

DIVERSIFICATION IN THE INCOME LEVELS OF EU FARM HOLDINGS SPECIALIZING IN THE PRODUCTION OF MILK

Katarzyna Szmidt, Armand Kasztelan, Andrzej Samborski
University of Life Sciences in Lublin

Maria Kierepka
State Higher School of Vocational Education in Zamość

Abstract. EU farms specializing in milk production are characterized by a considerable diversity in terms of income levels. This variation is due to the impact of a number of natural and economic factors. In EU-15, the level of income increased by 160% in 2011 as compared to 2004. This upward trend was even more strongly manifested – 330% – in the case of dairy farms in EU-10. Such a significant increase in revenue was due to, among others, integration and expansion of the EU, and opportunities for farmers to benefit from support schemes under the CAP.

Key words: milk production, prices, dairy market, productivity, European Union

INTRODUCTION

The agricultural sectors of the European Union have been continually changing in recent years, the changes resulting from internal reforms, integration processes and the impact of global factors. One of the areas characterised by the most dynamic changes is the dairy sector.

European integration – with the introduction of the Common Agricultural Policy (CAP) tools – was the main factor stimulating the restructuring of the dairy sector. The crucial elements in this process included: improvements in the quality of products, pre-accession support investment, growth in exports, increase in milk prices, the introduction of direct payments and the system of milk quotas [Malak-Rawlikowska et al. 2008]. In 1984 saw the introduction of dairy policies of the European Union (EU) quota system

Corresponding author: Katarzyna Szmidt, University of Life Sciences in Lublin, Department of Agricultural Sciences in Zamość, Szczepkowska 102, 22-400 Zamość, Poland,
e-mail: katarzyna.szmidt@up.lublin.pl

© Copyright by Warsaw University of Life Sciences Press, Warsaw 2016

for milk supply, which was already characterized by import tariffs, export subsidies and purchase intervention [Huettel and Jongeneel 2011].

This common European system, with quotas set for individual countries, guarantees farmers a stable income, and dairy product manufacturers, viable economic conditions for the processing of milk produced in the EU, by limiting price volatility within the limits of milk quotas allocated to individual countries. Also, consumers are provided with a balanced market, well stocked with dairy products of high quality, and of prices they may find acceptable [Seremak-Bulge 2005]. The aims of the breeder/producer is to obtain milk in the most economical manner, with the greatest possible profit [Szymańska 2007].

In many European Union countries, complex projects aiming at improving economic efficiency in dairy herds have been undertaken in recent years. Attention is drawn to the quality of the milk produced, while guaranteeing a widely understood physiological balance in animals, which is one of the essential elements of the so-called animal welfare [Teter 2008].

Quality milk production in accordance with EU standards, in addition to meeting the sanitary – veterinary conditions, and ensuring animal welfare needs, requires modern production technologies and related technical equipment. The main course of action is to implement technologies that help to achieve a high level of hygiene. An alternative to milk producers on an industrial scale are milking robots [Gaworski and Kupczyk 2004].

Changes in production techniques used in dairy farms have been a direct result of investments in new technologies. In addition, a noticeable change has taken place also in feeding practices [Malak-Rawlikowska et al. 2008].

The aim of this paper is to analyse differences in the level of income of farm holdings specializing in milk production.

MATERIAL AND METHODS

The study was based on data collected within the European system of Farm Accountancy Data Network (FADN), as well as information from The Dairy Farming Information Centre, Eurostat. The study embraced farms, whose dominant area of production was milk production, and included the data for the years 2000–2011.

To assess the economic situation of EU-15 we used income data from the family run agriculture farms (SE420) and income per fully employed person in a family (SE420 / SE015). In addition, an assessment of the economic situation of households was used: economic performance – output per AWU (total work units), the intensity of dairy production expressed as a ratio of milk production per ha of fodder production, capital intensity [fixed assets (SE441) / agricultural income (SE420)].

