

An Evaluation of Innovativeness and Activities of Local Development in Agricultural and Food Production Companies in Slovakia

Zhodnotenie inovatívnosti a aktivít lokálneho rozvoja v poľnohospodárskych a potravinárskych podnikoch na Slovensku

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Abstract

The „Farm to Fork“ strategy is a comprehensive initiative introduced by the European Union, which forms part of the European Green Deal. It aims to ensure the transformation of the EU food system so that it is more sustainable, resilient and in line with environmental and health objectives. Innovation plays a key role in the success and effectiveness of this strategy. By integrating innovative approaches and technologies, the general goals of sustainability and environmental protection can be achieved. The strategy is closely linked to the concept of local development, emphasizing the importance of sustainable agricultural practices. The paper evaluates innovations and activities supporting local development in agricultural and food enterprises in Slovakia. Questions regarding innovations and local development activities were answered by 57 enterprises engaged in agricultural production, food production and distribution. Based on the results, it could be concluded that 54% of companies are innovating in the area of new recipes and packaging technology (42%). As part of local development, 59% of businesses offer Slovak food and use raw materials from local suppliers during processing (54%).

Keywords: *Farm to Fork – Innovations – Local Development – Agriculture*

JEL Classification: Q1, Q10, M31

Introduction

The development of countries' economies is largely influenced by innovations carried out by companies applying innovative practices to their businesses. These enterprises are described as innovative business entities and are in the middle of the interests of experts and the general public (MURA L., 2021). We can classify innovation as one of the factors that affect the longevity of businesses (ORTIZ-VILLAJOS J., SOTOCA S., 2018). As argued by CAPPELLI A., CINI E., (2021), innovation is a crucial element of contemporary life. Innovation represents a key to advancing sustainable development, which involves activities such as creating new jobs, generating money, and reducing poverty (MOLINA-MATURANO J., SPEELMAN S., DE STEUR H., 2020). In addition, according to the OECD (2010), innovation is fundamental to improving living standards. Moreover, implementing innovation in business has various effects on individuals, organizations, entire economies, and nations. As the industry changes at a faster rate than ever, most businesses are aware that they need to innovate. All industries

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are being disrupted by technological advancements and thus businesses need to innovate to stay relevant and not fall behind (GREEN N., 2023). To sum it up, it could be concluded that in the competitive landscape of business, the concept of innovativeness has become a cornerstone for success and sustainability. This study provides insight into the use of innovations in companies operating in the agricultural and food sectors in Slovakia. It is aimed at finding out what innovative activities are implemented by companies operating in the agri-food sector. Moreover, the study is focused on finding out which local development activities companies operating in the agri-food sector are engaged in. The article is divided into three parts. In the literature review, we deal with concepts such as innovations, the benefits and barriers of the implementation of innovations, and the types of innovations. The second part of the study presents the methodology, where the method of data collection and the characteristics of the research sample are described in more detail. At the end of the study, the results are provided along with a discussion.

Innovation and its barriers and benefits

The OECD created the "Oslo Manual," which aims to describe the concepts of innovation, innovative activity, and types of innovation. According to the definition of innovation by the OECD in 2018, innovation is defined as a new or improved product or process (or a combination thereof) that is made available to potential consumers (product) or implemented by the unit (process) and that is notably different from the unit's prior products or processes. SAUNILA M., UKKO J., (2013) state that innovation represents a process that turns opportunities into new ideas and these ideas into widely used practices. JAIN Y., (2023) explains that innovation is a novelty in a product, service, strategy, or business model. Furthermore, BESSAND J., TIDD J., (2007) highlight that innovation is becoming increasingly vital to the successful operation of businesses in all sectors. In regard to sustainability, GAULT F., (2016) states that innovation fosters social cohesiveness and sustainable growth, and lessens the effects of climate change. Moreover, innovation stimulates economic growth and aids in resolving social issues (OECD, 2010). To conclude, the need to constantly innovate, develop, and adapt has become a fundamental element of organisational success in the competitive environment (YAM R. ET AL., 2004).

