PROFIT AND PROFITABILITY OF THE COMMERCIAL COMPANIES DEALING WITH DAIRY FARMING

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Abstract

The paper analyzed net profit and profitability of a panel of six commercial companies (C1-C6) raising dairy cows and supplying milk on the capital market in the period 2009-2018, based on the data from Balance Sheets which were processed using fixed index, descriptive statistics, points method, regression modeling, correlations and determination coefficients. All the companies registered an increased net profit in the analyzed period except C3 which registered losses in 2010, 2012, 2013 and 2018 and C5 with losses in 2016. The highest annual profit average was achieved by C4 (Lei 1.19 Million) and the lowest one by C5 (Lei 0.3 Million). Net profit margin varied between 23 %, the highest level in C5, and 1.1 %, the lowest level in C3. The highest average net profit obtained per one million used assets was Lei 370 thousand in C5 and the lowest level was Lei 6 thousand in C3.For one million equity, the return of net profit accounted for Lei 0.42 million in C5 and Lei 30 thousand in C3. The total costs of the firms increased influencing the net profit. For Lei one million expenses, the average net profit varied between Lei 310 thousand in C5 and 20 thousand in C3. The total number of points received for each analyzed indicator led to the following classification of the companies, in the decreasing order of profitability: C5, C4,C2, C6,C1 and C3. The F test confirmed that the linear regression models attested that costs have an influence on net profit. However, only in case of C5 and C2, the variation of net profit was caused by total costs in a higher proportion than 50%, and in case of C4 and C1 with about 31 %. The correlation coefficients reflected a high positive connection between net profit and costs in C2 (r = 0.994) and C6 (r = 0.711). The profitability analysis in these companies emphasized that even though they are in top agribusiness in dairy farming, they could get losses in a few years as net profit is influenced by costs. As a final conclusion, to increase net profit and profitability, the decision makers have to set up a development strategy of the business based on a deep financial analysis and prospecting the opportunities which could assure economic growth in the future.

Key words: net profit, net profit margin, return on assets, return on equity, return on costs, dairy farms, Romania

INTRODUCTION

The business analysis in dairy farming is focused in various directions: dairy herd, crops. labor, and financial aspects. Financial performance of a company dealing with dairy farming is "the mirror" of the whole activity run along the year evaluated at the end of the year and which enable the farm manager to understand in what direction his business is going, how to plane the future strategy and evaluate the farm position among the competitors. The Balance Sheet, Profit and Loss Account, and Cash Flow Statement are the information sources for assessing the financial situation of the farmer's business.

Besides the analysis of the assets, liabilities, income and expenses statement, cash flow statement, it is compulsory to analyze the financial ratios regarding liquidity, solvency, profitability, repayment capacity, efficiency which allow to evaluate the strengths, weaknesses, and opportunities of the business [4].

Business management is the science and art to use the known resources in an unknown context of the future. For this reason, decision makers should pay attention to the current farm performance analysis, technological, financial and economic factors, and to adopt a "probabilistic ways of thinking" and create scenarios and breakeven budgets based on key

elements of decision which could guess the future events and outcomes [12].

Profitability is the aim of a company to survival and growth is the guarantee for obtaining profit for a long run. Profit in terms of net profit is the first goal of a business because it represents the money which remain at the firm disposal after the deduction of all the expenses related to production and product selling. Income statement and also the relationship between income and expenses are crucial in determining profit. Profitability must be analyzed using the specific ratios. Growth opportunities are essential for business development and producing more profit and for this reason marketed products, number of employees, turnover and market share have to be items where managers have to be focused on [18].

Financial analysis is a decision tool for the future development of business in dairy farming. Financial statement has to be analyzed in order to identify the opportunities for improving efficiency and profitability [9, 10, 14, 17, 19, 22, 23, 24, 29, 30, 31, 32, 33, 49].

Dairy farmers must be more focused on farm finances because of the tendency of low profit margins visible nowadays. Farm production and financial records have to be carefully analyzed by managers. In order to maintain the viability of the business, farmers' objectives have to be: to assure profitability, a low risk, a high liquidity and income. Based on the information provided by the balance sheet, net farm income and cash-flow statements, farm managers could analyze "profitability, solvency, financial efficiency, and repayment capacity of the farm business" [52].

Various factors influence efficiency and profitability in dairy farming and they have been studied by many authors.

Studying the profitability, Arnis et all (2009) mentioned the key indicators which could be used for such an analysis [2].

Using Cobb-Douglas production function and multiple regression models to assess milk productivity and gross margin in small dairy farms of Bangladesh, Datta et al (2019) found

that the larger farms with a higher milk production have better results because it is a positive and statistically significant relationship between farm size, milk productivity and gross margin. Also, crossbred cows produce more milk and a higher gross margin than the indigenous breeds [5].

Delgado (2015) analyzed various factors influencing profitability of an animal in dairy farms along the time using an information visualization methodology and recommended to farm managers to use "the Cumulative lifetime profitability and its variant Adjusted for regressed opportunity cost of the postponed replacement" for making the decisions regarding the future strategy regarding profitability of the herd. He pointed out that profitability varies among dairy farms due to the different types of housing and milking systems, expenses till the age of the first calving and for solving the health problems [6].

Analyzing returns on costs (variable and total) and their correlations with milk price, variable cost, total cost, and year and also "the relationships between revenue, production, and cost factors among groups of high-, medium-, and low-profit dairy operations" in dairy farming of Kansas Farm Management Association for period of 22 years (1989 - 2010), Dhuyvetter (2011) concluded that high profit dairy farmers achieved the highest milk yield per cow, lower costs per cow, have slightly larger operations, get slightly higher milk price at delivery compared to low-profit producers. Therefore, milk yield, cost per cow and milk price are the key factors which assure the highest profit [7].

Dolewikou et al (2016) studied income and profitability of dairy farming found that the business was more profitable in the group of farms which applied for loans with low interest rate [8].

FAO, 2019, pointed out that farm size is the cause of the large variability economic efficiency and profitability in dairy farming. Farm size determines an asymmetric access to farm inputs, information, subsidies, and

environmental practices. The farms with a high efficiency will be more profitable [11].

An analysis of the gross and net profit of culture, cross and native-breed dairy cattle farms in Turkey, concluded that gross profit is higher in case of culture-breed farms because feeding cost is lower compared to other farms, a reason to recommend them for milk production in Turkey [13].

An analysis on gross profit margin in milk producing EU countries using regressions models led to the conclusion that the most influencing factors on profitability in dairy farming are herd size, forage area, milk yield, milk price, energy and labor cost [15].

Haloho at al (2013) studied the influence of the production factors (cost of forage, cost of concentrate, cost of labor, capital and farm experience) on the profit of the dairy farming using the profit function Output Unit Price Cobb-Douglas Multiple linear regression and found that farm inputs, forage and concentrate cost, partially the capital affected the revenue and profit [16].

