

## **NETWORK INTERCONNECTIONS AS A DRIVER OF INNOVATIVENESS IN MEAT INDUSTRY COMPANIES**

Władysława Łuczka

Poznań University of Life Sciences

**Abstract.** The article presents the outcomes of survey research conducted among meat industry companies located in the Wielkopolska Voivodeship. The aim of the research was to diagnose the innovativeness in these companies and to identify its determinants and particularly – the significance of network interconnections. It was concluded on the basis of the research that the majority of companies did not participate in modern network interconnections. This is caused by a number of factors, both on the part of the companies and on the part of other subjects – potential network participants. It mainly results from not noticing the scale of advantages resulting from network interconnections and insufficient knowledge in this area. Although companies remain open to cooperation with the science sector and other institutions dealing with the transfer of knowledge, they do not take actions aimed to initiate it.

**Key words:** economy, transfer of knowledge, cooperation

### **INTRODUCTION**

A great deal of research shows that building competitive advantage of companies rests on their innovativeness, though not merely limited to product and process innovativeness, but also the innovativeness of marketing and organisational changes indicating newness. Newness is the driving force behind the improvement in the market position of companies, especially under the circumstances of predominant globalisation of investments, R&D, science and technology. This is vital for Polish companies which, in this respect, have been occupying final positions among EU countries for a few years. Therefore, Poland is still included in the group of catching-up-countries, aiming to diminish the differences between them and highly innovative countries.

The food-and-farming sector has each and every chance to improve its competitiveness through innovative efforts. Although it has been modernised in the last decade, it is

still not using all the opportunities for increasing its effectiveness, which results, among others, in its relatively low degree of competitiveness on foreign markets. The key factor which affects its further development is the disintegration of producers, which, in turn, impede economies of scale. At the same time, lack of essential consolidation processes results in insufficient level of using the production potential. The condition of the meat industry has also been affected by the decrease in the number of livestock, increasing prices of raw materials and, consequently, increased production costs that result in a lower degree of competitiveness on foreign markets.

Although the modernisation of the meat industry has resulted in widening the assortment of products and increasing the turnover in international trade, it is still characterised by insufficient use of all the available opportunities for improving its profitability and competitiveness. In order to improve the competitiveness in the sector, it is essential to intensify innovative efforts on the part of companies [Szopik 2007, Szybiga, Prymon 2009]. Therefore, it is vital to identify both internal and external determinants of innovative efforts, defining the meaning of network interconnections between science and economy, particularly in the area of transferring new technological, production- and product-oriented solutions [Rosińska 2005, Plawgo, Klimczuk 2009]. This justifies the need to conduct research that would allow to define the degree to which the companies participate in network interrelations, possible limitations and opportunities for their successful overcoming in the future [Ratajczak-Mrozek 2009, Łuczka-Bakuła 2011]. They can also be used as a basis for further recommendations for public authorities that can be understood as an institutional factor supporting the innovative efforts of companies.

## DATA AND RESEARCH METHODOLOGY

In order to diagnose the innovative efforts of companies in the meat industry in the Wielkopolska Voivodeship as the source of an improvement in their competitiveness as well as in order to identify its external and internal determinants and particularly – network interconnections, survey research was conducted in 2012. The survey questionnaire was sent to 109 companies operating in the meat industry, dealing with animal slaughter and processing meat, located in the area of the Wielkopolskie Voivodeship. 52 surveys were received of which 48 were approved for final analysis. The survey questionnaire consisted of 19 one- and multiple-choice questions. The dominating part was built with closed questions with the possibility to give answer in „Other” field in case, when the provided cafeteria was not sufficient. Part of the answers contained a five-point scale from 1 (the lowest assessment) to 5 (the highest assessment).

Building competitive advantage requires from companies innovative efforts, understood as a range of activities of scientific (research), technical, organisational, financial and commercial nature whose aim is to compile and implement new or significantly improved products or processes, while the goods or processes are new, at least from the point of view of the company that introduces them [The innovative activity... 2006]. The diagnosis of these activities was conducted on the basis of identifying the following problems: (1) the signs of innovative efforts in companies; (2) their external and internal

determinants; (3) the meaning of network interconnections as an element of improving innovation capability in companies.

