European Dairy Industry Model

Review of MTR Impacts on the European Dairy Sector

Silke Huettel *(FAL)*
Werner Kleinhanss *(FAL)*

Working Paper 02 /2004

Review of MTR Impacts on the European Dairy Sector

Silke Huettel and Werner Kleinhanss (Federal Research Institute, Braunschweig)

1. Introduction

The intention of this paper is to present results of quantitative policy assessment of MTR-impacts in the dairy sector. This task has been found to be rather difficult: The policy process on the MTR of the Agenda 2000 started in July 2002 with a position paper of the European Commission, the legislative proposal was published in January 2003[1] and the final decision was made at the end of June 2003.[2] The legislation on national implementations of the MTR has to be finished by the end of July this year. Only few working groups have analysed the steps of the MTR and only a few results of the national implementation were available because no final decision has yet been made. In some EU member states, policy assessments might be realised within contracts by national ministries but some of them are confidential and therefore not available. As a consequence, the main outcome is described for those member states where studies were available. For other member states, the presented impacts are based on a scenario analysis with the CAPRI modelling system.[3]

The main focus of this review lies on milk supply effects of de-coupled direct payments and on changes of producer prices as the main influencing factor to the supply side. As far as we know from our own studies, the type of de-coupling (Single Farm Payment Scheme (SPS) or Regional Model (RM)) will not have significantly different supply effects in the short and medium term. With regard to the national implementation schemes, only the date of de-coupling the milk premium can affect milk supply.

Before the results are presented, the important aspects of the CAP reform for the dairy sector are listed below:

– The first year that the milk premium will be included in the single farm payment: In the standard model the volume of de-coupled milk premium refers to the farm individual milk quota on March 31, 2007. Alternatively, member states can already de-couple the milk premium in 2005, the volume refers to the farm individual milk quota on April 1, 2005.

---

[1] EUROPEAN COMMISSION (2003a).

[2] European Commission (2003b).

[3] There was no published information for Greece, Luxembourg, Belgium, Sweden or Portugal available.

– In the case of the application of the regional de-coupling model (and static or dynamic hybrid model), it is expected that redistribution effects on direct payments and farm income might be less if the milk premium belongs to the farm individual part.[4]

The implementation of de-coupling in the EU member states, insofar as information was available by the end of June, is summarised in Table 1.

Table 1: Implementation of the CAP reform in the EU member states[5]

Member State	Model of decoupling	Date of decoupling	Final implementation of the dynamic hybrid model	Milk Premium	
				Date of decoupling milk premium	Share of milk premium in the farm individual entitlement in the Regional Model
Germany	Dynamic Hybrid	2005	2013	2005	2005: 100 %; 2013: 0 %
France	SPS (partial)	2006	.	2006	.
UK					
England	Dynamic Hybrid	2005	2012	2005	2005: 90 %; 2012: 0 %
Scotland	SPS (partial)			2005	
Wales	SPS	2005	.	2005	
Northern Ireland	Static, Vertical Hybrid	2005		2005	100 %
Denmark	Static, Vertical Hybrid	2005		2005	75 %
Sweden	Static, Vertical Hybrid (partial)	2005		2005	67,5 %
Luxembourg	Static, Vertical Hybrid	2005		2005	85 %
Ireland	SPS (partial)	2005		2005	
The Netherlands	SPS (partial)	2006		2007	
Austria	SPS (partial)	2005		2007	
Greece	SPS (partial)	2007		2007	
Belgium					
Walloonia	SPS (partial)	2005		2005	
Flanders	SPS (partial)	2005		2005	
Finland	Static, Vertical Hybrid (partial)	2006		2006	75 %
Italy	SPS (partial)	2005		2005	2005
Spain	SPS (partial)	2005		2005	
Portugal	SPS (partial)	2005		2007	

Source: Agra Europe (2004), BMLFUW (2004), DEFRA (2004).

[4] The redistribution of income might influence long term adaptations of farms via investments, which (besides Finland) are not included in the underlying studies.

[5] Definitions: Static, Vertical Hybrid: combination of farm individual and area payments, no adaptation over time; Dynamic Hybrid: combination of farm individual and area payments, adaptation over time.

2 Review of Modelling Work assessing the MTR-Impacts on the Dairy Sector

The review covers a broad range of micro- and macro-economic models. Table 2 gives an overview of the models and methodologies. Scenarios, main assumptions and results for each study are presented in the following sections.

Table 2: Overview about the models and the scenarios

Study/Model	Methodology	Estimation period	Baseline Scenario milk price assumption	Scenarios
FARMIS (Germany)	Comparative static mathematical programming model	1999-2010	Milk Price: -11.25 %	- MTR Single farm payment with milk price decrease –15 % - MTR hectare payment with milk price decrease –15 %
France	Partial equilibrium model and mathematical programming model	2000-2010 and 1997-2007		MTR-decisions
FAPRI (UK)	Dynamic partial equilibrium model	Base year 2002		MTR-decisions
GTAP (The Netherlands)	General equilibrium model	1997-2010		MTR-decisions
Italy	Mathematical programming model	2013		MTR-decisions
CAPRI (Spain)	Comparative static equilibrium model	1998-2009		MTR-proposal
FAPRI-Ireland (Ireland)	Dynamic partial equilibrium model	2002-2012	Milk quota system: abolished in 2008	MTR decisions, implemented with a single farm payment
GTAP (Denmark)	General equilibrium model	1997-2013		MTR-decisions
PROJEKTOR (Austria)	Econometric dynamic model	2001-2008	Producer price for milk: -15 % in 2005-2008	MTR-proposal January 2003 - A: producer price for milk: -25 % in 2004-2008 - B: integrated demand effects for price development MTR-decisions June 2003 - A: partial de-coupling, premia for suckler cows 100 % coupled, slaughter premia 40 % coupled, milk premium fully de-coupled, producer price for milk: - 21 % - B: partial de-coupling, 75 % of cattle premia is coupled, suckler cow premia is fully de-coupled, milk price: -21 %
DREMFIA (Finland)	Dynamic recursive regional sector model	1995-2020	- Agenda 2000 up to 2015 - Prices for SMP and butter: -15 % in 2005-2008 - Producer price for milk: -15 % up to 2008	MTR_1: Luxembourg agreement - Intervention prices for butter and SMP: -25 % and –15 % - Market price for SMP and butter: -15 % and –25 % - Producer price for milk: -22 % up to 2007, milk price depends on supply and demand for all dairy products MTR_2: equals MTR_1 except: - Prices for butter and SMP: -16 %

2.1 Germany

Policy assessments of MTR-impacts on the dairy sector were analysed by KLEINHANSS and HUETTEL (2004). Therefore the farm group model FARMIS was used.

Methodology

FARMIS is a representative farm group model and based on a comparative-static process-analytical procedure. The core is a standard optimisation matrix that contains 27 main activities of crop production and 15 activities of livestock production. A positive mathematical programming procedure is used to calibrate the model to the observed base year levels (1999). This results in a non-linear objective function for scenario applications.

