Support of strengthening the cooperation and efficiency factors accelerating innovation processes in the food industry

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Abstract: The paper deals with the evaluation sub-measures of the "Cooperation for development of new products, processes and technologies, respectively the innovation in the food industry". It is a sub-measure under the Rural Development Plan (I. 1.3.2). The rating refers to the current programming period, but it was made in the context of a preparation of the new programming for 2014–2020. Strengthening of the cooperation and efficiency factors accelerating the innovation processes in food can act as a tool to gain competitive advantage for the future. It was based on the on- line survey on innovation in food companies, which are mainly in addition of supporting the product and process innovation demonstrating the effectiveness of the promotion of energy-reducing effects, increasing productivity and improving systems of logistics and distribution. This survey is indicative only. Therefore, the survey was completed as an analysis of the approved and paid projects on the measure and interview. The support enables the participating businesses to reduce debts; it shows, however, a need of the simplification and shortening of the administration of request, especially by small enterprises.

Key words: economic indicators, efficiency, research and development, rural development, structural support

A continuous innovation activity is the essential prerequisite for improving competitiveness of enterprises in every industry. A shift from a low-tech to high-tech innovations is needed for the food industry to become more technologically intensive, efficient and sustainable (Menrad 2004; Rodgers 2011). A recent research shows that the innovation activities in the food industry are strongly influenced by its orientation on market and demand. Iliopoulos et al. (2012) consider the market orientation as the innovation strategy with the highest potential to succeed and successful companies try to integrate and balance their marketing activities and the R&D.

Knudson et al. (2004) stress the importance of innovation centres that help businesses to create business plans, marketing strategies, and feasibility studies, allow the certification of business processes and offer certified training programs for the entrepreneurs and executives. The authors suggest applying the theory of innovation on the specific conditions of the agri-food industry using a holistic, process-oriented approach. The research should also focus on a range of training programs for entrepreneurs, depending on the type of entrepreneur-innovator.

Traill and Meulenberg (2002) try to understand the innovation strategies of companies in the food industry. They conclude that firms behave differently depending on their dominant "orientations" towards the product, the process, or the market, the types of market they supply (particularly whether they supply branded or private-label products), the nature of their ownership (public, private, co-operative), the market size and scope, and the company size. The legal form and the degree of internationalization of the company are also significant determinants of the innovation activity.

A very important role in the innovation activities within the food sector plays the institutional framework and networking. According to the research on modern innovation, companies almost never innovate in isolation, but they build their innovation

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activities on a vertical or horizontal cooperation and create a network or clusters of different actors (Menrad 2004). The economies of scale and export orientation also play a significant role in the level of innovations (Karantininis et al. 2010). The evidence suggests that innovation activities can have a positive effect on the business performance of the food companies, and the vertical cooperation in particular increases the export of processed food products (Ghazalian and Furtan 2007; Mukhamad and Kiminami 2011).

The research, development and innovation in the Czech food industry were analyzed in the Institute of Agricultural Economics and Information (IAEI) in the last years (Putičová and Mezera 2009). Consequently, the research has continued to focus on the Rural Development Plan with a focus on the sub-measures Adding value to agricultural products (I. 1.3.1). Closer discussed in the article of the authors Mezera and Špička (2013). However, it was necessary to research the cooperation for the development of new products, processes and technologies, respectively innovation in the food industry (CZSO 2008; CIAA 2009).

MATERIAL AND METHODS

According to the Innovation Scoreboard 2013 (Innovation Union Scoreboard 2013 – UIS 2013), which was prepared and published by the Economic and Social Research Institute on Innovation and Technology in Mastricht (UNU-MERIT) and was published in March 2013 by the European Commission, the EU Member States (in particular by the grouping analysis) are divided into:

– Leaders in Innovation, the innovation performance having a significantly higher level than the average EU-27, which are Denmark, Finland, Germany, Sweden.
– The countries close to the EU-27 average or with the performance slightly higher – Innovation Followers, namely: Austria, Belgium, Cyprus, Estonia, France Ireland, Luxembourg, the Netherlands, Slovenia and the United Kingdom.
– States with a lower performance than the EU-27 average – Moderate Innovators – the Czech Republic, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Slovakia and Spain.
– Countries with significantly lower innovative results than the average EU-27 – Modest Innovators, such as Bulgaria, Latvia, Poland and Romania. It can be inferred that the innovation performance of the most successful countries in the region (the average innovation performance is measured using a general – a combined index that is based on the data from 24 indicators, the lowest value is 0 and maximum 1, the figures are based on the years 2010/2011) is by 20% or more higher than the average innovation performance across the EU.

