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PRODUCTION AND INTERNATIONAL TRADE OF MILK AND DAIRY PRODUCTS IN THE USA

Abstract

The paper analyzes the production and foreign trade of milk and dairy products in the US. The main countries to which the US exports milk and milk products and importers were indicated. The data analysis was used descriptive and graphical methods. Source material constituted the USDA data. The USA is a major producer of milk in the world and the production of this raw material is varied regionally. Most milk producing states in 2013 in the USA include: California (41,256 million IBS), Wisconsin (27,572), New York (13,469), Idaho (13,431) and Pennsylvania (10,565). The USA exports milk and dairy products mainly

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to Mexico, China, Canada and the Philippines. Countries that provide milk and dairy products to the USA are mainly: New Zealand, Canada, Italy and France. The USA is a major exporter of milk on the world market and the 2012–2013 US exports accounted for 11% of the world export.

Keywords: milk, dairy products, exports, imports, balance

Introduction

International trade is an important factor in the development of a country and the formation of the Gross Domestic Product. This trade is often regulated by laws and policies. Exports allow countries to specialize in their strengths, which translates into better competitiveness for the economy.[1] Furthermore, the development of exports in agri-food earns funds to buy those products not produced domestically, such as bananas or coffee.[2]

Milk is a product that is widely traded. However, each country is unique in the role of dairy trade in its economy. Generally, the dairy exporting countries are more developed. The biggest milk producer is India, but exports of dairy products from India are negligible. This is due to the very large domestic demand, but also the relatively small scale of processing.[3]

The development of foreign trade in agri-food is influenced by demand growth abroad, the competitive prices of products, and product quality. In addition, the balance of supply and demand and relative cost of production for the same products are important export determinants.[4] Furthermore, transportation improvements, especially containerized shipping, have lowered the cost of transportation significantly.

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[1] I. Soczewka, A. Ginter, *Handel międzynarodowy artykułami rolno-spożywczymi w Polsce w latach 2007–2011*, "Journal of Agribusiness and Rural Development" 2013, No. 2 (28), pp. 225–234.

[2] K. Pawlak, *Zmiany w polskim handlu zagranicznym produktami rolno-spożywczymi po akcesji do Unii Europejskiej*, "Zeszyty Naukowe SGGW w Warszawie Problemy Rolnictwa Światowego" 2014, nr 14 (29), z. 2, p. 173.

[3] A. Parzonko, *Stan i kierunki zmian w produkcji mleka na świ*ecie, "Roczniki Nauk Rolniczych, Seria G." 2009, t. 96, p. 18.

[4] M. Krzemiński, *Polski handel zagraniczny produktami rolno-spożywczymi z wybranymi krajami UE-15 w latach 2005–2011*, „Zeszyty Naukowe SGGW w Warszawie Problemy Rolnictwa Światowego" 2012, nr 12 (27), z. 4, pp. 87–96.

The world milk market has changed in recent years. Most milk is used for local consumption. Milk is an important part of the human diet. The growth in global milk demand is sizeable and expected to grow further. In 2007–2010, the average annual consumption of milk and milk for butter production in the USA and in the member of the EU-15 amounted to approx. 280 kg/capita, and it was over twice higher than the average in the countries of South Africa, four higher than the average in Asia and approx. seven times higher than in Africa.[5] Experts from the Organization for Economic Cooperation and Development (OECD), predict that by 2020 the demand for milk products will exceed production with a further increase in consumption of milk and dairy products, especially in the South-East Asia and Latin America. It is estimated that milk production can rise significantly in these regions. The growth rate of milk production in developing countries will be three times higher than in developed countries.[6] Of course, the technological and genetic advances of recent decades are readily available for these countries, so their growth need not rely only on domestic technology.

Changes in production and the processing technology offer the opportunity to rapidly improve the industry. In the years 2001–2010 the dynamics of milk production accelerated. In the twentieth century, world milk production in 2010 amounted to almost 714 million tones and it was over 23% higher than in 2000. The largest producers of cow's milk in the world remains the European Union with production of approx. 150 million tons per year in 2010. The second place is occupied by the USA (production 84,5 million tons in 2010) and third India (50 million tons)[7].

1. Aim and methodology

The main objective of this study was to understand and quantify the volume of production and foreign trade of milk in the United States. The scope of the research concerning milk production in the USA included 2002–2014. The data about exports

[5] A. Baer-Nawrocka, R. Grochowska, E. Kiryluk-Dryjska, J. Seremak-Bulge, P. Szajner, *Światowy rynek mleka i jego wpływ na polskie mleczarstwo po zniesieniu kwot mlecznych*, Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej-PIB w Warszawie, Warszawa 2012, p. 13.