Database

Farm groups are built-up based on national FADN data (constant sample over the years 1998/99 and 1999/2000). Standard stratification criteria for the selection of farm groups are region, farm type and farm size. Consistency checks are made referring to national statistics. An improved aggregation scheme based on cross-entropy is used to get consistent weighted results with sector accounts of standard farm income, land use and livestock.

Scenarios

The **reference run** refers to the final implementation of the Agenda 2000 and its continuation up to the target year 2010. Future price developments are derived from the partial equilibrium model GAPsi: The producer price for milk will decline by 11.25 % compared to the base year 1999 (BERTELSMEIER et al., 2002).

Scenario I: MTR – Single payment scheme

Assuming total de-coupling, the level of the Single Payment is based on the average of all direct payments in the reference years 2000-2002. In the model, data from the base year 1999/2000 is used for this purpose. Based on experts' estimation, a decline of milk prices by 15 % (-20 %) was assumed for this scenario.

Scenario II: MTR – Regional implementation with area based entitlements

This represents the national implementation of decoupling in its final stage. The stepwise application of the Combi-model was not analysed. Area based entitlements (short: hectare payments) are determined according to the regional volume of premia, divided through eligible area. Assumptions for price developments correspond to Scenario I.

Results

Supply changes under terms of the MTR are as follows:

– Under the Single Payment Scheme (SPS), milk production will be reduced by 0.2 % at the sector level, while under the Regional Model (RM), milk production will not

change at all. Because quota trade is specified in the model, a tendency of reallocation of production from small to larger farms (due to scale effects) can be seen.

– Milk supply is usually sensitive to milk price changes. A full transmission of the reduced intervention prices (-20 %) leads to a 1.5 % reduction in milk production and a reduction of one percent for the above mentioned scenarios. Due to the existing system of quota trade allowing trade only within 20 trading regions, the quota will not be fully used in some regions in the South and East.

Changes of leasing prices for milk quotas depend on price changes under decoupling. Compared to the reference run, leasing prices for milk quotas will be reduced by 2-3 ct/kg, about one third. Price reductions are 1-2 ct/kg higher under less favourable milk price conditions (-20 %). In some of the regions, the price of milk quotas will become zero.

Under the terms of SPS, assuming favourable development of milk prices (-15 %), slightly positive income effects of less than one percent (expressed in net value added at factor costs) can be expected. Due to milk price reductions of 20 %, farm income will be reduced by 6 %. For the RM, average income changes are of the same magnitude, but due to a redistribution of direct payments, income losses occur in intensive dairy farms.

Table 3: Impacts of the CAP reform (2003) on the German dairy sector

Results	Production	Milk quota	Farm income
Baseline scenario	Stable milk production	Reduced leasing prices	
MTR Single Payment	Shift in milk production to greater farm sizes	More reduced leasing prices, about one third In some regions a leasing price of zero	Slightly positive income effects
MTR Regional Model	Decreasing milk production in the South and increasing production in the North	Further decreasing milk price leads to further decreasing milk quota prices	Slightly income effects but with favouring extensive dairy farms

Source: Kleinhanss et al. (2004).

2.2 France

Modelling work to assess the impacts of the CAP reform 2003 on the French agricultural sector was undertaken mainly by experts of INRA, using micro- and macro-economic approaches. The models focus on production and price effects. Other studies, dealing only with income effects (CHATTELIER, 2004), or without giving any detailed supply effects in the dairy sector (JAYET, 2003), are not presented.

Methodology

The following approaches were used:

– MEGAFF, a general equilibrium for France (GOHIN, 2004) with the following main characteristics: The model covers main agricultural products, primary production and

processing products. Policy instruments including external trade are specified in detail. Primary production can be re-allocated, that allows the assessment of the impacts of de-coupling on land prices.

– A partial equilibrium model for the EU dairy sector is used by INRA Toulouse (BOURMA-MECHEMACHE et al., 2004). It covers each of the EU 15 member states and the rest of the world (ROW), and includes the processing sector with 14 final products.

– The third model is a mathematical programming model of 'regional farms' by BARKAOUI and BUTAULT (2004). Regional farms are derived from FADN data (1997) and projections are made for the target year 2007.

Scenarios

MEGAFF: The *reference scenario* includes the Agenda 2000 policy system. Different policy options with full or partial decoupling were considered in different *scenarios*.

BOURMA-MECHEMACHE et al. (2004): The *baseline scenario* refers to Agenda 2000 and the other *scenarios* include different options of the MTR-decisions (2003).

Results

MEGAFF: The partial reduction of intervention prices for butter by ten percent induces a reduction of producer prices for milk of three percent. The implementation of the CAP reform with hectare payment leads to slightly lower price reductions of 2.9 %. The milk production will not change in all scenarios, independent from full or partial de-coupling of direct payments. The national milk quota will be used entirely, although the value of milk quotas will decrease.

Price projections for the EU-15 by **BOURMA-MECHEMACHE** et al. (2004) show reduced producer prices for milk (-16 %) in 2007 for Agenda 2000 compared to the base year. Due to an increasing demand, the milk price will slightly increase by three percentage points until 2010. Price reductions in 2010 under terms of MTR are less than changes of intervention prices, but two percentage points larger than in the reference scenario (Agenda 2000). The MTR-decisions lead to an increased milk production of 0.5 % which might be due to additional quotas, e.g., for Greece.

The analysis based on the 'regional farms' model (**BARKAOUI** and **BUTAULT**, 2004) does not show any change in milk production under terms of MTR. Milk quotas will be fully used in all regions of France. Economic pressures due to lower milk prices (and totally decoupled milk premia) are partially compensated by increasing productivity due to higher milk yields per cow. Cow numbers will decrease and therefore tendencies toward extensification of roughage fodder production are predicted.

Table 4 summarises the main results.

Table 4: Impacts of the CAP reform in France

Results		
Gohin (2004) (France)	Bourma-Mechemache et al. (2004) (EU-15)	Barkaoui et al. (2004) (France)
Producer price for milk compared to Agenda 2000 - SPS –3 % - RM (unified hectare premia) –2.9 %	- EU 15: producer price for milk (compared to the base year) in 2007: -16 % - Increasing demand for milk - 2007-2010: milk price +3 %	- No changes in milk production under MTR conditions - France: milk quota fully utilized - Increasing milk yield per cow and decreasing numbers of cows
No change in milk production Decreasing values of milk quotas	- Slightly increasing milk production under MTR conditions	- Extensification of fodder area

Source: Gohin (2004); Bourma-Mechemache et al. (2004); Barkaoui et al. (2004).

2.3 UK: England

For the UK dairy sector only one study from DEFRA[6], referring to the position paper of the European Commission in July 2002, is available. It is based on the FAPRI modelling system and was realised in a collaborative effort between the Queen's University of Belfast and the University of Missouri (MOSS et al., 2002).

The *results* show the same outcome for both the EU and UK: Compared to the *baseline scenario*, referring to the Agenda 2000, milk production and the number of dairy cows will not change under MTR, while the milk price is expected to increase by 0.1 %. Based on these results there are indications that milk quotas in the EU will be fully utilized.