According to the literature, many benefits are connected with implementing innovation in business. BOYLES M., (2022) stated that the business was severely impacted by the recent COVID-19 pandemic, and therefore, in today's fiercely competitive environment, innovation is essential to achieving organisational and economic progress. There are numerous competitors in most businesses providing comparable goods and services. A company may stand out from the crowd through innovation. The INTERNATIONAL INSTITUTE FOR MANAGEMENT DEVELOPMENT (2023) describes the fundamental benefits of implementing innovations as follows:

- Innovation as a competitive advantage - innovations help with creating and developing unique products and services that are distinguishable from the competition.
- Innovation helps with customer demands - companies that work to better understand their needs and meet them through continuous innovation are able to draw in new business and hold on to their current clientele.
- Innovation helps with business growth – by implementing innovation, businesses can better identify and take advantage of new opportunities.
- Innovation helps with efficiency and productivity - if a company can identify methods to enhance current procedures, simplify operations, and introduce new technologies, innovation can result in higher productivity.
- Innovation helps with adapting to changes – with innovations, the company is better prepared to identify emerging trends and can anticipate changes in the market in advance.
- Innovation helps with the attraction and retaining talent – innovation helps create an environment that engages workers and results in higher employee satisfaction and retention.

In some businesses, innovations are widely used. However, there are still a number of companies that are not implementing innovations (KAHN K., 2018). Different barriers can prevent the process of implementing innovations. Among the most common barriers to implementing innovations, according to

the SLOVAK BUSINESS AGENCY (2020), are mostly the lack of financial resources and personnel issues related to the acquisition and retention of qualified employees. Moreover, there are other barriers seen by both innovating and non-innovating businesses that include:

- there was no need to innovate due to previous innovations,
- high costs,
- difficulties in obtaining state subsidies or grants for innovations,
- many competing businesses on the market,
- lack of cooperating partners,

These results are in line with MORAVČÍKOVÁ D., TKÁČ F., MUŠINSKÁ K., (2021), who found that the lack of funds, high costs, and bureaucracy were evaluated as the most important attributes of agro-food companies in Slovakia when it comes to main barriers to implementing innovations. Furthermore, MCKINNEY P., (2023) describes that particular regulations and policies may restrict certain areas of innovation due to safety concerns or standards in the industry. Cultural norms and beliefs can also be considered barriers to implementing innovation. For example, some cultures may resist change more than others, indicating that they may perceive revolutionary ideas as too risky or inappropriate in those contexts. Furthermore, beliefs such as fear of failure can lead business owners away from taking risks and trying out new concepts. Another major obstacle to innovation can be a lack of time and motivation. Before an idea is realised, it often takes a lot of research and development, which might take days or even months, depending on how complicated the idea is. A study by KIELBASA B., (2015) examined the most important barriers to implementing innovation of 140 farmers in Poland. Based on the results it could be concluded that the biggest barrier in the process of implementation of new solutions in agriculture is the high cost of innovation. Moreover, the insufficient amount of free funds for investment processes and difficulty in obtaining cheap loans were evaluated as the second biggest barrier for Poland farmers. Approximately 17% of farmers also pointed out the problem with the sale of agricultural raw materials and the unstable agricultural market. Finally, approximately 14% of the farmers mentioned that they did not have knowledge and information about the innovation.

Types of innovations

Currently, we distinguish several types of innovation. The OECD (2018) divides innovation into technological and non-technological. The group of technological innovations includes the innovation of business processes and product innovation. The innovation of business processes refers to a new or improved business process for one or more business functions that differs significantly from the company's previous business processes. Moreover, product innovation represents a new or improved good or service that is significantly different from the firm's previous products or services that have been introduced to the market in the past. Marketing innovation and organisational innovation are part of non-technological innovations. A marketing innovation is defined as the implementation of a new marketing method involving fundamental changes in the design or packaging of the product, product placement, product promotion, or pricing. On the contrary, organisational innovation refers to the implementation of a new way of organising a company's business practices, workplace organisation, or external relations. It is aimed at changes in the workplace with the aim of increasing productivity but also increasing workplace satisfaction and reducing administrative or transaction costs. Part of the organisational innovation in the company is new business practises (new ways of managing the supply chain, quality management), new methods of organising human resources (training, centralization, decentralisation), and new methods of organising external relations with companies and other institutions. A special type of innovation defined by EUROSTAT (2023) is ecological innovation. Any form of innovation aimed at significant and demonstrable progress towards the goal of sustainable development is considered ecological innovation.