RESULTS AND DISCUSSION

The number of dairy cows in the European Union comprising 27 countries amounted to 22.8 million items in 2011. It should be noted that in EU-15 there was a reduction in the number of dairy cows (–12%) in the period of 2000 to 2011, on an average level of about 1% per year. A downward trend was also reported in the 10 countries acceded to

the Community in 2004 (EU-10), and those countries showed during the analysed period a decrease in herds of dairy cows by 13% – an average of about 2% per year. An even greater decline characterized dairy farms in Bulgaria and Romania (EU-2). In just four years the number of cows was reduced in these countries by 22%, which accounted for nearly a 6% decline per year.

The decrease in dairy herds in the European Union was compensated by an increase in their milk yield. In 2011, the average productivity of dairy cattle in the EU-27 amounted to 6,501 kg·pc⁻¹, which resulted from several factors, such as increased awareness of the relationship between animal feeding and milk production, breeding productive types of dairy cows, as well as the availability of improved tools and equipment [Boschma et al. 1999] – Figure 1.

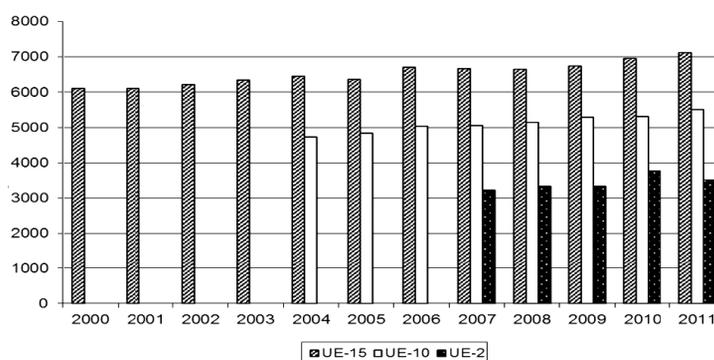


Fig. 1. Milk cow yields in the EU countries in the years 2000–2011 (kg·pc⁻¹)

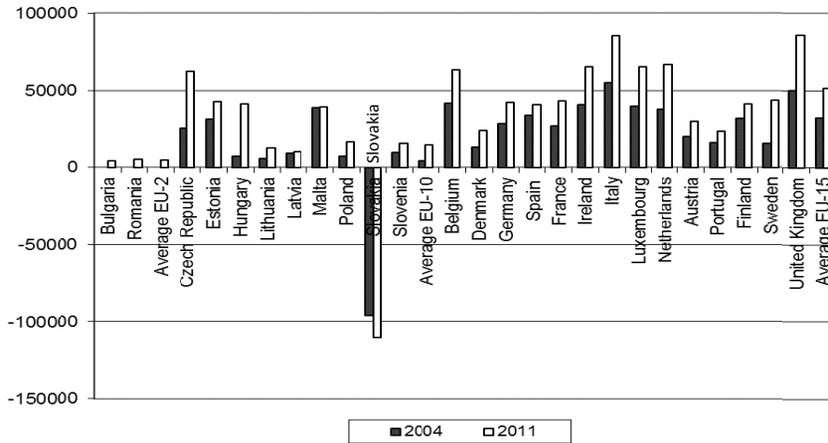
Source: <http://www.dairyco.net/datum/milk-supply/milk-production/eu-milk-deliveries.aspx>.

The highest yield was achieved by farmers in the EU-15 (7,152 kg·pc⁻¹, data for 2011). Similar results were achieved in 2004, when the figure stood at 6,503 kg·pc⁻¹. It should be noted that in this group of countries, the performance of dairy cows increased steadily – an annual average of about 92 kg·pc⁻¹ (Fig. 1). An upward trend was also reported in 10 countries recently acceded to the European Union, but at a much lower efficiency. Milk production in these countries in 2004 was on average at 5,222 kg·pc⁻¹, in 2011 at 6,075 kg·pc⁻¹. The average annual growth in the EU-10 in the period under study amounted to 138 kg·pc⁻¹.

