

# **ALLIANCE ENVIRONNEMENT**

**Groupement Européen d'Intérêt Economique**

## **EVALUATION OF THE ENVIRONMENTAL IMPACTS OF MILK QUOTAS**

### **EXECUTIVE SUMMARY**

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## **EXECUTIVE SUMMARY**

### **1 INTRODUCTION**

The milk quota system was introduced in the European Union (EU) in 1984 in order to limit milk production, which was considerably in excess of internal demand and the disposal of which was imposing a heavy burden on the Community budget. Under the quota scheme, Member States were allocated national reference quantities of milk quota, which were then attributed to individual producers. Individual producers whose production exceeds their quota are subject to a super levy. In order to facilitate structural development within the dairy sector, Member States have been able to set their own rules relating to the transfer of quota as well as to allocations from their national reserve. The implementation of these rules has taken place within a legislative framework set at EU level. Several reductions in national reference quantities of milk quota took place in the early periods of the regime, but they were subsequently expanded as part of the Agenda 2000 reforms. The current system of milk quotas is scheduled to expire in 2015.

The aim of this study is to examine the environmental impacts of the different rules for allocation and transfer of milk quota in individual EU Member States. It seeks to identify the ways in which differences in the implementation of milk quota regimes can impact on quota mobility both in relation to regional distribution of quota and to structural change at farm level and to examine the environmental implications. It is intended to complement a previous study<sup>1</sup> that evaluated the impact of market support measures in the EU dairy sector as well as the effect of applying reference quantities of milk quota at national level. In contrast, the main policy impacts considered in this study arise from national implementation of the following aspects of milk quota policy within Member States:

- Transfers of quota with land (including rural leases);
- Permanent transfers of quota without land (via market or administrative mechanisms);
- Temporary transfers of quota without land;
- Temporary redistribution of unused quota; and
- Management of the National Reserve.

However, since a number of other policy measures and market trends will influence the structure of dairy farming and its environmental consequences, isolating the impact of the quota regime and the way it is implemented is potentially difficult. Moreover, the linkages between milk quota implementation and environmental impacts are not straightforward. The environmental effects are various and can be either positive or negative, or both. For example, some structural changes linked to milk quota implementation may be beneficial in terms of greenhouse gas (GHG) emissions but negative in terms of water pollution or vice versa. The environmental

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<sup>1</sup> Evaluation of the environmental impacts of CAP measures related to the beef and veal sector and the milk sector (Alliance Environnement, 2007)

impact of some structural changes will also vary significantly depending both on local agro-climatic conditions and the extent to which production is concentrated in a particular region. Whether overall milk production is rising or falling in a Member State may be a key factor in determining the consequences of adopting certain rules.

## **2 SCOPE OF THE EVALUATION**

In terms of geographical scope, the main focus of the evaluation is on the EU 15. There is a more provisional overview of the implementation of milk quotas in the 10 new Member States which acceded to the EU in 2004 (henceforth referred to as the NMS 10). Much of the analysis within the study is focused on the seven Member States, which account for nearly 85 per cent of milk production in the EU 15, distributed over a range of production systems and agro-climatic zones. Case studies were conducted in France, Germany, Ireland, Italy, the Netherlands, Spain and the United Kingdom (UK).

The evaluation covers the period from 1988 until the present day, subject to more limited data availability in recent years. It focuses on the medium to long term impacts of milk quota implementation. Implementation rules have been in continuous evolution over the period, both endogenously, as Member States have adapted them in the light of experience, and exogenously in response to changes to EU regulations. The study does not attempt to assess each of these changes but to unravel the consequences of what can be identified as differences in Member States' longer-term philosophies and approaches regarding quota implementation.

The effect of different Member States' quota regimes on the regional distribution of milk production was identified as a key theme and this is given particular attention in the study.

## **3 METHODOLOGY**

The methodology for this study derives from two key evaluation questions based on the themes of *Coherence* and *Effectiveness*. The first question relates to the overall environmental impact of milk quota implementation at Member State level and its coherence with the environmental goals (relating to parameters such as water quality and biodiversity) enshrined in EU policies. The second task is to assess the degree to which any environmental objectives set by Member States within their milk quota regimes have been effective.

