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**LINKAGES OF FARMS WITH THE MARKET OF AGRICULTURAL PRODUCTS
AFTER POLAND'S ACCESSION TO THE EUROPEAN UNION
ВРЪЗКИ НА ФЕРМИ С ПАЗАРА НА СЕЛСКОСТОПАНСКИ ПРОДУКТИ
СЛЕД ПРИСЪЕДИНЯВАНЕТО НА ПОЛША КЪМ ЕВРОПЕЙСКИЯ СЪЮЗ**

Bożena Karwat-Woźniak, Michał Dudek*

Institute of Agricultural and Food Economics – National Research Institute

*E-mail: michal.dudek@ierigz.waw.pl

Abstract

The necessity to respond to the growing competition is associated with the continuous restructuring and modernisation of economic entities. The process also applies to agricultural holdings. A reflection of the undertaken measures in order to adapt to the ever-changing operating conditions was the transformation in the production and market activity as well as in the growing diversification of the position of farms in the agricultural products market, and consequently, their economic situation. Using the results of the representative field studies conducted periodically by the IAFE-NRI on a sample of about 0.2% of the agricultural holdings, the changes in contacts between agricultural producers and the agricultural products market have been analysed. The changes in that aspect have been shown in terms of external conditions and their impact on the transformations in basic agricultural structures. The results from the research showed that the on-going processes were immanent, but their pace was, to a large extent, determined by the economic situation in agriculture and in the non-agricultural labour market. However, the accession of Poland to the European Union (EU) was a turning point in the decisions made by farmers with respect to the role performed by their agricultural holdings and thus to the nature of the undertaken adaptation measures determining the intensification of contacts with the market. As a consequence, the changes have been reported in the processes taking place so far. The group of farms not involved in agricultural activities has been virtually eliminated. The market marginalisation of the growing group of agricultural holdings was accompanied by increasingly stronger production concentration processes and the development of the segment of entities whose socio-economic efficiency was comparable to that of non-agricultural enterprises, namely large-scale units. That group became an owner of more than 1/2 of the agricultural land and delivered almost 3/4 of the agricultural production to the market.

Key words: market contacts, agricultural holdings, commercial farms, large-scale farms, production potential.

INTRODUCTION

Meeting the market economy requirements and achieving the economic and production balance is associated with the necessity to undertake continuous measures to adapt to the current environment, which involves the constant restructuring and modernisation of economic actors. This process also applies to agricultural holdings. The knowledge concerning the adaptation in agricultural holdings indicates that the key factors determining the nature and pace of changes in the agricultural production are outside the agricultural sector. The point is, first of all, the level and growth rate of the domestic economic development, which largely affect the transformations in agriculture [Tomczak, 2005]. This does not change the fact that the indispensable standard in the effective adaptation of

farms to the exogenous conditions is the principle of sovereignty of farmers in making economic decisions, and especially the level and structure of production factors, size of employment, size, structure and intensity of production. This principle provides the conditions for the meaningful operation of entities under the competition. Moreover, it creates favourable circumstances to undertake various development projects, related mostly to modernisation of technical means and increased labour productivity in the agricultural activity, and consequently increased own and general prosperity. This requires taking various activities related to the appropriate selection and planning of the factors of production being at the farmer's disposal based on the economic calculation, in harmony with the market and environmental environment.

Achieving the most beneficial effects from the farm involves not only the full use of production assets. In some situations, it is more beneficial to change the structure, to reduce or even to abandon the agricultural production combined with the reallocation of or reduction in production resources and with shifting, mainly labour, to non-agricultural sectors of economy. Divestments are one of the important methods to restructure the specific economic organisation, which an agricultural holding is [Wojewodzic, 2010].

The characteristic of the market economy is the variability of the environment in which economic actors operate. Minor changes in the management conditions are taking place constantly, even during one year (e.g. seasonal price fluctuations). However, there are periods when the operating conditions are subject to deep and durable transformations. Then, farmers must respond, so as to restore the desired economic and production balance of their farms and to achieve the established objectives [Józwiak, 2013].

The effects of various adaptation measures undertaken by farmers are, *inter alia*, reflected in the changes in the production and market activity and in the increasing diversification of the position of farms in the agricultural products market, and, consequently, their economic situation. Although Polish farms have already gotten over the period of the basic adaptation for the effective activity based on the signals from the market, another change that could have disrupted the economic balance of farms achieved after the systemic transformations, was the Polish membership in the EU.

