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The End of the Milk Quota Regime in the European Union: The Perspective of the Dairy Sector with Particular Regard to Mountain Areas

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Abstract

In March 2015, the milk quota system in Europe that had lasted for more than 30 years was abolished to improve the competitiveness of the European dairy sector in the international market. Despite an increase in the consumption of dairy products in Europe, the milk price is expected to stabilize in the next decade after a decrease between 2015 and 2016. This stabilization of prices will be caused by a significant increase in production, with the proportion exceeding domestic demand to be exported. In the international market, the price of milk will reduce in the next decade, leading to a restructuring of the milk sector with a lower number of farms, but with higher production and efficiency. Mountain farms will follow the same trend, although these farms play an important social role by providing ecosystem services such as maintaining cultural services, reducing greenhouse gas emissions, promoting soil stability, and improving the aesthetic value of the landscape. Nevertheless, they remain at a disadvantage compared with lowland farms. To prevent the loss of mountain farms, there is thus a need to valorize the ecosystem services that they provide and promote the processing of milk into certified products of high quality.

Keywords: milk quota, cheese, price volatility, trade liberalization, mountain farm

Introduction

When the common agricultural policy (CAP) for dairy products started in November 1964 in six countries, namely France, Germany, Italy, the Netherlands, Belgium, and Luxembourg, agriculture was still backward. The main CAP objectives were to guarantee an adequate standard of living for farmers, improve the self-sufficiency of food production, and stabilize market prices (Jongeneel *et al*., 2011). The main tools were import duties, export refunds, and butter and skim milk powder storage, with a high price of milk the main consequence (European Commission, 2011; Jongeneel *et al*., 2011). The CAP seemed to have achieved its main objectives, namely a high (and guaranteed) price of milk, while the advanced knowledge on animal nutrition and genetic selection helped improve technology and farm management, thereby increasing milk production.

However, in the 1970s, production exceeded consumption, and stocks of butter rose dramatically, reaching 100 ktons in 1970, 150 ktons in 1971, and 300 ktons in 1972 (Ionescu, 1979). Stocks of powdered milk also increased rapidly, from 1,360 ktons in 1971 to 1,650 ktons in 1972 and 1,850 ktons in 1973. Hence, surplus stock became a structural issue and, at the same time, the butter and milk powder intervention prices increased by 29% and 121.5%, from 1970 to 1977, respectively (Ionescu, 1979). By 1976, the European Economic Community entry price of powdered skim milk had reached about 260% of the world price (Eurostat, 1977).

The situation was unsustainable from an economics point of view. In this context, a milk quota regime was introduced in 1984, which meant that every farmer had a maximum total amount of cow's milk to be sold to dairies and consumers. This quota was a structural measure that aimed to reduce European

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stocks of products derived from milk (Jongeneel *et al*., 2011). Although the problem of the production surplus did not disappear, the effect of the quota took hold immediately; from 1983 to 1984, milk production reduced by more than 2 million tons (Jongeneel *et al*., 2011).

In 2003, in the reform of the CAP that introduced the Single Farm Payment Scheme, milk quotas were only extended until 2015 (Baldock *et al*., 2008). This decision, confirmed in the CAP revision of 2008, was taken to make farmers more sensitive to international demand for milk and dairy products and encourage them to produce based on market demand rather than on quotas. This revision thus limited the distorting effect of the CAP on the managerial decisions of milk producers and reduced the problem of excess stocks. The result should be an increase in the competitiveness of the European dairy sector in world markets (European Commission, 2015).

