

**THE OUTPUT OF THE AVERAGE INDIVIDUAL FARM IN  
POLAND AND IN THE EUROPEAN UNION COUNTRIES.  
AN ATTEMPT OF DEFINING SIMILARITY  
OF STRUCTURES IN 2005**

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**Abstract.** The aim of this research is to compare an average Polish farm with an average EU farm according to agricultural total output. A comparative analysis is based on FADN data for the year 2005. Basic method of this research was a descriptive and comparative analysis. Descriptive statistics methods were also used – among them, so-called measure of structure's similarity. The comparison of results of Polish average farm with the results obtained by EU average farm revealed that the value of the majority of chosen economic variables observed in Polish average farm was c.a. three times lower than the EU average. In each of three rankings – prepared according to the criteria of total output, crops production, livestock production Polish average farm came low down. The results obtained with the use of the measure of structure's similarity, demonstrate that the structure of total output in Polish average farm in the 2005 year is – to some extent – similar to Belgian, Latvian and Finnish ones. On the other hand, structure of crops production in Polish farm was similar to a considerable degree to Finnish and British structures, while the livestock production of Polish average farm was similar to a large extent to the structure observed in Hungarian farms.

**Key words:** individual farm, agricultural output, similarity of structure

**INTRODUCTION**

Since the 1st May of 2004, Poland has been a member of the European Union (hereafter: EU). Before this date, Polish agricultural industry was less financially supported than the European one. In many cases Polish authorities used instruments that differed

much from tools implemented within Common Agricultural Policy (CAP). Moreover, many branches of Polish agriculture were not supported by the budget at all [Czyżewski and Henisz-Matuszczak 2004]. As a consequence of the inclusion of the Polish agriculture in the mechanism of the CAP, Poland has benefited from many forms of support, i.e. among other things: intervention purchases, direct payments, or export subsidies. Thanks to financial assistance from the EU, the Polish economy has obtained an impulse to increase the level of the economic development, huge enough to influence and induce changes – in a direct as well as indirect fashion – in Polish agriculture and, especially, in the situation of Polish farms [Polska w Unii... 2003].

Still, Poland is a country with a considerably large potential of agriculture. The area of arable lands in Poland is larger than in majority of the EU countries – in terms of overall area of arable lands Poland is third only to France and Spain [Strategia rozwoju... 2004]. Undoubtedly, the noticeable reserve of agricultural lands strengthen, the potential of agricultural activity. However, the basic constraint of further agricultural sector's development are: unfavourable structure of farms, difficult natural conditions, surplus of low-qualified labour force in the agriculture, low level of specialization of farms' production and perceptible lack of modern capital [Ryś-Jurek 2007].

The main goal of this research is to comprise of total output of individual farms from the EU-24 countries in the year 2005<sup>1</sup>, with the special consideration of Poland. Answers to the following questions are formulated:

1. What was the volume of the average individual Polish farm's output in the year 2005 in comparison with the output of average farms from other countries, so which place took the Polish average individual farm according to total output, crops production and livestock production?
2. How outstanding was the difference between the structure of output of average Polish individual farm and output of the average individual farms from other EU-24 countries?
3. Was there a similarity of output's structure of average individual farm observed between Polish average farm and average farms from other countries in European Union? If so, did individual farms from these countries achieve high output?

## MATERIAL AND METHODS

The research was based on the data from the Farm Accountancy Data Network (FADN)<sup>2</sup>. The data include basic information about economic situation of average farm in the EU in the year 2005. A whole database consists of 24 countries (excluding Malta)<sup>3</sup>.

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<sup>1</sup> In the FADN database there is no information on Malta available.

<sup>2</sup> Poland, as a member of the European Union, is obliged to create and maintain a national network of accountancy data of farms, which has to be compatible with the principles of classification and selection of farms in the FADN. According to research conducted in Poland, farms which were keeping the accounts, were systematically in better situation than the rest of farms in the whole country. Hence, the results of the analysis conducted on the basis of these farms were c.a. by 30% higher, than these obtained, while considering all farms in Poland [Woś 2000]. So the FADN data are burdened with measurement bias. However, data from this network are at the moment the only available and create a source of standardized information about farms in Poland.

The main goal of this research is to describe the output of an average Polish farm in the second year of membership in the EU. In order to conduct this research, the average Polish farm's basic economic variables were compared with the same estimated for the average European farm. A special attention was paid to the structure of output in average Polish and European farms – in order to search for possible similarities.

Basic method of this research was a descriptive and comparative analysis. Also chosen methods of descriptive statistics were used – among them, so called measure of structure's similarity. This method was used in order to compare the structure of output in average Polish individual farms with structures of output of average individual farms from the other EU countries. This analysis was conducted for total output, crops production and livestock production. The measure takes the following form [Wysocki and Lira 2005]:

$$\mu_i = 1 - \frac{\sum_{i=1}^k |c_{i(1)} - c_{i(2)}|}{2}$$

where:

$\mu_i$  – is a standardized value and takes values within a range of  $\langle 0; 1 \rangle$ ,

$c_{i(1)}$  – is a share of the  $i$  component in the first structure,

$c_{i(2)}$  – is a share of the  $i$  component in the second structure.