The financial result of farms participating in the FADN was assessed using the revenue from family farms, which is a form of remuneration for work [Ziętara 2011]. Differentiation of income per farm is shown in Figure 2.

In 2011, the lowest value of income characterized farms situated in Bulgaria and Romania. Milk producers in these countries achieved an average yield of 4,918.50 EUR. In nine countries, which joined the Community in 2004, the rate in 2011 amounted to 14,512.89 EUR, its value increased by 70% as compared to 2004. The situation was adverse in terms of income for milk producers in Slovakia. A constant problem in the production of milk in Slovakia are unsustainable increases in prices of means of production as well as fluctuating milk prices. This fact affects the efficiency and the level of income not only for dairy farmers, but also for the dairy processing industry [Masár et al. 2009].

The levels of income for dairy farms located in the countries of the former EU-15 in 2011 were on average 3.5 times higher than the rate characterizing dairy farms in the countries which joined the Community in 2004 (Fig. 2).



No data for Cyprus

Fig. 2. Milk farm incomes in the EU countries in 2004 and 2011 (EUR)

Source: Own study on the basis of FADN data (<http://ec.europa.eu/agriculture/rica>).

An economic category describing a potential remuneration for the work of the farmer and his family members (FWU) is the income from the farm per fully employed family member (Fig. 3).

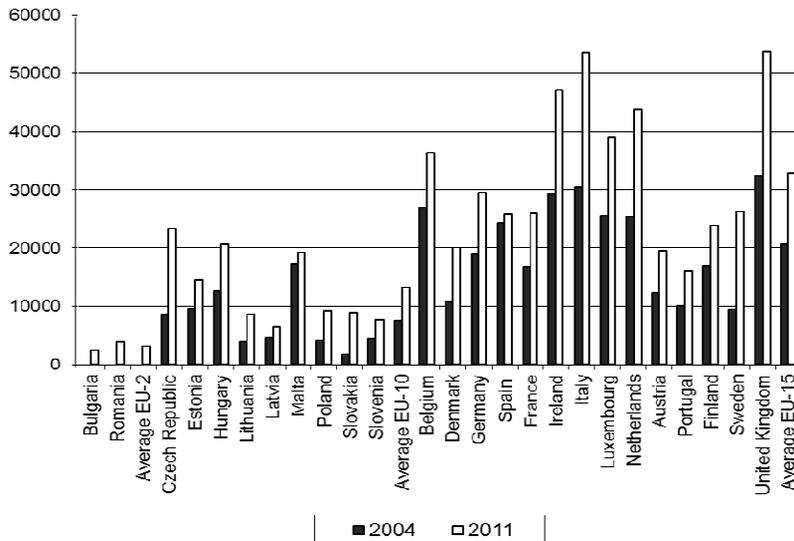


Fig. 3. Income per farm in 2004 and 2011 (EUR·FWU⁻¹)

Source: Own study on the basis of FADN data (<http://ec.europa.eu/agriculture/rica>).

The highest income per family member was reached by farms in the United Kingdom and Italy, then in Ireland, the Netherlands, Luxembourg and Belgium. In the rest of the EU-15 countries, income per family member was lower than the EU-15 average, which in 2011 amounted to 32,900 EUR and as compared to 2004 showed an increase of 18%. In the EU-10 countries in 2011 the highest level of income and remuneration for the work was received by producers from the Czech Republic, Hungary and Malta – above average, which stood at 13,213 EUR.

Differences in farm incomes can also be partly explained by differences in income earned for milk. Milk price depends on the products that are produced from it, and the way in which the production process is organized [Reijs et al. 2013]. In the years 2001–2007, prices paid to EU milk producers remained at a relatively stable level (Fig. 3). With a relatively high level in 2001, the price of milk was gradually decreasing until 2007. During this period, a reform of the EU dairy sector policies reduced intervention prices for butter and skimmed milk [LTO – International Milk Price Comparison 2010]. Positive changes for dairy farmers occurred in the years 2007 and 2008, when there was an increase in the prices of milk, caused in turn by the increase in demand for high value milk and dairy products, both in Europe and in the world [Dairy market... 2008]. Year 2009 saw a downward trend, prices paid to milk producers reached a historically low level. The source of the crisis was the weakness in global demand and a strong growth in the production of the largest non-European producers. This situation then changed in 2010 (Fig. 4).