Assessing profitability in improved dairy farmers compared to the local farmers using gross margin and cost benefit analyses, and also the economic efficiency based on a stochastic profit frontier model, Nyekanyeka (2011), found that the profit efficiency is higher in improved dairy farmers due to their higher education, longer experience and access to credit [20].

Pirvutoiu and Popescu (2010) proved that profitability analysis is fundamental for setting up the future strategy of the business in dairy farming [21, 25]. Also, the sane author affirmed that the larger the herd size and the higher the milk yield per cow, the higher milk production, income and profit in dairy farming [26].

For assuring a higher performance and efficiency in dairy farming, investments are required to keep pace with modern technologies [27].

Using Cobb-Douglas function in the analysis of profitability in dairy farms, Popescu (2014) affirmed that input cost (materials, labor), milk cost, marketed milk and milk price are the key factors

efficiency and influencing profitability in dairy farms [35, 36, 37, 38, 39, 45].

Milk market has also by carefully studied to bring information to farm managers regarding milk price, demand/offer ratio, milk and dairy products consumption, external market, milk and dairy products trade [28, 40, 41, 42, 43, 44, 46, 47].

Milk quality has a deep impact on milk price offered by milk processors and of course on income coming from marketed milk [1, 48].

The economic viability and efficiency of dairy cattle farms in Bulgaria is deeply influenced by herd size, and milk yield as found Stankov (2015). He also mentioned that largest farms of 100 dairy cows obtain a higher milk production, income and income per cow, profit and profit per cow, gross profit margin, a high cost-effectiveness and the highest profitability rate [50]. Also, Stankov et al (2015) using regression and correlation analysis identified that labor efficiency, farm size, and milk yield are the key factors with a deep impact on profit per milk kilogram and that the best results are obtained in the largest dairy farms [51].

Analyzing costs of milk production, gross production value, gross margin, absolute and relative profit of dairy cattle farms in Turkey, Yilmaz et al (2016) concluded that herd size and feeding cost have a deep influence of profitability [53].

In this context, the aim of this paper was to analyze profit and profitability by means of all the indicators where profit is a component and also its relationship with costs in six commercial companies confirmed as top milk producers in the counties from the South Romania surrounding the capital in the period 2009-2018, that is in the last decade.

The objectives of the paper were:

(i)to analyze the evolution of net profit, net profit margin, return on assets, return on equity, and return on costs,

(ii)to determine the average level of all these indicators mentioned above in order to set up the classification of the companies,

(iii)to analyze the relationship between the total costs of the each company and net profit

using a regression model, determination coefficient and correlation coefficients.

MATERIALS AND METHODS

Data collection
The paper was set up using the financial data provided by the Balance Sheets belonging to six commercial companies profiled on cattle growing for milk production. The firms are important raw milk suppliers for the capital of Romania being situated in its proximity. One company is located in Bucharest, two companies are situated in Ilfov Country, one company has its seat in Calarasi, one company is from Giurgiu County and the last one is from Prahova county. The data refer to the last decade for which the balance sheets were concluded 2009-2018 [3].

All the companies are in top agribusiness for dairy farming and in this paper they are codified C1, C2, C3, C4, C5 and C6.

The following indicators were taken into consideration: (i)Net Profit (NP), (ii)Net Profit Margin (NPM), (iii)Return on Assets (ROA), (iv)Return of Equity (ROE), (v)Total costs (TC) and (vi) Return on costs (RC).

Methodology applied
Fixed base Index, $I_{FB(\%)}$, according to the formula: $I_{FB(\%)} = (V_n/V_0)$ x100, where: V_n is the value of the variable in the year n and $V_{0,}$ the value of the variable in the year 0 was used for the temporal comparison among the studied farms based on the time series data.

Descriptive statistics was used for estimating Mean, Standard Deviation, Coefficient of variation, Minimum and Maximum values for all the indicators specified above.

The profit effect on profitability of the firms was analyzed using the following formulas:

Net Profit Margin (MPM): NPM= NP/T, where: NP = Net Profit and T = Turnover or Sales.

Return on Assets (ROA): ROA= NP/TA, where: TA= Total Assets.

Return on Equity (ROE): ROE = NP/E, where: E= Shareholders' Equity.

Return on Costs (RC): RC = NP/TC, where: TC= Total costs.

Points Method was used for establishing the rank of each company for each indicator and the final rank among companies based on the cumulated points.

ANOVA, the analysis of variance, Regression model based on the formula: Y = a + bx, was used for quantifying the impact of Total Costs, considered the independent variable X, on Net Profit, considered the dependent variable Y. For this purpose there were used the Excel facilities which also allowed to calculate: *the determination coefficient, R^2*, which reflect the influence of the variation of the independent variable on the variation of the dependent variable, and *the correlation coefficient, r.*

Comparisons were made between the six companies based on the average value, correlation coefficients, determination coefficients and regression equations for the studied indicators.

The results were represented in suggestive graphics and tables.

RESULTS AND DISCUSSIONS

Net Profit evolution
Net Profit increased in all the companies in the analyzed interval, but it varied from a firm to another.

In the company C1, net profit grew up from Lei 0.12 Million in 2009 to Lei 0.5 Million in 2018, meaning by 315.66% more than in the first year of the study. For C2, net profit increased by 42 %, from Lei 0.4 Million to Lei 0.6 Million. For C3, during the analyzed period, the financial result was positive only in the years 2009, 2011, 2014, 2015, 2016 and 2017, but in 2010, 2012, 2013 and 2018, the company registered losses. As a consequence, net profit value declined from Lei 0.03 Million in 2009 to the loss of Lei - 0.91 Million in 2018. For C4, net profit increased from Lei 0.4 Million to Lei 1.19 Million, meaning 2.97 times. The company C5 recorded profit in almost all the analyzed years, except 2016, when it registered Lei 0.12 Million losses. In 2018, C5 registered Lei 0.3 Million net profit by 23.1 % less than in 2009, when this accounted for Lei 0.39

