What will happen after the EU milk quota system expires in 2015?

An assessment of the Dutch dairy sector

Roel Jongeneel and Siemen van Berkum

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Preface

This report presents a medium run outlook for the Dutch dairy sector. The milk quota has expired after having been in place for more than 30 years. There is a clear interest to reflect on what the implications will be for the Dutch dairy sector and its contribution to a still rising demand for dairy products. This report is the product of the public private partnership project Market Outlook and Intelligence Agro and Food (TKI-AF-12805), in which the Dutch Ministry of Economic Affairs, LEI Wageningen UR and agribusinesses participate. The aim of the project is to provide market outlooks, taking into account the most up to date information with respect to policy and macro-economic developments, and also to provide information with respect to short-run developments by means of a quarterly farm survey (agro-barometer). Within the project special attention is paid to developments at EU member state level. By doing so the project aims to contribute to market transparency and provide input for strategic planning in the agro-food supply chain.

Ms. L.C. van Staalduinen
Managing Director

Summary

S.1 Key findings

This report provides an assessment of what will happen after the EU milk quota system has expired 1 April 2015. It includes a medium term outlook, taking into account the conditions in world dairy markets as these are foreseen by the OECD-FAO in their Agricultural Outlook 2014-2023 as well as the medium term outlook for the EU published by the EU Commission December 2014. The Dutch milk supply is projected to increase by about 17 per cent in the coming decade. The increase is related to expected market conditions (e.g. milk price), but also to other drivers and structural issues characterizing the Dutch dairy sector. With the milk quota now no longer being a constraint, the challenge for the Dutch dairy farmers is to revise their production strategy to optimally and sustainably produce within environmental side conditions.

S.2 Complementary findings

With the milk quota no longer being in place also the milk production in the EU member states neighbouring The Netherlands is estimated to increase. More generally, milk production in northern EU (excluding Scandinavia) is expected to increase in the coming decade by about 12 million tons.

S.3 Method

The assessment presented in this study is based on a modelling exercise, using the AGMEMOD model. The outcomes of this have been discussed with experts inside and outside The Netherlands. The results presented in this study are a synthesis, taking into account these modelling and expert inputs.

Samenvatting

S.1 Belangrijkste uitkomsten

Dit rapport bevat een verkenning van de impact die de afschaffing van de melk quotering per 1 april 2015 zal hebben op de Nederlandse melkproductie. Er wordt een middellange termijn projectie gepresenteerd (tijdshorizon 10 jaar). Voor wat betreft de ontwikkelingen op de wereldmarkt en de EU zijn de outlook-studies van de OECD-FAO (Agricultural Outlook, 2014-2023) en van de Europese Commissie (2024 Prospects for EU Agricultural Markets) als uitgangspunt genomen. Naar verwachting zal de Nederlandse melkproductie de komende 10 jaar een stijging laten zien met circa 17%. De geprognosticeerde toename hangt af van de verwachte marktomstandigheden (in het bijzonder de melkprijsontwikkeling), maar ook van andere factoren die bepalend zijn voor de structuur van de Nederlandse zuivel. Nu de melkquotering is weggevallen wordt het de uitdaging voor de melkveehouderijsector om haar strategie te herzien en in te zetten op een optimale en duurzame productieontwikkeling, rekening houdend met de randvoorwaarden vanuit het milieu (mest).

S.2 Overige uitkomsten

Het wegvallen van de melkquotering beïnvloedt ook de ontwikkeling van de melkproductie in de omringende EU lidstaten. Hun productie zal naar verwachting eveneens toenemen. Het algemene patroon dat zich aftekent is dat melkproductie met name in het noorden van de EU (met uitzondering van Scandinavië) zal groeien. De toename van de melkproductie in die landen wordt geschat op circa 12 miljoen ton.

S.3 Methode

De analyse zoals die in deze studie wordt gepresenteerd is gebaseerd op een kwantitatief economische analyse, waarbij gebruik is gemaakt van de inzet van het AGMEMOD model. De uitkomsten van deze analyse zijn daarna voorgelegd aan experts binnen en buiten Nederland. Dit is een gebruikelijke procedure bij het maken van market outlook-analyses. De hier gepresenteerde uitkomsten zijn een synthese die is gemaakt op basis van de modelinput en de inbreng van de experts.

1 Introduction

The dairy sector is important to Dutch agriculture. Its share in the total value of agricultural production is close to 20%, where it ranks as the second most important sector, after vegetables and horticulture. The sector currently comprises about 18,600 dairy farmers, which together manage a herd of 1.6m dairy cows. The Dutch dairy system is pasture based, with dairy cows consuming the grass and roughage (in particular forage maize) coming from 1.2m hectares of pasture and fodder area (about one third of total cultivable area in the Netherlands). Alongside the roughage intake, an average Dutch dairy cow consumes about 2,000 kg of compound feed annually. The Netherlands has a mild climate which is very suitable for dairy production. While about 35% of Dutch dairy production is domestically consumed, 65% is exported, with the EU being the most important export market outlet. The more than 12m tonnes of raw milk produced is processed in about 50 processing facilities, owned by 22 dairy processing firms. With a gross production value of €6.3bn, the dairy supply chain has a share of 1.2% in the nationally produced value added, generating 60 thousand jobs in primary production, processing, wholesale and retail (ZuivelNL, 2014).

2015 will be a watershed for the EU and Dutch dairy sectors, because on 1st of April the milk quota regime has expired, after having been in place for more than 30 years. The end of the supply management regime in dairy will create new opportunities for dairy farmers to reposition their business. The abolition of the milk quota happens at a moment when prices of dairy products at world markets have been at the highest level since 2006. The demand for dairy products has been and still continues to increase, in particular because of the economic growth and expanding consumer demand in Asia. However, as has become clear, dairy product and milk prices in the EU not only have reached a higher level, they also have become more volatile as a response to the transformation of the classical price support regime of the CAP into a safety net provision, which only protects farmers against extreme downside price risks. As a result, prices for dairy products in the EU are increasingly related to world market prices, and are also affected by the volatility of these prices (Jongeneel and Van Berkum *et al.*, 2010).

This report provides an assessment of what will happen to the dairy sector and milk production in The Netherlands now the EU milk quota system has expired. In order to understand the Dutch situation, local factors (e.g. environmental regulation) will be highlighted, but also the broader context of international market developments. Because of the increasing importance of world market conditions for Dutch farmers, this report starts with an assessment of the main trends observed at the international markets (Chapter 2). This analysis is based on the most recent OECD-FAO Agricultural Outlook (released in June 2014), but also accounting for developments that occurred after this study was published. Chapter 3 discusses the background to and expected results of projections of the Dutch milk production, which is argued to increase by about 17% in the coming decade. The increase in Dutch milk supply is related to expected market conditions (e.g. milk price), but also to other drivers and structural issues characterising the dairy sector. The expected developments at EU level and details for a group of selected EU member states are discussed in Chapter 4. Chapter 5 highlights a number of uncertainties underlying the analysis, and Chapter 6 closes with concluding remarks.

2 International developments at the dairy markets in the next ten years

2.1 Projections ten year ahead[1]

2.1.1 Assumptions and overall results

The OECD-FAO Outlook is presented as a baseline scenario that is considered plausible given a range of conditioning assumptions. These assumptions portray a specific macroeconomic and demographic environment which shapes the evolution of demand and supply for agricultural and fish products. Key macroeconomic assumptions underlying the projections refer to population and GDP growth, inflation and exchange rates, and energy (oil) prices. The assumptions are:

- A return to *more sustainable economic growth*, assuming an average annual GDP growth of 2.2% for OECD countries. The non-OECD area will grow faster, although growth rates will be below the previous 10-year average in China and India, whereas the EU15 growth rate will be less than the OECD average.
- *Inflation rates* in OECD remain moderate, yet problematic in many emerging economies. Inflation differentials drive exchange rates. The assumptions on *exchange rates* during the next decade are characterised by a stronger US Dollar compared to other currencies in line with the recovery of the US economy. This implies, for instance, that Brazil's competitiveness increases.
- *World oil prices* are assumed to continue to increase over the outlook period (2.8% annually in nominal terms) to reach USD147 per barrel, encouraging further biofuel production.
- *Policy assumptions*. Basically known and relevant policies in early 2014 are assumed to continue. Projections for the US are based on the 2008 Farm Act (not on the Agricultural Act, signed in February 2014) which was assumed to be extended and remain in effect through the period. For the EU, the baseline reflects only in part the reform of the common agricultural policy (CAP) towards 2020: expiry of the milk quota as of 2015, expiry of the sugar quota system as of 2017, budget ceilings for decoupled single farm payment and coupled payments are expected to stay at the current level.

The Outlook indicates that global *food consumption continues to increase* but at a slower rate than in the previous decade. Growing incomes and urbanisation result in a shift in diet from a cereal-based to protein-rich diet, with more processed and prepared foods. Population growth and changing dietary preferences drive the demand for dairy (and meat) products, which requires an expansion of livestock production. The latter also implies a greater demand for feed grains and oilseeds. The rate of production growth is constrained by different factors, including increasing costs of production, limited expansion of agricultural land, environmental concerns and changes in the policy environment. These factors are relevant in most countries but with different weight and hence impacts on a country or regional scale. As in the past decade, projected production growth through the outlook period will be led by Latin America, Sub-Saharan Africa, Eastern Europe and parts of Asia, with production growth in Western Europe increasing only marginally. Developing regions will account for more than 75% of additional agricultural output over the next decade.

2.1.2 Global dairy market highlights up to 2023

Figure 2.1 below summarises the expected developments of per capita *consumption* of dairy products. In developing countries dairy is mostly consumed in fresh form, but consumption of cheese and milk powder is expected to increase (respectively on average 1.9% p.a and 1.2% annually). The expansion in demand reflects robust income growth, expanding populations and a further globalisation of diets.

[1] This section summarises projections from OECD-FAO Agricultural Outlook 2014-2023 (June 2014)

Consumption growth figures are much lower in developed countries, but total consumption of dairy products in milk equivalents is still considerably higher than in developing countries. The difference stems mostly from the per capita consumption of cheese which in developed countries is more than ten times the per capita consumption in developing ones.

