ISSN 1899-5772

Journal of Agribusiness and Rural Development

www.jard.edu.pl

4(14) 2009, 135-148

THE RELATIONS BETWEEN THE OUTPUT, INCOME AND STOCK IN AGRICULTURAL FARMS

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Abstract. In this article an attempt was made to analyse the stock, output, and incomes in individual agricultural farms in Poland, in comparison with farms from the other EU countries in the year 2006. Research was based on the FADN database. The research showed, that (among other things) the Polish average individual farm had a four time lower the balance's sum than the medium one in the EU, and the average output and family farm income were about three times lower in Poland than the average in the Union. The highest share of stock in the balance's sum in Poland three direction of production had: permanent crops combined, specialist other field crops and specialist orchards – fruits. While in the Union the highest stock had the specialist wine. According to the regression's models, in Poland the positive influence on the increase of family farm income had stock, crops and livestock output. In the Union positive influence on an income's growth had crops and livestock production and negative influence had the stock.

Key words: stock of agricultural products, agricultural output, family farm income

INTRODUCTION

A stock is a considerable part of the assets in a majority of economic subjects. A stock participates in the economic processes and it has an influence on the financial result achieved by an economic subject and on his assets' situation [Rachunkowość... 2005]. The stock management serves, on the one hand, to assure the access to stock necessary for normal activity of the economic subject, but on the other hand, to maintain the stock's cost of ordering and storing on the lowest possible level. The stock maintenance is expensive, so the pressure on stock's decreasing always exists, which is a part of total strategy of the subject operated on cost reduction [Brigham and Houston 2005].

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The appropriate stock management in the individual farms appears to be a huge challenge for their managers. The rational stock management has to lead to cost cutting, especially under the circumstances of the growing competitiveness in agricultural markets. Hence the activity of agricultural farms in the market should be based on the constant search of the possibilities of further rationalization of production. A change and improvement in stock management can support achievement of such target, allowing the increase in effectiveness of production [Wasilewski 2004].

It is worth emphasizing, that in the agriculture the production relations are composite, because the production depends not only on decisions made by farm's manager about production's factors engaged, but on vegetation conditions, so depends on fate conditions [Woś 2004]. The consequence of these relations is a value of income from the individual farm. Successive, this amount in current period has an influence on the consumption level and the production's increase in the next period [Stępień 2007, Ryś-Jurek 2008]. It's worth to emphasis that the rational stock management is a one of costs cutting, so of increasing of production profitability [Ryś-Jurek 2009].

The aim of this article is to show the amount of stock of agricultural products, balance sum, the output and incomes in individual farms in Poland, in comparison with other 24 countries from the European Union (EU) in the 2006 year[1].

MATERIAL AND RESEARCH METHODS

In this research the data from the Farm Accountancy Data Network (FADN) for the year 2006 was used[2]. The research was conducted in three parts.

In the first part, the analysis of balance sheet, output and incomes of the average individual farm from Poland was made, in comparison with the medium results from the all the EU-25[3]. This data was supplemented by amounts calculated on the average farm's area in Poland and in the EU-25.

In the second part, the average share of stock of agricultural products in the balance sum was presented according to the economic size and to the direction of production[4]. This data was joined up with the values of output and family farm income according to the separated groups. Of course, the average results for Poland were presented in comparison with the average results for the EU-25.

In the third part, the relation between the family farm income and crops output, livestock output, the level of stock of agricultural products in the individual farm[5]. To execute this calculations, the FADN data about types of individual farms according to the

[1] This article directly continues the plots from the article Ryś-Jurek [2009]. Moreover this article completes the research for the 2006 year.

[2] Data from this network are not representative, but these data are at the moment the only available that can serve as a source of standardized information about farms in Poland and in other EU countries [Ryś-Jurek 2008].

[3] Category of the average individual farm come from FADN database and shows the medium results obtained by farms in a chosen country of the EU [FADN 2009].

