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INNOVATIVENESS OF THE FOOD INDUSTRY IN POLAND ON THE EXAMPLE OF THE DAIRY SECTOR

The work presents the innovativeness of the food industry in Poland, based on the example of the dairy industry. It describes the functioning, development and improvement of its technologies for the client's needs. It presents a form of business activity in the food industry, which is a cooperative and focuses on the characteristics of the dairy sector.

Key words: *innovations, Food industry, dairying.*

Зміни, що відбуваються у світовій економіці, усе сильніше впливають на економічну активність харчової галузі в Польщі. На це значною мірою впливають темпи соціально-економічного розвитку та світові тенденції. Підприємства перебувають під великим тиском, оскільки збереження пасивного ставлення до інновацій асоціюється з регресом. Це не тільки включає в себе модернізацію, пов'язану з виробничим обладнанням, але також стосується методів маркетингу, методів управління та організації. Підприємці прагнуть задовольнити загально визнані очікування та потреби споживачів. Конкретні форми прояву цієї діяльності впливають, головним чином, з її характеру та типу продукції, що пропонується на ринку.

Польський продовольчий ринок не дуже інноваційний з точки зору продукції. Нові продукти – це, в основному, «імітації», тому фактично вони є копіями існуючих, створеними за допомогою нової упаковки і ароматизаторів, або тільки покращених для того, щоб зменшити виробничі витрати і поліпшити якість. У нашій країні небагато нововведень використовуються і в технологічних процесах (сучасні технології). Нові, повністю оригінальні продукти рідко з'являються на внутрішньому ринку. Діяльність у сфері розвитку нового асортименту зосереджена, головним чином, на поліпшенні якості (63%, це головна мета підприємств), збільшення кількості продукції (57%), виграш на новому

ринку (54%), а не на створення нових технологій виробництва. Польська продукція на ринку ЄС не має постійно визнаного бренду і може бути замінена більш дешевою продукцією з третіх країн. Також існує високий ризик заміни продукції на внутрішньому ринку. Проблема зміцнення та підтримки конкурентних позицій польських продовольчих підприємств полягає у підтримці якості на високому рівні з відносно низькими цінами пропонованої продукції. Незалежно від того, на якому рівні перебуває економіка, співвідношення «ціна – якість» є невід’ємним елементом вибору продукції.

Ключові слова: *інновації, харчова промисловість, молочна промисловість.*

Introduction

In a market economy, the innovativeness of the Polish food industry is a key element of its competitiveness. Success of a product on the market depends first of all on the application of an appropriate technology, which makes it possible to obtain an attractive product incurring as little expenditure as possible at the same time. Therefore, entrepreneurs in the food industry try to systematically introduce new products to their offer, effectively competing on the market not only with price, but above all, with nutritional value, attractive taste, smell and appearance, as well as durability. Such activity increases the demand for new technologies of food production and storage (Baranowska and Piątka 2016).

In order to meet the demands of the modern market, companies constantly look for and implement new solutions. Innovative activity is the basis for the company's success and building its competitive advantage (Kijek 2012). Research into the innovativeness of the dairy industry is important due to the fact that it is considered to be one of the most important branches of the food industry in Poland. The contribution the dairy industry in the sales of the food industry in 2016 exceeded 20%, and in employment was 14.6% (CSO 2017). Milk processing is one of the few branches of the food industry in Poland, where the cooperative form of management dominates. Dairy cooperatives are considered to be one of the branches of the Polish cooperative movement, which has the greatest potential and develops very dynamically. Products of this industry successfully compete on foreign markets of the European Union. Therefore, maintaining a high competitive position by Polish dairy cooperatives requires effective innovative activity (Zakrzewska 2016).

The aim of the article was to present innovation in the food industry on the example of the dairy industry.

Innovation of the food industry in Poland

Innovation is important in all sectors of the economy, including the food industry. Food industry is one of the most important industrial sectors in the national economy in each country and occupies a high position in terms of employment, turnover, added value and investment. Historically, food processing derives from the processing of agricultural products. This caused less interest in the introduction of new solutions by food producers in the past. Nowadays, food industry enterprises operate in conditions of significantly increased competition, both on the domestic and international market. This requires an improvement in productivity and innovative actions allowing to gain a competitive advantage in

the long run (Lemanowicz 2013). There are many types of innovations, but the most commonly used is the division proposed by Schumpeter (1960) and Oslo Manual (2008), where innovations are divided into four groups: product, process, organisational and marketing innovations (Fig. 1).