## RESEARCH OUTCOMES AND DISCUSSION

Nearly a half of the studied companies were established in the first half of the nineties while one in five companies were set up before 1990. The companies established most recently only accounted for relatively low percentages (10.4% were set up between 2000 and 2004 and 4.2% were created between 2005 and 2009). The analysed group included mostly small companies, employing between 10 and 49 people (52.1%). Every third company belonged to medium companies (29.2%) while only a relatively small percentage of the studied companies (8.3%) were big companies (Fig. 1). The meat industry is dominated by small enterprises, which results in the dispersion of supply and, consequently, leads to a low use of production potential.

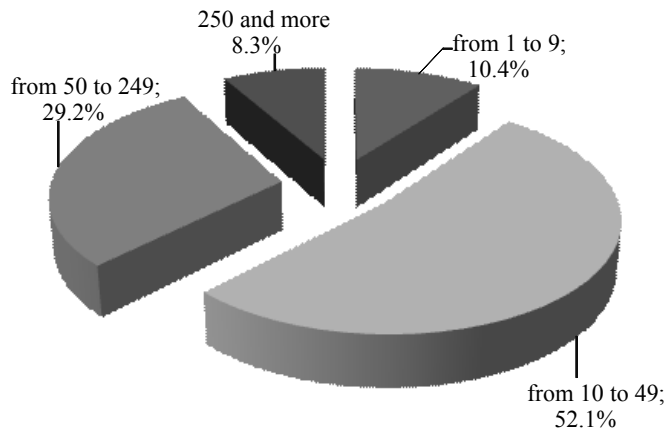


Fig. 1. The distribution of the analysed companies according to their employment figures  
Source: Author's own study.

As regards the legal and organisational form, the analysed group was dominated by the one-man businesses (47.9%). Each one in five companies was a registered partnership (20.8%), while limited liability companies constituted 14.6% of all companies and only 4.2% of companies were joint stock companies.

The first group of research questions included the companies' evaluation of financial, material and organisational assets in the context of their influence on innovative efforts in enterprises. The firms evaluated the influence of particular resources on innovative efforts using a five-grade scale (1 represented the lowest evaluation while 5 stood for the highest evaluation). As far as financial resources are concerned, the most commonly accepted statement was that implementing innovations involves bearing high costs (Table 1). The research shows that it is mainly equity that is the source of financing innovation and, consequently, its insufficiency constitutes one of the major barriers of making innovative

Tabele 1. Evaluation of company's resources and innovative efforts

Evaluation of resources	Mean score (scale 1–5)
Financial resources in companies	
Implementing innovations involves high costs	4.1
Introducing innovation is connected with a very high financial risk	3.6
The company does not possess financial resources inevitable to implement innovation	3.0
Material and organisational resources in companies	
The company's machinery stock is insufficient to introduce product and process improvements	3.4
The company possesses material resources to implement the innovation	2.6
The company possesses R&D background for creating innovativeness	2.2

Source: Author's own study.

efforts by companies. Therefore, in order to handle the problem, companies should switch to obtaining external funds and take actions aimed to include other subjects in financing innovations at various stages of their implementation. Each one in three companies perceives innovation as linked with high financial risk. Companies do not usually own resources which would enable them to design and implement innovation on their own. However, it is an interesting fact that in order to minimise the risk of innovation, the companies do not consider new opportunities of using venture capital or business angels or using EU funds for financing the modernisation of the food industry. It seems that the low level of activity in accessing external funds is mainly caused by two factors:

- firstly, adopting defensive strategies, especially by small companies, in times of market weakening and increasing risk of investment connected with a general deterioration of the financial condition of the meat industry;
- secondly, the information policy of the subjects of financial markets and insufficient level of information concerning the possibilities of external funding of investments.

As far as material and organisational resources are concerned, most companies believed that the machinery stock which they possessed was sufficient to introduce product and process improvements (3.4). On the other hand, possessing appropriate R&D background was only indicated by a relatively small proportion of respondents (mean score 2.2).

With reference to investment outlay, the purchase and modernisation of machines and appliances accounted for the highest percentage (65.8%), followed by the purchase of software (57.9%) which was connected with the needs of accounting department and for stock management purposes rather than in order to improve decision making processes (Fig. 2). Innovative efforts also constituted a relatively high percentage. These included innovation-focused professional trainings for employees (39.5%). The rank of expenditure on increasing the competence and skills of employees (third position) can be seen as evidence of perceiving human capital as important in making innovative efforts, which can result in positive changes in this respect in the future. One in five companies also indicated that expenses were made on purchasing of projects and pattern design. On the other hand, expenditure on research and development in companies was only made in 7.9% of companies. It is mainly caused by the lack of research infrastructure in small and medium-sized companies, which were the majority of participants in the research.