Dairy Sector in the European Union

In 2013, the number of dairy cows (head) was 23.5 million with a total milk yield of 15.2 million tons. In the same year, 30.8, 2.0, 8.7, 0.68, 1.1, and 2.1 million tons of drinking milk, butter, cheese, whole milk powder, skim milk powder, and whey powder were produced, respectively (CLAL, 2015a). Exports accounted for 47,000, 373,000, 251,000, 128,000, 786,000, 407,000, 374,000, and 579,000 tons of bulk milk, packed milk, condensed milk, butter, cheese, skim milk powder, whole milk powder, and whey powder, respectively, while imports were limited, involving only 42,000, 75,000, and 5,000 tons of butter, cheese, and skim milk powder, respectively, with a general self-sufficiency rate of the 113% (CLAL, 2015a).

From 2009 to 2013, despite the entry of Croatia into the European Union, the number of dairy cows slightly reduced (1.6%), while the milk yield at the farm gate increased by 3.2%, showing the increasing efficiency of the production process and allowing the self-sufficiency rate to rise to 4.1%. In the same period, the production of drinking milk and whole milk powder decreased by 2.8% and 2.0%, respectively, while that of butter, cheese, and skim milk powder increased by 3.2%, 5.7%, and 2.6%, respectively. Exports increased considerably, particularly bulk milk (56.7%), packed milk (137.6%), condensed milk (11.1%), cheese (38.1%), skim milk powder (77.7%), and whey powder (28.4%). Conversely, exports declined by 14.7% and 18.3% for butter and whole milk powder, respectively, while imports of butter, cheese, and skim milk powder reduced by 32.3%, 10.7%, and 18.0%, respectively (CLAL, 2015a).

End of the Milk Quota Regime

In Europe, the per capita consumption of milk, cheese, and butter in 2014 was 67.5, 16.1, and 3.8 kg/year, respectively, an increase of 1.8%, 2.0%, and 1.6% from 2013 (CLAL, 2015b). Thiele *et al*. (2013) expect dairy consumption to stagnate in the short-term. Conversely, OECD-FAO (2014) suggests that cheese consumption in the European Union and world will reach 19.5 kg and 3.1 kg per capita, respectively, by 2024 and that dairy consumption will become equivalent to that of milk, suggesting average annual growth of 0.41% and 1.5% until 2023 for Europe and the world, respectively.

OECD-FAO (2014) also suggests that global milk production will reach 932.9 million tons in 2024 with a growth of 1.8% per year from 2015 and that the greater proportion of this rise in milk production (78%) will be in developing countries. These data can be explained in several ways. For example, the world population is expected to increase by more than 33% by 2050, while annual global GDP is predicted to rise by 3%; moreover, the urban population in developing countries will increase by 83% (Corazzin *et al*., 2015; FAO, 2014; Hawksworth and Chan, 2015). It is also known that increasing wealth and the urban population will raise the consumption of products derived from ruminants (Smith *et al*., 2012, 2013), especially in developing countries that currently have a much lower consumption of milk compared with developed countries (68 vs. 209 kg per capita per year; Corazzin *et al*., 2015; FAO, 2014). In developing countries, where the population growth will be highest (37.2% from 2013 to 2050; FAO, 2014), the increase in the number of ruminants can also be hypothesized. In these countries, in the near future, improving genetic selection, the crossing programs between breeds, and the rise of technology could lead to higher production efficiency with a further increase in dairy production (Corazzin *et al*., 2015).

From these considerations, predicting the space for European dairy products in the international market in the near future is challenging. However, following the suggestions of the European Commission (2014) about the European market, milk production will increase to 158 million tons by 2024 (8% compared with 2014), with Denmark, Germany, Ireland, France, the Netherlands, Poland, and the United Kingdom showing the highest

growth in production. The number of dairy cows will reduce to about 22 million (European Commission, 2014). However, although Europe represents about 50% of international cheese production and this sector is not yet saturated, the increase in milk production will be mainly destined to the production of cheese (European Commission, 2013). Cheese production is projected to rise to 11 million tons by 2024, while fresh dairy products will increase by 3% in the next decade (European Commission, 2014).

