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## **TRENDS IN ANIMAL PRODUCTION FROM ORGANIC FARMING [REVIEW]**

### **Abstract**

Organic farming is an alternative method for dynamic agricultural system. Products that are obtained from organic farming are referred to as ecological or organic food [1]. These include products of animal origin that come from organic farming [2]. In the case of animal production in organic farming there are particular requirements for breed, animal welfare and feeding. Additionally, the origins of animals is also of crucial importance since, basically, such animals should be purchased from organic farms. However, there can be exceptions to this requirement, for instance, if the number of animals of a particular species or of a specific breed is not sufficient [3]. The main idea behind organic production is obtaining plant or animal products maintaining good soil structure, clean water and adjusting to the natural rhythm of nature. Enhancement of the social status has led to the situation where consumers pay more attention to the quality and origins of the products they choose. Numerous scientific papers from recent years, based on consumer's opinion, show substantial impact of welfare system on the quality of animal products. Since '90s there has been a systematic surge of interest in products from ecological systems and demand for these, which in turn affect the development of this agricultural sector.

The aim of the work is to compare the changes in organic production over the last 26 years in Poland with reference to the situation in Europe and whole globe. The research has been done on the basis of statistics since 1990 up till now as well as on scientific studies. Nowadays, there are increasing numbers of farms and redirections of production, as well as changes in the sizes of farms producing organic food.

### **Key words**

ecological production, organic, Poland, agriculture, farms

### **Introduction**

Farming has always been one of the most important branches of economy. Yet, apart from its crucial function, which is providing agricultural crops, attention has been shifted to the influence of agriculture on shaping the natural environment. Agricultural work is a significant part of the landscape which consists of soil, water, arrangement of agricultural area or grassland as well as crops which are grown there and animals that are grazed in such landscapes[4]. Principal agricultural system based on dynamic production of agricultural crops, through excessive use of chemical fertilisers and plant protection products, leads to soil erosion, groundwater contamination or decreasing of biological diversity [4,5]. Heavy use of agrochemicals can lead to the decrease in quality of food products and contaminating these with harmful substances. Such contamination may have negative impact on the health of people as consumers. Negative effects of contaminated food are manifested through allergies, weakened immune system or civilisation diseases [1]. This has resulted in the introduction of the principle of sustainable development by many countries, main assumption of which is combining political, social and economic actions with preservation of environmental balance and permanence of environmental processes so that future generations can enjoy the use of uncontaminated environment and natural resources. In consequence of such assumptions an alternative agricultural system was formed, organic farming [4]. In Poland, organic farming is dependent to both the EU legislation and other regulations: e.g. the Polish act on organic farming of 25 June 2009. Important standards are also: the act of December 21, 2000 on the commercial quality of agri-food products and numerous regulations of the Minister of Agriculture and Rural Development. One of the many EU regulations is Council Regulation No. 2092/91/ EEC of June 24, 1991 on organic farming and labeling of organic products [6]. Organic farming is a specific form of management and production. Food is produced based on natural methods, in clean and safe environment, practically without

chemical fertilisers, synthetic plant protection products and antibiotics, maintaining complete ban on growing genetically modified crops and feeding animals with feeds that are derived from such crops [7]. Moreover, such management system allows permanent soil fertility, animal health and obtaining products of good biological quality, which, in most cases, are technologically unprocessed [5]. Such products are referred to as organic food [1]. Organic food can be characterised by intensive aroma and taste, extensive freshness and abundance in vitamins and biologically active substances [8]. Negative side that contradicts the demand for organic products is their price which is 30-50% higher when compared with conventional food, yet, consumers are willing to pay more if products are of better quality [9,10].

Since 2000 there has been a growing interest in organic food among consumers worldwide, particularly in Europe and United States. Such situation is an outcome of enhancement of the social status worldwide, rise in consumer awareness of eating healthy and increased care for natural environment and animal welfare. Organic food is becoming more appreciated by consumers and organic farming is currently dynamically developing agricultural sector worldwide [11]. One of the most significant institutions responsible for proper development of organic farming is International Foundation of Organic Agriculture Movements, IFOAM, institution, which provides the principles for organic farming: health, ecology, fairness and care. These exact principles are the basis for the Act of 25 June, 2009 on organic farming that is binding in Poland [11].

The present article tries to answer the question: what is the organic farming potential in Poland? That's why, the aim of the study is to compare the changes in organic production over the last 26 years in Poland with reference to the situation in Europe and whole globe.

