



An agricultural-focused EAFRD financial instrument providing market-responsive financial products





DISCLAIMER

This document has been produced with the financial assistance of the European Union. The views expressed herein can in no way be taken to reflect the official opinion of the European Union or the European Investment Bank. Sole responsibility for the views, interpretations or conclusions contained in this document lies with the authors. No representation or warranty express or implied is given and no liability or responsibility is or will be accepted by the European Investment Bank or the European Commission or the managing authorities of Structural Funds Operational Programmes in relation to the accuracy or completeness of the information contained in this document and any such liability or responsibility is expressly excluded. This document is provided for information only. Financial data given in this document has not been audited, the business plans examined for the selected case studies have not been checked and the financial model used for simulations has not been audited. The case studies and financial simulations are purely for theoretical and explanatory illustration purposes.

The case projects can in no way be taken to reflect projects that will actually be financed using financial instruments. Neither the European Investment Bank nor the European Commission gives any undertaking to provide any additional information on this document or correct any inaccuracies contained therein.

The authors of this study are a consortium of five companies: Sweco (lead), t33, University of Strathclyde – EPRC, infeurope and Spatial Foresight.

Glossary, acronyms and definition of terms

Expression	Explanation
APO	Association of Producer Organisations
CAP	Common Agricultural Policy
DG AGRI	European Commission's Directorate General for Agriculture and Rural Development
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
EIB	European Investment Bank
EU-15	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the United Kingdom
EU-13	Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia
EUROSTAT	Statistical Office of the European Union
FAO	Food and Agricultural Organisation
JRC	European Commission Joint Research Centre
OECD	Organisation for Economic Co-operation and Development
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
PO	Producer Organisation
SMP	Skimmed Milk Powder
T	Tonnes, equal to 1 000 kilograms
WMP	Whole Milk Powder



Table of contents

Glossary, acronyms and definition of terms	2
Executive summary	4
1. INTRODUCTION	9
1.1 Context and objectives of the study	9
1.2 Structure of the Report	10
2. METHODOLOGY	11
3. DAIRY MARKET AND PRICE VOLATILITY IN TARGET MEMBER STATES	12
3.1 Production and trade	13
3.2 Level and volatility of price	22
3.3 Future trends in the EU milk market	27
4. THE DEMAND FOR INVESTMENT IN THE DAIRY SECTOR	36
4.1 Future investment needs of dairy farmers	37
4.2 The determinants of investment	39
4.3 Impact of volatility on investment behaviour	40
5. PRICE DETERMINATION AND MILK PRICE DATA	42
5.1 Price determination in Ireland	43
5.2 Price determination in Italy	43
5.3 Price determination in France	44
6. THE MILKFLEX FUND	45
6.1 Summary	45
6.3 Set up of the financial instrument	48
6.4 Investment strategy	49
7. OPPORTUNITIES AND CHALLENGES FOR SETTING-UP A FINANCIAL INSTRUMENT PROVIDING FLEXIBLE LOANS	50
7.1 Rationale and scope of the instrument	50
7.2 Available instruments and interest of banks and financial intermediaries	51
7.3 Challenges and barriers	52
8. PROPOSED DESIGN	55
8.1 Option One – Bespoke Cooperative based fund (MilkFlex model)	55
8.2 Option Two – Guarantee Model with Financial Intermediary (PAP +)	56
9. CONCLUSIONS AND RECOMMENDATIONS	58
9.1 Policy recommendations	58
9.2 Further areas for review	59
ANNEX A.1: FIGURES AND TABLES	60
ANNEX A.2: INTERVIEW TRANSCRIPTS	78



Executive summary

Dairy farmers are often confronted with substantial changes in the prices they receive for their milk, which can cause financial uncertainty about their income. For this reason, past EU policy instruments focused on stabilising milk prices including through intervention purchasing and production quotas. As these measures were increasingly considered economically inefficient and distorting for trade, EU policymakers decided to slowly replace them with a more market-oriented approach. As a consequence, and especially after the fundamental reform of dairy policy under the Luxembourg agreement in 2003, EU dairy prices became more closely aligned with world prices, which can be volatile.

Among other effects, price volatility can discourage investment in farm assets. So, as part of *fi-compass* activities, the European Commission's Directorate General for Agriculture and Rural Development (DG AGRI) and the European Investment Bank (EIB) have begun analysing the possibility of developing a financial instrument responsive to market situations, to address sub-optimal investment conditions and contribute to implementation of EU rural development policy through the European Agricultural Fund for Rural Development (EAFRD). The analysis is in two parts: this study, which evaluates the feasibility and market potential of a financial instrument that can help to address the impact of price volatility of cows' milk, which may be replicable in different Member States, and a second analysis related to the use and interest in flexible loans for farmers.¹

This report provides an overview of the dairy market in Ireland, Italy and France, including an analysis of current and future supply and demand, as well as historical and expected future prices. On this basis, the study provides insight into future demand for investment and sub-optimal investment situations. It estimates the interest of financial intermediaries in a potential market-responsive financial instrument in the milk sector and identifies barriers to implementation as well as specific implementation conditions. Finally, the report gives recommendations regarding possible EAFRD support to market-responsive financial instruments, also with a view to the post 2020 legal framework.

Current situation of the dairy market in the three Member States

The EU is currently the world's largest milk producer with 163 million tons in 2015. Following the 2009 decision to remove milk production quotas from 2015 production has increased. Following the emergence of a more market-based model, the sector has been restructuring in recent years, with farms increasing their herd size and becoming more efficient.