To understand the possible consequences of the end of milk quotas on the dairy price, it is necessary to consider the economic characteristics of milk demand and supply. Réquillart (2008) highlights that demand for dairy products is relatively inelastic, while supply is inelastic in the short run, but elastic in the long run. This elasticity consists of the variation in demand or supply in relation to the variation in market price. For example, inelastic supply means that supply varies little with a variation in market price. This is related to the structural characteristics of dairy cow breeding, the difficulty of changing herds in a short time, and large capital investments. Thus, an increase in milk production of 1% corresponds to a decrease in price of 4.5% (Andersson and Lingheimer, 2015).

In addition, Réquillart (2008) argues that given the inelasticity of demand, the probable increase in dairy production in a country is mainly reflected in an increase in exports. Indeed, the European Commission (2014) expects exports of cheese to increase to 1 million tons by 2024. In addition, the production of skim milk powder will increase, reaching 1.6 million tons in 2024, with 50% exported. Meanwhile, the production of whey powder will increase by 20% to reach 2.5 million tons in 10 years, with 35% exported. Consequently, considering the characteristics of the milk sector in Europe, an increase in dairy production will lead to increased exports, which could affect the international price.

Thiele *et al*. (2013) show a positive correlation (0.81/0.90) between the milk price in the European Union and that in the international market. OECD-FAO (2014) suggests that from 2014 to 2023, the international price of whole milk powder will slightly decrease (2.0% per year), as will those of skim milk and butter (1.9% and 1.8% per year, respectively), while the international prices of cheese and coarse grain will remain stable (-0.2% and -0.4% per year, respectively). Réquillart (2008) suggests that consumers are taking advantage of the fall in the price of dairy products. Pawlak (2014) suggests a reduction in the consumer price of milk and dairy products of $0.03-1.57\%$ in European Union countries and 0.41% in the world after the liberalization of the global milk trade.

In any case, as reviewed by Hansen and Li (2015) and OECD-FAO (2014), the international milk price is difficult to predict for a number of reasons. These include the growing demand for cereals for animal rearing (especially in developing countries) and for the production of biofuel, world economic growth and consequently the increase in the consumption of products of animal origin (especially in developing countries), the possibility that China will become self-sufficient for dairy products, the adverse climatic conditions that can affect the price of feed, the possible intervention in the international market by governments (i.e., trade agreements between countries), and the introduction of measures to reduce greenhouse gas emissions. Indeed, the cattle sector is responsible for about 9% of human-induced greenhouse gas emissions (Gerber *et al*., 2013).

In Europe, the milk price at the farm gate is expected to fall after the end of the quota regime and then stabilize at 350 euro/ton until 2024; however, even in this case, considering the importance of exports for the European milk market, the future macroeconomic situation can influence it deeply (European Commission, 2014). Rosa *et al*. (2015) explain that in Europe, in the two years after the end of the quota regime, milk production will grow by 5% but the milk price will reduce by 10%. These conditions could lead to the restructuring of the dairy sector. In particular, in the Italian context, they explain that such conditions will reduce the number of dairy farms, while farm size will increase to exploit scale economies. They also show that with a milk price at the farm gate lower than 0.30 euro/liter, 20% of farms with more than 200 heads will remain in activity. Hence, without proper government intervention, the dairy sector will become more vulnerable to the volatility of international prices.

International milk prices at the farm gate have recently been volatile, moving from 31.76 euro/100 kg in 2013 to 44.72 euro/100 kg in 2014 and to 28.94 euro/100 kg in 2015. Indeed, the high volatility of dairy products in the near future cannot be excluded (CLAL, 2015c). The European Union, to reduce the effects of such volatility, will maintain guaranteed prices for dairy products, but only as a safety net, and the Milk Market Observatory has been created with the aim of ensuring clearness in international milk pricing (European Commission,

2015).