The evaluation questions are structured according to a two-step process. Firstly, farm level and structural impacts of different aspects of milk quota implementation are evaluated. In the second step, the environmental consequences of these farm level impacts are assessed. The analysis is approached by testing six hypotheses. Those relating to the potential overall environmental impact of Member State implementation of milk quotas can be summarised as follows:

- Where quota trading or administrative transfers are confined within regions, more limited shifts in regional shares of quota will be experienced and potential environmental effects of changes in the location of milk production

will be slowed down or stopped. If regional concentration is therefore avoided, some environmental consequences can be expected;

- Where no market determined quota trading takes place between producers there will be a weaker tendency towards scale induced intensification of production methods, with the environmental consequences of greater intensification slowed down or avoided. These effects could be positive as well as negative;
- Where farmers leaving milk production cannot obtain the ‘market value’ for their quota separate from other assets, there will be a slower exit rate, with quota more likely to stay on the farm and land less likely to go to alternative uses or be abandoned, with varying environmental effects;
- Where transfers or allocations of new quota are linked to constraints or incentives regarding input use, substitution between inputs will occur, which may have positive or negative environmental impacts.

Two hypotheses were developed to assess the effectiveness of any environmental objectives, either *implicit* or *explicit*, which were attached to milk quota regimes by national authorities:

- Where milk quota regimes have *explicit* environmental objectives, less dairying or more extensive dairying can be expected to occur in certain regions with environmentally positive consequences;
- Where Member States have milk quota measures with *implicit* environmental objectives, such as maintenance of dairy production in the Less Favoured Areas (LFAs) or limits on production in areas of concentration, then potential environmental benefits may be expected in these areas.

The main counterfactual for this study is one of ‘minimum intervention’ linked to the degree of market orientation in the implementation of milk quotas at Member State level. The alternative scenario of ‘no milk quotas’ is not an appropriate counterfactual, since the objective is to evaluate the impacts of implementation and not the effects of milk quotas *per se*. The counterfactual scenario for assessing the effectiveness of environmental objectives is the absence of such objectives.

In addition to information gained from the detailed case studies, the evaluation has also drawn on a number of pan-European data sources including the Farm Accountancy Data Network (FADN), the Farm Structure Survey (FSS), other Eurostat data, published literature and results obtained in response to a questionnaire sent by DG Agri to Member State administrations in 2007. Whilst it has been possible to obtain data on structural changes in the EU, there is a lack of quantitative data and empirical evidence linking such developments to environmental indicators and thus environmental impacts.

### **3.1 Characterising National Regimes**

Having assessed the national measures on the transfer and allocation of quota, Member States have been ranked along a continuum of five levels, from ‘least market oriented’ (France and Ireland) to ‘most market oriented’ (UK and the Netherlands). Table 1 below shows rankings for the EU 15, based on the overall balance of their regimes throughout the evaluation period. The underlying assumption is that, at the

most market-oriented end of the spectrum, trends in location of production and in the structure of the sector are the least different from what they would have been in a situation without the quota scheme at all. The less market oriented the implementation approach is, the more it is expected that trends will diverge from the ‘minimum intervention’ counterfactual.

**Table 1      Average degree of milk quota market orientation in the EU 15, 1988 - 2007**

Level 1 – Least market orientation	Level 2 - weak market orientation	Level 3 – Moderate market orientation	Level 4 – Stronger market orientation	Level 5 – Most market orientation
France Ireland	Belgium Finland	Germany Italy Spain Luxembourg	Austria Denmark Greece Portugal Sweden	Netherlands United Kingdom

It should be stressed that this characterisation relates to the average extent of market orientation of the quota implementation rules over the entire study period rather than the most recent situation. The reason for this is that many environmental consequences of the trends, which national implementation rules may have influenced, require some years to develop, or at least to become apparent. Environmental improvement or damage that might have been attributed to national milk quota implementation in recent years is more likely to be the result of policies which have remained in place long enough for the cumulative impact on the environment to be observed.

