

FINANCIAL EFFICIENCY OF THE INDUSTRY PRODUCING FODDER IN COMPARISON WITH OTHER FOOD INDUSTRY SECTORS

Joanna Florek¹, PhD; Dorota Czerwinska-Kayzer², PhD
^{1,2}Poznan University of Life Sciences

Abstract. Efficiency, as a universal and comprehensive measure of management efficiency, may be referred both to a single enterprise, branch of industry, and the entire economy. The feed industry is a branch of the food industry, which differs greatly from its other sectors. Its specific character results from the generation of products, which are not directly consumed by humans, but are used to feed animals - both pets and farm animals, as a result satisfying human needs. Additionally, enterprises in the feed industry are to a greater extent exposed to the risk of the effects of natural factors than it is the case in other branches of the economy. The multitude of specific conditions influencing the feed industry sectors is reflected in its financial situation, first of all efficiency. The aim of the study was to assess financial efficiency in feed industry enterprises in Poland in the years 2011-2015 and showing its position in relation to the entire food industry sector. The study was conducted based on unpublished data of the Main Statistical Office (GUS). Variation in financial efficiency in individual branches of the food industry sector was assessed using a synthetic measure constructed using the classic TOPSIS method. These analyses indicate relatively good financial efficiency in a group of enterprises producing animal feed and fodder, although it varied in the class system. Generally higher efficiency was recorded for enterprises producing pet food.

Key words: financial efficiency, synthetic measure, feed industry, food industry.

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Introduction

Functioning of each entity, irrespective of the type of its operations and market situation, is determined by the management efficiency of available material and capital resources (Polaczek, 2008). In the literature on the subject the concept of efficiency is used in a broad and highly diverse sense, both within various fields of science and in the common language; for this reason it is difficult to provide their clear definition (Jaki, 2011). In the general sense, efficiency refers to the effectiveness of operations assessed on the basis of relationships between obtained effects and outlays. The effect is understood by a specific type of the result provided by the economic activity of the enterprises. Until recently, it was assumed that profit is such an effect, thus efficiency is measured based on this parameter (Dudycz, 2001). In recent years interest of researchers has been focused on actual cash flows, thus efficiency started to be measured considering operating cash flow. In terms of outlays, efficiency may be measured depending on the used material resource (e.g. equity capital, assets) or intellectual capital (Sierpinska, Jachna, 2007). An interesting approach to financial efficiency may be provided by the proposal by E. A. Helfert. He stated that it is "managing selected resources at the strategic level so that with time an economic value may be generated, ensuring not only the coverage, but also decent return on the incurred outlays, at the same time not exceeding the level of risk acceptable to the owners" (Kulawik, 2008; Helfert, 2004). A commonly applied method to measure efficiency is connected with the indicator approach. The selection of indicators is determined by the objective of the analysis (Capiga, 2011). In the theory of finances indicators are not clearly specified, which would objectively present financial efficiency of enterprises. It may be assessed using indicators from various areas of financial analysis, i.e. profitability, liquidity, effectiveness of activity.

The multidimensional character of the problem makes unequivocal assessment of financial efficiency difficult. Some ratios may point to a very good financial situation, whereas others may signal problems at the same time. In consequence of the diversified rules of assessment there is

¹Corresponding author. Tel.: + 48 61 846 61 01, E-mail address florek@up.poznan.pl

²Corresponding author. Tel.: + 48 61 846 60 92, E-mail address czerwinska-kayzer@up.poznan.p

excessive subjectivity of interpretation. Grzesiak (1997) was of an opinion that the analysis of efficiency conducted based on financial indicators should be supported by decision-making or taxonomic methods. A useful tool in the evaluation of financial efficiency may be provided by a synthetic measure (a synthetic measure of development). The synthetic trait is constructed as a real function of directly observable simple traits, representing significant elements and relations of a complex phenomenon (Zielinska-Sitkiewicz, 2017).

