

NUMBER AND STRUCTURE OF FARMS IN POLISH AGRICULTURE AND IN SELECTED EU MEMBER STATES BETWEEN 2005 AND 2013

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Abstract. The purpose of this study was to confirm the changes in the number and structure of farms in Poland, as well as in selected EU countries between 2005 and 2013. The selection of countries was intentional, taking into account the following criteria: level of gross domestic product (GDP) per capita and EU ‘seniority’ (older and newer states). A decrease in the number of farms was observed, along with the polarization process present in their structure, consisting in the occurrence of two leading farm groups: large commercial farms, being the main source of agricultural family income, and semi-subsistence or even substantial subsistence farms being the source of additional income. This cluster of farm groups was defined as auxiliary. Their share in the overall number of farms was dependent on the level of GDP per capita. In countries with high levels of GDP (Belgium, the Netherlands), it was lower and amounted to approximately 11%, while in the countries with a low level of GDP (Czech Republic, Hungary, Slovakia, Poland, Bulgaria, Romania), it went beyond 30%. In all countries, except for Bulgaria and Romania, the level of intensity of production organization in auxiliary farms was lower. This was also the for in the production volume per hectare of arable land.

Keywords: structure of farms, auxiliary farms, intensity, production organization, specialization of farms

INTRODUCTION

The introduction of the market system to the Polish economy after 1989 resulted in the emergence of tendencies typical of market economies. Their essence was the faster growth rate of labor-related costs in the national economy (with wages and salaries as the main element) and prices of productive inputs for agriculture as compared to the selling prices of agricultural products. In the period 1995–2016, wages and salaries in the national economy increased almost six fold (5.76), while the prices of productive inputs for agriculture increased more than threefold (3.19), and the selling prices of agricultural products more than doubled (2.12) (Ziętara and Adamski, 2018). The faster growth rate of labor-related costs in the national economy and prices of productive inputs for agriculture as compared to the selling prices of agricultural products resulted in a reduction in the unit agricultural production profitability. Farmers wishing to obtain the level of income from farm labor at the parity or similar level¹ have to increase the concentration of agricultural production. The simplest ways to achieve this objective include an increase in the area of

¹ Income parity: relation of income from farm labor per unit of own labor (Family Work Unit, FWU) to the average level of wages and salaries in the national economy.

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farms, share of intensive crops in farm area² and/or the number of farm animals maintained. Additionally, there are also farms at lower production concentration levels, which are not the basis for support of agricultural families. Working there also absorbed less than half of the total working time of such farmers intended for earning income meant to support the family. These farms are called auxiliary farms³ because they supplement the farmers' income from work outside the farm.

The share of auxiliary farms is decreasing; however, the supply of land is limited. The limited possibilities of increasing the area of farms induce the farmers to specialize the production. It reduces unit production costs and also meets the requirements of procurement and agricultural processing companies which are interested in systematic deliveries of products with a specified scale and quality.

The effect of the trends occurring in agriculture is a decrease in the number of farms and a change in their structure. The share of the following farms is changing: auxiliary farms with specialized production in the total number of farms; and the share of farms specializing in specific fields of production. Apart from economic effects, these phenomena also have social effects, since there is a decrease in the share of farming population in the total rural population and an improvement in the material status of families of holders of commercial farms being the main source of income in relation to the material status of other rural inhabitants. These issues result in the need to examine changes of the structure of farms and related trends.

PURPOSE OF THE STUDY, DATA SOURCE AND RESEARCH METHODS

The purpose of the study is to identify the trends in the changes of the selected structures of the Polish farms in comparison with farms from selected countries of the

European Union. This analysis deals with changes in the number and structure of farms captured in total and only for auxiliary farms, taking into account farm specialization processes. From the sample, specialized farms were separated in total and from that farms specialized in field crops, horticultural crops and permanent crops, and animal production, and additionally a class of farms with multilateral production were not specialized.

As mentioned above, the analysis covered Polish farms and farms from selected countries of the European Union. Purposeful selection was used for selecting the latter, based on the following three criteria: geographical latitude of a country similar to Poland, EU membership seniority and the share of auxiliary farms in the total number of farms in the country in the final year covered by the analysis.