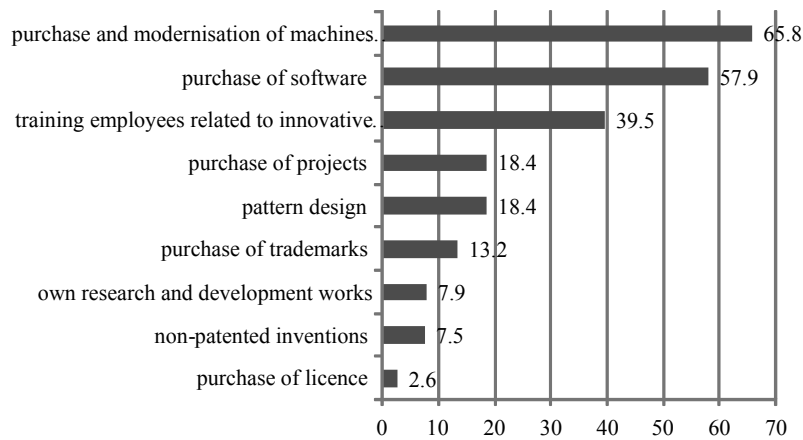


Fig. 2. Investment outlays (%)

Source: Author's own study.

Companies make innovative efforts in order to achieve certain aims, mainly relevant to their strategic objectives. The analysed companies indicated three main objectives (Fig. 3): improving the quality of their products (84.8%), increasing or maintaining their market research (76.1%) and increasing their product range (58.7%). Respondents stressed that they paid a lot of attention to the quality of their products due to the fact of its increasing role in buyer decision processes and, consequently, in reaching competitive advantage. Success in gaining competitive advantage results, in turn, in maintaining market share or its increase. The majority of companies focus on maintaining their market share, which is not easy given the local scope of their sales and increasing competition on the part of huge commercial chains offering products at lower prices. Another aim of companies' innovative efforts is increasing their product range, which is also perceived as an efficient tool of gaining competitive advantage.

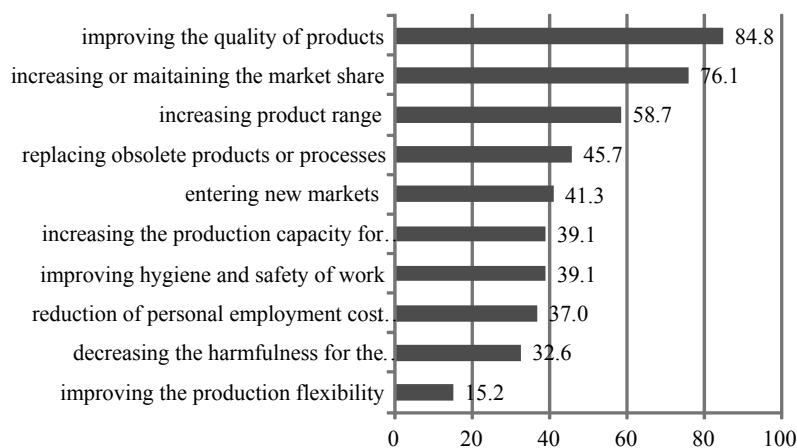


Fig. 3. Aims of companies' innovative efforts (%)

Source: Author's own study.

The majority of the studied companies (66%) evaluated their innovative efforts as average and a relatively low percentage (23.4%) described it as minimal. As regards various sorts of innovation, in the last three years, most of the studied companies have implemented product innovations, focusing mostly on improving the taste and colour of their products. Innovative changes in most companies included organisation and marketing department while only a low proportion of these changes were connected with production processes. All sorts of innovation were implemented on a microeconomic scale and their newness was limited to the area of a given company. At the same time, it is worth noticing that when it comes to organisational and marketing innovations, including “soft” elements, they were qualified intuitively [Kalinowski 2008]. For example, some companies treated exchanging the label on packaging as marketing innovation while others claimed that this activity could not be regarded as innovative.

Among the extrinsic determinants of innovative efforts, formal and informal network interconnections between the company and its environment are becoming increasingly important. These include various forms of cooperation with different subjects, aimed to boost, implement and diffuse innovation. The complexity of the phenomenon of innovation in contemporary economy makes it necessary to involve a number of subjects, not merely from the areas of business and science, but also from the area of finance and consulting [Martin 2010]. More than a half of the surveyed companies (53.2%) claimed that they had made innovative efforts in cooperation with other subjects in the last three years. However, the cooperation mainly included vertical links within the value chain, with suppliers and customers. Business support centres only played a minor part, which was indicated by nearly one in four studied companies. The range of cooperation with research and development centres and universities can be perceived as slightly worrying, as it was only indicated by 13.3 and 6.7% respectively (Fig. 4).

