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## RESEARCH IN ECONOMICS AND RURAL SOCIOLOGY

### **Impact of the Luxembourg agreement on milk and dairy products**

*The Luxembourg agreement, finalised in June 2003, represented a major change in the Common Agricultural Policy (CAP). This agreement ushered in the “decoupling” of subsidies, making grants depend on a number of requirements, including environmental criteria. To assess the Luxembourg reform, we use the simulation tool for dairy policy reforms developed by the INRA-ESR unit in Toulouse. We show that the reform does not fundamentally challenge the dairy market balance. We also show that it is unlikely that decoupling will lead to any significant fall in European production. However the introduction of decoupling may lead to restructuring of dairy production, favouring the implementation of a more fluent system of quota transfers between producers.*

### **Research Objective**

The Luxembourg agreement, signed in June 2003, represents a major change in the Common Agricultural Policy (CAP). This agreement ushered in the “decoupling” of subsidies, making grants depend on a number of requirements, including environmental criteria. “Decoupling” means that the subsidies received by a farm are not dependent on the current production circumstances of that farm. Furthermore, a certain form of subsidy distribution is left at the disposal of the Member States of the European Union (EU), providing them with a powerful distribution tool.<sup>1</sup>

In the case of the Dairy Common Market Organisation (CMO), since 2007 direct payments granted for dairy activity are integrated into the overall aid payment made to farms. Furthermore, the Luxembourg agreement maintains the principle of milk quotas until 2014. The object of our research is to analyse the impact of the milk CMO reform introduced by the Luxembourg agreement, and to compare that policy with the terms of the 2000 Agenda.

### **The assessment tool of the dairy policy impact**

The simulation tool used to analyse dairy policy reform was developed in the Toulouse INRA-ESR unit, in partnership with the French Milk producers’ union (CNIEL<sup>2</sup>, and more recently, ONILAIT<sup>3</sup>). The tool was used to analyse various options of reform within the preparation of the CAP halfway revision for the European Commission (European Commission, 2002)<sup>4</sup>.

The model of the European dairy sector incorporates the following properties:

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<sup>1</sup> We must not forget that the agricultural budget reached 45.5 billion Euros in 2006, that is to say around 0.5% of European GNP

<sup>2</sup> CNIEL (French milk Institute of Research).

<sup>3</sup> ONILAIT (French Office of Milk and Dairy products).

<sup>4</sup> For further information, see Bouamra, Chavas, Cox and Requillart (2002).

- Modelling of the vertical structure of the dairy chain including milk supply, milk processing into final products and demand for final products.
- Disaggregated analysis taking into account, both the multi-product nature of the dairy industry (14 final products: butter, skimmed milk powder (SMP), whole and half-skimmed milk powder, condensed milk, liquid milk, cream, casein, and 6 categories of cheese) and the variations in the dairy sector between different Member States.
- Regarding milk process technology: the milk model considers both main milk components (fat and proteins) and imposes some equilibrium constraints of assessments for its components.
- Modelling of the various policy tools used by the EU to regulate the dairy sector: milk quotas, intervention prices for butter and SMP, purchase of excess butter, subsidies for butter and SMP consumption, subsidies for casein production, subsidies to exports, customs duties and quota imports. We also modelled the constraints imposed by the GATT/WTO as regards subsidized exports and imports (minimum and current access).

Evolution over time was tracked with reference to changes in dairy policies and changes in the demand (development trends).

For each scenario of the dairy policy reform, the model resolution gives the price and production of the milk and dairy products for each EU Member State. The model also determines the consumption, exports and imports of each dairy product, the public purchases of butter and SMP as well as the unitary subsidies allocated to the various products. The model assesses the milk policy impact on the producers and taxpayers' surplus and on the global welfare of the EU.

### **Main mechanisms in play**

To manage the market, Public Authorities make use of two tools which can be adjusted in the short term: subsidies to consumption and production (for butter, SMP and casein) and subsidies to export. Through these instruments, the effect is that Public Authorities maintain the market prices of butter and SMP at levels close to their intervention level. Intervention prices set floor prices for butter and SMP<sup>5</sup>. The model schematizes this mechanism by calculating the consumption (and production) and export subsidies which allow the market price of butter and SMP to be equal to their effective intervention price<sup>6</sup>. In this way, a fall in intervention prices is translated by a downward adjustment of subsidies to exports and subsidies for domestic consumption. If subsidy is zero, the only decrease in the intervention price has no impact on the equilibrium market price.