Within the EU, France is the second largest cow milk producer (16%) after Germany (20%). France's five largest milk-producing regions have favourable agro-climatic conditions, and they account for 50% of the national production. France has a greater diversity of dairy farmers compared to other Northern European Member States, and fewer specialised farmers.

The dairy sector in France relies on a **mix of cooperative and private dairies** and includes five world-scale groups (Lactalis, Danone, Sodiaal, Bongrain, Bel) that process approximately half of the milk produced. There are more than a dozen other dairies with turnover of more than EUR 200 million, including dairies focused on consumer goods or ingredients and those with diversified production. The dairy sector has **very strong international brands** and protected designation of origin (PDO) / protected geographical indication (PGI) cheeses which, due to their high demand, ensure access to export markets. Milk prices in France are **similar to Ireland** and are **more volatile than in the EU** as a whole.

¹ *fi-compass* (2018), Flexible financial products for the agricultural sector in the EU.



There is a high concentration of retailers in France, making price negotiation particularly difficult for dairies. This also leads to large dairies asking their farmers to accept more volatile international prices for a significant part of their production.

Irish production (4% of the EU total) is based on seasonal grassland and benefits from low production costs. The dairy industry is almost **exclusively Irish-owned, mainly through farmer cooperatives**, and highly trade-oriented. The industry is dominated by three large firms, Glanbia with about 33% of domestically produced milk, Kerry with about 20% and Dairygold with approximately 16%. Milk price volatility has been higher than the EU average, especially since 2009. This can be explained by the concentration on producing storable dairy products, which see more price volatility than the valued-added, short shelf life products supplied directly to the retail and catering sector.

Italian milk production is 7% of the EU total and is concentrated in three northern regions. The available land is limited, in particular in the most productive areas, which has led to intensive farming. This makes the dairy farmers more dependent on fodder, which increases the cost of feeding the livestock. The high cost of land and climatic conditions are also disadvantages. More than **half of domestic production is used to make PDO cheese**, mainly through cooperatives. For other dairy products, the French multi-national Lactalis is the most important player with 24% of the Italian dairy market by volume. The milk price is higher and less volatile than in France and Ireland, due to the importance of milk supply for PDO cheese production, which protects dairy farmers.

Future production and price trends

EU milk production is expected to grow slowly, in response to slow growth in domestic demand. This limited growth will be driven primarily by increased demand for dairy products in developing countries. Moreover, EU milk production is expected to further concentrate in Germany, France, Ireland and the UK, at the expense of less competitive areas.

In the past, the EU milk price was more subject to seasonality and was more predictable. However, with fewer EU intervention prices and the progressive removal of quotas, it has become more affected by wider world price and demand fluctuations. **Over the next decade, milk price volatility is expected to continue, if not increase**, as economic, environmental and political shocks disrupt the balance between demand and supply. Forecasts of future volatility cannot be precise because short-term price changes depend on several variables, including production by competitors, demand from developing countries and the availability of inputs, such as fodder, which are very difficult to predict. In the coming years, **milk prices are expected to recover** from their current low levels in the EU, driven by growing export demand.

Investment demand and suboptimal investment situations

Among the three Member States considered, **the Irish dairy sector shows the clearest focus on expansion**. According to recent estimates, expected output growth should result in approximately EUR 1.5 billion of new investment in the 2014 to 2020 period, of which EUR 230 million should be invested by new entrants. In addition, dairy farmers are expected to invest EUR 140 million per year in other equipment and land improvements.

French dairy processors, even cooperatives, prefer a controlled approach to production expansion, which transfers almost all the risk of expansion onto any suppliers looking to increase milk production. This is likely to decrease French farmers' appetite for growth.

Increased scale and efficiency and the **increased automation of production** as well as the **movement of dairy production to the most favourable regions** will drive future dairy farm investments. Due to the low specialisation of dairy farmers, the comparative advantage of dairy versus other products will also affect future investment. Foreign



investment (Chinese in particular) is expected to finance an increase in capacity of cooperative dairies to transform the additional milk volume produced.

Consolidation will underpin future dairy farm investment in Italy, against the background of an expected minimal increase in milk production. The high costs and limited availability of land, as well as high levels of debt due to past investments in land and infrastructure, are expected to discourage new investment.

The **determinants of farm investment** in the literature are **technical, economic, or concern household characteristics and farmer attitudes**. Such determinants include **market price and farm income levels**, as well as **farmers' aversion to risk**. Study interviews confirmed **that volatility can reduce investment demand** by making the assessment of potential dairy investment proposals significantly more challenging and lead to more risk-averse farmers deciding against additional investment. They also clarified that **milk price expectations can be a factor when assessing the repayment capacity of farmers applying for finance**. This potentially reduces the supply of finance or lenders require more security in times of increased price uncertainty.

Study interviews also indicated that milk price **volatility can have other knock-on effects on investment, as this tends to be cyclical and typically happens during booms, when infrastructure costs more**. In practice, farmers tend to drive up prices when expanding their facilities during boom periods, when they invest. In addition, this can also create difficulties with repayments during the next downturn.

Price determination and farm price/income stability

Milk prices in the EU are freely negotiated between farmers and producers as one element in milk supply contracts. Such contracts are increasingly made in writing in advance of delivery and, in addition to price, cover volume, duration, payment conditions, collection and stipulations in the event of *force majeure*.

In each of the three Member States analysed, new types of private contracts include indicators of milk production costs and product mix, to offer more price stability to farmers. Under these contracts, the milk price is adjusted based on an index combining prices of the dairy products and production factors, such as livestock feed. To reach an agreement between dairy farmers and milk buyers on how such indexes should be calculated has sometimes proven to be a challenge.

