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DETERMINANTS OF PROFITABILITY OF ENTERPRISES OF MEAT INDUSTRY IN POLAND

Elżbieta Jadwiga Szymańska✉

Warsaw University of Life Sciences – SGGW

ABSTRACT

The aim of the study was to determine the strength and direction of influence of individual factors on the return on equity of the enterprises of the meat industry in Poland in 2008–2012. A detailed analysis covered 86 enterprises engaged in slaughtering and processing of pork and published financial reports in the analysed period. The profitability rate of the studied enterprises are identified based on the return on equity ratio. Du Pont analysis was used in order to determine the reasons for the change in structural system use. The research showed that the meat sector is characterized by relatively low profitability. This is primarily due to high production costs and low selling prices. The economic situation of the enterprises is affected by the high fragmentation of the industry and limited specialization. An additional difficulty are the emerging market affairs that reduce consumer confidence in meat products. Effective management of the enterprise of meat industry requires, therefore, successful analysis of indicators of profitability.

Key words: profitability, return on equity, Du Pont analysis, enterprises, meat industry

INTRODUCTION

Profitability of companies is a major objective the managers set, and is particularly watched by company stakeholders. That's why the rates of return are among the most important measures the companies target during a financial year [Zelgalve et al. 2014]. Profitability means achieving a positive financial result out of the economic activity. It expresses the degree to which the invested capital and assets as well as the resources used in the economic activity of the company have proved efficient. Therefore, it represents the relationship of the financial result to referenced economic values. It determines the functioning and development of individual economic entities and in the macroeconomic scale constitutes the engine of development of particular sectors and the whole economy. It is used not only to evaluate enterprises but also their management's ability to generate profits on capital employed. Profitability ratios are often regarded as the most important element of analysis of the company's economic and financial standing, not only for persons conducting business activity, but also for individuals and businesses entities of the immediate environment (e.g. business partners, customers, suppliers, banking institutions etc.).

Understanding the determinant profitability is the key factors that helps managers in developing an effective profitability strategy for their company [Gitman and Zutter 2012]. The meat industry is the largest sector of the food industry, both in Poland and the EU. Domestic output in this sector is close to EUR 12 billion and it represents approximately 18.0% of the entire food sector [Urban 2011]. Subsequent to Poland joining the EU, the meat sector was one of the fastest growing areas of Polish food economy. However, a continuous

✉elzbieta_szymanska@sggw.pl

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weakness this industry struggles with is a high fragmentation and slow consolidation processes, which is the primary cause of why a full advantage of the industry's potential has not been taken. The meat industry is facing many difficulties, although it is relatively resistant to economic fluctuations. The sector is negatively affected by declining pig population and high production costs (costs of energy and labour), and especially by high purchase price of raw materials, which represent the most important cost item in the profit and loss account of meat plants.

The analysis of profitability is one of the most valuable sources of information to properly assess the financial situation of the company. Profitability of a business entity is the higher, the greater is the profit are and the lower is the capital employed to generate it [Waśniewski and Skoczylas 2004]. The analysis means not only the study of the profitability ratios but also of their disaggregation and building correlation pyramids of the studied profitability to other ratios. The aim of this study was to determine the strength and impact directions of selected factors on the return on equity ratio of the meat companies engaged in the slaughtering of pigs and pork processing in 2008–2012. In order to achieve the main objective, two specific objectives have been formulated:

- identification of factors affecting the profitability of companies based on literature review;
- determining changes in profitability of selected meat companies.

MATERIALS AND METHODS

The research was based on the studies of reference books and on the data storage statistics from the Central Statistical Office of Poland and the General Veterinary Inspectorate. A detailed analysis covered 86 meat companies which provided financial reports in the years 2008–2012. The profitability of the surveyed companies was determined on the basis of the return on equity ratio which is one of the most important indicators of economic benefits obtained by all types of companies operating in the market economy. The ability to accumulate capital by generating profits is in the long run a decisive precondition to continue or discontinue a business, regardless of industry.