Public Authorities also use the quota system to influence markets. In the dairy sector, prices are very sensitive to production levels. A 1% increase in the milk production thus leads to a 3 to 4% fall in the milk price, all other factors being equal. This result can be explained by the low elasticity of the aggregated demand for dairies in relation to the price.

As a consequence, the milk price trend is very sensitive to the autonomous trend in demand. Therefore, for a given production (i.e. for example, in the presence of quotas), a 1% increase in the demand for dairies leads to a more or less 3% raise in the milk price, *ceteris paribus*<sup>7</sup>. On the other hand, if production is not fixed (what would be the case if milk quotas were withdrawn), then the increase in demand has a lesser effect on the price and can be translated by an increase in production. The greater the elasticity of supply, the smaller the effect on price.

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<sup>5</sup> As a rule, intervention must make allowances for the effects of economic phases (particularly intra-annual ones). An economic intervention (i.e. during several consecutive years) is not tenable (see: the accumulation of butter stocks in the 80s which led to the implementation of quotas). Therefore, we consider the market equilibriums for which instruments are adjusted in order to avoid public stocks. However, it is possible, for a given year, to simulate the impacts of the dairy policies by allowing the possibility of public stock.

<sup>6</sup> Let us note that in the case of butter, the effective intervention price is equal to 92% of the intervention price.

<sup>7</sup> The « autonomous » trend in demand corresponds to the demand changes linked to the tendencies in tastes and food habits. In the present case, analyses are based on a 0.75% increase in the global milk demand per year (in milk equivalent).

## **Description of the reform scenario and its main results**

The Luxembourg reform intensifies the steps taken within Agenda 2000. The quota is bigger than 300,000 tons, with rises specific to some countries, and the fall in the intervention price for butter and SMP is asymmetric and more substantial for butter (see table 1).

To summarise the re-negotiations of the international agreements in matters of border protection and export subsidies, two major assumptions are made in our simulation. On the one hand, from 2005<sup>8</sup> the minimum imports to the European Union are doubled. On the other hand, the volume of the subsidized exports and customs duties of the out-of-quota imports are cut by 26.5% and 36% over 5 years.

### **Milk market**

The milk quota development being roughly identical in the Luxembourg reform and in AGENDA 2000, milk production is only slightly modified (see figure 1)<sup>9</sup>. According to our Luxembourg agreement simulations during the 2004-2007 reform, milk prices would fall by 5% per year to reach a minimum in 2007. Then, milk price rises by 1.2% per year in response to the further demand trend. In the end, the Luxembourg agreement implies a 13% price fall between 2000 and 2010. These results depend on two assumptions that we shall discuss later:

- The impact of decoupling on production
- The development of the domestic demand.

### **Final product market**

Butter price decreases with intervention price (see figure 2). That price fall is made possible through the increasing milk production and through the reduction in domestic subsidies and exports which, from 2006, cancel each other out. Moreover, from 2007, since milk quotas are frozen, butter prices become higher than the intervention price and slightly increase under the increasing global demand for fat (through the increase in cheese demand). Therefore, the intervention price for butter has no more utility as a structural price support after 2007. However it does continue to serve an economic purpose, and offers insurance in case of crisis.

The production of butter usually decreases in response to the “closing” of international outlets. The reduction in export subsidies is higher than the fall in the domestic price, what induces a loss of competitiveness in butter exports.

The SMP price decreases with the intervention price and then remains at this level until the end of period (see figure 2). Subsidies to export are regularly reduced and cancel each other out in 2007. However, even if they are low at the end of period, domestic subsidies remain positive.

The SMP production decreases evenly in response to the reduction of these aids which induces a fall in the subsidized consumption of animal food. Non-subsidized domestic consumption remains steady and exports fall off slightly.

The production of consumer goods (cheese, fresh products, and liquid milk) mainly increases under the impact of the economic trend of rising domestic consumption. The fall in product prices being relatively limited, the increase in consumption, in response to price variations, is marginal.

Overall we have seen a not insignificant fall in the production of processed products (butter, SMP, fat powder and casein) in favour of a development of consumer products (see table 2). Thus, between 2000 and 2010, the proportion of processed products drops from 38% to 33% in fat equivalent and from 24% to 19% in protein equivalent. Conversely, consumer products use an increasing amount of the fat and protein produced in the EU.

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<sup>8</sup> By convention, the 2005-2006 campaign is quoted 2005.

<sup>9</sup> In order to compare the Luxemburg reform with Agenda 2000, we mention the results for Agenda 2000 in all the figures.