To improve price stability for farmers, double volume/double price systems have been established in France. For example, both Danone and Sodiaal have an 'A price' based on the French market and a 'B price' based on the world market. This allows them to manage differences between milk suppliers, in terms of size, region and strategy, and to improve the management of surplus milk.

Other tools used by dairies to improve price stability for their milk suppliers include fixed milk price schemes through which dairy farmers can hedge a significant share of their milk production. These have operated in Ireland for a number of years.

Despite the various existing approaches, none of the Member States analysed has a price index that could be used as an input variable for a financial instrument responsive to price variation that is not limited to the members of a cooperative or included in a specific supply contract.

Identification options for a publicly-supported, market-responsive financial instrument

Against the new initiatives to increase price or income stability for dairy farmers, study interviews indicated that a market-responsive financial instrument could be an efficient and suitable solution, as **part of a set of instruments that work together** to help farmers meet their diversified needs.



This study found loan products with elements of flexibility for borrowers, i.e. farmers, on loan terms in certain circumstances. As envisaged in the conclusions of this report, a second step could be a much more detailed bank-practice analysis as the basis for more thorough and concrete recommendations linked to financial instruments and price volatility. Still, the current findings serve as a good start.

In **Ireland**, a bespoke loan fund structure, the MilkFlex Fund was developed in 2015 to address the impact of price volatility on dairy farmers' ability to service their loans and repayment terms change automatically under conditions or 'triggers'² based on the milk price. Other financial intermediaries **in both France and Ireland** offer loans with repayments depending on the financial situation of dairy farmers where repayments can be reduced or suspended. However, such flexibility is not linked to automatic triggers as with the MilkFlex Fund but requires agreement by the bank or financial intermediary based on an individual assessment of the dairy farm's economic circumstances (Ireland), or can be activated on the dairy farmer's request up to pre-defined limits (France).

Based on these products, two options can be envisaged for a publicly-supported market-responsive financial instrument. First, public support could be used to share the risk with financial intermediaries, for example, through guarantees which would enable improved market-responsive debt instruments for farmers. Better conditions may, for example, reduce the security requirements for the borrower, or extend the periods for loan repayment reduction or suspension. This may also improve access to finance where price volatility exists. The guarantee instrument might also help in stimulating new financial intermediaries to offer market-responsive debt instruments.

Alternatively, public support could be provided through new funding structures involving dairies, who could put their organisation's commercial and financial potential to work for the benefit of their milk suppliers. In this case, a cooperative dairy appears to offer the best conditions for development. Long-term supply contracts with cooperative members would allow payment deductions to be made directly from the farmer's milk cheque, reducing the risk for other investors. A cooperative dairy can also provide some of the infrastructure needed to implement the fund, for example to support the loan repayment process. Additionally, study interviews indicated that a cooperative dairy may in principle be available to take on a small share of the risk, depending on their other financial commitments.

This study indicates that developing a loan product for dairy farmers addressing milk price volatility with automatic triggers could be far more challenging than leaving the flexibility of loan payments to the complete discretion of financial intermediaries. For example, it could be difficult to design an objective milk price index as the basis for a trigger for farmers who are not members of a dairy cooperative. In addition, triggers may be more expensive to administer, and this may be an impediment, especially for financial intermediaries offering standardised products that require low costs to stay competitive. Thresholds used to trigger flexibility would need to be further analysed to ensure they can address the needs of dairy farmers, while providing suitable repayment schedules for lenders.

Conclusions and recommendations

Interest in market-responsive financial products seems to have already translated into real market demand. Some 'flexible' loan schemes have been found, although they are characterised by different levels of specialisation and complexity. The products have been developed by market operators, such as cooperatives and commercial banks, with the majority not benefiting from any public support.

The study findings suggest that public support may help to further improve the conditions of existing market-responsive financial products and make such products available to more dairy farmers, including in other Member States where these products are not yet available.

2 In financial agreements, a trigger is a defined condition (e.g. rise or fall in price of an index or security, rating of a counterpart, financial ratios of a company, etc.). An event which breaches or meets (depending on definition in the agreement) the trigger level, automatically produces another event (e.g. sale, repayment, provision of collateral, renegotiation of terms, etc.).



On the basis of the analysis, the following initial policy recommendations can be made, also with a view to the post 2020 EAFRD framework³:

- Support for existing models of financial products through slightly adapted financial instruments and enabling greater flexibility, could be considered as a policy option under the EAFRD. The study, based on a limited scope of investigation, proposes a capped portfolio guarantee instrument, with flexibility in the underlying loans could be the basis of a financial instrument addressing price volatility.
- A complex and very specific structure such as MilkFlex cannot be considered as a policy option for standardised instruments supporting the dairy sector across the EU (nor agriculture in general) mostly because it was designed for a specific need in a specific market. However, this should not exclude an EAFRD contribution to instruments similar to MilkFlex or to instruments that apply some MilkFlex conditions. In this context, legal flexibility at EU level allowing similar operations on an individual (e.g. Member State or region) basis would need to be ensured.
- Publication of guideline documents and good practice case studies, along with experience transfer between stakeholders and administrations, could promote the use of market-responsive financial instruments. This could start before including any specific design into the EAFRD framework, which may require more time to incorporate flexibility addressing market specificities. Further discussions on that point are to follow in the second stage of the work under the assignment.
- The report's results suggest that any policy action aiming to support market-responsive financial instruments should be well coordinated with any other measure addressing market volatility for farmers (e.g. income stabilisation instruments under EAFRD or public support for the development of private risk management tools such as futures contracts for agricultural commodities).
- A possible widening of the scope for working capital support under EAFRD should also be taken into account, since this might help farmers in managing their cash flow and might reduce the need for specific financial instruments responsive to price volatility.