[4] In FADN database, there was no information about stock of non-agricultural products [Wyniki standardowe... 2006].

[5] The selection of variables included in a model was made on the basis of existing literature and on statistical criteria.

economic size and the direction of production in the EU-25, was used. A particular type is an aggregate unit, which is created on the average results from the many individual farms with the same direction of production and economic size in chosen EU country [Ryś-Jurek 2008]. In the FADN database for the 2006 year, the information on 50 Polish types of individual farms according to the economic size and direction of production is available. Moreover, the research was made for all the EU-25 and the data about 620 types was used.

In the first and second part of research a descriptive, comparative analysis and basic methods of descriptive statistics was used. In the third part was made a regression.

BALANCE SHEET AND THE VOLUME OF OUTPUT AND OF INCOMES IN INDIVIDUAL FARMS

The analysis of the balance sheet according to the FADN data for the year 2006 showed that Polish average individual farm managed the balance sum in amount of 77 142 euro (Table 1). However, this value achieved only c.a. 25% average level observed in the EU-25 (309 026 euro)[6]. In the structure of average individual farm's assets (both Polish and from the EU) dominated the fixed assets – their average value amounted to more than 80% of balance sum's value[7]. It's worth to emphasis that in the structure of fixed assets in average individual farm from Poland and from the EU-25 occurred the fundamental difference. The value of buildings in the Polish average individual farm was equalled to 31 026 euro, being about c.a. 48% of fixed assets' value and achieving about 68% of the EU-25 level. The next high share (about 28%) had the value of machines and equipments with volume of 17 740 euro. Whereas in the average individual farm from the EU-25, almost 65% of value of fixed assets in the analysed year was a value of land, permanent crops and production quotas – 161 281 euro, at the same time in Poland this value achieved only about 8% of the level observed in the EU-25 (Table 1). Next, about 18% of fixed assets' value was the value of buildings (45 457 euro).

In the analysed year, a considerable difference occurred in the level and in the structure of current assets in the Polish average individual farm in comparison with the average farm from the EU-25. The average value of current assets of Polish individual farm in the year 2006 amounted to 13 005 euro, when of the average farm from the EU-25 was equalled to 60 849 euro. So this value achieved only c.a. 21% average level observed in the EU-25. The highest share in the current assets' structure of average

[6] It is worth to emphasize, that according to the FADN data, the average area of individual farm in Poland in the year 2006 amounted to 17.3 hectares, while in the EU-25 was equalled to 34.7 hectares. Moreover, in this year Polish average individual farm achieved only about 30% of the economic size of average farm from the Union and this volume amounted to 10.2 ESU (European Size Unit) [FADN 2009].

[7] It is a result of freezing capital in the fixed assets by the farms, because the seasonal leasing of the farm equipments is difficult in the agricultural branch. It happens that in the same time every farm demands agricultural equipments. So the high share of fixed assets makes the farm independent from the leasing firms, but it decreases the farm's flexibility and increases its fixed costs [Poczta and Średzińska 2007].

Table 1. The balance sheet in agricultural farms
Tabela 1. Bilans majątkowy w gospodarstwach rolnych

Details Wyszczególnienie	Poland Polska	EU-25 UE-25	Poland/EU-25 Polska/UE-25
	euro		%
Balance sum Suma bilansowa	77 142	309 026	25.0
Assets Aktywa			
Total fixed assets, including: Aktywa trwałe, w tym:	64 137	248 177	25.8
land, permananent crops and quotas ziemia, uprawy trwałe i kwoty produkcyjne	12 562	161 281	7.8
buildings budynki	31 026	45 457	68.3
machinery maszyny i urządzenia	17 740	30 173	58.8
breeding livestock zwierzęta stada podstawowego	2 809	11 266	24.9
Total current assets, including: Aktywa bieżące, w tym:	13 005	60 849	21.4
non-breeding livestock zwierzęta stada obrotowego	2 575	8 888	29.0
stock of agricultural products zapasy produktów rolniczych	4 510	7 897	57.1
other circulating capital pozostałe aktywa obrotowe	5 920	44 064	13.4
Liabilities Pasywa			
Total liabilities, including: Zobowiązania ogółem, w tym:	7 800	45 062	17.3
long and medium-term loans kredyty długo- i średnioterminowe	5 413	33 704	16.1
short-term loans kredyty krótkoterminowe	2 387	11 320	21.1
Net worth Kapitał własny	69 342	263 964	26.3

