech Republic.

3. Although Hungary had the highest profit and revenues, it also had the highest costs of all the countries. This was reflected in the return on investment indicator that ranked Hungary at the third place.

4. Shares of overhead costs on the total own production costs were assessed only for the Slovak Republic, the Czech Republic and Poland. Of these countries the highest proportion of overhead costs was found in Poland. As in the crop production also Poland's livestock production reported higher proportions of overhead costs on total own costs.

5. When taking into account the selected period, the highest revenues from wheat cultivation were achieved in 2012 in Hungary and the Slovak Republic.

6. The wheat production in all selected countries except Hungary generated loss in 2009. The following years were more successful and profitable than 2009. In case of

oilseed rape 2012 was the most successful year. The best result was achieved by Hungary, followed by the Slovak Republic and the Czech Republic. Generally it can be noted that the most *profitable* country growing wheat and oilseed rape is Hungary.

7. The paper also pointed out that to achieve efficient productivity it is important to make use of appropriate cost management tools. *ABC method* is an effective tool for process management. The nowadays' trend is the gradual enlargement of process management, and therefore it can be assumed that it will be increasingly used in for farms despite the fact that it is a very specific sector of the economy. The reason for its usage is its continuous improvement in terms of management, which is important for maintaining and strengthening market position. Ongoing processes are now becoming one of the key (critical) success factors. The quality of processes taking place in businesses and their effective management and arrangement affect not only the amount of the costs, but they have a significant impact on the enterprises' effectiveness. Process management brings competitive advantage that minimizes costs, improves product quality, and maximizes profits. It is therefore essential that organizations pay attention to the way they organize and manage their processes and seek their continuous improvement. Top experts in management expect all enterprises shifting to process management.

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#### АНАЛИЗ РАСХОДОВ И ДОХОДОВ ОТ СЕЛЬСКОХОЗЯЙСТВЕННЫХ ПРОДУКТОВ В ОТДЕЛЬНЫХ СТРАНАХ ЦЕНТРАЛЬНОЙ ЕВРОПЫ

Проведено сравнение и оценка общих издержек производства, связанных с производством отдельных сельскохозяйственных культур, и полученных доходов в четырех странах Центральной Европы. Также сделана оценка доли накладных расходов, понесенных для собственного производства сельскохозяйственных культур. Частичной целью работы является также оценка затрат и доходов для животноводства и растениеводства. При оценке сельскохозяйственных компаний по-прежнему используются традиционные методы расчета.

**Ключевые слова:** общие издержки производства, накладные расходы, рентабельность затрат, управление затратами, страны Центральной Европы, сельскохозяйственные продукты.

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