

Causes of the Butter Crisis in Europe – The Perspective of Poland

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Abstract: This article presents the problem of butter prices increase in 2016-2018. According to the data of the Polish Agricultural Market Agency, the price of butter in Poland increased by nearly 69%, in Germany by 80.6%, and in the Netherlands by 88%. Therefore, one can ask: What is the reason for fluctuations in butter prices in the world and in a given country? What are the effects? This article presents the causes and manifestations of the crisis related to butter prices and shows answers to some problems. The aim of the article is to determine the main reasons for the increase in butter prices on retail markets in Europe. Growing demand for butter in countries such as the US and China is analysed, and production restrictions in New Zealand and Australia, caused, inter alia, by bad weather conditions. Speculative factors are also considered. The conducted analysis shows that increase in butter prices is due to butter demand in the US and China, as well as to weather fluctuations in New Zealand, the largest butter exporter in the world.

Keywords: agriculture, butter production, prices, agricultural policy

JEL Classification codes: F20, F40, Q17

INTRODUCTION

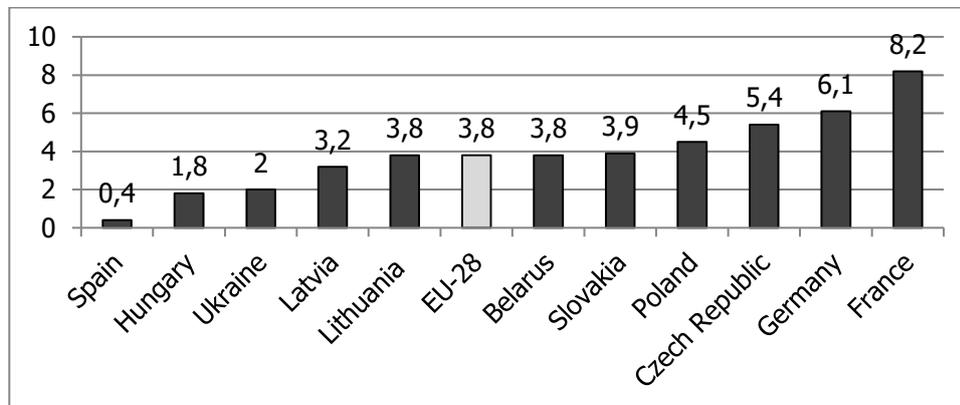
Butter was already known by the Sumerians, who in 3500 BC used it for sacred purposes, to anoint the body, and also as sacred food. In Ancient India, butter was similarly used both for culinary and ritual purposes (Short story of butter, 2012). Till today in many countries, including European ones, butter is one of the basic food products (Fig. 1). In 2016, the average Pole consumed 4.5 kg of butter, more than the average EU citizen (3.8 kg). France remains the biggest consumer of butter, with the average consumption of 8 kg a year per citizen.

Despite a wide selection of cheaper fat products (margarines, vegetable and animal fat mixes) and numerous scientific research suggesting negative impact of saturated animal fats on human health (in particular, they lead to hypercholesterolemia, atherosclerosis and other metabolic and cardiovascular diseases), the number of people preferring butter seems to be growing over time. In Poland, in the years 2012-2017 the consumption of butter per capita increased by 15% (compared with 6% for the entire EU, or 36% for New Zealand).

Since 2016, on numerous markets the change in the price of butter can be observed, which in the period 2016-2017 increased in different countries from 70 to 100% (Increases in butter

prices, 2017). The aim of the following article is to determine the main reasons for the price increase of this product in Europe in 2016-2018.

Fig. 1 Consumption of butter per capita in selected European countries in 2016 (in kg)



Source: Butter consumption per capita by country

1 LITERATURE REVIEW

Problems regarding the price of butter seem to be cyclical, that is evidenced by publications from, for example, the 1970s (The butter mountain that vanished, 1972; Baert, 1979). At that time New Zealand, the largest producer of butter, New Zealand, has raised its price by about 60 per cent. For many consumers, this price was unacceptable which deepened the market perturbations (Wickström, 1973). In the period of price increase a promotion and quality of products become more important, as the Greek market, for example, illustrates (Oustapassidis, 1998). The situation on a given market is a result of many factors, as claimed by Bakucs, Fertő, and Szabó (2013). It depends, for instance, on the size of farms, on opportunistic behavior of farmers and on connections in distribution channels, as well as on consumer habits. Despite various opinions, milk and butter in many countries are, however, the basic foodstuff. Nevertheless it is noteworthy, that consumers buy dairy products because it is not expensive and it is possible to buy it in the supermarket, so the price and product availability are the main determinants of purchasing (Lanfranchi, et al., 2017).