2.4 The Netherlands

Methodology

The general equilibrium model GTAP was used for the analysis (LIPS, 2004). GTAP is a multi-regional and multi-sectoral model and assumes perfect competition as well as constant returns to scale.[7]

Database

The database refers to the year 1997. The Netherlands are handled as one region and the other EU member states are aggregated into another region. Further regions are Turkey, Russia, North America, South America, Australia and New Zealand, High Income Asia, China and Hong Kong, Other Asian countries, Sub Saharan Africa and the Rest of the

[6] Online-document: www.defra.gov.uk/farm/capref/webnoterev16.pdf. Retrieved:June 2004.

[7] Internet: http://www.gtap.agecon.purdue.edu/default.asp, retrieved June 2004.

World (ROW). The sectors are partitioned into eight sectors of agricultural raw production, five sectors of food processing and five sectors for the rest of the economy.

The data preparation consists of two main steps. The EU refers to Agenda 2000 and the WTO tariffs have to be adjusted for China because of the Chinese WTO accession. Further adjustments refer to the "Uruguay Round" and the "Agreement on Textiles and Clothing". Further, the EU enlargement is included and trade liberalization between the EU and the CEEC countries was therefore integrated.

Scenarios

For the *baseline scenario* a continuation of Agenda 2000 up to 2010 was assumed. The *Scenario C1* refers to the MTR-decisions while S*cenario C2* additionally includes the Harbinson Proposal[8]. The implementation of the MTR in the GTAP modelling system involves the Single Farm Payment Scheme (SPS). The payment for raw milk is included in the SPS and a substantial part is still coupled to production and modelled as an output subsidy.

Results

The implementation of the *MTR* causes all Dutch agricultural sectors to maintain or reduce their outputs. Reduced subsidies for cereals, oilseeds and cattle lead to increasing production costs. Two main effects are pointed out for the milk sector. First, decreasing raw milk prices due to the reduction of the intervention prices for butter and skimmed milk powder lead to reduced production costs for the dairy industry by 6.5 %. Second, the assumption of a partially coupled compensation payment for milk leads to a supported raw milk producer price. These two effects induce a 2.6 % decrease of the producer price.

The Scenario *C2*, which considers the Harbinson Proposal, shows that the tariff reduction leads to a decrease of the cattle/red meat output while raw milk production will be equal to the quota level and the quota rent will be reduced.

The implementation of the *MTR (Scenario C1)* leads to increasing welfare of about 0.03 % of the Gross Domestic Product (GDP) in the EU 14. Further, a reduced quota rent in the EU 14 leads to incomes of about three percent below the baseline. In the Netherlands, income is reduced by 2.2 %. For the CEEC, a partly reduced quota rent, resulting from open access to the EU 15 market, causes losses of agricultural income of about 4.8 %.

Scenario *C2*, that considers the Harbinson Proposal, shows increasing welfare for the EU 14, but welfare losses for CEEC's. The Netherlands will reduce production more strongly and hence, farm income decreases by 7.6 %. Further, the milk quota rent in the EU 14 is reduced more than in the Netherlands.

---

[8] The Harbinson Proposal requires a tariff reduction in three steps for developed countries depending on the current tariff level and for developing countries the reduction has to take place in four steps (LIPS, 2004).

The main results are summarized in Table 5.

Table 5: Impacts of the MTR-decisions for the Netherlands

Results	Production	Producer price for milk	Quota rent	Welfare/Income
C1 MTR	In all sectors: reduced outputs	-2.6 %	Reduced quota rent	Total agricultural income is reduced about –2.2 %
C2 MTR and Harbinson proposal	Decreasing cattle output, stable milk production	-6.7 %	Reduced quota rent	Total agricultural income is reduced about –7.6 %

Source: Lips 2004.

2.5 Italy

The impacts of the CAP reform on the Italian agricultural sector were analysed by ARFINI, DONATI, SEVERINI and SUPPIROLI (2004).

Methodology

In this study a positive mathematical programming (PMP) model is used to estimate the adaptive behaviour of farms differentiated by region, economic size and economic conditions. The modelling system is able to assess farm adjustments to different policy options. First, the input data has to be transformed in a suitable form for the PMP modelling software. Second, the initial situation (base year) is calibrated to represent the current situation using PMP. Afterwards, different policy scenarios are determined and specific parameters are therefore included in the model for the simulation procedure.

This methodology is used for a) farm level models with single farm data, b) a regional model with representative simulations of dynamics in a region and c) a sector model. For the analysis of the MTR impacts the sector model is used in homogenous regions in Italy.

Database

The **FADN** database provides information about the farm structure, the agricultural land, revenues, costs and yields for the activities. Further, the national **AGEA** database is used for the amount of the direct payments. In this quantitative analysis, the EU 14 is handled as an aggregated region and Italy as a single region, divided in four homogenous sub-regions, but the focus lies on the impacts on the Italian agricultural sector.

Scenarios

In the **baseline scenario,** the Agenda 2000 policy system continues up to the target year 2013. Further, three scenarios are determined according to the MTR decisions. **Scenario "Sim_1"** includes fully de-coupled payments, except the payments for durum wheat, rice and protein crops. In **scenario "Sim_2"** it is assumed that partial de-coupling takes place.

A total of 25 % of the former arable crop payments remain coupled and further, 100 % of the slaughter premia, 75 % of the premia for male cattle, 50 % of sheep and goat premiums remains coupled. In **scenario "Sim_3"** (partial de-coupling) 40 % of the former hectare payments for durum wheat remain coupled. This implies a payment of 285 € per hectare and this is equal to 82 % of the Agenda 2000 payments.

The development of prices refers to results of the GTAP modelling system. Milk price is reduced by 2.81 % in EU 15 and 2.66 % in Italy.

Results

Milk production and the number of dairy cows increase by 3.2 % with the implementation of the MTR as compared to the reference scenario in Italy. There are only slight differences between the scenarios. Further, forage area increases by 10 % to 14 %, especially pasture, under terms of the MTR. Farm income in total decreases slightly (-1.4 %) but the farm income with livestock production increases slightly (+1.36 %). Milk and livestock production tend to be realised with lower intensities.

Milk production is concentrated in the north of Italy and increases further in this region. The total farm income increases by 3.5 %. In the Centre, the highest increase of dairy cows (by 6.45 %) is expected. Due to this situation and the strong increase of goat and sheep, the forage area increases, especially the pasture land (+34 % in *Scenario 1*). In the Centre of Italy, total farm income is expected to decrease by 5 %. In the South, pasture land increases by about 10 % compared to the baseline, and the increase of dairy cows is equal to the average of Italy. Total farm income will decrease by 3.5 %.

2.6 Spain

The Spanish dairy sector is analysed with the CAPRI modelling system by WIECK, PEREZ and BRITZ (2003), in this study only the MTR-proposal was considered.

Methodology

CAPRI is an EU-15-wide agricultural sector model that covers 200 regions and contains 50 activities, 60 products and 35 inputs. It is designed and used to simulate impacts of agricultural policy options on production, income, markets and environment[9]. The modelling system is based on a *physical consistency framework* which includes balances for agricultural area and nutrient requirements for animals and crops. Furthermore, the modelling system is based on *economic account principles* and covers all outputs and inputs of the national EAA. Revenues and costs are broken down into regions and production activities. *Detailed policy description* is also a basis for the system and

[9] Internet: http://www.agp.uni-bonn.de/agpo/rsrch/capri/capri_e.htm, retrieved June 2004.

includes all relevant payment schemes, and on the market side, all relevant tariffs, intervention purchases and subsidised exports.

