

EVALUATION OF SCOPE OF USING THE INFORMATION SYSTEMS DEPENDING ON SECTOR OF AGRIBUSINESS¹

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Abstract. Companies from the agribusiness sector are still insufficiently recognized in terms of logistics solutions for its business. The paper examined the companies in two planes. The first was the size of the company, who has determined by the number of employees. The second plane was a branch within agribusiness sector. The level of advance and organizational area of company supported by IT systems were different depend on size of company. In small enterprises the scope of use IT systems was very low.

Key words: information systems, logistic, agribusiness

1. INTRODUCTION

The information is the result of organizing data. The organization is made through a computer system, which is a tool that is used to integrate data from multiple sources in a particular stream of information [1]. In case of companies from the agribusiness sector, there is often the need to connect different spheres of production, storage and transport with each other. Such connectivity is provided by an IT system which supports orders. It generally performs the following functions: collecting, processing, storage, presenting, information transmission and providing the efficiency of the flow [2]. Logistics information systems include hardware, software and trained staff used for controlling and monitoring and evaluation of the logistics of the company [3]. The information accompanying the material flow is the most important element in building up an efficient supply chain and therefore also customer satisfaction. Information logistics should therefore be effective both inside and outside the company [4]. Through the development of appropriate procedures for the flow of cargo and information in every situation (peak, average), latter assessment of the flow of information with the guidelines is possible [5]. The implementation of appropriate IT tools enables performing planned activities by employees in the proper order as well as saving time [6]. There are programs

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offered on the market that make it possible to optimize the production and logistics processes, to conclude simulation, to plan and to schedule in real time. The purpose of such logistics support is to help in the decision making processes [7]. Most frequently, indicated benefits from the implementation of the ERP system include better warehouse management, lowering the inventory level, higher level of customer services and demand forecasting [8]. An important constraint for the implementation of such systems are high costs but also little knowledge of the solutions offered by such systems, or lack of acceptance by end users [8]. Companies from the agribusiness sector are still unrecognized in terms of logistics solutions, including those associated with the use of IT systems. The research conducted by Rokicki and Wicki in grain processing companies showed that companies with a small-scale action, use the IT methods for supporting logistics in a low degree. One comprehensive IT system was owned mainly by large companies [9]. However, in studies conducted in the milk processing enterprises it was found out that the differences between internal and external assessment of logistics activities in enterprises are higher in small and medium-sized enterprises. This means that despite often declared sufficient level of knowledge of logistics, the applied solutions differ from recommended practices. Most often, the shortages related to the area of IT [10].

2. RESEARCH METHODS

The aim of the study was to assess the level of solutions in supporting logistics processes in enterprises of the most important sectors of agribusiness industries. Data were collected on the basis of surveys which were carried out from December 2009 to March 2010. The questionnaires were sent to all small, medium and large companies, operating in the food processing sector, based on REGON number [the National Official Register of the National Economy Units] and 1.5 thousand randomly selected micro-enterprises. There were 10 thousand enterprises in total. 511 responses were obtained (5.11%). The data for this study were used without their processing; only the records with the lack of data were not recognized in the analyses. The study focuses mainly on enterprises in branches which received at least 10 responses (Table 1).

The companies selected for the research of agribusiness sector included the following trades: manufacturing and meat processing, fruit and vegetable processing, manufacturing of dairy products, manufacturing of grain mill products and starch, production of bakery and farinaceous products, animal feed production, manufacturing of beverages.

Table 1. Number of researched enterprises by sector.

Sector	Number of enterprises by size				
	micro	small	medium	large	total
meat	9	59	38	11	117
fruit and vegetable	2	18	11	2	33
milk	2	8	8	6	24
cereals	13	15	7	2	37
bakery industry	25	164	24	1	214
fodder	2	11	1	0	14
beverage producers	3	6	4	0	13
Total	56	281	93	22	452

3. RESULTS

The companies from the agribusiness sector differed due to the nature of manufacturing operations. For instance, the processes of supply and production in companies producing dairy products and processing fruit and vegetables were different. Seasonality is certainly an important factor.