Million. For C6, net profit raised by 23.21 % from Lei 0.56 Million in 2009 to Lei 0.69 million in 2018. Therefore, in general, all the six companies had a good financial situation, except a few companies which registered losses in a few years (Fig.1).
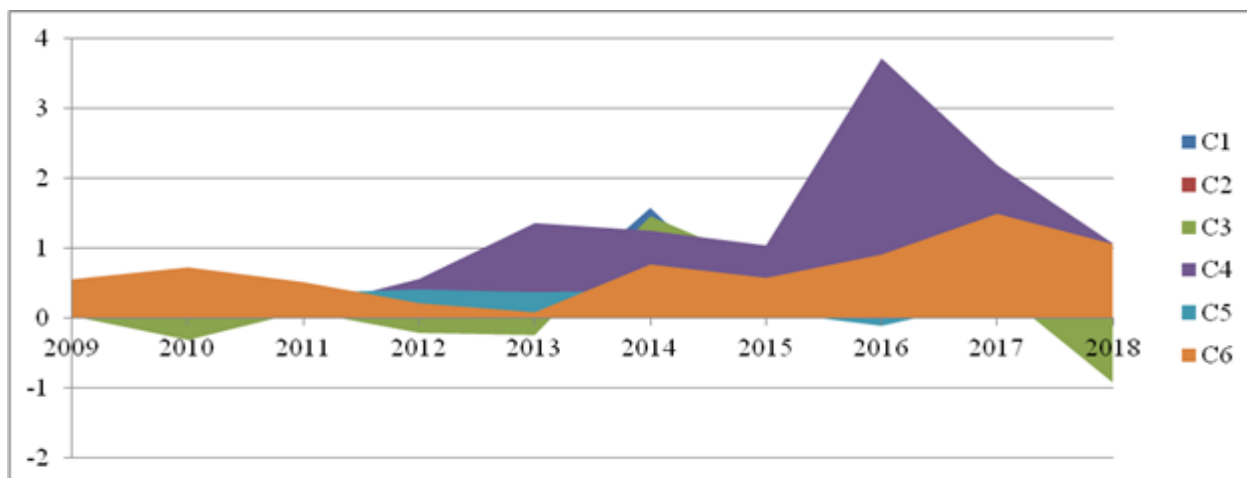

Fig.1.The evolution of net profit by company in the period 2009-2018 (Lei Million)
Source: Own design based on the data of the Balance Sheets of the six companies [3].

Fig.1. reflects very well that the highest net profit was achieved by C4 followed by C6 , and mainly in the last years of the analysis, while C3 registered losses in a few years.

Net Profit Margin was considered an important indicator for making comparisons between the analyzed firms as it reflects the share of the net profit in sales, in other words, how much turnover is represented by net profit, that is after taxation, in Romania, profit tax being 16 % on gross profit.

Net Profit Margin registered different levels from a firm to another depending on its sales, and also on the income and expenses levels.

For C1, the net profit margin accounted for 12.11 % in 2018 compared to 4.38% in 2009, which is a positive aspect, and it varied between 0.88%, the lowest level registered in 2010 and 35.71%, the highest level, recorded in 2014.

For C2, net profit margin was 9.28% in 2009, but 7.37% in 2018. Its level ranged between 1.37%, the minimum value in 2012 and 28.45%, the maximum value in 2016.

The company C3 has a special situation, because of the losses registered in the years 2010, 2012, 2013 and 2018. In this case, if in 2009, C3 registered 0.7% net profit margin, in 2018, it was recorded a negative margin accounting for -6.07%. The highest net profit margin accounted for 14.62 % in 2014 and the lowest one was - 8.20% in 2010.
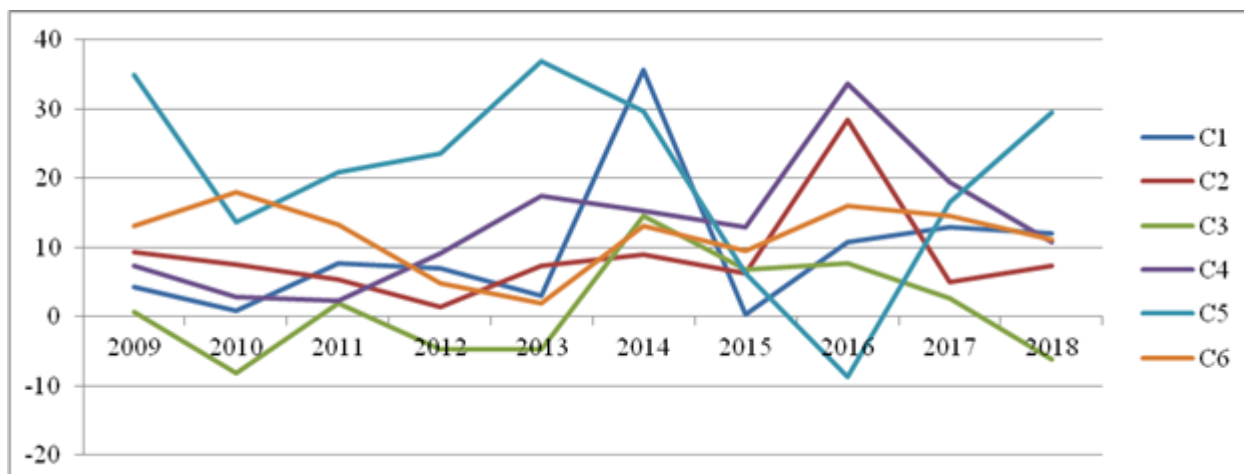

Fig. 2. Dynamics of Net Profit Margin in the analyzed companies, 2009-2018 (%)
Source: Own design based on the Balance Sheets of the firms [3].

For C4, net profit margin increased by 47.5% in the analyzed interval from 7.3% in 2009 to 10.77% in 2018. The highest net profit margin was 33.72% recorded in 2016, and the lowest one was 2.32% in 2011.

For C5, net profit margin declined from 34.89% in 2009 to 29.61 % in 2018, but the highest level was achieved in the year 2013 and accounted for 36.935 and the minimum level was -8.69% in 2016.

For C6, net profit margin was 13.16% in 2009 and 11.12 % in 2018, the peak of this indicator being 18.04% in 2010 and the lowest level was 1.995 in 2013 (Fig.2).

Return on assets (ROA) was used in order to establish how much of net profit was produced using the total assets (fixed and working capital) of the companies.

For C1, in 2009, the utilization of Lei 1 assets produced Lei 2.02 net profit, while in 2018, the company obtained Lei 9.67 net profit, meaning 4.78 times more than in the first year of the interval. The highest ROA level was Lei 19.55 recorded in 2014, and the lowest value was 0.46 lei in 2010.

For C2, in 2009, it was achieved Lei 4.32 net profit per Lei one assets, while in 2018, the company got Lei 4.23 net profit. Therefore, in 2018, the net profit per asset was by 2.1 % smaller than in 2009. The highest net profit per Lei one asset was Lei 19.71 in the year 2016 and the lowest level accounted for Lei 0.97 in 2012.

For C3, the years when the company carried out net profit using its assets were 2009, 2011, 2014, 2015, 2016 and 2017, when per Lei one asset it was obtained Lei 7.74 net profit, the highest value in 2014, and Lei 0.34 net profit, the lowest level in 2009. In the other years, the company achieved losses per Lei one asset varying between Lei - 4.22, the highest loss in 2010, and Lei -1.8, the lowest loss registered in 2013.