In terms of synthetic approach, however, this indicator does not create wide possibilities of interpretation as the only thing it allows for is to conclude whether the achieved profitability is the result of a high net profit or low equity. Much more knowledge about the cause and effect relationship provides the structural system called "a pyramid structure of ratios". It provides information not only on the profitability level but also indicates the reasons for its changes. It is an indispensable tool for a comprehensive assessment of the companies functioning. The study used the Du Pont analysis. Therefore, the following financial ratios have been defined here:

- return on equity (ROE) – the amount of net income returned as a percentage of a business equity;
- return on assets (ROA) – the amount of net income returned as a percentage of total assets of a business;
- return on sales (ROS) – the amount of revenues from sales returned as a percentage of total assets of a business;
- asset turnover ratio (ATO) – the ratio of the value of a company's sales or revenues generated relative to the value of its assets;
- equity multiplier (EMT) – the ratio of a company's total assets to its stockholders' equity.

Mentioned ratios were calculated for each of the companies surveyed in selected years. Subsequently, companies with outlying indicator values were removed from the group. For this purpose, scatter plots, arithmetic means, standard deviation and variation coefficients were calculated (Table 1). Finally, in the analysed group, remained 70 companies, which were the subject of analysis between the years 2008–2012. They do not belong to the representative group of all meat companies that deal with swine slaughter and/or swine processing, but some of them depend on trends and tendency over the years.

Du Pont's analysis is most often used for individual companies, but also in the literature of the subject there are studies that use this method based on the average for the group of entities [Jarka 2005, Bereżnicka and Franc--Dąbrowska 2008, Bórawski 2009, Wnuczak 2012]. In order to determine the dependencies and tendencies of changes in this group, the mean values of the indicators were used in further analyses.

To calculate the impact of the particular ratios (return on sales, total asset turnover and equity multiplier) on increase or decrease in on the return on equity ratio, the partial differences method was used. This method consists in simultaneous distinguishing individual partial deviations and partial deviations expressing the joint impact of factors as well as in treating them as separate elements of analytical analysis [Bednarski et al. 1993].

Table 1. Variability indices for the analyzed variables

Year	Return on equity (ROE)	Return on assets (ROA)	Return of sale (ROS)	Asset turnover ratio (ATO)	Assets on equity (EMT)
2008	2.17	1.44	2.47	0.65	0.96
2009	2.07	1.36	1.56	0.65	0.68
2010	1.05	1.23	1.47	0.57	0.75
2011	3.56	3.02	3.11	0.57	0.72
2012	3.10	1.68	2.17	0.66	0.74

Source: Author's construction based on financial reports of enterprises.

According to the partial differences method, the impact of the analysed factors on the return on equity was determined in the several following stages:
1. Determining absolute deviations of the analysed ratios.
2. Determining the impact of a change of ratio level on the level of deviation of the return on equity ratio.
3. Determining the joint impact of the combination of the two subsequent factors on ROE changes.
4. Calculating the joint impact of the all three factors on ROE deviations.
5. Comparing the sum of partial deviations and the absolute deviation of ROE.
6. Determining the force and direction of the impact of partial changes on ROE.

FACTORS AFFECTING PROFITABILITY OF COMPANIES

Profitability of companies is affected by many factors that can be divided into internal and external ones. They are interconnected, which could strengthen or weaken their impact on the financial results of the company. Furthermore, the effect can be different in the short and long term. According to D.W. Olszewski, the most important internal factors affecting the profitability of a company are [Szczepankowski 2007]:
- the value and structure of the company's assets;
- financial liquidity;
- development of sales;
- the capital or obligations structure;
- efficiency in working capital management;
- organization of the production process of the company;
- qualified employees.

Whereas the external factors that shape the profitability of the company can be divided into:

- macroeconomic factors – those which are governed by the state of the overall economy; they include a set of conditions related to the fact that the company operates in a given country or region, in a particular climatic zone, in particular political and legal systems and so on;
- sectoral factors – which characterizes the sector, industry, or branch to which the company belongs.

The most important macroeconomic factors include [Radosiński 2010]:

- the phase of the business (development) cycle;
- the price level of strategic raw materials;
- exchange rate policy, interest rate;
- inflation rate;
- the state's economic and fiscal policies;
- other factors such as the influence of trade unions or even applied accounting systems.

On a sectoral basis, the following factors can be distinguished [Cebrowska 2010]:

- intensified competitiveness;
- direction of demand changes;
- characteristics of markets, products and employed technologies, such as product uniformity or feasibility of automate manufacturing processes;
- capacity utilization;
- price level.

In the long term, provided a free flow of information and capital, profitability of the intersectoral systems levels off. In turn, in the short term there can be observed significant differences in this regard.