The main objective of this paper is to investigate how the processes of integration of the Polish economy with the EU structures affected the diversification of production and market attitudes of users, and, consequently, the intensity of relations between agricultural holdings and the market. These transformations taking place have been analysed in terms of the changes in the external conditions and their impact on the transformations in basic agricultural structures.

MATERIALS AND METHODS

Basic empirical material, which was used to prepare the paper, were the results of field studies conducted periodically (every 4–6 years) by the Institute of Agricultural and Food Economics-National Research Institute (IAFE-NRI), mainly from 2000, 2005 and 2011. The study covered all farms with an area of more than 1 ha of agricultural land

(AL)¹, managed by natural persons², i.e. individual agricultural holdings, which are, in fact, family farms [Sikorska, 2014]. The analysed entities³ were located in the same 76 villages across the country. The villages were chosen purposefully so that the size of the analysed farms was proportional to the actual agrarian structure of farms [Sikorska, 2001].

Nowadays, the size of farm to a lesser extent designates its production potential and economic effects achieved from the conducted agricultural activity, since the land increasingly turns from a productive factor into the environment and space of agricultural production [Sikorska, 2013]. However, in Polish agriculture, the area of farm is still significantly associated with other economic characteristics of the farm [Zegar, 2009] and, above all, with the level of equipping with technical means of production [Karwat-Wozniak, 2011], achieved production results, as well as socio-demographic characteristics of farmers and [Dudek, 2010], main objectives of the agricultural activity, and even the level of environmental sustainability [Zegar, 2009]. For this reason, it may be concluded that the analysed group reflects the socio-economic structures of Polish agriculture, which is a dominant segment of the sector⁴.

Each time, the analysed entities accounted for about 0.2% of the actual number of individual agricultural holdings, and their number in the latest study (2011) amounted to more than 3.3 thousand and almost all of them (99.7%) pursued the agricultural activity. The large size of the analysed sample and the application of the same study method, which determined the data continuity and comparability, allowed to recognise the processes taking place in the attitudes of farmers towards their agricultural property and to analyse the changes in the nature and scope of contacts with the market. The panel character of the study provided an opportunity to determine the trends and growth rate of the changes taking place, and the value of representativeness allows to keep the reliability of the described trends.

The analysis covered the years 1996–2011, with particular consideration given to the period of 2000–2011, by cycle before (2000–2005), and after (2005–2011) the accession of Poland to the European

¹ Pursuant to the Act on the establishment of the agrarian system (Journal of Laws 2003 No 64, item 592), the agricultural holding should have at least 1ha of AL.

² Despite certain conceptual differences, the terms family farm and agricultural holding are used interchangeably.

³ In the text of the paper, the terms: agricultural holding and entity are used interchangeably.

⁴ In 2010, individual agricultural holdings account for 99.7% of all farms in Poland and owned 88.9% of agricultural land, while in 2013 this percentage amounted to as many as 90.8%.



structures. The adoption of such observation periods was determined by empirical material used in preparing this paper and by the fact that, since the beginning of the 21st century, there has been a change in the operating conditions related to the integration with the EU market, which disturbed the economic balance of agricultural holdings appearing after the systemic transformations in Poland recorded in the mid-90s of the 20th century [Józwiak, 2013]. The empirical data from field studies, used in the analysis, each time applied to the business year or the status as of the end of such year, which in the paper is briefly defined as the years 1996, 2000, 2005 and 2011. It should also be stressed that the information on the investment activity covered the projects implemented between the studies. In preparing the paper, we applied the statistical analysis methods using statistical analysis, including structure ratios and growth rate ratios.

When considering a relation between the farms and the market, and thus when determining its type, we may apply many criteria, including the criterion of the commercial production volume (value)⁵, the value of which was determined arbitrarily in absolute terms [Production objectives...2004, Economic Report...2006], or relative measures, determined based on the relations of the value of commercial production of entities with respect to the average level of production placed on the market by the overall analysed group [Szemberg, 1991, Karwat-Woźniak, 2006], or to the value of the final [Market activity...2013] or global production [Rychlik, Kosieradzki, 1981]. In this paper, to determine the intensity of the relation between agricultural holdings and the market, the criterion of the commercial agricultural production (value of the production sold in the business year) has been applied. Taking, as the main criterion, the sales volume of the production from farms, which is also one of the most important determinants of their economic strength [Woś 1998], overall economic development and market position [Adamowski, 1998], two basic segments of farms have been distinguished:

- **without contacts (relations) with the agricultural products market** – that group included the entities producing exclusively for own purposes (self-subsistence units), i.e. pursuing the agricultural activity, while not selling agricultural production.

