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ECONOMIC EFFICIENCY ANALYSIS OF ORGANIC CROP AND ANIMAL FARMS IN ROMANIA. COMPARATIVE EVOLUTIONS

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Abstract

The organic sector in our country, although as shown in continuous development, faces a multitude of problems: the climatic conditions of our country, characterized by periods of drought in many parts of the country, high input prices, the majority of which are imported; difficulties in identifying markets for products, reduced subsidies, standardized conditions difficult to meet, etc. The problems the sector is facing reflect in the organization of the production activity and hence the economic performance of farm production. Accordingly, the aim of this paper was to analyze on the basis of annual financial and accounting information collected in the two vegetable farms and the two animal breeding farms, their efficiency / inefficiency, and the results were compared to identify the causes of the differences obtained in the efficiency at a farm level. The results obtained reveal a higher level of return on integrated vegetable farm in a joint recovery and a high efficiency for chain integrated animal farms.

Key words**:** *efficiency, organic crop production, organic livestock, return rates*

INTRODUCTION

Many research studies regarding the organic and conventional agriculture concluded from an economic point of view that the organic farming, due to balanced crop rotation and the utilization of organic inputs, can be more efficient [4]. Actually there are many studies in this area that point out the economical differences of organic agriculture versus conventional agriculture like the following: the energy costs are lower [1]; the manual work costs rise the total cost with 20-30% [5]; the energy efficiency is higher for organic crops [6]; the lower yields need to be compensated by adequate technologies and management decisions to insure profitability [3]; etc.

In Romanian agriculture, conventional and organic farmers' efficiency is affected by many factors: the fragmentation of agricultural land and small physical dimension; outdated technology and reduced competitiveness; lack of working capital for farmers; difficulties of access to bank loans. etc. [2]. Regarding the efficiency of organic farms compared with conventional farms, this is often a much disputed subject. Due to the low yield per hectare and in many cases to higher prices of inputs, organic agriculture is often considered to be inefficient. In this context, our main purpose was to identify organic farms that can insure economic efficiency, and to point out their main characteristic and the condition in which these farms succeed to resist on the market.

MATERIALS AND METHODS

The research regarding organic farming efficiency was conducted on four organic farms: Farm A – vegetal profile - average surface of 420 ha (Tulcea County); Farm B - vegetal profile – average surface of 750 ha (Călăraşi County); Farm C – animal breeding profile – average livestock of 50 (Suceava County); Farm D - animal breeding profile – average livestock of 60 (Suceava County). At these farms' level we accomplish an economical-financial analysis based on annual financial statements from 2008-2012 periods concentrating on the main financial indicators and the main efficiency indicators [7]. We will concentrate in this paper on the efficiency indicators, respectively: the efficient utilization of resources (assets, human resources, receivables, etc.) by reporting the indicators to 1000 RON turnover; commercial, economic and financial rates of return.

RESULTS AND DISCUSSIONS

The main organizational characteristics of vegetal farms in 2008-2012 periods:

Farm A - organic crops are located in a droughty area; has an irrigation system; productivity per hectare is similar to that of conventional agriculture; the inputs are purchased through the association; the production is sold through the association; the distribution and transport it's done by ships (Danube River).

Farm B - organic crops are located in a droughty area; has an irrigation system; productivity per hectare is lower than that that of conventional agriculture; the inputs are obtained from local distributors; the production is stored in their own silage compound; the production it's sold at the farm gate.

The main economic characteristics of vegetal farms in 2008-2012 periods:

Farm A - specialized in crop production, in 2012 had a turnover of 1.4 million RON, with 20.3% lower, compared to 2008 [8]. The farm ensures its revenue in proportion of 62.6% from the sale of production and in proportion of 26.8 % from subsidies. Of the total costs, 35.6% are raw material costs and 20.7% are external services expenses 20.7%. With regard to economic and financial efficiency, the analysis revealed the following: the farm was profitable (operational and financial results are positive); the degree of material resources use has been declining; the farm ensures the efficiency of fixed assets, receivables, human resources and total costs; the farm didn't ensure the efficiency of external services expenses; the commercial, economic and financial return rates were growing.

Farm B - specialized in crop production, in 2012 had a turnover of 2.4 million RON, lower with 31.9% compared to 2008 [9]. The farm ensures its revenue in proportion of 54.5% from the sale of production and in proportion of 32.7 % of commodity sales. Of the total costs, only 18.5% are raw material costs, only 16.4% are external services expenses and 29.7% are commodity expenses. With regard to economic and financial efficiency, the analysis revealed the following: the farm was less profitable and its profitability was declining; the degree of use of material resources has been increasing; the farm didn't ensure the efficiency of fixed assets, receivables, human resources and total costs; the farm ensures in a small measure the efficiency of raw materials and external service expenses; the commercial, economic and financial return rates were decreasing even though the farm was very active on the market.