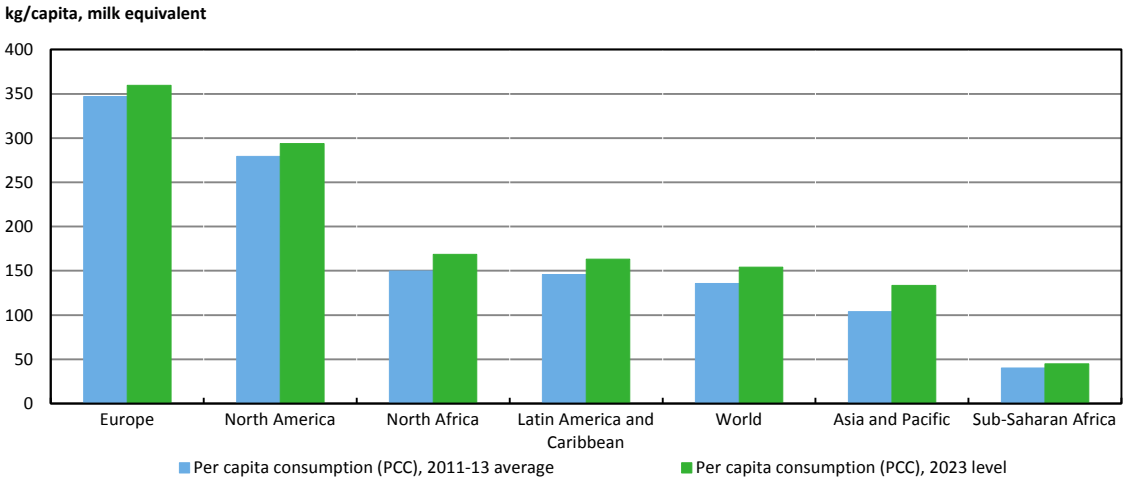

Figure 2.1 *Dairy consumption projections in the world, per region*
Source: OECD, Agricultural Outlook, 2014-2023

Over the next decade, world milk *production* growth is expected to slow down from 2.2% to 1.9% p.a. Four out of five extra litres of milk produced will originate from developing countries, where most of the production growth stems from an increase in the dairy herd, compared to yield growth. India is expected to outpace the EU and will become the largest milk producer in the world (see Figure 2.2 below). In their Agricultural Outlook, the OECD-FAO project only sluggish growth in EU milk production over the coming decade (0.5% p.a., however see Chapter 4 for a more recent estimate of the EU Commission). According to the OECD-FAO, the milk quota abolition is likely to have little impact on the overall milk production in the Union although some regional concentration is expected to occur. EU's slow production growth is mainly explained in terms of being a response to little growth in EU domestic demand and its relatively high production costs. The latter constrains the EU's ability to participate in the faster growing export markets.

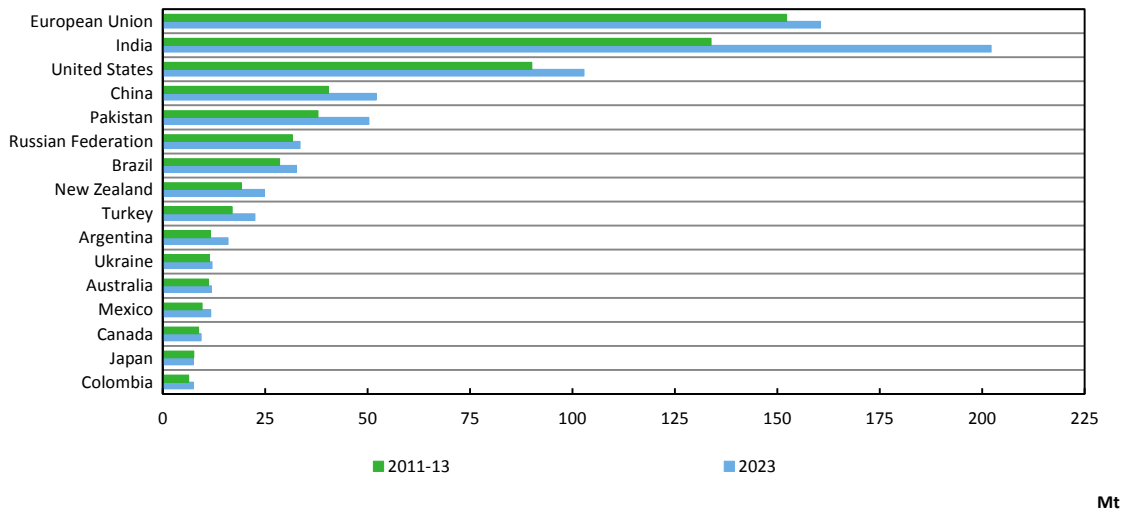

Figure 2.2 *Outlook for milk production*
Source: OECD, Agricultural Outlook, 2014-2023

Reviewing the recent past, OECD-FAO note that milk and dairy product *prices* on the global market increased in 2013 due to a large production shortfall in China and increasing feed costs. Also, major exporters of cheese, butter and milk powder to the world dairy market – the United States, the EU, New Zealand and Australia – produced less milk than in 2012. In the second half of 2013, though, production in the major dairy exporting countries started to react to the price signals, also because prices for feed grains declined considerably since mid-2013. Combined with an expected recovery of the domestic milk production in China, this will likely lead to declining dairy and milk prices in the near future, according to OECD-FAO's estimate.

Over the medium-term, increasing incomes and globalisation of diets are expected to raise the demand for milk and dairy products in developing countries. Most of the growth in demand will be satisfied domestically by increasing dairy herds and rising yields. Increasing import demand (especially by countries in Asia and Africa) will support prices of dairy products during the next decade. Cheese prices are expected to develop the strongest over the outlook period. On the other hand, butter prices are expected to remain below SMP prices in the next decade (see Figure 2.3).

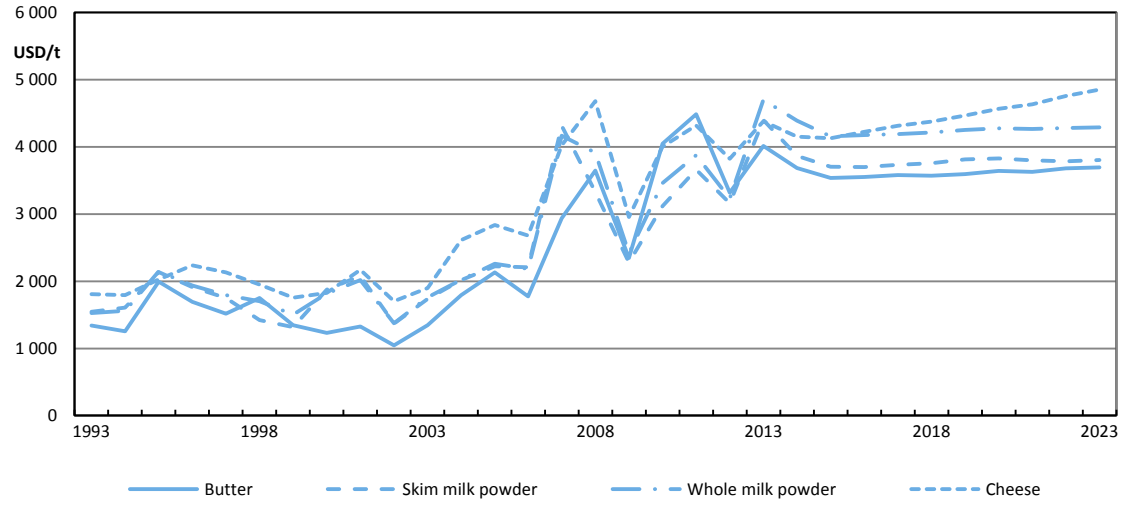

Figure 2.3 *Prices of dairy products*
Source: OECD, Agricultural Outlook, 2014-2023

2.2 Review of 2014 market developments and short term forecasts

The OECD-FAO Agricultural Outlook 2014-2023 has been published in June 2014 and is based on data available until early 2014. In the meantime things have changed, notably the oil price and exchange rate figures (see also chapter 5). This section adds a review of 2014 agricultural market and price developments in order to update the base for our own mid- and longer term outlook of the EU dairy market. Thereby use is made of the short-run outlook and 2024 Prospects for EU Agricultural Markets as published by the EU Commission (2014a and 2014b).

The 2014 cereal harvest reached an all-time record of more than 2.5bn tonnes, improving world stock-to-use ratios for cereals up to 25% in early 2015.[2] As a result international prices for all cereals declined to its lowest level since July 2010, the decline being most pronounced for wheat, followed by

[2] http://www.fao.org/worldfoodsituation/csdb/en/ retrieved March 5, 2015

maize.[3] In addition to countries such as Argentina, Russia and Ukraine, the EU accounted for wheat production gains, hitting record levels too, driving higher than average exports and allowing for cheaper feed. The latter is expected to benefit the livestock sector. In addition, oilseeds prices also show a downward trend since summer in anticipation of large harvests in the US (soybean) and the EU (rapeseed). Both cereal and oilseed market developments contribute to downward price trends of all main feed commodity compounds.

At the same time, milk and dairy markets showed declining prices throughout 2014. In response to increasing prices in the course of 2013, milk production continued to climb in major exporting countries for most of 2014. However, international dairy prices have plummeted due to increased global milk production, lower import demand (especially from China), the Russian ban on imports of dairy products from several major producers (EU, USA and Australia), and a strengthening dollar. Businesses and experts' expectations (at Agrimoney.com, 5 January 2015) all indicate that dairy prices will be under pressure during 2015, whereas the speed at which they recover will depend on drawing down stocks that will have accumulated in exporting and importing countries.

The latest EU (weighted) average milk price is available for December 2014 (pictured March 5). At that date the average price paid to farmers was 18% less than in December 2013, with some member states showing an further decline of prices (e.g. Netherlands: - 30% and Germany: -23%). This trend in prices did not lead to the lowering of production: for the milk year beginning April 2014, there is a cumulative year-on-year increase of 4.2% at EU level (Dairyco.org.uk/market- information website). The EC explains the rather slow reaction of farmers to lowering prices by stating that milk collection has been stimulated by very good forage availability, including during the summer, and by strong milk prices (EC, 2014)[4]. Moreover, the number of dairy cows increased because farmers have been preparing for milk quota abolition in April 2015. For the whole year 2014, the EC projects EU milk deliveries could reach 146.4m tonnes (+3.7% compared to 2013). In 2015, milk collection could increase further by up to 1.6%, which is significantly less than in 2014. Three main elements will play a role in this lower increase: a decrease in milk collection in the first quarter of the year in the Member States bound by the quota, a rebound after the quota expires in these countries (though lower than previously expected) and a slower supply increase in the other countries due to lower milk prices expected next year.