Source: own preparations and calculations based on FADN data [2009].
Źródło: opracowanie własne na podstawie danych FADN [2009].

individual farm from Poland and the EU-25 had other circulating assets (Table 1)[8]. The share of other circulating assets in the current assets of Polish average individual farm amounted almost to 46% (with the value of c.a. 5920 euro), while for the farm from the EU-25 amounted to more than 72% (with the value of 44 064 euro). Additionally the relation Poland/EU-25 for the other circulating assets was equalled to 13.4%. In the structure of current assets of Polish average individual farm, the stock of agricultural products took a considerable place, achieving about 57% of the EU-25 level. Their share in the year 2006 amounted almost to 35% with the value of 4510 euro. While, in the average individual farm from the EU-25 the stock of agricultural products were about 13% of current assets' value – with the value of 7897 euro. We can suppose that in the year 2006 Polish produced with the support of own agricultural materials.

Analysing the structure of assets in the relative way, we can observed that in the Polish average individual farm in the year 2006 occurred a considerable higher level of value of buildings, machinery and stock of agricultural products than the average level in farms from the EU-25 countries. Whereas a considerable lower level of land, permananent crops and quotas was noticed (Table 1).

Polish average individual farm was also characterized by lower inclination to debt incurring than the average one in the EU-25 countries (Table 1). In the analysed year, the share of total liabilities in the balance sum amounted to about 10%. At the average in the EU-25, this relation amounted to c.a. 14.5%. Comparising Poland with the EU--25, it can be observed, that the total liabilities of the average Polish farm achieved only 17.3%, and the net worth only 26.3% of the level observed in the EU-25 (Table 1)[9].

In the year 2006, the total output from the Polish average individual farm amounted to 23 282 euro, while the average individual farm from the EU-25 countries obtained 63 110 euro of the total output's value (Table 2). It's worth to emphasis that the structure of Polish average individual farm's output was as follows (approximately): 52% – crops output, 46% – livestock output and 2% – other output. The similar structure of output of the average individual farm occurred in the EU-25 countries. So, this output consisted of: 51% crops output, 44% livestock output and 5% other output. While calculating the total output taking into account medium area of farm, Polish farm achieved only c.a. 1344 euro of total output and farm from the EU-25 – c.a. 1817 euro in the year 2006. So, in Poland this average farm obtained only 74% of the level observed in the EU-25 (Table 2).

Using the absolute values, in the year 2006 the average family farm income from Polish individual farm was equalled to 9087 euro, and without the subsidies was equalled only to 4166 euro. Whereas in the EU-25 countries in the analysed year the average family farm income amounted to 19 700, and without the subsidies 7567 euro (Table 2). So using the relative values, Polish average family farm income calculated on 1 hectare of agricultural area in the year 2006 was lower by c.a. 42.5 euro than the one observed in the EU-25. While analysing the average family farm income without the

[8] The other circulating assets consist of the value of the cultivations while being sold standing, the farm's share in other agricultural units, the short-term dues and amount of the cash reserve in the cash box and in the bank [Wyniki standardowe... 2006]. In this position is showed the high level of data's aggregation, but more precise information are unavailable in FADN database.

[9] In FADN database are unavailable information about the components of the net worth [FADN 2009].