2 METHODOLOGY

In Poland, the wholesale price of block butter reached its maximum in September 2017 – EUR 5.4 (PLN 22) per kilogram, which is 72% more than the year before. The purpose of this article is to determine the main reasons for the price increase. For this purpose, the statistical data available in the CLAL database – Italian Dairy Economic Consulting Company, data and industry publications from various markets, as well as publications of the European Commission, Eurostat and the Central Statistical Office were analyzed. The analysis of secondary data and comparative analysis method were used in the study.

3 RESULTS AND DISCUSSION

3.1 Butter characteristics and production

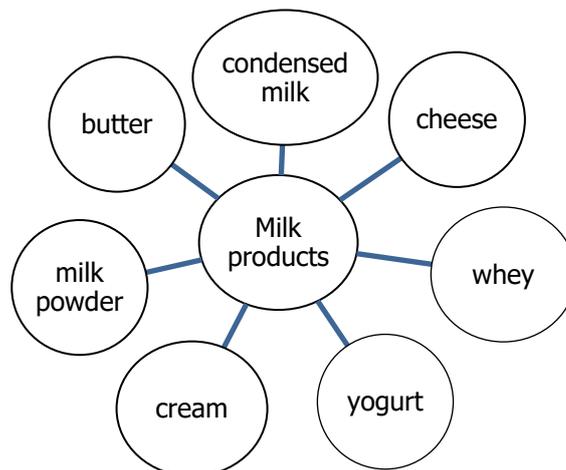
Milk, the basic raw material in the production of butter, in many cultures is the basis of nutrition, in particular of children. It contains protein, lipids, unsaturated fatty acids, lactic acid, calcium and vitamins, which are all ingredients necessary for the functioning of the human body. Thus, the consumption of milk and butter is an important supplement to the daily diet (Mleko, n.d.).

One liter of cow's milk contains an average of 4 % fat. This amount can be used for the production of 3.2% drinking milk, however, little fat will be left and the producer will actually earn only on the sale of milk. Therefore, it is more profitable to collect all the fat and sell butter, cream, and skimmed milk or milk powder. Consequently, the dairy industry relies on the processing of milk for other, more profitable products.

One of the milk-derived products is butter, which is made of cream obtained from the centrifuged milk. The cream has 30-35% fat and needs to be cooled at first so that it crystallizes and solidifies. Next, the cream is mixed and as a result the butter is separated from the buttermilk. The final step is kneading the butter to remove water and get the right percentage of fat in the product (above 80%). At this stage, salt can also be added (How butter is made?, n.d.). The basic products made from milk are shown in Figure 2.

Dairy products made in Europe are sold all over the world, mainly in the US and China. In 2017, China was also one of the world's largest importers of dairy products, in particular butter (92 thousand tons) and milk powder (717 thousand tons). In recent years, the export of dairy from the EU in China increased by over 174%.

Fig. 2 Basic products made with the use of processed milk



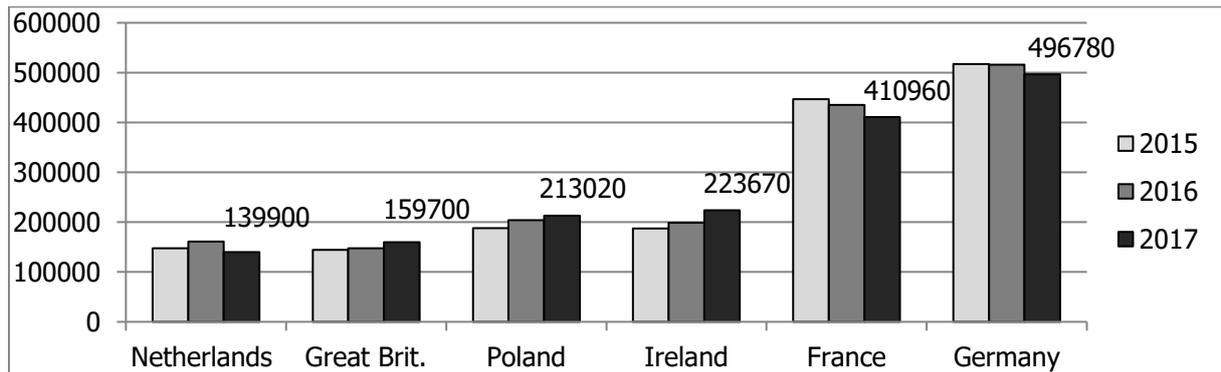
Source: own study

Chinese dairy import kept growing fast in the first part of 2018: +15.3% in quantity and +24.2% in value y-o-y. Import is over 758,000 tons of milk and derivatives, for a total value of 2.58 billion dollars (China increases its imports, 2018). New Zealand is still a privileged partner of China, especially for whole milk powder, whose export increased by 12% in the first quarter of 2018, y-o-y. New Zealand accounts for 96% of whole milk powder export to China,

leaving the remainder to Australia, France, the US, and the Netherlands. China is also one of the largest importers of Polish dairy products from outside the EU, and the main export product is whey (How butter is made?, n.d.). The most butter in Europe is produced in Germany – approximately 500,000 tons per year. Then in France, Ireland, and Poland (Fig. 3).