Considering the above criteria, four groups of the countries were identified:

I – Belgium and the Netherlands, “old” EU countries with a smaller share of auxiliary farms in the total number of farms;

II – Austria, Denmark, Finland, Germany and Sweden, “old” EU countries with a greater proportion of auxiliary farms in the total number of farms

III – Czech Republic, Slovakia, and Hungary, EU members since 2004; countries with a larger share of auxiliary farms in the total number of farms than previous groups. Poland also meets the criteria of this group.

IV – Bulgaria and Romania, EU members since 2007; countries with a smaller share of auxiliary farms in the total number of farms than in group III.

All the data used in the article was retrieved from Eurostat as at January 16, 2017 (<http://appsso.eurostat.ec.europa.eu>; downloaded on November 13, 2017). The data refers to 2005 and 2013. Farms specializing in animal production are not divided into production types. Tabular summaries were used in the analysis of the gathered data.

POLARIZATION PROCESSES IN THE STRUCTURE OF FARMS

An important determinant of structural transformations in agriculture is the question of whether a particular country has a market or a planned economy system in place. In countries with a planned economy, including Poland in the period 1950–1990, the planned system was implemented, in which the role of the market was limited. Prices of goods did not result from supply and

² Intensive crops (e.g. field production of vegetables and horticulture) are characterized by high labor and capital outlays per unit of land used agriculturally.

³ Apart from the aforementioned two extreme groups of farms, there is a third group referred to as “farms at a crossroads” which fail to provide agricultural family incomes at the parity level. Their operators have two options: the first is to enhance the farm to make it fully agricultural; the second is to discontinue farming activities or reduce its area and treat it as an auxiliary farm.

demand but were fixed officially. In this situation, the structural transformation in agriculture was determined by government policies. Individual farms with a highly fragmented structure dominated in the Polish agriculture. They were deprived of development opportunities, especially related to an increase in the area. After the collapse of the agriculture collectivization program in 1956, priority in the agricultural policy was given to development of the state-owned sector, namely state farms and agricultural production co-operatives (Trzęsowski, 1985). In this situation, the opportunities for improvement in the structure of farms were highly limited. This is illustrated by the changes in the area of farms in the countries with a market economy and in Poland. In 1960–1990, the area of farms in Denmark and in the Netherlands more than doubled (and more than tripled in Germany) whereas in Poland it increased by only about 7% (from 5.9 to 6.3 ha) (Ziętara and Adamski, 2018).

After the political and economic shift in Poland in 1989, which resulted in introducing the market system, Polish agriculture faced an evolution in the structure of farm characteristic for countries with a market economy. This is because labor costs (wages and salaries) in the national economy grew faster than prices of productive inputs purchased by farmers and than selling prices of agricultural products. These trends occur in all countries with a market economy (Ziętara and Adamski, 2018), and result in a decrease in unit profitability of agricultural production. In order to obtain satisfactory levels of farming income (e.g. at the parity level), farmers must increase the scale of production, mainly by extending the area of farms. This results in a polarization in the structure of farms, consisting in the fact that on one hand, there is an increase in the number of large commercial farms, while on the other there are farms which fail to provide the farming family with an income at the parity level. In the case of the latter, farming income becomes a supplement to earnings from other sources. These are subsistence, social, and semi-subsistence farms (Wąs, 2015). The basic identification criteria for this group, are usually their area (below 5 ha of arable land) or economic size (up to EUR 8,000 worth of SO⁴) (Wąs, 2015; Ziętara, 2015). Another criterion is the farmer's working time on a farm which is below 50% of

his/her total working time. In this paper, these farms are referred to as “auxiliary farms.”