The first indications of a slowdown in growth of milk production in the EU is that December 2014 showed a 1.3% production increase compared to December 2013, a growth rate that is significantly below the overall 2014 average. Moreover, this figure includes a 16.8% drop in output in Ireland, where producers face penalties for overproduction. With a farm gate price quoted at around or even below €30/100 kg, penalties of €28/100 kg will be an effective incentive not to produce over-quota milk in many countries.

With EU's production growth slowing down and drought doing the same in New Zealand, international dairy product prices are likely to recover in the first months of 2015. However, the signs of a price rally, if any, are fragile (see Agrimoney news items for latest figures and stories).[5] Some market analysts are optimistic because milk price decline early 2015 was less than initially expected. However, Fonterra, a leading dairy company, kept its forecast for the price it will pay to its farmers at an eight year low level (28 February), although dairy commodity values had risen. Rabobank said that 'global supply is still relatively strong in most key export regions', although acknowledging that 'production growth is now slowing'. And China, the top dairy importer, 'remains mostly sidelined by the market' thanks to slowing growth in domestic demand. 'A major recovery in global commodity markets is still a few months away', the bank said (Agrimoney.com, 28 February).

[3] http://www.fao.org/worldfoodsituation/foodpricesindex/en/ retrieved March 5, 2015

[4] EC, DG AGRI (2014). Short term outlook for arable crops, dairy and meat markets in 2014 and 2015. Short term Outlook no. 10. Autumn. Data available until 15 September 2014 have been used.

[5] Note that the (monthly) FAO dairy price index increased from 174 in January 2015 (lowest level since July 2010) to 182 in February 2015

3 Expected developments in the Netherlands

3.1 Recent developments in Dutch dairy

3.1.1 Sector structure

Figure 3.1 summarises the evolution of the Dutch dairy sector over the period 2000-2014. This is a period for which the milk quota still applies. During the quota period a steady decline of the dairy cow herd is observed: in the period 1983-2007 the total dairy cow herd declined by 41% or by of about 2.1% per annum. This decline reflects the milk yields growth per cow, as well as the quota constraint faced by farmers. As a result of the EU's so-called soft landing-policy strategy, over the period 2009-2014 the milk quotas have been annually increased by 1%. In several EU member states this soft landing strategy implied a gradual phasing out of the milk quota, viz. the milk quota constraint not being binding anymore. In the Netherlands, though, the quotas have been effectively constraining milk production continuously.

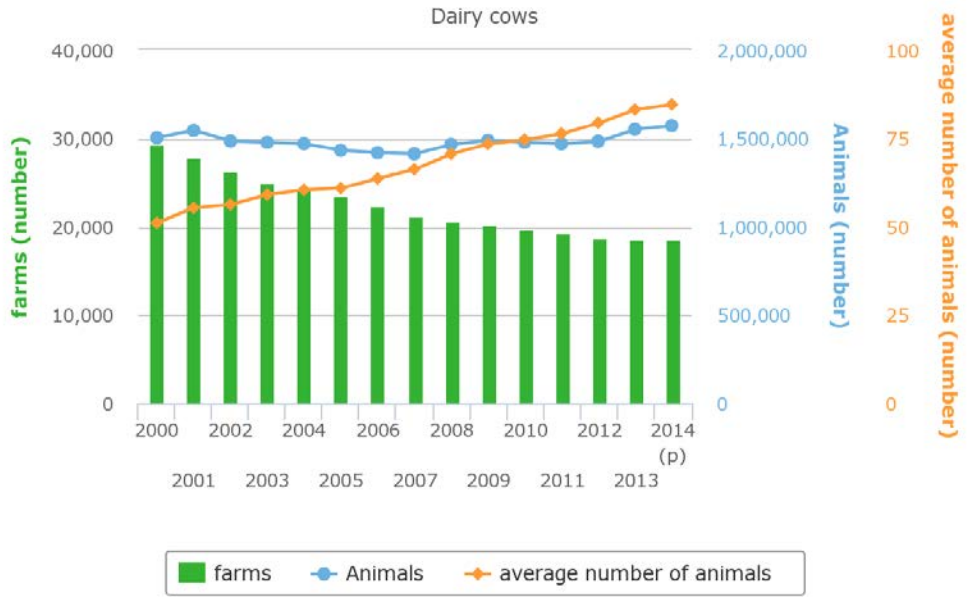

Figure 3.1 *Evolution of the Dutch dairy sector in the period 2000-2014*
Source: LEI, Agrimatie based on CBS Landbouwtelling.

Figure 3.1 also illustrates that the size of the dairy herd of the average dairy farm has increased steadily from about 50 in 2000 to more than 80 animals in 2014. This increase in scale continued irrespective of the quota system, although it has been facilitated by the tradability of the milk quota in the Netherlands. As Figure 3.2. shows, the increase in herd size or dairy farm scale allows farmers to reduce their per unit cost of milk production, or equivalently to increase their margin per litre of milk produced. The cost of production is derived from LEI's FADN (various years). The per unit cost of production is influenced by various factors, of which labour costs and feed costs are represented separately. Figure 3.2 shows that the cost of production of milk declines with the increase in farm size. This is in particular due to the decline in labour costs per kg of milk, as well as the decline of other costs. The latter category includes a variety of costs, including the per unit costs associated with fixed factors (e.g. buildings, equipment, machinery), which clearly show a tendency to decline with increasing farm size. Roughly speaking each additional 15 dairy cows contribute to a decline in the per unit cost of milk by 1 eurocent/kg (for a farm expanding from 60 dairy cows to 75 dairy cows this

implies a pure cost reduction gain of about €6,000). From some additional analysis it was estimated that under the current conditions (based on 2011-2013 data), the optimal farm scale (the farm scale associated with the minimum per unit cost of production) is at a herd size of about 210 dairy cows[6]. Note that with respect to feed costs differences in performance over different farm sizes are negligible. This phenomenon of scale economies provides dairy farmers with a clear incentive to expand their farms.

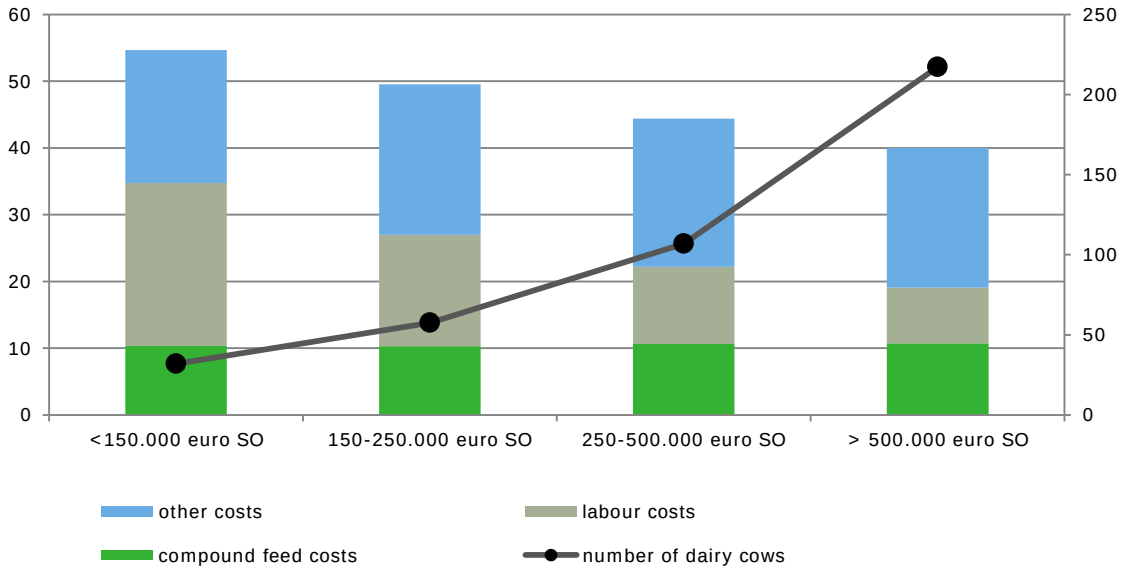

Figure 3.2 *Costs of production and the size of dairy farms (2011-2013 averages)*
Source: LEI FADN, averages over 2011, 2012 and 2013. Note: SO = standardized output.

Based on information about the farm characteristics underlying Figure 3.2, the average milk production per hectare is estimated to be close to 15 thousand kg, with relatively large farms having a higher than average milk production per hectare of land (grassland and forage area). So, large farms are using land in a more intensive way and are also using more purchased (roughage and concentrate) feed input per cow than small farms.

As Figure 3.1 shows, the number of dairy cows has increased since 2012. This could be seen as an anticipating response of Dutch dairy farmers to the announced milk quota abandonment on 1 April 2015. Dutch milk supply has increased also in these years (see also Figure 3.4 below), thereby leading to production in excess the quota level.

3.1.2 Milk price and milk supply

As has been shown in the previous section, the dairy herd and the average size of a farm has increased substantially over time, and thus also the milk output per dairy farm. The aggregate milk supply remained roughly within the boundaries of the milk quota levels, with some minor deviation to those levels. As can be observed from the recent past, although the milk quota system has remained in place, milk prices in the EU have been much more volatile since 2007 (see Figure 3.3). In the period 1982-2006 the average variability of the milk price (difference between highest and lowest observed price) was about 4.5 eurocents/kg. This variability mainly resulted from seasonality. More recently, this variability has roughly doubled to 9.7 eurocents/kg (average for the period 2007-2015). The increased variability, which is equivalent to nearly 30% of the average milk price over this period,

[6] The optimal farm scale is a variable that is dependent on technology and prices and as such a number that will move over time.

is mainly due to the increased transmission of movements in dairy product prices at world markets to the Dutch or EU dairy market. This is the result of EU policy changes to reduce export subsidies and lower intervention prices for dairy products.

