

**Economic Impact of the Abolition  
of the Milk Quota Regime  
– Regional Analysis of the Milk Production in the EU –**

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## **Executive Summary**

### *Background*

The dairy sector makes a substantial contribution to the agricultural turnover in many Member States (MS) of the European Union (EU) as well as in the EU as a whole. Nevertheless, within the EU-27, the size and agricultural importance of the dairy sector varies considerably between MS and across regions, basically reflecting climatic and other agricultural factors. The EU dairy market is regulated by the Common Market Organisation (CMO) for milk and milk products, of which the milk quota regime is one of the most noticeable elements. The EU milk quota system was originally introduced in 1984, in order to limit public expenditure on the sector, to control milk production, and to stabilize milk prices and the agricultural income of milk producers. Since the milk quota regime was introduced, milk quota has become a scarce production factor: on the one hand limiting milk production and, on the other hand, stabilising milk producer prices and maintaining dairy activities in less competitive regions. However, in the course of time European dairy policy has been continuously changing and has increasingly encouraged producers to be more market-oriented. Policy developments, including reductions of intervention prices and specific quota increases of various amounts to MS, together with most recent market developments, have provoked that quota is no more binding in some MS and regions of the EU. With the Luxembourg Agreement on the Mid-Term-Review (MTR) on 26 June 2003, the spotlight shifted again on the EU's milk quota regime, because the MTR stipulated that the milk quota system will come to an end in 2015. Within the Health Check of the Common Agricultural Policy (CAP) the European Commission endorsed the proposal of milk quota abolition and suggested an increase of quota by 1% annually from 2009 to 2013 to allow a "soft landing" of the milk sector to the end of quotas. In this context it is especially important to clarify, which economic effects can be expected of an abolition of the milk quota regime.

The current report is the last report of a series of three reports delivered to DG Agriculture and Rural Development (DG AGRI) within the project entitled "Economic Impact of the Abolition of the Milk Quota Regime – Regional Analysis of the Milk Production in the EU" (AGRI-2007-0444). The project aims at a thorough policy impact analysis of the EU dairy markets in the year 2020 regarding the removal of milk quotas within the framework of the Health Check of the CAP. This study has been led by the European Commission's Joint Research Centre - Institute for Prospective Technological Studies (JRC-IPTS) and provides a quantitative assessment based on different simulation scenarios performed with the CAPRI (Common Agricultural Policy Regionalised Impact) model and allows the comparison to results published in previous studies performed by the AGMEMOD, CAPSIM and EDIM consortia (Chantreuil *et al.* 2008; Witzke *et al.* 2008; Réquillart *et al.* 2008).

Within the project a significant amount of work was devoted to a rigorous update of the CAPRI model and database. The model updates were essential and comprised three objectives. The first one was to update the base year of the CAPRI system to a 2003-2005 three-year average. This was an important challenge due to the complexity of the CAPRI system and the problems to update world-wide supply and use tables from FAOSTAT. The second objective of the model update was the implementation of a formal link to an econometric framework for estimating marginal costs of milk producers. This additional module should increase the validity of the analysis, as it provides price-supply elasticities for raw milk based on historical FADN (Farm Accountancy Data Network) records (data up to year 2005) and actual estimates of regional quota rents (i.e. the difference between the farm milk price under quota and the marginal cost of production). The third objective of the model update was to incorporate expert data and medium-term projections on dairy commodities provided by the Directorate-General Agriculture and Rural Development (DG AGRI).

The profound update of the CAPRI model provides the basis for a comprehensive quantitative assessment of possible implications of the dairy policy reform, with an explicit focus on regional effects in the EU-27 of a milk quota abolition in the year 2015.

### *Specification of the Model*

The CAPRI model is an agricultural sector model covering the whole of EU-27, Norway and Western Balkans at regional level (250 regions) and global agricultural markets at country or country block level. CAPRI makes use of non linear mathematical programming tools to maximise regional agricultural income with explicit consideration of the CAP instruments of support in an open economy. CAPRI consists of a supply and market module which interact iteratively. The supply module follows a 'template approach', where optimisation models can be seen as representative farms maximising their profit by choosing the optimal composition of outputs and inputs at given prices. Major outputs of the supply module are crop acreages and animal numbers at regional level, with their associated revenues, costs and income. The market module consists of a constrained equation system with a spatial world trade model. Major outputs of the market module include bilateral trade flows, market balances and producer and consumer prices for the products and world country aggregates.

The CAPRI version used for this study is standard comparative-static, i.e. adjustment costs are not considered and policy simulations reveal a situation where dairy farmers were given time to adjust their fixed factors to the new policy framework. By incorporating an econometric supply module for the most representative dairy farms in the EU, the update of the CAPRI model allows for a better representation of the dairy sector, as additional information on milk quota rents and price supply elasticities are now explicitly introduced for dairy products.