- **contacting the agricultural products market** – that group was composed of the units selling agricultural products. Among those entities,

two subgroups have been distinguished: **farms producing mainly for own purposes (self-subsistence farms)** and **farms producing mainly for sale (on the market), i.e. commercial farms**. In determining the limit volumes of the commercial production, implying the membership in one of the above-mentioned subgroups, we used the ratio of the commercial agricultural production value of the given entity to the average value of production sold per 1 unit placing its production on the market in the entire sample in the given year. In 1996, this indicator amounted to EUR 5,899, in 2000 – 6,240, in 2005 – 9,024 and in 2011 – 12,782. It was considered that the entities whose commercial production value did not reach 20% of the average value for individual periods should be included into the subgroup of **mainly self-subsistence farms**, therefore, not market-oriented farms. On the other hand, the entities whose sales level is at least equal to the limit value were included into the subgroup of **commercial farms**⁶, i.e. market-oriented units. In addition, within under the group of commercial agricultural holdings, the entities were distinguished in case of which the commercial agricultural production volume allowed to obtain income from work at the family farm, per 1 fully employed person⁷, at the level at least equal to average non-agricultural income. The commercial production volume, specified in this way, accounted for at least twice the average sales value from the agricultural holding in the given period, and the entities meeting that criterion were called **large-scale farms**. These farms due to achieved income and management efficiency had the competitive capacity.

As a result, 4 categories of farms have been distinguished, i.e. /1/ **only** and /2/ **mainly self-subsistence**, /3/ **commercial** and /4/ **large-scale**. In addition, due to the change in the definition of the agricultural holding⁸ resulting from the introduction, since 2010, of gradual changes in the methodology of agricultural studies aimed at adapting to the EU standards and including the transformations taking place in Polish agriculture, a group of **agricultural**

⁶ According to the adopted assumptions, in 2011 the commodity holding placed on the market the production worth at least EUR 2,560.

⁷ Employment at the holding has been expressed as an FTE equivalent, i.e. as the number of fully-employed persons, which is identical to the situation when 1 fully-employed person works at the agricultural holdings for 2,120 hours a year, i.e. 265 working days of 8 hours a day which corresponds to 1 annual work unit (AWU).

⁸ According to the applicable definition, agricultural holdings do not include owners of at least 1 ha of AL, not running the agricultural activity as well as owners with an area of less than 1 ha of AL, pursuing the small-scale agricultural activity [Statistical Yearbook...2014].

⁵ The commercial production criterion is also applied in grouping farms by objective of the agricultural activity or their market activity.

holdings not running the agricultural activity has been distinguished. This approach was dictated by the will to show the overall impact of the Common Agricultural Policy (CAP) on the attitudes towards the possessed agricultural property.

RESULTS AND DISCUSSION

The distribution of selected types of farms

A characteristic feature of Polish farms is their great diversification, also from the point of view of the intensity of their relations with the market. Also, the process of changes in this area is going on and its speed and nature is determined mainly by the exogenous factors. However, permanently, there are the entities characterised by the different production activity and, consequently, by the different market activity. This argument is also confirmed by the results of the analyses carried out, from which it appears that in the analysed years as well as in the entire period of the 90s there were all above-mentioned types of farms. Although from the macroeconomic point of view, important is not the fact of the presence of the above-mentioned groups of agricultural holdings, but their number, as their mutual proportion evidences the situation of the entire sector and possibility of guaranteeing food security of the population.

From the studies conducted it results that in the period of European integration there was virtually no situation where the function of the used agricultural property was limited to the family home, while from the beginning of the economic transformation until the accession to the EU, the phenomenon of setting aside the entire land of the farm was growing gradually. It is evidenced by the fact that in the years 2005-2011 the percentage of units without the agricultural activity was reduced by a dozen or so times (from 3.7% to 0.3%) (tab. 1), i.e., to the level from before the systemic transformations. The restriction and then elimination of setting aside entire farms⁹ should be connected with covering Polish agriculture with the CAP and the possibility of obtaining direct payments.