Figure 3.3 also shows how the price support has been brought down since 2004. The intervention price has been stepwise lowered to a level equivalent to €0.213 per kg of (standardised) milk. At this low level, price support is offered only as a safety net in order to cope with very extreme events. Note that after the introduction of the milk quota system in 1984 (with quota allocated applying some formula to the 1983 deliveries) initially milk prices (measured in nominal terms) increased until about 1988, after which they have roughly been stable (except for the regular seasonal variation) until early 2000. Thereafter prices gradually declined in both nominal and real terms mainly as a result of the declining price support following from the Midterm review of the CAP. This reform implied a stepwise reduction of SMP and butter intervention prices by 15 and 25 per cent respectively, while also the milk quota were stepwise increased by 1.5 percent (known as the soft landing strategy).

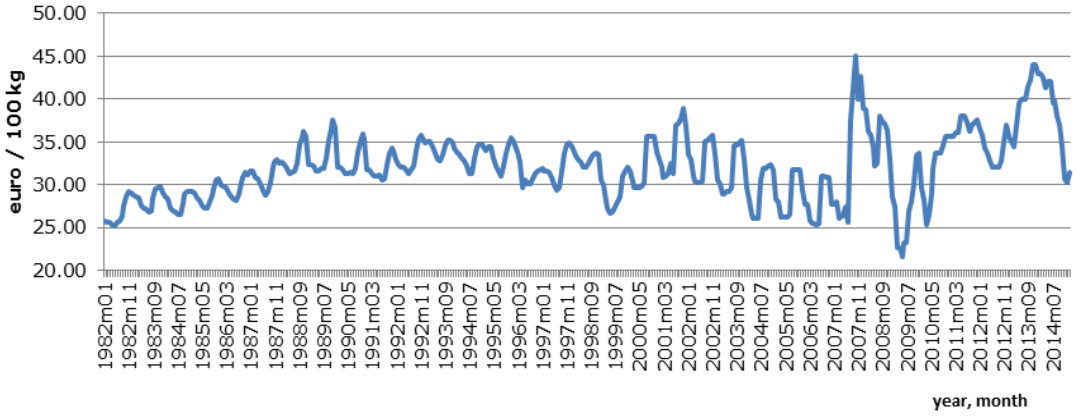

Figure 3.3 *The Dutch milk price evolution: monthly farm gate price for raw milk*
Source: DG-AGri, Milk market observatory

Figure 3.4 shows the evolution of Dutch milk production since the introduction of the milk quota in the early 1980s. After a few quota-reduction rounds, the milk quota stabilised Dutch milk supply around 11m tonnes in the period 1991-2006, after which a gradual increase took place[7]. This increase roughly followed the gradual quota increase that was part of the EU's so-called soft landing-strategy. In 2013 milk supply increased by about 4.7%, while the number of dairy cows increased by about 4%. In 2014 Dutch milk production showed again further increase by an estimated 2.5%. The growth in milk supply beyond the quota level reflects how farmers were anticipating the announced milk quota abandonment. It might also be a response to the growing uncertainty in these years with respect to new environmental regulatory constraints that might be imposed to the sector. The total dairy cow herd in 2014 is about 1.57m dairy cows, a number comparable to the dairy herd in 1996. For comparison: in 1983 the total herd size amounted to 2.5m dairy cows, implying the current herd size to be about 38% lower than that of 1983.

[7] The sharp fluctuation in 2001 is related to a foot and mouth disease outbreak.

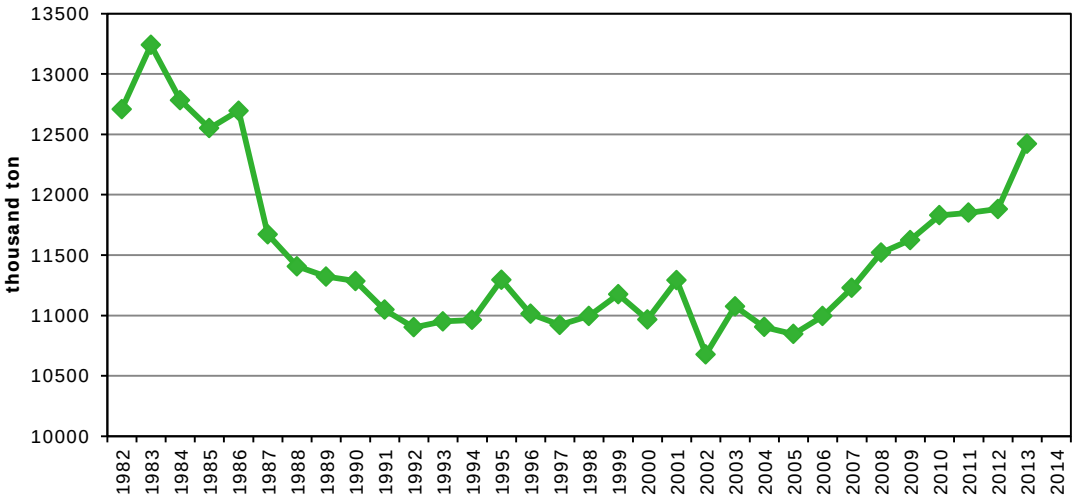

Figure 3.4 *Evolution of Dutch milk supply in the period 1982-2014*
Source: LEI: Landbouwcijfers, various years and AGMEMOD-database

The gearing up in readiness for expansion of milk production in the quota-free period and the over-quota production in milk year 2013/14 of about 475m kg implies that the Netherlands will have to pay a super levy of about €140m (other countries with super-levy payments are Germany (€300m), Poland (€160m), Ireland (€75m) and Denmark (€29m)). This is the highest super-levy bill since the introduction of the milk quota in 1984. It is expected that the over-quota production in 2014/15 will be more limited (see Chapter 2), but still the Netherlands will have to pay a significant levy to Brussels. The EU Commission recently decided that EU dairy farmers may pay their super-levy bills in three interest-free instalments, which are likely to be spread over the period 2015-2017.

3.2 Drivers of Dutch milk production

This section considers key drivers of future Dutch milk supply. Three drivers have been identified, being the margin per kg of milk produced to dairy farmers, the production capacity at farm level and the regulatory framework. It is assumed that all milk produced can be marketed and sold (see Chapter 5, where this issue is addressed). The demand side is therefore not separately assessed as a driver, although its influence is recognized to be important and will affect farmers via the milk price.

3.2.1 Milk and feed prices

Two key factors determining the margin farmers make on producing milk are the farm gate milk and feed prices. As Figure 3.5 shows, the factory price of milk and the feed concentrate price tend to move in a similar direction. However, as also can be seen from Figure 3.5 the milk price/feed price ratio tends to slightly worsen over time (the margin narrows) and, as was already noted before, since 2007 the variability of milk as well as feed prices increase.[8] Based on the outlook at the international markets for dairy products and the expected cereal and oilseed market developments (contributing to a downward trend of all main feed commodity compounds; see Chapter 2) the milk/feed price ratio is expected to increase over the coming years. However, in the Dutch dairy system for which grazing and own roughage production (silage grass and silage maize) are important characteristics (concentrate) feed costs is only a part of the farmer's production costs (see Figure 3.2). The assumption underlying the projection of future milk production follows from the modelling analysis and implies a further decline of the output/input price ratio (see Figure 3.7 for further details), basically indicating that labour and 'other' costs will become more important in milk production costs.

[8] As can be derived from Figure 3.5, the milk price/concentrate price ratio tends to decline over time, although it fluctuates from year to year. Early 2000 the milk price/feed price-ratio was about 1.9, whereas in 2013/14 it has declined to 1.4. For a good comparison one should also account for changes in the feed efficiency per kg of milk (feed conversion rate).

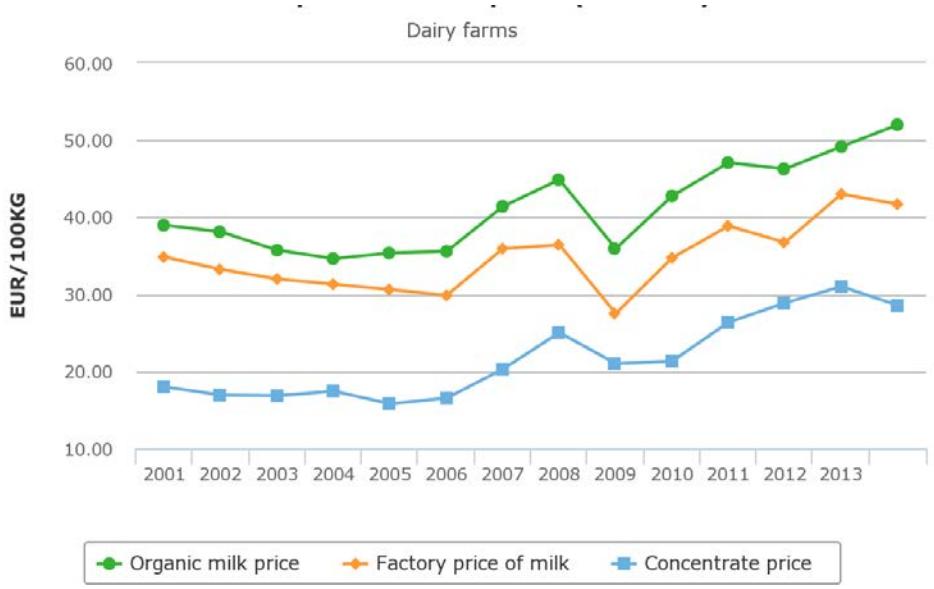

Figure 3.5 *Milk and compound feed prices, 2000-2014*
Source: LEI, Agrimatie based on FADN

3.2.2 Production capacity and production factors

A second factor which will co-determine future milk production is the production capacity. Dairying is a capital intensive sector and as such expanding dairy production requires serious investments into production factors like land, buildings, machinery and dairy herd. In the Dutch situation land is a scarce and expensive factor (see further details below). As regards the production capacity as defined by stables or cow sheds, the dairy sector made substantial investments in recent years, partly renovating old buildings but also expanding its production capacity. Moreover, due to the milk quota and the over time increasing milk yields (genetic progress) cow numbers declined, creating spare capacity in the existing stables. It is estimated that the underutilisation of the existing stables allows for about 10 to 15% increase of the Dutch total dairy cow herd, without needing any further investments.

As regards the projections of future milk output, the observation presented above implies that considerable production expansion is possible within the current capacity. Taking into account an autonomous milk yield growth of about 1% per annum, during the next decade milk production could expand by about 20% (10% more cows having a 10% higher yield) without needing extra investments beyond the normal level of investments (replacement investments).[9] Whether these idle capacities will be used once the quota expires depends to a great extent on the environmental regulatory framework. This issue is discussed in the next subsection.