The comparative economic and efficiency indicators evolution on crop farms (Table 1).

Table 1: Comparative analysis of economic and financial statement of organic crop farms

	Farm A	Farm B	Observations
Revenue			
The share of revenue from the sale production in the turnover	91,8%	62,5%	Farm B completes its revenues by selling organic inputs to other producers. Farm A kept the level of sales of goods in the period 2008-2012 almost constant.
The share of revenue from the sale production in total revenue	62,6%	54,5%	
Share of subsidies in total revenue	26,8%	4,4%	The share of subsidies in total revenue is lower for Farm B. This is the main reason of dissatisfaction of the proprietor.
Costs			
Raw materials and supplies costs	35,6%	18,5%	Farm A purchases inputs by association from customers or external suppliers, ensuring higher productivity. Farm B, provides its inputs from local suppliers and within own farm. (we consider that the difference is of about 3000 lei/ha between the two companies regarding this category of expenditure).

	Farm A	Farm B	Observations
Costs with external services	20,7%	16,4%	Farm B, due to larger surface obtains greater efficiency in relation with third parties (especially for mechanical work). As a share these expenses are lower in total expenditure.
Energy and water costs	3,2%	3,9%	Farm B, located in the south of Romania, consumes more for irrigation, these expenses having a higher share.
Personnel costs	8,7%	5,3%	Farm A, employs more laborers annually, although it has a smaller area, which increases the amount of the expenses in total costs.
Profit			
Net profit	420145	-197505	Farm B had loss in 2012, due to high costs for goods and low productivity. Farm A has a greater stability of profit, which is higher than that achieved by Farm B, even though the cultivated area is smaller. This is due to the stability provided by the association and results in higher productivity per hectare.
Effectiveness of work (SIG)			
Trading margin	+	+	Farm B, as mentioned before, had difficulty in valuing goods, but managed to maintain a positive trade margin.
Year production	+	+	Both companies fail to provide more value than the value of goods and services from third parties, and a very high production year, however EBE is negative, which indicates that the companies did not obtain availabilities from operating activities. However, the inefficiency of costs use has made its mark on Farm B, which demonstrates an actual financial inability for funding future work.
Value added	+	+	
Gross operating surplus	-	-	
The result of the operation	+	-	
Year result (net profit)	+	-	
Self-financing capacity	+	-	
Evaluation of results and commercial performances			
Dynamics index - turnover (I_{CA})	$I_{CA} > I_{Qf}$	$I_{CA} < I_{Qf}$	Farm A has a tendency for stock formation but in decrease just as Farm B, but Farm B manages to make better production.
Dynamics index –commodity production (I_{Qf})			
Dynamics index - commodity production (I_{Qf})	$I_{Qe} > I_{Qf}$	$I_{Qe} > I_{Qf}$	Both companies have blocked the assets under form of stocks, and also an increase in domestic consumption.
Dynamics index - year production (I_{Qe})			

	Farm A	Farm B	Observations
I_{CA}/ I_{Qf}	<1	<1	Delivery rate is lower than the rate of production, but faster for Farm B.
I_{Qf} / I_{Qe}	<1	<1	Production completion rate is lower than the rate of total volume of activity, but faster from Farm A.
Resource utilization assessment during 2008-2012			
Profit from 1000 Lei fixed assets	↑	↓	Farm A: efficiency Farm B: inefficiency
Stock rotation speed	↓	↑	Farm A: inefficiency Farm B: efficiency
Average time for recovery of claims	↑	↓	Farm A: inefficiency Farm B: efficiency
Work productivity	↑	↓	Farm A: efficiency Farm B: inefficiency
Total costs for 1000 Lei from operating revenue	↓	↑	Farm A: efficiency Farm B: inefficiency
Costs with raw materials and consumables for 1000 Lei in operating revenue	↓	↓	Farm A: efficiency Farm B: efficiency
External services costs for 1000 Lei in operating revenue	↑	↓	Farm A: inefficiency Farm B: efficiency
Evolution of return rates during 2008-2012			
Trade margin rate	↓	↓	As appreciated by the heads of farms, commercial, economic and financial profitability has decreased in the analysis period. Only Farm A managed to ensure a surplus reported profit and equity in net assets. This proves the inefficiency of the operating activity in relation to turnover, assets in which were invested and capital used.
Gross operating margin rate	↓	↓	
Net operating margin rate	↑	↓	
Margin rate on value added	↓	↓	
Economic profitability rate	↑	↓	
Gross margin rate of accumulation	↓	↓	
Rotation coefficient of capital	↓	↓	
Gross economic active return	↓	↓	
Net financial return	↑	↓	
Financial return before tax	↑	↓	
Profit rate	2,8% - 2008 27,4% - 2012	11,6% - 2008 6,7% - 2012	

Source: own evaluation based on annual financial statements

The main organizational characteristics of animal breeding farms in 2008-2012 periods:

Farm C – land cultivated with forage; productivity is similar to that of conventional agriculture; human resources requirements are

small (one employee and day workers); production is stored in their own cooling tanks; the production is sold at farm gate to the milk factory (LaDorna).
workers and family members); production is stored in their own cooling tanks; the production is sold at farm gate to the milk factory (LaDorna) and 1% is kept for family consumption.