Table 2. The production and incomes categories in agricultural individual farms
Tabela 2. Kategorie produkcyjno-dochodowe w gospodarstwach rolnych

Details Wyszczególnienie	Poland Polska	EU-25 UE-25	Poland/EU-25 Polska/UE-25
	euro		%
Total output, including (euro): [a)] Produkcja ogółem, w tym (euro):[a)]	23 282	63 110	36.9
total output crops and products produkcja roślinna	12 183	32 101	38.0
total output livestock and products produkcja zwierzęca	10 772	27 601	39.0
other output [b)] inna produkcja[b)]	327	3 408	9.6
Total output calculated on 1 hectare (euro/1 hectare) Produkcja ogółem w przeliczeniu na 1 ha (euro/1 ha)	1 344.2	1 817.2	74.0
Family farm income (euro) Dochód z gospodarstwa rolnego (euro)	9 087	19 700	46.1
Family farm income calculated per 1 hectare (euro/1 hectare) Dochód z gospodarstwa rolnego w przeliczeniu na 1ha (euro/1 ha)	524.7	567.2	92.5
Family farm income without current subsidies (euro) Dochód z gospodarstwa rolnego bez bieżących dopłat (euro)	4 166	7 567	55.1
Family farm income without current subsidies calculated per 1 hectare (euro/1 hectare) Dochód z gospodarstwa rolnego bez bieżących dopłat w przeliczeniu na 1 ha (euro/1 ha)	240.5	217.9	110.4

[a)]Total output is equal to sum of total crops, crops products, livestock and livestock products and of other output.

[b)]Other output – for example: leased land ready for sowing, forestry products, contract work for others, hiring out of equipment, etc.

Source: own preparations and calculations based on FADN data [2009].

[a)]Produkcja ogółem to suma końcowej produkcji roślinnej, zwierzęcej i innej produkcji w gospodarstwie.

[b)]Inna produkcja – na przykład: produkcja z wydzierżawionej powierzchni lub produkty leśne lub zakontraktowana praca na rzecz innych, wynajem sprzętu itp.

Źródło: opracowanie własne na podstawie danych FADN [2009].

subsidies calculated on 1 hectare of agricultural area, we can noticed that in Poland farms obtained higher values about 10% than average in EU-25 countries (Table 2). It is evidence that Polish farms had a better activity efficiency, mostly thanks to lower costs of activities.

THE RELATIONS BETWEEN THE OUTPUT, INCOME AND THE LEVEL OF STOCK IN AGRICULTURAL FARMS

A 6 groups of average individual farms were separated in Poland and in the EU-25 countries according to the economic size in the year 2006 (Table 3). Using the absolute values, the Polish average individual farm according to the economic size in the analysed groups had a stock of agricultural products on a same level that in the EU-25 countries, but it had a lower balance sum. Hence, the share of stock of agricultural products in a balance sum in Poland in the year 2006 was higher than observed one in the EU-25 countries and was equalled to at the average 5.8%. It is worth to emphasize,

Table 3. The comparison of balance sum and stock of agricultural products with the output and family farm income according to the economic size

Tabela 3. Zestawienie sumy bilansowej i zapasów produktów rolniczych z produkcją i dochodem z gospodarstwa rolnego według wielkości ekonomicznej