The Value Summary Innovation Index (SII) of the CR was 0.402, and it is by about 26% lower than in the EU average and by 46% lower than at the head of Sweden. Modest Innovators as a whole are not sufficient enough to make the country's innovation more successful, creating an "innovation gap".

By the branches summary analysis of the underlying R&D Technology Centre AS CR (2008), the number of patents in the fields of food is not too significant. When it comes to innovation, then in the CR, there operates a nationwide cluster focused on the production of beer. Also in the CR, there was identified a supra-regional cluster in the production of healthy food (Frank 2008).

The outputs of the research project "The new theory of economics and management of organizations and their adaptation processes (authorized by the Grant Agency of the Ministry of Education under the registration number MSM 6138439905) in the section on the incentives for innovation in the Czech enterprises (Theodor 2011), these companies make far more innovation lower orders, which can be expected.

The examination of the INNOVATION program, according to Čadil (2012), showed that in the terms of the type and number of innovations, there prevailed among supported enterprises the product innovation and new innovations in the Czech market.

The present IAEI research team based their findings on the on-line survey on the innovation in food companies. The questionnaire survey "Innovative food business activity in the Czech Republic" was implemented from 1 July 10 September 2013 in two rounds. The questionnaire was completed by 38 subjects. The rate of return, defined as the ratio of the completed and displayed questionnaires, was 24.8%. This is an approximate figure, which does not take into account those addressed respondents who did not display the introductory text (did not click on the link to the questionnaire). In terms of the rate of return, it is not possible to consider the results of the survey as representative and to generalize from them. Also, the statistical analysis of dependencies between the responses is not relevant. The comments must, therefore, be viewed as only indicative.

RESULTS AND DISCUSSION

On-line survey on the innovation in food companies

More than half of the respondents regarded the innovation activities of the company as significant (52.63%). These companies are hereinafter referred to as innovative. The respondents who do not see any significant innovation activity in the company (47.37%), marked as a major obstacle to innovation the financial performance, a small size company with regional powers in contrast to the high bargaining power of the retail chains, lack of time, the low support of small family businesses by the state, the lack of apprenticeship and the satisfaction with the current form of the company. The most significant obstacles to innovation activities of the enterprises in the food industry lie in the lack of equity and the high risk of failure due to the market uncertainty. The latter factor related to the long development cycle of innovation due to the dynamics of the market.

On the contrary, innovative companies were seeking a significant innovation activity in the business investment in modern technologies of processing of raw materials, packaging technology modernization with an emphasis on the functional packaging , searching for new ingredients and their combinations in order to offer products with new flavours with no artificial additives as favourable nutritional properties , further emphasizing expanding of the range and finding new sales methods and ways of communicating with the customers.

The greatest weight was attached to product innovations by the respondents (the average score of 4.14 on the scale from 1 – not significant after 5 – very important). Product innovation is the introduction of the goods or services that are new or significantly improved with respect to their characteristics or the intended use. Unlike the innovation process, it is sold directly to the customers. The respondents were attaching less importance to the business marketing innovation (the average score 3.05), but the marketing innovation in terms of the response rates was comparable with the product innovation. The most common forms of marketing innovation are the innovation of design and the innovation support product sales (both 66.67% of the innovative enterprises). The innovations in product placement are also less common (38.10% of the innovative enterprises), probably because the changes in product placement in the retail chains to the positions more attractive to consumers are relatively expensive. The cost of innovation is usually at the maximum of 20% of the turnover of the company (with 85.72% of enterprises).

In terms of internal impulses that have an impact on the innovation activities of enterprises, they play an important role in marketing (61.9% of enterprises) and the enterprise management incentives (47.62% of enterprises). On the contrary, the production and materials management and the employee incentives are the least numerous (19.05%, respectively. 23.81%). Definitely, the most important external impulses that affect the innovative activity of the food business are the customers and competitors (both those factors were identified by over 70% of the enterprises). From the emphasis on the customers, marketing and competition, it is therefore evident that the innovation activities of food businesses are affected by the market requirements. As less numerous innovative external factors, there are given the fairs and exhibitions and the legislative requirements (both those factors were identified by over 30% of enterprises). On the contrary, relatively low impulses are different study tours, benchmarking, the knowledge of science and research and professional literature (less than 5% of enterprises). The responses show an insufficient transfer of research results into practice.