The model is a comparative static equilibrium model with supply and market modules iteratively coupled. The *supply module* consists of separate regional non-linear programming models on the NUTS II level. Further, supply and feed demand functions are calibrated in the *market module* and then the market module is solved resulting in producer prices at the member state level. The world is aggregated into 12 regions with systems of supply, human consumption, feed and processing functions that are determined by elasticities from other modelling systems.

The supply of crops and animals is determined by a two-step decision-making process. First producers determine the optimal variable input coefficients per hectare or head, and in the second step, the optimal crop mix and the number of livestock are determined simultaneously with cost minimizing for feed and fertilizer mix.

For dairy products, balances for fat and protein are integrated. Production of dairy products is based on a quadratic cost function driven by the difference between the market price and the value of fat and protein.

Database

EUROSTAT's SPEL and REGIO database are used and completed by national and regional statistics. Policy variables like premiums and set-aside are based on national or regional databases. Tariffs and administrative prices, quotas, etc., are determined at the EU-level and for other countries the OECD PSE/CSE database is used. Further, the Economic Accounts for Agriculture are necessary for consistency checks. The relationship between cattle production activities was implemented, especially for assessing impacts on the dairy sector and for the definition of effective numbers of livestock at the regional level. For consistency in this part, the INTRASTAT, CRONOS, REGIO and COMEXT databases are used.

Scenarios

Starting from the base year 1998, scenarios are defined for the target year 2009. The development of yield is determined exogenously and refers to a trend analysis at the EU member state level. The demand system in the EU is calibrated to observed member state data on per capita consumption, income and population levels. Changes in demand behaviour correspond to assumptions and trend analysis provided by the EU Commission and FAPRI.

The **reference scenario** implies a continuation of Agenda 2000 to the year 2009. The **MTR scenario** includes the MTR proposals (July 2002)[10] and the analysis for the dairy

[10] No other study or analysis for the Spanish dairy sector was available, even not in Spanish language. For the July 2002 Communication paper see COMMISSION OF THE EUROPEAN COMMUNITIES (2002).

sector responds to “Option 1” of the MTR proposal that includes no changes in dairy policy. To generate the uniform premium, premia paid under conditions of the Agenda 2000 were modified according to the MTR proposal, de-coupled and modified by dynamic modulation. Furthermore, intervention prices for cereals were reduced by 7.5 %.

Results

Spanish total raw milk output increases by 2.4 % due to additional quotas according to the Agenda 2000. Milk production is at nearly the same level under terms of the MTR. The production of butter and skimmed milk powder decreases under the Agenda 2000. With the MTR proposal, the production of butter decreases more and the production of skimmed milk powder decreases less (+1.26 %). Production of cheese and fresh milk products increases but not as much with the MTR proposal as with the Agenda 2000. On the demand side, cheese and fresh milk products increase and the net trade with Spanish dairy products increases as well. Impacts on agricultural income in Spain are negative, a decrease of the agricultural income of 14.5 % is shown with Agenda 2000 compared to the base year. Under terms of the MTR proposal, a slightly stronger decrease is expected.

Furthermore, the developments in the regional production structure in Spain were analysed too. Milk production is traditionally concentrated in the Northern regions and suckler cow herds are concentrated in the Centre and the South of Spain. Due to increasing milk yields between the base and target year, herd sizes with ‘high milk yield cows’ were reduced by 12.6 % and herd sizes with ‘low milk yield dairy cows’ by 8.3 %. This development is due to decreasing producer prices for milk and lower by-product yield from young animals. The income of dairy farmers depends on the intensity of production. Farms with low yield cows expect an increase of income by 16.5 % and farms with high yield cows of 4.1 %.

The *MTR proposal* leads to a shift of milk production to higher milk output per cow and milk production is expected to be intensified. In the beef chain, reduced herd sizes and an increase of the average slaughter weights are expected.

The model allows animals to be traded all over the EU. Reduced dairy cow herd sizes in Spain lead to a reduced number of male and female calves and heifers raised for breeding in the *reference scenario*. Fattening calves processes are affected by this development as well and drop by 15 %. Under terms of the *MTR proposal*, beef fattening and suckler cows were reduced as well as demand for calves in the EU. The main results are summarized in Table 6.

The authors expect that the results are also valid for the legislative proposals of the MTR from January 2003. The quota increase will depress the producer and consumer prices and lead to additional demand. Furthermore, producers will gain from increased milk quantities and will have losses from reduced milk prices. If farmers manage well, the increased quota amount will help to use scale effects, but increased dairy cow herds will also lead to depressed calf prices and suckler cow herds will be reduced.

Table 6: Impacts of the MTR proposals on the Spanish dairy sector

Results	Production	Farm income	Allocation of production
Scenario Agenda 2000 (Compared to the base year)	- Increasing cheese production and demand +11 % - Increasing net trade with Spanish dairy products - Increasing number of suckler cows	- Farm income decreases -14.5 % - Reduction of consumer prices - Decreasing welfare	- Slow down in increase of milk yield - Herds with high milk yield: -12.3 % - Herds with low milk yield: -8.3 %
MTR scenario (Compared to the reference scenario)	- No difference in dairy production - Reduced suckler cows and decreasing meat supply - Increasing producer price for beef	- Slightly stronger decrease of farm income: -0.81 % below the baseline scenario - Overall premia –19 %	- Intensified milk production with a shift to higher output per cow

Source: Wieck et al. (2003).

2.7 Ireland

BREEN, DONNELLAN and HENNESSY (2003) analysed the Irish dairy sector under terms of the MTR decisions.

Methodology

The FAPRI-Ireland partnership model was used to determine milk and calf prices and to project the farm development over time. This part of the modelling system is a dynamic partial equilibrium model of the agricultural sector. Another part of the modelling system, based on a mathematical programming model for representative farms, was used to determine the amount of compensation payments for milk and the single farm payment. Further information is available in HENNESSY et al. (2003).

Database

The database is the Teagasc's national farm survey based on representative farms. Furthermore, the national FADN database is used for the farm level model. In the equilibrium macro-model statistical data is utilized to estimate future prices. The estimation period is from 2002 to 2012.

Scenarios

Baseline scenario: It was assumed that the Agenda 2000 continues up to 2012. Further assumptions are that the milk quota system continues beyond 2008, the over-30-month-scheme (related to the BSE crisis) will be phased out between 2004 and 2006.

MTR-Scenarios: De-coupling is implemented with a single farm payment scheme. In the different scenarios, options of partial de-coupling were analysed.

Results

Reduced intervention prices for butter and skimmed milk powder (SMP) will lead to a decreasing market price for milk; under MTR, prices for SMP remain at the Agenda 2000 level, while the butter price will decrease by 4 %, prices for cheese by 8 % and for whole milk powder by 6 %. Further, the Luxembourg agreement leads to fulfilled milk quotas that are key factors of supply, but the price for all dairy commodities will be reduced.