Polarization processes in the structure of farms were pointed out by Wąs and Małażewska (2012), Wigier (2013), Wąs (2015) and Ziętara (2015). When analyzing the structure of farms in Poland, M. Wigier emphasized the dual nature of Polish agriculture: on the one hand, there are farms with a small economic potential and limited development opportunities; on the other hand, there are economically strong commercial farms delivering 80% of food traded in the market (Wigier, 2013). According to M. Wigier, farms of the first group perform important functions in the field of sustainable development and preservation of biodiversity despite low production. This statement is highly questionable, since according to Kuś and Matyka (2014): “In the case of minor farms (1–10 ha), especially the smallest ones (1–5 ha), there is no rational management. [...] About 80% of arable land was sown with cereals, mostly including species classified as extensive (oats, rye, cereal mixes)”. In 2010, the share of small farms (up to EUR 8,000 worth of SO) in the total number of farms in EU-27 countries amounted to 73.2%. In EU-15, it was substantially lower and amounted to 52.8%, whereas in EU-12 it was 88.7%. In highly developed countries, such as Denmark, France, the Netherlands and Germany, it ranged from 11.6% to 22.9%, while in Romania and Hungary it was 96.8% and 89.7%, respectively. In Poland, the share of this group of farms was 69.7%. On the other hand, the share of farms with a maximum size of EUR 8,000 worth of agricultural production (expressed as SO), did not exceed 1% in Denmark, France, the Netherlands and in Germany. In Hungary and Poland, it was 28.3% and 12%, respectively. The share of arable land in the total national area was approximately two times higher than the share of these farms in the production volume expressed as SO. These numbers suggest less effective use of land by small farms (Ziętara, 2015).

CHANGES IN THE NUMBER OF FARMS AND IN THE SHARE OF AUXILIARY FARMS IN POLAND COMPARED TO OTHER EU COUNTRIES

The characteristics of changes in the total number of farms, including auxiliary farms, in the analyzed groups in 2005–2013 are specified in Table 1. In the first two groups, the number of farms in total and auxiliary farms

⁴ SO (Standard Output): standard value of agricultural production expressed in EUR thousand (calculated as 5-year average level).

Table 1. Changes in the number and structure of all and auxiliary farms between 2005 and 2013

Group of countries*	2005		2013		Growth rates** (%)	
	A	B	A	B	A	B
Number of farms per country (thousand)						
I	66.7	7.3	52.5	5.8	-21.3	-20.5
II	151.7	53.7	117.1	41.9	-22.8	-22.0
III	275.2	102.9	96.5	65.9	-64.9	-36.0
IV	2395.4	845.7	1942.0	429.1	-18.9	-49.3
Poland	2467.5	798.9	1429.0	482.7	-42.1	-39.6
Share of auxiliary farms in the total number of farms (%)						
I	10.9		11.0		0.1 percentage points	
II	35.4		35.8		0.4 percentage points	
III	37.4		68.3		30.9 percentage points	
IV	35.3		22.1		-13.2 percentage points	
Poland	32.4		33.8		1.4 percentage points	

* Group I – Belgium and the Netherlands; Group II – Austria, Denmark, Finland, Sweden and Germany; Group III – Czech Republic, Slovakia and Hungary; Group IV – Bulgaria and Romania.

** $(2013/2005 - 1) \times 100$.

A – Farms in total.

B – Auxiliary farms.

Source: Eurostat, n.d.

reduced by approximately 21%. On the other hand, in the Group III (farms in countries who joined the EU in 2004), the decrease in the total number of farms was approximately three times faster while the decrease in the number of auxiliary farms was almost 50% slower. This may be explained, for instance, by the fact that economically weaker farms were merged with, or taken over by, economically stronger ones (see Table 3). On the other hand, the opposite occurred in farms from the Group IV, characterized by a much larger decline in the number of auxiliary farms than farms in the total number of farms.

In Poland, changes in the number of farms from the respective groups did not resemble any of the trends occurring in other countries with short membership seniority in the European Union (countries from the Group III and IV). They were, however, similar to that observed in group 1 and 2 countries, although the changes were approximately two times faster. Polish agriculture was probably catching up with the change in agricultural

structure resulting from the country functioning in centrally planned economy for approximately 40 years.

Changes in the number of farms in both groups were reflected in the evolution of the agricultural structure, i.e. the share of auxiliary farms in the overall number of farms. In the Group I, the share of auxiliary farms was the smallest and was stable. In both years, it amounted to approximately 11%. In the Group II, it was also stable but more than three times greater than in the Group I. The share of auxiliary farms in 2005 in the other two analyzed groups was similar and ranged between 35.3% and 37.4%. In the following years, as a consequence of changes, the share of auxiliary farms in the Group III increased by almost 31 percentage points in 2013, and in the Group IV, it decreased by about 13 percentage points.