In this research, the following ranges of the similarity measure were set:

$\langle 0.8; 1.0 \rangle$  – two structures are similar to the high degree,

$\langle 0.6; 0.8 \rangle$  – two structures are similar to the medium degree,

$\langle 0.4; 0.6 \rangle$  – two structures are similar to the low degree,

$\langle 0.2; 0.4 \rangle$  – two structures are similar to the very low degree,

$\langle 0.0; 0.2 \rangle$  – two structures are different (have nothing in common with each other).

When the value of measure of structure's similarity is close to 1 (so it exceeds 0.95), the two structures are similar to the highest extent. On the contrary, when the result is close to 0 (the value of measure is less than 0.05), the two structures differ from each other [Wysocki and Lira 2005].

## RESEARCH

In order to fulfil the main aim of this research, the FADN data were used. The comparison of average individual farms' results in Poland and the EU-24 in the year 2005 are presented in Table 1.

As it can be noticed, in the year 2005 the output of Polish average individual farm was equal to 22 307 euro. This output was obtained with the use of an average agricultural area amounted to 17.2 hectares and allowed to obtain family farm income amounted to

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Then, with the above-mentioned reservation, they can serve as a base for a comparison of Poland with other EU countries, while pondering the situation of agriculture.

<sup>3</sup> In the FADN database for the year 2005 there is no information available on Great Britain, Italy, Slovenia and Sweden. This lack of data was completed by data for the year 2004.

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Table 1. Chosen economic categories for average individual farm in the EU and in Poland in the year 2005

Tabela 1. Wybrane kategorie ekonomiczne dla przeciętnego indywidualnego gospodarstwa rolnego w UE i w Polsce w 2005 roku

| Category<br>Kategoria   | EU <sup>a)</sup><br>UE <sup>a)</sup> | Poland<br>Polska | Poland/EU<br>Polska/UE<br>(%) |
|---|--------------------------------------|------------------|-------------------------------|
| The simplified calculation system of the family farm income (euro)<br>Uproszczony rachunek dochodu z gospodarstwa rolnego (euro)  |                                      |                  |                               |
| 1. Total output <sup>b)</sup> – Produkcja ogółem <sup>b)</sup>  | 60 074                               | 22 307           | 37.1                          |
| 2. Total intermedial consumption <sup>c)</sup> – Zużycie pośrednie <sup>c)</sup>  | -6 048                               | -13 127          | 36.4                          |
| 3. Balance current subsidies and taxes<br>Saldo bieżących dopłat i podatków   | +10 762                              | +3 067           | 28.5                          |
| 4. Gross farm income – Wartość dodana brutto  | = 34 788                             | = 12 247         | 35.2                          |
| 5. Depreciation – Amortyzacja   | -8 446                               | -499             | 41.4                          |
| 6. Farm net value added – Wartość dodana netto  | = 28 342                             | = 8 748          | 30.9                          |
| 7. Total external factors <sup>d)</sup><br>Koszt czynników zewnętrznych <sup>d)</sup>   | -9 777                               | -1 177           | 12.0                          |
| 8. Balance subsidies and taxes on investments<br>Saldo dopłat i podatków na inwestycjach  | + (-18)                              | + (-281)         | ×                             |
| 9. Family farm income – Dochód z gospodarstwa rolnego   | = 16 547                             | = 7 290          | 44.1                          |
| Other economic variables – Inne kategorie ekonomiczne   |                                      |                  |                               |
| 10. Total agricultural area (hectares)<br>Całkowita powierzchnia UR (ha)  | 34.9                                 | 17.2             | 49.3                          |
| 11. ESU <sup>e)</sup> – ESU <sup>e)</sup>   | 31.9                                 | 10.1             | 31.7                          |
| 12. Subsidies (euro) – Subsydia (euro)  | 11 104                               | 3 311            | 29.8                          |
| 13. Family farm income without current subsidies (euro)<br>(9-12)<br>Dochód z gospodarstwa rolnego bez bieżących dopłat<br>(euro) (9-12)  | 5 443                                | 3 979            | 73.1                          |
| 14. Family farm income without current subsidies divided<br>by total agricultural area (euro/ha) (13/10)<br>Dochód z gospodarstwa rolnego bez bieżących dopłat<br>w przeliczeniu na 1 ha UR (euro/ha) (13/10) | 155.96                               | 231.33           | 148.3                         |
| 15. Total labour input (AWU) <sup>f)</sup><br>Całkowity nakład pracy (AWU) <sup>f)</sup>  | 1.68                                 | 1.79             | 106.5                         |

<sup>a)</sup>Without Great Britain, Italy, Malta, Slovenia and Sweden. <sup>b)</sup>Total output is equal to sum of total crops, crops products, livestock and livestock products and of other output. <sup>c)</sup>Total intermedial consumption is a value of net used materials (including fuel), raw materials of energy, technical gases and external services and costs of business trips and others costs (advertising, hire, etc.). <sup>d)</sup>Total external factors are a cost of hire labour, rent for hire means of production, interests of credits, etc. <sup>e)</sup>ESU – economic size unit. <sup>f)</sup>AWU – annual work unit.

Source: own preparations and calculations based on FADN data.

<sup>a)</sup>Bez Wielkiej Brytanii, Włoch, Malty, Słowenii i Szwecji. <sup>b)</sup>Produkcja ogółem to suma końcowej produkcji roślinnej i zwierzęcej w gospodarstwie. <sup>c)</sup>Zużycie pośrednie obejmuje wartość zużytych materiałów (w tym paliwa) netto, surowców energii, gazów technicznych i usług obcych oraz kosztów podróży służbowych i inne koszty (reklamy, wynajmu, itp.). <sup>d)</sup>Koszt czynników zewnętrznych obejmuje koszt pracy najmniejszej, czynsze za donajem środków produkcji, odsetki od kredytów itp. <sup>e)</sup>ESU – ekonomiczna jednostka wielkości. <sup>f)</sup>AWU – roczna jednostka pracy.