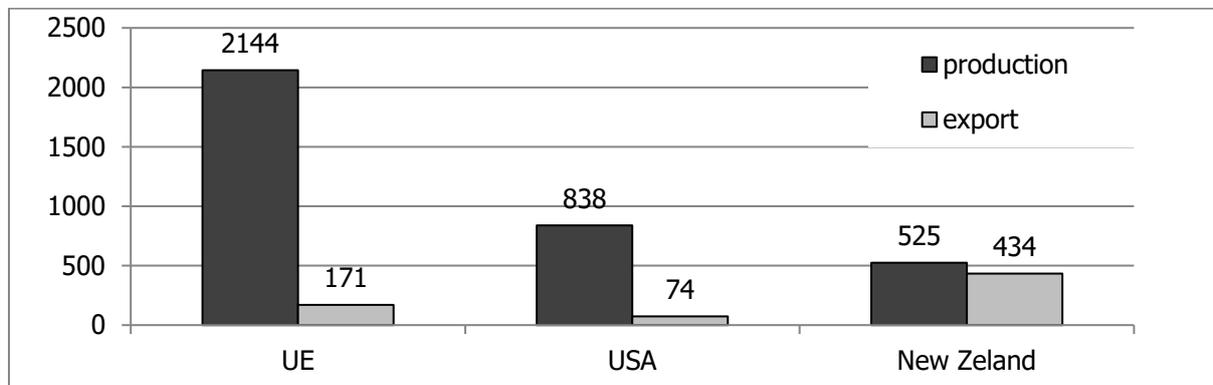
One of the large producers of milk and milk products, next to the US and the EU, is New Zealand. Although the EU – or even Germany alone, or the US – produces more milk, it is New Zealand that is the biggest exporter, as shown in Figure 4. It is worth noting that China (producing 35 450 000 tonnes of milk annually, compared to 21 460 000 tonnes produced in New Zealand), produces and exports butter in trace amounts (Produzioni burro, n.d.).

Fig. 3 The largest butter producers in Europe (in tonnes)



Source: Produzioni burro

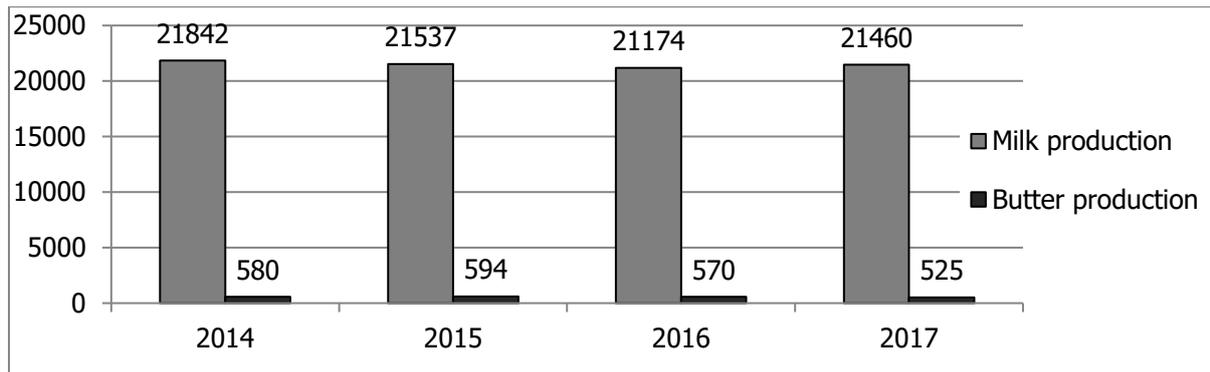
Fig. 4 Production and export of butter in the UE, USA, and New Zealand in 2017 (in thousands of tonnes)



Source: Produzioni burro

As data in Figure 4 show, the EU and USA produce much more butter than New Zealand, but it is consumed on internal markets. On the other hand, New Zealand exports 83% (434,000 tonnes) of the butter it produces. Therefore, this country's production influences the demand on international markets to a much larger degree than production in other countries. However, it should be noted that production volume in this region is largely dependent on seasonality and weather conditions. The peak of the season is September – October and it is during this period that the price growth of butter on international markets is forecast. The production of milk and butter in New Zealand in the years 2014-2018 is presented in Figure 5.