In Poland, the share of auxiliary farms in the total number of farms underwent small changes between the years being compared. In the quantitative extent, the

Table 2. Changes in land area, livestock and agricultural output of auxiliary farms between 2005 and 2013 (%)

Group of countries*	Share in the national area of arable land (%)		Share in the national livestock population** (%)		Share in the country's agricultural output*** (%)	
	2005	2013	2005	2013	2005	2013
I	4.0	4.0	2.8	2.2	2.1	2.0
II	16.4	20.8	6.5	10.0	9.1	12.6
III	7.8	7.6	6.8	5.5	7.4	6.8
IV	11.0	9.7	13.3	18.2	14.1	13.6
Poland	16.1	17.9	9.5	7.1	12.1	12.0

* See note for Table 1.

** Number of farm animals expressed in LSU.

*** Output calculated as SO^a.

Source: Eurostat, n.d.

^aSO (Standard Output) – production value calculated using the coefficient method. Standard output is the average per hectare value of production specified with agricultural activity, plant or animal within one year, per hectare or per animal, in average production conditions prevailing in the region concerned. It is calculated as a 5-year average in order to eliminate fluctuations in the production value.

share in both years was similar to the one in the farms of the countries of the Group II.

The share of auxiliary farms in the total number of farms in the country reflects their social importance. It relates to the share of families for whom the owned farm is an additional (rather than main) source of income. However, apart from that, auxiliary farms use agricultural land, participate in animal breeding and provide agricultural products. Their importance within these scopes (and the respective changes between 2005 and 2013) are summarized in Table 2. The share of auxiliary farms as users of agricultural land in the analyzed groups of “old EU” countries remained unchanged between 2005 and 2013 (Group I) or increased (Group II), while it decreased in both groups of countries with a shorter membership seniority in the European Union (Group III and IV). Characteristically, in 2005, the largest share of auxiliary farms in the use agricultural land resources was recorded in Poland and in the second group of EU countries covered by the analysis. Direction of this tendency of changes was also convergent, so in 2013, despite a slightly slower pace of changes in Poland, the situation persisted.

It is not difficult to see the discrepancy between the assessment of importance of auxiliary farms measured by their share in the total number of farms in the analyzed groups of countries and their share in the national

area of arable land. It is caused by differences between the average area of farms in the country and the average area of auxiliary farms (Table 3). The average area of arable land calculated for all farms in all analyzed groups of countries and in Poland was higher than the average area of arable land calculated for auxiliary farms.

The importance of auxiliary farms was even smaller when their share in the national livestock population was adopted as the evaluation criterion. Farms sold products of plant origin or processed products as a part of animal production. In the latter situation, there was an increase in value added, not only because of the mere fact of processing plant products, but also for other reasons. By-products of animal production (known as organic fertilizers) are valuable agents improving soil fertility, while by-products of plant production are, in a given situation, an important and cheap component of animal fodder. Therefore, the number of animals per unit of an agriculturally used area, also referred to as livestock density, is important for the operation of agriculture. An excessively low livestock density suggests a small extent of processing products of plant origin and indicates problems with providing adequate soil fertility. Livestock density in Poland and in the analyzed groups of EU countries is shown in Table 4.

In the study period, the highest average livestock density was reported in both groups of “old EU” countries.

Table 3. Average area of all farms and auxiliary farms (ha) in 2005 and 2013

Group of countries*	2005		2013		Growth rate** (%)	
	A	B ^d	A ^c	B ^d	A ^c	B ^d
I	25.4	9.6	31.0	12.5	22.0	39.2
II	37.9	17.8	46.7	24.0	23.2	34.8
III	39.2	4.6	74.2	13.6	89.3	195.6
IV	4.2	1.4	10.9	2.7	159.5	92.8
Poland	6.0	3.0	10.1	5.3	68.3	76.7

*, ** See all notes for Table 1.

Source: Eurostat, n.d.

Table 4. Livestock density in all farms and auxiliary farms in 2005 and 2013 (number of LSU*** per hectare of arable land)

Group of countries*	2005		2013		Growth rate** (%)	
	A	B	A	B	A	B
I	3.03	2.06	3.16	1.71	4.3	-17.0
II	0.92	0.44	0.94	0.43	2.2	-2.3
III	0.53	0.42	0.44	0.31	-17.0	-26.2
IV	0.48	0.77	0.30	0.51	-37.5	-33.8
Poland	0.72	0.42	0.64	0.25	-11.1	-40.5

*, ** See all notes for Table 1.