3.2.3 Environmental constraints

The Dutch government wants a sustainable growth of the dairy sector, implying that the constraints as they follow from the Nitrate Directive will be taken into account. In collaboration with the sector a plan has been made in 2014 which has led to the law “Verantwoorde groei melkveehouderij” or Responsible Growth Dairy Farming (RGDF) adopted December 2014 and applicable to the sector from 1 January 2015. Key elements in the RGDF law regulating the space for manoeuvre for the dairy sector are:

[9] Note that this refers only to capital goods and not to land. When the production will be tied to land, increasing production would most likely imply additional investments in land, thereby increasing the marginal costs of producing additional milk.

- The phosphate production from dairy cows is determined at farm level by taking the animal numbers in 2013 and multiply these with the manure excretion standards (forfait-based) for 2015;
- The calculated phosphate output is compared to the land a farmer has in use and the 2013 application norms;
- The difference between the calculated phosphate production and the possibilities to place this on the land in use is the so-called Phosphate reference 2013. All dairy farms having no manure surplus get a Phosphate reference of zero. The Phosphate reference is farm specific and non-tradable among farmers but it can be moved on the farmers' successor (requiring a first degree family relationship between the farmer and his successor).
- A dairy farmer having a zero Phosphate reference may expand his business utilizing still unused placement possibilities on the land he uses. Farmers having a non-zero Phosphate reference can produce within the existing limits (produce up to their Phosphate reference 2013), which then will usually imply that they have to find outlets for the surplus part of their manure, i.e. placing this at other farmer's land by making manure placement agreements. Any growth beyond the Phosphate reference (the so-called dairy cow phosphate surplus) will have to be compensated by either acquiring more land (including farmer to farmer contracting of land), 100 percent manure processing or a combination of both measures (EZ, 2015a).

The RGDF-law ensures that growth of the dairy sector will take place within the limits as imposed by the Nitrate Directive. As such this does not imply that dairying has to be tied to land. Already soon it became clear that, from an economic point of view, expansion of dairy production combined with 100% manure processing (landless-growth) could become an attractive option (EZ, 2015a). However, linking dairy production to land has been a broad concern that is to different degrees shared by society, politics and also stakeholders in the sector (dairy processors, farmers union LTO). For that reason the legislator announced already in December 2014 that additional conditions would be added to the RGDF in order to preclude landless-growth of milk production in The Netherlands[10].

The additional conditions imposed on farmers beyond what has already been specified by the RGDF are determined by an order in council (Algemene Maatregel van Bestuur). A draft order has been published 30 March 2015, which indicates that, depending on their current phosphate surplus per hectare, dairy farmers that would like to expand their production beyond 2014 levels have to acquire additional land in order to be able to place part of the additionally produced manure on this (EZ, 2015b). Dairy farmers having a dairy cow phosphate surplus of more than 50kg per hectare and that are further expanding production will be allowed to offer a maximum of 50% of the additional manure for being processed. The remainder or other half has to be placed on land taking into account the legal application standards (see Figure 3.6). Dairy farmers with a dairy cow phosphate surplus in the range of 20 to 50kg phosphate per hectare of land are allowed, when they expand milk production, to have 75% of the additionally produced manure processed (see Figure 3.6). The remainder 25% will have to be put on land. Farmers having a dairy phosphate surplus of less than 20 kg phosphate per hectare face no additional restrictions when they are growing (they may, within limits, opt for landless growth). So farmers having a dairy cow phosphate surplus of 20 kg phosphate per hectare or more, when expanding their production, will also have to expand their land base. This can be done in non-proportional way: a farmer expanding its milk production by x% will have to increase its land base with less than x%. As figure 3.6 illustrates, the higher the dairy cow phosphate surplus, the more land will have to be attracted per unit of milk production expansion. This implies that for dairy farmers that have already an intensive way of production (have a relatively high milk production per hectare of land) achieving additional growth has become more costly since it will require making additional costs or investments for attracting land.

[10] Several scenarios have been analysed which could strengthen the link of dairy production to land (pasture and forage area) (see De Koeijer et al, 2014 and 2015 for details).

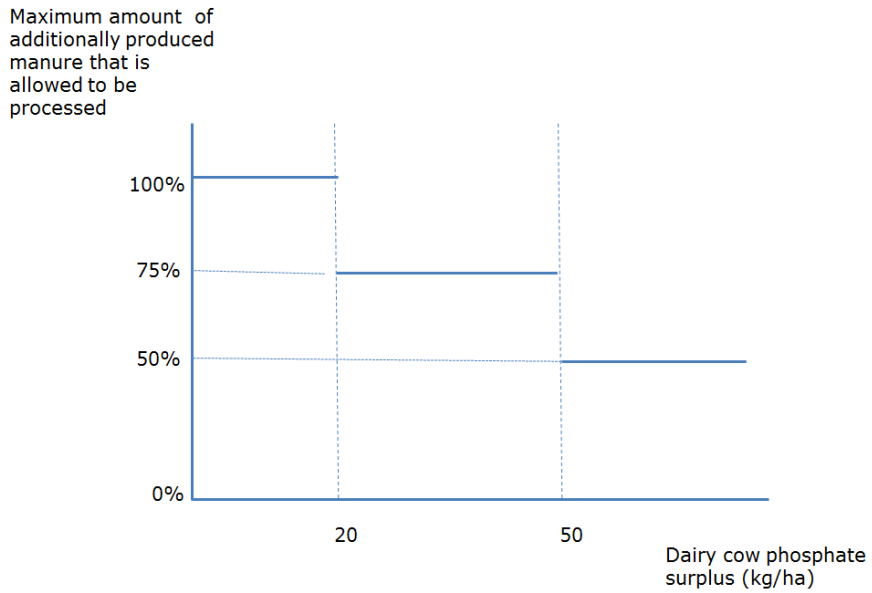

Figure 3.6 *Relationship between dairy cow phosphate surplus and manure processing.*

Summarising, this set of rules implies that milk production becomes more closely tied to the land. Although it more or less accepts the situation in 2014 as a status quo, additional growth beyond that level will require additional land for all farmers having a surplus of 20kg phosphate or more. In 2013 about 75% of the dairy farms had a dairy cow phosphate surplus of less than 20kg/ha. About 14% had a surplus in the range of 20-50kg phosphate per hectare and 12% had a surplus of 50kg or more (EZ 2015a)[11].

Although a detailed assessment was beyond the scope of the current analysis, it is felt that the new legislation still allows for considerable growth possibilities of the Dutch dairy sector[12]. The hectares of land the dairy sector could attract, either purchasing or renting it, or because they are able to fix manure placement rights to land owned by other sectors (e.g. the arable sector), will determine how much manure can be placed, which in turn determines the maximum amount of dairy cows and/or milk that can be produced[13].

The total phosphate plafond applying to the Netherlands amounts 173m kg. Within this limit as specific phosphate plafond for the dairy sector an amount of 84.9m kg. phosphate is sometimes used[14]. Further increase in the dairy cow herd might create a risk that the dairy specific phosphate plafond might be hit and might even go to be exceeded. According to De Koeijer et al as compared to the situation in 2009 a 20 percent increase in milk production will be possible within the limit of the phosphate plafond, taking into account that the sector will take several measures to reduce the amount of phosphate excretion (for example by developing concentrate feeds with low phosphate levels)[15].

[11] De Koeijer et al (2015) has as estimates 70, 20, 10, which is slightly different.

[12] The Order in Council specifying the additional conditions was published in the same week as this study was finalized. Moreover, assessing the implications of the new rules will require a detailed analysis at farm level, whereas the focus of this study is at sector level. The sector model tool used for this analysis does not easily allow for inclusion of the impact of the new legislation without having an analysis at micro-level underpinning it.

[13] See for details about the manure excretion and manure application rates Remmelink et al. (2014).

[14] Note that under the current legislation there are restrictions on the exchange or substitution of manure between sectors (e.g. between dairy and the intensive livestock sector). There is still a slack in the total manure that can be produced according to the plafond. See for details De Koeijer et al 2014.

[15] Secretary of State Dijksma has announced that expansion of manure production beyond the phosphate plafond will lead to additional measures for the sector.

3.3 Expected Dutch milk supply

The expected milk supply will be co-determined by the expected milk price (see drivers discussed in previous section). The future milk price in the Netherlands will be a derivative of the prices that can be made for different dairy products (e.g. butter, cheese, yogurts, skimmed milk powder, whole milk powder, whey, other dairy ingredients) at different markets (domestic and world market). Figure 3.7 provides an estimate of the projected milk price evolution, taking into account conditions at aggregate EU and world market for dairy products, as foreseen in the latest OECD-FAO's Agricultural Outlook (see discussion in Chapter 2) and a further refined analysis of the responses by EU member states, as derived from the EU baseline analysis with the AGMEMOD modelling tool[16]. As Figure 3.7 shows, the milk price in 2015 is expected to be lower than that of 2014. In 2016 a further decline in the milk price is expected, which is mainly caused by the increase in milk supply due to the quota abolition. Figure 3.7 also includes an index representing the input cost evolution, which includes alongside the cost of feed also other costs, such as costs associated with energy, veterinary services and capital costs. As can be seen from the figure the rate of increase of costs is higher than the milk price increase, implying a worsening of the output/input price ratio over time.