The economic size[a] Wielkość ekonomiczna[a]	Poland – Polska					EU-25 – UE-25				
	Balance sum Suma bilansowa	Stock of agricultural products Zapasy produktów rolniczych	Share of stock of agricultural products in balance sum Udział zapasów produktów rolniczych w sumie bilansowej	Total output Produkcja ogółem	Family farm income Dochód z gospodarstwa rolnego	Balance sum Suma bilansowa	Stock of agricultural products Zapasy produktów rolniczych	Share of stock of agricultural products in balance sum Udział zapasów produktów rolniczych w sumie bilansowej	Total output Produkcja ogółem	Family farm income Dochód z gospodarstwa rolnego
	euro		%	euro		euro		%	euro	
Very small Bardzo małe < 4 ESU	38 624	2 044	5.3	9342	3 666	41 952	1 992	4.7	8838	3 502
Small Małe 4 <= 8 ESU	53 003	3 151	5.9	13 755	5 789	81 690	2 090	2.6	13 276	5 966
Medium--small Średnio-małe 8 <= 16 ESU	90 892	5 600	6.2	26 644	11 228	148 600	3 740	2.5	24 725	10 186
Medium-big Średnio-duże 16 <= 40 ESU	157 399	8 730	5.5	50 708	21 698	258 073	8 201	3.2	49 767	19 622
Big Duże 40 <=100 ESU	319 273	18 911	5.9	120 664	45 004	429 174	18 196	4.2	116 174	36 684
Very big Bardzo duże >= 100 ESU	111 5035	67 500	6.1	546 443	95 770	1 114 772	94 817	8.5	396 485	100 036

[a] The economic size in the ESU units (European Size Unit).
Source: own preparations and calculations based on FADN data [2009].
[a] Wielkość ekonomiczna w jednostkach ESU (Europejska jednostka wielkości).
Źródło: opracowanie własne na podstawie danych FADN [2009].

that in Poland aside from separated groups of farms according to the economic size, this share was on the similar level (Table 3). A different situation occurred in case of an average for EU-25 countries. So, the highest share of stock of agricultural products in a balance sum had a very big (more than 100 ESU) average individual farms. This value amounted till to 8.5% in the year 2006. Whereas in the average individual farms from 4 to 16 ESU from the EU-25 countries, this share amounted only to c.a. 2.5%. It's worth to underline, that in the separated groups of farms according to the economic size, the level of Polish output and of Polish family farm income was similar as a level observed in the EU-25 countries (Table 3).

A 14 groups of average individual farms were separated in Poland and in the EU-25 countries according to the direction of production in the year 2006 (Table 4)[10]. Using the absolute values, in Poland in the year 2006 the highest balance sum and the highest stock of agricultural products had two direction of production: permanent crops combined and specialist orchards – fruits. For these production's directions the share of stock of agricultural products in a balance sum were equalled adequately to 23.8% and 9.3%. The similar share of stock was achieved also by farms with specialist other field crops (9.6%). As well using the absolute values, the lowest level of stock in Poland in the year 2006 had farms, which were engaged with specialist horticulture and specialist sheep and goats. For these directions, the shares of stock of agricultural products in a balance sum were equalled adequately to 1.3% and 2.8%.

Table 4. The comparison of balance sum and stock of agricultural products with the output and family farm income according to the direction of production

Tabela 4. Zestawienie sumy bilansowej i zapasów produktów rolniczych z produkcją i dochodem z gospodarstwa rolnego według kierunku produkcji

Direction of production [a] Kierunek produkcji [a]	Poland – Polska					EU-25 – UE-25				
	Balance sum Suma bilansowa	Stock of agricultural products Zapasy produktów rolniczych	Share of stock of agricultural products in balance sum Udział zapasów produktów rolniczych w sumie bilansowej	Total output Produkcja ogółem	Family farm income Dochód z gospodarstwa rolnego	Balance sum Suma bilansowa	Stock of agricultural products Zapasy produktów rolniczych	Share of stock of agricultural products in balance sum Udział zapasów produktów rolniczych w sumie bilansowej	Total output Produkcja ogółem	Family farm income Dochód z gospodarstwa rolnego
	euro		%	euro		euro		%	euro	
1	2	3	4	5	6	7	8	9	10	11
Specialist COP Zboża, oleiste i strączkowe	104 379	6 714	6.4	28 403	12 038	366 910	8 033	2.2	52 659	16 499

[10] The names of production's directions come from FADN database, in which the farms are grouping according to the basic agricultural types (TF8) [Wyniki standardowe... 2006]. In Poland not occurred two direction of production: specialist wine and specialist olives.

Table 4 – cont. / Tabela 4 – cd.