The meat industry is the largest but also the least profitable branch of the agri-food industry in Poland. This is due to the increasing cost pressure, i.e. increasing prices of feed, large fluctuations in the prices of livestock and consequently low profitability of meat production. A large number of business entities operating on the market and rapidly changing market conditions mean that the fight for the consumer is exacerbating. An additional difficulty is the scandals emerging on the market which limit consumer's confidence in meat products.

Companies in the meat industry faced a particularly difficult situation in 2008–2009 due to the crisis in the financial markets. During this period, many small and medium-sized companies in the meat industry ceased their activities. These were slaughterhouses that were particularly hard hit by the crisis, a large proportion of which ceased further activity due to high raw material prices and the lack of liquidity. In view of the crisis the balance of powers in the meat industry also underwent changes. Some of the biggest meat corporations distributing their products throughout Poland started to dictate their conditions [Szymańska 2014].

Large fragmentation of the industry adds to the negative trends in red meat market. According to the General Veterinary Inspectorate at the beginning of April 2013, 1,158 operators were active in the country, 658 of which were active in pigs slaughtering. The market is largely build by companies with a small production potential. These facilities have gained a strong position in the local market, creating their own brand. Generally, they have a disposable capital, which ensures efficient supply, and a chain of privately-owned shops, which facilitates the sale of the output. Nevertheless, they have a little bargaining power in negotiations with large chain stores and distributors, and they are under increasing pressure from their side. Companies with a high technical, logistical and capital potential make but a small group. It is them that constitute a natural partner for large-scale retail chains and demanding export markets. Due to a large diversity in the meat companies in the Polish market, consolidation processes are slow paced. Many entrepreneurs who have developed their business in recent years are reluctant to integrate with other entities.

Another problem, observed especially with regards to small and medium-sized companies, is insufficient specialization of their production. A lot of meat plants produce even dozens of different products, which does not favor effective utilization of a company's machinery and workforce. This prevents them from concentrating on

producing the most profitable kinds of meats and sausages. A significant fragmentation of Polish producers and their wide range of production also stems from the Polish tradition of producing meat and sausages for domestic or local market's needs. Many of them are products specific to the region, which is why some companies do not want to give up their original recipes and products.

A recent key factor determining the shape of the domestic market was the infestations with ASF virus in Poland. The following economic and political constraints caused the Polish exporters of pork to lose particularly important markets, including the countries of the Customs Union, China, Japan and Korea. As a result of these difficulties in the foreign trade Polish market faced an additional supply of meat, which led to significant price declines. Warehouses in many plants were filled with unsold products that were previously sent to the Eastern markets. In this way, some of the meat plants struggle with unused processing capacities.

CHANGES IN THE PROFITABILITY OF THE MEAT INDUSTRY COMPANIES

In the years 2008–2012 the return on equity in the analysed companies kept changing. It was probably related to the crisis in the financial markets. In 2008, it amounted to 12.49% (Table 2). The following year, this ratio increased by 5 percentage points (p.p.), and in 2010 reached 17.49%. Then, in years 2011–2012, as a result of the economic downturn on the live pig market, the return on equity ratio fell by 60.0%. The rate of return on assets showed similar trends but was lower. In 2008, it leveled 7.62%. In the next year it increased to 8.62% and in 2010 reached the level of 10.34%. In 2011–2012, it declined to respectively 4.31 and 4.07%.

Table 2. Average profitability indices in the analysed enterprises

Year	The size of ratios					Absolute deviations				
	ROE	ROA	ROS	ATO	EMT	ROE	ROA	ROS	ATO	EMT
2008	12.49	7.62	2.05	4.05	2.83	×	×	×	×	×
2009	13.04	8.62	2.74	4.20	2.55	0.55	1.01	0.69	0.15	–0.28
2010	17.49	10.34	3.49	3.69	2.43	4.45	1.72	0.75	–0.51	–0.11
2011	8.28	4.31	1.64	3.83	2.45	–9.21	–6.03	–1.85	0.14	0.02
2012	6.95	2.42	0.65	3.74	2.61	–1.34	–1.89	–0.99	–0.09	0.16

Source: Author's construction based on financial reports of enterprises.