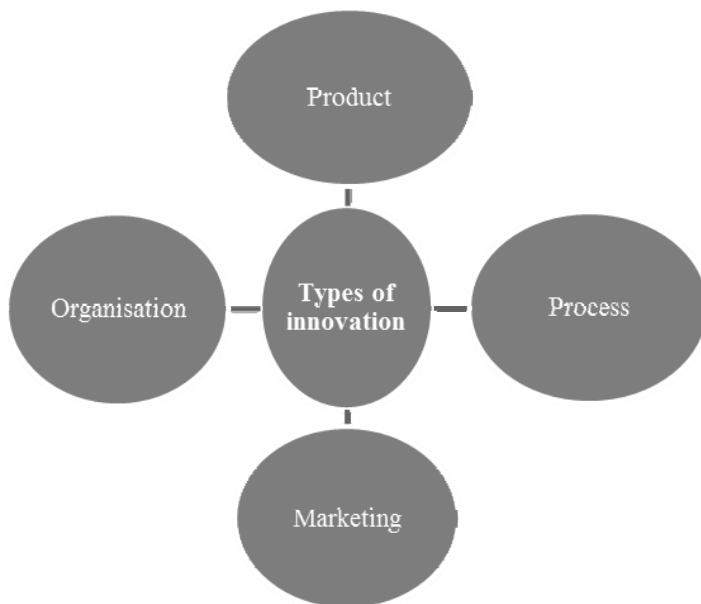


Fig. 1: Types of innovation

Source: own study based on Oslo Manual. 2008. *Guidelines for Collecting and Interpretin Innovation Data*, Thirt Edition, Organistion for Economic Cooperartion and Development, Statistical Office of the European Communities, Paris.

As a result of an integrating economy characterised by unpredictability and variability, it is important to be able to process, acquire knowledge and information. Entrepreneurship, knowledge and innovation are becoming very important. In order to survive on the market, companies need to constantly expand their business activities. This is the only way to meet customer expectations and reduce the risk of loss (Oleksiuk 2012).

When discussing the issue of innovation in scientific theories, which discuss the effects, causes and conditions of economic processes, one must not ignore the views of the sociologist and economist Florida (2010), who creates the notions of the so-called creative class and economy. He draws attention to the social dimension, motivation and willingness to implement innovations. He claims that only the society has the greatest significance. People are the most important and the greatest resource, and the source of growth is broadly understood technological, artistic, cultural and economic human creativity.

Innovation of a company is a synonym of modernity; it is implementing something that is not yet on the market (Grzelak 2011). It may concern the technology of creating products, technological lines, food additives or packaging

techniques. Innovations have a positive resonance, they are associated with something better, new.

In enterprises we can divide innovations into technological and non-technological ones. Technological innovations introduce new solutions concerning processes and products to the market. On the other hand, non-technological innovations do not strive for change in organisation and marketing. Majority of enterprises use technological innovations. Many companies on the market strive for innovation in a given field (Górka and Runowski 2017). Introduction of innovative changes is difficult and burdensome, because it must meet certain requirements and be characterised by appropriate skills. It is believed that economic success is achieved by those enterprises which will liberate and develop the ability to generate innovation like knowledge and intellectual capital (Janasz 2011).

There are constant changes in consumer preferences on the market, so everything should be analysed carefully. Innovations must relate to the technology used, taste, appearance, degree of processing, but also to the type and size of packaging. The ability to react to changes in our environment is very often the key to success. Innovative companies should have sufficient data on buyers, markets and a real concept of product marketing. In addition, they should assess the risk, time factor and chance of success well. A company must have a great deal of advertising possibilities. Innovation is not a goal in itself, its main objective is to achieve a competitive advantage among companies (Grzelak 2011).

Food industry in Poland

The food industry is an area of economic activity that meets the basic needs of the population. Therefore, it is one of the most widespread and diverse industries in the world. In Europe, it is one of the most important and dynamic industries. It consists of over 300 thousand companies employing 4 million people and their annual turnover exceeds 900 billion euros (Date&Trend 2017). In Poland, its importance in the domestic economy is evidenced by sales revenues at the level of over PLN 150 billion. and over 3.5% share in GDP.