Efficiency, as a universal and comprehensive measure of management efficiency, may be referred both to a single enterprise, branch of industry, and the entire economy. The feed industry is a branch of the food industry, which differs greatly from its other sectors. Its specific character results from the generation of products, which are not directly consumed by humans, but are used to feed animals - both pets and farm animals, as a result satisfying human needs. The agricultural sector is the recipient of the feed industry outputs, the demand for which resulting first of all from the direction, scale and intensity of animal production (Drozd et al., 2014). Additionally, feed enterprises are mutually dependent on economic entities from one sphere of production. On the one hand, they purchase the raw material required for production from farms (cereals, lupine, pea etc.), while, on the other hand, these entities produce feeds and concentrates for farms, which are used in animal production. For this reason, the turnover in feeds is limited, which may result in a greater risk of destabilisation in the economic activity of participants in this market. Additionally, enterprises in the feed industry are more exposed to the risk of the effects of natural factors than it is the case in other branches of the economy. The multitude of specific conditions influencing the feed industry sectors is reflected in its financial situation, first of all efficiency.

For this reason, the aim of the study was to assess financial efficiency in feed industry enterprises in Poland in the years 2011-2015 and showing its position in relation to the entire food industry sector. The article describes the following research tasks: - the economic characteristics of feed production enterprises were made, analyse of the financial situation of feed enterprises in comparison to the food industry, indicate the position of the feed enterprises in the food industry.

Materials and research methods

Source materials for this analysis included unpublished financial data for the years 2011-2015, in terms of the food industry branches according to the Polish Classification of Economic Activity, originating from the Main Statistical Office (Unpublished data..., 2012-2016). This system made it possible to evaluate a total of 26 branches of the food industry sector. Variation in financial efficiency in individual branches of the food industry sector was assessed using a synthetic measure constructed using the Technique for Order Preference by Similarity to an Ideal Solution - TOPSIS (Hwang, Yoon 1981). The value of the synthetic measure of financial efficiency for branches of the food industry sector was established in five stages (Stanislawska, Wysocki, 2008). In stage 1, simple characteristics were selected, describing financial efficiency based on factual and statistical principles. In order to construct the synthetic measure of financial efficiency in the branches of the food industry sector, 20 potential financial indicators were proposed, describing broadly understood efficiency. Based on statistical analyses strongly correlated variables were eliminated. Finally, 7 simple characteristics were selected for analyses: return on equity, return on operating assets, profitability of sales, operating cash flow/sales ratio, the indicator of global assets turnover, the indicator of current liquidity, the indicator of dynamics of sales revenue. In the next stage the character of the parameters was unified and their value was converted to a comparable

¹Corresponding author. Tel.: + 48 61 846 61 01, E-mail address florek@up.poznan.pl

²Corresponding author. Tel.: + 48 61 846 60 92, E-mail address czerwinska-kayzer@up.poznan.pl

form applying the unitarisation procedure. Based on unified (standardised) values of simple characteristics, Euclidean distances were calculated for individual branches from the benchmark and the anti-benchmark of development. Finally, the value of the synthetic measure of financial efficiency for branches in the food industry sector was obtained to be within the (0, 1) range. A greater value of the measure indicates a more advantageous financial efficiency of a given branch, while a value close to 0 is typical of a branch of an inferior financial efficiency.

Economic characteristics of enterprises in branches of the feed industry

As it was already mentioned, the feed market is a closed market, for this reason within this market a limited number of entities operates (tab. 1).

Table 1

The number of enterprises producing feeds in the years 2011-2015 in terms of entity size

Feed enterprises	2011	2012	2013	2014	2015
Small (up to 9 persons employed)	73	75	80	79	79
Medium (from 10 to 249 persons employed)	28	29	34	34	35
Large (over 250 persons employed)	6	5	4	5	4
Total	107	109	118	118	118