Farm income is affected by milk and calf prices. The producer price for milk will decrease up to the target year 2012 by about five percent compared to the baseline scenario. The milk price depends on the product mix in Ireland, therefore a shift towards more cheese would lead to higher milk prices than under terms of the baseline. The compensation payments with dairy premia, introduced in 2004, will not fully offset income losses due to milk price reductions.

The calf price, that affects the farm income as well, will decline. In the *scenario with full de-coupling* raising male animals is no longer effective. The supply with male calves will remain stable because of a stable number of dairy cows but the calf price will decline. Furthermore, the implementation of de-coupling in other EU member states will affect the Irish calf price as well. In the *scenario with partial de-coupling* higher calf prices are expected. Dairy farmers benefit more but mixed farms were affected negatively.

Due to lower direct returns for milk and calves, exit farming and retirement will be more attractive for farmers, leading to a decreasing number of dairy farms. Therefore sales of milk quotas are stronger than in the baseline scenario. The reduction of the number of dairy farms in Ireland leads to an increase of the volume of milk quota in the national restructuring scheme.

In conclusion, a table with the main results is presented.

Table 7: Impacts of the MTR-decisions on the Irish dairy sector

Results	Production	Farm income
Baseline scenario		Milk premium is coupled to production that leads to more farms staying in production
MTR scenarios	- Producer price for milk: 5 % below the baseline - Prices for calves and male cattle below the baseline - Shift towards cheese in dairy processing	- Reduced calf and milk prices affect profitability - Value of milk sales 15 5 below the baseline - Consequence: more attractive exit from farming, increasing sales of milk quota

Source: Breen et al. (2003).

2.8 Denmark

Methodology

In this study the GTAP model was used to analyse economic implications of the CAP reform and of the EU-enlargement (JENSEN et al., 2003).

Database

The database of the used GTAP version refers to DIMARAN et al. (2002). In the database the CAP and all EU-25 member states are represented.

In the model de-coupling is implemented as a uniform hectare premium and all used agricultural area is eligible. The estimation period is from 1997 up to 2013. It is assumed that the acceding countries enter the EU in 2013.

Scenarios

For the **baseline scenario** the 'Everything But Arms' (EBA) initiative of the EU was implemented as well as the preferential market access for bovine meat products and other meat products from the acceding countries (AC). The enlargement conditions are shaped by the results of the baseline.

In the **Enlargement Scenario 1** it was assumed that the Agenda 2000 policy system is relevant for the EU 15 and the acceding countries in 2013.

In the **Enlargement Scenario 2 (**minimum/partial de-coupling), the CAP reform 2003 is implemented in the EU 15 and all acceding countries. The further reduction of the intervention prices is partially offset by additional payments to milk producers. For all member states it was assumed that 25 % of the hectare payments, 50 % of sheep and goat premia and 100 % of slaughter premia remain coupled to production. All other premia are converted to a single farm payment.

In the **Enlargement Scenario 3** (national de-coupling) it was assumed that in Denmark 75 % of the special male premiums remain coupled (other cattle premia is de-coupled). For other member states different de-coupling options were assumed, and for the acceding countries the payments were fully de-coupled.

For the **Enlargement Scenario 4 (**maximum de-coupling) it was assumed that payments are fully de-coupled from production.

Results

The results are divided into global, EU-15, AC-10 and national levels. The results are available for the baseline scenario in the period 1997-2013 and for the different enlargement scenarios for the year 2013. In the baseline period (1997-2013), milk production in the EU 15 remains stable at around 126 million tons. In the AC, *milk production* increases annually by 1.7 %. Joining the EU and the introduction of quotas leads to lower production in the AC (35 % less than they would have produced without

joining the EU). With the MTR reform, the EU 15 milk production decreases slightly in all scenarios and in the EU 25 milk production decreases by about 7 %.

The impacts of the MTR on *agricultural factor income* at the member state level depend on the amount of de-coupled payments, changes in terms of trade and the initial structure of production and input use.

In *Denmark*, the amount of milk production does not change in all scenarios. Further, the total amount of direct payments increases by about 20 % and land prices increase by 12 % in the *Total De-coupling Scenario 4*.[11] Employment in the agricultural sector declines by 1.2 %, capital stock is reduced by 2.5 % and hence, the total factor income in the Danish agricultural sector increases by 1.7 %. Total welfare in Denmark decreases in the *Agenda Scenario* and in the *MTR Scenarios* 1, 2 and 3. In the *Maximum De-coupling Scenario 4* the total welfare increases by € 10 million. The main results for Denmark are presented in the following table.

Table 8: Impacts of de-coupling in Denmark

Results	Agenda 2000	Minimum decoupling	National decoupling	Maximum decoupling
Milk production		No changes expected in Denmark		
Factor income		+1.6 %	+1.1 %	+1.7 %
Total economic welfare	€ -76 million	€ -13 million	€ -10 million	€ + 10 million

Source: Jensen et al. (2003).

2.9 Austria

The following describes a study by NEUNTEUFEL (2004) analysing the impacts of the mid term review and of the Agenda 2000 for the Austrian agricultural sector.

Methodology

PROJEKTOR is a model for the Austrian agricultural sector, disaggregated into three homogenous regions. Parameters of the model are based on econometric estimation. Previous values of several years are used to determine future reactions of farmers according to changes in the policy system. A basic assumption for predicting future values based on empirical data is that behaviour does not change over time.

Thirteen crop production activities and five livestock production activities were aggregated, seven input factors as well as several aggregates for agricultural land are

[11] The increasing price for land is due to the modelled SPS that still refers to the area. Other studies show (KLEINHANSS et al., 2004) that under terms of the SPS, the prices for land decrease and with the RM the prices increase due to the quasi-coupled payments to eligible area.

implemented into the model. The profitability per hectare determines the crop mix. Producer prices, direct payments and milk quotas are the main explanatory variables. The use of input factors is determined by exogenous variables like the current employment rate. The use of input factors is estimated depending on the level of production and input prices.

The procedure started with the determination of regional values and then the values for the Austrian sector were identified. The base year is 2001 and the target year 2008 with the full implementation of the milk market reform in Austria. The results were calculated for every single year.

Database

The parameter estimation is based on the annual data of NUTS III regions in Austria for the years 1995-1998, aggregated to three homogenous groups. The parameters are estimated separately for every region based on time series cross section database. For ex-post validation of the model, data from the years 1999 – 2001 were used. Further data sources are the national FADN data, the national structure survey and economic accounts for agriculture.

Scenarios

In this study five scenarios were run to assess the impacts of the MTR-proposal (January 2003) and MTR-decisions (June 2003) on the Austrian agricultural sector. The focus lies on the development of production, farm income and the labour input in the sector. Arrangements like cross compliance are not integrated into the model.

In the **baseline scenario** it was assumed that Agenda 2000 continues up to 2008 with further assumptions of a reduced milk price of about 15 % from 2005 until 2008.

In the **scenario 'MTR-proposal (January 2003)'** direct payments are de-coupled from production and compared to the baseline scenario. Milk prices decrease 25 % in the years 2004 until 2008. Further, the milk quotas increase slightly.