The return on sales in 2008 amounted to 2.05%. In 2009, it increased to 2.74%, and the following year it reached 3.49%. In 2011, the return on sales, as well as other ratios of profitability fell by 53.0%. In the next year this ratio was only 0,65%. The asset turnover ratio changed in the analysed period changed from 4.20 to 3.69, which means that sales revenues were more times higher than the average value of the assets in the companies. However, whereas in 2008–2009 its value increased, in 2010 it was recorded to be reduced. In 2011, the average asset turnover ratio reached 3.83 but in 2012 its value decreased to 3.74. The value of the capital multiplier was the highest in 2008 and amounted to 2.83. In the years 2009–2010 it was recorded to be reduced to 2.43, and in the years 2011–2012 it reported an increase to 2.61.

In order to determine what factors were decisive for the change of the return on equity ratio, it was decomposed using the Du Pont model (Fig. 1). In practice, the system is widely applied for its strong operability, and achieved the goal to provide corporate financial position and operating results, and other information related to

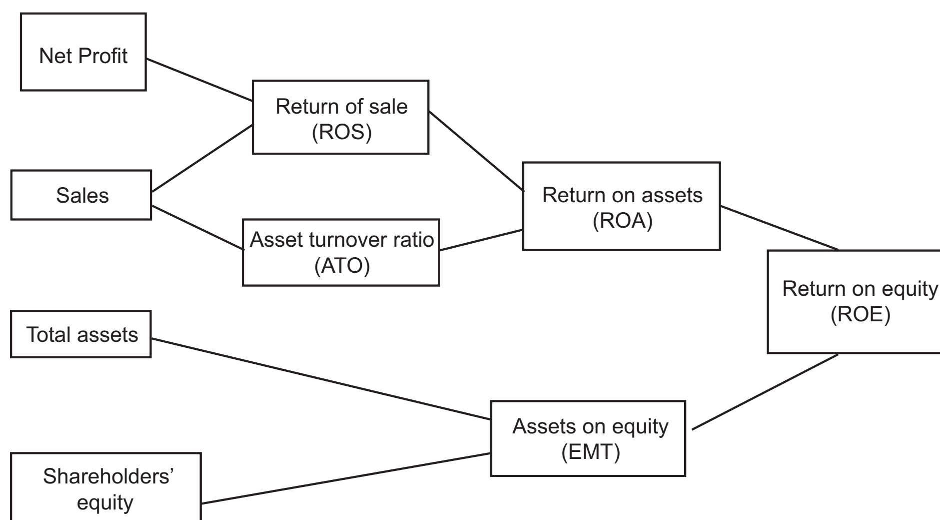

Fig. 1. Du Pont model in the analysis of enterprise efficiency

Source: Author's construction.

the target decision for investors, creditors and other stakeholders [Cheng et al. 2014]. This model shows that the return on equity is conditioned on the return on sales, asset turnover and the financial leverage according to which mechanism the increase in debt translates, on the one hand, into the reduction of the share of equity, and on the other, into the growth of profit per equity [Wędzki 2006].

Throughout the analysed period it was the return on sales that had the greatest impact on the return on equity changes in the meat companies (Table 3). The force of the impact was particularly high in 2010. Compared to the previous year, it increased almost 3 times. At the same time, the changes of this ratio in the first years of the analysis was positively correlated with the changes in the return on equity, while in 2011–2012 different correlations were recorded. In 2010, the increase in the return on equity was mostly due to a slight increase in the return on sales. The impact of asset turnover ratio on the level of return on equity in 2009 was small. The situation changed in 2010 when the importance of the asset turnover in shaping the return on equity increased dramatically, the correlations between these ratios being negative. In the years 2011–2012 again the impact of asset turnover ratio on the level of return on equity was very small, but the character of the relationship between these

Table 3. The impact of return on sales, total asset turnover and capital structure on the return on equity of the analysed enterprises

Year	Impact of changes of factors on size of deviation ROE			Strength of impact		
	ROS	ATO	EMT	ROS	ATO	EMT
2009	7.93	1.18	–3.25	135.22	20.10	–55.31
2010	7.99	–4.53	–1.46	399.75	–226.91	–72.84
2011	–16.60	0.58	0.10	104.25	–3.61	–0.64
2012	–9.33	–0.14	0.39	102.81	1.54	–4.35

Source: Author's construction based on financial reports of enterprises.

ratios was different. The impact of the equity multiplier was the highest in years 2009–2010. Simultaneously, the increase of this ratio contributed to the reduction in the companies' return on equity. A similar situation occurred in the years 2010–2011, but the importance of this ratio in shaping the return on equity was definitely lower.