[6] A. Parzonko, *Globalne i lokalne uwarunkowania rozwoju produkcji mleka*, Wydawnictwo SGGW w Warszawie, Warszawa 2013, p. 80.

[7] A. Baer-Nawrocka, R. Grochowska, E. Kiryluk-Dryjska, J. Seremak-Bulge, P. Szajner, *op.cit.*, p. 20.

and imports are mostly from 2013 and these changes are compared to 2012. The data are from USDA.

The substantive scope of the research includes analysis of imports and exports. In addition, the paper presents the geographical structure of foreign trade in dairy products. The description and analysis of the results use tabular, graphical and descriptive research methods.

2. Results

The latest milk production report showed December 2014 milk production up 3.1% from a year earlier, the sixth consecutive sizeable monthly increase. This is bearish, although the increase was expected. Once again, the growth in milk production was mostly in milk per cow rather than higher cow numbers. The national dairy herd this December is only 1% greater than in December 2013.[8]

The average herd size of milk cows in United States is 115 and 85 percent of milk is produced by farms with more than 100 cows. On the other hand 75 percent of dairy farms have fewer than 100 cows. Despite the tendency for farms to grow, many small farms also exist. Small dairy farms must adopt management strategies to remain competitive. Some small dairy have transitioned to organic dairy production.[9]

Milk production is regionally diversified in the USA. The five states with the highest total milk production in 2013 were: California (41,256 million lbs), Wisconsin (27,572 million lbs.), New York (13,469 million lbs), Idaho (13,431 million lbs) and Pennsylvania (10,565 million lbs).

Total milk production increased in 2013 in comparison to 2012, mostly in the following states: Kansas (7,3%), Massachusetts (5,0%), Hawaii (3,9%), Connecticut (3,6%) and Colorado (3,4%). On the other hands such the USA states as: Alaska (–43,9%) and Rhode Island (–6.6) decreased the milk production in 2013 in comparison to 2012. These two The USA stated decreased the number of milk cows: Alaska (–25%) and Rhode Island (10%). These results demonstrated that even though the

[8] J.W. Dunn, *Market psychology*, Dairy Outlook 2015.

[9] C.D. Mayen, J.V. Balagtas, C.E. Alexander, *Vertical Economies of Scope in Dairy Farm*ing, "Journal of Agricultural & Food Industrial Organization" 2009, Vol. 7, Issue 7, pp. 1–15.

USA is increasing the production of milk in global as a country, but some states are decreasing the production because of weak condition for milk production.[10]

Milk is a frequently purchased product for most households. Different milk products differ mainly by fat contents and other ingredient.[11] American society increased per capita consumption of cheese from 11.4 to 25.0 pounds in the years 1970–1991. On the other hand consumption of fluid milk, butter, non fat dried milk, and other dairy products decreased during this period.[12] Since 2000, consumption of whole milk decreased from 66 to 44.9 (32%) pounds per capita. At the same time, the consumption of dairy products overall increased. American consumers are consuming more processed milk products. These results demonstrate that the USA must look for new purchasers of milk since it has overproduction. Over the past two decades milk per cow has increased an average of 1.7% per year, which population has grown by 0.92% per year. This means if the industry depends on domestic demand is to stay the same size, it needs fewer cows each year. In fact, the herd size shrunk slightly from 1995 until 2005, and has grown slightly since with more exports.

As we can see the production of milk increased in the USA. Total milk production increased from 170,063 million lbs. in 2002 to 201,218 million lbs. in 2013 (18.32%).

Another characteristic is milk per cow, which increased from 18,608 lbs. per year in 2002 to 21,816 lbs. per year in 2013 (17.27%). In comparison to European measure, one typical American cow produces more than 10,000 kilograms per year, wherein European Union countries have yields that are much lower, about 8,000 kilograms in more developed EU countries. The annual milk yield per cow in Poland is about 5,000 kilograms.[13]

The average herd size also increased. It increased from 123 cows in 2002 to 196 cows in 2013 (59.35%). This reflects a fundamental change in production practices, with the growth of much larger farms that buy most of their feed, while in the

[10] US Department of Agriculture 2014.

[11] A. Bonanno, L. Chenarides, III R. Volpe, *The Size vs. Health Trade-off in Lower-Income Households' Food Choices: The Case of Fluid Milk*, Agricultural & Applied Economics Association's 2013 AAEA & CAES Joint Annual Meeting, Washington, DC 2013, August 4–6.

[12] F. Yavuz, C. Zulauf, G. Schmitkey, M. Miranda, *A Spatial Equilibrium Analysis of Regional Structural Change in the U. S. Dairy Industry*, "Review of Agricultural Economics" 1996, Vol. 18, pp. 693–703.