The **scenario 'MTR-proposal (January 2003) with integrated demand effects'** includes demand development for livestock products. Milk prices decrease by 25 % in the years 2004 until 2008.

The **scenario 'MTR-decisions (June 2003) A'** assumes partial de-coupling of direct payments in crop production. For livestock production, the payments for suckler cows are fully coupled, slaughtering premia are assumed to be 40 % coupled and milk premia to be fully de-coupled. The milk quotas increase slightly in relation to the baseline scenario. Due to changes of the intervention prices, the producer price for milk will be reduced by 21 % from 2004 until 2007.

The **scenario 'MTR-decisions (June 2003) B'** assumes 75 % coupled premia for cattle and fully de-coupled premia for suckler cows and slaughter premia. The price development corresponds to the scenario 'MTR-decisions (June 2003) A'.

Results

Livestock production is more affected than crop production in all scenarios. Declines of gross value added are less than for production values because of possible cost savings.

In the *baseline scenario* the labour input will be reduced by 15 % below the 2002 level. A further decrease of 3 % is expected with the implementation of the *MTR-proposal* (January 2003) respectively by 2.5 % with the *MTR-decisions* from June (2003). Consequently, de-coupling does not significantly affect the labour input.

In the *baseline scenario*, the production of veal, beef and milk decreases, whilst production of pork, poultry and eggs increases. The *MTR-scenarios* show similar developments in the shift of the production mix. However, under the *MTR-scenario* (January), the value of production is 9 % below the baseline level. Assuming increasing demand, the production value is only five percent below the baseline. That means that the effects of de-coupling are weakened and the reduced supply leads to increasing prices. Slowed down effects are expected with the *MTR-scenario* (June-decisions). The value of production of beef, veal and milk is reduced only by half of those within the legislative proposal.

The results also show tendencies on allocation of production in Austria**.** In the *baseline scenario*, a slight movement of livestock production to the Alpine regions is expected. In the *MTR* scenarios, part of livestock production increases slightly in lowland and hilly regions and decreases in the Alpine regions. This development is due to a better profitability of pork production in these scenarios. The main results are summarized in Table 9.

Table 9: Impacts of the MTR-proposal and MTR-decisions on the Austrian agricultural sector

Effects on:	Baseline	MTR-proposal A	MTR-proposal B	MTR-decisions A	MTR-decisions B
Labour input	-15 % below the base year 2001	-3 % below the baseline scenario	-3 % below the baseline scenario	-2.5 % below the baseline scenario	-2.5 % below the baseline scenario
Crop production	Cereals +3 % above the base year; decreasing oil and protein plants	Cereal production decreases below the baseline scenario level, changes in crop mix, rye and corn decreases, part of oil seeds and protein plant in the crop mix increases			
Livestock production	Beef, veal and milk production –3 % below the base year 2001, pork, poultry and egg production increases	Similar shift than baseline but: value of production 9 % below the baseline	Less shift, value of production 5 % below the baseline	Less shifts, weakening the effects, only 50 % of the reduction in production	
Geographic allocation of production	Shift of livestock production to Alpine regions	Livestock production shifts to the lowland and declines in the Alpine regions due to more profitability of pork and poultry production			

Source: Neunteufel (2004).

2.10 Finland

In this part, the study by LEHTONEN (2004) based on the model DREMFIA was analysed.

Methodology

In this study a dynamic regional sector model to assess impacts of de-coupling on Finnish Agriculture is used. This dynamic recursive model simulates the development of agricultural investments and markets from 1995 up to 2020. The model system consists of two main parts:

1. The technology diffusion model determines the major driving forces of investments at sector level. This part was implemented to handle structural change endogenously.
2. The optimisation routine simulates annual price changes by maximising producer and consumer surplus with balances and resource constraints. This part of the model is a spatial price equilibrium model that provides annual supply and demand using the outcome of the previous year as the initial value.

The model was designed to evaluate medium and long-term impacts of agricultural policy changes. The long-term development of production depends on initial assumptions like the development of input prices, interest rates, aggregate demand and EU price. Milk quota trade, exports and demand are integrated in the modelling system.

The model covers complete land use and livestock production in the regions. Four main areas are included into the model: Southern Finland, Central Finland, Western Finland, Northern Finland, being further divided into sub-regions (17 production regions).

Database

The main database is the national farm register of Finland. This database provides information about costs, revenues, producer support, direct payments and the entrepreneurial profit. Exogenous data is needed for input prices, interest rates, aggregate demand of agricultural products and EU price level of agricultural commodities.

Scenarios

The **baseline scenario** is related to Agenda 2000 extended to the year 2015. The intervention prices for butter and skimmed milk powder as well as the producer price for milk decrease by 15 % until 2008.

The **MTR Scenario 1** follows the Luxembourg agreement. Changes of the intervention prices for butter and skimmed milk will result in reductions of producer prices of 22 % between 2003 and 2007. The **MTR Scenario 2** refers to the CAP reform decided in June 2003 as well, but the prices for butter and the butter components decrease by only about 16 %.

Results

The **ex-post evaluation** analyses the Finnish dairy sector in previous years. In 2001, 3.8 % of livestock in Finland was on large dairy farms (more than 50 cows), 45.6 % in medium sized dairy farms (20-49 cows) and 50.6 % in small dairy farms (1-19 cows). Predicted structural change is slightly faster than in reality in the years 1995, 1998 and 1999. Further, milk production is overestimated in the years 1995-1998 but underestimated in the years 2000-2002.

The effects on dairy investments show that the 3 % increase of producer price for milk in the years 2000 and 2001 lead to higher investments. In the *baseline scenario,* decreasing investments on small dairy farms are expected due to decreasing milk prices in 2005-2008. De-coupled payments in the MTR-scenarios (*MTR1* and *MTR2*) lead to lower investments. This is due to a loss of profitability in dairy production and therefore many small and average sized farms will not invest in efficient production techniques. Especially medium sized dairy farms would be most affected. This situation will recover and the level of investments will reach the 2001/02 level in the year 2015 because of slightly increasing milk prices and improvements in production systems (increasing milk yield due to better feed rations). De-coupling and a reduced producer price for milk under the *MTR_1* scenario lead to less investments in small dairy farms. This is due to the fact that small dairy farms would have income losses of 50 % if they shift to cereals or set-aside. As a consequence, labour input decreases in these farms by 90 % and income by 50 %. Most affected farms are small dairy farms with young cattle and fattening bulls.

In all scenarios, a reduced milk production is expected until 2008, in the *MTR* scenarios even after 2008. De-coupling leads to lower milk prices in 2008 but the prices will recover partially. In the *MTR_1* scenario, the milk price drops in 2008 by 8.3 % below the baseline, meaning 20 % below the level of 2002. In 2014 the price recovers and production nearly reaches the level of the baseline. In 2020 the producer price for milk falls again and is five percent below the baseline. Milk production decreases by 11 %, which is 13 % below the national quota. In the *MTR_2* scenario the producer price for milk decreases by 2 % below the baseline. In 2009-2017, the production level is 3-9 % below the national quota, and in 2020 production recovers to two percent below the baseline.

In the **sensitivity analysis**, lower labour costs and a slow down in economic development were assumed. The decrease of milk production is expected to be smaller if the wage rates were lower. In this case the structural change would be less because the lower wages act like a subsidy in production.