The elimination of a phenomenon of not using agricultural land for production purposes according to the rules of good agricultural condition was accompanied by an increase in the size of the group of entities, which conducted the agricultural production for own purposes only. Farms without contacts with the market, which act only as extended households are a permanent feature of Polish agriculture and were also present in the period

⁹ In the further part of the paper, the entities of this type have been ignored. This resulted not only from their incidental occurrence but also from a small amount of agricultural land within that group. Even in the period of the greatest intensity of not pursuing the agricultural activity, that situation applied only to 1.4% of the total area of agricultural land covered by the IAFE-NRI study.

preceding the change in the economic system¹⁰, as their existence is determined not only by economic but also by cultural factors [Sikorska, 2003].

From the studies it results that the growing conduction of the agricultural production for own purposes only was clearly strengthened by the Polish accession to the EU. In the years 2005-2011, the share of entities without contacts with the market increased from 9.4 to 27.5%, i.e. by 3 percentage points (pp) on a yearly average. In the period directly preceding the accession (2000-2005), the share of such entities increased by 0.3 pp. on a yearly average and in the years 1996-2000, it was 0.4 pp.

During the functioning within the EU structures, the trends recorded in case of units producing mainly for own purposes were clearly different than those in the previous years. In the years 2005-2011, the percentage of such entities declined from 31.4 to 24.4%, i.e. by 1.5 pp. on a yearly average, while before the accession to the EU the size of this category of agricultural holdings was increasing, and the pace of that process was speeded up. In the years 1996-2000, the share of such entities increased by 1.1 pp. on a yearly average, while in the years 2000-2005 it was 1.3 pp.

In interpreting the changes in the number of agricultural holdings which are only and mainly self-subsistence farms, we should take into account the situation in the non-agricultural labour market, which has improved after the accession to the EU. The increase in employment opportunities outside the farms intensified the diversification processes in the professional activity of the farming population. Taking up employment usually involved a reduction in the income-generating significance of the agricultural activity. This situation was usually associated with the gradual termination of contacts with the market, and not with the total liquidation of the agricultural holding, as possessed land was either a security in the event of job loss, or sort of a capital investment. At most, the cultivated land was adapted to the self-subsistence needs, and the surplus of this resource was most often leased. The intensity of tendencies to abandon the production for sale was also strengthened by an increase in the requirements to be met by agricultural producers so as to place their production on the market.

Facing the increasing competition and maintaining a position on the market as well as obtaining satisfactory income from the agricultural activity was associated with carrying out development activities. In most cases, this task was too difficult,

¹⁰ From the Institute's data it results that in the decade preceding the systemic transformations i.e. in the 80s of the 20th century, in 1988 the percentage of units without the commercial production was 1.5%.



Table 1. Changes in the structure of agricultural holdings by type of contacts with the agricultural products market

Farms	Structure (in %) in			
	1996	2000	2005	2011
- with no agricultural activity	1.1	2.8	3.7	0.3
- only self-subsistence	4.3	7.8	9.4	27.5
- mainly self-subsistence	20.7	24.9	31.4	22.4
- commercial	73.9	64.5	55.5	49.8
including large-scale	8.2	11.1	12.0	15.0

Source: own calculations based on IAFE-NRI surveys 1996, 2000, 2005 and 2011.

therefore, the group of commercial farms was regularly decreasing (tab. 1). As a consequence, in 2011, less than half of agricultural holdings were commercial entities. The process of the diminishing group of commercial units was immanent as it took place regardless of the external management conditions. However, along with the increasing opportunities to use the EU funds supporting modernisation of agricultural holdings and the increasing farmers' ability to act under the conditions of competition, the intensity of this process was decreasing. While in the years 1996-2000, the percentage of commercial entities decreased by almost 2.4 pp. on a yearly average, in the years 2000-2005 the same indicator amounted to 1.8 pp., and in the years 2005-2011 it was even lower and amounted to less than 1.0 pp.