3 The content of this study was finalised before the publication of the European Commission legislative proposals on the common agricultural policy (CAP) beyond 2020, on 1st June 2018: https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap_en



1. INTRODUCTION

1.1 Context and objectives of the study

In the 2014-2020 programming period, EAFRD managing authorities are paying more attention to financial instruments as potential delivery modes to support implementation of their Rural Development Programmes (RDPs). This interest is due to the potential advantages that financial instruments offer in terms of leverage, the capacity to attract additional public and private resources, the possible reuse of resources and the potential for easier access to finance for farmers, agri-businesses and rural entrepreneurs. This increased interest is additionally supported by developments at the EU level, such as the European Fund for Strategic Investments (EFSI), the development of *fi-compass* as an advisory platform and its Targeted Coaching for EAFRD managing authorities, EAFRD-EFSI combinations and the Initiative launched in November 2016, and to a smaller extent because of EU-wide financial instruments. Moreover, the last report by the Agricultural Markets Task Force (2016)⁴ recommends to further improve the design and targeting of financial instruments, including those designed to reflect and manage price volatility, so these become a viable part of the toolbox for the future Common Agricultural Policy (CAP).

To date, the highest attention paid so far by EAFRD managing authorities to the potential deployment of financial instruments has been to provide financial support for farmers and agro-food processors. While other rural businesses such as forestry entrepreneurs and rural tourism are noted, agriculture remains at the centre of ex-ante assessments for EAFRD financial instruments and is the leading sector for funding and investment volumes under the EAFRD.⁵ It is also a sector where outputs (and hence farm incomes) are often affected by market and non-market developments including natural disasters and trade restrictions, which in turn makes access to finance extremely important.

In this context, and given the specificity of many agricultural sub-sectors, access to medium- and long-term finance for farmers can often be hindered by the high level of price volatility in some agricultural markets. Volatile prices can be a result of agricultural production cycles, with low prices during high supply periods, weather events affecting production volumes and quality, trade measures involving closed borders for exports or diseases, undeveloped local market supply chains, or the predominant role of intermediates.

Price volatility creates uncertainty which increases risks for farmers seeking finance and financial institutions. Uncertainty may impact the lender's risk assessment and result in higher prices and other requirements, for example collateral. Furthermore, a farmer may be discouraged from activities or investments due to unpredictable revenue streams, non-existent or expensive insurance, or a lack of income support tools to mitigate the effects of price volatility. Such circumstances may lead to sub-optimal investment decisions in agriculture, which in turn suggest that conditions to support new financial instruments supported by the EAFRD may exist. For this reason, DG AGRI and the EIB in the context of *fi-compass*, have initiated this feasibility study. The study aims to analyse the feasibility, possible value added and scope of a specific financial instrument for the dairy sector, which builds on an existing market-responsive model, the MilkFlex fund in Ireland. This report covers Phase I of the study, with more detailed banking analysis and possible design scenarios to be covered in Phase II.

⁴ Agricultural Markets Task Force (2016), 'Enhancing the position of farmers in the supply chain', November 2016.

⁵ DG AGRI presentations during EAFRD *fi-compass* conferences.



1.2 Structure of the Report

This report is structured as follows:

- **Chapter 2** details the approach and methodology used for the feasibility study;
- **Chapter 3** analyses the market context, price volatility and future trends for production and price in France, Ireland and Italy;
- **Chapter 4** analyses the demand for investment in the dairy sector;
- **Chapter 5** analyses price determination and milk price data;
- **Chapter 6** presents an overview of the MilkFlex Fund;
- **Chapter 7** highlights challenges to setting-up and implementing a market-responsive financial instrument in the dairy market;
- **Chapter 8** details *fi-compass* proposals for the possible design of such market-responsive financial instrument;
- **Chapter 9** outlines conclusions and policy recommendations.



2. METHODOLOGY

The overall objective of this feasibility study is to assess the rationale, possible value added and scope of a potential financial instrument, as well as its potential design and set-up, taking into account the high volatility (including price volatility) of agricultural markets such as the dairy market. The aim is to increase the contribution of financial instruments to implementation of rural development policies. This study builds on an existing market-responsive model, the MilkFlex Fund.

In detail, this study aims to:

- Provide an overview and analysis of the dairy market in France, Ireland and Italy;
- Leverage on lessons learned from existing dairy sector financing models such as the MilkFlex Fund and other financial products, to better understand sub-optimal investment situations in the dairy sector that could benefit from a market-responsive financial instrument in each of the three Member States;
- Explain the methodologies currently used to determine market prices in the dairy market in the three Member States, analysing the accuracy and reliability of the data sources, and identifying those suitable for financial intermediaries when implementing a market-responsive financial instrument;
- Propose potential solutions and options for the design and set-up of a market-responsive financial instrument which could be implemented during the 2014-2020 programming period. These solutions and options may also be taken into account for the post-2020 period in view of the new CAP to be implemented from 2020 onwards.

The analysis has been carried out through:

- **Desk research**, including EU regulations, DG AGRI sector reports, Agricultural Market Task Force report, outlooks and studies, EU sector reports and monthly outlooks, studies and academic research;
- **Data analysis**, mainly using the EU Milk Market Observatory database, but also EUROSTAT, Food and Agricultural Organisation (FAO), Farm Accountancy Data Network data and national statistics. The analysis covers from 2000 to 2015, to assess the evolution of the market. Special attention has been paid to the period from 2007, when the major CAP changes anticipated in the 2003 Luxembourg agreement were finalised and fully introduced, until the full removal of milk quotas in April 2015. The analysis focused on three variables: raw milk from cows, which is 97% of EU milk production, butter, and skimmed milk powder (SMP). Trends for other dairy products have also been assessed where relevant;
- **Interviews with dairy sector stakeholders** in the three Member States and an expert workshop. There were 14 interviews with cooperatives, dairies, farmers' organisations, financial intermediaries and other stakeholders with five each in Ireland and France, and four in Italy. Additionally, an expert workshop was held at the EIB premises in Luxembourg.