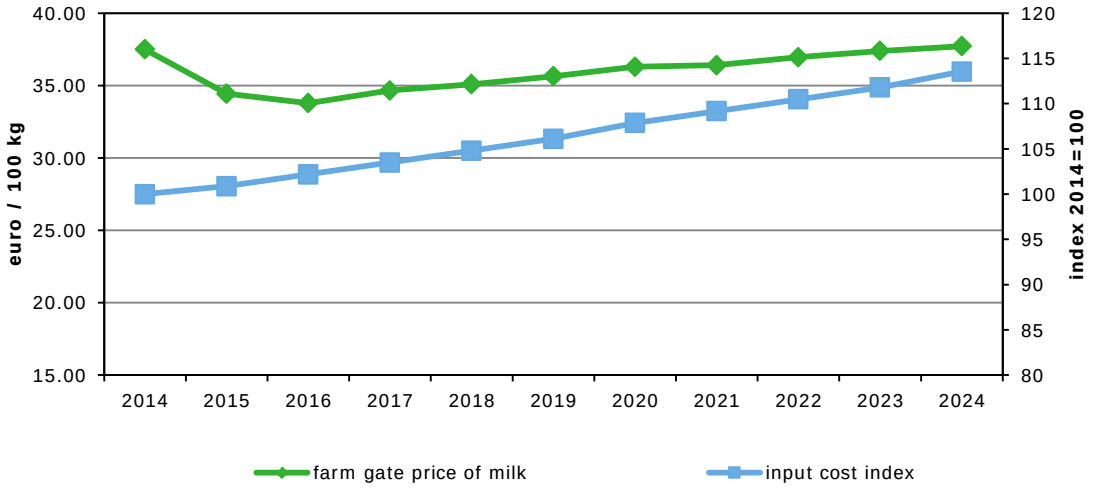

Figure 3.7 *The projected producer price of milk at farm level (euro/100kg, excluding VAT; standardised at 3.7% fat and 3.5% protein) and cost index for The Netherlands*
Source: based on own calculations and AGMEMOD modelling market outlook analysis

The projected Dutch milk supply, taking into account the milk price evolution as presented above, is presented in Figure 3.8. This estimate is based on input from the AGMEMOD outlook modelling tool, the results of which are adjusted according to expert information from and gathered by the authors. The Dutch milk output is expected to increase to 14.9m tonnes by 2024 (+17.4% to 2014). The grey lines provide a kind of confidence interval, emphasising the uncertainty with respect to the regulatory constraints and their impact on the evolution of the dairy cow herd. The lower grey line (lower bound) assumes that the dairy cow herd will not be allowed to exceed 1.6m dairy cows. Moreover, it is assumed that the phosphate excretion per kg of milk can be reduced by innovations in the compound feed technology. Together these assumptions approximate the estimated possible growth in milk production under relatively strict environmental constraints (not allowing competition for manure placement between sectors, satisfying the phosphate plafond specified for dairy). The upper bound

[16] AGMEMOD is an econometric, dynamic, multi-product partial equilibrium model that allows to make projections and simulations in order to evaluate measures, programmes and policies in agriculture at the European Union (EU) level as well as at the Member States level. The model has been recently adjusted to improve its suitability for making market outlook analyses. See for http://www.agmemod.eu/ for further details or Chantreuil et al (2012).

line is the projected milk production assuming a lower input costs increase, due to assumed lower costs for manure treatment (less strict environmental regulation, allowing for industrial processing options).[17] As Figure 3.7 indicates, the abolition of the milk quota will not lead to a big one shot jump in milk production, but has been translated into additional growth that is smoothed out over a number of years and then gradually levels off[18].

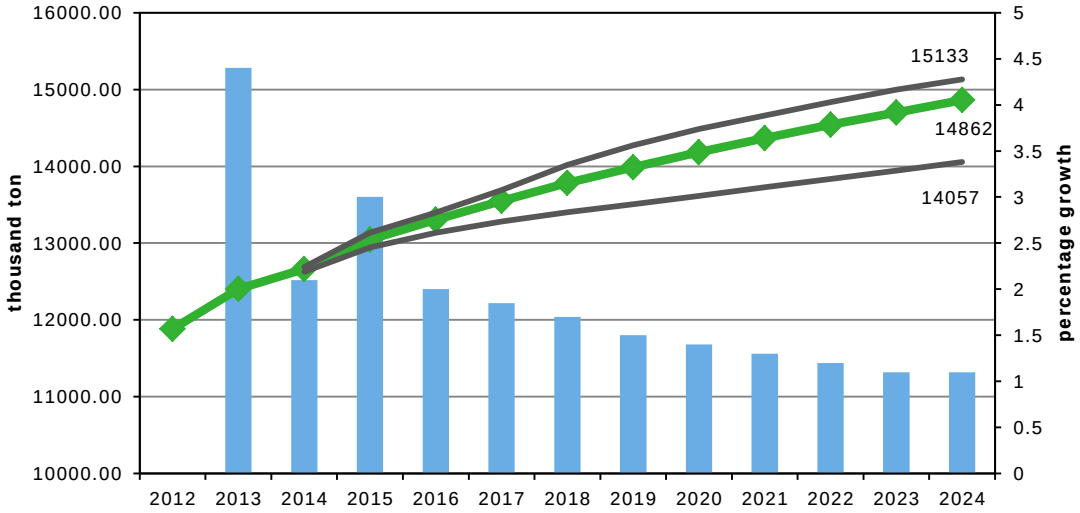

Figure 3.8 *Projected milk supply in the Netherlands for the period 2015-2024 (in 1,000 tonnes, left axis; annual growth rates; right axis)*
Source: based on own calculations/modelling analysis complemented with expert assessment

Note that in particular with respect to the longer run there are considerable uncertainties. The evolution of the milk price (see Figure 3.8) is already relatively favourable when comparing it to crop prices (i.e in particular cereals). In case the price evolution of root crops (sugar beet and potatoes), which are important in the Dutch arable crop mix, would lag behind more than under the current assumptions, new entrants might come in (e.g. arable farms that convert to dairy), which would allow the dairy production to further grow (Jongeneel, 2014). Moreover, as regards the competition for manure placement space, determining on its relative profitability and the flexibility included in the manure regulation, the dairy sector could outcompete the intensive livestock sector (in particular the pig sector). Under the current legislation competition for manure placement space between sectors is effectively prohibited. Under more flexible conditions there is clearly a potential in the Netherlands to end up with a future milk production that significantly exceeds 20m tonnes.

[17] Taking environmental constraints into account in a sector model is not easy and is necessarily done in a rough and approximate way. So this result should be interpreted with due care and has been mainly added to make the reader aware of the general uncertainties associated with the environmental constraints. Another reason to use a lower cost estimate is that the concentrate feed and energy costs might turn out to be lower than has been foreseen in the OECD-FAO agricultural outlook (see also discussion about uncertainties in chapter 5)

[18] Note that the AGMEMOD projection tool only takes into account systematic factors and sketches the trend that this will lead to. The impact of incidental factors (such as weather conditions, external shocks in world markets such as a drought in New Zealand or an unexpected change in the euro-dollar exchange rate) is not accounted for. As such it neglects the volatility in prices and fluctuations in quantities that are normally observed from year to year.

4 Expected developments in the EU and some selected Member States

4.1 EU dairy production

The expected evolution of EU-28's milk production is a result of what will happen in different member states (see some further details in next section). According to the medium-run outlook of the EU Commission of December 2014 EU milk production is expected to increase from 146.5m tonnes in 2014 to 158.3m tonnes in 2024 (+12m tonnes or equivalently +8%). The increase in 2014/15 is expected to be about 1.6%, while the observed increase in the year before was 3.8%. The longer run trend shows a growth rate of about 0.8% per annum. It should be noted that the projected increase in EU milk production (+8%) is larger than the projected increase as it was accounted for in the OECD-FAO's Agricultural Outlook (increase about +4%; see Chapter 2). While in this analysis the world market price evolution has been taken as given, based on the OECD-FAO's estimate, the higher milk increase we (and the EU Commission) obtained may impose some further downward pressure on prices (see also discussion below).

As Figure 4.1 shows, the total dairy cow herd in the EU is expected to gradually decline, after having shown some increase during 2014. The increase in EU milk production is driven by the favourable expected milk price evolution. At the same time it is accounted for that different member states will show a different evolution of their milk supply, with some member states expanding production, while in other member states milk production might stagnate or even decline.

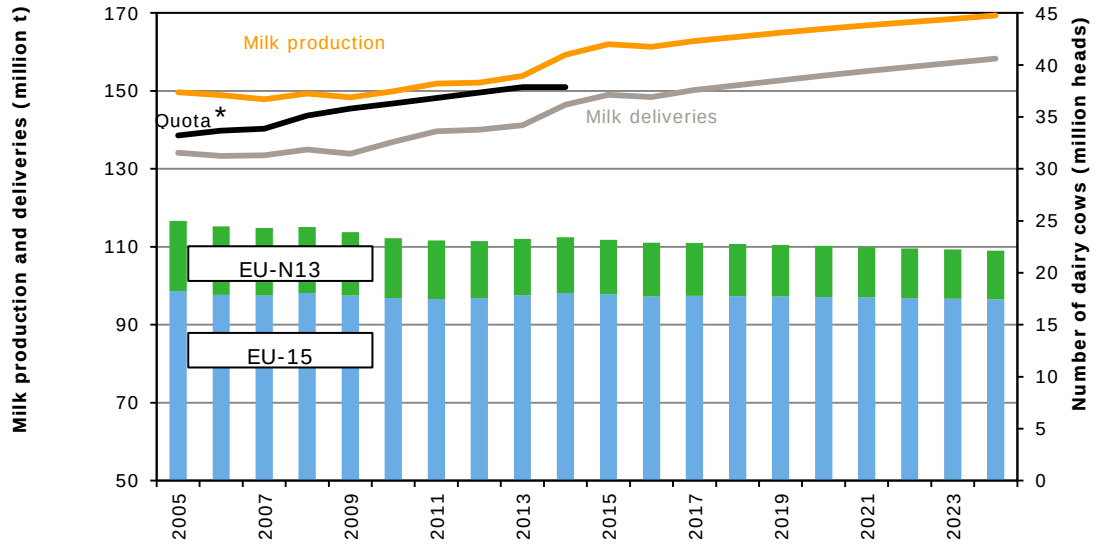

Figure 4.1 *Projected evolution of EU milk production, deliveries and dairy cow herd*
Source: DG Agri (2024 Prospects for EU Agricultural Markets; Brussels, 5 December 2014)

The EU's increase in milk supply will be in particularly used to expand EU cheese production, for which there is still a potential growth in consumption in the domestic market. However, given the limited growth projections for the consumption of dairy products in the EU's home market, most of the additional milk supply will have to be exported to the world market in the form of various dairy products (e.g. cheese, skimmed milk powder, whey, butter). As a result the EU's market share in world trade of dairy products is likely to increase, in particular for whey (about 60%), cheese (close to about 40%) and skimmed milk powder (about 30%). This not only underlines the increasing reliance

of the EU on world markets of dairy products for the valorisation of its milk, but also makes clear that the developments in the EU may affect price formation at world markets.
The EU's increased reliance on third markets will increase the sensitivity of the EU dairy sector for shocks at these markets. Recently a significant shock was felt with the imposition of the Russian trade ban in 7 August 2014, which can be seen as an experiment or test case to evaluate the robustness of the new regime. Between 2011 and 2013 EU exports of dairy products to Russia accounted for 1.4% of EU milk production (for specific member states this share could be substantially higher) and for 13% of EU exports. The Netherlands, together with France, Germany, Belgium and Denmark, belonged to the main exporters of dairy products to Russia (measured in volume terms). As regards specific dairy products, close to one third of the EU's cheese exports and about 25% of the EU's butter exports went to Russia. As such the Russian ban on EU dairy product exports to Russia implied a severe shock to the system. The impact of the shock has been a shift in EU exports to different market outlets (e.g. increasing butter exports to the US, putting additional cheese on the home market in specific member states), which required accepting lower prices in order to induce sufficient take up in these alternative outlets. The sector has turned out to be resilient in that the negative impact of this shock of losing such an important export market on the milk price was, in relative terms, limited (although varying over member states), irrespective of 2014 being a year with above average deliveries. EU milk prices stayed far beyond the safety net provision-level of €21.5/100 kg for all EU member states.