*** LSU or LU (Livestock Unit) – reference unit equivalent to one cow.

A – Farms in total.

B – Auxiliary farms.

Source: Eurostat, n.d.

Furthermore, these indicators underwent a slight increase at that time⁵. In terms of livestock density, Polish agriculture was third among the analyzed groups; however, in 2013, livestock density decreased instead of increasing, similarly as in other countries with short membership seniority in the European Union. The situation in the auxiliary farms was different. In all analyzed

cases, livestock density decreased in the period 2005–2013, though to the greatest extent in both groups of countries with short membership seniority in the European Union, as well as in Poland. A large decrease in the auxiliary farms was an important cause of a drop in the average stocking density in those countries. In 2013, in some of the analyzed auxiliary farms (including in Poland), livestock density was so low that it failed to address the farms' demand for organic fertilizers, except for cases where substitutes were used.

Table 2 also indicates the share of auxiliary farms in the value of national agricultural output. Only in the Group IV of countries (Bulgaria and Romania) and in Poland, they contributed 12% or more to national agricultural output 2005 and in 2013. In 2005–2013, this

⁵ In the first analyzed group of countries, the average livestock density was so high that it significantly exceeded the level deemed to be the maximum density necessary to fertilize soil with fertilizers of organic origin. It is very likely that these farms bought large quantities of animal fodder to add more value from their processing activities as a part of animal production, and the resulting surplus of organic fertilizers was subsequently traded.

threshold was also exceeded by auxiliary farms in the Group II of countries. In the majority of the analyzed groups of countries (Group I, III, IV) and in Poland in 2013, the share was lower from that recorded in 2005 by 0.1 percentage points, 0.6 percentage points, 0.5 percentage points and 0.1 percentage points, respectively. These observations may be commented on as follows: in 2005–2013, the importance of auxiliary farms as suppliers of products of agricultural origin followed a slight downward trend.

CHANGES IN THE STRUCTURE OF FARMS IN POLAND AND IN THE EXAMINED GROUPS OF COUNTRIES IN 2005 AND 2013 BY DEGREE OF SPECIALIZATION AND AGRICULTURAL TYPE

An interesting question concerns the share of farms engaged in specialized production in Poland as compared to farms from other EU countries. In order to provide an answer, the following types of farms were identified based on available data: farms specializing in field crops, horticultural crops, permanent crops and in animal production. However, this data did not enable the identification of farms specializing in the production of milk, slaughter cattle, slaughter pigs or poultry as a part of animal production. Additionally, the class of farms with heterogeneous (non-specialized) production was identified.

Table 5. Changes in the share of specialized farms in Poland and in groups of other EU countries in 2005–2013

Group of countries*	Share of specialized farms (%)		Differences in percentage points
	2005	2013	
I	80.2	83.5	3.3
II	77.4	83.7	6.3
III	43.4	59.4	16.0
IV	40.1	43.4	3.3
Poland	48.7	66.9	18.2

* Group I – Belgium and the Netherlands; Group II – Austria, Denmark, Finland, Sweden and Germany; Group III – Czech Republic, Slovakia, and Hungary; Group IV – Bulgaria and Romania. Source: Eurostat (n.d.). Retrieved Nov 13th 2017 from: <http://appsso.eurostat.ec.europa.eu>

The annex presents the values characterizing changes in the structure of farms in Poland and in groups of selected EU countries. The criterion used was the share of farms engaged in specialized production (arranged by agricultural types, including auxiliary farms) in the total number of farms. On the other hand, Table 5 compares changes in the share of farms with specialized production in the total number of farms in Poland and in groups of selected EU countries.

Two conclusions result from the Table above. Firstly, in the years compared, the share of farms engaged in specialized production was lower in Poland and in countries with short membership seniority in the European Union (Group III and IV). Secondly, only some of them (including Poland) were catching up with the two groups of farms from “old EU” countries (Group I and IV). As a result, in 2013 the distance separating agriculture in Poland in terms of the share of specialized farms was smaller than the share in the Group I and II of countries by nearly 17 percentage points, whereas in other countries with short member seniority in the EU this share was greater by at least 7.5 percentage points.