For C4, per Lei one asset, the company produced Lei 5.68 net profit in 2009 and Lei 5 in 2018. The ROA of this company ranged between Lei 16.7 in 2016, the maximum level, and Lei 0.82, the minimum level registered in 2010.

In case of C5, per Lei one utilized asset, the firm obtained Lei 45.92 net profit in 2009 and Lei 77.97 in 2018, that is by 70.91% more than in the first year of the studied period. The highest net profit per Lei one asset was Lei 77.97 achieved in 2018, and the lowest level was Lei 8.48 in 2015. But, this company achieved losses of Lei -17.12 per Lei one asset in the year 2016.

In case of C6, the net profit per Lei one asset declined by 2.8% from Lei 5.8 in 2009 to Lei 5.64 in 2018. The top net profit was noticed in 2017 and accounted for Lei 8.71m and the minimum net profit was Lei 0.74 registered in 2013 (Fig.3).
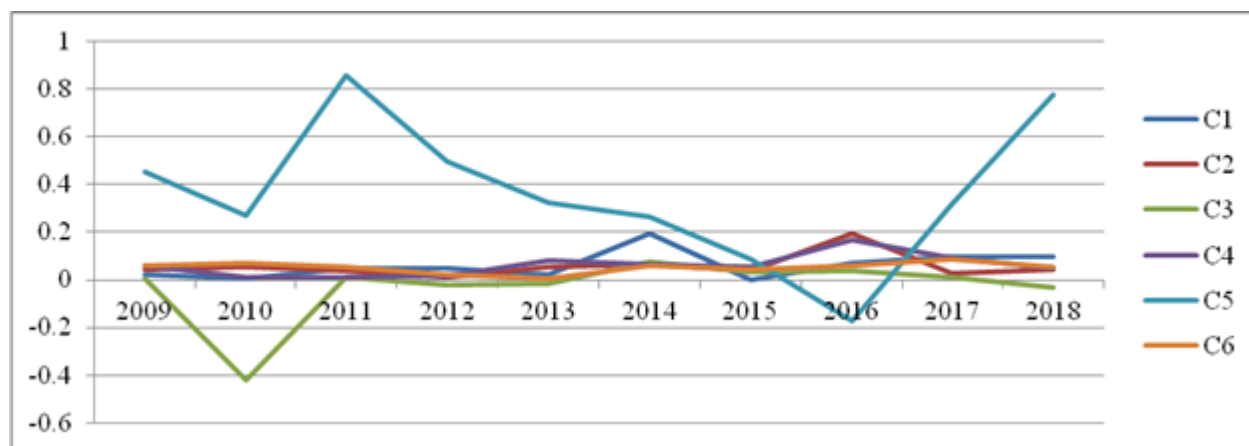

Fig.3.The evolution of Return on Assets (ROA) by company, 2009-2018
Source: Own calculation and design based on the data from the Balance Sheets

Return on Equity (ROE) was also an important indicator reflecting profitability taking into account how much profit resulted using the shareholders' equity.

For C1, per Lei one equity, it was achieved Lei 0.04 net profit in 2009 and Lei 0.13 in 2018, that is 3.25 times more. The value of net profit ranged between the maximum level Lei 0.13 registered in 2018 and the minimum level Lei 0.01 achieved in 2011.

For C2, per Lei one of equity, the company produced Lei 0.07 net profit in 2009 and Lei 0.09 in 2018, that is by 28.57 % more than in the first year of the interval. The net profit per Lei one equity varied between the maximum level Lei 0.29 in 2016 and the minimum level Lei 0.01 in 2012.

For C3, the net profit per Lei one equity ranged between Lei 0.007 in 2009, the lowest level and Lei 0.29 in 2014, the highest level. But, in the years 2010, 2012, 2013 and 2018, this company achieved losses. The highest loss was Lei 0.09 per Lei one equity in 2018, and the lowest loss was Lei 0.06 in 2012.

For C4, the net profit per Lei one equity declined by 41.7% from Lei 0.12 in 2009 to Lei 0.07 in 2018. However, C4 registered the highest net profit per Lei one equity Lei 0.27 in 2016, and the lowest level Lei 0.03 in 2011.

For C5, ROE accounted for 0.57 in 2009 and by 56.14% more in 2018, that is 0.89. The highest net profit per Lei one equity was Lei 1 in the year 2011, and the lowest level was Lei 0.08 in 2015. In 2016, the company registered Lei -0.16 loss per Lei one equity.

For C6, the net profit per Lei one equity decreased by 8.4% from Lei 0.12 in 2009 to Lei 0.11 in 2018. The highest net profit was Lei 0.18 in 2017 and the lowest one was Lei 0.05 in 2012 (Fig. 4).
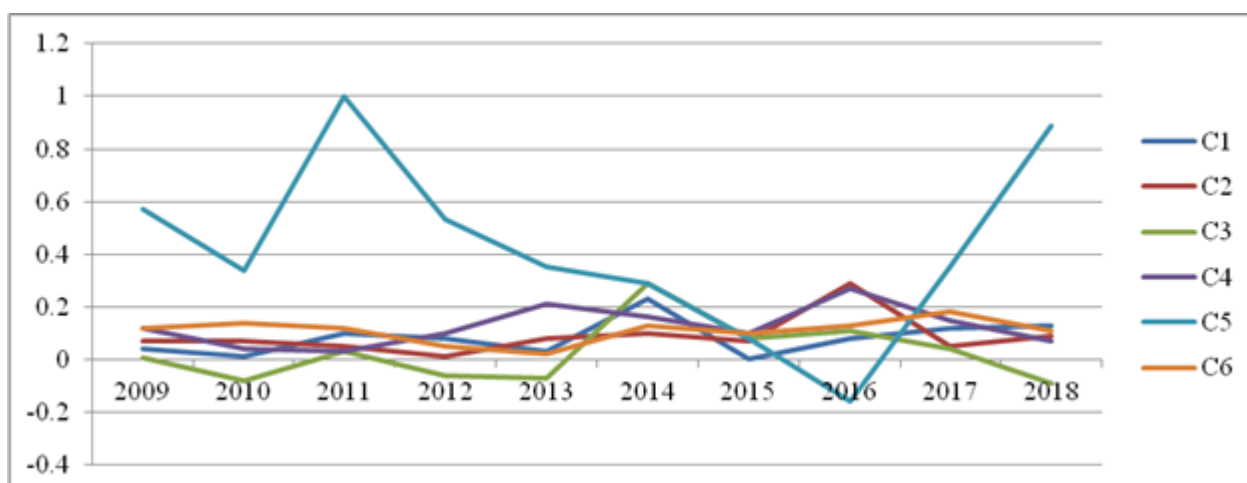

Fig.4.The evolution of Return on Equity (ROE) by company, 2009-2018
Source: Own calculation and design based on the data from the Balance Sheets

Return on Costs (RC) was also studied because this indicator reflects how much profit was carried out by the company per Lei one expenses.