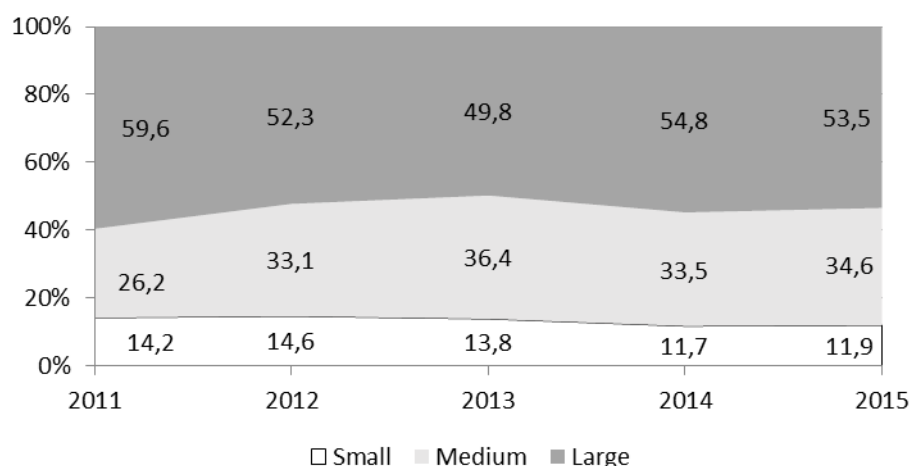
Source: author's calculations based on GUS data

It can be concluded from the data presented in Table 1 that since 2011 the number of enterprises producing animal feeds has been increasing, at present involving 118 economic entities. When analysing the number of feed enterprises in terms of their size, the greatest dynamics of changes was observed in the group of small and medium-sized enterprises (Florek, Czerwinska-Kayzer, 2012). In 2011, a total of 101 small and medium-sized feed enterprises were involved in feed production, while in 2015 their number increased to 114 enterprises. In the group of large economic entities employing 250 workers or more, the situation was relatively stable - in the analysed period there were from four to six.

The presented number and its distribution in terms of the size groups of feed enterprises indicates strong competitiveness on the market, which is a positive phenomenon, as many small and medium-sized enterprises stimulate economic development and reflect the entrepreneurship spirit in the society (Skowronek-Mielczarek, 2003). On the domestic market of the feed industry the dominance of the largest entities is evident in terms of the number of employed workers (Fig. 1).

¹Corresponding author. Tel.: + 48 61 846 61 01, E-mail address florek@up.poznan.pl

²Corresponding author. Tel.: + 48 61 846 60 92, E-mail address czerwinska-kayzer@up.poznan.p

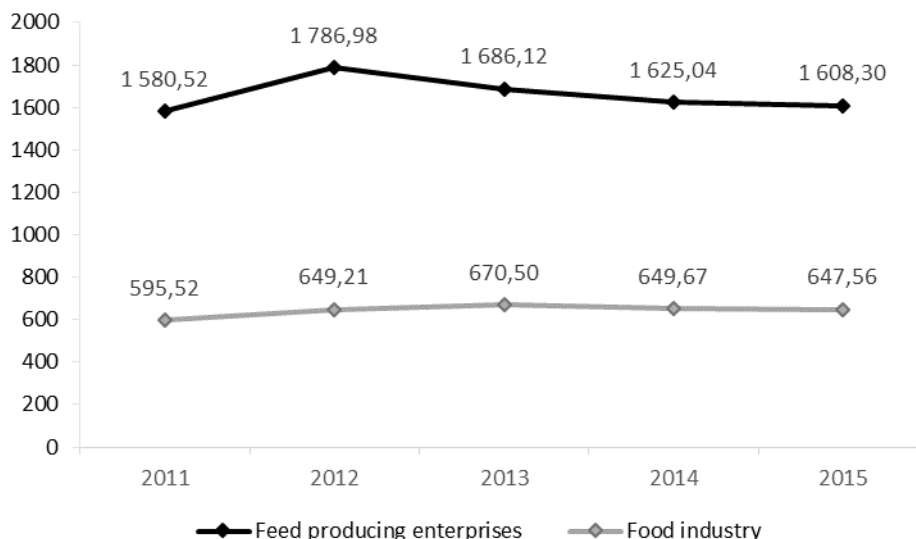


Source: author's calculations based on GUS data

Fig. 1. The share of individual groups of enterprises producing animal feeds in revenue from sales (%)

Studies showed that 4 large entities generated over 50 % total revenue from feed sales in Poland. In turn, medium-sized producers have an approx. 35 % share in the total revenue from feed sales, while a large number of small entities generated only 12 % revenue from sales.