3. DAIRY MARKET AND PRICE VOLATILITY IN TARGET MEMBER STATES

This section analyses dairy sector production and price evolution and covers all current EU Member States from 2000 to 2015. Special attention is given to the post-2007 period, when the CAP changed significantly. This chapter sets out the market dynamics for Ireland, France and Italy, which together account for 27% of EU total production and 33% of EU-15 countries. It also details expected future trends for both production and prices for these Member States.

The role of policy in the EU⁶

Prior to the fundamental reform of dairy policy under the 2003 Luxembourg agreement, EU instruments had very successfully isolated EU dairy commodity prices from more volatile world prices. Intervention purchasing placed a floor on prices while measures such as production quotas, export refunds, import tariffs and subsidised consumption helped to ensure higher and much less volatile prices. However, the Luxembourg agreement saw the milk sector fully integrated into the 'new' CAP. As a result, EU dairy prices became more closely aligned with world prices and for the first time in decades, experienced the extreme price volatility of global commodity markets. To mitigate the effects, the CAP reform of 2003 introduced decoupled farm payments through the Single Payment Scheme. This issues payments based on historic production levels and enables producers to switch production to products demanded by the markets. As part of this reform, a dairy premium was introduced in 2004 and will last until 2020. This premium is compensation for the reduction in intervention prices (25% for butter and 15% for SMP). It is decoupled from the milk quota and added to the Single Payment from April 2005.

A major price collapse in 2009 caused much concern, not least among EU dairy farmers, who experienced a severe reduction in income. The price collapse arose primarily from a supply-and-demand imbalance with supply expanding in 2009 in response to very high prices in 2007/8 and a major downturn in demand, largely as a result of the global economic recession. As a result, a high-level group was established under the European Commission to investigate ways of providing greater market stability. This group proposed a number of reforms. The high-level group was chaired by the European Commission and all Member States were represented by their agriculture ministries. This led to the milk package in 2012, which included measures to boost the position of dairy producers in the dairy supply chain and prepare the sector for a more market-oriented and sustainable future. The measures included promoting written contracts between farmers and processors, promoting producer organisations which can negotiate contract terms collectively, including the price of raw milk, and the application of rules for inter-branch organisations in the milk sector. These rules allow players in the dairy supply chain to carry out promotion, research, innovation and quality improvement. Finally, an EU milk market observatory to enhance transparency in the EU milk market was established in 2014.⁸

The most recent reform⁹ saw the expiration of milk quotas while recognising the need for a 'safety net' if there are serious imbalances in the market. The measures include the extension of volumes for 'public intervention' and granting aid for cheese storage costs. This reform also acknowledges that export refunds can be used to counter market imbalances with specific ad-hoc measures in case of emergency.

The main goal of the milk package was to improve the position of producers in the chain. According to the latest report published in November 2016¹⁰, there is evidence of some success, including through collective actions of producers going beyond the milk package:

- 6 Information reproduced from D. O'Connor, D. Bergmann and M. Keane (2016), 'The challenges posed by price volatility in the EU dairy sector', pp. 4-5.
- 7 The so-called 'Milk Package' (Regulation (EU) No 261/2012) was published in March 2012. It has been in full force since 3 October 2012 and applies until 30 June 2020. It was designed for the longer-term future of the dairy sector following the end of the quota system in 2015. For more information: http://ec.europa.eu/agriculture/milk/milk-package/index_en.htm
- 8 The EU Milk Market Observatory provides the EU dairy sector with more transparency by disseminating market data and short-term analysis in a timely manner. Launched in April 2014 by the European Commission, it publishes raw data, as well as analysis on past and present trends in EU and world dairy markets, covering production, the balance between supply and demand, production costs and market perspectives.
- 9 See Commission Communication on the CAP towards 2020, COM (2010) 672 final and Regulation (EU) No 1305/2013 (rural development), No 1306/2013 ('horizontal' issues), No 1307/2013 (direct payments), and No 1308/2013 (market measures).
- 10 European Commission (2016), 'Report from the Commission to the European Parliament and the Council – Development of the dairy market situation and the operation of the 'Milk Package' provisions', p.14, COM (2016) 724 Final.



- Compulsory delivery contracts formalise relations between producers and processors in Member States with few cooperatives that account for 41% of EU milk deliveries.
- Producer Organisations are recognised in 11 Member States. These are delivering tangible results to farmers, with better or more stable milk prices. Most do much more than negotiating prices and deliveries, providing services that add value to the supply of milk or support producer activities, such as milk collection, quality control, technical support and joint procurement of inputs.
- Collective negotiation with first purchasers is regarded by farmers as a primary benefit of belonging to a producer organisation. This happens in Germany, France and the Czech Republic and to a lesser extent in Spain, the United Kingdom and Bulgaria.
- The regulation of supply for PDO/PGI cheeses is providing positive results in Italy and France, with adjustment of supply to demand, price stabilisation and protection of cheese production in disadvantaged areas.
- Interbranch Organisations are contributing to greater transparency across the supply chain and have proved their usefulness in a wide range of activities such as defining standardised contracts, promotion and giving technical advice.
- Compulsory declarations of milk deliveries have secured a rigorous information system, while significantly improving the timeliness of the information.
- Member States generally acknowledge that the Milk Package does not aim specifically at disadvantaged regions, but in France producer organisations and supply regulation for PDO/PGI cheese are deemed as preserving milk production in such regions.