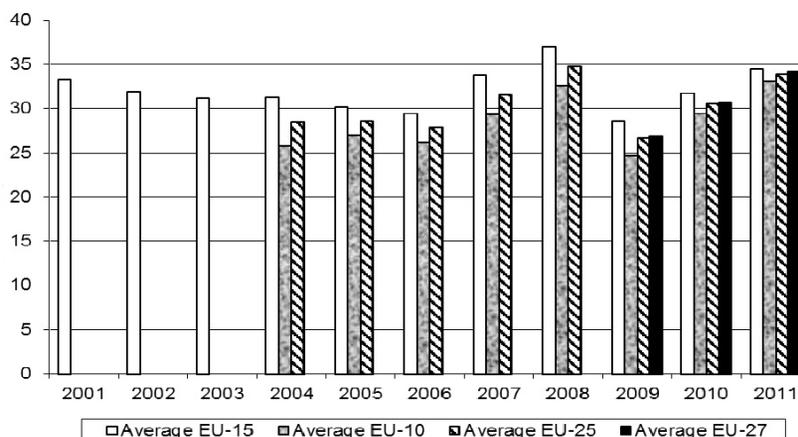


Fig. 4. Prices paid to EU milk producers in the years 2001–2011 (EUR·100 kg⁻¹)

Source: <http://www.dairyco.net>.

The global economic crisis contributed significantly to fluctuations in the price of milk between 2008 and 2011. In 2011, the average price of milk in the EU-15 amounted to 34.51 EUR for 100 kg. In nine (no data for Malta) countries which joined the Community in 2004, milk producers earned prices lower by 4%, while dairy farmers in Bulgaria and Romania obtained prices lower by 12% compared to the prices paid to farmers in the EU-15 (Fig. 5).

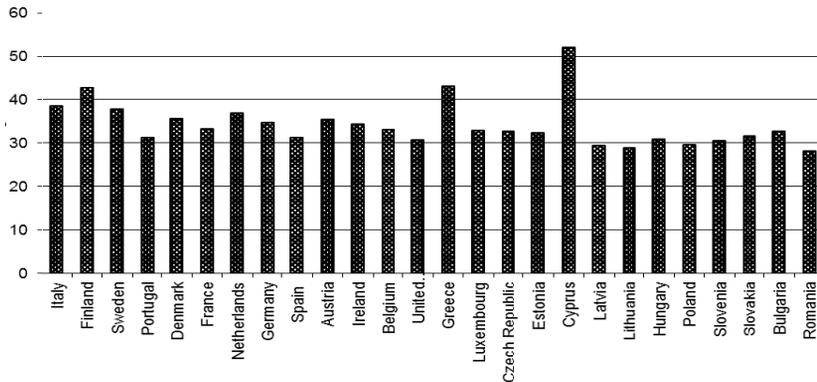


Fig. 5. Prices paid to EU producers of milk in 2011 (EUR·100 kg⁻¹)

Source: <http://www.dairyco.net>.

In 2011, the highest prices for milk were received by producers in Cyprus. One of the reasons for such a high price was the lack of competition and high production costs because, unlike most EU countries, Cyprus has no pastures of its own, and farmers are forced to buy feed from outside. The main supplier of grain is the state itself and it has a monopoly on supplies [*Competition – Cyprus* 2010].

In 2011, the lowest rates among the EU-15 were obtained by milk producers in the UK, mainly due to high feed prices and low prices for dairy products (cream) on world markets [Rucinski and Polet 2010].

The income levels are also determined by the relationship between the prices of agricultural products sold by farmers and the costs of production, whose main component are costs of non-agricultural origin [Ziętara 2011]. Such values showed a great diversity within the European Community (Fig. 6).