### Resources and methods

Agricultural and Food Quality Inspection (AFQI) is supreme administrative authority that is responsible for creation and execution of domestic system of control over organic agriculture [12]. AFQI started its activity on 1 January 2003 under the national Act of December 21, 2000 on Marketing Quality of Agricultural and Food Products. International Federation of Organic Agriculture Movements (IFOAM - Organics International) is the worldwide umbrella organization for the organic agriculture movement, which represents close to 800 affiliates in 117 countries. The study has been carried out on the basis of reports on the condition of organic farming in Poland published by AFQI, IJHARS, data from Federation of Organic Agriculture Movements, IFOAM, and other scientific papers. The work presents situations of organic farms in Poland with reference to Europe and the whole world. Changes that have been occurring since 1990 till the present day are compared. The comparison includes data such as: number of organic farms, the size of organic farms, percentage of arable lands of organic farms in total number of agricultural lands in Poland and sale of organic products in Europe and worldwide.

### History of organic farming

The beginnings of the development of organic farming in the world date back to 1930s. Pioneers of alternative management on a global scale include Sir Albert Howard, considered as organic farming pioneer, J.I. Rodale (United States), Rudolf Steiner (Germany), Lady Eve Balfour (United Kingdom), Hans Mueler (Switzerland) and many others. It was in these countries as well as in Denmark and the Netherlands that first biodynamic farms were formed [13,14,15]. First organic farm in Poland was formed in 1930 by S. Karłakowski in Szelejewo. War and the period of the post-war hindered the development of other farms in Poland, the emphasis was put on agricultural intensification [8,10]. Return to the idea of organic farming took place at the turn of 1970s and 1980s [8].



Fig. 1. Organic farming logo  
Source: [3]

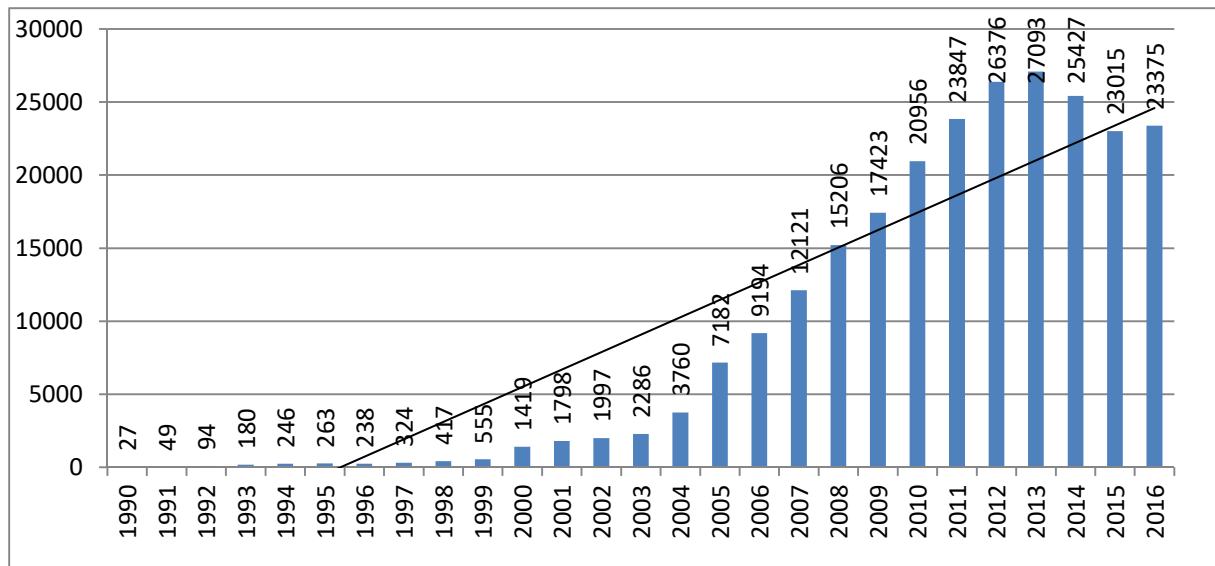


Fig. 2. Number of organic farms in Poland in years 1990-2016.