Źródło: opracowanie własne na podstawie danych FADN.

7290 euro. At the same time in average individual farm from the EU countries, total output was equal to 60 074 euro, while the average agricultural area was nearly 35 hectares. The family income of the average EU's farm equalled to 16 547 euro. So the family farm income of the average Polish farm in the 2005 was c.a. two and a half times lower than the one observed in the EU (Table 1). It is worth emphasizing, that the situation was totally different, while comparing family farm income without current subsidies. In this case income of Polish average farm was only 1.3 times lower than the one observed in the EU. This can serve as an evidence that the system of farm's direct support influences economic situation of EU farms to a very significant extent. The family farm income without subsidies divided by total agricultural area in Polish average individual farm equalled to 231.33 euro/ha, in EU equalled only to 155.96 euro/ha.

The comparison of the medium results of average individual farms from Poland and from the EU's countries, showed that the majority of chosen economic categories in Polish average farm was c.a. three times lower than EU's one. For example, total inter-medial consumption was lower in Poland (13 127 euro) than in the EU (36 048 euro). Similarly, three times lower than EU's averages were: balance current subsidies and taxes, gross farm income and farm net value added of average Polish individual farm. The noticeable difference occurred in the event of depreciation and total external factors. In first case, the value of Polish average individual farm's depreciation amounted to 3499 euro, when the EU's value was only 2.5 times higher and amounted to 8446 euro. In second case – total external factors, this value was c.a. eight times lower in Polish average individual farm (1177 euro) than the EU's one (9777 euro). It is worth emphasizing once again, that Polish average individual farm in the analysed year had two times lower total agricultural area and it equalled to 10.1 ESU<sup>4</sup>, while the average EU area was about 31.9 ESU. Total labour input in Polish average individual farm was higher than in EU's one and in the year 2005 amounted to 1.79 AWU<sup>5</sup>, while in EU's average farm amounted to 1.68 AWU (Table 1).

In order to extend the range of research, the rankings of the average EU-24 farms in year 2005 were prepared (Table 2). These rankings contain information about: total output, crops production and livestock production observed in an average farm in every EU-24 country. First ranking, prepared according to total output, placed the Polish average individual farm on the nineteenth place. Second ranking, based on crops production of farm, depicted the situation of the Polish average farm almost identically – it took the twentieth place. The situation was likewise in the third ranking, which was created with the consideration of livestock production. According to it, Polish average farm took the nineteenth place once again.

Observation of presented rankings brings some conclusions on sharp contrast between the output in average farms of new members of the EU. For example, the leading farm in all three rankings was Slovak average farm. It was characterized by almost 548.3 hectares of agricultural area and the value of output amounting to 372 946 euro. Such positive result was achieved due to a very strong financial support from the EU. Slovak farms in the year 2005 were a beneficiary of subsidies amounted to 91 248 euro per capita. At the same time the Polish average farm received only about 3311 euro of subsidies. When we converted these results, we obtained: in Slovak average area 166.4

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<sup>4</sup> ESU – economic size unit.

<sup>5</sup> AWU – annual work unit.

Table 2. Rankings of average individual farms, according to total output, crops production and livestock production by country in the EU in the year 2005

Tabela 2. Rankingi przeciętnych indywidualnych gospodarstw rolnych według produkcji ogółem, produkcji roślinnej i produkcji zwierzęcej według kraju UE w 2005 roku