The EU market share in the world market is significantly reduced. In this way, in 2010, exports in fat and protein equivalent represent only 5% and 10% of the EU availabilities against 12% and 16% in 2000. These results depend particularly on two assumptions that we shall discuss later:

- Evolution of demand, particularly for fats, in the EU;
- Development of the global market for SMP.

## **Surplus and Subsidies**

Thanks to the direct aids granted for milk production, the Luxembourg reform seems, eventually, more favourable to producers than the Agenda 2000 does (see figure 3). In the absence of these subsidies, the AGENDA 2000 reform would be more favourable. From 2008, the increase impact of milk prices on the producers' surplus has a not insignificant impact of 350 M€/year. Given that rise, the producers' surplus, at the end of period, is roughly identical to the one they had at the beginning of the period.

Though the market support cost (net import receipts) highly decreases during the period studied, for the taxpayer the global cost imputable to this sector increases (from 2004 and 2005, according to the scenario) because of the granting of direct aid (see figure 3).

The Luxembourg reform is good for consumers. From 2003-2010 the average benefit was in the order of 100M€ per year compared with AGENDA 2000. From 2007, this benefit is reduced to reach 600M€ in 2010. In terms of overall subsidies, the effects of the Luxembourg reform are not much different from AGENDA 2000 policy. The effects are highly redistributive (benefits transferred from taxpayer to producer).

## **Reliability of the results and discussion**

### **The impact of aid decoupling**

Even if, from a theoretical point of view, we may assess the impact of aid decoupling, this impact is much more difficult to assess from an empirical point of view. Therefore, it seems likely that our results overestimate the capacity of milk producers to resist falling prices and maintain their milk-producing activity in a context where subsidies do not depend on the final production and where producers are able to change activities more easily. Given some milk profession handicaps, particularly as regards work organization, a large number of producers could be driven to quit milk production.

If this were to happen, what would be the effect on the markets? Might there be a significant fall in European milk production?

We simulated the impact of a 2% fall in European milk production. That production fall would bring a rise in the milk price which would settle at 90 instead of 84. The fall in the milk price at the height of the reform would be limited to 12% instead of 18%. This result suggests that a significant fall in the European production is not conceivable in response to the aid decoupling because it generates a very strong positive answer from the milk price which, in return, prompts to produce.

### **The impact of a less favourable development of demand for fats**

The model results are sensitive to the assumptions made with regard to the autonomous development of demand (that is to say the temporal evolution linked to the development of incomes, of the population and tastes and not of price factors). For a few years we have been observing a substitution of the consumption of products with high content in fat by low-fat products and this recent trend has not been taken into account in our modelling. What would be the impact of that consumption tendency which reduces the European demand for fat?

From 2007, given our assumptions of demand development, market butter price is higher than the intervention price. There is room for a price adjustment in response to falling demand. This room for manoeuvre would allow the sector to handle a demand for fat 70,000 tons (in butter equivalent) lower

than that foreseen in the model. In this case the butter price marker would fall by 6% and would be equal to the intervention price. This would bring a 2% fall in milk price and falling prices for other dairies.

If the fall in the fat demand were bigger, it would not be possible to sell off the surpluses on markets. In that case, a solution would be to increase the subsidies to export to be able to find a foreign market for surpluses. This seems unlikely given the Public Authorities wish to cut export subsidies. A second solution would be to allow butter stocking, what is not viable on the long run. In the end, the only options would be either to further reduce intervention prices or reduce quotas, in order to reduce the volume of surpluses.

### **The impact of a depreciated SMP global market**

The model relies on a favourable assumption of the SMP world market position. In such a context, the European Union would keep on exporting a big amount of SMP on the world market after implementation of the Luxembourg reform, and this despite the strengthening of WTO constraints on subsidized exports. The question then is whether the EU would go on exporting in a less favourable position on the global market. But, given that the SMP price remains at intervention price at model equilibrium, and that from 2006 the subsidy level is zero, maintaining SMP exports in a depreciated world market requires the use of export subsidies. In the absence of this option, the only tool for market adjustment would be intervention prices (not sustainable in the long run).

### **Summary**

The Luxembourg reform does not fundamentally change the milk and dairy market compared with Agenda 2000. The only innovative element of the reform is the decoupling of direct aids to producers. However a significant drop-off in European production in response to aid decoupling is unlikely, because this would cause a positive spike in milk prices which in return stimulates production. On the other hand, decoupling will encourage some producers to quit milk production. Conversely, some producers will be encouraged to increase their production. One must expect big quota transfers between producers, posing questions about how to regulate a more fluid system of quota transfers and making a strong case for quota management within regions or countries.