Innovations in Agricultural Sector

Nowadays, according to the EUROPEAN COMMISSION (2023) agribusiness, which encompasses the entire agricultural value chain from production to distribution, faces several challenges connected with climate change, resource scarcity, and the need for increased food production to feed a growing global population. Moreover, as reported by PIGNATTI E., CARLI G., CANAVARI, M., (2015), the agricultural sector is currently facing numerous problems, such as dealing with the depletion of natural resources, enhancing working conditions for farmers, and becoming more competitive. Therefore, it is crucial to embrace and utilize technological innovations for the success of the agriculture industry. Innovativeness in this context is the main driver for transforming traditional agricultural practices into modern, sustainable, and technology-driven models that can meet the demands of the present and future. Furthermore, agricultural research and innovation in the EU is characterised by a long-term strategic approach that focuses on creating value from land through sustainable primary production and on strengthening rural innovation. It is an important tool in the fight against challenges such as climate change, environmental degradation, and biodiversity loss (EUROPEAN COMMISSION, 2023). As stated by FAO (2018), agricultural innovation describes a process whereby individuals or organisations bring new or existing products, processes, or ways of organisation into use for the first time in a specific context to raise effectiveness, competitiveness, and resilience to shocks or environmental sustainability and thereby contribute to food security and nutrition, economic development, or sustainable natural resource management. CHABÉ-FERRET, S., LE COENT, P., REYNAUD, A., SUBERVIE, J., LEPERCQ (2019) highlight the need for "eco" solutions because the condition of the environment, the rate and direction of climate change, and consumer health are all significantly impacted by agriculture. As reported by IICA (2014), innovation is essential to addressing society's problems, such as the improvement of competitiveness, sustainability, and equality in agriculture. Furthermore, to prevent climate change, there is a need to reduce greenhouse gas emissions, produce more food for a growing population, and use a limited amount of farmland. This implies that knowledge must be applied more heavily in agricultural production, which calls for innovation. It has been shown that investment in agricultural research and development improves economic growth, agricultural development, and poverty reduction (WORLD BANK 2007).

According to ŠEBESTA A., (2019), the agricultural sector in Slovakia achieves low productivity. GDP per hectare is two times lower compared to the Czech Republic or Hungary and up to seventeen times lower than in the Netherlands – the leader in innovations. Slovakia especially needs to increase the production of crops with high added value, such as fruits and vegetables. Modern greenhouses can largely automate the entire process and increase the quality of the farmer's life. There is a chance to increase animal production, for example, almost fully autonomous dairy farms can help. Thanks to robotic milking equipment, they increase animal satisfaction and, at the same time save farmers time. Digitization and innovation are a huge opportunity to put Slovak agriculture back on its feet. At the same time, they will enable sustainable production and increase employment, which is equally good for nature and the economy.

Methodology

The paper's objective is to evaluate innovations and activities supporting local development in agricultural and food enterprises in Slovakia. Primary data were collected through an online questionnaire survey distributed in 2022. Questions regarding innovations and local development activities were obtained by 57 enterprises engaged in agricultural production, food production, and distribution. According to Table 1, it could be concluded that 42% of enterprises operated in the field of food production, and approximately 23% of enterprises operated in food distribution. More than 35% of companies represented the field of agricultural product production. Moreover, the largest representation was companies operating at the local level (39%) and regional level (28%) of business. Approximately 42% of companies had 1–9 employees, and only 12% of companies had between 50 and 249 employees.

Tab. 1 Characteristics of the participating companies

	Categories	Frequency	Frequency (%)
Business field	Food production	24	42,11%
	Food distribution	13	22,81%
	Processing of agricultural products	20	35,08%
Number of employees	1-9	24	42,11%
	10-49	18	31,58%
	50-249	7	12,28%
	More than 250	8	14,03%
Territorial area	Local	22	38,60%
	Regional	16	28,07%
	National	8	14,03%
	International	11	19,30%