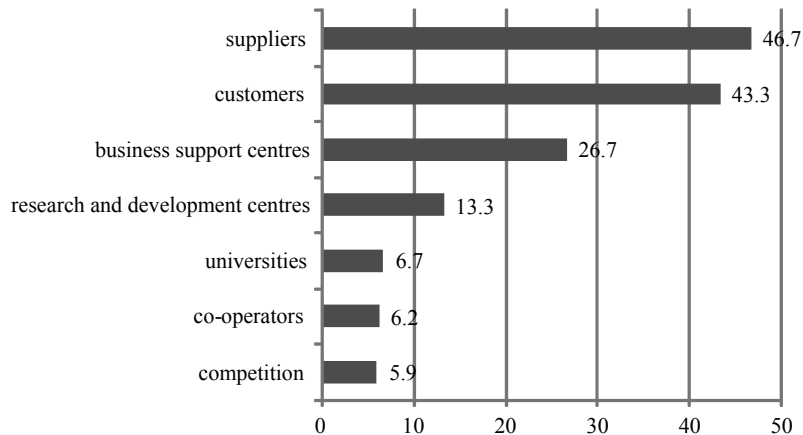


Fig. 4. Cooperation in the area of innovation in the last three years (%)

Source: Author's own study.

Companies' expectations concerning the cooperation with business support centres show that for most of them (65.9%) it is most important to obtain information about new technologies (Fig. 5). Every one in two enterprises would appreciate it if training

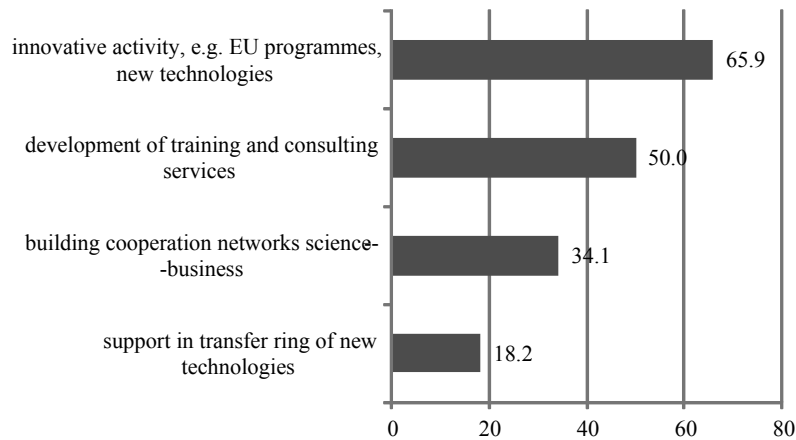


Fig. 5. Companies' expectations concerning their cooperation with business support centres with respect to innovation (%)

Source: Author's own study.

and consulting services were developed by these centres. A relatively low percentage (34.1%) of companies expect the centres to build interconnection networks between science and economy, which is mainly caused by not perceiving any advantages from it and by a relatively low level of knowledge in this area. Research shows that the process of gaining competitive advantage and increasing the degree of companies' innovativeness (including SME) is going to be influenced by network interconnections between economy and science more and more increasingly. Knowledge transformation and its adaptation for the needs of economy requires cooperation on the part of the subjects creating knowledge with the subjects creating economy. It is particularly true of small and medium-sized enterprises which are in general unable to create innovations on their own in global economy.

Research shows that opportunities provided by cooperation of companies with various scientific institutions are not used in the meat industry. Hence, increasing competitiveness in this sector may be in question. It is worth considering why there are hardly any initiatives to introduce a system of branch cooperation between business and science. Companies encounter difficulties to find appropriate partners in the research and development sector. This is frequently the case in the SME sector, whose companies do not possess sufficient human and financial resources to take actions aimed to introduce innovation. It seems that one of the causes of limited cooperation is a shortage of incentives that would encourage scientific organisations to commercialise research outcomes, which, in turn, is a consequence of the passive policy of public authorities in this respect and particularly, lack of legal regulations that would stimulate the commercialisation of science by, e.g. creating favourable fiscal conditions [Kłopotek 2002, Rychtowski 2004].