First of all, the dynamics of the total costs in the period 2009-2018 reflected a continuous growth in all the companies.

For C1, the total costs increased 2.29 times from Lei 4.33 Million in 2009 to Lei 9.94 Million in 2018, the average accounting for Lei 6.82 Million.

For C2, the total costs raised by 66.29% from Lei 5.4 Million in 2009 to Lei 8.98 Million in 2018, meaning Lei 6.89 Million in average.

For C3, the costs raised 3.14 times in 2018, reaching Lei 17.45 Million compared to Lei 5.54 Million in 2009. The average total cost accounted for Lei 9.93 Million in the studied period.

For C4, the total expenses raised 2.59 times from Lei 3.9 Million in 2009 to Lei 10.10 Million in 2018.

For C5, the total costs accounted for lei 0.66 Million in 2009 and for Lei 1.52 Million in 2018, that is 2.3 times more.

For C6, the total spending increased 2.73 times from Lei 5.36 Million in 2009 to Lei 14.64 Million in 2018, the average costs in the whole period accounting for Lei 8.99 Million (Fig.5).
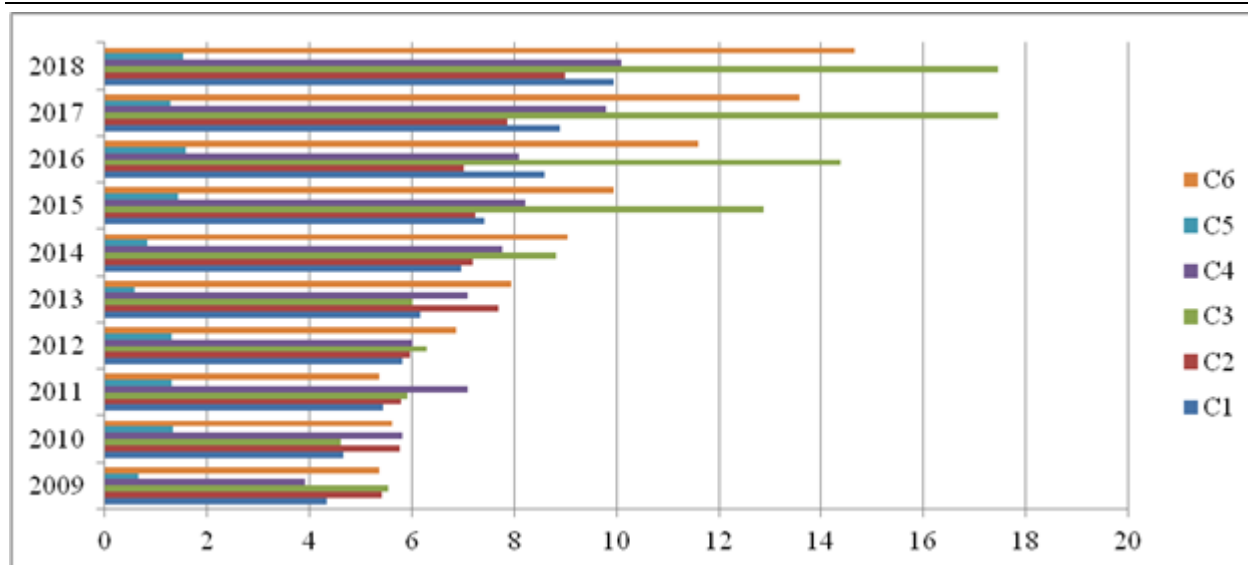
Fig.5.The evolution of Total costs (TC) by company, 2009-2018 (Lei Million)
Source: Own calculation and design based on the data from the Balance Sheets

As a consequence of the evolution of the net profit and of the total costs, the Return on Costs (RC) registered different levels by company.

For C1, RC increased 4.5 times from Lei 0.02 net profit per Lei 1 costs in 2009 to Lei 0.09 in 2018. The RC value ranges between the maximum level Lei 0.23 per Lei 1 costs in 2014 and the minimum level Lei 0.002 registered in 2015.

For C2, RC remained at the same level in 2018 like in 2009, respectively Lei 0.07 net profit per Lei 1 costs. But, during the analyzed period, it was registered the highest net profit per Lei 1 cost, Lei 0.32 in the year 2016 and the minimum level Lei 0.01 in 2012.

Fir C3, per Lei 1 costs, the company achieved Lei 0.16 net profit, the highest level in 2014, and Lei 0.001, the lowest level in 2009. In the years with losses, the highest loss per Lei1 spent was Lei 0.07 in 2010 and the lowest loss was Lei 0.03 noticed in 2012.

For C4, the net profit per Lei 1 costs increased from Lei 0.10 in 2009 to Lei 0.11 in 2018, that is by 10 % more. For C4, RC ranged between Lei 0.46 in 2016, the maximum level, and Lei 0.02 in 2010 and 2011, the minimum level.

For C5, per Lei 1 costs, the company carried out Lei 0.58 net profit in 2009 and Lei 0.43 in 2018, meaning by 26% less. However, the highest net profit was Lei 0.66 in 2013 and the lowest level was Lei 0.06 in 2015. In 2016, this company registered Lei 0.08 loss per Lei 1 costs.
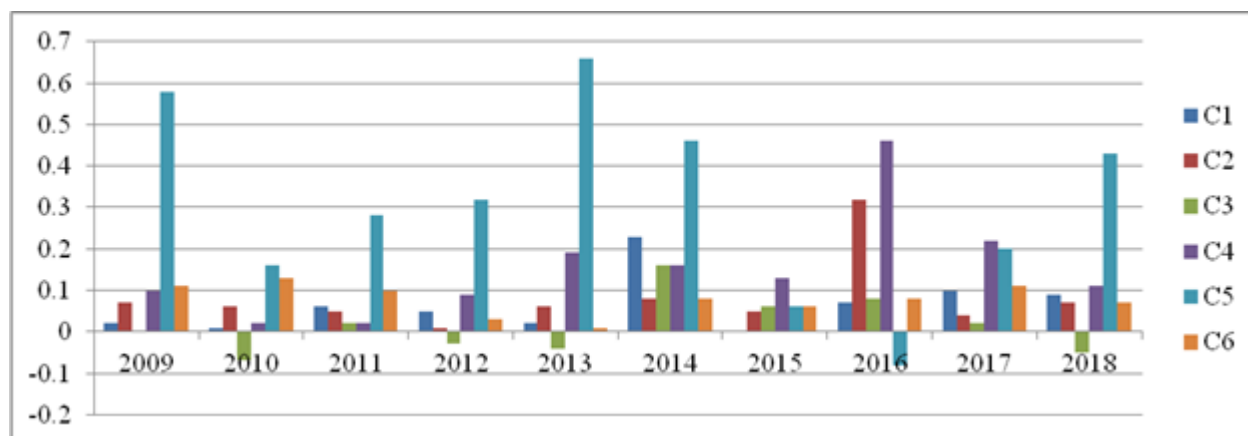

Fig.6.The evolution of Return on Costs (RC) by company, 2009-2018
Source: Own calculation and design based on the data from the Balance Sheets

For C6, the net profit per Lei 1 costs declined by 36.4 % in the analyzed period from Lei 0.11 in 2009 to Lei 0.07 in 2018. The minim net profit per Lei 1 spent was Lei 0.01 recorded in 2013 and the highest net profit was Lei 0.13 registered in 2010 (Fig. 6).