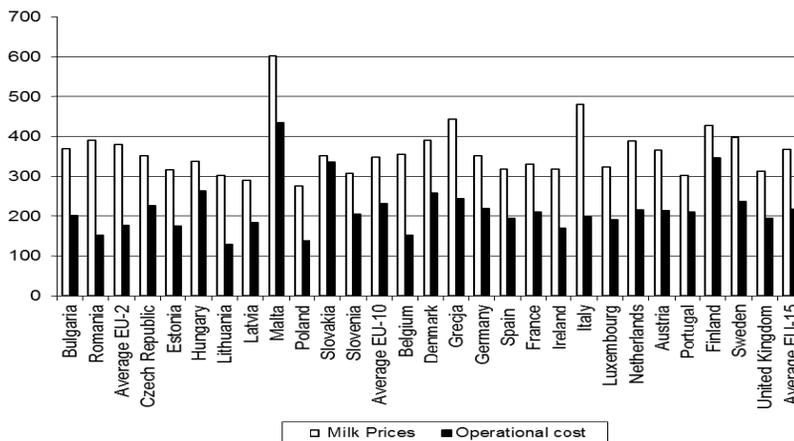


Fig. 6. Price to operational cost ratio in milk production in 2011 (EUR·t of milk⁻¹)

Source: EU Dairy farms report 2012. European Commission Directorate – General for Agriculture and Rural Development. Brussels (http://ec.europa.eu/agriculture/rica/publications_en.cfm#DAIRY, access April 2013).

In 2011, milk producers in Central and Eastern European countries incurred operating costs at the level of 232 EUR for 1 t. This figure, as compared to the average in the EU-15 countries was about 7% higher. The high level of this indicator was due to high operating costs incurred by the milk producers of Malta, where the high cost of production in this country resulted from the need to import feed [*Dairy report farm report 2011, 2012*]. A competitive cost position in relation to EU-15 was observed among the following producers: Lithuania, Poland, Estonia, Latvia and Slovenia. Costs lower by 18% as compared to the average of EU-15 were shown by the production of milk in Bulgaria and Romania (Fig. 6).

One of the factors leading to an improvement of income situation of farmholds is to increase their areas, which, however, is related to a necessity of abandoning production by a number of farmers [Ziętara 2009]. In 2011, the agricultural area of dairy farms averaged 184.69 ha in EU-10, that figure marked a 17.5% increase as compared to 2004 area of land used for agriculture. Growth of the agricultural area was also noticeable in farms of the former EU-15. In 2011, the smallest area of land used for agriculture was seen in farms in Bulgaria, Romania and Malta. The greatest potential of land used for agricultural production was demonstrated by Slovakian dairy farms. In the years 2004–2011 there was an increase of agricultural land use in the farms under our study (<http://ec.europa.eu/agriculture/rica>).

The intensity of dairy production ratio was expressed by milk production volumes per one hectare of fodder crops. This indicator measures the productivity of the land, but cannot be used separately to evaluate the performance, as there are differences in the use of purchased feed between countries [Reijs et al. 2013] – Figure 7.

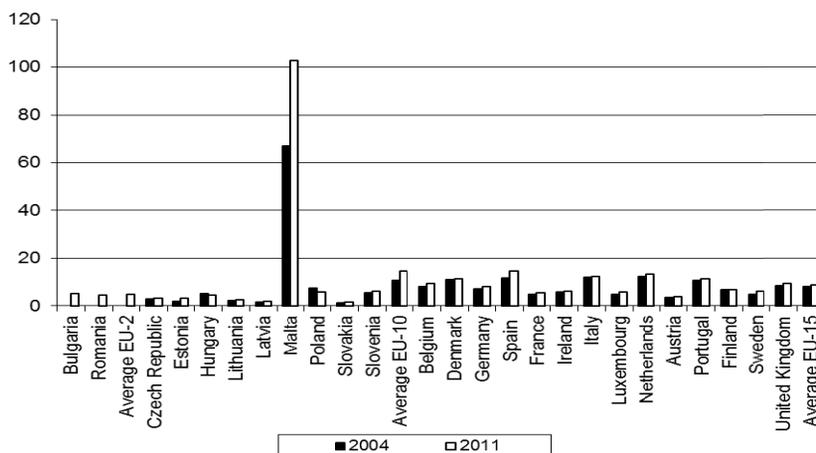


Fig. 7. Intensity of production in dairy farms in EU countries in 2004 and 2011 (t·ha⁻¹)