The conducted research shows (Fig. 6) that the greatest percentage of companies would appreciate it if they were given the opportunity to cooperate with universities and research and development institutions in preparing analyses and expert opinions (53.7%). They also see the need to educate highly qualified specialists (51.7%). Companies show

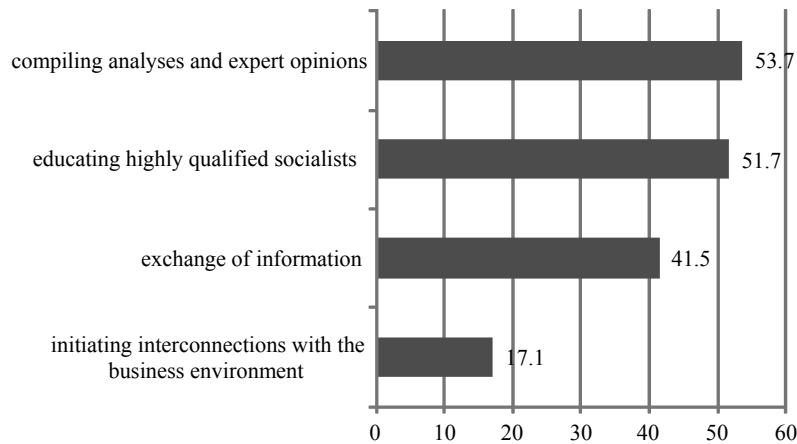


Fig. 6. Expectations of cooperation with universities and research and development institutions as regards innovation (%)

Source: Author's own study.

quite substantial differences as regards their expectations of initiating interconnection networks with business by scientific institutions. Most companies are not interested in these activities because they do not see the need of such cooperation. This means that the companies create a demand barrier and limit the transfer of knowledge. This confirms the necessity to popularise the best examples of cooperation between R&D institutions and companies and the need to create systematic solutions for the whole country in order to stimulate commercialisation of knowledge and technologies as tangible benefits of cooperation between business and science. It would also prove of value to popularise the new concept of cooperation between subjects, i.e. network approach, created to improve the generation of knowledge and innovations in economy [Kozioł-Nadolna 2011].

## CONCLUSIONS

The innovativeness of economy and its subjects is currently one of the major determinants of its capability to handle the increasingly competitive environment, both in Poland and globally. The barriers of low innovativeness of Polish companies in the meat industry can be traced both in endogenous factors and in the factors that originate in the closer and further environment. Innovativeness requires a considerable involvement of human, material and financial resources, which can prove insufficient on the level of a single company. Therefore, the process of its initiation should be supported by various subject creating network interconnections between science and economic practice. Therefore, network interconnections should be addressed when looking for one of the ways to improve the innovativeness of the meat industry companies, which face a huge challenge imposed by the future decisions connected with restructuring. The conducted research shows that the majority of companies do not participate in modern network interrelations stimulating investments. It is caused by numerous factors, both on the companies' part



and on the part of other subjects, potential participants of these networks. The main cause is failure in noticing the benefits which can result from network interconnections and insufficient knowledge in this area. Although companies expect cooperation in this respect with scientific centres and other centres dealing with the transfer of knowledge, they do not take any actions to initiate it.

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**Streszczenie.** W artykule przedstawione zostały wyniki badań ankietowych przeprowadzone wśród przedsiębiorstw przetwórstwa mięsnego zlokalizowanych na terenie województwa wielkopolskiego. Celem badań była diagnoza działalności innowacyjnej tych przedsiębiorstw oraz identyfikacja jej uwarunkowań ze szczególnym uwzględnieniem znaczenia powiązań sieciowych. Na podstawie przeprowadzonych badań stwierdzono, że większość przedsiębiorstw nie uczestniczy w nowoczesnych powiązaniach sieciowych stymulujących

działalność innowacyjną. Jest to spowodowane wieloma przyczynami leżącymi po stronie samych przedsiębiorstw, ale także innych podmiotów będących potencjalnymi uczestnikami owych sieci. Główną tego przyczyną jest niedostrzeżenie skali korzyści, jaka może wynikać z powiązań sieciowych oraz niedostatecznej wiedzy na ten temat. Wprawdzie przedsiębiorstwa oczekują współpracy w tym zakresie z nauką i innymi ośrodkami zajmującymi się transferem wiedzy, ale nie podejmują działań zmierzających do jej inicjowania.

**Słowa kluczowe:** gospodarka, transfer wiedzy, współpraca

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