A separate department dealing with managing information was reported by few entities (Figure 1). Such division was organized by entities from the dairy industry (21%), grain industry (16%) and those manufacturing feed. Only in case of companies producing beverages no entity declared the existence of such separate department. Especially, small companies do not see the need of having the organizational unit.

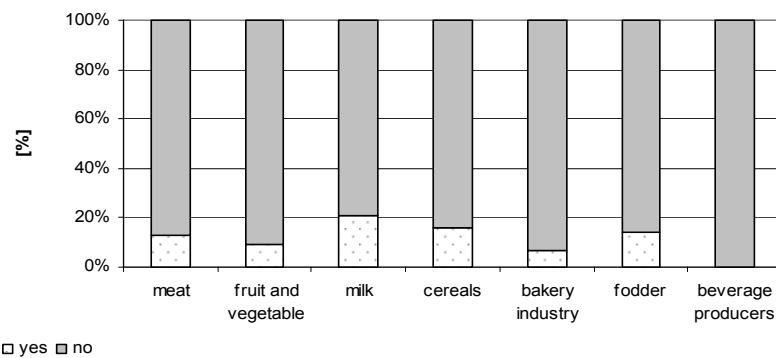


Figure 1. Existence a separate department dealing with managing information in agribusiness sector (%).

The respondents had to choose the areas of logistics activities in which a separate costs record is kept. Five business activities were differentiated: the sphere of inventory, warehousing, transportation, packaging and information management. Certainly, not all companies kept record of the costs in particular areas (Figure 2). In relation to the IT sphere, the best situation was in milk processing companies (13% of entities) and feed manufacturing (7%). Keeping the record of costs was not present in any of fruit and vegetables processing, grain and beverages manufacturing trades.

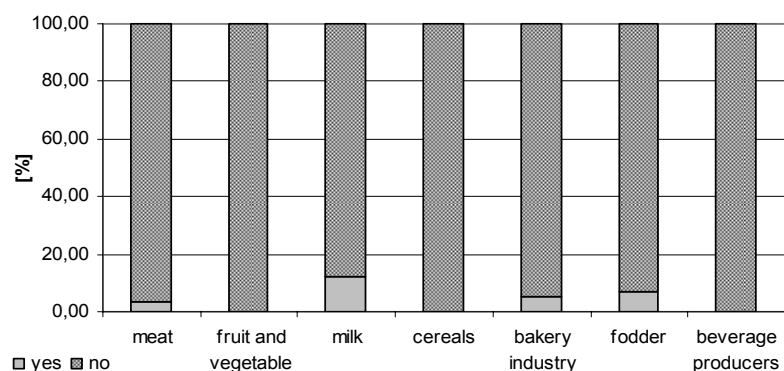


Figure 2. Records of the cost of information management in agribusiness sector (%).

Having one comprehensive IT system in the company allows planning, coordinating and supervising of individual activities (Figure 3). A comprehensive system was present in most companies of the dairy industry sector (38%) and beverage manufacturing sector (33%). A small percentage of these companies were among the companies of grain sector. An additional advantage of a comprehensive system is the ability to easily transfer data between different sections of companies.

Chi² test for independent variables carried out, pointed to a statistically significant relationship between the existence a separate department dealing with managing information and the existence a comprehensive information system ($\chi^2_{emp.} = 13,90$, $\chi^2_{0,05} = 3,84$, p-value = 0,0002, df = 1).

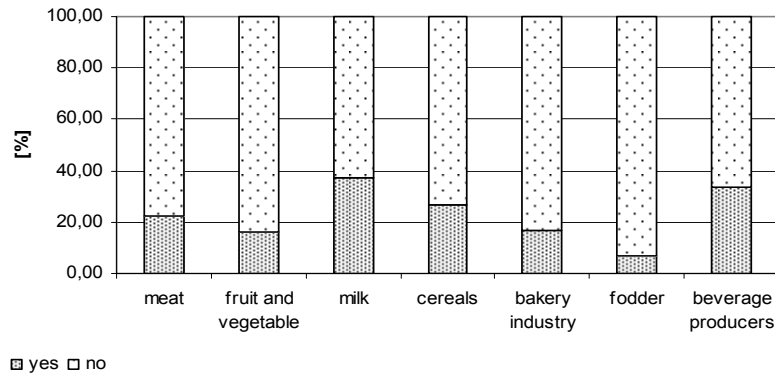


Figure 3. Existence a comprehensive information system in agrobusiness sector.