Source: own elaboration

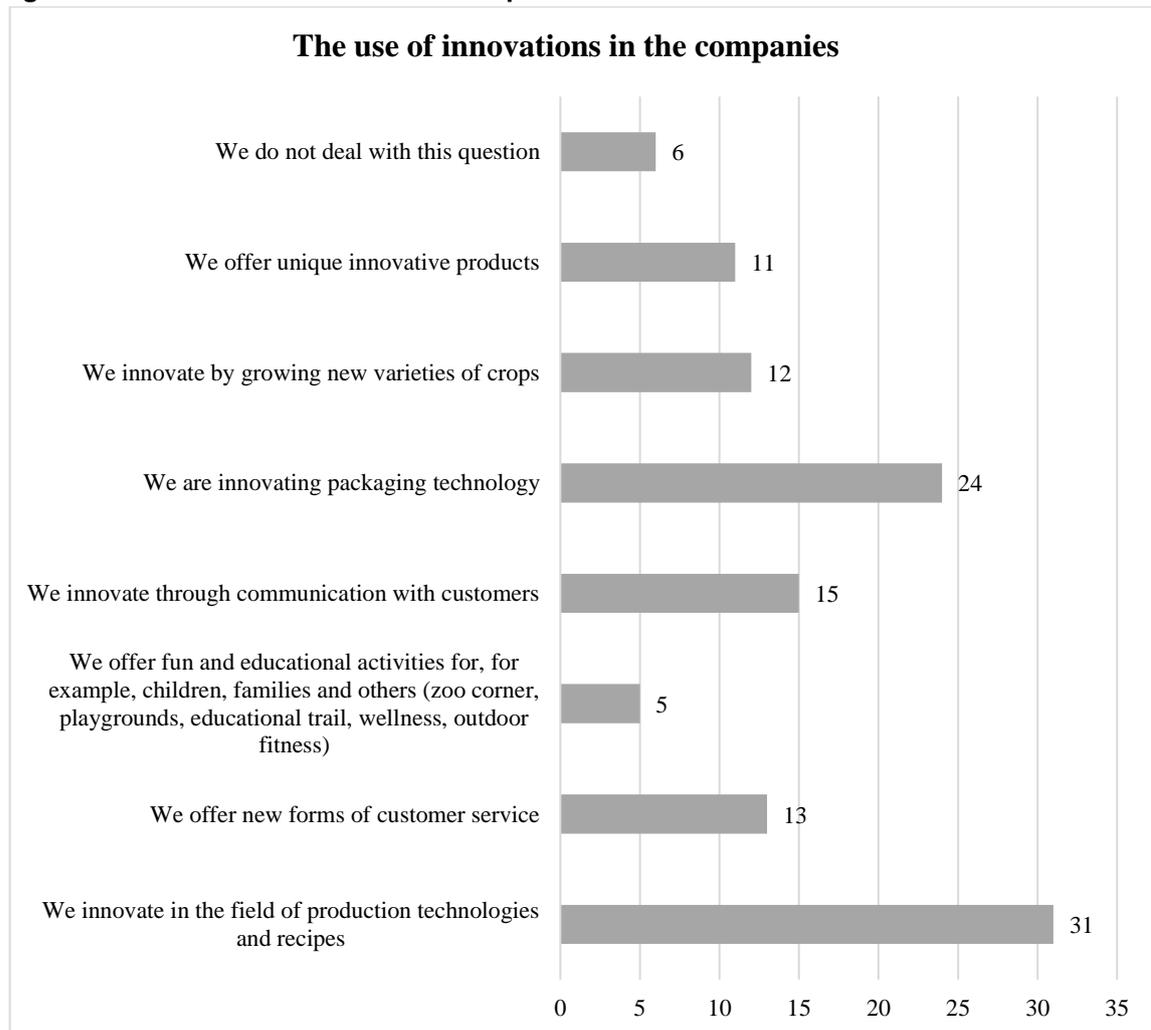
Results and discussion

Innovation in agribusiness is a dynamic and essential driver of growth, sustainability, and efficiency within the agricultural sector. As the global population continues to expand, putting increased pressure on food production, technology and innovation become critical components in addressing the challenges faced by the agribusiness industry. This evolution is not only about introducing new technologies but also about adopting creative strategies, processes, and business models to enhance overall productivity and sustainability. The first question in the questionnaire contained multiple-choice answers. According to the results, it could be concluded that more than 42% of enterprises are innovative in the form of new packaging technologies, and 54% of companies are innovating in the area of new recipes. Moreover, approximately 26% of companies claimed that they try to implement new communication with customers, and 23% of companies offer new forms of customer service. Innovation through the new varieties of crops as the new innovation in business claimed 21% of companies, and 19% of companies try to offer new innovative products in their selection. Results revealed that 11% of participating companies do not deal with innovations in their businesses (Figure 1).