In conclusion, a table with the main results is presented.

Table 10: Impacts of de-coupling on the Finnish agricultural sector

Results	Baseline	MTR_1	MTR_2
Effects on dairy investment	Decreasing investments due to declining producer prices for milk	Decoupling leads to losses in incentives to invest, especially on small dairy farms, stronger than under baseline conditions	
Effects on milk production	Milk production volume stays stable with slightly variations between the years	In 2008 milk production declines and recovers only slightly in 2020: 13 % below the national milk quota	In 2008 milk production declines and is 3-9 % below the baseline level up to 2017; the production recovers in 2020: 2 % below the baseline level
Effects on the producer price for milk	Milk price declines up to 2008, recovers and stays at a constant level up to 2020	Milk prices decline very strongly up to 2008, recovers up to 2014, decline again up to 2017, increase slightly (2018) and decline again (2020)	Producer price for milk declines with the same trend like in the baseline scenario but decreases slightly more

Source: Lehtonen (2003).

2.11 EU

The following results of the 'DYNASPAT project' are drawn online[12]. Tables show results of the CAPRI modelling system for the whole European Union. Interactive maps can be used to draw results at the regional level. For the dairy sector, activity levels for high and low yield cows are given, from which changes in milk production in the regions were calculated.

Scenarios

In this study a reference scenario that included the continuation of Agenda 2000 up to the target year 2009 and a MTR scenario (SPS) were run.

Results

Milk production in the EU increases slightly by 1.36 % compared to the base year 2001 under Agenda 2000 and MTR. Milk quota will be fulfilled in the target year 2009. Milk production will partially shift from dairy cows with high milk yield (-2.2 %) towards dairy cows with lower milk yield. For the latter, milk yield per cow increases by 15 % during the years 2001-2009. The implementation of the MTR leads to lower effects on intensities. Compared to the reference run, the decrease of 'high yield dairy cows' is less and the increasing production of 'low yield dairy cows' is lower. The producer price for milk will decrease in the reference run by 20 %. The probable implementation of the MTR in the EU induces a slightly higher producer price for milk in 2009 (+1.13 % related to the reference run)[13].

[12] Internet: http://www.agp.uni-bonn.de/agpo/rsrch/dynaspat/xml/scenario.xml, retrieved June 2004.

[13] Unlike other studies in these results a increasing producer price for milk in the case of the implementation of the MTR is projected. That could be due to an increasing demand.

The processing of raw milk will shift towards more cheese (+12.2 %). For the *reference run* it is expected that the production of fresh milk products slightly decreases (-1.37 %) and the production of skimmed milk powder decreases by 24.1 %, butter production remains stable. Prices for all dairy products decrease. In the *MTR-scenario* the production of skimmed milk powder will decrease more than in the reference run while other products reach the same level. Prices for butter and skimmed milk powder will decrease more under terms of the MTR (-5.3 % and -.4 %).

The agricultural income will decrease by 9.58 % compared to 2001 under Agenda 2000. The *MTR-scenario* induces an increasing farm income of 2.8 % related to the reference run. The profit of dairies has an opposite reaction, the profit increases in the years 2001-2009 under Agenda 2000 but under MTR the profit of dairies will decrease by 2 %.

Further results concerning the implementation of the *MTR* are: Maize in fodder rations decreases by 4.9 % and an increasing use of fodder root crops (+12.3 %) is expected. Further, more fodder is produced on arable land (+15.2 %) and grassland is used more extensively (+2.7 %) while intensive grazing drops down by 2.6 %. Fodder prices will increase by 5.3 % in the EU.

Table 11: Impacts of the probable MTR implementation in the EU

Results	Agenda 2000 (related to 2001)	Probable MTR implementation (related to the reference run, 2009)
Milk production	+1.36 %	+0.15 %
Producer price for milk	-18.66 %	+1.03 %
Farm income	-9.58 %	+2.77 %

Source: CAPRI (2004).

Furthermore, some results of the CAPRI model concerning milk production in the member states, for which no impact analysis was available, are presented. In **Greece**, the milk quota is fully utilized in the reference run and in the *MTR-scenario*. Milk is produced mainly with high yield dairy cows. The increase of milk production with high yield cows is stronger (average: +18 %) than the increase by low yield cows (varying in the regions from +12 % up to 15 % related to the reference run). The high increasing rates are due to additional milk quota for Greece.

In **Sweden**, under MTR, milk will be produced more in 'high yield cow herds' compared to the reference run. The production of 'low yield cows' decreases and this development varies in the regions from -1.03 % to –5.34 %. Production of 'low milk yield dairy cows' increases compared to the base year. Under Agenda 2000 increasing production with 'low yield cows' is stronger, that might be an indicator for an extensification of milk production. The quota is expected to be utilized in both scenarios.

In **Portugal**, under terms of the MTR, milk production with 'high yield cows' increases compared to the reference run in a range of +0.5 % and +1.1 % but compared to the base

year the production with ‘high yield cows’ decreases. Production with ‘low yield cows’ decreases compared to the reference run but between 2001-2009 the production increases in a range of +4 % and +20 %. This development might be due to an extensification tendency in the EU. The milk quota will be fully utilized in all regions for Agenda 2000 and MTR.

3 Conclusions

The following items were discussed in the previous sections:

– Type and spatial coverage of the models

– The main outcomes of the studies related to the dairy sector

For assessing impacts of the MTR decisions on the dairy sector at the member state level, **macro-** and **micro-economic models** were used:

– **Macro level modelling** is mainly based on the GTAP model or partial equilibrium models. In all cases these models cover the whole EU and disaggregated databases for member states. At the moment only one regionally differentiated sector model, covering the EU and regionally disaggregated regions (220) is available.

– **Micro level models** are in most cases based on farms groups and are used for policy assessment in the member states. Farm group models that cover all EU member states like the model from INRA (in Nancy and Grignon) are available, but results for the dairy sector were not yet published.

The results show, that the impacts of the MTR decisions on the dairy sector follow in nearly all cases the same trend:

– Changes of intervention prices for butter and SMP are only partially transmitted to producer prices as a result of the endogenous determination of price changes by the general or partial equilibrium models. These prices were taken as inputs for farm group models.

– Depending on the price transmission and the development of the producer price, changes in milk supply are determined. Most of the models, except the Finnish model, show an almost stable milk supply. By some teams a full transmission of the reduction of intervention prices to the producer prices were assessed without showing significant impacts on supply, even in the case of total de-coupling.

– The milk quota is still binding and therefore will be fully used. Results indicate further, that milk production increases according to the additional quota under terms of Agenda 2000. De-coupling might induce a regional reallocation of quota within the member states or from small to larger sized farms. Only in the case of Finland will the milk quota not be fully used.

– Further, some studies indicate a slightly positive income or welfare effect due to de-coupling but in most cases the income effects for the dairy sector are rather small. The study for Germany, focussing on the effects of the type of de-coupling, indicates that on average dairy farms will have slightly negative income effects. The transformation of all premia for arable crops, beef and milk into area based entitlements will induce large distribution effects of direct payments and of income, whereby rather extensive farms will be favoured. The study for Ireland shows that reduced calf and milk prices as main influencing factors of farm income cannot be offset with de-coupled milk premia.