### *Scenario Description*

Four scenarios are considered in the analysis:

- Scenario S1 corresponds to the ex-post base year scenario, which is constructed for year 2004 (i.e. 2003-2005 three-year average). It includes the full implementation of the Agenda 2000 reform, with 2003 agreements on the Mid-Term Review not being yet effective. This means that in this scenario the dairy and sugar markets were slightly more protective than after the Luxembourg Agreement in 2003 and direct payments were still coupled to production. Market access for developing countries was provided for by the "Everything but Arms" (EBA) agreement and the EU-10 (10 EU MS after the enlargement in 2004) and EU-2 (Bulgaria and Romania) were not yet fully part of the single market.
- Scenario S2 is a counterfactual simulation of the baseline policy applied to year 2004. It builds on the legislation ratified in year 2004, i.e. scenario S2 includes the central elements for the dairy sector of the Luxembourg Agreement in 2003, namely the decoupling of direct payments together with a stepwise reduction of intervention prices for butter and SMP. Furthermore it also includes further reforms on single markets (tobacco, olive oil and cotton sectors), the reform of the sugar quota, a 2% expansion of milk quotas in 2008 and the abolition of obligatory set-aside. Scenario S2 was mainly elaborated to show the impact of the 2003/2004 reform ex-post, i.e. more for technical purposes. Due to its high degree of abstraction and rather minor direct relevance to the analysis of milk quota abolition, results of scenario S2 are not further analysed in this report.
- Scenario S3 represents the baseline policy in year 2020. It assumes the same policy setting as scenario S2, i.e. the full implementation of the Luxembourg Agreement and further reforms mentioned in scenario S2. Moreover, scenario S3 includes expert-driven assumptions on the development of dairy markets and milk quota rents. For this scenario, DG AGRI provided statistical information on milk deliveries, export subsidies, intervention stocks for dairy products and, medium-term projections for dairy markets.
- Scenario S4 is conducted to represent the effects of a milk quota abolition. It is a counterfactual scenario to scenario S3, i.e. with other policy elements being equal to scenario S3, scenario S4 enables the comparison of possible differences between scenario S3 and a milk quota removal taking place in year 2015. As scenario results are generated for the year 2020, the dairy sector is assumed to have adjusted to the new market environment between 2015 and 2020.

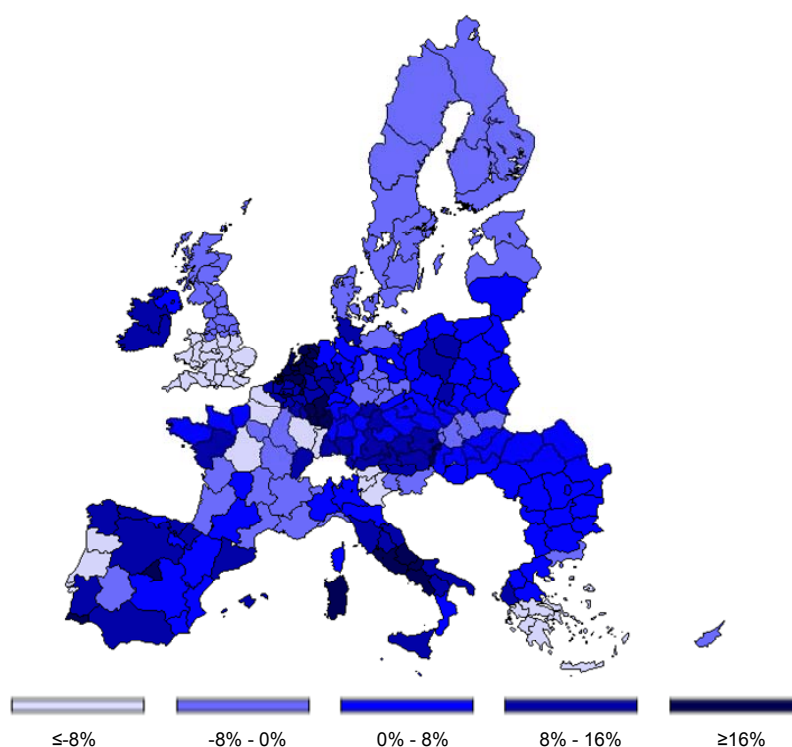
### *Results and Conclusions of the Milk Quota Abolition Scenario*

As an explicit focus of this report is on the regional effects in the EU-27 of a milk quota abolition in year 2015, conclusions can predominantly be drawn by comparing the results of

scenario S4 and scenario S3. Results of scenario S1 are of a pure calibration nature (i.e. reproduction of statistical data) and are commented in the context of the baseline scenario within the report. As scenario S2 was mainly elaborated for technical purposes, results remain of a technical nature (i.e. ex-post behaviour of the model to policy changes in the baseline) and are therefore also not further commented in the report.