Source: [19], [21]

The first country to support organic farming politically was Denmark. It was there that first regulations of law, basic production criteria, principles of supervision and certification were introduced. In 1988 in Germany there were first subsidies for organic farmers, subsidies were obtained from agriculture projects within the European Union. It was the introduction of agri-environmental programmes that triggered the development of organic farming in Scandinavia, Italy and Austria [16]. Currently, all norms regarding production, distribution, control and labelling of organic products are determined by Council Regulation (EC) No 834/2007. Legal basis in Poland are regulated under the Act of 5 December, 2014 on amendment of the Act of 25 June, 2009 [17]. March, 2009 was the year of introduction of new logo for labelling organic products. The logo is the official symbol of the EU. It presents twelve stars that form a leaf on a green background (Figure 1.). One colour version is also allowed [18].

#### Organic farming in Poland in comparison with the situation in Europe and worldwide

In comparison with other European countries, natural environment in Poland is characterised as the one that has favourable wealth of nature, low level of soil degradation and traditional rural landscape [19]. The growth of organic farming in Poland traces back to 1990 when a group of farmers started transforming their farms between 1986-87 as well as to the formation of Association of Ecologically Produced Food, EKOLAND, in 1989, association, which in 1990 granted 27 farm certifications [8]. Till 1999 number of farms had been increasing very slowly and reached the maximum with 555 farms which was the effect of low demand for such products. In 2001, in comparison with 1999, the number of farms increased by 224%. Forthcoming Act on organic farming and introduction of subsidies were the factors that encouraged farmers to transform the production, mostly from extensive to organic [19]. Polish and EU integration allowed sales market for products labelled with the "leaf" and granting the financial support for the production which caused proliferation of organic farms in Poland from 2004 till 2013. There were 3800 farms with the area of 82 730 ha when the integration of Poland and EU took place (Figure 1). Introduction of funding regarding organic farming caused dynamic growth in number of farms, yet, it did not affect the production. Part of the farms fulfilled only the basic requirements, usually these were extremely extensive farms, sometimes with any production [20]. In 2013 number of organic farms accounted for 27 093 farms with the total area of 669 969 ha [21].

In 2014 the number of farms dropped by 6.1 percentage points in comparison with the previous year. In 2015 the decrease accounted for 10.48%. However, in 2016, number of organic farms rose by 1.54% and reached 23 375 organic farms with the total area of 536 579 ha in Poland. For comparison, in Czech Republic in 2016, there have been over 4 250 organic farms registered with a total area of over 505 000 ha [22]. In the case of Slovakia there have been over 416 organic farms registered with a total area of over 187 000 ha [23]. Figure 2. depicts a clear uptrend of biodynamic farms in Poland. Based on individual calculations it should be noticed that following the accession of Poland to the EU the number of organic farms rose by more than 6 times

whereas the size of organic farms by 6.5 times. In 1990 Poland was the last one to be on the list of largest producing countries of the EU, yet, in 2015 it was sixth. Among the countries that were larger producing countries than Poland were: Italy (52 609), Spain (34 673), France (28 884), Germany (25 078) and Austria (23 070) [19]. Upon data presented by Eurostat, more than 271.5 thousand of agricultural producers were engaged in organic farming in the EU in 2015. In 2010 there were 234.3 thousand of organic farmers in EU. This number rose by 13.7% in EU within the period of 5 years.

Table 1. The changes in the area under farming on the continents and in Poland in 2005, 2009, 2012 and 2015 (A), the numbers are given in millions of hectares and the percentage of the area under organic farming in the total area of agricultural lands in 2005 and 2012 (B).

| Continent     | A     |       |      |       |      | B    |      |
|---------------|-------|-------|------|-------|------|------|------|
|               | 1999  | 2005  | 2009 | 2012  | 2015 | 2005 | 2012 |
| Australia     | 5.3   | 11.81 | 12.1 | 12.6  | 22.8 | 2.57 | 2.88 |
| Europe        | 3.7   | 6.76  | 8.2  | 11.08 | 12.7 | 1.34 | 2.28 |
| Poland        | 0.069 | 0.16  | 0.42 | 0.66  | 0.58 | -    | -    |
| North America | 0.7   | 2.22  | 2.5  | 3.01  | 3.0  | 0.57 | 0.74 |
| South America | 1.2   | 5.06  | 8.1  | 6.84  | 6.7  | 0.81 | 1.11 |
| Asia          | 0.2   | 2.68  | 3.3  | 3.22  | 4.0  | 0.2  | 0.23 |
| Africa        | 0.2   | 0.49  | 0.9  | 1.15  | 1.7  | 0.05 | 0.11 |
| In total      | 11.3  | 29.02 | 35.1 | 37.9  | 50.9 |      |      |

Source: [20,21,24,25,26,27,28]

In 2010 the highest number of organic farmers fell on Africa (512.67 thousand), then it was Asia (503.86 thousand), South America (272.23 thousand), Europe (234.26 thousand), North America (16.87 thousand) whereas the lowest one on Australia (3.13 thousand) [24]. Though Australia belongs to countries with the lowest number of organic farmers, farmers in Australia have big farms, on average, it's 5611 ha per one farm. The smallest area of farms falls to Africa (2 ha) and Asia (6 ha). Farms in North America are quite substantial in size with the average of 157 ha, whereas the average farm in Europe reaches 36 ha and in South America 30 ha [24].