Calculations show that in the analysed group of companies, in 2010 the return on equity decrease only by 0.55 p.p. A different situation was observed in 2011. Then the return on equity ratio declined by 4.45 p.p. in relation to the previous year. This was due to the following changes:

- reduced return on sales resulted in lowering the ROE by 16.60 p.p.;
- the increase of the assets turnover contributed to a lower ROE of 0.58 p.p.;
- the change in the capital structure led to the increase in ROE of 0.11 p.p.

In 2012, the reducing of the return on equity ratio was stopped. This ratio increase by 7.27 p.p. in relation to the previous year. It was significantly affected by the following changes (Fig. 2):

- the decrease in the return on sales triggered the increase in ROE of 9.33 p.p.;
- the decrease of the assets turnover contributed to a lower ROE of 0.14 p.p.;
- the change in the capital structure led to the decrease of 0.39 p.p. in ROE.

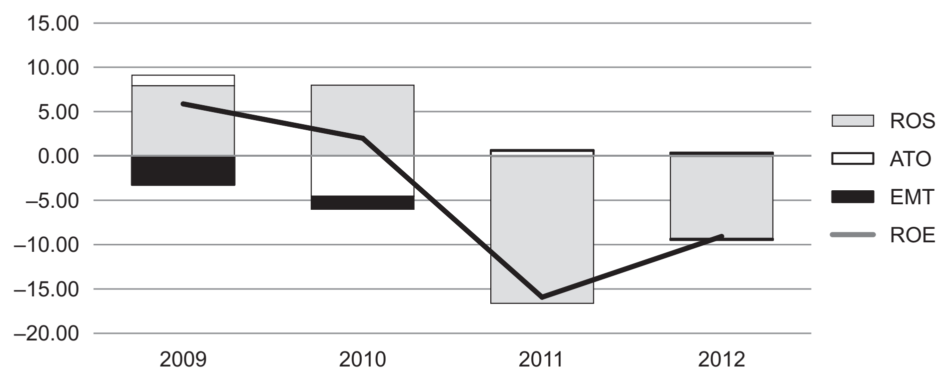

Fig. 2. Decomposition of ROE between 2009 and 2012

Source: Author's construction based on financial reports of enterprises.

CONCLUSIONS

1. The meat industry is the largest sector of the food industry, both in Poland and the EU. Subsequent to Poland joining the EU, the meat sector was one of the fastest growing areas of Polish food economy. Thanks to the EU subsidies a lot of companies increased and modernized their production potential. The situation on the pork market has worsened following the crisis in the financial markets. During this period, many small and medium-sized companies in the meat industry ceased their business activities due to high raw material prices and the lack of liquidity.
2. The meat industry companies are characterized by a relatively low profitability. This is mainly due to a low profitability of meat production, which is determined by high live pig acquisition costs and low selling prices of the products. The economic situation of the companies is also affected by the fragmentation of the industry and insufficient specialization.
3. Profitability of companies can be assessed using different ratios that determine the degree of efficiency of the invested capital and assets as well as the resources used in the economic activity of the company. In terms of synthetic approach, however, these ratios do not create wide possibilities of interpretation. Much more

knowledge about the cause and effect relationship provides the structural system of profitability ratios represented by the Du Pont's pyramid.

4. The research shows that the return on sales had the greatest impact on the changes of the ROE ratio. In 2012, of key importance was also the assets turnover. The impact of the return on sales on the ROE ratio was positive in 2009–2010 and negative in 2011–2012. In turn, the impact of asset turnover ratio on the return on equity was positive only in 2009 and 2012. The smallest effect on the changes in the return on equity was produced by the capital structure ratio.
5. By virtue of a great impact that the return on sales has on the return on equity, company managers should pay particular attention to this indicator, analyse the production structure, its volume and selling price. Making these analyses enables rational decision-making in business management in the meat industry.

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REFERENCES

Bednarski, L., Borowiecki, R., Duraj, J., Kurtys, E., Waśniewski, T., Wersty, B. (1993). Analiza ekonomiczna przedsiębiorstwa. Wydaw. Akademii Ekonomicznej we Wrocławiu, Wrocław.