Fig. 5 Production of milk and butter in New Zealand (in thousands of tonnes)

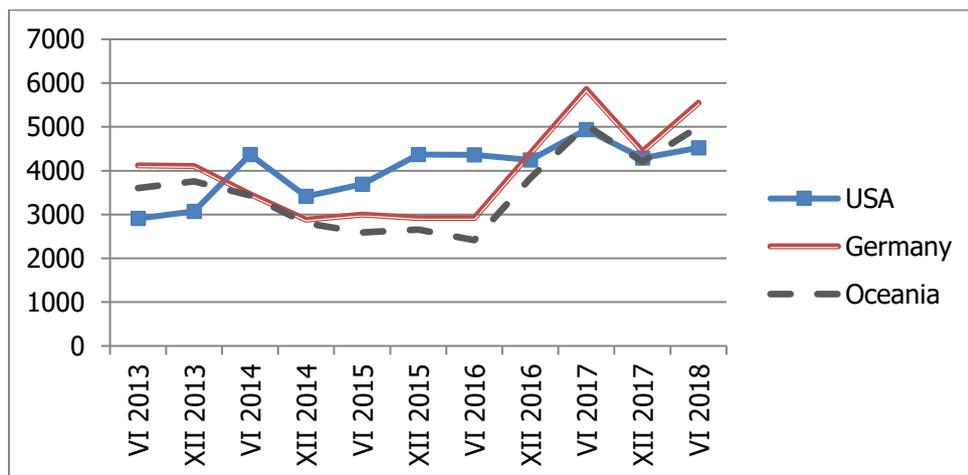


Source: Produzioni burro

An increase in demand on some markets and decrease in production in others can result in a crisis. In the case of general economic crises, the first symptoms are visible on the stock exchanges, where declines in indexes predict the upcoming bear market. A similar situation occurs on the industry markets, when the crisis does not impact the whole economy, but only a part of it; changes in indexes are then observed on wholesale markets. The common feature of both crises is how they cause the downfall of those companies which had not been sufficiently prepared for a change, which finds its reflection in the level of prices and also on the job market. Such a situation could be observed in the years 2016-2018 on the international market of dairy products, and especially on the butter market (Figure 6).

Crisis, understood as a difficult situation threatening the functioning of a given economic sphere, may occur for various reasons. These can be internal reasons, such as an industry's failure to adjust to the changes in the market structure or the expectations of consumers. There can also be external reasons, such as the weather or speculative activity, which is discussed in further parts of the article.

Fig. 6 The dynamics of butter prices on selected markets in the years 2013 - 2018



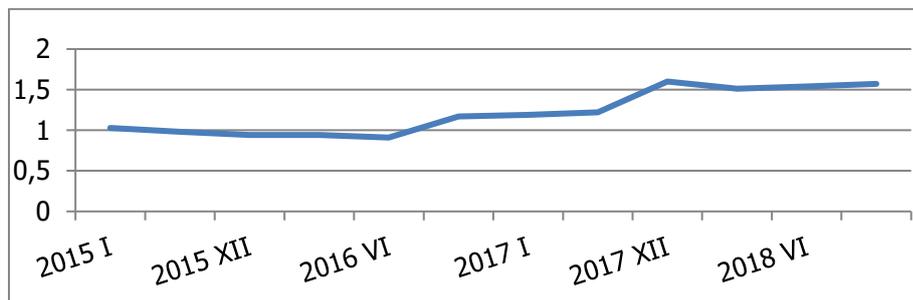
Source: Produzioni burro

3.2 Fluctuations in butter prices – analysis

According to the research of the Polish Institute of Agricultural and Food Economics, the price of butter cubes (200 g) in the period from May 2016 to November 2017 increased by approximately 72%. At the end of 2016, we could buy it for about PLN 4.70, and a year later we paid about PLN 7 for the same product (Promotion of Polish dairy products, 2018). Since October 2016, a continuous increase in butter prices has also been recorded in other EU states. In April 2017, the average price of butter was EUR 4.27/kg – 66.3% more than in the previous year. According to data from April 2017, in Germany for 200 g of butter one had to pay EUR 0.89, similarly in the Netherlands: EUR 0.9. In comparison with the data from May 2016 in Germany, the price of butter increased by 80.6%, and in the Netherlands by 88%. In Polish stores at the beginning of this year (2019), a cube of butter is still expensive: in Tesco we will pay EUR 1.64 (PLN 6.99) for 200 g, in Carrefour: EUR 1.99 (PLN 8.49), in Netto the price is EUR 1 with a discount (PLN 4.29) – on average the price of butter is EUR 1.54 (PLN 6.59). It is worth adding that in May 2016, a cube of butter was EUR 0.71 (PLN 3.03; calculated according to the NBP rate from 01/02/2019: 1 PLN = 0,234 EUR). The dynamics of wholesale prices for a cube of butter in Poland is presented in Figure 7.