Ranking of the companies based on the results obtained for profit and the studied indicators characterizing profitability is presented in Table 1.

On the 1st position is C1 which came on the top position for NPM, ROA, ROE, TC and RC, but on the 5th position for NP.

On the 2nd position is situated C4, which occupied the 2nd position for NOM, ROA, ROE and RC, on the 1st position for NP and on the 4th position for TC.

On the 3rd position was placed C6, which was ranked the 2nd for NP, the 3rd for NPM, ROE AND RC, and the 4th for ROA and the 5th for TC.

Also, on the 3rd position is situated C2, which summed the same number of pints like C6. But, it got the following positions: the 2nd for TC, the 3rd for NP and RC, the 4th for ROE and the 5th for NPM.

On the 4th position came C1, which was situated on the 2n place for ROA, on the 3rd for TC, on the 4th for NP, NPM and RC and on the 5th for ROE.

Finally, on the 5th position was situated C3. It came on the 5th position for ROA and RC, on the 6th position for NP, NPM, ROE and TC (Table 1).

Table 1. The ranking of the companies based on the average value of the studied indicators

	Specification	NP	NPM	ROA	ROE	TC	RC	Total points	Rank
C1	Value	0.50	0.095	0.06	0.08	6.82	0.07	-	-
	Rank	4	4	2	5	3	4	22	4
C2	Value	0.57	0.087	0.057	0.09	6.89	0.08	-	-
	Rank	3	5	3	4	2	3	20	3
C3	Value	0.22	0.011	0.006	0.03	9.93	0.02	-	-
	Rank	6	6	5	6	6	5	34	5
C4	Value	1.19	0.13	0.06	0.13	7.38	0.15	-	-
	Rank	1	2	2	2	4	2	13	2
C5	Value	0.30	0.23	0.37	0.42	1.18	0.31	-	-
	Rank	5	1	1	1	1	1	10	1
C6	Value	0.69	0.12	0.051	0.11	8.99	0.08	-	-
	Rank	2	3	4	3	5	3	20	3

Source: Own calculation.

Analysis of the relationship between Net Profit and Costs based on regression model, determination coefficient and correlation coefficient

The considered hypothesis has been:

H0: There is no significant influence of total costs on net profit

H1**:** It is a significant impact of costs on net profit.

To test the hypothesis it was used the linear regression model.

The interpretation of the F Stat supposes to compare the Sign. F, the critical calculated value of the test, with F tab, that is α, usually for p=0.05. If Sign F < α the hypothesis of lack of significance of the independent variables H0 is rejected in favor of the hypothesis H1, that is the two variables are

statistically significant and the regression model is confirmed as significant as well.

Considering that the degrees of freedom, df, are 1 for regression and 8 for residuals, it was found Ftab= α = 5.32.

The results regarding ANOVA, regression model and the determination coefficient are presented in Table 2.

Table 2 shows that for all the studied companies, Sign F was < α, therefore the H0 hypothesis was rejected and the H1 hypothesis was accepted, meaning that costs have an influence on net profit and the regression models are confirmed.

The determination coefficient registered different values from a company to another, and it showed that the variation of the net profit is caused by the variation of the total

costs in a lower proportion that is: 2 % for C3, 26.2 % for C4, 31.8% for C5, 32.6 % for C1, and in a higher proportion: 98.9 % for C2, and 50.6% for C6.

Table 2. ANOVA, regression model and the determination coefficient for Net profit, Y and Costs X by company

Company		df	Sum of squares	Mean square	F	Sign F
C1	Regression	1	0.763345	0.763346	3.870572	0.084687
	Residual	8	1.577744	0.197218		
	Total	9	2.34109			
	R^2	0.326	Regression equation: Y= 0.1549659 X -0.557867			
C2	Regression	1	3.254132	3.254132	741.3065	3.5709
	Residual	8	0.035118	0.00439		
	Total	9	3.28925			
	R^2	0.989	Regression equation: Y= 6.974884 X +3.433848			
C3	Regression	1	0.097919	0.097919	0.167976	0.692672
	Residual	8	4.663520	0.58294		
	Total	9	4.76144			
	R^2	0.020	Regression equation: Y = 0.020388 X + 0.021507			
C4	Regression	1	2.824444	2.824444	2.849449	0.129883
	Residual	8	7.929796	0.991225		
	Total	9	10.75424			
	R^2	0.262	Regression equation: Y = 0.3008529 X - 1.028400			
C5	Regression	1	0.039344	0.039344	0.903388	0.369702
	Residual	8	0.348416	0.043552		
	Total	9	0.38776			
	R^2	0.318	Regression equation: Y = - 0.1850626 X + 0.520373			
C6	Regression	1	0.745272	0.745272	8.204026	0.021013
	Residual	8	0.726738	0.90842		
	Total	9	1..47201			
	R^2	0.506	Regression equation: Y = 0.084671 X - 0.06828			

Source: Own calculations.

The coefficients of correlation between Net profit and Total costs reflected a very weak relationship, $r = 0.143$ in case of C1, a weak relationship in case of C5 ($r = 0.318$), a moderate connection in case of C4 and C2 ($r = 0.512$ and, respectively, $r = 0.571$) and a high relationship in case of C6 and C2 ($r = 0.711$ and, respectively, $r = 0.994$) (Table 3).

Table 3. The correlation coefficient between Net profit and Costs by company

C1	C2	C3	C4	C5	C6
0.571	0.994***	0.143	0.512	0.318	0.711*

*Statistically significant for $\alpha = 0.05$. *** Statistically significant for $\alpha = 0.05$, $\alpha = 0.02$ and $\alpha = 0.01$.
Source: Own calculations.