The significant decrease in the group of commercial farms was accompanied by strong processes of concentration and evolution of very market-oriented units, with very strong and stable relations with the market, with the level of the socio-economic efficiency comparable to the efficiency of entities from non-agricultural sectors, i.e. large-scale holdings. In the analysed period, the group of such entities has grown nearly twice, while their number was still small. In 2011, the share of large-scale entities among all entities operating in the sphere of agricultural production amounted to 15.0% (tab. 1).

From the perspective of food security and competitive opportunities and potential of Polish agriculture, of importance is, first of all, how large is the group of agricultural holdings with the economic potential, thus, what is the extent of prevalence of large-scale entities among commercial farms. From the analyses carried out it results that the integration processes with the EU and the related increase in the competition, and, at the same time, the increasing flow of financial resources for the development of agriculture, accelerated the process of evolution of the segment of agricultural holdings with the competitive potential. According to the survey data, in the years 2000-2005 the share of large-scale entities in all

commercial units increased by 0.8 pp. on a yearly average, while in the post-accession period the same indicator amounted to 1.4 pp. Consequently, in 2011, every third commercial agricultural holding had the competitive potential, while six years before – every fifth, and in 1996 only every seventh.

The improvement in the proportion between large-scale and commercial entities, recorded in the analysed period, and especially after the accession, indicates an increase in the competitive potential of our agriculture and the possibility of providing food security as well as the increasingly better position of agriculture in the European Agricultural Model (EAM).

Selected determinants of the activity of farms in the agricultural products market

An important component of the market activity is to decide about the role of the farm towards the user and the members of their family and, as a consequence, to launch measures in order to achieve the set objective of the agricultural activity. The decision on the type of projects to be implemented is determined by many factors, among which the most important include the location of the professional activity of the agricultural family members and the production (economic) potential of the agricultural holding.

The impact of the farm's importance in meeting the needs of the family and in the allocation of employment on the intensification of contacts with the market is evidenced by, *inter alia*, the main source of income for the family. From the analysis of the data on the sources of income, it results that in each period selected for analysis there was a rule that the larger was the importance of the agricultural activity in the positioning of the professional activity and as a main source of income, the closer were contacts with the market. This is evidenced by, *inter alia*, the differences in the percentage of entities with predominant income from agriculture between the compared groups of farms (tab. 2). Among large-scale entities, the cases where income from work at the farm was lower than that from earnings were occasional.

Table 2. Main sources of income of the selected groups of family farms

Percentage of farms with the highest income from	Farms								
	self-subsistence						large-scale		
	only			mainly					
	2000	2005	2011	2000	2005	2011	2000	2005	2011
- agricultural activity	-	0.6	2.8	8.6	8.5	12.0	99.4	98.2	98.1
- earnings	57.1	58.5	64.8	57.2	55.7	60.5	0.4	0.6	0.6
- social benefits	42.9	40.9	31.3	34.2	35.5	27.2	0.2	-	-
- other		-	1.1	-	0.3		-	1.2	1.3

Source: own calculations based on IAFE-NRI surveys 1996, 2000, 2005 and 2011.

However, it must be added that in each case large-scale entities were the main place of work for at least 2 persons. Among entities producing only and mainly for own purposes, earnings were more and more predominant, with the declining importance of social benefits. At the same time, covering Polish agriculture by the CAP and obtaining direct payments resulted in the increased percentage of entities for which the agricultural activity was the biggest source of income. Nevertheless, such families were still relatively rare. In 2011, the farming activity was dominant income for 2.8% of families from farms without the commercial production and 12.0% of families using mainly self-subsistence units.

At the same time, many adaptation measures are reflected in changes in the production potential of agricultural holdings, which is determined by a number of factors, and may be illustrated by very diversified parameters. Following the correlation between the individual parameters and the sales value¹¹, for illustrating the production potential we selected the data regarding the area, livestock density, mechanisation level, labour force quality and, above all, the skills of managers of farms, which are formally reflected by the level of their education, especially agricultural¹².

From the analysis of the characteristics of agricultural holdings by type of contacts with the market, it results that in each period selected for analysis, farms differed in terms of comparable indicators, and large-scale entities performed particularly positively (tab. 3, 5, 6, 7, 8). In addition, there was a progress in the process of differentiating the analysed groups of entities in terms of the value of indicators selected to illustrate their production potential, or the possibility of further changes.

¹¹ To illustrate the correlations, we used the correlation coefficient and presented only those parameters for which the correlation coefficient was statistically significant.