The main economic characteristics of animal breeding farms in 2008-2012 periods:

Farm C - specialized in milk production, had in 2012 a turnover of 1.5 million RON, higher with 37.9% compared to 2008 [10]. The farm ensures its revenue in proportion of 84.9% from the sale of production and in proportion of 15.1 % from subsidies. The main expenses were with raw materials (75.4%), human resources (10.1%) and with external services (6.3%). The farm was profitable in the analyzed period, except for 2011, and ensured a high degree of use of all material resources. Also the farm ensured the efficient use of fixed assets, stocks, receivables, human resources and costs. Also, its commercial, economic and financial return rates were increasing.

Farm D - specialized in milk production, had in 2012 a turnover of 0.44 million RON, lower in the entire period with 40-50% compared to 2008 [11]. The farm ensures its revenue in proportion of 95.2% from the sale of production and in proportion of 4.8% from subsidies. The main expenses were with raw materials (24.1%), human resources (29.4%) and with external services (21.9%). The farm was slightly profitable in the analyzed period, ensuring the use of material resources until 2011. The farm didn't ensure the efficient use of fixed assets, stocks, receivables, human resources and raw material costs. Also the commercial, economic and financial return rates were low.

The comparative economic and efficiency indicators evolution on animal breeding farms (Table 2):

Farm D – land cultivated with forage; productivity is lower to that of conventional agriculture; human resources requirements are higher (four employees, a veterinarian, day

Table 2: Comparative analysis of economic and financial statement of organic animal breeding farms

	Farm C	Farm D	Observations
Revenue			
The share of revenue from the sale production in the turnover	87,5%	98,7%	The companies leverage almost the entire production to the LaDorna milk factory.
The share of revenue from the sale production in total revenue	84,9%	95,2%	
Share of subsidies in total revenue	14,1%	1,24%	Subsidies share is higher for Farm C, it having fewer livestock.
Costs			
Raw materials and supplies costs	75,4%	24,1%	Farm C acquires the majority of inputs, organic feed being bought from a supplier located 100 km away. Farm D has greater capacity to insure fodder, owning more organically certified land.
Costs with external services	6,3%	21,9%	Farm D has a higher share of costs to third parties, owning more land that requires technological works.
Energy and water costs	1,02%	0	This type of costs have a low share in total.
Personnel costs	10,1%	29,4%	Farm D has more employees and laborers annually (4 permanent employees, 1 veterinarian, about 20 laborers).
Profit			
Net profit	184140	812	Farm C operates with only one employee and family members, obtaining a higher productivity per animal, ensuring its high profitability, especially with subsidies.
Effectiveness of work (SIG)			
Trading margin	+	0	Sales of goods is an ancillary activity, with little importance to ensure farm income.
Year production	+	+	Both livestock farms fail to add value to the over consumption of third
Value added	+	+	
Gross operating surplus	+	+	