In Poland in the period 2005–2013, attention is drawn to the large increase in the share of farms which became specialized in field crops, to such an extent that in 2013 this share was almost 50% of all the farms in the country (Table 6). In all analyzed groups of other EU countries, this share was at least 8.5 percentage points lower (in “old EU” countries, it was even at least 16.1 percentage points lower). An important reason for the above was the rapid growth of the share of auxiliary

Table 6. Changes in the share of farms specializing in field crops in Poland and in groups of other EU countries in 2005–2013

Group of countries*	Shares of specialized farms (%)		Differences in percentage points
	2005	2013	
I	16.2	24.6	8.4
II	30.3	33.1	2.8
III	25.8	40.7	14.9
IV	24.8	28.2	3.4
Poland	31.4	49.2	17.8

* See notes for Table 5. Source: as in Table 5.

farms specializing in field crops in Poland (from 42% in 2005 to about 63%, i.e. ca. 21 percentage points, see Annex to this paper). Owners of small and very small farms choose their production structure so as to reduce the outlays of their own labor, to make sure farming does not interfere with their (or their family members') non-agricultural salaried activities. Instead of engaging in animal production, these farms are focused on crops that are not labor-intensive, such as cereals and other plants with similar characteristics (Józwiak, 2013; 2016; Wojewodzic, 2010).

In most cases analyzed, a negative downward trend was affecting the share of farms specializing in horticultural crops (Table 7). Poland did not show any special qualities in this aspect in the analyzed years compared to the majority of country groups under review. However, it should be emphasized that the share of farms specializing in horticultural crops in the Group I was still (despite a deep drop) approximately five times higher than in Poland.

Table 7. Changes in the share of farms specializing in horticultural crops in Poland and in groups of other EU countries in 2005–2013

Group of countries*	Share of specialized farms (%)		Differences in percentage points
	2005	2013	
I	13.6	10.7	-2.9
II	2.5	2.1	-0.4
III	2.2	1.9	-0.3
IV	0.7	0.8	0.1
Poland	2.3	1.9	-0.4

* See notes for Table 5.
Source: as in Table 5.

Table 8 presents the characteristics of changes in the share of farms specializing in permanent crops. The table shows that the highest decrease in the share of this group of farms was observed in Poland. A drop in the share was also recorded in both of the analyzed groups of “old EU” countries. On the other hand, the groups of countries with the shortest membership seniority in the European Union maintained, or even increased, their share from 2005.

Table 8. Changes in the share of farms specializing in permanent crops in Poland and in groups of other EU countries in 2005–2013

Group of countries*	Shares of specialized farms (%)		Differences in percentage points
	2005	2013	
I	2.7	2.5	-0.2
II	6.3	5.9	-0.4
III	8.0	8.0	0.0
IV	2.4	4.6	2.2
Poland	5.1	4.5	-0.6

* See notes for Table 5.
Source: as in Table 5.

Attention is drawn to the substantial difference between the share of Polish farms specializing in breeding and rearing animals in the country's total number of farms and the situation in both groups of “old EU” countries (Table 9). In this aspect, the situation in Poland was similar to that found in both of the analyzed groups of countries with short membership seniority in the European Union. The situation in Poland was not improved by the greater share of farms engaged in heterogeneous production (Table 10), most of which conducted mixed, plant and animal production activities. In Poland, the total share of farms specializing in breeding and rearing animals and those with heterogeneous production

Table 9. Changes in the share of farms specializing in breeding and rearing animals in Poland, and the groups of other EU countries in 2005–2013

Group of countries*	Shares of specialized farms (%)		Differences in percentage points
	2005	2013	
I	47.7	49.7	2.0
II	38.3	42.6	4.3
III	7.4	8.8	1.4
IV	12.2	13.0	1.8
Poland	9.9	11.3	1.4

* See notes for Table 5.
Source: as in Table 5.