#### **4 ENVIRONMENTAL IMPACT OF MEMBER STATE IMPLEMENTATION OF MILK QUOTAS**

Several aspects of the rules for quota management adopted by Member States for reasons apparently unconnected with the environment were identified as having potential environmental implications. The empirical evidence for testing these hypotheses, however, was generally rather limited.

##### **4.1 Regional quota mobility**

A key aspect of national quota regimes with clear differences between Member States is the degree of quota mobility. In some Member States, quota transfers can take place freely throughout the territory with no restrictions (or with rather minor ones, as in the UK). In others, transfers can take place only within a defined region, although a limited amount of redistribution may occur through a national reserve. Germany had regional restrictions of this kind for most of the evaluation period. In some Member States there are substantive restrictions on the transfer of quota out of the LFA. In many cases, rules relating to regional transfer have changed over time, usually in the direction of lessening restrictions on transfer.

Data on the location of milk production within Member States indicates some degree of regional redistribution over time in every case. In Member States with few or no

restrictions on regional transfers, this tends to have occurred at a faster pace than in those countries with more constraints. However, additional factors must also have been involved in some cases. In Spain, for example, transfers have taken place on a larger scale than might have been expected. The study attempts to explain the observed pattern of redistribution in some of the larger Member States, in terms both of their quota implementation rules and other underlying factors.

In considering the impacts of policy it is important to note that, contrary to the substantial quota reductions, and consequent declines in production in most of the EU 15 during the early part of the regime, the national quotas of Spain, Italy and Greece were increased in the mid 1990s. This gave rise to production increases in some areas without corresponding falls elsewhere. In the United Kingdom, there were virtually no restrictions on regional transfers throughout the period. Total milk production fell by 12.5 per cent between 1984/85 and 2006/07, and reductions in a few of the main production regions reflected this trend. However, there were significant variations, with production tending to fall most in regions which already had a low share of total milk output and where dairying faced strong competition from other agricultural land uses. In all regions, output per herd more than doubled, indicating that strong forces towards scale increases were operating regardless of whether the region was gaining or losing quota.

Against this benchmark of a liberal regime, other Member States tend to exhibit a lower rate of regional transfer but with a similar tendency for losses to be greatest in the relatively minor production regions. In France national production fell by 12 per cent over the period, with regional variations ranging from a loss of nearly 18 per cent in Centre to a gain of 3 per cent in the Massif Central. In Germany, where reunification and the addition of the new Länder since 1990 has to be taken into account, national production fell by 13 per cent. Losses ranged between 21 per cent in Hessen to 4 per cent in Brandenburg. Both in Germany and France there was a drop in the number of producers over the period, reaching more than 70 per cent in Germany. In Italy, by contrast, total national milk production increased by 10 per cent, with regional changes ranging from a loss of 13 per cent to a gain of nearly 30 per cent. In a few regions, output per herd increased more than threefold over the period between 1993 and 2006.

Comparable data for Spain were not obtainable for this period. However, over the period since 1999, during which national deliveries of milk rose by nearly 11 per cent, regional redistribution appears to have been significant, ranging between a fall of 37 per cent in the Balearics to an increase of 26 per cent in Spain's most important milk-producing region, Galicia. All the six main producing regions, which together account for more than 80 per cent of production, raised output during this period, whereas there has been a significant decline in output and cattle numbers in more peripheral areas, including some mountainous regions.

In smaller Member States the pattern also varied but there was significant mobility in the Netherlands, Greece and Sweden.

In most Member States where the data are available, significant transfers out of the LFA do not appear to have occurred. Explicit policies to retain production in LFAs in France and Italy appear to have been successful, although it is difficult to assess the

role of other factors, which include both market forces and policy interventions, such as rural development measures.

Leaving aside the issue of transfers to or from the LFAs, considered further below, there is limited empirical evidence about the environmental impact of the level of regional redistribution that reasonably could be attributed to the operation of quota transfer rules. The tendency for production to build up in more competitive regions will have been constrained where restrictions on transfers apply. Greater regional concentration is generally undesirable as it increases nutrient load and feed production within a catchment, raising the risks of water pollution, even though these risks may be offset by improved management. In practice, with a falling trend in milk production in many Member States in recent years, absolute increases in regional production have only occurred in a limited number of regions, notably in Spain and Italy. Evidence on the impacts of regional transfers in Member States such as the UK with significant redistribution is rather mixed.