Generation of such a high revenue is connected with the specific character of employment. In enterprises producing feeds, in the investigated period employment increased from year to year and in 2015 it was over 11 thousand workers (Unpublished data..., 2012-2016). Labour efficiency measured by the value of revenue per one employee in feed producing enterprises was rather high in that period (Fig. 2).



Source: author's calculations based on GUS data.

Fig. 2 Revenue from sales per one employee in feed producing enterprises and in the food industry in the years 2011-2015 (thousands PLN)

In comparison, the efficiency in enterprises of the entire food industry was by almost 60 % higher. One employee in a feed producing plant generated in 2011 approx. 1581 thousand PLN revenue from sales, while in 2015 - it was 1608 thousand PLN, whereas in the food industry these figures were 596 thousand PLN and 648 thousand PLN, respectively.

Assessment of financial condition of feed industry enterprises

The basic criterion in the assessment of financial efficiency is provided by financial indexes, which in this study were divided into four groups, i.e. profitability, return of cash flow and effectiveness of activity. Their values are presented in Table 2.

Table 2

Values of financial indicators characterising financial efficiency in the group of feeds enterprises in Poland in the years 2011-2015

Indicators	2011	2012	2013	2014	2015
ROE (%)	17.3	21.2	19.3	15.5	12.8
ROAO (%)	12.7	13.5	13.3	11.0	9.1
OS (%)	105.1	105.2	105.7	105.0	104.0
RA	2.6	2.8	2.5	2.4	2.3
WGS (%)	4.8	5.2	5.5	5.1	4.9
QR	1.5	1.5	1.6	1.6	1.7
DPS (%)	19.0	16.0	-0.1	2.0	4.7

Source: author's calculations based on GUS data

In the group of profitability indicators this study was conducted based on: return on equity (ROE), expressed as a ratio of net profit to equity capital and return on assets (ROAO), established as a ratio of profit from operating activity to the involved total property. The characteristic showing financial efficiency in the analysis was return on equity (ROE), which in enterprises producing feeds ranged from 12.8 % (in 2015) to 21.2 % (in 2012). It needs to be stressed that the rate of return on equity has been systematically decreasing since 2012. In the analysed period it decreased by 8.4 p.p. In turn, for the entire food industry the value of this index ranged from -18.7 % to 40.7 % (tab. 3). One of the factors affecting the level of the rate of return is connected with return on involved equity. In this study, in order to eliminate the effects of the policy of selecting financing sources the indicator of return on operating assets was applied (Czerwinska-Kayzer, 2014). These data show that this return in feed producing enterprises ranged from 9.1 % to 13.5 %. The direction of changes in this indicator is comparable to that indicated by the rate of return on equity. However, the change is by 50 % lower and it amounts to 4.4 p.p. Economic activity is based first of all on the coverage of incurred operating costs. For this reason, in this study we analysed another parameter characterising financial efficiency, i.e. cost-effectiveness of sales. In feed producing enterprises, similarly as in the entire food industry, this indicator was stable – on average 105 %. It results from the presented data that feed production is a profitable economic activity. This conclusion is confirmed by other studies of the authors (Czerwinska-Kayzer, Bieniasz 2017). Indicators of return are particularly interesting for owners, as profit leads to cash flows, which are the primary sources of value for any company (Boratynska, Wloczewska 2014). For this reason, another area of financial efficiency analysis included cash flow efficiency, supplementing accrual analysis of returns (Stanislawski, Florek 2013). The measure value indicates that enterprises in the feed industry maintain adequate cash levels, making it possible to maintain the self-financing principle and potential for unhindered continuation of their operations (Table 2). This is additionally confirmed by the low variation in the analysed index. For an enterprise to be able to continue efficient operations over a long period it needs to have an adequate level of security for liabilities using current assets of high liquidity. Thus, a synthetic measure was constructed based on the quick ratio (QR). It results from data presented in Table 2 that in the investigated period it assumed values from 1.5 to 1.7, i.e. it fell within the closed interval (1.5-2.0) (Sierpiska, Jachna,

¹Corresponding author. Tel.: + 48 61 846 61 01, E-mail address florek@up.poznan.pl

²Corresponding author. Tel.: + 48 61 846 60 92, E-mail address czerwinska-kayzer@up.poznan.p