Table 10. Changes in the share of heterogeneous (non-specialized) farms in Poland and in groups of other EU countries in 2005–2013

Group of countries*	Shares of farms engaged in heterogeneous production (%)		Differences in percentage points
	2005	2013	
I	19.8	16.5	–3.3
II	22.6	16.3	–6.3
III	7.4	8.8	1.4
IV	59.9	53.4	–6.5
Poland	51.3	33.1	–18.2

* See notes for Table 5.
Source: as in Table 5.

amounted to ca. 44% in 2013 and was at least 14.5 percentage points lower than in both compared groups of “old EU” countries.

The income of Polish farms was limited by the absence of animal production based on plant products of farms and/or purchased fodder. This situation also raised questions in relation to meeting the requirement of organic soil fertilizing in the majority of farms, unless a suitable amount of respective substitutes could have been used for this purpose.

Worse still, Table 10 shows that in Poland in 2005–2013, the drop in the share of farms with heterogeneous production was many times greater than the growth in the share of farms specializing in breeding and rearing animals. If continued, this trend will deteriorate the situation presented in the previous paragraph.

CONCLUSIONS

The analysis covered changes in the number of farms and major structures which occurred in 2005–2013 in Polish agriculture in the context of changes which occurred in other selected EU countries. This paper focused on: changes in the share of auxiliary farms which require less than half of the total time the farmer spends on earning incomes meant for family support; and changes in the share of farms specialized in field crops, horticultural crops, permanent crops and in breeding and rearing animals. Also addressed were the changes in the share of farms engaged in heterogeneous

(non-specialized) production. The criteria used in the selection of EU countries for the comparisons were as follows: geographical latitude similar to that of Poland; EU membership seniority; and the share of auxiliary farms in the total number of farms in the country. The selected countries were divided into four groups: (1) Belgium and the Netherlands; (2) Austria, Denmark, Finland, Sweden and Germany; (3) Czech Republic, Slovakia, and Hungary; and (4) Bulgaria and Romania. All numeric data used in this paper was retrieved from Eurostat as at January 16, 2017.

The general conclusion from this analysis is that the behavior of Polish farms places them between the farms from countries with the longest membership seniority in the European Union (“old EU” countries) and those from countries who became members in 2004 and 2007. More detailed observations arising from this analysis are specified below.

- In Poland, changes in the total number of farms, including auxiliary ones, did not resemble any of the patterns occurring in other countries with short membership seniority in the European Union (countries from the Group II and IV). However, the pattern of changes was similar to that observed in Group I and II countries, although the reduction in the number of farms between the years compared was approximately two times larger in Poland. Polish agriculture was catching up with the change in the agricultural structure resulting from the country functioning within the centrally planned economy for nearly fifty years.
- The share in the number of auxiliary farms in the total number of Polish farms underwent small changes between the years compared, similarly as in the I and II comparable group. However, in the quantitative extent, the share in both years was similar only to the share in the agriculture of countries of the Group II.
- In 2013, the share of auxiliary farms in the total number of farms in Polish agriculture exceeded 33%. The processes occurring in farms of this kind were therefore of great social importance for the national farming population, and also for a large part of rural communities.

On the other hand, auxiliary farms had less economic importance. This is reflected by their share (ca. 18%) in the county’s arable land area. Auxiliary farms were of even lower importance when considering their share in

the domestic value of agricultural output (12%). However, they had the lowest economic importance in terms of the number of farm animals kept. This share was only ca. 7% of the total livestock population in 2013 on a countrywide basis, expressed in LSU. Worse still, it was lower by approximately 2 percentage points than in 2005.

- In the years compared, Poland and the countries with short membership seniority in the European Union had a lower share of farms engaged in specialized production. Only some of them (including Poland) were catching up with the two groups of farms from “old EU” countries (Group I and II). Therefore, when it comes to the share of specialized farms in 2013, Poland did not lag that far behind “old EU” countries as other countries with short membership seniority in the European Union.
- In 2005–2013, Poland experienced a noticeable increase in the share of farms which became specialized in field crops, to such a high extent that in 2013 this share was nearly 50% of all the farms in the country. In all other analyzed groups of EU countries, this share was lower by at least 8.5 percentage points. An important cause of this phenomenon was the rapidly growing share of auxiliary farms specializing in field crops, which increased from 42% in 2005 to about 63% in 2013, i.e. by 21 percentage points.
- In most cases analyzed, a downward trend was affecting the share of farms specializing in horticultural crops. Poland did not show any special qualities in this aspect compared to the majority of country groups under review.
- It was observed that Poland experienced the highest decrease in the share of farms specializing in permanent crops. In the groups of “old EU” countries (Group I and II), the decrease was lower by about 50%. On the other hand, no drop was recorded in the groups of countries with short membership seniority in the European Union (Group III and IV).
- There was a very large difference between the share of Polish farms specializing in breeding and rearing animals in the total number of farms in the country and the situation in both groups of “old EU.” In this aspect, Poland was in a similar situation to the one which occurred in both of the analyzed groups of countries with short membership seniority in