| Place<br>Miej-<br>sce | Average farm<br>from country<br>Przeciętne<br>gospodarstwo<br>z kraju | Total<br>output <sup>a)</sup><br>Produkcja<br>ogółem <sup>a)</sup><br>(euro) | Place<br>Miej-<br>sce | Average farm<br>from country<br>Przeciętne<br>gospodarstwo<br>z kraju | Crops<br>production<br>Produkcja<br>roślinna<br>(euro) | Place<br>Miej-<br>sce | Average farm<br>from country<br>Przeciętne<br>gospodarstwo<br>z kraju | Livestock<br>production<br>Produkcja<br>zwierzęca<br>(euro) |
|-----------------------|---|--|-----------------------|---|--|-----------------------|---|---|
| 1                     | 2   | 3  | 4                     | 5   | 6  | 7                     | 8   | 9   |
| 1                     | Slovakia<br>Słowacja  | 372 946  | 1                     | Slovakia<br>Słowacja  | 163 001  | 1                     | Denmark<br>Dania  | 148 422   |
| 2                     | The Netherlands<br>Holandia   | 299 259  | 2                     | The Netherlands<br>Holandia   | 147 653  | 2                     | The Netherlands<br>Holandia   | 132 432   |
| 3                     | Czech Republic<br>Czechy  | 261 353  | 3                     | Czech Republic<br>Czechy  | 130 434  | 3                     | Slovakia<br>Słowacja  | 129 826   |
| 4                     | Denmark<br>Dania  | 218 749  | 4                     | Great Britain <sup>b)</sup><br>Wielka Brytania <sup>b)</sup>          | 80 133   | 4                     | Czech Republic<br>Czechy  | 116 912   |
| 5                     | Great Britain <sup>b)</sup><br>Wielka Brytania <sup>b)</sup>          | 183 392  | 5                     | Germany<br>Niemcy   | 71 072   | 5                     | Belgium<br>Belgia   | 100 177   |
| 6                     | Belgium<br>Belgia   | 173 446  | 6                     | Belgium<br>Belgia   | 70 128   | 6                     | Great Britain <sup>b)</sup><br>Wielka Brytania <sup>b)</sup>          | 94 198  |
| 7                     | Germany<br>Niemcy   | 168 587  | 7                     | France<br>Francja   | 67 008   | 7                     | Luxembourg<br>Luksemburg  | 83 901  |
| 8                     | Luxembourg<br>Luksemburg  | 130 212  | 8                     | Denmark<br>Dania  | 54 963   | 8                     | Germany<br>Niemcy   | 79 787  |
| 9                     | France<br>Francja   | 127 815  | 9                     | Sweden <sup>b)</sup><br>Szwecja <sup>b)</sup>                         | 44 321   | 9                     | Sweden <sup>b)</sup><br>Szwecja <sup>b)</sup>                         | 61 006  |
| 10                    | Sweden <sup>b)</sup><br>Szwecja <sup>b)</sup>                         | 122 173  | 10                    | Italy <sup>b)</sup><br>Włochy <sup>b)</sup>                           | 35 507   | 10                    | France<br>Francja   | 55 898  |
| 11                    | Estonia<br>Estonia  | 63 702   | 11                    | Hungary<br>Węgry  | 27 308   | 11                    | Finland<br>Finlandia  | 36 187  |
| 12                    | Finland<br>Finlandia  | 63 034   | 12                    | Luxembourg<br>Luksemburg  | 27 187   | 12                    | Estonia<br>Estonia  | 33 714  |
| 13                    | Austria<br>Austria  | 59 957   | 13                    | Estonia<br>Estonia  | 24 297   | 13                    | Austria<br>Austria  | 31 482  |
| 14                    | Italy <sup>b)</sup><br>Włochy <sup>b)</sup>                           | 53 926   | 14                    | Finland<br>Finlandia  | 22 836   | 14                    | Ireland<br>Irlandia   | 28 059  |
| 15                    | Hungary<br>Węgry  | 53 845   | 15                    | Spain<br>Hiszpania  | 22 103   | 15                    | Hungary<br>Węgry  | 18 524  |
| 16                    | Spain<br>Hiszpania  | 37 956   | 16                    | Austria<br>Austria  | 16 465   | 16                    | Latvia<br>Łotwa   | 17 037  |
| 17                    | Latvia<br>Łotwa   | 34 208   | 17                    | Latvia<br>Łotwa   | 15 041   | 17                    | Italy <sup>b)</sup><br>Włochy <sup>b)</sup>                           | 16 648  |
| 18                    | Ireland<br>Irlandia   | 32 474   | 18                    | Greece<br>Grecja  | 14 556   | 18                    | Spain<br>Hiszpania  | 15 107  |
| 19                    | Poland<br>Polska  | 22 307   | 19                    | Lithuania<br>Litwa  | 11 476   | 19                    | Poland<br>Polska  | 11 157  |

Table 2 – cont.

| 1  | 2  | 3      | 4  | 5  | 6      | 7  | 8  | 9      |
|----|--|--------|----|--|--------|----|--|--------|
| 20 | Lithuania<br>Litwa                               | 19 968 | 20 | Poland<br>Polska                                 | 10 848 | 20 | Slovenia <sup>b)</sup><br>Słowenia <sup>b)</sup> | 9 496  |
| 21 | Portugal<br>Portugalia                           | 19 143 | 21 | Portugal<br>Portugalia                           | 10 002 | 21 | Cyprus<br>Cypr                                   | 8 785  |
| 22 | Greece<br>Grecja                                 | 18 601 | 22 | Cyprus<br>Cypr                                   | 8 195  | 22 | Portugal<br>Portugalia                           | 8 347  |
| 23 | Cyprus<br>Cypr                                   | 17 043 | 23 | Slovenia <sup>b)</sup><br>Słowenia <sup>b)</sup> | 4 315  | 23 | Lithuania<br>Litwa                               | 8 070  |
| 24 | Slovenia <sup>b)</sup><br>Słowenia <sup>b)</sup> | 15 784 | 24 | Ireland<br>Irlandia                              | 3 452  | 24 | Greece<br>Grecja                                 | 3 810  |
|    | EU <sup>c)</sup> – UE <sup>c)</sup>              | 60 074 |    | EU <sup>c)</sup> – UE <sup>c)</sup>              | 29 123 |    | EU <sup>c)</sup> – UE <sup>c)</sup>              | 27 528 |

<sup>a)</sup>Total output is equal to sum of total crops, crops products, livestock and livestock products and of other output.

<sup>b)</sup>Data for the year 2004.

<sup>c)</sup>Without Great Britain, Italy, Malta, Slovenia and Sweden.

Source: own preparations and calculations based on FADN data.

<sup>a)</sup>Produkcja ogółem to suma końcowej produkcji roślinnej i zwierzęcej w gospodarstwie.

<sup>b)</sup>Dane za rok 2004.

<sup>c)</sup>Bez Wielkiej Brytanii, Włoch, Malty, Słowenii i Szwecji.