The area under organic farming in respect of the whole world increased almost four times within the last years. The most dynamic growth, and the most visible one, took place in Asia as the area under organic farming there rose 19 times, as a comparison, in Poland it was more than 7 times (7.4).

The growth of organic farming in Poland was more dynamic than the one in Europe (2.4) or North America (3.3). In Africa, over the period of 7 years (2005-2012), the percentage of the area under organic farming in the total area of agricultural lands rose almost by 55%, which was the greatest change of all, while in Europe by 41%. The least substantial change was noted in Asia.

## Changes of the concentration of organic farms in Poland

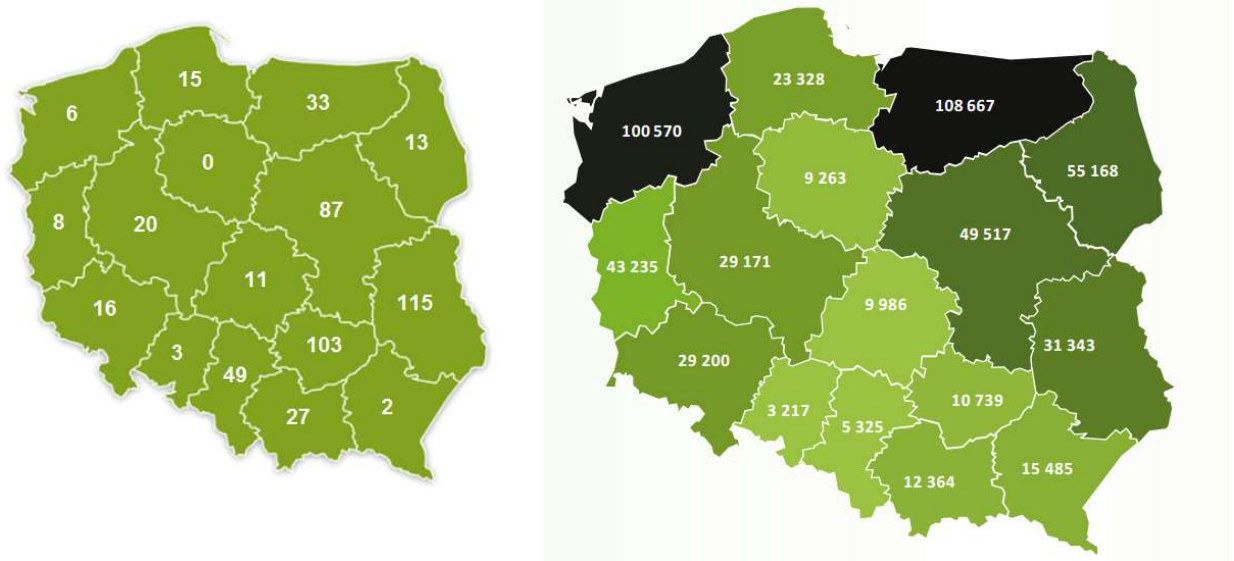


Fig. 3. Changes of the concentration of organic farms in Poland in 1999 and 2016.

Source: [21], [27]