¹² The value of the correlation coefficient was different in the analysed period. In case of the area, it ranged from 0,888 to 0,815, livestock density – from 0,798 to 0,723, farmer's age – from 0,514 to 0,503, education of holding managers – from 0,683 to 0,767.

From the comparison of changes in the production potential of the statistical unit with the various activity on the market it results that in the analysed period the processes of concentration of the productive assets in commercial, and especially large-scale units have intensified. Against this background, the situation in farms producing only or mainly for own purposes was slightly different. Those types of entities were dominated by divestments, consisting in adapting the value of the possessed productive assets to the needs of production for the family purposes. As a consequence, there was an increase in a distance in the equipment level between market-oriented farms and those producing only or mainly for own purposes.

Large-scale farms performed particularly positively against the background of other groups. This applied to all analysed characteristics and to the entire analysed period, but those differences were exceptionally stronger after the accession to the EU, particularly in the capital-labour ratio. For example, in 2011 67% of large-scale units were well-equipped with means of mechanisation, while in the group of holdings producing mainly for own purposes the same indicator was 1%. In 2005, the same shares amounted to, respectively, 59% and 2% and in 2000 – 22% and 2%.

The relatively dynamic elimination of technical backwardness was a necessity for market-oriented entities – in order to meet the growing competition and maintain or improve their market position they had to modernise techniques and technologies of the production. Also, the inflow of resources from EU funds for investments in farms and the improvement in the agricultural situation resulted in an increase in income from the agricultural activity. That situation revived the investment production activity, especially in the group of large-scale entities (tab. 4).

Changes also took place in the number of livestock and the nature of those changes was determined by the intensification of contacts with the market (tab. 5). In only or mainly self-subsistence farms, the processes of abandoning the animal production

**Table 3.** Technical equipment of selected groups of farms

Farms	Share (in %) of entities well equipped with means of mechanisation			
	1996	2000	2005	2011 r.
- only self-subsistence	0.8	0.6	-	-
- mainly self-subsistence	2.5	2.1	1.9	1.1
- commercial	7.6	9.1	27.4	35.1
including large-scale	19.1	22.1	59.1	66.9

Source: own calculations based on IAFE-NRI surveys 1996, 2000, 2005 and 2011.

Table 4. Investment activity of selected groups of farms

Specification	Farms								
	mainly self-subsistence			commercial			large-scale		
	2000	2005	2011	2000	2005	2011	2000	2005	2011
% of farms with investments	13.4	19.2	21.2	44.3	56.1	78.0	75.2	80.5	87.2
Value (in thousand EUR) of investment per 1 entity*	1.2	2.1	4.1	6.9	12.3	22.4	13.3	30.0	54.9

Source: own calculations based on IAFE-NRI surveys 1996, 2000, 2005 and 2011.

Table 5. Livestock density in the selected groups of farms with the livestock production

Farms	Livestock density in (LU) per 100 ha of AL			
	1996	2000	2005	2011
- only self-subsistence	49.6	47.9	47.7	46.0
- mainly self-subsistence	61.0	51.1	50.9	43.9
- commercial	69.3	67.7	82.6	84.8
including large-scale	61.3	62.9	102.5	105.9

Source: own calculations based on IAFE-NRI surveys 1996, 2000, 2005 and 2011.

and reducing the scale of animal breeding were dominant. As a consequence, the livestock density, mainly in the latter category of agricultural holdings, was decreasing. In 2011, the livestock density per 100 ha of AL in the group of mainly self-subsistence farms was 43.9 LU and was lower by 13.8% when compared to the year 2005, by 14.1% when compared to the year 2000 and by 28.0% when compared to 1996.

A different phenomenon was visible in agricultural holdings producing mainly for market purposes, especially in the group of large-scale entities. Admittedly, animal breeding was implemented in the decreasing number of large-scale entities, but those trends were gradually disappearing¹³. Here, the trend was accompanied by

¹³ Both in 2005 and in 2011, the percentage of large-scale holdings conducting the livestock production was the same and amounted to 75%, while in the years 2000-2005, the percentage of large-scale entities with animal breeding was decreasing by 0.8 p.p. on a yearly average, and in the years 1996-2000, the speed of abandoning the livestock production was twice bigger.