2007). This means that on average in feed enterprises a loss of financial liquidity, measured by the quick ratio, was not too high, which may not be generalised in relation to all branches of the food industry. In 2015, in 25 % branches of the food industry the quick ratio was below 1.3, i.e. below the assumed norm, and in 25 % branches this index was greater than 2.0, which also is not advantageous, as this may indicate excessive liquidity. An important element of financial efficiency is also connected with operating efficiency, i.e. the ability to effectively utilise owned equity. The primary measure of this ability is provided by the asset turnover index. The presented data show that the economic activity of enterprises producing animal feeds is a branch of low capital intensity. The turnover index in this branch in the years 2011-2015 ranged from 2.3 to 2.8 and it was greater than the mean for the food industry, which in 2011 amounted to 1.6. and in 2015 - to 1.5.

Table 3

Descriptive statistics characterising financial efficiency of branches in the food industry in Poland in 2011 and 2015

Financial indexes	Min		Max		Lower quartile		Median		Upper quartile		Coefficient of variation (%)	
	2011	2015	2011	2015	2011	2015	2011	2015	2011	2015	2011	2015
ROE (%)	-4.7	-18.7	40.7	28.6	7.8	9.4	10.7	11.8	20.6	17.3	70.8	74.7
ROAO (%)	2.1	-9.5	27.1	18.6	6.5	6.6	7.2	8.4	14.6	11.6	60.3	63.6
RA	0.9	0.7	3.8	3.3	1.4	1.1	1.6	1.5	1.8	1.6	39.1	42.3
OS (%)	101.7	95.4	136.2	111.4	103.6	103.9	104.4	106.5	107.8	109.9	6.8	3.5
WGS (%)	1.4	-4.4	23.0	13.2	4.0	5.5	6.2	7.5	9.4	12.0	67.1	51.6
QR	1.0	0.7	3.3	3.4	1.1	1.3	1.3	1.4	1.5	2.0	36.1	35.5
DPS (%)	-50.4	-43.7	55.8	33.3	7.2	-6.1	17.2	3.4	30.3	12.5	122.4	1170.3

Source: author's calculations based on GUS data

The evaluation of financial efficiency was supplemented with the dynamics of increase in sales, which reflects the position and potential for enterprise development. This analysis shows that in the first two years revenue from sales increased by 19 % in 2011 and 16 % in 2012. In 2013, a rapid decrease was observed in revenue from sales, which may have been a consequence of greater competitiveness on the market (Table 1). In the following years, the situation became stable, which caused slow increases in revenue from sales. It needs to be stressed that the index of increase in sales was the most diverse measure in all the branches of the food industry, as indicated by the very high level of the coefficient of variation, which in turn had a considerable effect on the ordering of branches in the food industry.

The position of the feed industry in the food industry

In order to determine the position of the branch producing prepared feeds for farm animals and manufacture of prepared pet foods in the food industry sector, the conventional TOPSIS method was applied. Values of the indicators established using this method provided linear ordering of individual branches of the food industry in terms of the investigated characteristics. Based on the obtained results considerable variation was stated between the branches in terms of their financial efficiency (Table 4).

¹Corresponding author. Tel.: + 48 61 846 61 01, E-mail address florek@up.poznan.pl

²Corresponding author. Tel.: + 48 61 846 60 92, E-mail address czerwinska-kayzer@up.poznan.p

Table 4

The position of the feed industry in the food industry according to financial efficiency