Źródło: opracowanie własne na podstawie danych FADN.

euro of subsidies for 1 hectare of agricultural area, in Polish average farm 192.5 euro of subsidies for 1 hectare of agricultural area. This is an evidence directing, that big farms, thanks to help from the EU and favour agricultural conditions in member countries, became even more stronger. For Polish farms, it means that the indispensable condition of output's increasing is not only receiving the subsidies from the EU, but continuous increasing of agricultural area of farm.

Table 3 contains results of the analysis of the structure of output in average individual farm in the EU and in Poland in the year 2005. As it can be observed, crops output and livestock production in Polish average individual farm were c.a. three times lower than in the EU's one. Taking into consideration absolute values, only the production of poultry meet was higher in Polish average individual farm than in European one, amounting to 2487 euro (in the EU's one it was 1777 euro respectively). Despite of producing quite high volumes of cereals, potatoes, sugar beets, pig meet, Polish average farm achieved only a half of the EU level in these fields of production. For the sake of climatic conditions in Poland, production of citrus fruits, wine and grapes, olives and olives oil was hardly conducted, being so small that it was of no use to take it into account. Similarly, the production of sheep and goats was almost unnoticeable.

In the year 2005, share of crops production amounted to 48.63% and share of livestock production amounted to 50.02% in the overall production of Polish average individual farm (Table 3). At the same time, shares of these branches in overall production of the average EU farm accounted for 48.48% and 45.82% respectively. It is worth underlining that in the year 2005, the highest percentage of crops production achieved an average individual farm in Greece (78%), while the highest percentage of livestock production was obtained in the Irish one (86%).

Table 3. Structure of output in the average farm in the EU and in Poland in the year 2005 (euro and %)

Table 3. Struktura produkcji przeciętnego gospodarstwa rolnego w UE i w Polsce w 2005 roku (euro i %)

| Details<br>Wyszczególnienie   | EU <sup>a)</sup><br>UE <sup>a)</sup> | Poland<br>Polska | Poland/EU <sup>a)</sup><br>Polska/UE <sup>a)</sup> | EU <sup>a)</sup><br>UE <sup>a)</sup> | Poland<br>Polska |
|---|--------------------------------------|------------------|--|--------------------------------------|------------------|
|   | euro                                 |                  | %  |                                      |                  |
| 1   | 2                                    | 3                | 4  | 5                                    | 6                |
| Total output, including:<br>Produkcja ogółem, tym:                                      | 60 074                               | 22 307           | 37.13  | 100.00                               | 100.00           |
| 1. total output crops and products,<br>including:<br>1. produkcja roślinna, w tym:      | 29 123                               | 10 848           | 37.25  | 48.48                                | 48.63            |
| cereals<br>zboża  | 6 579                                | 3 534            | 53.72  | 10.95                                | 15.84            |
| protein crops<br>uprawy na nasiona  | 165                                  | 61               | 36.97  | 0.27                                 | 0.27             |
| potatoes<br>ziemniaki   | 1 391                                | 983              | 70.67  | 2.32                                 | 4.41             |
| sugar beets<br>buraki cukrowe   | 1 450                                | 726              | 50.07  | 2.41                                 | 3.25             |
| oil-seed crops<br>rośliny oleiste   | 1 208                                | 535              | 44.29  | 2.01                                 | 2.40             |
| industrial crops<br>rośliny przemysłowe   | 679                                  | 60               | 8.84   | 1.13                                 | 0.27             |
| vegetables and flowers<br>warzywa i kwiaty  | 6 993                                | 3 356            | 47.99  | 11.64                                | 15.04            |
| fruits<br>owoce   | 1 978                                | 1 244            | 62.89  | 3.29                                 | 5.58             |
| citrus fruits<br>owoce cytrusowe  | 514                                  | 0                | 0.00   | 0.86                                 | 0.00             |
| wine and grapes<br>winogrona  | 3 761                                | 0                | 0.00   | 6.26                                 | 0.00             |
| olives and olive oils<br>oliwki i oleje   | 1 539                                | 0                | 0.00   | 2.56                                 | 0.00             |
| forage area<br>pasza  | 1 885                                | 80               | 4.24   | 3.14                                 | 0.36             |
| other crop output<br>inna produkcja roślinna  | 981                                  | 269              | 27.42  | 1.63                                 | 1.21             |
| 2. total livestock output and products,<br>including:<br>2. produkcja zwierzęca, w tym: | 27 528                               | 11 157           | 40.53  | 45.82                                | 50.02            |
| cow milk and milk products<br>mleko krowie i produkty mleczne                           | 10 260                               | 3 486            | 33.98  | 17.08                                | 15.63            |

Table 3 – cont.

| 1  | 2     | 3     | 4      | 5     | 6     |
|--|-------|-------|--------|-------|-------|
| beef and veal<br>wołowina i cielęcina                            | 4 790 | 1 088 | 22.71  | 7.97  | 4.88  |
| pig meat<br>wieprzowina  | 7 119 | 3 578 | 50.26  | 11.85 | 16.04 |
| sheep and goats<br>baranina i kozłęcina                          | 931   | 27    | 2.90   | 1.55  | 0.12  |
| poultry meat<br>drób   | 1 777 | 2 487 | 139.95 | 2.96  | 11.15 |
| eggs<br>jaja   | 624   | 303   | 48.56  | 1.04  | 1.36  |
| ewes and goats milk<br>owcze i kozie mleko                       | 1 045 | 10    | 0.96   | 1.74  | 0.04  |
| other livestock and products<br>inna produkcja zwierzęca         | 983   | 178   | 18.11  | 1.64  | 0.80  |
| 3. other output <sup>b)</sup><br>3. inna produkcja <sup>b)</sup> | 3 423 | 302   | 8.82   | 5.70  | 1.35  |

<sup>a)</sup>without Great Britain, Italy, Malta, Slovenia and Sweden.