Price fluctuations on national or regional markets are a reflection of global prices. Therefore, what was happening with the prices in Poland and other European countries results from the behaviors of consumers and sellers on international markets.

Fig. 7 The dynamics of wholesale butter prices in Poland in the years 2015-2018 (EURO/200 g)

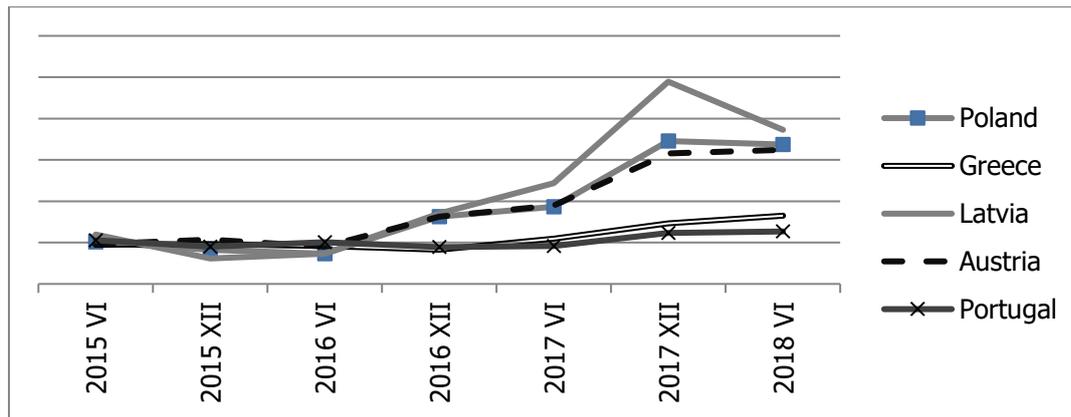


Source: Butter consumption per capita by country, Poland

Not all countries reacted in the same way to the changes on international markets. As Figure 8 shows, countries such as Portugal, Greece, or Spain, where the main cooking fat is olive oil, maintained a relative stability of butter prices. Moreover, it can be noticed that small countries, such as Latvia, which are largely dependent on export, reacted with higher price increases than large countries. Thus, the uncertainty of the market and the fear of insufficient supply were more significant here.

The production of butter is inextricably linked to the production of skimmed milk and milk powder. Therefore, as far as profitability of production is concerned, it is not only the price of butter that is important, but also the price of milk powder, which is produced from the raw material remaining after the removal of fat. If the prices of milk powder continue to fall and the producers limit its production, it will impact the supply of butter. The best example of such a situation was 2017, when, despite quite high sale prices of butter, its production was 5.5% lower than in the corresponding period of the previous year, because it was more profitable for producers to produce cheese than butter and powdered milk. It is presented in Figure 9, which shows the changes of prices of butter and milk powder.

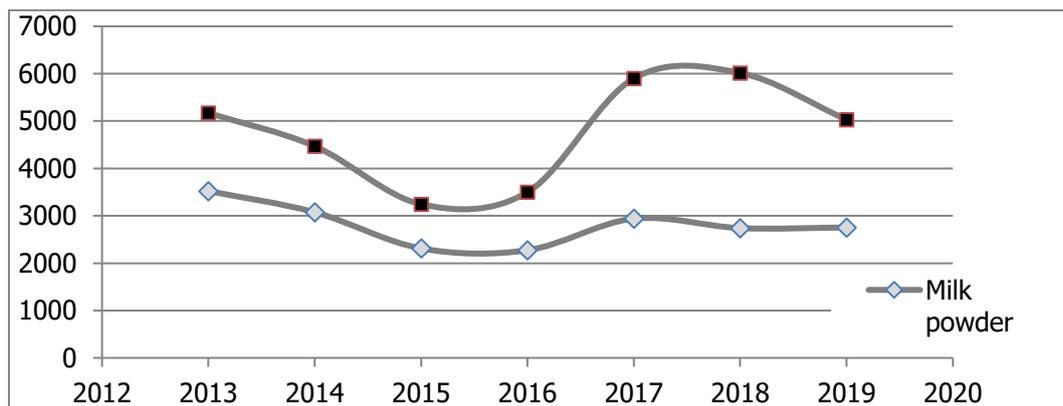
Fig. 8 The dynamics of butter prices in selected countries (previous year = 100)



Source: https://www.clal.it/en/index.php?section=quadro_europa&country=PL

As Figure 9 shows, until 2016, the price of milk powder and the price of butter would change in parallel, i.e. the fall in the price of milk powder corresponded to a proportional drop in the price of butter, and vice versa.

Fig. 9 World prices of milk powder and butter (EUR/per tonne)



Source: Produzioni burro

The statistical calculation of dependencies indicates that there is a positive correlation here, and the correlation coefficient is 0.596 (significant, moderate relation). However, something disturbed this relation in 2016, as the prices of milk powder went slightly up and then down, while the prices of butter suddenly increased a lot. The following part of the article will be devoted to the analysis of the causes of this phenomenon.