Bereżnicka, J., Franc-Dąbrowska, J. (2008). Płynność i rentowność w zmodyfikowanym modelu Du Ponta – próba weryfikacji. Roczniki Nauk Rolniczych, seria G, 95, 1, 183–191.

Bórawski, P. (2009). Wykorzystanie modelu Du Ponta w ocenie rentowności gospodarstw pozyskujących alternatywne źródła dochodów. Acta Scientiarum Polonorum Oeconomia, 8 (4), 5–12.

Cebrowska, T. (2010). Rachunkowość finansowa i podatkowa. Wydaw. Naukowe PWN, Warszawa.

Cheng, L., Wang, S., Qiao, Z. (2014). DuPont Model and Product Profitability Analysis Based on Activity-based Costing and Economic Value Added. European Journal of Business and Management, 6, 30, 25–35.

Gitman, L.J., Zutter, C.J. (2012). Principles of Managerial Finance, 13th ed. Addison Wesle, USA.

Jarka, S. (2005). Wykorzystanie analizy Du Ponta do oceny rentowności przedsiębiorstw. Roczniki Naukowe SERiA, 7, 1, 98–102.

Radosiński, E. (2010). Wprowadzenie do sprawozdawczości, analizy i informatyki finansowej. Polskie Wydaw. Naukowe, Warszawa.

Szczepankowski, P. (2007). Wycena i zarządzanie wartością przedsiębiorstwa. Wydaw. Naukowe PWN, Warszawa.

Szymańska, E. (2014). Zmiany strukturalne na rynku wieprzowiny w Polsce po integracji z Unią Europejską. Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 361, 250–258.

Urban, R. (2011). Polski przemysł mleczarski, mięsny i drobiarski w Unii. Przemysł Spożywczy 3, 6–16.

Waśniewski, T., Skoczylas, W. (2004). Teoria i praktyka analizy finansowej w przedsiębiorstwie. Fundacja Rozwoju Rachunkowości w Polsce, Warszawa.

Wędzki, D. (2006). Analiza wskaźnikowa sprawozdania finansowego. Oficyna Ekonomiczna, Kraków.

Wnuczak, P. (2012). Wpływ wybranych czynników na rentowność kapitałów własnych przedsiębiorstw notowanych na giełdzie papierów wartościowych. Zeszyty Naukowe Uniwersytetu Szczecińskiego. Finanse. Rynki Finansowe. Ubezpieczenia, 51, 401–412.

Zelgalve, E., Sproge, I., Berzkalne, I. (2014). Profitability Assessment of Latvian Companies: Emphasis on ROE. Journal of Applied Economics and Business, 2, 45–58.

Szymańska, E.J. (2017). Determinants of profitability of enterprises of meat industry in Poland. Acta Sci. Pol. Oeconomia 16 (3) 2017, 83–91, DOI: 10.22630/ASPE.2017.16.3.36

DETERMINANTY RENTOWNOŚCI PRZEDSIĘBIORSTW Z BRANŻY MIĘSNEJ W POLSCE

STRESZCZENIE

Celem badań było określenie siły i kierunków oddziaływania wybranych czynników na rentowność kapitału własnego przedsiębiorstw z branży mięsnej w Polsce w latach 2008–2012. Szczegółową analizą objęto 86 przedsiębiorstw, które zajmowały się ubojem żywca wieprzowego i przetwórstwem wieprzowiny oraz publikowały sprawozdania finansowe w analizowanym okresie. Rentowność badanych przedsiębiorstw określono na podstawie wskaźnika rentowności kapitału własnego. W celu określenia przyczyn jego zmian wykorzystano układ strukturalny, zwany analizą Du Ponta. Z badań wynika, że sektor mięsny charakteryzuje się stosunkowo małą rentownością. Związane jest to z dużymi kosztami produkcji, zwłaszcza pozyskania surowca oraz niskimi cenami sprzedaży produktów. Na sytuację ekonomiczną przedsiębiorstw wpływa także duże rozdrobnienie branży oraz ograniczona specjalizacja. Dodatkowym utrudnieniem są skandale wybuchające w mediach dotyczące produktów spożywczych, które ograniczają zaufanie konsumentów do produktów mięsnych. Efektywne zarządzanie przedsiębiorstwami mięsnymi wymaga zatem dokładnej analizy wskaźników rentowności.

Słowa kluczowe: rentowność, zwrotu z kapitału, analiza Du Pont, przedsiębiorstwa, przemysł mięsny