1	2	3	4	5	6	7	8	9	10	11
Specialist other field crops Inne uprawy polowe	83 520	7 981	9.6	28 763	12 401	343 776	8 188	2.4	67 935	21 561
Specialist horticulture Uprawy ogrodnicze	109 065	1 437	1.3	54 153	14 474	298 759	10 242	3.4	154 362	34 032
Specialist wine Winnice	–	–	–	–	–	274 483	50 135	18.3	62 024	21 111
Specialist orchards – fruits Drzewa i krzewy owocowe (z cytrusowymi)	120 641	11 272	9.3	27 824	11 869	175 236	3 230	1.8	35 762	15 154
Specialist olives Gaje oliwne	–	–	–	–	–	154 033	797	0.5	15 217	10 698
Permanent crops combined Pozostałe uprawy trwałe	123 643	29 389	23.8	34 596	14 107	172 681	6 943	4.0	41 570	16 305
Specialist milk Bydło mleczne	82 583	2 960	3.6	20 132	10 979	606 127	4 803	0.8	113 367	34 040
Specialist sheep and goats Owce, kozy i inne zwierzęta żywione w systemie wypasowym	52 626	1 458	2.8	9 335	8 348	362 899	1 997	0.6	50 229	20 868
Specialist cattle Bydło – mleczne, hodowlane, tucznik	106 213	4 020	3.8	26 900	14 066	408 649	3 191	0.8	48 996	19 909
Specialist granivores Zwierzęta żywione paszami treściwymi	103 979	3 920	3.8	52 297	13 049	433 057	3 940	0.9	196 995	41 988
Mixed crops Mieszane uprawy polowe ogrodnicze i trwałe	57 287	3 856	6.7	14 463	6 374	185 431	4 355	2.3	36 585	13 939

Table 4 – cont. / Tabela 4 – cd.

1	2	3	4	5	6	7	8	9	10	11
Mixed livestock Mieszany z przewagą zwierząt	60 114	3 162	5.3	15 363	6 261	155 307	3 299	2.1	42 587	12 148
Mixed crops and livestock Mieszany z przewagą upraw	62 157	4 392	7.1	17 179	6 620	313 458	6 458	2.1	72 255	16 831

[a)]The names of production's directions are compatible with the classification of farms according to the agricultural types TF8.
Source: Own preparations and calculations based on FADN data [2009].
[a)]Nazwy kierunków produkcji są zgodne z klasyfikacją gospodarstw rolnych według typów rolniczych TF8.
Źródło: opracowanie własne na podstawie danych FADN [2009].

It is worth to say that in Poland the highest output and family farm income achieved specialist horticulture farms, and the lowest ones occurred in farms with mixed direction of production – with the share of stock of agricultural products in a balance sum amounted to at the average 6.3% (Table 4). The other situation occurred for the EU-25 countries. The highest balance sums had farms with livestock production, beside the low levels of stock of agricultural products. Hence, their share of stock in a balance sum didn't exceed 1%. The low share of stock had also farms with specialist olives (0.5%). Whereas using the absolute values, the highest stock of agricultural products had farms with specialist wine, so their share of stock in a balance sum were also the highest and amounted until to 18.3% (Table 4). It's worth to emphasis that in the year 2006 in the EU-25 countries the highest average output and family farm income had a farms with specialist granivores, specialist horticulture and specialist milk.

THE FACTORS INFLUENCES ON THE FAMILY FARM INCOME

Elaborating the models characterized the relations between family farm income, among the variables distinguish more often the value of crops and livestock production. However, the value of stock of agricultural products was added, because the rational management of stock caused the cost cutting, so it can increased the family farm income [Wasilewski 2004, Ryś-Jurek 2009][11].

For to show the relation between family farm income and crops production, livestock production and stock of agricultural products, the linear regression analysis was used. The calculations were made on FADN data about individual farms' types according to the direction of production and to the economic size in the EU-25 countries.