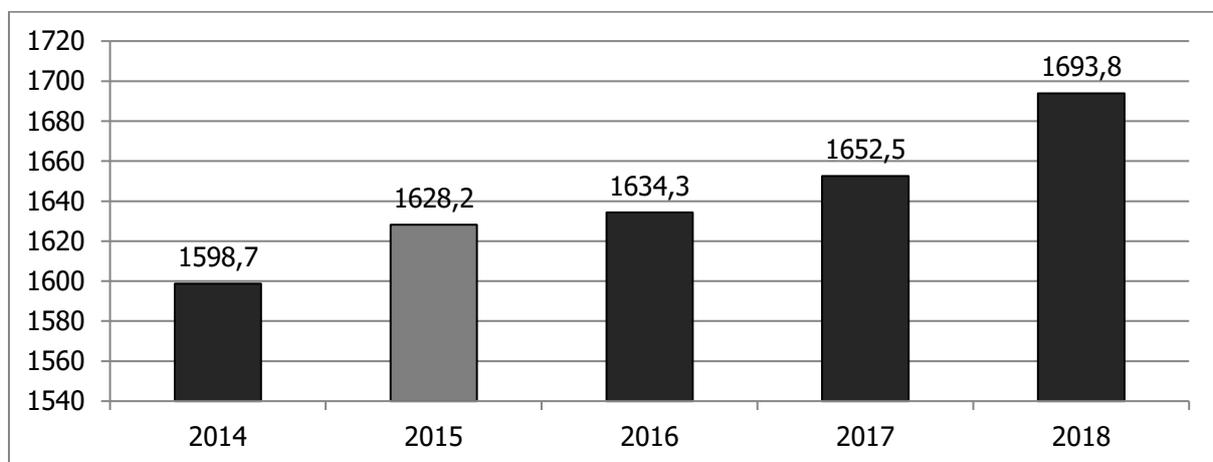
3.3 Determinants of price changes – discussion

The EU policy

In 1984, as part of the Common Agricultural Policy, the European Union introduced a system for limiting the production of milk and derived products among member countries, called the milk quota system. The premise of the program was to protect the EU market from oversupply, thanks to which the prices of dairy products would be protected against excessive drops (Grant, 1995). The quotas, negotiated annually for the period April-March by each member

state, were enforced by imposing penalties on producers for exceeding the assigned quotas. On the other hand, within the quotas they could count on purchase of milk and its derivatives at guaranteed prices (however, dependent on factors unrelated to the system, such as global dairy prices, changes in foreign exchange rates, or specific quality and/or supply requirements for specific dairy products). And although various variables influence the supply of milk, the level of milk and dairy products production in the European Union was usually almost equal to the assigned quotas. There were also opinions that price interventionism and interfering with production efficiency under the Common Agricultural Policy weakened the EU's position on the global market of milk and milk products, making the European dairy unattractive for emerging markets, especially when compared to the offer of South American markets. From 1 April 2015, it was decided to abolish the milk quotas in the European Union, which resulted in an increase in its supply on the market. This issue is addressed in Figure 10.

Fig. 10 Milk production in the EU (in thousands of tonnes)



Source: Produzioni burro

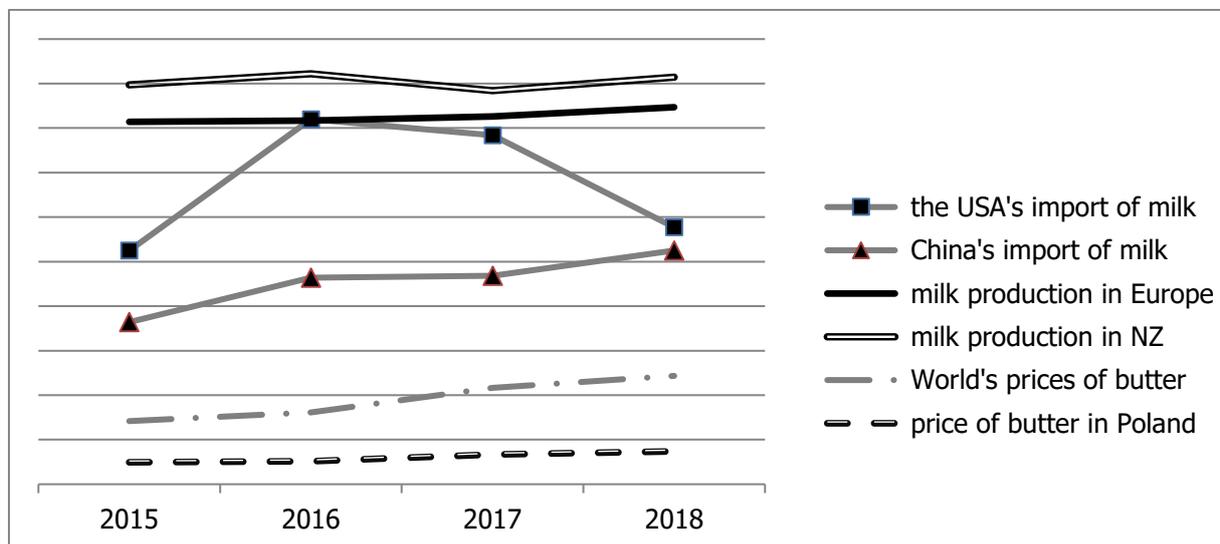
It can be noticed that the production of milk in the EU also increased before 2015, but entrepreneurs processed milk into milk powder and butter, and European countries used the method of intervention buying. And although in 2015 the milk quotas were abolished, the opponents of those changes feared a rapid surge in production and a sudden drop of milk product prices. In response to these fears, EC Regulation 2016/1613 of 8 September 2016 introduced the so-called Hogan's package, also known as the milk package, aimed at providing "adjustment aid" (in the total amount of EUR 350 million) for dairy farmers as well as goat, pig, and sheep breeders. Already at that time, the market imbalance between milk supply and demand was noticeable – however, the issue back then was the production surplus over the outlets for dairy products.