3.1 Production and trade

The dairy sector provides a major contribution to many rural and mountainous areas, with more than 12 000 milk production and processing sites across Europe.¹¹ The industry employs more than 300 000 people and provides about 14% of EU agricultural income. Five of the top ten global dairy companies are in Europe. More than 80% of European dairy companies are SMEs, and 50% of the milk is collected by cooperatives. Finally, the milk industry contributes a surplus of more than EUR 10 billion to the EU trade balance.

Key findings from the EU dairy market analysis

In the EU:

- The EU is currently the world's largest milk producer. Production increased following the decision in 2009 to remove milk production quotas from 2015.
- Cow productivity, the second in the world after the USA, increased while the number of cows and dairy farms progressively reduced. Herd size grew and in terms of production, EU farms are more efficient.
- Half the milk is collected and processed through cooperatives.
- Exports of dairy products are growing but still low compared to production and intra-EU trade. Since internal consumption is stagnant, trade with countries outside the EU is fundamental to EU dairy sector expansion.
- In some products, especially cheese, the EU has already achieved a comparative advantage and is a world leader.

¹¹ These data are from the European Dairy Association (2016), 'Economic Report 2016/2017, p.4. All figures and numbers in this report are based on a survey by the European Dairy Association (EDA) of its members between November 2015 and February 2016. These findings have been backed up with external sources: EDA Membership Survey, (Nov 2015- February 2016), CNIEL, ZMB, EU Commission, Farm Accountancy Data Network, Eurostat, International Dairy Federation (IDF).



In Ireland:

- Irish cow milk production is 4% of the EU total and has increased since 2009, in particular since 2012.
- Irish production is based on seasonal grassland and benefits from low production costs.
- The dairy industry is almost exclusively Irish-owned, mainly through farmer cooperatives.
- The industry is dominated by three large firms, Glanbia which buys about 33% of domestic production, Kerry about 20% and Dairygold approximately 16%.
- Irish dairy production is highly trade-oriented.

In Italy:

- Italian cow milk production is 7% of the EU total.
- Most dairy production is for high-value added products. More than half is used to produce PDO cheese.
- Milk for PDO cheese is mainly from cooperatives. The French multi-national Lactalis is the most important player in the Italian dairy market with some 24% of processed milk volume.
- Production is concentrated in three northern regions and mainly in 3 000 large farms.
- Land and production costs are higher than the EU average.
- Most dairy exports are as cheese; more than one third of cheese production is for export.

In France:

- France is the second largest cow milk producer in the EU (16%) after Germany.
- The dairy sector relies on a cooperative and private dairies. It includes five world-scale groups (Lactalis, Danone, Sodiaal, Bongrain, Bel) that process approximately half the milk produced. There are more than a dozen other dairies with turnover of more than EUR 200 million, including those focused on consumer goods, or ingredients and some with diversified production.
- France has a higher diversity of dairy farmers compared to other Northern European Member States, and fewer milk farmers are specialised.
- France has favourable climatic conditions for milk production and land prices are low compared to other Member States.
- Although milk production is spread across much of France, processing is concentrated in just a few regions. The five largest account for 50% of French milk production. Bretagne is the largest by volume, followed by Pays de la Loire and Basse-Normandie.
- French farmers have high forage autonomy and hired labour often supplements family labour.
- The dairy sector has very strong international brands and PDO/PGI cheeses that support access to export markets. 40% of cheese production is exported.

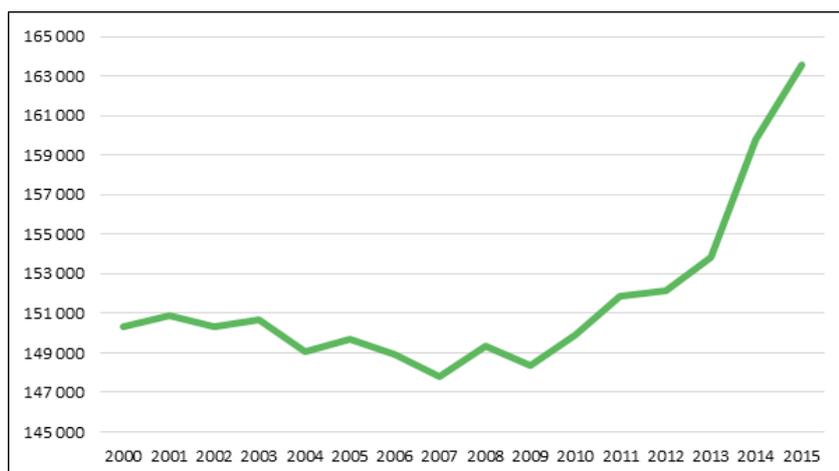
3.1.1 The dairy market in the EU

The EU-28 **is the main milk producer in the world** and the **second exporter** after New Zealand. Around 98% of milk production comes from cows and most of this is delivered to dairies, of which nearly 40% is for fresh products and 60% for manufactured products.

In 2015, the latest year of data available, production was almost one tenth higher than in 2000, at nearly **163 million tonnes**. Average growth between 2000 and 2015 was 0.6% per year.