Negative impacts on landscape and biodiversity may occur where dairy farms using extensive production systems cease production, especially where these farms relied on grazing of species-rich grassland. This problem was highlighted in Spain in particular and is likely to have occurred elsewhere, although it is unclear how far dairying has been replaced by other farming systems involving the continuation of grazing.

#### **4.2 Scale increases and intensification**

In addition to the issue of quota mobility *between regions*, the report also examines whether Member States' implementation rules have slowed down quota mobility *between producers* and the associated trend towards larger herd sizes. If it has, the tendency towards intensification associated with larger herd sizes may have been restrained.

The evidence suggests that the type of quota regime applied has had an influence on the growth of average herd size. A regression analysis shows that the degree of market orientation of the quota regime, together with average scale at the start of the quota period, explains 85 per cent of the variation between Member States in the change in average scale of dairy farms in the EU 12 between 1989 and 2005.

Scale increases tend to be associated with higher levels of input use and increased milk yields per cow. Consequently, these are grounds for concluding that the extent of scale increases and accompanying intensification have been slowed down in Member States with more restrictions on quota transfer. However, the full environmental implications of this association require further investigation. Smaller units do not necessarily exhibit better environmental management, for example in relation to slurry storage and spreading, but small producers are probably predominant in the relatively small group of High Nature Value (HNV) dairy farms. Some of the literature could be interpreted as suggesting that larger units perform better in terms of greenhouse gas emissions but possibly worse in relation to biodiversity and landscape, although this has not been fully established.

#### **4.3 Cessation of production**

The study also considers whether differences in national implementation rules have influenced the rate at which farmers leave the dairy sector. In the absence of quota



markets, the main scope for redistribution between farmers (and, where this is allowed, between regions) is via administratively controlled transfer systems or via national reserves. In the former, expanding producers pay for the quota, in the latter they do not. The amount of quota that can be distributed in this way depends on the rate of producer exit. We hypothesise that, where farmers can sell their quota separately from land at a market-determined price, the rate of farmer exits will be higher than otherwise. However, in the absence of a market, administrative reallocation schemes where prices are inevitably lower than implicit market rates, may replace some of this incentive. Evidence on this question was not decisive. There was no clear relationship between the rate of producer exits over the full period and the degree of market orientation. Moreover, the environmental effects of producers deciding to cease dairying depend on the subsequent use of the land that is liberated, and the destination of the quota that becomes available for reallocation. Available data do not allow us to investigate these consequences sufficiently, although they may be significant in some regions.

#### **4.4 Constraints and incentives with respect to input use**

A fourth aspect of national quota regimes examined concerns the rules for quota allocation and transfer between farms and the various constraints and incentives attached to them. These vary considerably between Member States. In some cases limits on average milk production per hectare have been imposed on quota transfers by national authorities. However, these have generally been set at a high level, 20,000kg per hectare in several cases, and do not appear to have had a discernible effect on production intensity or the environment, as illustrated in the Netherlands. In France, one of the priority groups of farms targeted through administrative transfers is producers with investment plans. This will have created incentives to invest in new equipment on expanding farms but there is no clear evidence on which to base judgements about the environmental outcomes.

Another priority group for redistribution, in France and elsewhere, is young farmers, who will include a proportion of new entrants, a category generally disadvantaged by the quota system. There is evidence of different trends between Member States in the proportion of dairy farmers under 45 years old with a significantly higher proportion of young farmers in France than the UK since 1985. The milk quota transfer rules may well have been a factor explaining some of the differences in national trends and if so, there may have been environmental implications, but the evidence is not available to identify this impact with any confidence.

## **5 THE EFFECTIVENESS OF MEASURES WITH ENVIRONMENTAL OBJECTIVES**

The second evaluation question focuses solely on these national measures governing the allocation and transfer of milk quota, with *implicit* or *explicit* environmental objectives. It considers how far these measures have led to positive environmental outcomes in practice.