Source: Own study on the basis of FADN data (<http://ec.europa.eu/agriculture/rica>).

In 2011, among all the countries of the Community, the largest milk production per ha of fodder crops was demonstrated by dairy farmers in Malta ($103 \text{ t}\cdot\text{ha}^{-1}$), compared to 2004 there was an increase of 53% in the ratio. The average for the ten countries, which together with Malta joined the EU in 2011 amounted to $15 \text{ t}\cdot\text{ha}^{-1}$. In Denmark, in 2011, the intensity of production increased by 3% as compared to 2004 and amounted to 11 t of milk per ha, and was higher than the EU-15 average, which stood at $9 \text{ t}\cdot\text{ha}^{-1}$. In Sweden and Finland, milk production per ha of fodder crops remained at the constant level – about 6 t in these countries, where a short vegetation period is likely to play a significant role.

The highest economic productivity in 2011 was observed in Danish farms, where they reached an improvement rate of 102%, as compared to 2004 (Fig. 8); though the greatest improvement in economic productivity was achieved in dairy farms in Estonia, Slovakia and Slovenia (on average at around 163%). The lowest value of the index was observed in dairy farms in countries admitted to the Community in 2007 – an average of 7,000 EUR per AWU.

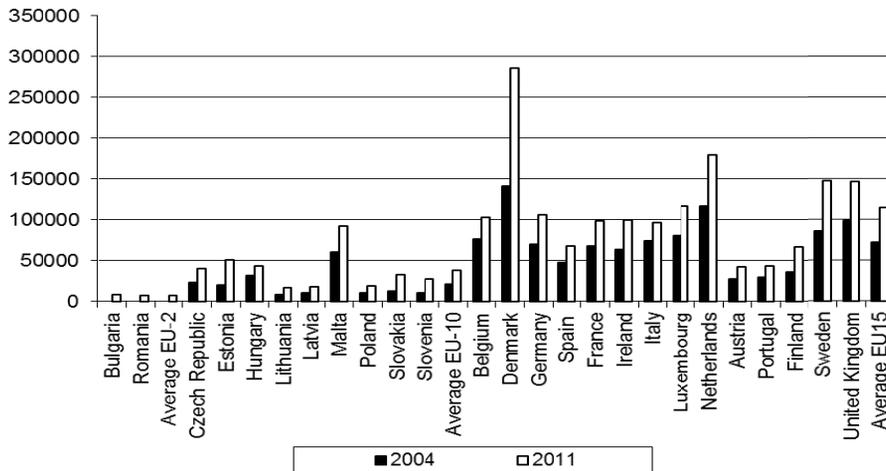


Fig. 8. Economic productivity of human labour in selected EU countries in 2004 and 2011 (EUR·AWU⁻¹)

Source: Own study on the basis of FADN data (<http://ec.europa.eu/agriculture/rica>).

In the years 2011 and 2004, milk production in EU-15 was characterized by higher capital intensity, the rate in both analysed years remained at a similar level and an average of 23 EUR. Milk production in EU-10 in 2011 was characterized by capital intensity of 9 EUR; in comparison to 2004, this value was higher by 19% (Fig. 9).

The index value was varied between countries of the Community. In 2011, the highest level of capital intensity was recorded in Denmark, the Netherlands, Sweden, Malta, Slovenia and the Czech Republic (Fig. 9). Farms specializing in milk production in these countries were characterized by high economic productivity of labour and high yields of dairy cows. High capital intensity may contribute to the increase in production costs, but it can also be a factor in the improvement of the results in the long run.