The decision-making process of innovation in the food business is starting with the customer requirements or the competition offers. Consequently, the corporate leadership and resources looking for ways on how to implement innovation consider either the purchase new equipment and processing technology/packaging products in order to expand the range of new products, or to improve the design and functionality of the package or change marketing strategy. The companies are thus not regarding as the primary impetus the research and development in order to offer a completely new product without the pre-made marketing research.

The absence of own internal research and development department is at the micro- and small food businesses partially substituted by the innovation co-operation with other enterprises or institutions. The total 61.9% of innovative enterprises cooperate on innovation with other enterprises or institutions. The most frequent partner with whom the respondents cooperate on innovation, clients and customers in the Czech Republic and suppliers in the Czech Republic and EU.

Working with consultants, commercial labs or private or public research organizations and universities is rather exceptional. Approximately 70% of the

enterprises that have used the co-operation on innovation implemented in the period 2007–2013 for one to three projects of cooperation on innovation. The number of the cooperating partners ranges from one to three. The higher number is not very frequent; probably it would have been difficult in terms of the project management. With the public support, there was mostly implemented either none, or a cooperation project on innovation.

The main barriers to the increased cooperation on innovation are considered by the respondents the problems of the macroeconomic environment (average grade 1.875), as the least important factor, there is perceived the lack of transfer of the research results into practice (the average grade 2.095). As specific causes or barriers to collaboration on innovation, the respondents considered the business red tape, more stringent standards than the EU legislation requires, too rapid changes in legislation, the lack of the available capital together with the fact that the larger companies the have an easier access to subsidies compared to the smaller ones.

Regarding the innovation on finance, the respondents listed the combination of equity and debt. Foreign capital is exceptionally replaced by the private capital of a partnership firm. The venture capital, which carries the risk of loss of the invested funds in the case of bankruptcy of the company, or the investor itself, is not used at all. Financial support for the implementation of the innovative activities was not received by 47.62% of enterprises; the same percentage received financial support from the EU funds, resp. from the state budget. The average amount of support ranged mostly to the maximum of 40% of the eligible expenditures. The support takes the form of investment subsidies; some respondents identified also the subsidy of interest on the loan and marketing support.

The access to public resources for innovation was deemed insufficient by 55.26% of all respondents. As the reasons for the dissatisfaction, they indicate the lack of clarity, the transparency and opacity rules, the lack of awareness and the lack of promotion grant opportunities to smaller producers, poor communication offices, a large bureaucratic burden in obtaining the finance, the environment, corruption and the suspicions of rigged competition, the unavailability of the micro- and small enterprises (contrary preference for larger firms). One respondent criticized the regional programs, as the companies with the nationwide coverage distribution of goods throughout the country, producing outside the supported region, are not in the call logging.

Whether the innovation support programs of the EU and the national programs were properly "set", cannot assess 50% of the respondents. Another 42.11% disagree with it. They argue most the non-transparency system of the agencies that distribute the grants, unequal conditions for the small and large businesses, incompetent conditions set by the authorities, creating unequal opportunities in the market supports.

The respondents also criticized that the legislation does not meet the current EU requirements in the field of cooperation and innovation (26.32% of respondents). Most respondents, however, cannot judge the valid EU legislation in this respect (65.79%). Similar relations occur in response to the question on the national legislation. The ignorance regarding the national and European legislation, the needs of the companies in the field of cooperation and innovation creates an opportunity for advice from the private or public sector.

The respondents expect from the food sector in the period up to 2020 primarily the financial support to small and family businesses to purchase new equipment, technology and real estate for the business to innovate products and production processes, to increase labour productivity, to improve the working environment and to reduce energy consumption. The acquisition of new technology is by 71.43% of the respondents considered the most important in the terms of strengthening the competitive advantages for the next 2014–2020. As relatively important factors for improving the competitive advantages of the enterprises, they consider the price of the agrarian raw materials (46.43% of all respondents) and the quality of the agricultural raw materials (39.29% of all respondents).

Compared with the existing targeted support, the next programming period (2014–2020) should be directed to support the education of professionals (master classes, the recovery and reform of vocational education), the education of customers in terms of the quality and labelling of food products, technological innovation, the quality and safety of food, support of the application of new knowledge from the research and development to production with high added value, reducing the bureaucratic burdens. When assessing the applications for support, there should be also taken into account the company history, turnover, financial health and payment practices.