– Results might be influenced by the type of models and natural or structural conditions of farms. Compared to other (static) farm group models the model for Finland is dynamic (investments are modelled endogenously). Therefore the model predicts long term farm adaptations. Other models, based on the PMP approach, indicate that reactions of PMP might be less than with LP models. This could be due to the calibration procedure for the base year. Further, the aggregation level of the database influences the results.

Regarding the ongoing controversial debate on economic pressures in the dairy sector, i.e., in Germany, the above reviewed studies do not prove this discussion. Further modelling work in the dairy sector seems to be necessary with the following aspects to be considered:

– A sensitivity analysis to better model supply effects with regard to milk price chances, price transmission of the reduced intervention prices and different options of de-coupling

– Short and long term farm adaptations including welfare effects of de-coupled payments and the implementation of dynamic structural change

– A more detailed specification of the models including detailed representation of policy instruments in the base scenario and in the scenarios with de-coupled payments and a further disaggregation of the models with regard to scale and allocation effects

References

AGRA EUROPE CAP SEMINAR 22/23 June 2004: CAP reform implementation. A country-by-country guide

ARFINI F, DONATI M, SEVERINI S, ZUPPIROLI M (2004): Analisi della Riforma di Medio Termine sul Sistema Agricolo Italiano: Aspetti Metodologici e Evidenze Empiriche. Paper in press, Parma 2004

BARKAOUI A, BUTAULT J (2004): Impacts sur l'offre des regions francaises des différentes options de la réforme de la PAC de 2003. Recherches en economie et sociologie rurales. No 4-5/03 Fevrier 2004

BERTELSMEIER M, GÖMANN H, KLEINHANSS W, KREINS P, MANEGOLD D, OFFERMANN F (2002): Modellanalysen zu den Auswirkungen der KOM-Vorschläge im Rahmen der Halbzeitbewertung der Agenda 2000. Arbeitsbericht 12/2002 an der Bundesforschungsanstalt fuer Landwirtschaft Braunschweig

BMLFUW Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft (2004): Die Reform der EU-Agrarpolitik. BMLFUW, Wien

BOUAMRA-MECHEMACHE Z, HADJ ALI-KEIN H, REQUILLART V (2004): L'impact sur les marches du lait et des produits laitiers de l'accord de Luxembourg. Recherches en economie et sociologie rurales. No 4-5/03 Fevrier 2004

BREEN J, DONNELLAN T, HENNESSY T (2003): A future for dairy farmers after Fischler? Online-document <http://www.teagasc.ie/publications/2003/20031112/paper11.htm.> Retrieved June 2003

CHATTELIER V (2004): La revision à mi-parcours de la pac (Juin 2003) et les exploitations laitières francaises. Recherches en economie et sociologie rurales. No 4-5/03 Fevrier 2004

COMMISSION OF THE EUROPEAN COMMUNITIES (2002): Communication from the Commission to the Council and the European Parliament. Mid-term Review of the Common Agricultural Policy. Online document <http://europa.eu.int/eur-lex/en/com/cnc/2002/com2002_0394en01.pdf >. Retrieved June 2004

COMMISSION OF THE EUROPEAN COMMUNITIES (2003a): Proposal for a council regulation establishing common rules for direct support schemes under the common agricultural policy and support schemes for producers of certain crops, amending Regulation (EC) No 1257/1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF) and repealing Regulation (EC) No 2826/2000, on the common organisation of the market in cereals, on the common organisation of the market in rice, on the common organisation of the market in dried fodder, for the marketing years

2004/05 to 2007/08, amending Regulation (EC) No 1255/1999 on the common organisation of the market in milk and milk products, establishing a levy in the milk and milk-products sector. Online-document: < http://europa.eu.int/comm/agriculture/capreform/memo_en.pdf>. Retrieved: June 2004

COMMISSION OF THE EUROPEAN COMMUNITIES (2003b):Council Regulation (EC) No 1782/2003 of 29 September 2003: Establishing common rules for direct support schemes under the common agricultural policy and establishing certain support schemes for farmers and amending Regulations (EEC) No 2019/93, (EC) No 1452/2001, (EC) No 1453/2001, (EC) No 1454/2001, (EC) 1868/94, (EC) No 1251/1999, (EC) No 1254/1999, (EC) No 1673/2000, (EEC) No 2358/71 and (EC) No 2529/2001. Online-document: < http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_270/l_27020031021en00010069.pdf>. Retrieved: June 2004

DEFRA Department for Environment Food and Rural Affairs (2004): Common Agricultural Policy – Reform. Online-information: <www.defra.gov.uk/farm/capreform/index.htm>. Retrieved: June 2004

DIMARANAN BV, MCDOUGALL R (2002): Global trade, assistance, and production. The GTAP 5 database, Centre for Global Trade Analysis, Purdue University

GOHIN A (2004): La réforme de la PAC de 2003 et le regime du paiement unique. Impacts de différentes options de mise en oeuvre au niveau francais. Recherches en economie et sociologie rurales. No 4-5/03 Fevrier 2004

HENNESSY T, KELLY P, BREEN J (2003): Farm level adjustment in Ireland following decoupling. Paper presented at national dairy conference 2003 at Teagasc. Online-document <http://www.teagasc.ie/publications/2003/20031112/paper11.htm>. Retrieved June 2004

JAYET A (2003): La réfrome de la PAC de 2003 et le regime du paiement unique. Impacts de différentes options de mise en oeuvre au niveau francais. Recherches en economie et sociologie rurales. No 4-5/03 Fevrier 2004

JENSEN HG, FRANDSEN SE (2003): Impacts of the Eastern European Accesion and the 2003-reform of the CAP. Consequences for individual member countries. Working Paper 11/03 at the Danish Research Institute of Food Economics (FOI)

KLEINHANNS W, HUETTEL S (2004): Auswirkungen der MTR-Beschlüsse im Milchbereich. In: Berichte über Landwirtschaft 03/2004, in press

LETHONEN H (2004): Impact of de-coupling agricultural support on dairy investment and milk production volume in Finland. In: Acta Agric. Scand., Sect, Food Economica 00:1-17

LIPS M (2004): The CAP mid term review and the WTO Doha Round. Analyses for the Netherlands, EU and accession countries. Report on the Agricultural Economics Research Institute (LEI), The Hague

MOSS J, MCERLEAN S, KOSTOV P, PATTON M, WESTHOFF P, BINFIELD J (2002): Analysis of the impacts of decoupling on Agriculture in the UK. Online-document: <www.qub.ac.uk/afe>. Retrieved: June 2004

NEUNTEUFEL MG (2003): Halbzeitbewertung der Agenda 2000: Folgenabschätzung für Österreich. Bundesanstalt für Agrarwirtschaft

WIECK C, PEREZ I, BRITZ W (2003): Medium term prospects for EU dairy markets under Agenda 2000 and the mid term review proposals. A quantitative analysis for the Spanish dairy sector with the CAPRI modelling system. Paper presented at Seminario de la AEEA Lugo, Spain, March 2003