	Farm C	Farm D	Observations
The result of the operation	+	+	parties, as well as high production year. Positive EBE reveals that the farms have availability from operating activities, especially since the factory's daily delivery and fast payment.
Year result (net profit)	+	+	
Self-financing capacity	+	+	
Evaluation of results and commercial performances			
Dynamics index - turnover (I_{CA})	$I_{CA} > I_{Qf}$	$I_{CA} < I_{Qf}$	Farm C shows an increase in inventories, unlike Farm D who succeeds to make better production.
Dynamics index – commodity production (I_{Qf})			
Dynamics index - commodity production (I_{Qf})	$I_{Qe} < I_{Qf}$	$I_{Qe} > I_{Qf}$	Farm C shows a reduction in the consumption share of third parties. Farm D show blocked assets under the form of stocks, but also an increase in domestic consumption.
Dynamics index - year production (I_{Qe})			
I_{CA}/ I_{Qf}	>1	<1	For Farm D the delivery rate is lower than the production rate and this reversed for Farm C.
I_{Qf} /I_{Qe}	>1	<1	For Farm D the production completion rate is lower than the rate of the total volume of activity and this is reversed for Farm C.
Resource utilization assessment during 2008-2012			
Profit from 1000 Lei fixed assets	↑	↓	Farm C: efficiency Farm D: inefficiency
Stock rotation speed	↓	↑	Farm C: inefficiency Farm D: efficiency
Average time for recovery of claims	↑	↓	Farm C: efficiency Farm D: inefficiency
Work productivity	↑	↑	Farm C: efficiency Farm D: efficiency
Total costs for 1000 Lei from operating revenue	↓	↓	Farm C: efficiency Farm D: efficiency
Costs with raw materials and consumables for 1000 Lei in operating revenue	↓	↑	Farm C: efficiency Farm D: inefficiency
External services costs for 1000 Lei in operating revenue	↓	↑	Farm C: efficiency Farm D: inefficiency
Evolution of return rates during 2008-2012			
Trade margin rate	-	↓	As the manager of Farm C had stated, the commercial, economic and financial return is good. The farm had the advantage of winning a Measure 112 Project which allowed it to invest no additional cost. Farm D though shows a decrease in market activity, as well as a lower economic and financial return. This is due to the investments made in recent years in construction and animals, the farm having a policy of expansion.
Gross operating margin rate	↑	↑	
Net operating margin rate	↑	↑	
Margin rate on value added	↑	↓	
Economic profitability rate	↑	↓	
Gross margin rate of accumulation	↑	↑	
Rotation coefficient of capital	↑	↓	
Gross economic active return	↑	↑	
Net financial return	↑	↓	
Financial return before tax	↑	↓	
Profit rate	0,4% - 2009 13,6% - 2012	1,9% - 2008 4,0% - 2012	

Source: own evaluation based on annual financial statements

CONCLUSIONS

The comparative analysis of the efficiency of large organic crop farms, taken into study, shows that the overall work is cost effective for the farm integrated into the associative system, while the company operating by itself on the market managed to stay profitable only in the agricultural years with favorable climatic conditions.

The economic crisis, lack of productivity, problems in selling goods, increased costs, reduced subsidies, etc. adversely affected Farm B (750 ha), there were years when the profit rate fell below 1%. Farm B (420 HA) without getting a great return in the period analyzed, thanks to distribution through the association of the inputs used and the productivity achieved, managed to get a rising rate of profit that came to 27 4% in 2012. The company's strategy to invest in quality inputs, more labor (which reduces work time), seed production, etc. gives better stability on the market.

Farm C (20 cows and 20 young cattle) has been very profitable in the period under review, with an increasing profit rate (13.6% in 2012). The company invested through Structural Funds, but having a lack in overall technical infrastructure for livestock. Increased investment and business expansion in the absence of structural funds financing affected the results obtained by Farm D (57 cows), with an economic and financial return and a lower profit rate of up to 4%.

The integration of these two farms in the LaDorna Factory structure of milk collection, plus subsidies for being located in a disadvantaged area and access to green fodder base, leads us to say that the two farms fail to remain active on the milk market in the analyzed area.

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REFERENCES

[1]Bălan, A., Toma, E., 2012, Organic crops'economic efficiency based on a case study from the Călărasi county crops 2008 – 2009, Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development", USAMV Bucharest , 12 (4): 9-12

[2] Cofas, E., 2012, National agricultural policy for organic farming, Sustainable Rural Development. International Scientific Symposium, Timişoara, Romania, 25 May 2012, AgriPrint, 14 (1): 151-156

[3] De Ponti, T., Rijk, B., Van Ittersum, M. K., 2012, The crop yield gap between organic and conventional agriculture. Agricultural Systems, 108:1-9

[4] Grigore, A.A., Abargaoniei, S.V., Nancu, D.V., Ghiculescu, R., 2008, Analiza comparative privind eficienţa economică a produselor agricole convenţionale şi a celor ecologice, Lucrări Ştiinţifice Seria Agronomie, 51(3):333-338

[5] Morna, A., 2010, Organic farming-past, present and future, Lucrări Ştiinţifice, Universitatea de Ştiinţe Agricole şi Medicină Veterinară a Banatului, Timişoara, Seria I, Management Agricol, 12(2)

[6] Seufert, V., Ramankutty, N., Foley, J. A., 2012, Comparing the yields of organic and conventional agriculture. Nature, 485(7397): 229-232

[7] Vintilă Georgeta, 2000, Gestiunea financiară a întreprinderii (Financial management of the enterprise), Editura Didactică si Pedagogică, Bucuresti

[8] *** Annual financial statements – S.C. ADAFLOR S.R.L.

[9] *** Annual financial statements – S.C. AUGER PETRUŞ S.R.L.

[10] *** Annual financial statements – S.C. DANY LILY S.R.L.

[11] *** Annual financial statements – S.C. BEST COWS S.R.L.