Figure 1: Cows' milk production in the EU-28 (1000 tonnes 2000-2015)



Source: European Commission. Milk Market Observatory. 2016

However, there are significant differences:

- **In the growth pattern** pre- and post-2007 (Figure 1). Before 2007, production went down by 0.1% per year, from 2008 to 2015 the average increase was 1.2%, peaking between 2013 and 2015 at 3.1%. Production tends to respond to higher prices, as in 2014/15. However, there is normally a time lag for biological reasons, so production can sometimes peak when demand has weakened, leading to very low prices in the short term.
- **In Europe**, EU-15, which represents more than 75% of European production, drives the growth pattern, with average yearly growth of 0.7% over the whole period and 1.5% post-2007. Production in the remaining part of the EU (EU-13) has remained fairly constant, with an average increase of only 0.1% both before and after 2007.

The rapid growth since 2009, and especially since 2013, is due to several factors including the **gradual loosening of milk quota restrictions**.¹² Since 2009, following the decision to abandon the quota regime, a 'soft landing' was ensured to gradually erode the value of quotas to almost zero by 1 April 2015. Quotas increased by 1% each year from 2009/10 until 2013/14. Reductions in fat corrections further increased production potential. Another reason for increased production is **cow productivity growth**, which jumped from 5 484 kg/dairy cow in 2000 to 6 876 in 2015, a 25% increase.¹³

In addition, input costs grew in line with the increase in milk prices between 2009 and 2013 for the EU as a whole but **input prices fell** in 2014. Thus, the incentives at the beginning of 2014 to increase milk production were boosted by a fall in input costs.

Similar to milk, the **production of SMP** decreased from 2000 to 2007 and increased thereafter. **Butter production** follows a similar pattern.

¹² See A. Matthews (2015), 'Is the removal of quotas responsible for the increase in EU milk production in 2015?'

¹³ Productivity has grown particularly in the EU-13, +33.2% against +21.7% in the EU-15. However, productivity in EU-13 is still below EU-15 (5 163 kg/dairy cow against 6 876 in 2015).



The structure of European dairy farms: key aspects

The expansion of milk and dairy production in Europe has been accompanied by changes in farm size and number. The number of cows has significantly reduced in all Member States, with the exception of Ireland (+7.6%) and Italy (+16%). The reduction was particularly significant in the EU-13.¹⁴ There were fewer cows in the EU in 2015, 23.6 million, the EU-10 figure in 1983. This reduction is attributable to increased productivity, which allowed farmers to obtain the same quantity of milk from fewer cows.

There has also been a significant reduction in the number of farms with dairy cows. Between 2003 and 2013 the number of farms halved, from more than 3 million to less than 1.5 million.¹⁵ The decrease confirms the trend of the last 30 years, when in the 10 EU Member States, an average of 326 holdings per day ceased their activity. The reduction has been particularly large in Poland and Spain. France saw 29% fewer dairy farmers between 2006 and 2013, Italy 26% and Ireland 18%.¹⁶

However, with the increase in milk supply and significant decrease in the number of farms and cows, the herd size has increased. In all Member States reviewed the average herd size has grown, from 34 cows per farm to 46 in France between 2006 and 2013, from 36 to 53 in Italy and from 48 to 63 in Ireland.

Most of the milk is collected and processed through cooperatives. In thirteen EU Member States (see Figure A8) they have more than 50% of the market (measured in milk volume at the first-handling and processing stages). Approximately 64% of all milk deliveries are made by member farmers to their processing or collecting cooperative.¹⁷ In Ireland the share of processing and collecting cooperatives is over 90%, in Italy nearly 70% and in France more than 50%. Almost half the dairy cooperatives also supply inputs to their members (especially in Ireland, France, Portugal, and the Czech Republic). About 20% also supply credit to their members. More than 25% of the cooperatives also produce milk (e.g., in Estonia, Spain, Slovakia and Romania). In most western and northern regions of Europe production is on private farms while dairies focus on processing and marketing.¹⁸

Trade in dairy products is an increasingly important source of demand in Europe. Milk and dairy products are already a basic part of the diet in most European countries and western and northern Member States annually consume 280 to 300 kg per capita. The EU average is 243 kg milk equivalent, which is very similar to the United States and Canada. Eastern Member States are around 200 kg, which is high compared to the rest of the world.¹⁹ The potential to extend the market for milk and dairy products within the EU is very small, with the major potential for increased consumption mainly in the eastern Member States, in particular for cheese, fresh dairy products and to some extent butter. Trade with countries outside the EU could be a driving force for EU dairy sector expansion, especially since the EU has already gained important comparative advantages in international competition in most dairy sectors.

The EU is at the same time the world's largest exporter of cheeses and SMP, followed by the United States and New Zealand, and the second largest exporter of butter, after New Zealand.²⁰ The trade balance with third countries is positive, with exports notably exceeding imports for the most important dairy products.

14 In some EU-13 countries the reduction has been particularly significant. In Poland, the number decreased from 2.7 million in 2007 to 2.1 million in 2015, in Romania from 1.6 to 1.2 million.

15 Eurostat (2016), 'Agriculture, forestry and fishery statistics – 2015 edition', p. 17, figure 1.4.

16 Promar International (2015) 'The European dairy industry towards 2020 – European producer summary - Challenges, strategies and change', p. 13.

17 European Commission (2014), 'Development of the dairy market situation and the operation of the 'Milk Package' provisions', p.4.

18 J. Bijman et al. (2012), 'Support for farmers' cooperatives', European Commission, p. 42.

19 H.D.Thiele, E.Richarts, and H.Burchardi (2013), 'Economic analysis of EU dairy sector development beyond 2015: trade, exports and world market integration', p. 11.