[13] Milk Production Report, USDA, February 2014.

traditional dairy area the mostly smaller farms tend to produce much of their feed needs and are generally family operated.

It should be noted that the USA is a country self-sufficient in the production of milk and dairy products. Self-sufficiency rate was in 2007 for the American 102%, which means that the country has overproduction of milk and milk products and the surplus is available for export.[14]

The FAO Food Price Index is a commonly used indicator to assess changes in global food prices developed by the United Nations. Purchase prices depend on the situation on the market. An analysis of the global food price index for dairy products FAO shows that its value was increased in the period considered. This means an increase in food prices on world markets. Downward trends could be observed rate in 2006 (a decrease of 4.07% compared to 2005), 2009 (a decrease of 33.4% compared to 2008) and 2012 (a decrease of 15.6% compared to 2011). Index changes in world market prices should be seen in the reasons associated with the economic crisis, the blockade of eastern markets and the increased supply of dairy products.

Table 1. Milk production in the USA in the years 2002–2014

Year	Total milk production (in millions of lbs)	Number of cows (in thousands)	Milk per cow (lbs per year)	Licensed dairy herds	Average herd size
2002	170,063	9,139	18,608	74,110	123
2003	170,394	9,083	18,760	70,375	129
2004	170,832	9,010	18,960	66,830	135
2005	176,931	9,050	19,550	64,540	140
2006	181,782	9,137	19,895	62,070	147
2007	185,654	9,189	20,204	59,130	155
2008	189,982	9,315	20,395	57,127	163
2009	189,334	9,203	20,573	54,942	168
2010	192,848	9,119	21,148	53,132	172
2011	196,245	9,194	21,346	51,291	179
2012	200,642	9,237	21,722	49,281	187
2013	201,231	9,224	21,816	46,975	196
2014	206,046	9,257	22,258	45,344	204

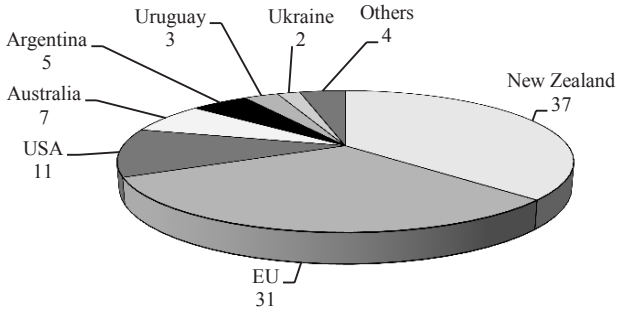
Source: February 2014 Milk Production Report, USDA.

[14] *Ibidem.*

When the dollar is strong compared to the currencies of other exporter, such as the Euro, U.S. dairy products are less competitive and U.S. milk prices fall because the domestic market must absorb the surplus product. In 2009, the very strong dollar caused milk prices to crash and few, if any, dairy farmers made money. As the dollar fell, exports recovered and milk prices rose. Recently the European Union has resorted to its version of quantitative easing, increasing the money supply and lowering interest rates. The weaker euro has made EU dairy exports more affordable and U.S. dairy exports have suffered. The dollar has also risen compared to the New Zealand and Australian dollars. Despite fewer exports, milk production continues to grow.

The United States has experienced an enormous increase in dairy product exports in the past decade. Historically, the USA exported about 5% of milk production, with most of these subsidized exports for famine relief and other food aid. Since then, US dairy prices have been closer to world prices and US exports have been competitive on world markets. Figure 3 shows the market share of the major dairy exporters. During mid 2014, the country exported about 17% of milk production, driving milk prices sharply higher in the process. More recently exports have fallen, as a stronger dollar relative to the currencies of the other major exporters (New Zealand, the European Union, and Australia) hurt exports and exports have fallen to about 12% of milk production. Decreasing imports by China recently have also hurt dairy exports. In any case, dairy exports are now essential to American dairy demand, and the past of independence from world market prices is over.

Figure 1. Share of Value of World Dairy Exports in 2013



Source: Dairy Australia

Table 2. Main importers of milk and dairy products in the USA in 2013

Country	Imports from USA in 2013 (thousand dollars)	Percentage change in comparison to 2012 (%)
Mexico	1,431,125	+16
China	706,915	+70
Canada	648,699	+16
Philipines	364,245	+15
Indonesia	316,368	+66
Japan	303,982	+7
South Korea	301,033	+34
Vietnam	239,886	+72
Malaysia	181,395	+36
Saudi Arabia	166,590	+31
Egypt	152,597	+107
Australia	136,577	+29
Algeria	133,297	+440
New Zealand	119,282	+6
Morocco	116,675	+61

Source: own elaboration on the basis of USDA data.