CONCLUSIONS

In the period 2009-2018 in the analyzed companies net profit increased in general with a few exceptions.
The analysis of profit and profitability in the six top agribusiness commercial companies dealing with dairy cows growing proved that even thou they carried out the best performances in the field, the financial year could be not always ended with profit like in case of C3, which had losses in 2010, 2012, 2013 and 2018 and C5 with losses in 2016.
The highest performance was carried out by the companies C4 and C5 where the annual average net profit in the whole period accounted for Lei 1.19 Million and, respectively, for Lei 0.3 Million.
The highest net profit margin was achieved by C5, 23 %, and the lowest one by C3, 1.1 %..
Return on assets registered the highest annual average level in C5 and the lowest annual average level in C3, respectively for Lei one

million used assets it was obtained Lei 370 thousand net profit and Lei 6 thousand.

Return on equity reflected that for Lei one million equity, it was produced

for Lei 0.42 million net profit in F5, the highest level and Lei 30 thousand in C3, the lowest one. In the analyzed interval, the total expenses of the companies increased having a deep influence on the net profit. For Lei one million expenses, the average net profit varied between Lei 310 thousand in C5, the highest value and 20 thousand in C3, the minimum value. Based on the total number of points cumulated for all the analyzed indicators, the ranking of the companies in the descending order of profitability was: C5, C4,C2, C6,C1 and C3. Total costs have a deep influence on net profit, as we know very well that expenses and incomes are the main determinant factors of profit. The linear regression models confirmed the relationship between net profit and total costs. The determination coefficients reflected that only in case of C5 and C2, the variation of profit was caused by the variation of total costs in a higher proportion than 50%. In case of C4 and C1 the found determination degree was about 31 %. In case of the other companies, C3 and C6, net profit is much more influenced by other factors than costs.

Between net profit and costs it is a positive relationship, but its intensity differs from a company to another. The highest correlation coefficients reflecting a high positive connection between net profit and costs were r = 0.994 in C2 and r =0.711 in C6.

As a final conclusion, to increase net profit and profitability, the company managers have to make a careful financial analysis and indentify the risk factors and unutilized resources, and to set up a development strategy which has to valorise the opportunities assuring the future economic growth.

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REFERENCES

[1]Angel, E., Popescu, A., 2009, Milk Quality Management at Flav O'Rich Dairy, USA, Scientific Papers Management, Economic engineering in agriculture and rural development, Vol.9(1), p.11-14.
[2]Arnis, N. I., Kolias, G. D., Filios, V. F., 2008, The profitability of the Greek retail firms and the relations among the determinants (in Greek). Review of Economic Sciences, 14, 161-180.
[3]Balance Sheets of F1, F2, F3, F4, F5, F6 concluded at the end of the years 2009-2018.
[4]Betz, R., Nott, S., Schwab, S., Knuth, J., Staton, M., 2012, Spartan Dairy Farm Business Analysis Workbook, Financial Section, https://msu.edu/~steind/Dairy%20Farm%20Business%20Analysis%20Handbook.pdf, Accessed on Jan. 2, 2020.
[5]Datta, A.K., Haider, M.Z., Ghosh, S.K., 2019, Economic analysis of dairy farming in Bangladesh, Trop Anim Health Prod. 51(1):55-64, https://www.ncbi.nlm.nih.gov/pubmed/30003526, Accessed on Jan. 2, 2020.
[6]Delgado, H.A., 2015, Profitability analysis of Quebec Dairy Cattle suing health and management data via visualisation tools, Thesis for Dr. in Philosophy, McGill University.
[7]Dhuyvetter, K., 2011, Factors Impacting Dairy Profitability: An Analysis of Kansas Farm Management Association Dairy Enterprise Data, Kansas State University, https://www.agmanager.info/node/7139, Accessed on Jan. 2, 2020.
[8]Dolewikou, R.L., Sumekar, W., Setiadi, A., 2016, The profitability analysis of dairy cattle business on the group of dairy farmers in West Ungaran District Semarang Regency https://www.researchgate.net/publication/314194006_The_profitability_analysis_of_dairy_cattle_business_on_the_group_of_dairy_farmers_in_West_Ungaran_District_Semarang_Regency, Accessed on Jan. 2, 2020.
[9]Dragotă, V., Dragotă, M., Obreja, L., Ciobanu, D., 2003, Financial Management, Vol. I & II, Economica Publishing House, Bucharest, pp.142-149.
[10]Dumbrava, M., 2010, Model of analysis of firm performance, Theoretical and applied economics, Vol. XVII, No. 8(549), 105-119.
[11]FAO, 2019, Profitability and Efficiency of Indian Dairy Farms, http://www.fao.org/3/x6170e36.htm, Accessed on Jan. 2, 2020.
[12]Ferris, A, Malcolm, B., 1999, Sense and Nonsense in Dairy Farm Management Economic Analysis, University of Melbourne, https://pdfs.semanticscholar.org/91c6/27ef11df029c269de6f9fa6ebe3e093bc721.pdf , Accessed on Jan. 2, 2020.
[13]Gencdal, F., Yildirim, I., 2018, Gross and net profit of dairy cattle farms- A case study in Eastern Anatolia Region of Turkey, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 18(4):121-127.

[14]Ghic, G., Grigorescu, C. J., 2009, Economic and financial analysis, Universitaria Publishing House, Bucharest, 130-135.

[15]Gołaś, Z., 2017, Determinants of milk production profitability of dairy farms in the EU member states, Problems of Agricultural Economics, 3(352):19-40.

[16]Haloho, R.D., Santoso, S. I., Marzuki, S., Roessali, W., Setiadi, A., 2013, Profit function analysis of dairy cattle farming in getasan and west ungaran districts, semarang regency https://www.researchgate.net/publication/297728341_Profit_function_analysis_of_dairy_cattle_farming_in_getasan_and_west_ungaran_districts_semarang_regency, Accessed on Jan. 2, 2020.

[17]Isfanescu, A., Robu, V., Hristea, A. M., Vasilescu, C., 2002, Economic and financial analysis, ASE Publishing House, Bucharest, 75-80.

[18]Maverick, J.B., 2019, Is Profitability or Growth More Important for a Business?, https://www.investopedia.com/ask/answers/020415/what-more-important-business-profitability-or-growth.asp, Accessed on Jan. 2, 2020.

[19]McLaughlin, E., 2019, Case study: Financial analysis, https://www.sophia.org/tutorials/case-study-financial-analysis--2, Accessed on Dec.20, 2019.

[20]Nyekanyeka, T., 2011, Analysis of profitability and efficiency of imporved and local smallholder dairy production: A case of Lilongwe Milk Shed Area, M. Sc. Thesis, University of Malawi, Bunda College.

[21]Pirvutoiu, I, Popescu, A., Grigoras, M.A., 2010, Profitability Analysis – a Study Case Agroindustriala Pantelimon Joint Venture Dairy Farming Company, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.10(2)/2010, 161-164.

[22]Popescu, A., 2003, Financial Analysis in Dairy Farming, The 2nd International Symposium on "Prospects for the 3rd Millenium Agriculture", USAMV Cluj-Napoca, 9-11 Oct. 2003, Bulletin of UASVM Cluj-Napoca, Zootehnie si Biotehnologii (Animal Science and Biotechnologies), Vol.59, 11-14.