an increase in the scale of animal breeding in large-scale entities, which did not abandon the animal production. As a consequence, in 1996-2011, the livestock density per 100 ha of AL in large-scale farms increased from 61.3 to 105.9 LU¹⁴ i.e. by 44.6 LU (by 72%) and 89% of those positive changes took place in the pre-accession period, i.e. in the years 2000-2005 and resulted from an increase in the concentration in dairy cattle breeding. The intensification of concentration processes in that period should be associated, on one hand, with the growing requirements on the part of customers of raw materials of animal origin and development of the production base by producers expecting the increased competition at the time of the accession to

¹⁴ It should be added that the growing concentration in large-scale holdings with the livestock production did not generally result in exceeding the environmental condition of sustainable agriculture, adopted for the level of the stocking density, whose limit value is 2 LU per 1 ha of AL (Wilk, 2005).

the EU. Due to the relatively long period of building (e.g., cow herd) and achieving production effects, actions should be taken with a certain advance.

From the analysis of changes in the level of land resource of the selected categories of farms it results that the concentration of agricultural land¹⁵ is linked with the tendencies to rationalise the agrarian structure, as well as to adapt the land to the function defined by the farmer for the possessed agricultural property and the needs of the agricultural activity.

This principle is also confirmed in the conducted research, from which it results that in the years 1996-2011 the average area of the large-scale farm increased from 20.8 to 34.8 ha of AL (tab. 6). This means that in the analysed period the area of the statistical large-scale unit increased by 67.3%, i.e. by 4.5% on a yearly average. However, that positive trend became visible with varying degrees of intensity in the individual analysed years. Although the intensity of land concentration in large-scale farms results from many factors, they were mainly related to changes in the overall economic situation and its impact on the possibilities of the non-agricultural labour market and economic situation in agriculture as well as the circumstances in the agricultural land market. The relatively favourable situation in the agricultural land market in the years 2000-2005 and the prospect of launching direct payments significantly affected the intensification of the increase in the acreage of large-scale entities. At that time, the average area of the large-scale farm increased by 5.4% on a yearly average, while in the years 1996-2000 and 2005-2011 the same indicators were about 3%. The reduction in the pace of land concentration in the group of large-scale agricultural holdings, recorded after the accession to the EU, is associated mostly with the small supply of land.

In farms producing only or mainly for own purposes, the growth processes did not take place at all or their intensity was relatively small (tab. 6). As a consequence, there was an increase in the distance in land resources between the discussed categories of agricultural holdings. For example, in 1996 the average area of the large-scale farm was by about 5 times larger than that of the agricultural holding producing mainly for own purposes, four years later – by 7 times, and in 2011 by more than 9 times. Currently, agriculture is becoming the more and more complex segment of the economic activity and achieving success from the agricultural activity requires farmers to have large knowledge, creativity and skills. Therefore, the production growth

¹⁵ From the CSO data it results that in the years 1995-2013 the average area of the individual agricultural holding increased from 6.7 to 9.5 ha of AL, i.e. by nearly 42%

opportunities are increasingly determined by the current professional background and ability to absorb new skills. This argument is also confirmed by the characteristics of managers of categories of farms selected for the studies (tab. 7).

From the studies, it results that the advancement in the processes of employment rationalisation (a decrease in labour inputs in the agricultural industry¹⁶), were translated into the production and market activity intensification. The changes in the efficiency of using inputs, i.e., their ratio to final outputs is enabled by productivity indicators. Due to the specificity of data gathered, it was possible to carry out only a partial analysis of differences in the efficiency of management and only by reference of the value of the commercial agricultural production to land and labour resources. Adopted indicators determining the land and labour productivity do not always fully reflect the efficiency of using these production factors, especially labour productivity. However, they allow to illustrate trends and assess the scale of the ongoing transformations in this regard.

From the comparison of the commercial production value in the selected groups of farms it results that in the entire analysed period they were higher per 1 ha of AL and AWU, especially when it comes to the labour inputs productivity. Moreover, it should be stressed that this differences grew (tab. 8). However, in the years 2000-2011 the scale of these differences did not change. In 2011, the average value of the commercial production per 1 ha of AL in large-scale farms remained at the level of EUR 1.6 thousand. At that time, the comparable indicator for entities producing mainly for sale was only 14.1% of the productivity factor in the group of large-scale agricultural holdings. In 2005, the difference calculated in the same way amounted to 17.4%, in 2000 – 19.1%. In case of the labour productivity factor, the disproportions were even greater. In 2011, the commercial production value per 1 AWU in large-scale units was at the level of EUR 32.8 thousand. At that time, the comparable indicator for mainly self-subsistence entities accounted only for 3.2% of the labour productivity factor in the group of 4% of large-scale entities. Similarly, the difference in the identically calculated labour inputs productivity indicators in 2005 amounted to 4.4% and in 2000 – 4.6%.