The results of scenario S4 are presented in relative terms to scenario S3, i.e. the baseline scenario in year 2020. Therefore, this analysis isolates the effects of the abolition of the milk quota system in the EU-27 on specific economic indicators at MS and regional level. Key results of scenario S4 are that milk production increases by about 4.4% in the EU-27, and EU raw milk prices decline by 10%. Production of butter, skimmed and whole milk powder would increase by 5-6% while their prices would decline by about 6-7%. The production of cheese and fresh milk products would increase by about 1% and their prices could decline by 4-6%.

At EU MS and regional level, the effects of milk quota abolition are quite diverse. MS like Austria, Belgium, Ireland, the Netherlands and Spain are projected to increase their milk production significantly, and with the exception of Spain, there is little heterogeneity among their sub regions. Within MS, projected changes in milk production are especially heterogeneous in Germany, France, Spain and the UK. In Germany a significant reduction of milk production is expected for the Eastern part, while most of the remaining regions expand their production, many even quite significantly. On average the German milk production is projected to increase by 7%. In the United Kingdom an overall reduction of milk supply by around -5.7% is projected, whereas this decline is more considerable in the southern part than in the north. The projected impacts on regional milk production are mainly determined by the estimated milk quota rents in the baseline scenario. Especially regions with high quota rents, such as in Austria (all above 28%), the Netherlands (all above 27%), Belgium (Brabant Wallon 38%, the rest above 28%), Luxembourg (29%), and to a lesser extent Italy (Lazio, Molise and Abruzzo above 33%) and Germany (Saarland, Koblenz and Rheinhessen-Pfalz above 32%) increase their milk production significantly. As the overall increase of milk production drives down dairy prices in the EU-27 this exerts economic pressure on regions with low quota rents, especially to be found in the United Kingdom (eastern, south east and south west regions), Sweden (Mellersta Norrland and Oevre Norrland) and all Finnish regions. The percentage change of milk production in European regions after quota abolition are visualised in the following map on a NUTS 2 level:



Comparing the average production changes in the (20%) most strongly expanding and receding countries in the EU-27, regional heterogeneity within EU MS is highest in Germany, Italy and Portugal; with the strongest heterogeneity expected in Portugal where Lisboa reduces milk production by -13% (in Lisboa the quota rent in scenario S3 was +1%) whereas the Algarve region increases production by 18% (the quota rent in scenario S3 for this region was +22%). In turn, regional homogeneity is highest within the Netherlands, Austria and Hungary, when comparing production changes in the 20% least expanding and receding countries.

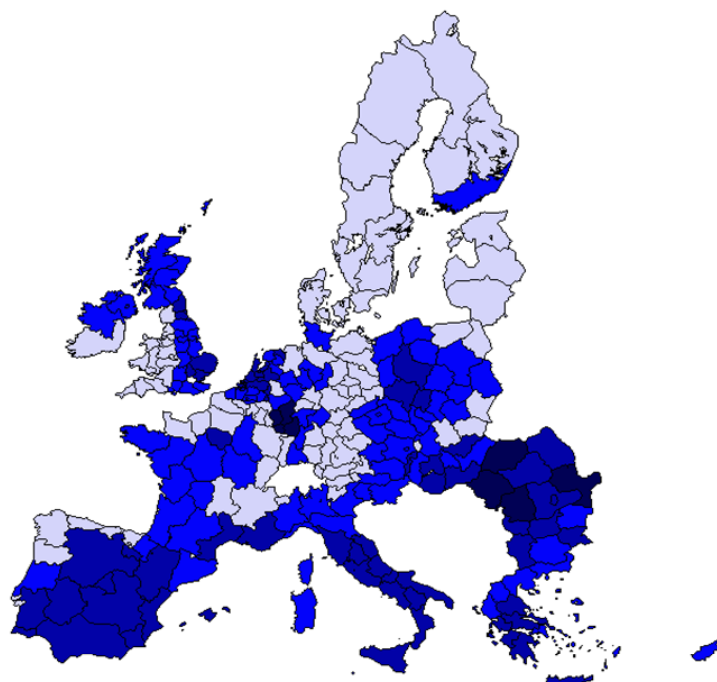
The increase in cow milk production in the EU-27 is mainly due to a 4.2% increase in dairy cow herds. At MS level, increases in dairy herds between 11% and 20% are projected for the Netherlands, Austria, Belgium, Ireland and Spain. Concerning the NMS, the biggest increases in dairy cow herds are projected for Hungary (6.1%) and Poland (4.5%). The increase in dairy herds usually translates into a modest increase in cattle density, because other cattle types for fattening are not substantially affected and suckler cows will decline, as prices for calves are driven down by additional supply from dairy cows. In contrast, some MS face decreases in dairy cow herds, especially the United Kingdom, Sweden and France (-5.8%, -4.8% and -3.2% respectively). The only NMS with a mentionable decrease in dairy cow herds is the Slovak Republic (-2%).