The food industry is an important chain in the Polish food economy. It determines both the efficiency of the economy, as well as the efficiency of links between its individual spheres in a modern food economy, plays an organisational and integration role (Matysik-Pejas 2018). The food industry is a very varied area of economic activity. Due to the nature and type of products manufactured and raw materials used, it belongs to the areas of industrial activity characterised by a strong link with the raw material base and sales markets (Grzybowska 2012). The dominant feature of the Polish food industry is its ability to adapt its production structure to the constantly developing domestic and European markets. Enterprises operating in the food industry contribute to the improvement of the entire economy, stimulate local and regional development and support the functioning of large enterprises.

Each region of Poland is unique and specific. One of the food industry chains in Poland is the dairy sector. Poland is ranked among the leaders in milk production in the European Union. According to calculations, the amount of milk produced in Poland values at EUR 3.5 billion annually. The dairy industry is based on individual customers who produce about 12 million tons of milk annually (Jabłońska-Urbaniak 2010). For milk processing producers it is important that the market is saturated. This has a significant impact on the implementation of innovative measures based not only on technological processes and technologies, but also on the marketing and product dimension (Chądrzyński 2014).

Cooperative as a form of conducting business activity

The cooperative is a voluntary association of an unlimited number of people, who change and they submit different share fund, which conducts joint business activity on behalf of its members (Mierzwa and Jankiewicz 2017). It may conduct educational, cultural, social and environmental activities for the benefit of its members (Penc 2012). Another definition of a cooperative says that it is a group of people who, in order to achieve a common goal, undertake cooperation in an organized way. It is an association of people, not capital, and this is what distinguishes it from capital companies (Kwapisz 2012). A cooperative is an organisation in which the first priority is to satisfy the needs of its members, and the second is to bring profits to shareholders (Mroczko 2014). We distinguish many types of cooperatives, e.g. agricultural production cooperatives, dairy cooperatives, folk and artistic handicraft cooperatives or housing cooperatives (Table 1).

Table 1

Types of cooperatives

Type of cooperatives	Activity
Agricultural production cooperatives	They operate a joint farm and are active on behalf of individual farms of members of a given cooperative
Dairy cooperatives	The object of the Cooperative's activity is to conduct activities in the field of milk purchase, its processing and sale of finished products.
Cooperatives of folk and artistic handicrafts	They create new and cultivating traditional values of culture
Work co-operatives	The subject of their activity is running a joint venture, which is based on the personal work of the members of the cooperative
Cooperatives of farm wheels (agricultural services)	They provide services for agriculture and the rural environment
Housing cooperatives	They meet the needs of residents, as well as their economic and cultural needs, which result from living in a cooperative housing estate or building

Source: own study based on <http://przedsibiorstwo.edu.pl/spoldzielnia>, access date: 11.11.2018r.

Dairy cooperatives are one of those industries in Poland that is developing most dynamically and has the greatest potential. There are currently 221 dairy cooperatives in the country, of which 110 meet the criteria of production standards and EU standards. Dairy cooperatives focus mainly on investments in the production process, i.e. they invest in new technological lines, equipment, using their own resources and EU co-financing. This is necessary for dynamic and systematic increase of production quality. Cooperatives deal mainly with buying and processing milk. Economic conditions forced enterprises to take skilful actions in order to consolidate cooperation with contractors and strengthen their ties. Thanks to this, it improves the quality of dairy cooperatives' products. In addition, more and more attention is focused on investing in modern management, including IT systems and product innovation. The dairy industry is strongly related to the efficiency of production and increasing profitability. An important factor affecting the rate and level of investment is the use of EU funds (<https://www.krs.org.pl/>).

Dairy farming in Poland has been operating mainly on the basis of cooperative principles since its inception up to the present. The idea of cooperative movement, which was created in Western Europe over two centuries ago, saw social, joint and democratic values. Initial activities were of economic and practical importance. The main task of the cooperative was buying milk, processing it into dairy products, selling products and making a fair distribution of profits among members of the cooperative. The most important goal of creating a dairy cooperative was to improve the farmers living conditions (Wyszkowska 2007). For the dairy industry, typical enterprises produce a full range of products, which requires many technological lines and adequate capital resources for investments. It causes the dispersion of the potential of resources and especially the human factor. Enterprises in the dairy industry are divided according to different sizes and can be described as big or small, and in the small group significant positions are occupied by enterprises operating as cooperative.