Finally, it is advisable to note that the analysis does not take into account the accession impact of the ten applying countries. It seems that, on the mid run, it only has a slight direct impact on milk and dairy market equilibriums of the European Union. On the other hand, the accession could have strong repercussion on the joining countries. These effects remain to be analysed and we are currently carrying on in this direction.

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**For further information**

**Bouamra-Mechemache Z., Chavas J.-P., Cox T., Réquillart V. (2002).** EU dairy policy reform and future WTO negotiations : a spatial equilibrium analysis. *Journal of Agricultural Economics*, vol. 53, n° 2, pp. 4- 29.

**European Commission (2002).** *Study on the impact of future options for the milk quota system and the common market organisation for milk and milk products.* A report to the EC by the consortium INRA-University of Wageningen, CAP Reports, Luxembourg.

**Table 1: Comparison of various measures of the dairy policy for Agenda 2000 and Luxembourg reforms**

	2004	2005	2006	2007	2008	2009 to 2014
<b>Milk quotas</b>						
Luxembourg	CS	CS	+0.5%+CS	+1%+CS	+1.5%+CS	+1.5%+CS
Agenda 2000	-	+0.5%	+1%	+1.5%	+1.5%	+1.5%
<b>Butter intervention price</b>						
Luxembourg	-7%	-14%	-21%	-25%	-25%	-25%
Agenda 2000	-	-5%	-10%	-15%	-15%	-15%
<b>Intervention price SMP</b>						
Luxembourg	-5%	-10%	-15%	-15%	-15%	-15%
Agenda 2000	-	-5%	-10%	-15%	-15%	-15%
<b>Direct support</b>						
Luxembourg	11.81€/t	23.65€/t	35.50€/t	35.50€/t	35.50€/t	35.50€/t
Agenda 2000	-	8.33€/t	16.67€/t	25.00€/t	25.00€/t	25.00€/t

Changes are in% of variation from 2003

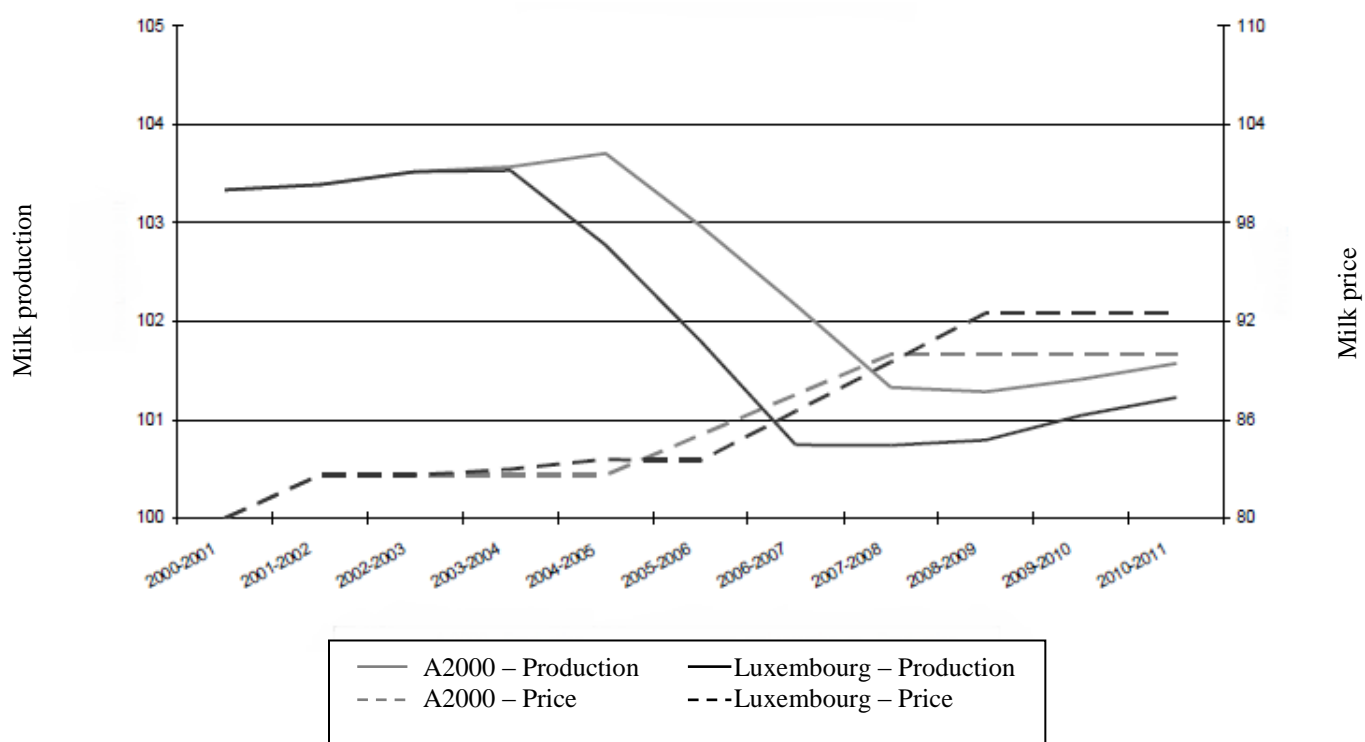
CS: specific changing for Portugal and Greece