Companies wanting to operate effectively in the market must use modern tools. Financial and accounting systems [FK] were most commonly used by the companies (Figure 4). Such systems were used by more than 50% of entities in each of the branches. MRP (material requirements planning) system was used most often in baking and farinaceous companies (22% of enterprises), and least often in case of companies dealing with feed production (2%). ERP class systems (enterprise resource planning) were used with similar frequency as MRP systems. However, they were mostly used by dairy companies (17%) and fruit and vegetables processing companies (12%). None of the companies producing feed used the ERP system. Electronic data interchange (EDI) was used by half of the dairy companies. In case of bakery, feed and meat industries, less than 10% of companies used this system. Expert decision support systems (BI - Business Intelligence) were used by individual companies in particular industries.

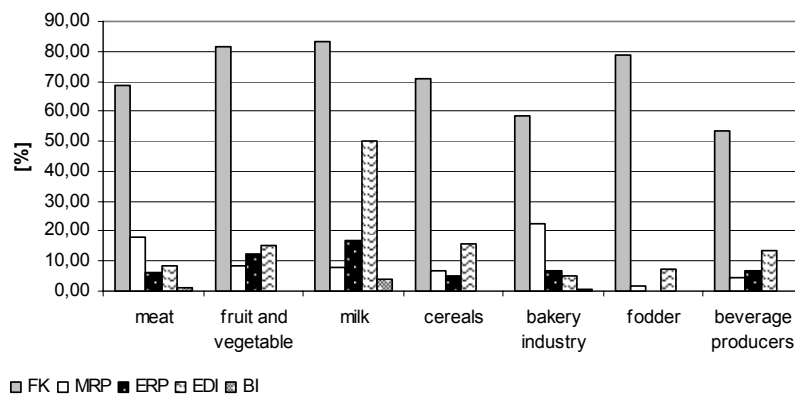


Figure 4. IT systems supporting logistics in agrobusiness sector - multiple choice (%).

In the agribusiness sector enterprises, commercial EAN-13 bar codes were used most often, as a way of products labeling (Figure 5). This method was used in most enterprises of the dairy industry (96% of companies) and fruit and vegetables processing companies (76%) and least often in feed manufacturing entities (14%). The percentage of companies using bar codes for summary units (ITF-14) and bar codes for logistics entities (EAN-128, SSCC) was low. Dairy and fruit and vegetables industries also lead in case of this element. RFID codes were used only in two bakery companies. Little popularity of this method of marking is associated with high costs of its application.

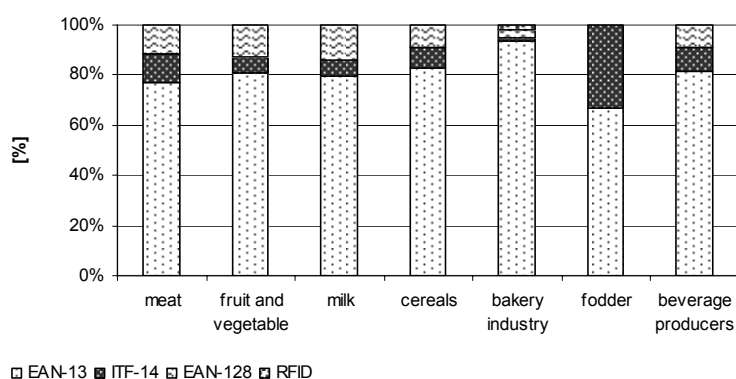


Figure 5. Methods of products labeling in agribusiness sectors - multiple choice (%)

Agribusiness sector companies usually evaluate the use of the information support in their own company as well (Figure 6). The best were the sectors that had previously showed, in the largest degree, the use of IT systems supporting logistics, i.e. milk and meat industries. IT support was assessed as poor in grain and bakery companies.