Characteristics of the dairy sector in Poland

Each region of Poland is unique and specific. One of the food industry in Poland is the dairy sector. Poland is one of the leaders in milk production in the European Union. According to calculations, the value of milk produced in the country is 3.5 billion euros per year. The basis of the dairy industry are individual customers who produce about 12 million tons of milk per year (Jabłońska-Urbaniak 2010) (Table 2). It is important for the milk processing producers that the market should be saturated. This has a major impact on the implementation of innovative activities based not only on technological processes and technologies, but also on the marketing and product dimension (Chądzyński 2014). In Poland, the level of economic development is not the same. The reason for these disproportions is a multitude of factors with varying intensity of influence and character. There are many indicators that can be used to diagnose the level of territory development, but also to determine the differences between them.

Table 2

The production of cow's milk and the average annual milk milking from 1 cow in 2015

Province	Milk production				The average annual milk milking per cow in l	
	Altogether	Including individual farms	Altogether	Including individual farms	Altogether	Including individual farms
	In million liters		Per 1 ha of agricultural land in l			
Poland	12859,4	11959,1	884	903	5395	5307
Dolnośląskie	190,6	119,5	210	159	4548	3806
Kujawsko-pomorskie	928,3	808,8	872	838	5865	5660
Lubelskie	782,7	761,8	542	542	5370	5351
Lubuskie	85,2	61,9	218	184	3002	2704
Łódzkie	981,5	973,0	1009	1016	5201	5196
Małopolskie	324,6	310,7	604	597	3805	3733
Mazowieckie	2794,3	2779,9	1447	1468	5549	5553
Opolskie	266,6	164,2	537	440	6346	5551
Podkarpackie	230,4	222,3	401	407	4302	4275
Podlaskie	2564,8	2561,2	2424	2456	5673	5677
Pomorskie	350,4	312,9	461	491	4992	4860
Śląskie	240,8	217,8	675	659	5293	5105
Świętokrzyskie	256,4	252,6	533	530	4145	4114
Warmińsko-mazurskie	959,6	914,1	965	1049	5013	5009
Wielkopolskie	1731,2	1394,3	997	931	6283	6036
Zachodniopomorskie	172,1	103,1	206	162	4376	3667

Source: own study based on GUS „Rocznik statystyczny województw”, Warszawa 2016

Milk processing is one of the most important types of food activity in Poland. What is evidenced mainly by the production structure (about 14% of the food industry) and the number of employment around 10%. What's more, the sale of dairy products creates 16% of domestic food production and almost 3% of the sold value of industrial products in general (Rocznik Przemysłowy 2011). Milk production in Poland is diverse (Table 1). The most milk is produced in the Mazowieckie voivodship - 2794.3 million liters, and the least in the Lubuskie voivodship, as only 85.2 million liters. The situation in Podkarpackie is as follows: total milk production is slightly over 230 million l, including individual farms 222, 3 million liters. For 1 ha of agricultural land, 401 million liters of total milk is obtained, of which individual farms produce 407 million liters. As you can see the Podkarpackie takes 13th place in the ranking of cow's milk production. The average annual milk milking in the Podkarpackie voivodship is 4302 l, where in Poland it is 5395l.

Summary and conclusions

The changes that are taking place in the world economy are more and more strongly influencing the economic activity of the sector in Poland. This is greatly influenced by the pace of social and economic development and global trends. Enterprises are under great pressure, because maintaining a passive attitude is associated with regression. This does not only include modernisation activities related to production equipment, but also concerns marketing techniques, management methods and organisation. Entrepreneurs aim to satisfy broadly understood expectations and needs of consumers by running a business. The specification of this activity results mainly from its character, type of products offered on the market (Martynowska and Piechowski 2014).

The Polish food market is not very innovative in terms of products. New products are mainly “imitations” so they are copies of existing products, created through new packaging and flavours or only improved in order to reduce production costs and improve quality. In our country few innovations are used in technological processes (modern technologies). New, completely original products rarely appear on the domestic market. Activities in the area of development of new assortment and creation focused on quality improvement (63%, this is the main objective of enterprises), increasing the number of products (57%), and winning a new market (54%), and not on creating new production technologies (Rejman 2004). Polish products on the EU market do not have a constantly recognized brand and can be replaced by cheaper products from third countries. There is also a high risk of replacing products on the domestic market. The problem for strengthening and maintaining the competitive position of Polish food entrepreneurs is through maintaining quality at a high level with relatively low prices of the offered products. Regardless of the level at which the economy is located, price and quality are an inseparable element of product selection.

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