4.2 Evolution of milk supply in selected Member States

As has been already mentioned before, the milk increase at EU level, which shows a modest growth, is a result of developments taking place in different member states. The general pattern is that milk production is likely to expand in a band in Northern Europe (excluding the Scandinavian member states), where the production circumstances are relatively favourable. Estimates (in % as well as volume terms) about the milk supply increase in selected member states are presented in Table 4.1. Note that the projected increase of the selected member states is more than 12m tonnes. The estimates of experts differ in particular with respect to Ireland and Poland. The estimates presented in Table 4.1 for these countries might be still somewhat conservative (a 10 percentage points higher increase of the milk supply for these countries is still within the range of expert estimates found for these countries).

Table 4.1
Expected milk supply increase in period 2014-2024 for selected EU member states

Member State	Milk supply change (%)	Milk supply change (million tonnes)
Netherlands	17.3	2.2
Germany	9.5	3.1
Denmark	8.0	0.4
Poland	14.7	1.8
Belgium	6.1	0.2
Ireland	27.2	1.7
United Kingdom	4.5	0.6
France	8.9	2.4
Total		12.4

Source: based on own modelling calculations (PPS Market Outlook calculations February 2015), the EU medium-term outlook (December, 2014) and experts from different member states.

EU member states that are expected to show a decline in future milk production are Spain, Italy, Greece, Bulgaria, Hungary, Czech Republic, Slovenia, Slovakia and the Scandinavian countries Sweden and Finland (European Commission, 2014b). In volume terms the impact of the decline in their production on the EU-28's total production is expected to be limited. The real impact might even be more limited, because the EU's prospects do not yet take into account the full implications of the CAP

towards 2020-reform. This reform allows member states to take side measures (including the option of introducing voluntary coupled payments for dairy farmers) that could help farmers in more marginal areas to continue dairy production.

5 Uncertainties

The outlook presented in the previous two chapters is conditional to a set of assumptions about the policies in place, the responsiveness of market participants and the future values of exogenous market drivers such as the macroeconomic environment or weather conditions. This chapter points at the macroeconomic environment that has changed significantly in 2014 and discusses the possible impacts of these changing environment on the outcomes projected. Next, the impacts of recent and most plausible future policies relevant for the dairy sector are discussed and interpreted.

Economic growth

Projections of GDP growth are continuously updated by IMF, World Bank and other institutes like central banks of national states. In its January 2015 update IMF raised its growth projections for the US, indicated a decline of China's economic growth in 2015/16 by 0.5% and slightly reduced growth rates of the euro area and Japan for the coming two years. A much weaker outlook is projected for Russia, due to the decline of the oil price, the devaluation of the rouble and the trade sanctions with the EU and a number of other countries. Other countries that produce a lot of oil, such as many Middle Eastern countries and some countries in Latin America, will also suffer from low oil prices.

Figure 5.1 shows the GDP growth projections for the Russian Federation, assumed in the 2014 Outlook (based on IMF and World Bank projections in early 2014) and two consecutive updates by the IMF. The Russian economy shows a sharp slowdown, which also severely weakens the outlook for other economies in the Commonwealth of Independent States (CIS) group. In its February 2015 update the World Bank revised its Russia GDP growth forecast for 2015 to -3.8 percent, indicating a continued weakening of the Russian economy.

A marked slowdown of economic growth in China and Russia would affect the rest of the world, as exports to these countries would weaken. A serious decline of economic growth in these two net importing countries of dairy products (as are the oil exporting countries in the Middle East and Venezuela) would probably have depressing effects on international prices of dairy products and could reduce the export opportunities for EU/Dutch dairy products, with the consequently effect of lower prices and a disincentive for further expansion of milk production.

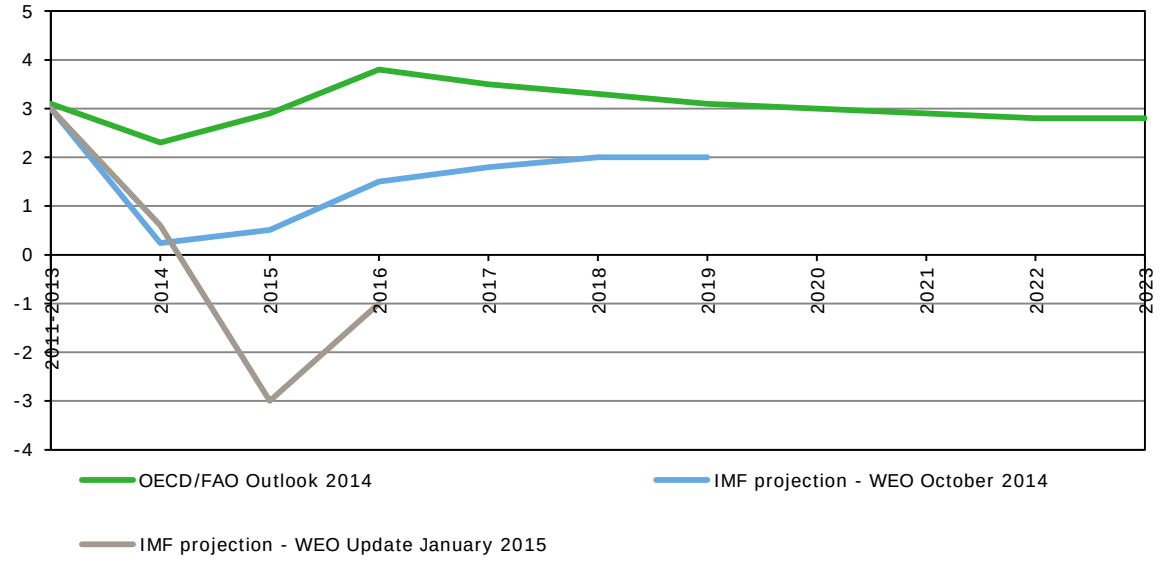

Figure 5.1 *Different GDP growth projection for the Russian federation reflecting the increased uncertainty*

Oil prices

The World Bank's revised outlook for the Russian economy builds on a projected oil price of USD53/barrel in 29015 and USD57/barrel in 2016. The latter shows the dramatic decline of the oil price since early 2014, see Figure 5.2, when oil prices fluctuated around USD100-115/barrel. OECD/FAO Agricultural Outlook assumes a steady increase of the Brent oil price of 110 (in 2014) up to USD147/barrel in 2023. Based on the future oil price growth rates of the World Energy Outlook (IEA, 2014) it can be assessed that the value in 2023 as it is foreseen at closing the writing of this report is approximately USD 90/barrel (-39 percent as compared to the estimate used in the OECD-FAO Agricultural Outlook that was taken as a starting point for the current analysis).

What does this imply for the agricultural markets? The contemporary food system is very reliant on cheap oil, as oil refined for gasoline and diesel is used to run tractors and other farm vehicles and equipment whereas food processing and delivery is highly oil-based. Moreover, the oil price is a key determinant of the chemical fertilizer price. Oil prices impact food prices through production costs, but also through their impact on demand for food crops as biofuel feedstock (see Baffes, 2009). Lower oil prices projected throughout the outlook period would imply an upward trend in production, yields and demand as food production costs would be lowered and feed stocks for biofuels would lose its attractiveness, all resulting in lower food prices compared to the levels projected in the Outlook.

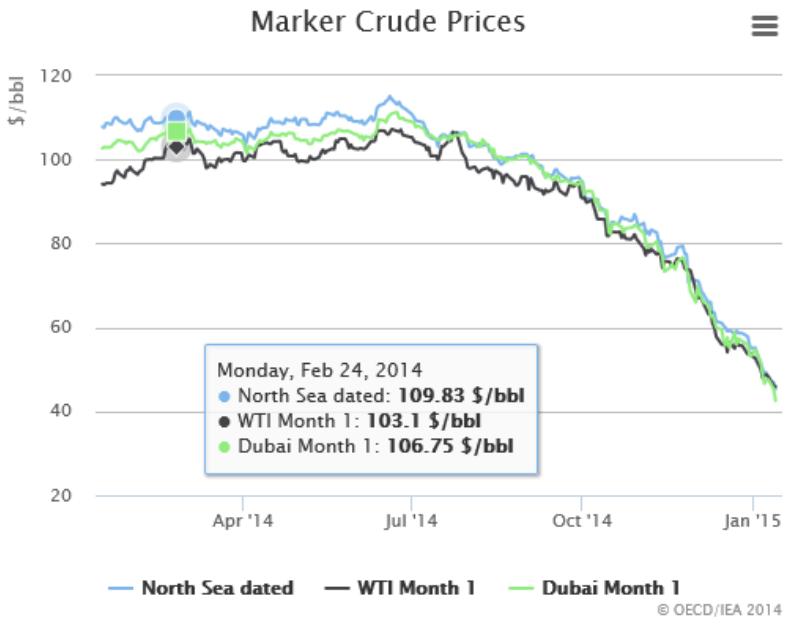

Figure 5.2 *Dramatic oil price decline during second half of 2014*

Exchange rate fluctuations

The Outlook assumes a EUR/USD value of 0.75 over the projected period. This reflects a long-term average ratio comparable to what it has been over the past ten year. Economic developments in 2014 and 2015 have turned into a weakening of the euro against the US dollar. On 10 March 2015 the EUR/USD valued 0.93 and experts anticipate a value of 0.91 for 2016 (ABN-AMRO, 1 April, 2015). The much lower euro value will stimulate EU exports as it improves competitiveness, whereas imports will become more expensive.