In terms of explicit environmental objectives, the measures adopted for specific transfers of quota taken in the context of national or regional restructuring

programmes are considered, including the following, set out in Council Regulation (EC) No 1234/2007:

- compensation for producers who abandon milk production - Article 75 1(a);
- provision for the retention of milk quota by producers who transfer land with a view to improving the environment - Article 75 1(d); and
- provision for producers to transfer quota without also transferring land to allow for the extensification of production - Article 75 1(f).

*Implicit* environmental objectives include those where national rules in some sense protect production in LFAs in terms of quota allocation and transfer, since the farmed landscape in many LFAs is valuable in environmental terms.

### **5.1 Measures with explicit environmental objectives**

As far as we can tell, only one Member State, Spain, has an *explicit* environmental objective in its milk quota regime. The related national measures, however, which are targeted at extensification of production and production in LFAs, appear to have had limited or no impact in terms of reducing or extensifying dairying. Accordingly, no environmental benefits of note appear to have been delivered.

### **5.2 Measures with implicit<sup>2</sup> environmental objectives**

Several Member States appear to have measures with *implicit* environmental objectives as part of their milk quota regime. A number of Member States - France, Italy, Ireland, Germany, Spain and the UK - have or have had rules regarding the transfer of quota between regions which seek to maintain a territorial distribution of milk production<sup>3</sup>, while others - Belgium, Finland, and the Netherlands - have rules referring to a maximum amount of quota that can be transferred with land.

From the evidence available, it would appear that milk quota measures with *implicit* environmental objectives, based on allocating quota to LFAs or ring-fencing of quota, have helped support milk production and dairy farming in those areas relative to what might have occurred in the absence of such restrictions. For example, in France, Italy and Ireland, the rate of decline in the number of LFA dairy farms compared to non-LFA dairy farms has been slower. Without such measures, it is likely that milk production would have migrated to dairying areas with a comparative advantage in terms of grassland productivity, location and other factors.

It is important to note, however, that dairy farms located within the LFAs are likely to have access to a wider range of additional support than those located outside the LFAs, for example LFA and agri-environment payments and investment aid.

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<sup>2</sup> It is important to note that the primary objectives of measures considered in this section are not explicitly environmental, although their subsidiary objectives may be. On the contrary, the primary objectives will be driven by other factors including socio-economic objectives linked to farm income and rural population. Nonetheless measures included within this section have the potential for positive environmental impacts, even if these will tend to be indirect in relation to objectives.

<sup>3</sup> Although this may correspond to a rural development or rural population objective rather than an environmental one.

The environmental consequences of this are less clear, however. In some situations (France and Italy, for example), retaining milk production in LFAs, may have maintained a number of environmental benefits including soil quality, pastoral landscapes and biodiversity. The key benefit is the retention of grazing systems on permanent pasture where other forms of production are not viable. However, some environmental disbenefits affecting biodiversity, landscape features and water quality may have occurred in specific parts of ring-fenced LFAs, where there has been a more rapid intensification of dairying than would have occurred in the absence of ring-fencing.

On the other hand ring-fencing measures are likely to have the positive effect of reducing potentially adverse environmental impacts arising from the geographic concentration of dairy production in the most productive dairying areas, particularly in relation to water pollution. Changes in land use have been inhibited with likely environmental benefits which are difficult to judge very precisely from the evidence, as noted above.

## **6 CONCLUSIONS**

### **6.1 Broader Environmental Impacts**

Environmental impacts have arisen more as a consequence of the economic effects of quota implementation rules rather than because of explicit environmental objectives incorporated in these rules. The study found evidence of differences in economic impacts that can be attributed at least in part to different implementation rules. These differences relate, in particular, to the extent of regional redistribution of quota, and the growth of average farm size and associated input intensification.