Farmers should react to this volatility by improving production efficiency by reducing costs and increasing technological level. From the costs point of view, the European situation is characterized by huge differences within and between countries, probably because of the specific climate and agricultural conditions of each country (Jansik and Irz, 2014). The above cited authors report that with one hour of labor it is possible to produce 255 kg of milk in Denmark, 58 kg in Finland, and only 15 kg in Latvia. Moreover, Hemme *et al*. (2014), considering the milk production cost of 46 countries in 2010, report an average value of 42.0 USD/100 kg for ECM (energy corrected milk), with the highest cost in Western Europe (53.6 USD/100 kg) and the lowest in Asia (30.4 USD/100 kg). IFCN (2013) reports a cost of milk production of 41.2 USD/100 kg for ECM in the United States.

However, in general, Jansik and Irz (2014) show that increasing farm productivity is already taking place. This increase could continue in future years and perhaps further rise because of the lack of subsidies. Indeed, Latruffe *et al*. (2011), in a study that considers seven countries (Denmark, France, Germany, Ireland, Spain, the Netherlands, and the United Kingdom), show that subsides have depressed technical efficiency in a uniform way in these countries. However, Jansik and Irz (2014) highlight that the adoption of new technologies in the dairy sector is easier and faster at the sector than at the farm level.

In Switzerland, the abolition of the milk quota system started in May 2009. The reasons for which it had been introduced were similar to those reported for Europe (Koch, 2002). Haller, (2014) describes the consequences of the abolition of milk quotas in Switzerland. In particular, since 2009, the price of milk has been characterized by volatility. Moreover, the same author shows that from 2000/2002 to 2010/2012, milk production increased by 8%, while the market price reduced by 22%, and the percentage of milk and cheese exported increased by 6% and 15%, respectively. Further, from 2003 to 2012, the four main dairy producers augmented processed milk by almost 40% (Haller, 2014). This data can be explained by the asymmetrical distribution of power along the dairy value chain (oligopolistic structure), where farmers are in a disadvantaged position (Haller, 2014). Indeed, from 1999 to 2012, the number of dairy farms reduced by almost 40%, but they increased their size and productivity (Haller, 2014). Hence, the consequences of the abolition of milk quotas in Switzerland may not be readily transferable to the situation for Europe because of the different size and structure of the dairy sector and capacity of Europe to influence the international market.

Korea is characterized by low competitiveness in the milk sector, with a total cost of milk production of 0.807 USD/l (USDA, 2014). Milk production is 2.2 million tons, and this will remain stable until 2024. Altogether, 76% of milk is for drinking, with the remainder processed (USDA, 2014; OECD-FAO, 2014). In 2024, cheese and skim milk powder will reach 0.31 million tons (+1.7% in 10 years) and 0.26 million tons (stable from 2015), respectively, while their consumption will reach 2.6 kg per capita (+2.4% in 10 years) and 3.2 kg per capita (+0.5% in 10 years), respectively. In addition, the import of cheese and skim milk powder will increase by 3.1% and 1.0%, respectively (OECD-FAO, 2014). These data suggest that the Korean dairy sector will become more dependent on foreign countries in the next decade; however, considering the very low level of exports, slight decline in the international price of milk, and stable price of cheese, the effect of the end of quotas on the Korean dairy sector should be limited.

End of the Milk Quota Regime: Effect on Mountain Areas

From the scenario previously described, because of their high production costs compared with non-mountain areas, the number of farms in mountain areas may decline, while their productivity may increase. Indeed, Van Roest (2000) shows that in Italy, the costs of the production of Parmigiano Reggiano cheese and milk are higher by 22.9% and 41.8% in mountain farms compared with lowland farms, respectively. However, the abandonment of mountain areas is already in place, with the number of holdings reducing by 18% from 1995 to 2007 in Europe (European Commission, 2009). Similarly, in the Italian Alps, from 1995 to 2010 there was a reduction of 44% in the number of farms with a strong intensification of production (rise from 41 to 88 tons of milk per farm; Pieri, 2010). This increase in production was made possible by improving management and increasing the spread of breeds such as Holstein (Sturaro *et al*., 2013) that, on the one hand, are very productive but, on the other, are not adapted to graze on the poor Alpine pastures. Indeed, from 1990 to 2010, in Italian alpine areas, pastures and meadows reduced by 26% (ISTAT, 2013). Conti and Fagarazzi (2004) report that in the past 50 years, woodland