[23]Popescu, A., 2004, Prospects for dairy farm management under milk quota. The International symposium on"Prospects for the 3rd Millenium Agriculture", USAMV Cluj-Napoca, 20-23 Oct.2003, Bulletin of UASVM Cluj-Napoca, Zootehnie si Biotehnologii (Animal Science and Biotechnologies), Vol.60, 14 - 20.

[24]Popescu, A., 2004, Financial Statement - a tool in decision making in dairy farming. The International symposium on"Prospects for the 3rd Millenium Agriculture", USAMV Cluj-napoca, 20-23 Oct.2003, Bulletin of USAMV Cluj-Napoca, Zootehnie si Biotehnologii (Animal Science and Biotechnologies), Vol.60, 384 - 389.

[25]Popescu, A., Muresan, G., 2004, Analysis in dairy farming in Arad County achievements and prospects under the background of Romania's entry into the E.U. The International symposium on "Prospects for the 3rd Millennium Agriculture", USAMV Cluj-Napoca, 20-23 Oct.2003, Bulletin of UASMV Cluj-Napoca, Zootehnie si Biotehnologii, (Animal Science and Biotechnologies), Vol.60, p.385.

[26]Popescu, A., 2005, Research concerning dairy cows, farm structure and milk performances in the proximity of the capital, The 4th International Symposium "Prospects of the 3rd Millennium Agriculture, 6-7 Oct.2005, Bulletin UASVM Cluj-Napoca, Romania, Series Zootehnie si Biotehnologii si Medicina Veterinara (Series Animal Science and Biotechnologies and Veterinary Medicine), Vol.61, 399-403.

[27]Popescu, A., 2006, Research concerning the economic impact of investments in dairy farms of various size, International Symposium "Prospects of Agriculture in the 3rd Millennium", UASVM Cluj-Napoca, 5-6 October 2006, Bulletin of USAMV Cluj-Napoca, Romania, Seria Zootehnie si Biotehnologii si Medicina Veterinara (Series Animal Science and Biotechnologies and Veterinary Medicine), No.62, 8-12.

[28]Popescu, A., 2006, Study upon milk market in the EU countries, Bulletin of the University of Agricultural Sciences and Veterinary Medicine, Animal Husbandry and Biotechnologies, Vol. 62, 214, Symposium on Prospects for the 3rd Millenium Agriculture, Oct.5-6, 2006, Cluj-Napoca

[29]Popescu, A., 2006, Managementul financiar in fermele de vaci, Ed. Dominor Bucuresti, (Financial management in dairy farms, Dominor Publishing House, Bucharest), 69 p.

[30]Popescu, A., 2007, Analiza financiara, Ed.Dominor, Bucuresti (Financial Analysis, Dominor Publishing House, Bucharest), 188-194.

[31]Popescu, A., 2009, Considerations upon Net Working Capital Management, Scientific Papers Series Management, Economic engineering in agriculture and rural development, Vol.9(2):125-128.

[32]Popescu, A., 2010, Net Sales Analysis in a Dairy Farming Company, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.10(2):179-184.

[33]Popescu, A., 2010, Research concerning Gross Margin Forecast based on Milk Yield using the Least Square Method of Regression Analysis, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.10(2):173-178.

[34]Popescu, A., 2012, Economia productiei in ferma de vaci, Ed.Eikon, Cluj Napoca, coeditare cu Ed.RawexComs, Bucuresti, (Production economics in dairy farms, Eikon Publishing House, Cluj Napoca, coediting with RawexComs Publishing House, Bucharest), 45-52.

[35]Popescu, A., 2014, Research on milk cost, return and profitability in dairy farming, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.14(2):219-222.

[36]Popescu, A., 2014, Research on profit variation depending on marketed milk and production cost in dairy farming, Scientific Papers Series Management,

Economic Engineering in Agriculture and Rural Development, Vol.14(2):223-230.

[37]Popescu, A., Condei, R., 2014, Considerations regarding the criteria of efficiency for the classification of dairy farms, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.14(3):256-265.

[38]Popescu, A., Condei, R., 2014, Study on the average marketed milk as a measure of profitableness threshold in dairy farms, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.14(4):219-222.

[39]Popescu, A., David, L., 2014, Research on regression modeling of profit related to milk yield in dairy farming, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.14(4):211-218.

[40]Popescu, A., 2015, Research on the top Romanian trademarks in the milk and dairy products market, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.15(1): 367-376.

[41]Popescu, A., 2015, Research on the trends in milking livestock and milk production in Romania, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.15(1):377-386.

[42]Popescu, A., 2015, Research on the trends in milk production and consumption in Romania, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.15(1):387-392

[43]Popescu, A., 2015, Research on the trends in Romania's milk and dairy products foreign trade, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.15(1):391-398.

[44]Popescu, A., 2015, Regression modeling in prediction milk production depending on the dairy bovine livestock, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.15(4): 225-230.

[45]Popescu, A., 2015, Multiple correlation and regression in predicting milk price, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.15(4):231-238.

[46]Popescu, A., 2016, The milk market concentration and competition thresholds in Romania, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.16(2):247-253.

[47]Popescu, A., 2017, Trends in milk market and milk crisis impact in Romania, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.17(2):281-290.

[48]Popescu, A., Angel, E., 2019, Cow raw milk quality and its factors of influence in relationship with milk price, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.19(1): 421-440.

[49]Robu, V., Georgescu, N., Analiza economico-financiara, ASE, (Economical and financial analysis, ASE) Digital Library, http://www.biblioteca-digitala.ase.ro/biblioteca/carte2.asp?id=113&idb=6, Accessed on Dec.20, 2019.

[50]Stankov, K., 2015, Economic efficiency analysis of dairy cattle farms in Bulgaria, Trakia Journal of Sciences, Vol. 13, Suppl. 1, pp 226-232,

[51]Stankov, K., Stoyanova, S., Petrov, D., 2015, Regression analysis of profit per 1 kg milk produced in selected dairy cattle farms, Int. J. Curr. Microbiol. App. Sci (2015) 4(2): 713-719.

[52]Tranel, L.F., Frank, G., 2002, Managing Dairy Farm Finances, Iowa State University, Cooperative Extension, https://www.extension.iastate.edu/dairyteam/files/page/files/ManagingDairyFinance2.pdf, Accessed on Jan. 2, 2020.

[53]Yilmaz, H., Gül, M., Akkoyun, S., Parlakay, O., Bilgili, M.E., Vurarak, Y.,Hizli, H., Kilicalp, N., 2016, Economic analysis of dairy cattle farms in east Mediterranean region of Turkey, Revista Brasileira de Zootecnia, 45(7):409-416.