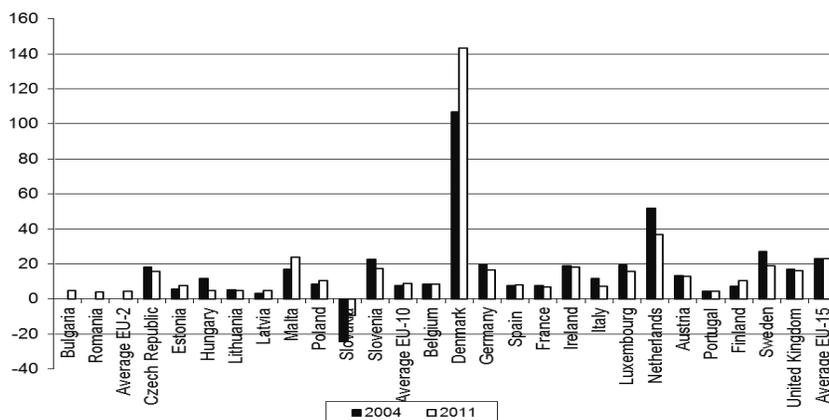


Fig. 9. Capital intensity in milk production in EU countries in 2004 and 2011 (EUR)

Source: Own study on the basis of FADN data (<http://ec.europa.eu/agriculture/rica>).

CONCLUSIONS

The analysis demonstrated a significant degree of variation in income earned by EU milk producers. This variation resulted from the situation on the commodity markets, which greatly affected not only the revenue from the sale of milk, but also feed costs, which constitute a large portion of the operating costs. In EU-15, the level of income increased in 2011 compared to 2004 by 160% and amounted to 51,483 EUR. An upward trend was even more strongly manifested in the case of dairy farms in EU-10, where there was 339% increase in revenue, which in 2011 averaged 14,513 EUR. Such a significant increase in revenue was due to the integration with the EU and the new opportunities to benefit from support schemes under the CAP – direct payments.

At the national level, the highest income in 2011 was reached by milk producers from the UK and Italy at an average of 86,000 EUR. Income level was also high in the Netherlands, Ireland, Luxembourg, Belgium and the Czech Republic on the average of 65,000 EUR. Good results in terms of revenues could, among others, be due to such various factors as the price of milk and low operating costs (as in Italy).

The lowest level of this indicator was reached by the producers from Slovakia, Latvia, Lithuania, Slovenia, and Poland. The disadvantage of the countries located in this part of Europe are lower milk prices, as compared to the EU-15, and farmers may try to increase their earnings by improving quality of the production. Milk production in these countries was characterized by lower operating costs in comparison to those of the EU-15. These benefits may however disappear if the prices of local resources increase. To remain competitive, it is necessary to use them more effectively. Producers who obtain a higher level of income had more efficient cattle in terms of milk production. In 2011, the productivity of dairy cattle in EU-15 amounted to an average of 6,975 kg·pc⁻¹, which was higher by 28% than the performance obtained by the milk producers of the EU-10.