Regarding regional dairy cow herds, nearly 70% of the European regions show an increase in dairy cow herds as a consequence of quota abolition. Strongly increasing dairy herds of more than +16% can be observed in about 10% of the regional units, as for example Saarland, Rheinhessen-Pfalz, Koblenz and Trier in Germany (above +33%), all Dutch regions (around

+20%), Lazio, Molise and Campania in Italy (above +21%), Comunidad de Madrid in Spain (+18%) and Algarve in Portugal (+18%). On the other hand, around 17% of the regional units face a quite significant decrease of dairy cow herds of more than -4%, as for example most of the Greek regions (-12% to -19%), Lorraine and Alsace in France (-17%), Lisboa and Norte in Portugal (-12%) and South East and Eastern in the UK(-11% to -13%).

The regional effects on agricultural income follow from price and quantity impacts on the input and output side. The bottom line in terms of agricultural income is crucially determined by the impacts on revenues from raw milk and meats and related impacts on non fodder items. While fodder activities are important for a detailed analysis, no significant effect on income can be observed since revenues and costs tend to cancel each other. In general, agricultural income losses are observed all across the EU-27 MS (equating to a loss of -2% on total utilizable agricultural area for the EU-27). The decrease in agricultural income can mainly be attributed to decreases in income from cow milk and meat and to rising non fodder feed costs, with the income losses of the dairy cattle sector (-14% for the EU-27) being the main driver for overall losses in agricultural income.

At MS level the biggest losses in agricultural income are projected for countries in northern Europe, which reflects the situation that in northern Europe the share of milk production in total production tends to be higher than in Mediterranean countries. The largest decreases in agricultural income are projected for Sweden (-5.2%) Finland and Ireland (both -4,5%), Lithuania (-3.8%) and Germany (-3,6%). Nevertheless within MS, mostly those regions that show high quota rents in the baseline see a rather favourable income development (but there are exceptions, as e.g. regions in the Netherlands and Austria also have to cope with small income losses). Agricultural incomes are most heterogeneously affected in Germany, Portugal and Spain. For example in Germany, where overall agricultural income decreases by -3.6%, the most benefitting regions, Saarland and Trier observe income gains of up to 4.8% and 4.4%, while the most negatively affected regions Schwaben, Sachsen-Anhalt, Thuringen and Oberbayern, face agricultural income losses between -6.6% and -5.5%. Hence, in Germany the gains in agricultural income are found in regions with a rather tiny dairy sector, while with Schwaben and Oberbayern, two of the biggest cow milk producing regions in Germany, are among the most negatively affected regions. In Spain, decreases in agricultural income are projected for all regions, with an overall loss in agricultural income of -0,92% on average. However, by far the biggest decreases in agricultural income are projected for the regions in the north west of Spain (Cantabria, Asturias and Galicia face losses between -8.5% and -5.3%), hence in regions where cow milk production plays a major role in agricultural income. Fairly homogeneous income impacts are expected in Finland, Sweden and in particular Hungary, where income losses are in the small range of -0.7 to -1.2%. The percentage changes of overall agricultural income in European regions after quota abolition are visualised in the following map:



Overall welfare effects are slightly positive for the EU-27. Whereas total agricultural income would decline due to lower milk prices on average, the EU dairy industry would benefit as prices of dairy products are expected to decline less than raw milk prices (i.e. input costs decreasing more than revenues). Impacts on the FEOGA budget would arise mainly from additional export subsidies for butter and moderate losses of tariff revenues. If a full transmission of lower agricultural raw milk prices along the downward supply chain to consumers is assumed, the main beneficiaries of milk quota abolition would be consumers, who benefit from various declining consumer prices, most notably declining prices for cheese.

The results described in this analysis are based on several implicit and explicit assumptions, hence it is important to take into account these limitations. The current analysis allows for a partially endogenous representation of regional cost structures for dairy producers. Nevertheless, it is important to remark that the cost estimation framework for milk producers applied to this study has been done separately from the simulation analysis with CAPRI, so that no exchange of information between both models has been attempted (due to the short-time frame of the study and its methodological complexity). Although the results of scenario S4 presented are in line with results of other studies, the simulations are based on certain key model parameters. The sensitivity analysis revealed that the higher the assumed elasticity of milk supply, the wider the variety of regional effects. While high supply elasticities tend to make the gap between winning and losing regions broader, lower supply elasticities produce uniform changes among regions. With regard to quota rents, it has to be stressed that an



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assumption of different quota rents would have significant effects on the results of milk production as well as on milk prices and agricultural income.