Price volatility

Price fluctuations are an inherent part of agricultural commodity markets. The *Outlook* price projections reflect the usual assumptions of stability in weather, animal diseases and in economic and policy conditions. Under these 'normal' conditions, prices are not expected to reach the peak levels of 2007/08, 2011 or 2013. However, actual price outcomes are likely to exhibit significant variations around the projection trend (OECD/FAO, 2014: 207). This may be increasingly the case for milk produced in the EU, now that the milk quota expires and production decisions are less influenced by

this policy (NZO, 2014). EU prices are therefore more affected by international demand and supply developments than before. In fact, EU milk and dairy markets are increasingly related to the international markets already since 2007 when export subsidies on dairy products were abolished. Berger (2015) also shows that since 2008 EU's milk price increasingly fluctuates, to the extent that is commonly seen in the USA. The EC expects milk prices in the EU to vary between 30 and 40 eurocents/kg (EC projections). An increasing range of price fluctuations is challenging farmers to be entrepreneurial and to enhance their ability to plan liquidity flows and/or hold financial reserves in order to overcome periods of low prices.

Thinking about financial risk management is specifically relevant to the Dutch dairy sector that is characterized by a, relative to other EU member states, high investment per kg of milk. This feature not only contributes to a high productivity, but also puts a burden in terms of financial obligations that have to be satisfied timely (e.g. payback and costs of loans). Increased price volatility will also challenge farmers' entrepreneurship with regard to short-run optimisation of production decisions: with frequently changes output and input prices which marginal kilograms of milk can be profitably produced? This includes optimising the timing of cow replacement and herd management. Increased price fluctuations need also a rethinking of the farmer's medium to long-term ambitions with respect to the size of farming. His capacity to use loans for expanding production also depends on investments and operational adjustments necessary to comply with, among others, quality standards, environmental requirements, and animal health and welfare issues.

Agricultural policies

Agricultural support to dairy producers has many forms, is widespread and changes in these policies may affect international market outcomes. Recent changes in the world's major producing countries are introduction of the US Farm Bill 2014 and proclaimed increasing investments in the dairy industry by the Russian government after it introduced import bans on dairy and other food products. The latest US farm bill contains a new 'margin insurance' programme that pays farmers when the difference between their operating income and their operating costs goes below a certain amount. It is a voluntary risk management program that replaces the direct income support instrument. Market effects of this policy change are estimated to be modest as production levels are not expected to respond to this safety net income support measure (reference). Russian government has a long-term strategy to stimulate agricultural production and become more self-sufficient in food production. While successful in pork and poultry production, the milk sector in Russia has not shown any noticeable growth in recent years. Recent USDA reports (November 2014) have predicted a decline in Russian milk production for the next two years, with 2014 production down 2.1%, followed by a further 2.0% in 2015. Reasons are the current high interest rates (limiting investment in increasing production capacity) and a fall of domestic demand (due to inflation and economic recession).

Biofuel policies and feed markets

Several countries (EU, US) have recently moderated their biofuel policies with important implications for international markets of feedstock. The EU lowered first generation biofuels targets for 2020 and the US reduced total biofuel mandates for 2014 (OECD-FAO, 2014). Consequently, the demand for feedstock (maize, oilseeds, sugar) for biofuel use will diminish. Moreover, the use of second generation biofuels (wood, waste etc.) is being encouraged (although with relatively little impact on biofuel production), but most importantly current low prices of fossil fuels are not attractive to biofuel production. The interaction between the energy and agricultural markets is highly complex, though, not least because of the many policy interventions in both markets. Any reform in the coming years in the biofuel policy area will have some impact on the biodiesel and ethanol markets and subsequently on the prices for agricultural raw material. For the coming years, however, biofuel policies and the situation at the energy markets are not expected to put further pressure on prices of feedstock. As feed is an important input for animal production sectors, this is likely to have a favourable impact on their margin.

6 Conclusions

From the analysis and discussion provided above a number of observations can be made:

- At world level the demand for dairy products is projected to continue growing also in the coming decade, although the growth rates will be somewhat lower than those observed in the past decade. In particular the demand growth in Asia, the world's most important dairy deficit region, will stimulate demand and world trade in dairy products. At the supply side there are still several possibilities for growth, but the EU's main competitor (Oceania-region) is increasingly facing environmental and water availability constraints, which is likely to slow-down its future growth potential.
- Since 2006 prices for dairy products seem to have arrived at a higher plateau. Also for the future the projected world market prices for dairy products are at a substantial higher level than in the period before 2006. Growth is still there but both on demand side and supply side (New Zealand) growth seems to slowed down a bit.
- Milk production in the Netherlands is expected to expand by about 17% or 2.2m tonnes in the coming decade. This estimate is conditional on the world market prices for dairy products reaching the levels as presented in the OECD-FAO's Agricultural Outlook, 2014-2023. The projected expansion will take place in a relative smooth way. Dairy farmers have already anticipated the quota abolition by adjusting their investment and delivery strategies.
- Future milk production in the Netherlands is projected under a number of uncertainties, which include the impact of the new manure regulation. There is also some uncertainty with respect to the world market prices for dairy products (see remark below) and macroeconomic conditions (exchange rate, oil price).
- EU milk production is projected to increase as well in the period 2014-2024, but showing a much more moderate growth (+8%) than is expected in the Netherlands. This is because some EU member states show a significant expansion of dairy production, some show a stagnating milk production and others show a gradual decline in future production. The projected increase in the EU's milk supply as it is projected in this study (and also by the EU Commission in its recent medium-run outlook) is higher than previously estimated by the OECD-FAO. For that reason the milk price evolution as projected by the OECD-FAO might be a bit too positive.
- When looking at results for selected EU member states, a growth pattern emerges in which in particular in a band comprising the northern part of the EU (excluding Scandinavia) show an above average expansion of dairy production. Milk production in the southern and and south east part of the EU (Romania being an exception) as well as in the Scandinavian member states is likely to shrink. In volume terms the impact of this decline on total EU milk production is likely to be limited.
- After the exspiration of the milk quota the expansion in EU milk production will increase the EU's reliance on the world market for dairy products (in particular for whey, cheese and SMP), because a significant part of the additional production will need to be exported to outside the EU. The EU's increasing market shares in world dairy trade makes it more vulnerable to shocks affecting world dairy markets. In addition changes in EU supply are likely to have repercussions on world market prices for dairy products (see chapter 5 for a discussion of the uncertainties).

Producing milk in a quota free world implies a number of challenges for Dutch dairy farmers. World market conditions will become more important, increasing the need for Dutch dairy farmers to be and stay competitive and to be ability to, more than in the past, cope with fluctuating output (milk) and input (feed, energy) prices. At the same time, their entrepreneurship is further challenged because they need to cope with a set of regulations (manure) and standards (quality, animal health and welfare), that will allow only sustainable growth. Being efficient, innovative and collaborate among the supply chain, elements that already characterise the Dutch dairy sector, will therefore be key to address these future challenges.

References

ABN-AMRO (2015) Visie op rente en euro; Wispelturige euro verder omlaag. Amsterdam, ABN-AMRO, 1 April 2015.

Baffes, J. (2009) More on the energy/non-energy commodity price link. WashingtonDC, World Bank, Development Prospects Group; Global Trend Team, Policy Research Working Paper 4982.

Chantreuil, F., Hanrahan, K.F., Van Leeuwen, M. editors (2012) *The Future of EU Agricultural Markets by AGMEMOD*. Dordrecht, Springer.

European Commission (2014a). *Short term outlook for arable crops, dairy and meat markets in 2014 and 2015. Short term Outlook no. 10. Autumn.* Brussels. DG-Agri.

European Commission (2014b). *Prospects for EU agricultural markets and income 2014-2024..* Brussels. DG-Agri.

EZ (2015a) Nota van toelichting bij amvb grondgebonden groei melkveehouderij. The Hague, Ministry of Economic Affairs, 31 March, 2015.

EZ (2015b) Kamerbrief: Reactie op verzoek vaste commissie voor Economische Zaken d.d. 12 maart 2015 (2015Z04476). The Hague, Ministry of Economic Affairs, 31 March, 2015

FAO Food Outlook, Rome, October 2014.

IEA (2014) *World Energy Outlook 2014*. Paris, International Energy Agency, November 2014.

Jongeneel, R., Van Berkum, S., Bont, C., Van Bruchem, C., Helming, J. and Jager, J. (2010) E*uropean dairy policy in the years to come. Quota abolition and competitiveness.* The Hague, LEI-WUR, Report No.2010-017.

Jongeneel, R. (2014) Structural change in the Dutch dairy sector: past, present and future. The Hague, LEI-WUR. Paper to be presented at IAAE conference Agriculture in an Interconnected world, August 8-14 2015, Milano. Paper made as part of the PPS Market Outlook AgroFood project.

Koeijer, T.J. de, Blokland, P.W., Helming, J.F.M. and Luesink, H.H. (2014) *Ex-ante evaluatie wetsvoorstel Verantwoorde groei melkveehouderij.* The Hague, LEI-WUR, Report 2014-019.

Koeijer, T.J. de, Blokland, P.W., Daatselaar, C.H.G., Helming, J.F.M. and Luesink, H.H. (2015). *Scenario's voor grondgebondenheid: Een verkenning van de varianten binnen het wetsvoorstel Verantwoorde groei melkveehouderij.* Wageningen, LEI Wageningen UR (University & Research centre)

LEI, Farm accountancy data network (FADN), URL http://www.wageningenur.nl/nl/Expertises-Dienstverlening/Onderzoeksinstituten/LEI/Binternet-3.htm

NZO (2015) Factsheet prijsvolatiliteit. http://www.nzo.nl/sites/default/files/pointofview/attachment/150211_factsheet_prijsvolatiliteit.pdf

OECD-FAO Agricultural Outlook 2014-2023. Paris/Rome

Remmelink *et al*. (2014) *Handboek voor de melkveehouderij 2014.* Livestock Research, Wageningen. http://www.wageningenur.nl/nl/show/Handboek-Melkveehouderij.htm

Roland Berger, Sterke prijsschommelingen zuivelsector. 17 february 2015

World Bank, Russia Monthly economic developments February 10, 2015

IMF World Economic Outlook Update January 19, 2015

Agrimoney.com, several news items

ZuivelNL (2014) *Zuivel in cijfers 2013*. The Hague.

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