The evidence suggests that a more liberal milk quota regime tends to allow for a greater degree of structural change in terms of regional mobility of quota, concentration of production and changes in scale of production. With this potential for change comes a greater probability of environmental impacts (both positive and negative). Conversely, more restrictive regimes, by constraining regional mobility and farm-size growth, are likely to have prevented environmental impacts that would otherwise have occurred due to these structural changes. However, the precise influence of quota regimes can be difficult to separate out from that of other leading drivers even where it appears to have a key role, as with the retention of quota in the LFA.

The most common restrictive rule, which is a ceiling on the quantity of quota transferred per hectare, generally has been set at too high a level to constrain more intensive production systems.

There is some impressionistic evidence linking differences in structural change as a result of quota implementation rules to environmental impacts, for example relating to management changes as the scale of production increases. However, it has been difficult to draw very firm conclusions, not only due to a lack of environmental data but also because environmental impacts are often location specific. The potential water pollution hazard is higher on larger, more intensively managed farms but in

practice the actual level of pollution depends on the farm management, level of investment, influence of legislation, and other factors.

There is a great variety of possible environmental impacts (relating to water quality, greenhouse gas emissions, soils, biodiversity, landscape etc), which are all potentially significant in their own right. Changes in farm scale may have negative impacts related to the use of one environmental indicator but have positive impacts regarding others. The differing effects need to be individually and collectively assessed; it is in general misleading to trade one environmental issue off against another.

Aside from national quota regimes other factors influencing dairy farm management include market requirements, the Nitrates Directive and other environmental legislation, agri-environment and LFA payments, and labelling systems such as PDO designations (concerning products of protected designation of origin linked to certain geographical areas). Some PDO requirements include environmentally beneficial conditions placed on production, for example feed requirements linked to traditional grazing systems. Implementation of the Nitrates Directive was identified as a driver in some Member States but it should be noted that derogations from the normal maximum level of nitrogen input per hectare have been agreed in some of the regions specialising in dairy production.

## **6.2 Environmental Objectives**

Despite the legal possibility of incorporating explicit environmental objectives into measures for specific transfers of quota taken in the context of national or regional restructuring programmes, these have been used by only one Member State, Spain. These measures were targeted at the extensification of production and production in LFAs. However, they do not seem to have been effective and no environmental benefits of note appear to have been delivered.

Based on the limited evidence available, quota measures aimed at retaining dairying in LFAs appear to have contributed to achieving this outcome relative to what might have occurred in the absence of such a restriction. Much more data would be needed to assess the environmental implications comprehensively and accurately, but there is likely to have been:

- More dairy production in the LFA than otherwise would have been the case, which may have led to landscape benefits in a number of areas;
- Maintenance of some environmentally valuable grazing systems – although it is unclear to what extent this would have been delivered through other means, such as beef production, if dairying had been abandoned;
- Less production in regions where more intensive forms of management predominate, potentially reducing environmental pressures;
- Some abandonment of land in LFAs may have been prevented, although this is not clear and the environmental profile of alternative land uses to dairying needs more examination.

## **7 RECOMMENDATIONS**

In principle it is to be expected that there will be greater regional concentration of milk production if the milk quota system comes to an end by 2015. In some Member States, this might include a significant net loss of dairying from the LFA (with potential for both positive and negative environmental impacts) although the economic dynamics of the sector in such a scenario lie beyond the scope of this study. On the evidence of the case studies, LFA production appears likely to remain profitable in a number of locations in some Member States, particularly where natural handicaps are not too severe or where producers are able to capture a premium linked to a particular market.

It is recommended that in Member States where there is a concern about the potential loss of milk production in the future detailed studies be undertaken of the likely viability of continued production, particularly in more extensively farmed regions. These need to take account of market and price developments as well as policy scenarios. Insofar as a decline in production is predicted, the impacts on land management need to be identified, taking account of alternative farming systems that might take over. If a loss of grazing in areas of high landscape or biodiversity value is expected then remedial measures should be developed to meet environmental goals and commitments. Such measures could potentially take a number of different forms and the options include:

- Pillar II rural development measures targeted at dairy systems associated with the delivery of biodiversity and landscape benefits, for example through agri-environment schemes; and
- Targeting of direct payments from Pillar I resources at such dairy systems through Article 69 of Regulation 1782/2003 or its successor following the CAP Health Check.