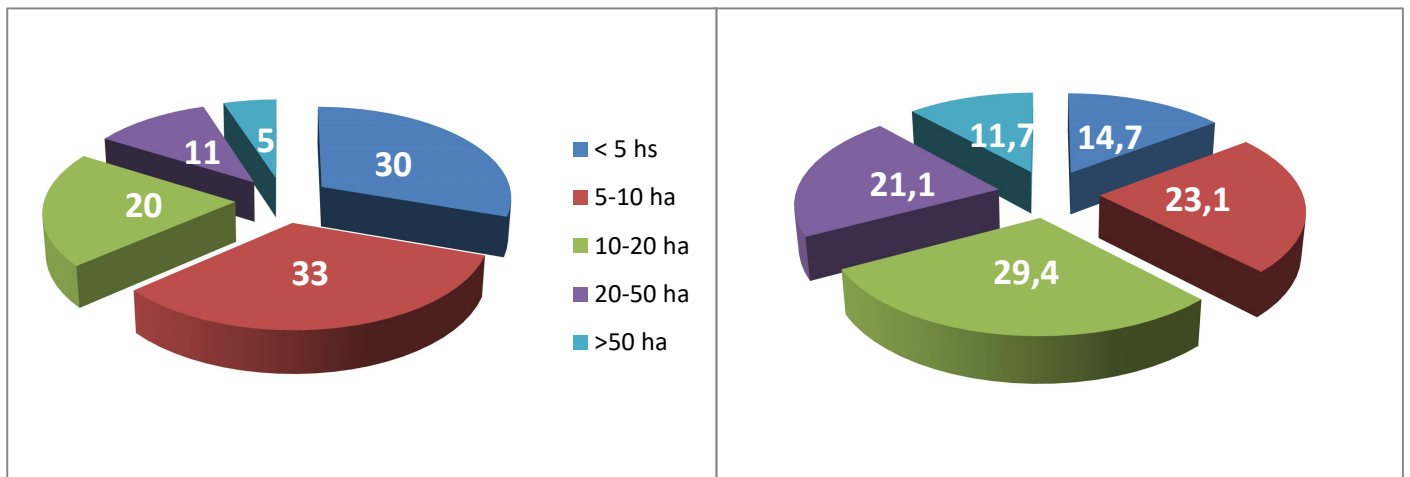


Fig. 4. Changes of the size structure of organic farms in 1999 (left) and 2016 (right) in Poland [%].

Source: [21], [27]

Over the course of the last 17 years the number of organic farms in particular voivodships in Poland has risen. In 1999 there were 555 organic farms, yet, in 2016 their number reached 23 375 farms. In 1999 the highest concentration of organic farms fell to Świętokrzyskie and Lubelskie voivodships (more than 100 farms in each of these). Through these 17 years the rise of consumer awareness, growth of the demand for organic products, providing subsidies for organic farming and the opening of the European market have led to the growth of the number of organic farms. In 2016 the highest concentration of these was found in Zachodniopomorskie and Warmińsko-Mazurskie voivodships and the lowest one in Opolskie and Śląskie voivodships. It turns out that along with the change in number of organic farms there was also the change in arrangement of the size of the area of organic farms. As stated by a lot of authors the factor that resulted in modifications of small unbacked farms in organic farming were the subsidies[20]. Farming in Poland can be characterised by quite a big dispersion of farms; there are mostly farms managed by families, farms which concentrate large number of farmers in general [29]. The size of organic farms is presented on Graph 2.. The right graph depicts the situation of 1999 whereas the left one of 2016. During the period of 17 years, the percentage of small farms decreased by 10 ha, from 63% to 43.1%. Percentage of small farms decreased by 31,5%, while the area of medium size farms (10-50 ha) rose by 63% in relation to 1999. Additionally, percentage of large farms (more than 50 ha) rose from 5% to 11.7%. This constitutes a growth of 134%. What also changed was the average size of organic

farms in Poland. On the grounds of individual calculations based on the reports of IJHARS it can be deduced that in 1999 a statistical farm in Poland had the area of 12.6 ha, while in 2016 the area of a statistical farm reached 22.96 ha.