<sup>b)</sup>other output – for example: leased land ready for sowing, forestry products, contract work for others, hiring of equipment, etc.

Source: Own preparations and calculations based on FADN data.

<sup>a)</sup>bez Wielkiej Brytanii, Włoch, Malty, Słowenii i Szwecji.

<sup>b)</sup>inna produkcja – na przykład: wynajęty obszar gotowy do wysiania, produkty leśne, kontraktowa praca dla innych, wynajem sprzętu innym, itp.

Źródło: Opracowanie własne na podstawie danych FADN.

According to Table 3, some conclusions can be drawn from the study of the crops output's structure observed in Polish and EU average individual farms. Namely, in the structure of crops production of Polish average individual farm production of cereals (15.84%) dominated, while vegetables and flowers (15.04%) took the second place. A reverse phenomenon could be revealed, while analysing the EU farm's structure of crops production: vegetables and flowers (11.64%) were of the highest share, whereas the production of cereals (10.95%) was a bit smaller. The examination of the average livestock output's structure revealed that in the structure of the output of both Polish and EU average individual farms production of pig meet and cows milk was of the greatest importance (pig meet: 16.04% and 11.85%; cows milk: 15.63% and 17.08% respectively).

Table 4 classifies the results of the use of the measure of structure's similarity for Poland and other EU-24 countries according to the output and its composition in the year 2005. The same research was conducted for total output, crops and livestock production. The calculations revealed that within the whole EU-24 the identical structure of total output as Polish one didn't exist. Moreover, crops output and livestock output in the average Polish individual farm differed much from the EU-24 ones.

Table 4. A comparison of the similarity of the structure of output obtained in Polish average farm and in average farms from other EU<sup>a)</sup> countries in the year 2005Tabela 4. Porównanie podobieństwa struktury produkcji polskiego przeciętnego gospodarstwa rolnego z innymi przeciętnymi gospodarstwami z krajów UE<sup>a)</sup> w 2005 roku

| Ranges of values of the measure of the structure's similarity<br>Przedziały wartości miary podobieństwa struktur              | Average farm from<br>Przeciętne gospodarstwo z   | Value of the measure of total output structure's similarity<br>Wartość miary podobieństwa struktury produkcji ogółem | Average farm from<br>Przeciętne gospodarstwo z                                       | Value of the measure of crops production structure's similarity<br>Wartość miary podobieństwa struktury produkcji roślinnej | Average farm from<br>Przeciętne gospodarstwo z   | Value of the measure of livestock production structure's similarity<br>Wartość miary podobieństwa struktury produkcji zwierzęcej |
|---|--|--|--|---|--|--|
| 1   | 2  | 3  | 4  | 5   | 6  | 7  |
| <0.8; 1.0)<br>structure is similar to the high degree to Polish one<br>struktura jest podobna w wysokim stopniu do polskiej   |  |  | Finland<br>Finlandia<br>Great Britain <sup>b)</sup><br>Wielka Brytania <sup>b)</sup> | 0.85<br>0.82  | Hungary<br>Węgry   | 0.88   |
| <0.6; 0.8)<br>structure is similar to the medium degree to Polish one<br>struktura jest podobna w średnim stopniu do polskiej | Belgium<br>Belgia<br><br>Latvia<br>Łotwa<br><br>Finland<br>Finlandia<br><br>Czech Republic<br>Czechy<br>Great Britain <sup>b)</sup><br>Wielka Brytania <sup>b)</sup> | 0.77<br><br>0.72<br>0.72<br><br>0.69<br>0.69   | Denmark<br>Dania<br>Belgium<br>Belgia<br>Austria<br>Austria<br><br>Latvia<br>Łotwa   | 0.75<br>0.74<br>0.73<br><br>0.70  | Austria<br>Belgium<br>Belgia<br>Czech Republic<br>Czechy<br>Germany<br>Niemcy<br>The Netherlands<br>Holandia<br><br>Latvia<br>Łotwa<br><br>Italy <sup>b)</sup><br>Włochy <sup>b)</sup><br>Denmark<br>Dania<br>Portugal<br>Portugalia | 0.79<br>0.78<br>0.78<br>0.77<br>0.76<br><br>0.74<br><br>0.71<br>0.70<br>0.69   |

Table 4 – cont.