[11] The selection of variables for a model was made on the basis of existing literature and on statistical criteria. The model with a stock of agricultural products increased by a value of a non-breeding livestock was not presented, because it hadn't a statistical significance of results. While presented and established models are the parts of broader analysis in dynamic way for the years 2004-2006, caring on plots from the article Ryś-Jurek [2009].

In this way two models were elaborated, first one for Poland, second one for all the EU-25 countries (Table 5)[12].

On the basis of a determinant coefficient elaborated for a regression's model for Polish individual farms' types according to the direction of production and to the economic size, it can be noticed that the variability of family farm income in the year 2006 was explained in more than 97% by value of crops output, livestock output and stock of agricultural products. Meanwhile, for types of individual farms according to the direction of production and to the economic size from all the EU-25 countries, on the basis of determinant coefficient, it was found that only about 38% of the family farm income's variability in the year 2006 was explained by value of crops output, livestock output and stock of agricultural products.

Table 5. The models of family farm income
Tabela 5. Modele dochodu z gospodarstwa rolnego

Country Kraj	Parameters of model Parametry modelu	R^2	n
Poland Polska	$\hat{y} = 0.28x_1 + 0.27x_2 + 0.73x_3$ (31.95) (17.54) (9.11)	0.97	50
EU-25 UE-25	$\hat{y} = 20\,573.91 + 0.13x_1 + 0.12x_2 - 0.14x_3$ (8.58) (13.65) (–2.53)	0.38	620

Explanations: $\hat{y}$ – dependent variable – family farm income (euro), x_1 – independent variable – value of total output crops and products (euro), x_2 – independent variable – value of total output livestock and products (euro), x_3 – independent variable – value of stock of agricultural products (euro), R^2 – determinant coefficient, n – number of individual farms' types according to the production's direction and to the economic size; numbers in brackets – values of t-Student statistics.

Source: own preparations and calculations based on FADN data [2009].

Objaśnienia: $\hat{y}$ – zmienna zależna – dochód z gospodarstwa rolnego (euro), x_1 – zmienna niezależna – wartość produkcji roślinnej (euro), x_2 – zmienna niezależna – wartość produkcji zwierzęcej (euro), x_3 – zmienna niezależna – wartość zapasów produktów rolniczych (euro), R^2 – współczynnik determinacji, n – liczba typów indywidualnych gospodarstw rolnych według kierunku produkcji i wielkości ekonomicznej; liczby w nawiasach – wartości statystyki t-Studenta.

Źródło: obliczenia własne na podstawie danych FADN [2009].

In a regression's model estimated for Poland in the year 2006, it can be observed the similar influence of values of crops output and of livestock output on a value of the family farm income. The growth of value of crops output by 1 euro influenced an increase of family farm income by 0.28 euro (with the established level of other variables), and the enlargement of livestock output's value *caeteris paribus* by 1 euro was accompanied by the growth of family farm income 0.27 euro. However, an increase of the stock of agricultural products influenced in the highest degree on the family farm

[12] In article: Ryś-Jurek [2009] for the year 2006 the satisfactory regression's models were not obtained. In model for Poland the stock of agricultural products were statistically insignificant, and a model for all the EU was not established, because all variables were statistically insignificant. This time the research was a success, because the FADN database was complemented.

income's growth. This increase *caeteris paribus* by 1 euro caused the growth of income's value by 0.73 euro. It can be proved that in Poland, with established level of crops production and of the livestock production in the year 2006, the costs spend on the agricultural products' stock maintenance weren't a weight for the individual farms and didn't caused a dimension of family farm income[13].

In a regression's model estimated for the EU-25 countries in the year 2006, on the basis of estimated parameters, it can be observed also the similar influence of values of crops output and of livestock output on a value of the family farm income. The growth of value of crops output *caeteris paribus* by 1 euro influenced an increase of family farm income by 0.13 euro, and the enlargement of livestock output's value by 1 euro caused the growth of family farm income by 0.12 euro (with the established level of other variables). While, a negative influence on a family farm income had a stock of agricultural products. The stock's growth by 1 euro *caeteris paribus* caused a decrease of income by 0.14 euro. It can serve as an evidence, that in the EU-25 with given level of crops and livestock output in the year 2006, the costs spend on the agricultural products' stock maintenance were a weight for the individual farms and caused a reduction of family farm income.