Problems with the sale of milk and its products are the reason for introducing intervention buying. Nonetheless, precisely because of the intervention buying of skimmed milk powder in the years 2015-2017, EU warehouses store record amounts of this product. According to the European Commission, at the end of October 382.2 thousand tonnes of milk powder were subject to storage. In Poland, there were 38 thousand tonnes stored in intervention warehouses (Rynek mleka, 2018). The EU butter stocks, under the mechanism of subsidies for private storage amounted to only 66 tonnes at the end of 2017. This means that despite the abolition of milk quotas in 2015, the EU member states still provided help for milk producers by buying and storing milk powder. As part of intervention buying, the producers sold powder milk at the prices established by the state, while butter prices could be shaped by the market.

In this way, the producers were supplying more butter to the market, but despite the increased demand its price did not drop. This might result from the fact that in the discussed period the EU countries began to export more milk, especially to the US and China (Figure 11), which will be discussed in the next section. It is worth adding that in January 2018, the EU Council decided to stop purchasing skimmed milk powder, so the difficulties in selling milk powder will automatically impact the volume of butter production.

It might seem that an increase in milk production will cause a drop in the prices of butter and other products, but the surplus of milk powder influenced its low prices and the unprofitability of butter production. And – as has already been mentioned – the limitations of milk powder production automatically mean restrictions on butter production. Therefore, one of the main reasons for the increase in butter prices in Europe is the abolition of the milk quota system and intervention buying of milk powder (Zuławinski, 2018).

Fig. 11 Selected variables characterizing the situation on the milk and butter market in the years 2015-2018



Source: <https://news.clal.it/en/chinas-butter-import-double-volume-triple-value/>

<http://maxumfoods.com/china-increases-its-imports-of-butter-and-milk-powders-cheese-slowed-down/>

https://ec.europa.eu/agriculture/market-observatory/milk/latest-updates_en

<https://usda.library.cornell.edu/concern/publications/fn106x926?locale=en#release-items>

A change in the consumers' lifestyle

The export of butter from the EU to the US in the period 2015/2016 rose by nearly 50%. This is mainly connected with the increasing awareness of the American society, who begins to appreciate natural and full-value products, with butter undeniably being one of them. New trends of healthy lifestyles and warnings against factors that cause a number of diseases have contributed to this. One of these factors are, among others, are trans fats, which are largely found in margarine – a substitute for the natural and healthy butter. The US as one of the most developed countries are struggling with a plague of civilization diseases such as obesity and cardiovascular diseases. Many publications in the American mass media in recent years emphasized the benefits of natural fats, and so the consumers began to expect healthier food. In response to the new trend, in 2015 McDonald's announced that they were introducing real butter into their breakfast products such as muffins, cookies, and bagels, and also into their

grilled foods (Shah, 2015). What is more, in 2016 Pimpin et al. (2016) published in the scientific journal PLoS ONE the results of meta-analysis and systematic review of research and publications on the impact of butter consumption on the risk of cardiovascular diseases, diabetes, and general mortality. The analyzed data of more than 600,000 patients allowed the authors to conclude that butter has a low or neutral effect on diseases traditionally attributed to saturated animal fats. This publication echoed widely, somehow rehabilitating butter and at the same time confirming the arguments of animal fat proponents in the debate against margarine. The American internal market initially was not able to satisfy the increasing demand, so the US began to import milk and butter from Europe. The situation lasted two years, after which time the internal market adjusted and the import of butter significantly decreased.