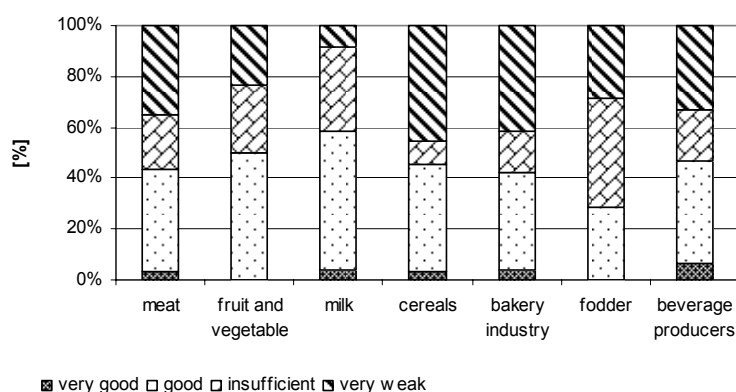


Figure 6. Own assessment of the rank of IT support in agribusiness sectors (%)

In addition to the own assessment of the company, perceiving the place of the company among competitive companies from the sector is important. As a rule, extreme ratings are most rarely used and those describing the position of the company, similar to the average, dominate.

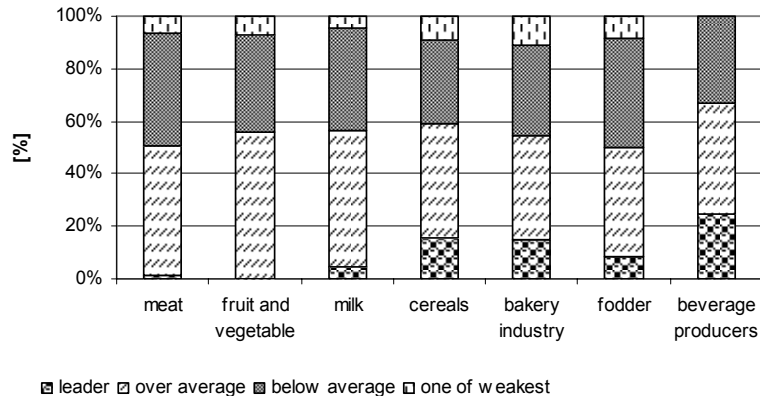


Figure 7. Evaluation of information management in compare to competition in agribusiness sectors (%)

Perceiving of IT support in their own company is worse than in comparison with other companies. This may mean that the level of the use of IT systems in the agribusiness sector is low.

4. SUMMARY

Information systems are essential in business activities of every company. The level of their use in various trades of agribusiness sector has not been recognized yet. Factors that differentiate the scope of information systems are scale of production and trade. Introduction of modern IT solutions is associated with large capital investments. The article presents the results of research on the diversity of the use of information systems in various sectors of agribusiness.

Few companies had a separate department dealing with information management and even smaller percentage of entities keeps a separate record of costs in this area. Regarding this element, dairy companies were presented most favorably. Most companies in this industry declared also the use of one comprehensive IT system supporting logistics.

Financial and accounting systems were common, regardless of industry. Other systems were used to a lesser extent. Probably a large impact on their use was the scale of business activity. In relation to systems used, the best situation was again in case of dairy industry. Bar codes EAN-13 were most frequently used for

products labeling by the companies. Codes for summary or logistics units were used less frequently. Again, dairy industry was presented most favorable regarding this element, while bakery and feed companies were the worst. Practically, the radio technology with RFID tags was not used.

Usually, the companies perceived their IT support as good. The share of entities assessing themselves in this aspect was considerable (mainly bakery and grain companies). Perceiving of IT support in their own company is worse than in comparison with other companies. This may mean that the level of the use of IT systems in the agribusiness sector is low. The fact that it may be much higher is seen in case of dairy companies. This profitable trade made high investments expenditures since the beginning of the twenty-first century. This may mean that IT investments are too costly for some less profitable trades.

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