¹⁶ According to the survey data, in 2011 labour inputs per 100 ha of AL amounted to 17.7 AWU in only self-subsistence holdings, 14.7 AWU in mainly self-subsistence holdings and only 4.8 AWU in large-scale holdings. The decrease in labour inputs was common and became visible in every group of holdings selected for studies, although its intensity was very diversified. Those processes were particularly strong after 2005, mainly in holdings with loose contacts with the market which resulted from the increase in their activity in the non-agricultural labour market.

**Table 6.** Agricultural land resources of the selected groups of farms

Farms	Average area (ha of AL)			
	1996	2000	2005	2011
- only self-subsistence	3.8	2.7	3.0	2.9
- mainly self-subsistence	3.9	3.2	3.6	3.8
- commercial	9.9	11.4	14.0	15.4
including large-scale	20.8	23.2	29.5	34.8

Source: own calculations based on IAFE-NRI surveys 1996, 2000, 2005 and 2011.

Table 7. Selected socio-economic characteristics of managers of the selected groups of farms

Share of persons	Farms					
	self-subsistence		commercial		large-scale	
	2000	2011	2000	2011	2000	2011
with education:						
- secondary and higher	17.3	31.8	17.9	35.3	27.3	42.2
- agricultural	10.4	17.3	30.1	29.5	51.1	51.3

Source: own calculations based on IAFE-NRI surveys 1996, 2000, 2005 and 2011.

Table 8. Land and labour productivity in the selected groups of farms

Value (in EUR) of commercial production per:	Farms								
	mainly self-subsistence			commercial			large-scale		
	2000	2005	2011	2000	2005	2011	2000	2005	2011
1 ha of AL	199	200	225	689	965	1 053	1 045	1 261	1 605
1 AWU	836	965	1 055	5 544	9 851	11 890	16 019	21 626	32 809

Source: own calculations based on IAFE-NRI surveys 1996, 2000, 2005 and 2011.

CONCLUSIONS

On the basis of the analysed research results, it should be concluded that for Polish farmers the years 2000-2011 were another, after the economic transition, period of taking activities aimed at the efficient adaptation of agricultural holdings to the conditions of the growing competition resulting from the accession to the EU and the advancement of globalisation. The possibilities and pace of adaptation of production processes to the effective demand were determined by a number of factors which sometimes were conflicting. However, the type of undertaken activities were determined, first and foremost, by the value and characteristics of production assets, the importance of the farm as a place of professional activity and a source of income, as well as the attitudes and skills of managers.

A consequence of those processes, there were changes in the number of different types of farms, and above all, in the value of the possessed

production assets as well as the efficiency of their use. These processes were immanent but their pace was largely determined by the economic situation in agriculture and in the non-agricultural labour market. From the studies it results that the accession of Poland to the EU was a turning point in decisions made by farmers with respect to the role performed by their farms and thus to the type of the strategy undertaken. The agricultural holdings with no agricultural activity have been virtually eliminated. At the same time, in the group of farms running agricultural activity there have been dynamic processes of polarisation into not market-oriented entities and farms which, due to the achieved production results, were able to compete efficiently, i.e. large-scale holdings. This process was accompanied by the relatively stronger processes of concentration of production assets in the latter category of farms. Consequently, this segment strengthened its position in the agribusiness structures and possessed 52% of total agricultural

land, 55% of technical means of production, 68% of livestock and supplied almost 75% of production to the market. However, this potential is too small to definitely determine the market situation as well as the shape of domestic farming sector. From the perspective of the competitive potential, food security and effectiveness of Polish farms within the EAM, economically strong entities should possess about 80% of total agricultural land. Changing such a situation requires well-programmed agrarian transformations within farms, which, as it results from the experiences, is a very complex process. The essence and pace of these transformations are determined by many factors which go beyond the agriculture.

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