For years, there has also been an increase in interest in Western products in Asia, especially in China and Japan. In recent years, an increased interest of Asian markets in European dairy products has been especially visible. The United States Department of Agriculture in 2017 predicted a 38% increase in imports of milk and milk products to China, with a global increase in butter consumption of 3%. Adding to this the growing popularity of bakery products (e.g. croissants) in Asia, it is understandable that with the Chinese population being three times the size of the European Union, even a small increase in demand in China may disturb the market balance in Europe (Wang, Parsons, Zhang, 2010). As shown in Fig. 11, in recent years the demand for milk and butter and China has been growing. This is accompanied by a lower production of milk in New Zealand in 2017 (bad weather); in relation to that, in 2017 the export of butter from New Zealand was 470,000 tonnes compared to 554,000 tonnes exported in 2016. Thus despite the US having decreased its import and Europe producing more milk, lower production in New Zealand and high demand in China destabilized the prices of butter.

Russian sanctions

In August 2014, as a response to the Western sanctions imposed as a result of causing war in Ukraine, Russia introduced an embargo on commerce with the EU, USA, Australia, Norway, Ukraine, Albania, Montenegro, Iceland, and Liechtenstein (Russia has updated the list of goods, 2018). The embargo remains in force until the end of 2019 and includes such milk products as milk, whey, cottage cheese, butter, and pastes based on milk products. Expert opinions on the results of the embargo are divided – some believe that producers started selling on other markets and came out unscathed, while others claim that everyone loses on the embargo. It can be illustrated by the fact that if on a given market a perishable product, such as milk, cannot be sold, then the producers switch to cheese production, as cheese is easier to store. And so despite the increased milk production, there is more cheese than butter and milk powder on the market. In addition, milk powder had previously been stored, so the stocks are sufficient to satisfy the demand. Butter, on the other hand, cannot be stored this long, and consequently its stocks are smaller.

Speculative factors

There are rumors in the expert circles that the "butter crisis" has long passed and the prices should stabilize. The largest retail chains in Poland are accused of price fixing, which is typical of cartels. Since 2018, the Office of Competition and Consumer Protection has been conducting proceedings to clarify whether the largest corporations impose too high margins. Their high level allows to significantly lower the prices of butter periodically, attracting customers tempted by the bargain, and are an ideal tool in the hands of retail chains, which achieve higher profits. In February 2019, the prices of butter in Poland are at the level of EUR 1.52 – 1.64 (PLN 6.50 – 7.00), so they are still almost twice as high as compared to 2015 and the beginning of 2016.

Analysts particularly pay attention to a disproportionate increase in butter prices relative to the price increase of other products, such as cheese or powdered milk. Hence the assumption that trade has benefited from periodic price fluctuations on wholesale markets, has increased

retail prices and maintains them at a high level, although the price of butter has dropped on international markets. If we look at butter prices in 2018, it is clear that the average price for the entire year was EUR 5,200/tonne. Even if the retail sphere bought the product for the highest price of EUR 6129 per tonne, the price for 200 g (one cube of butter) could be EUR 1.22 (no margin). Currently the price of butter in stores is as much as EUR 1.63 (PLN 6.99), so calculations show that taking into account the highest purchase prices in the wholesale sector, the retail sphere imposes a margin of 33%.

It should be added that this concerns international markets. Poland, on the other hand, is a large producer of butter, and retailers can buy it on the national market, where the costs of transportation and additional costs such as storage or insurance are lower. Thus, retailers are buying the product cheaper, and yet the prices of butter do not go down. This means that retail chain stores artificially maintain high prices, probably because in Poland a large part of consumers consider butter part of the daily diet, and buys it at any price (Yoon, Kijewski, 1997).

CONCLUSION

The purpose of this study was to determine the main reasons for the increase in the prices of butter on European markets, particularly in Poland. This was achieved through analyzing data concerning the supply and demand of milk and butter, and also through searching for dependencies between other variables, such as intervention buying of milk powder.

The conducted analyzes show that the increase in butter prices is caused by:

- the EU states' interventionism on the milk market (purchasing milk powder at predetermined prices, which limited the profits, hence the increasing prices of butter);
- weather fluctuations in New Zealand, influencing the volume of butter export;
- increased demand for butter in the US and China.

The difficulties with the export of milk and its products to Russia, as well as probable price collusion between large retailers maintaining high prices in Poland may also be of some importance. The problem is extremely complex and more indirect causes could probably be pointed (as, for example, speculative activities). An interesting issue is whether governments can prevent such crises - it seems that due to the open market and many conflicting interests, they cannot. Although, it seems to be important to know and understand the factors influencing butter prices in order to be able to predict the scenarios of future development.

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