REFERENCES

- Dairy market: Council approves 2 percent increase in milk quotas from April 2008 (2008). European Commission, Brussels. Retrieved from www.europa.eu/rapid/press-release_IP-08-455_en.htm (accessed March 2008).
- EU dairy farms report 2011 (2012). European Commission. Directorate – General For Agriculture And Rural Development. Brussels. Retrived from www.ec.europa.eu/agriculture/rica/pdf/Dairy_report2011.pdf (accessed December 2011).
- Gaworski, M., Kupczyk, A. (2004). The future of milk production in Poland and milking robots. *Przegląd Hodowlany / Overview of Breeding*, 11, 6–8. (English Abstract).
- Huettel, S., Jongeneel, R. (2011). How has the EU milk quota affected patterns of herd-size change? *European Review of Agricultural Economics*, 38 (4), 497–527.
- LTO – International Milk Price Comparison 2010 (2010). Available at www.milkprices.nl (accessed August 2011).
- Malak-Rawlikowska, A., Fałkowski, J., Milczarek-Andrzejewska, D. (2008). The concentration of milk production in Poland and distribution channels. *Issues of Agricultural Economics. Institute of Agricultural and Food Economics – National Research Institute – PIB*, 3, 45–59.
- Masár, I., Božik, M., Šajbidorová, V., Belešová, S., Matošková, D. (2009). An assessment of the competitiveness of the dairy food chain in Slovak Republic. *AgriPolicy Enlargement Network for Agripolicy Analysis*, 14. Available at: www.europartnersearch.net/agripolicy (accessed March 2009).
- Reijs, J.W., Daatselaar, C.H.G., Helming, J.F.M., Jager, J., Beldman, A.C.G. (2013). Grazing dairy cows in North-West Europe Economic farm performance and future developments with emphasis on the Dutch situation. LEI Report 2013-001. Project code 2275000595LEI Wageningen UR, The Hague. Available at www.wageningenur.nl (accessed July 2013).
- Rucinski, P., Polet, Y. (2010). Dairy and Products Annual. Global Agricultural Information Network, 1–14, available at <http://gain.fas.usda.gov> (accessed October 2010).
- Seremak-Bulge, J. (2005). Polish farming in Europe. Production of milk. Institute of Agriculture and Food Economy. Cooperation Fund. Office of Rural Programs. Warszawa (English Abstract).
- Szymańska, A.M. (2007). Analysis of cattle breeding and milk production in relation to the Polish rural areas. Summary of 2006 and prospects. *Cattle breeding*, 12 (English Abstract).
- Teter, W. (2008). Efektywność produkcji mleka w gospodarstwach farmerskich Polski południowo-wschodniej z uwzględnieniem technologii utrzymania krów [The efficiency of milk production on farms in south-east Poland with the technologies to maintain cows]. *Annals of PTZ*, 4, 1, 69–76.
- Ziętara, W. (2009). Model of Polish agriculture – approach to current challenges. *Scientific Papers of the Warsaw Agricultural University. Economics and Organization of Food Economy*, 73, 5–21 (English Abstract).
- Ziętara, W. (2011). Status and trends of farmholds focused on milk production. *Breeding Review*, 5, 3–6 (English Abstract).

ZRÓŻNICOWANIE POZIOMU DOCHODÓW UNIJNYCH GOSPODARSTW SPECJALIZUJĄCYCH SIĘ W PRODUKCJI MLEKA

Streszczenie. Celem opracowania było zbadanie poziomu dochodów wybranych unijnych gospodarstw specjalizujących się w produkcji mleka. Wykonano analizy porównawcze, zestawiając ze sobą wskaźniki ekonomiczno-organizacyjne dotyczące gospodarstw, takie jak: liczebność pogłowa, wydajność, cena. Przeprowadzona analiza wykazała, że unijne gospodarstwa specjalizujące się w produkcji mleka charakteryzowały się znacznym zróżnicowaniem pod względem wysokości uzyskiwanych dochodów. Zróżnicowanie to było wynikiem oddziaływania wielu czynników naturalnych oraz ekonomicznych. W krajach UE-15 poziom dochodów wzrósł o 160% w 2011 roku w porównaniu do 2004 roku. Jeszcze silniej przejawiającą się tendencję wzrostową (330%) zaobserwowano w przypadku gospodarstw mleczarskich UE-10. Tak znaczny wzrost dochodów był spowodowany m.in. integracją z UE i możliwością skorzystania z systemu wsparcia w ramach WPR.

Słowa kluczowe: produkcja mleka, ceny, rynek mleka, wydajność, Unia Europejska

Accepted for print: 27.01.2016

For citation: Szmidt K., Kierepka M., Kasztelan A., Samborski A. (2016). Diversification in the income levels of EU farm holdings specializing in the production of milk. *Acta Sci. Pol., Oeconomia*, 15 (1), 133–149.