CONCLUSIONS

1. At the average in Poland, the individual farm in the year 2006 had a balance sum four times lower than observed one in the EU-25, but this farm kept relatively high stock of agricultural products, it shows that Polish individual farm managed the production based in higher degree on own agricultural materials.

2. In the year 2006 in Poland, the average total output from the individual farm was three times lower and the average family farm income was two times lower than ones in the EU-25. Whereas considering the average family farm income without the subsidies calculated on 1 hectare of agricultural area, it can be observed, that in Poland this one was higher by about 10% than the average one in the EU-25 countries. It was a result of situaion that Polish farms had a better activity efficiency, mostly thanks to lower costs of activities.

3. The share of agricultural products' stock in a balance sum in Poland in the year 2006 in the individual farms according to the economic size was higher than observed one in the EU-25 countries and was equalled at the average to 5.8%. The highest share of stock of agricultural products in a balance sum in Poland had three directions of productions: permanent crops combined, specialist other field crops and specialist orchards – fruits. The lowest level of stock in Poland had farms, which were engaged with specialist horticulture and specialist sheep and goats. While in the EU-25, the lowest share of stock (to 1%) in a balance sum had the farms with livestock production and with

[13] This conclusion is supported by a fact, that in a balance sheet of Polish average individual farm in the year 2006 occurred a relatively high level of stock of agricultural products in comparison with the average stock's level in the EU-25 countries (compare: Table 1, 3 and 4).

specialist olives. Whereas the highest stock of agricultural products had a specialist wine.

4. On the basis of the regression's models established for Poland and the EU-25, it can be observed a positive influence of crops output and of livestock output on the value of family farm income. The difference occurred in case of stock of agricultural products. In Poland the stock had a positive influence on the increase of income, and in the EU-25 negative.

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RELACJE MIĘDZY PRODUKCJĄ, DOCHODEM I ZAPASAMI W GOSPODARSTWACH ROLNYCH

Streszczenie. W pracy podjęto próbę przedstawienia zapasów, produkcji i dochodów w indywidualnych gospodarstwach rolnych w Polsce w porównaniu z innymi krajami Unii Europejskiej w 2006 roku. W badaniach wykorzystano dane FADN. Badania wykazały między innymi, że polskie przeciętne gospodarstwo rolne dysponuje około czterokrotnie mniejszą sumą bilansową niż unijne, a przeciętna produkcja i dochód z gospodarstwa rolnego były około trzykrotnie mniejsze w Polsce niż średnio w Unii. Udział zapasów produktów rolniczych w sumie bilansowej w polskich gospodarstwach był dwukrotnie większy niż w Unii. Największy udział zapasów w sumie bilansowej w Polsce miały trzy kierunki produkcji: pozostałe uprawy trwałe, inne uprawy polowe oraz drzewa i krzewy owocowe. Natomiast w Unii największe zapasy utrzymywały winnice. Według modeli regresji, w Polsce na zwiększenie dochodu pozytywnie wpływały zapasy, produk-

cja roślinna i zwierzęca, a w Unii na zwiększenie dochodu oddziaływały pozytywnie produkcja roślinna i zwierzęca, a zapasy – negatywnie.

Słowa kluczowe: zapasy produktów rolniczych, produkcja rolnicza, dochód z gospodarstwa rolnego

Accepted for print – Zaakceptowano do druku: 15.11.2009

For citation – Do cytowania: Ryś-Jurek R., 2009. The relations between the output, income and stock in agricultural farms. J. Agribus. Rural Dev. 4(14), 135-148.