the European Union. The situation in Poland was not improved by a greater share of farms engaged in heterogeneous production activities (Table 10), most of which were active in mixed plant and animal production. In Poland in 2013, the total share of farms specializing in breeding and rearing animals and those with heterogeneous production was ca. 44% and was by at least 14.5 percentage points lower than in both compared groups of “old EU” countries.

The value added by Polish farms was limited by the absence of animal production based on plant products of farms and/or purchased fodder. This situation also raised questions in relation to meeting the requirement of organic fertilizing of soils in the majority of farms, unless suitable amount of substitutes could have been used for this purpose.

In conclusion, it is worth adding that all observations arising from this paper could be explained based on knowledge held by the authors. The issues should be analyzed further, e.g. the causes of the decrease in the share of Polish farms specializing in permanent crops or the causes of the common downward trend affecting the share of farms specializing in horticultural production. Explanations should also cover the reasons behind a low share of farms using organic fertilization of animal origin. The lack or insufficient level of such fertilization lowers the average yields of crops, while it increases their fluctuations in the subsequent years.

There is one more suggestion. Poland and some of the countries with short membership seniority in the European Union differ greatly from “old EU” countries in the average area of arable land of farms. Thus, it is worth considering the possibility of a comparative analysis within a limited group of farms with a similar area of arable land.

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ANNEX

A1. Structural changes in farms grouped ^a by level of specialization and agricultural type (%)

Specialization levels and agricultural types	Farms in total		Including auxiliary farms	
	2005	2013	2005	2013
Group I*				
With specialized production:	80.2	83.5	70.2	90.8
field crops	16.2	24.6	24.2	28.3
horticultural crops	13.6	10.7	6.1	5.4
permanent crops	2.7	2.5	3.0	2.2
breeding and rearing animals	47.7	49.7	36.9	54.9
With heterogeneous production	19.8	16.5	29.8	9.2
Group I in total	100.0	100.0	100.0	100.0
Group II				
With specialized production:	77.4	83.7	83.7	87.6
field crops	30.3	33.1	40.9	43.9
horticultural crops	2.5	2.1	0.9	0.8
permanent crops	6.3	5.9	6.6	5.7
breeding and rearing animals	38.3	42.6	35.3	37.3
With heterogeneous production	22.6	16.3	16.3	12.4
Group II in total	100.0	100.0	100.0	100.0
Group III				
With specialized production:	43.4	59.4	51.3	64.4
field crops	25.8	40.7	32.7	48.6
horticultural crops	2.2	1.9	2.1	1.1
permanent crops	8.0	8.0	11.0	8.6
breeding and rearing animals	7.4	8.8	5.5	6.1
With heterogeneous production	56.6	40.6	48.7	35.6
Group III in total	100.0	100.0	100.0	100.0
Group IV				
With specialized production:	40.1	43.4	38.8	49.4
field crops	24.8	28.2	34.3	29.2
horticultural crops	0.7	0.8	0.5	1.0
permanent crops	2.4	4.6	3.6	6.4
breeding and rearing animals	12.2	13.0	0.3	12.8
With heterogeneous production	59.9	53.4	61.2	50.6
Group IV in total	100.0	100.0	100.0	100.0
Poland				
With specialized production:	48.7	66.9	56.8	73.5
field crops	31.4	49.2	42.0	63.1
horticultural crops	2.3	1.9	2.2	1.0
permanent crops	5.1	4.5	7.1	4.2
breeding and rearing animals	9.9	11.3	5.5	5.2
With heterogeneous production	51.3	33.1	43.2	26.5
Group IV in total	100.0	100.0	100.0	100.0

* See notes for Table 5.

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