| 1  | 2   | 3    | 4  | 5    | 6  | 7   |      |
|--|---|------|--|------|--|---|------|
|  | Germany<br>Niemcy                             | 0.68 |  |      |  | Sweden <sup>b)</sup><br>Szwecja <sup>b)</sup> | 0.67 |
|  | France<br>Francja                             | 0.66 |  |      |  | Slovakia<br>Słowacja                          | 0.66 |
|  |   |      |  |      |  | Spain<br>Hiszpania                            | 0.66 |
|  | Hungary<br>Węgry                              | 0.65 | Germany<br>Niemcy                                | 0.65 | France<br>Francja  |   | 0.65 |
|  | Denmark<br>Dania                              | 0.65 | Lithuania<br>Litwa                               | 0.65 | Finland<br>Finlandia   |   | 0.65 |
|  |   |      | Hungary<br>Węgry                                 | 0.65 | Estonia<br>Estonia   |   | 0.65 |
|  | Austria<br>Austria                            | 0.64 | Sweden <sup>b)</sup><br>Szwecja <sup>b)</sup>    | 0.64 |  |   |      |
|  |   |      | Czech Republic<br>Czechy                         | 0.64 |  |   |      |
|  |   |      | France<br>Francja                                | 0.63 |  |   |      |
|  | Sweden <sup>b)</sup><br>Szwecja <sup>b)</sup> | 0.62 | Cyprus<br>Cypr                                   | 0.62 |  |   |      |
|  | The Netherlands<br>Holandia                   | 0.62 |  |      |  |   |      |
|  | Cyprus<br>Cypr                                | 0.62 |  |      |  |   |      |
|  | Lithuania<br>Litwa                            | 0.61 |  |      | Great Britain <sup>b)</sup><br>Wielka Brytania <sup>b)</sup> |   | 0.61 |
|  | Italy <sup>b)</sup><br>Włochy <sup>b)</sup>   | 0.61 |  |      | Cyprus<br>Cypr   |   | 0.61 |
|  | Spain<br>Hiszpania                            | 0.60 |  |      |  |   |      |
|  | Portugal<br>Portugalia                        | 0.60 |  |      |  |   |      |
|  | Estonia<br>Estonia                            | 0.60 |  |      |  |   |      |
| <0.4; 0.6)<br>structure is similar<br>to the low degree<br>Polish one<br>struktura jest podobna<br>w niskim stopniu<br>do polskiej |   |      | Italy <sup>b)</sup><br>Włochy <sup>b)</sup>      | 0.59 |  |   |      |
|  |   |      | Slovenia <sup>b)</sup><br>Słowenia <sup>b)</sup> | 0.57 | Lithuania<br>Litwa   |   | 0.57 |
|  |   |      | Spain<br>Hiszpania                               | 0.57 |  |   |      |
|  | Slovakia<br>Słowacja                          | 0.55 | Estonia<br>Estonia                               | 0.55 |  |   |      |
|  |   |      | Ireland<br>Irlandia                              | 0.54 |  |   |      |

Table 4 – cont.

| 1   | 2  | 3    | 4                           | 5    | 6  | 7    |
|---|--|------|-----------------------------|------|--|------|
|   |  |      | Slovakia<br>Słowacja        | 0.52 | Luxembourg<br>Luksemburg                         | 0.52 |
|   |  |      |                             |      | Slovenia <sup>b)</sup><br>Słowenia <sup>b)</sup> | 0.52 |
|   |  |      | The Netherlands<br>Holandia | 0.50 |  |      |
|   |  |      | Portugal<br>Portugalia      | 0.50 |  |      |
|   |  |      | Luxembourg<br>Luksemburg    | 0.48 |  |      |
|   | Slovenia <sup>b)</sup><br>Słowenia <sup>b)</sup> | 0.45 |                             |      |  |      |
|   |  |      | Greece<br>Grecja            | 0.42 | Ireland<br>Irlandia                              | 0.44 |
|   | Luxembourg<br>Luksemburg                         | 0.40 |                             |      |  |      |
| <0.2; 0.4)<br>structure is similar<br>to the very low degree<br>to Polish one<br>struktura jest podobna<br>w bardzo niskim stopniu<br>do polskiej | Greece<br>Grecja                                 | 0.37 |                             |      |  |      |
|   | Ireland<br>Irlandia                              | 0.35 |                             |      |  |      |
| <0.0; 0.2)<br>structure is different<br>struktura jest różna  |  |      |                             |      | Greece<br>Grecja                                 | 0.18 |

<sup>a)</sup>without Great Britain, Italy, Malta, Slovenia and Sweden.

<sup>b)</sup>data for the year 2004.

Source: own preparations and calculations based on FADN data.

<sup>a)</sup>bez Wielkiej Brytanii, Włoch, Malty, Słowenii i Szwecji.

<sup>b)</sup>dane za 2004 rok.

Źródło: opracowanie własne na podstawie danych FADN.

Taking into consideration the total output, Polish structure was similar to the medium degree to eighteen structures, and to the highest degree to Belgian, Latvian and Finnish ones. Results for these countries amounted to 0.77, 0.72 and 0.72 respectively. However, the achieved results allowed to classify, to the same similarity group, also fifteen average farms from: Czech Republic, Great Britain, Germany, France, Hungary, Denmark, Austria, Sweden, The Netherlands, Cyprus, Lithuania, Italy, Spain, Portugal and Estonia. Hence, the result is biased with some inconclusiveness, because this group is relatively wide. So we can only accept that total output's structure of Polish average individual farm is most similar to the structures observed in farms from North-western Europe (Table 4).

The analysis of crops production and livestock production brings more precise results. The crops production's structure of the average Polish farm appeared to be similar to the high extent to Finnish (0.85) and British (0.82) ones (Table 4). Hence, Polish

structure of crops production in average farm was similar to the one observed in Northern Europe. Different results were obtained while analyzing the livestock production. The Polish average farm's structure was similar to the high degree to the structure of Hungarian average farms. Calculated value equalled to 0.88. Therefore taking into consideration the other results (close to 0.80) the Polish structure of livestock production in average farm was much the same as the livestock production of the farms from Central and Western Europe. Conducted research showed clearly, that the structures of output (total, crops, livestock) of the average Polish farm differed undoubtedly from the same structure observed in two EU-24 countries, namely: Greece and Ireland.