Branches of food industry	Value of the measure	Rank in the year	Value of the measure	Rank in the year
	2011		2015	
Sugar	0.645	1	0.606	12
Manufacture of starches and starch products	0.600	2	0.635	10
Manufacture of prepared pet foods	0.554	3	0.602	13
Cocoa, chocolate and sugar confectionery	0.424	4	0.544	21
Margarine and similar edible fats	0.416	5	0.205	26
Ice cream	0.415	6	0.779	1
Processed and preserved poultry meat	0.415	7	0.597	14
Prepared feeds for farm animals	0.407	8	0.638	8
Condiments and seasonings	0.402	9	0.651	5
Manufacture of bread; manufacture of fresh pastry goods and cakes	0.400	10	0.648	6
Processed and preserved potatoes	0.395	11	0.607	11
Homogenised food preparations and dietetic food	0.369	12	0.703	2
Meat and poultry meat products	0.368	13	0.637	9
Grain mill products	0.338	14	0.507	23
Processed and preserved meat	0.334	15	0.584	17
Processed tea and coffee	0.330	16	0.679	4
Other food products n.e.c.	0.319	17	0.580	19
Other processing and preserving of fruit and vegetable	0.317	18	0.590	15
Dairy and cheese products	0.313	19	0.462	24
Processed and preserved fish, crustaceans and molluscs	0.312	20	0.585	16
Macaroni, noodles, couscous and similar farinaceous products	0.307	21	0.681	3
Fruit and vegetable juices	0.298	22	0.531	22
Rusks and biscuits; preserved pastry goods and cakes	0.270	23	0.566	20
Production of beverages	0.254	24	0.582	18
Prepared meals and dishes	0.179	25	0.381	25
Oils and fats	0.170	26	0.640	7

Source: author's calculations based on GUS data

The greatest values of the synthetic measure in 2011 were recorded for the following branches: production of sugar (0.640), manufacture of starches and starch products (0.600) and manufacture of prepared pet foods (0.554). In turn, in 2015 the best financial efficiency was recorded for the following branches: production of ice cream (0.779), production of homogenised food preparations and dietetic foods (0.703) and production macaroni, noodles, couscous and similar farinaceous products (0.681). They exhibited the highest level of returns, low capital intensity and maintenance of financial liquidity. The lowest financial efficiency in 2011 was observed for the production of oils and fats (0.170), production of prepared meals and dishes (0.179) and production of beverages (0.254). In turn, in 2015 branches of the lowest financial efficiency included production of margarine and similar edible fats (0.204), production of prepared meals and dishes (0.381) and processing of dairy and cheese products (0.462).

¹Corresponding author. Tel.: + 48 61 846 61 01, E-mail address florek@up.poznan.pl

²Corresponding author. Tel.: + 48 61 846 60 92, E-mail address czerwinska-kayzer@up.poznan.p

The presented data show that the analysed branch producing prepared pet foods in 2011 ranked 3rd, while in 2015 it ranked 13th. In turn, production of prepared feeds for farm animals in both analysed years ranked 8th. On this basis it may be concluded that enterprises producing prepared feeds for farm animals recorded relatively high returns, adequate financial liquidity and efficient management of involved equity. Moreover, this situation is relatively stable in comparison to the other branches.

Conclusions

- 1) The feed industry is a closed market. On the domestic market of the feed industry the dominance of the largest entities is evident in terms of the number of employed workers. Studies showed that 4 large entities generated over 50 % total revenue from feed sales in Poland.
- 2) The research indicate, that financial efficiency in of the food industry in terms of the branches was varied. The conducted analyses indicate a relatively good financial efficiency in the group of enterprises producing prepared feeds for farm animals and pet food. This is manifested in the satisfactory level of profitability and effectiveness of activity.
- 3) Financial efficiency in the branches of the feed industry in terms of classes was varied. Generally, lower efficiency was observed for enterprises producing prepared feeds for farm animals. However, the situation of this class over a longer period is relatively more stable in comparison to the class of enterprises producing pet foods. Manufacture of prepared pet foods was ranked 3 in 2011 (value of the measure TOPSIS 0.554) and 13 in 2015 (0.602). In turn, prepared feeds for farm animals in the analyzed years were in the 8th position.
- 4) As it is indicated by the generalised form of the results. the financial situation of all the branches in the feed industry facilitates survival and development of enterprises operating in this sector and as such makes it possible to maximise profits for their owners.

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¹Corresponding author. Tel.: + 48 61 846 61 01, E-mail address florek@up.poznan.pl

²Corresponding author. Tel.: + 48 61 846 60 92, E-mail address czerwinska-kayzer@up.poznan.pl

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¹Corresponding author. Tel.: + 48 61 846 61 01, E-mail address florek@up.poznan.pl

²Corresponding author. Tel.: + 48 61 846 60 92, E-mail address czewinska-kayzer@up.poznan.pl