Analysis of the approved and paid projects

This paragraph deals with the analysis of the project valid from 31st December, 2012 from the sub-measures

I. 1.3.2 focused on financing of the innovative activities. The purpose of the grant could be the creation and introduction of a new technology, a new process or product, or the improvement of the existing technology or product, which leads to the increased production efficiency and improved competitiveness. Supported activities include the manufacture of food products and beverages. The amount of subsidy per 1 beneficiary for the period from 2007 to 2013 could be up to 90 mill. CZK. The subsidy could be up to 50% of the eligible project costs.

The analysis is performed for 26 projects, which corresponds to 20 subsidy recipients. The recipients are legal persons – 13 joint-stock companies (65% of the beneficiaries of subsidy), 5 limited liability companies (25%) and 2 cooperatives (10%). Most projects (13 projects) were passed in 2010. The total expenditure for the co-financing amounted to 412 mill. CZK. The contribution of the European Union represented 309 mill. CZK (75% of the public resources) and the contribution from the national budget was 103 mill. CZK (25% of the public resources). The minimum amount of expenditures intended for co-financing from the EU and the Czech Republic was 1.2 mill. CZK, the maximum amount was 46 mill. CZK, and the average value was 16 mill. CZK. The grants were awarded to the incurred costs of the project. The maximum amount was equivalent to 50% of the eligible project costs. The level of public support defined as the ratio of public expenditures to the total eligible project costs ranged from 46% to 50%.

Half of the projects were in the processing and preserving of meat and the production of meat products. The shares of the branches are shown in Figure 1. Least projects were in the beverage industry.

The indicator of the time administration of the grant application is defined as the time from the submission of the grant application to signing of the financing agreement. This indicator ranged from 5.0 to 8.6 months with the average of 5.8 months. The grant recipient was required to plan the project so that the request for payment was made within 36 months from signing of the financing agreement. The time since signing of the financing agreement to the request for repayment was from 1.4 to 24.3 months with the average of 11.6 months.

The interview with representatives of R&D

Interviews with representatives of research institutes focused on the development of innovation, the phase of the cooperation between the research institutes and enterprises, the barriers of collaboration and the focus of public supports. These interviews with the representatives of the departments dealing with the R&D in the food processing were in the context of the creation of the Rural Development Programme for the period 2014–2020. These interviews showed, among other things, as a suitable tool the creation of sub-enabling the provision of innovation vouchers for the food and beverage producers. It would be a subsidy to companies that meet the definition of a small and medium-sized enterprise (SMEs) according to the EC Regulation, for the purpose of the direct purchase of services and knowledge from universities, public research institutions and research organizations. The grant funds support the collaboration and transfer of knowledge between knowledge providers and SMEs.

CONCLUSIONS

The research shows, especially that:

– the sub-measures under the Rural Development Plan (I. 1.3.2) strongly support the transfer of re-

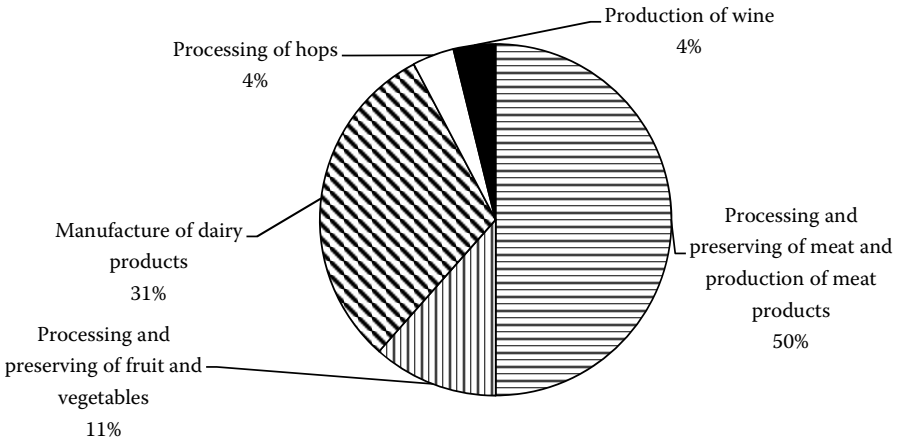

Figure 1. The project by the type of production

Source: own calculation

search results into practice and strengthen the innovation processes;
– the greatest weight is attached to the product innovations by the respondents; the product innovation is the introduction of the goods or services that are new or significantly improved with respect to their characteristics or the intended use, unlike the innovation process they are sold directly to the customers;
– as the main barriers to the increased cooperation on innovation, the respondents consider the problems of the macroeconomic environment and the administrative requirements especially for the SMEs;
– it is recommended to consider creating innovative vouchers on a wider scale.

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