Summing up, Polish individual farms fitted well to the farms of well-developed North-central-western European countries, but the overall production and economic situation of Polish farms was under the EU level. However, adaptation to the European structure of agriculture brings forward the beneficial changes of the situation of Polish farms. This chance must not be missed, in order to allow Polish farms to be more efficient and compete successfully with higher-subsidized farms from "old" EU countries as well as with low-cost production from the East.

## CONCLUSIONS

1. The area of arable lands in Poland is larger than in majority of the EU countries. In terms of agriculture lands, Poland is third only to France and Spain. However, this situation is of not significant advantage for the economic results of Polish farms. The comparison of results of the average Polish farm with results of the average EU-24's farm, revealed that the majority of chosen economic variables observed in Polish average farm took c.a. three times lower values than in the EU-24 in the year 2005. For example:

- the output of Polish average farm was equal to 22 307 euro in the year 2005, while average agricultural area amounted to 17.2 hectares and family farm income amounted to 7290 euro. At the same time in EU, total output equalled to 60 074 euro and average agricultural area amounted to 35 hectares, whereas family farm income amounted to 16 547 euro,
- the family farm income without subsidies divided by total agricultural area in Polish average individual farm equalled to 231.33 euro/ha, in EU equalled only to 155.96 euro/ha,
- Polish average farm had size equalled to 10.1 ESU, when the average EU's one had size about 31.9 ESU,
- total labour input in Polish average individual farm was higher than in EU's one and amounted to 1.79 AWU, while in EU's average farm amounted to 1.68 AWU,
- favourably for Poland, cost of total external factors was c.a. eight times lower in Polish average individual farm (1177 euro) than the EU's one (9777 euro).

2. In three prepared rankings – according to total output, crops production and livestock production – Polish average farm came low down, taking poor places: 19th, 20th, and 19th respectively among farms from 24 European countries.

3. The analysis of the structure of output in average farm in Poland and in the EU in the year 2005 showed that crops output and livestock output in Polish average farm were c.a. three times lower than EU ones. Polish average farm produced fairly high

amounts of cereals, potatoes, sugar beets, poultry meat, and pig meat. Owing to climatic conditions in Poland, the production of citrus fruits, wine and grapes, olives and olives oil was not realised or was so low that it was not taken into account. Similarly, the production of sheep and goats was almost unnoticeable.

4. The results obtained with the use of the measure of structure's similarity, demonstrated that structure of Polish total output in average farm in the year 2005 was to some extent similar to Belgian, Latvian and Finnish ones. However, Polish structure of crops production was similar to a considerable degree to Finnish and British structures, while the livestock production was similar to a high degree to structure observed in Hungary.

5. In the year 2005, Polish individual farms fitted well to the farms of well-developed North-central-western European countries according to the output's structures. However the production and economic situation of Polish farms was under the EU level. The adaptation to the European structure of agriculture brings forward the beneficial changes of the situation of Polish farms. Polish farms should be more efficient and compete successfully with higher-subsidized farms from "old" EU countries as well as with low-cost production from the East.

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## PRODUKCJA ROLNICZA W PRZECIĘTNYM INDYWIDUALNYM GOSPODARSTWIE ROLNYM W POLSCE I KRAJACH UNII EUROPEJSKIEJ. PRÓBA OKREŚLENIA PODOBIENSTWA STRUKTUR W 2005 ROKU

**Streszczenie.** Celem badania było porównanie produkcji rolniczej przeciętnego polskiego indywidualnego gospodarstwa rolnego z produkcją przeciętnego gospodarstwa unijnego. Analiza została oparta na danych FADN dla 2005 roku. Podstawowymi metodami badawczymi były analiza opisowa i porównawcza. Wykorzystano również wybrane metody statystyki opisowej, a wśród nich – miarę podobieństwa struktur. Porównanie przeciętnych wyników polskiego i unijnego gospodarstwa rolnego wykazało, że większość podstawo-

wych kategorii ekonomicznych w polskim przeciętnym indywidualnym gospodarstwie rolnym była około trzykrotnie niższa niż w gospodarstwie unijnym. W trzech przygotowanych rankingach, według wartości bezwzględnych produkcji ogółem, produkcji roślinnej i produkcji zwierzęcej, polskie przeciętne gospodarstwo rolne zajęło końcowe pozycje pośród innych przeciętnych unijnych gospodarstw rolnych. W wyniku zastosowania miary podobieństwa struktur, okazało się, że struktura produkcji ogółem polskiego przeciętnego gospodarstwa rolnego jest w znacznym stopniu podobna do struktury produkcji gospodarstwa belgijskiego, łotewskiego i fińskiego. Natomiast struktura produkcji roślinnej przeciętnego polskiego gospodarstwa rolnego jest bardzo podobna do struktury produkcji roślinnej gospodarstwa fińskiego i brytyjskiego. W przypadku struktury produkcji zwierzęcej, w polskim przeciętnym gospodarstwie rolnym jest ona podobna do węgierskiej.

**Słowa kluczowe:** indywidualne gospodarstwo rolne, produkcja rolnicza, podobieństwo struktur

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