### Characteristics of the Polish, European and global market

The growth of number of producers and the area under organic farming are the result of the growth of the demand for organic products. The demand exceeds the supply substantially which stimulates the development of this production method. Possibility to gain higher incomes through redirection of production makes farmers more interested in organic production. Still, this factor is the negative one since by investing in the market an institution very often causes market's misrepresentation [19]. In some cases this provokes starting farms that have no relation to the real production [20]. Organic food market in Poland is developing dynamically though there happens to be inappropriate adaptation of supply to the areas of real demand [17]. Farmers find it problematic to sell the goods that are produced on a small scale and to meet the market demand for the batch size of particular products. Insufficient number of factories that process organic products hinders the sale of such products. It forces farmers to sell their goods at regular prices to factories that are not specialised at organic farming [29]. Despite the obstacles Polish market can be characterised by dynamic growth up to 30% annually. In 2014 it constituted 3% of the global food market. The percentage of Polish organic food in Europe accounts for 5.7% in 2013 [17]. Germany is the leading country of organic products on the European market. In 2012 the sale of organic products there reached 7 040 million euros which constitutes 30% of the total value of turnover in Europe that was estimated for 22 795 million euros. Additionally, in 2017, organic food products generated revenues of about 10.04 billion euros, an increase compared to the previous year at 9.48 billion euros generated [30]. The second place on the EU's list belongs to France (4 004 million euros), then there is the Great Britain (1 950 million euros), Italy (1 885 million euros) and Switzerland (1520 million euros). Polish market was estimated for 120 million euros [31]. In 2015 the sale in Europe reached 29.8 billion euros, amounting to the sale of 8.6 billion euros in Germany and 167 million euros in Poland [25]. Growth tendency is also visible on the global market. Following 2000 the value of sales rose by 63 billion US dollars. In 2015 the USA generated 43.3 billion dollars which constituted 53% of the global turnover that was estimated for 81.6 billion US dollars (75,7 billion euros). Figure 3 presents changes in the global sale of organic products. The most dynamic changes and the rise in the turnover of organic products was noted in the first decade of the XXI century. Between 2000-2005 it was 79.8%, between 2005-2010 83.5%, which was the highest one, but taking into consideration recent times the growth of sale was at the level of only 38%.

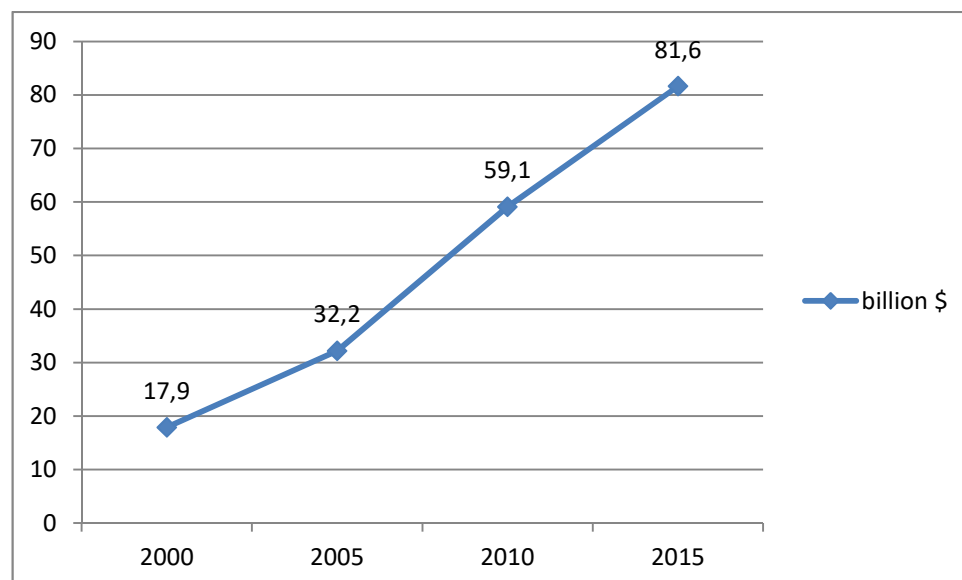


Fig. 5. Growth in organic food and drink sales on the world 2000-2015.

Source: [25]

### Summary and conclusions

Organic farming can be characterised as one that has been developing dynamically in Poland, Europe and globally. Organic food market is becoming more and more significant, in 2015 the value of the European

market amounted to 29 billion euros which makes 39% of the global turnover. As financial situation gets better, the interest of consumers in organic farming also rises. The factor that proves people's interest in organic products is the ever increasing percentage of sales of organic food. This constitutes great prospect for further development of organic farms in the world. Since 1990 there has been a tendency of growth of the number of organic farms in Poland as well as in the world. Along with the growth of the number of organic farms there is also the growth of the areas of land used biodynamically and their contribution to the total number of agricultural land. Over the course of the last 17 years there has been a change of structure of organic farms in Poland as small farms have been outnumbered by medium size and large farms. IFOAM- Organics International reported [6], that 57.8 million hectares were organically managed at the end of 2016, representing a growth of 7.5 million hectares over 2015; it was the largest growth that have been ever recorded. Which means, that organic farmland increases by 15%. In the case of countries, the largest organic share of agricultural are the Liechtenstein (37.7%) and French Polynesia (31.3%). While, the top 3 countries market in billion euro's: USA 38.9, Germany 9.5 and France 6.7. The highest increase in organic market growth was demonstrated in Ireland - 21.8%. This indicates that the market is still developing, and no a limit to demand has yet been identified.

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