**Table 2: Impact of the Luxembourg reform – Equilibrium of dairy markets in 2010**  
(Index 100 for the year 2000)

	Butter	SMP	Fat powder	Liquid milk	Cheeses
Production	90	82	83	104	108
Price	81	85	84	97	94*
Domestic consumption	101	90	133	104	111
Exports	11	84	49	-	87
Imports	111	181	100	-	149

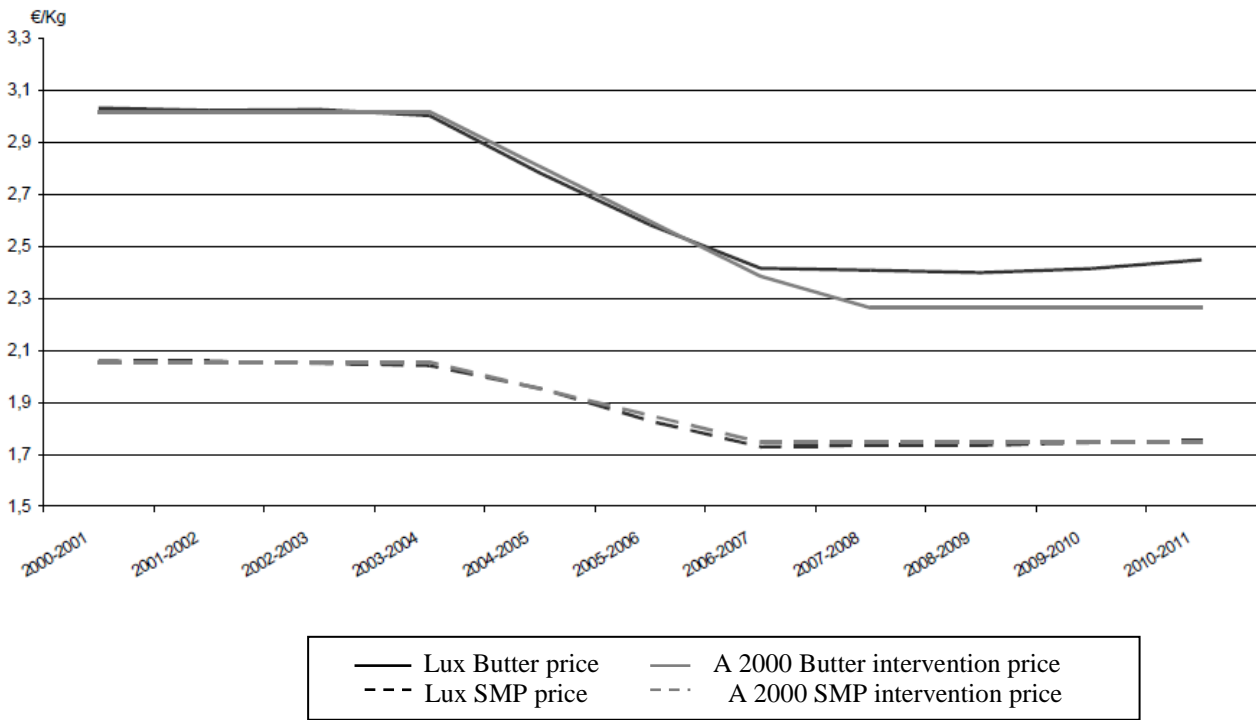
\*index for semi-hard cheese

**Figure 1: Milk price and production evolution**  
Scenarios Agenda 2000 and Luxembourg





**Figure 2: Evolution of the market price and intervention price of butter and SMP  
Luxembourg scenario**



**Figure 3: Evolution of producers' surplus and taxpayers' cost  
Luxembourg scenario**