As mentioned above, generally, innovations include more than just technology, for example, strategy, marketing, organisation, management, and design. Agro-food enterprises can not only adopt new technologies but also implement different ways of thinking and novel approaches (VAN DER PLOEG ET AL., 2004; KNICKEL K., ET AL., 2009). A study BY MORAVČÍKOVÁ D., TKÁČ F., AND MUŠINSKÁ K., (2021) revealed that approximately 75% of Slovak agro-food companies claimed they had carried out innovations in the last 5 years. In more depth, technological innovation was implemented by 34% of companies. New innovations in the form of new products and services innovations were claimed by 26% of companies. Approximately 15% of agro-food companies in Slovakia implemented marketing and organisational process innovations. When finding out what specific innovations Slovak agro-food enterprises are implementing, they declared mostly the purchase of machinery, modernization of technical equipment, new websites, new product composition, new labels, packages, new varieties etc. These results are in line with the SLOVAK BUSINESS AGENCY (2020). According to the survey, most of the companies declared that they implement product or service innovation. Marketing innovations were implemented by approximately 53% of businesses. On the other hand, organisational innovation was declared by less than 41% of those surveyed enterprises.

DUDEK M., WRZASZCZ W., (2020) investigated the implementation of eco-innovation in agriculture in Poland. According to the results, it could be concluded that using appropriate family and local tangible, as well as intangible, assets in a specific way contributed to the creation of innovative products, processes, and marketing and organisational solutions that were pro-ecological and economically beneficial. Furthermore, the study has proven that in the process of applying eco-innovations, particular personal traits of farmers and a proactive approach to the advancement of food production play an important role.

Fig. 1 The use of innovations in the companies



Source: own elaboration based on the questionnaire survey

A study by PIGNATTI E., CARLI G., CANAVARI M., (2015) examined the adoption of innovations in agriculture in Greece, Turkey, and Italy through face-to-face interviews and focus groups. The results showed that the actual level of integration of technological innovations in agriculture is quite low, and their complexity is sometimes too high to let innovations access farmers' daily routines. Moreover, participating farmers claimed that technological innovations are distinguished by providing many benefits and opportunities, such as for improvement in a sector that shows some deficiencies, especially in terms of organisational and managerial aspects. Technological innovations are associated with higher efficiency and productivity and provide a more rational overview of a farm's activities, performances, and management, supporting a better and easier decision-making process. In addition to reducing uncertainty in production processes and optimising the management and use of inputs and resources, they can improve working conditions and comfort (automation, digitization), as well as performance (production optimisation, cost reduction). Finally, technical advancements can help open up new production areas and market niches where environmental restrictions make cultivation difficult. The use of technological innovation in agriculture systems is fundamental, according to FERRARI E., ET AL. (2013), PARDEY P., ET AL. (2010), and WRIGHT B. (2012). Agricultural tractors are a prime example of how technological advancements are used to enhance working conditions for drivers and reduce environmental effects by producing and using energy resources more efficiently (CAVALLO E., ET AL. 2015).

Fig. 2 Local development activities in companies



Source: own elaboration based on the questionnaire survey

The application of innovations in agriculture is integral to local development. By fostering economic growth, creating employment, improving infrastructure, and promoting sustainable practices, agricultural innovations play a pivotal role in enhancing the overall well-being and resilience of local communities. As another question in the questionnaire survey, we were examining the activities companies carry out in the direction of local development. Participating companies could answer the question with multiple answers. As INBIZNIS (2020) states, local development is understood if entrepreneurs create job opportunities in a given region, bring innovation, and help local communities grow. Our study reveals that approximately 70% of interviewed companies support local development by employing local people. As part of local development, 59% of businesses offer Slovak food and use raw materials from local suppliers during processing (54%). Moreover, 33% of enterprises declared that they had yard sales where customers could buy fresh products. Only 1 participating company declared that they do not care about local development (Figure 2).

Conclusion

Innovativeness refers to an organization's ability to create and implement novel ideas, solutions, and approaches that result in meaningful improvements or advancements. In the dynamic and competitive world of business, being innovative is not merely an option but a strategic model. Innovation in agribusiness is crucial for ensuring food security, environmental sustainability, and economic viability. As the agribusiness landscape continues to evolve, embracing technological advancements and creative solutions becomes essential for farmers, businesses, and policymakers alike. The main objective of the study was to investigate the use of innovations in companies operating in the agricultural and food sectors. A questionnaire survey was applied to obtain primary data, to which 57 companies responded. The results shows that 54% of participating enterprises declared the application of innovation in the production technologies and recipes and 42% implemented their packaging

technology. With regard to local development 70% of companies employ local people and 59% of businesses offer Slovak food and use raw materials from local suppliers during processing (54%).

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