has increased by 30% in Western Europe. The end of milk quotas may exacerbate this situation. Indeed, the European Committee on Agriculture and Rural Development (2013) explains that mountain farms will be at a competitive disadvantage after the end of quotas. Lehmann *et al*. (2001) claim that milk production in mountain regions will reduce by 18% mainly because of the reduction in the number of farms. Mountain areas account for 19% of the European territory (Pantić, 2015), and 10% of milk is produced in these areas (European Committee on Agriculture and Rural Development, 2013). Consequently, the main concern is not the reduction in the milk produced by mountain farms, but that these farms play a key social role in producing so-called ecosystem services.

Ecosystem services are defined by MEA (2005), and those provided by mountain farms are reviewed by Battaglini *et al*. (2014) as providing food and water, reducing greenhouse gas emissions through carbon sequestration, providing and maintaining cultural services such as tourism and tradition, promoting soil stability, and improving the aesthetic value of the landscape. Given their social importance, these services should be enhanced and supported by public bodies. In this case, the difficulty is quantifying in economic terms such services that have no market value (Ripoll-Bosh *et al*., 2013).

On the contrary, the competitiveness of these farms could be improved by directing production towards high quality branded products that can be easily recognized by the consumer (Haller, 2014). From this point of view, labels such as Protected Denomination of Origin (PDO), Protected Geographical Indication (PGI), and Traditional Speciality Guaranteed (TSG) have been introduced in Europe, with the optional quality label Mountain Product (Reg. UE 1151/2012) specifically designed for mountain or disadvantaged areas. Moreover, other labels have recently been introduced to highlight the breed used, such as the "Only of Italian Simmental Breed" (Romanzin, 2014). Garavaglia and Marcoz (2014), in an Italian survey, show that consumers are willing to pay more for a product with PDO certification and state that the origin of food products is an important attribute that influences the purchasing decisions of consumers. Moreover, the expected preference of consumers for a cheese obtained from grazing animals with respect to that obtained from hay-fed cows kept in barns is much higher (Romanzin *et al*., 2015), probably because consumers recognize the association between mountain/pasture and naturalness and health.

Despite these advantages of European labels, however, McMorran *et al*. (2015) highlight that the use of PDO or PGI can be further improved. Indeed, only one-third of the milk obtained in French mountains is used to produce cheeses labeled as PDO or PGI. Here, the label "mountain product" alone is insufficient; hence, an appropriate marketing strategy is needed (McMorran et al., 2015). Moreover, Fontes *et al*. (2012) highlight that the knowledge of consumers about PDO labeling is often low.

Another possibility for improving the competitiveness of mountain farms is to modify the vertical structure of the dairy sector to reduce the distance between farmers and consumers through direct sales, favoring cooperation between farmers and farmers' markets (Blasi *et al*., 2015; Jarosz, 2008). Finally, through both CAP direct payments and rural development programs, different European countries and/or regions have the possibility of supporting disadvantaged and mountain areas (European Commission, 2015).

Conclusions

In summary, the international dairy market will be characterized by milk price volatility in future years and this volatility is expected to decrease. From this situation, the consumer will take advantage. In general, farms will compare their competitiveness at the international level, perhaps leading to a reduction in their number, but an increase in their size and productivity. The same trend will involve mountain areas. However, because of the social importance of mountain farms, their development should be distinguished from those of lowland farms. In particular, the public should pay attention to the ecosystem services that they provide, while production should be directed towards certified products of high quality that meet the expectations of consumers sensitive to environmental, health, and cultural issues.

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