The USA is very active in dairy international trade. The biggest US dairy export customers are Mexico (1,431,125), China (706,915) and Canada (648,699). The results demonstrate that the most important dairy product customers are countries located close to America. The USA does not exporting milk and dairy products to EU, mainly because of trade barriers and because the EU is self sufficient in milk production and a major dairy exporter. Also an issue is a fundamental disagreement between the USA and the EU about regional appellations, which the USA does not have.

The most important exporters of dairy products to the USA are: New Zealand (595,734 thousand dollars), Canada (424,835 thousand dollars) and Italy (336,707 thousand dollars). Many of these dairy imports are varietal cheeses common to the country of origin. For example, the USA imports a lot of Mexican cheese purchased by the many Mexicans living in the country. The results show that seven countries of EU export milk to the USA. EU is a very important milk and dairy products producer and export these goods to the USA. It is surprising that USA is the leader in milk yield per cow and achieves low costs of production of milk. That is why United

Table 3. Main exporters of milk and dairy products to USA in 2013

Country	Export in 2013 (thousand dollars)	Percentage change in comparison to 2012 (%)
New Zealand	595,734	–19
Canada	424,835	+5
Italy	336,707	+5
France	232,828	+13
Denmark	168,780	+34
Mexico	167,890	+1
The Netherlands	154,846	–1
Ireland	126,823	–3
Germany	110,935	–6
Switzerland	97,262	+20
Spain	82,590	+32
Australia	81,530	+6
India	74,769	+45
Great Britain	66,493	+5
Argentina	47,783	–10

Source: own elaboration on the basis of USDA data.

Stated Department of Agriculture in the 2008 FARM BILL the intervention in rural markets. The USA generally has a policy to import goods that are cheaper outside the USA rather than producing these goods in the USA. The US and the EU are still one of the most serious players in the global markets agricultural products. Their position in the ongoing WTO negotiations on trade liberalization agriculture is of vital importance for the future of agriculture.

Conclusions

The US dairy industry is concentrated in a few states, especially in a traditional dairy industry in the Great Lakes region with smaller, family farms that produce much of their feed needs, and a more recent dairy region in the western United States, where the farms are much bigger and buy most of their feed. Both regions have their competitive advantages. The traditional farms are less susceptible to droughts and furthermore, they are closer to the majority of the nation's population. The western farms have economies of scale, but are more dependent on outside feed

that increases their production costs. The farms everywhere are getting larger and the farms are much more professional and efficient than a decade ago. The industry is now a major exporter of dairy products, both to its North American neighbors, Mexico and Canada, but also to Asia, and especially China. Milk per cow is greater than any other country, except South Korea, with Sweden, Canada, and Finland the only countries with comparable production per cow. These other countries all have limited potential to dramatically expand milk production, while the US has much more growth potential.

The USA is the second largest milk producer in the world (production 84,5 million tonnes in 2010) after the European Union. The changes in US agricultural price supports and free trade agreements has brought US prices in line with world prices and led to much greater exports of dairy products. In recent years, the US has exported about 12% of milk production, with Mexico, China, and Canada among its major customers. (US Dairy Export Council 2015).

The USA also imports milk and dairy products, mainly from New Zealand, Canada, Italy, France, Denmark and other countries. These importsare generally specialty cheeses and ethnic foods to serve the diverse US population. Some countries of European Union remain important partners for the USA in dairy business. Lowering the costs of transport and overcoming trade barriers can enhance cooperation between the USA and European Union.

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PRODUKCJA I HANDEL MIĘDZYNARODOWY MLEKIEM I PRODUKTAMI MLECZARSKIMI W USA

Streszczenie

W artykule analizie poddano produkcję oraz handel zagraniczny mlekiem i produktami mleczarskimi w USA. Wskazano główne kraje, do których USA eksportuje mleko i przetwory mleczne, oraz importerów. W analizie danych posłużono się metodami opisowymi

i graficznymi. Materiał źródłowy stanowiły dane USDA. USA to znaczący producent mleka na świecie, a produkcja tego surowca jest zróżnicowana regionalnie. Stany produkujące najwięcej mleka w 2013 roku w USA to Kalifornia (41 256 mln gal), Wisconsin (27 572), New York (13 469), Idaho (13 431) i Pennsylvania (10 565). USA eksportuje mleko i produkty mleczarskie głównie do Meksyku, Chin, Kanady i Filipin. Kraje, które dostarczają mleko i produkty mleczarskie do USA, to głównie Nowa Zelandia, Kanada, Włochy i Francja. USA jest ważnym eksporterem na światowym rynku mleka – w latach 2012–2013 eksport z USA stanowił 11% światowego eksportu.

Tłumaczenie Piotr Bórawski

Słowa kluczowe: mleko, produkty mleczne, eksport, import, saldo

Kod JEL: Q11, Q14