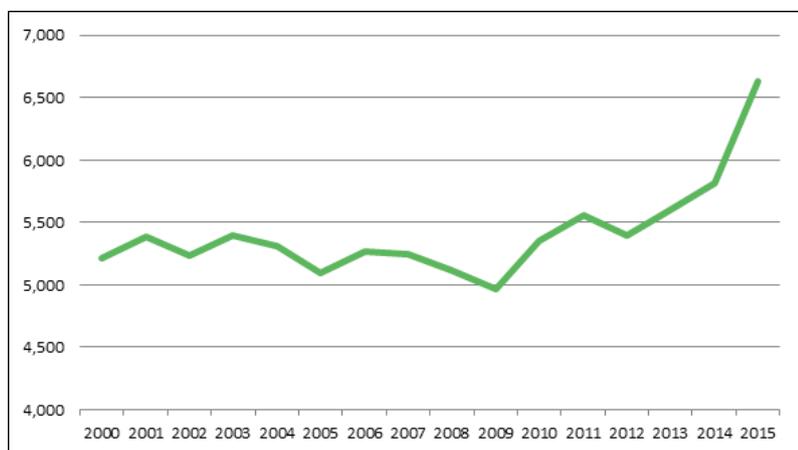
20 See Milk Market Observatory (2016), 'Historical series – EU export of dairy products to third countries' and FAO (2016), 'Food Outlook – Biannual Report on Global Food Markets'.



3.1.2 The dairy market in Ireland

Ireland produced 4.1% of EU cow milk in 2015. From 2000 to 2007 production was nearly static at around 5.3 million tonnes per year (figure 2). Since 2012, however, production has increased to around 6.6 million tonnes per year. Recent growth has reflected the rapid expansion of the industry with dairy quotas being finally abolished in April 2015.

Figure 2: Cow milk production in Ireland (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016

Irish butter production was 10.6% of the EU total (it was 9.4% in 2000). Production decreased from 228 000 to 185 000 tonnes between 2005 and 2010, while from 2010 onwards, growth has been 6.4% per year on average, reaching 251 000 tonnes in 2015.

Irish SMP was 2.6% of the EU total (it was 3.6% in 2000). Production was cyclical, especially between 2005 and 2010 when it moved between 60 000 and 80 000 tonnes. SMP production did not expand in line with butter production during this period as skimmed milk raw material was diverted into casein and whey products.

The high seasonality of Irish milk production

Ireland has a mild climate with few extremes and the adequate is well suited to milk production from cows grazing outdoors. To take advantage of this low-cost feed source, most dairy cows in Ireland are calved between February and April with 10-month lactation and a dry period from November to January before the calving and milking cycle recommences in February. The low cost of milk from outdoor grazing is routinely reflected in cost comparison studies. These typically show that Irish costs per litre are the lowest in the EU and the lowest in the world with the exception of New Zealand, with which Ireland is often compared. A significant disadvantage of this production system is that Irish milk supply is highly seasonal. For example, about 78% of milk supplies for 2015 were in the seven months from March to September, and just 22% in the five months from October to February inclusive. Irish monthly milk supply varied by a factor 7.6 from the lowest to the highest month in 2015. This is unique in the EU but similar to New Zealand, where production is also based on seasonal grassland.

The manufactured milk products sector in Ireland used approximately 6.5 billion litres of domestically produced milk in 2015 plus a further 500 million litres imported from Northern Ireland as raw material. The advantage of low-cost seasonal milk production is countered by the major disadvantage of very uneven milk supply. So, dairy factories in Ireland typically achieve only about 60% capacity utilisation over the whole year. The dairy industry is also disadvantaged by the need for greater storage of dairy products produced seasonally but supplied year round to the retailing and catering sectors. From a marketing perspective there is a constraint as the product portfolio is focused to long-term storable products.



Because of its seasonal milk input the Irish dairy industry is dominated by six major storable products; butter, hard and semi-hard cheeses (mainly cheddar), SMP, Whole Milk Powder (WMP), casein/caseinates, and whey products.

These are produced in large modern automated factories. Given its favourable grass growing image and high quality standards, Ireland has developed a very large infant formula industry and virtually all global multinational baby food suppliers have large factories in Ireland.

Milk and dairy producers in Ireland

There were 17 600 milk producers in 2015, slightly less than in the previous year, producing an annual average of 364 000 litres from an average of 70 cows, virtually all either Friesian or Holstein breeds. The dairy farms are almost exclusively family-owned and managed and most milking is done in a 12 or 16 unit herringbone milking parlour, though robotic milking units are also increasingly being used.

The average dairy farm covers about 60 hectares, with about 80% owned by the farmer and 20% leased. Labour on the farm is normally one full-time person (the dairy farmer) and about half a person providing seasonal support (family or hired labour). The typical Irish dairy farmer is about 50 years old. All younger farmers have a third-level qualification suited to a career in dairying.

The Irish dairy industry is almost exclusively Irish-owned, mainly through farmer cooperatives. There are three large firms, Glanbia which buys about 33% of the milk, Kerry about 20% and Dairygold about 16%. Lakeland dairies is another significant cooperative with over 10% and these four collectively account for about 80% of total milk intake. The remainder is covered by about 10 smaller cooperatives. The two largest companies, Glanbia and Kerry, have a complex ownership structure. Both are comparatively large public companies (PLCs) with shares traded daily on international stock exchanges. However, both also retain a farmer cooperative business, with the cooperative collectively owning a proportion of the public company. As expansion in Ireland over the last 30 years was severely constrained by the EU milk quota scheme, both Glanbia and Kerry have evolved into significant multinational firms, with their Irish dairy operation playing an increasingly smaller part of their overall activities. This is reflected in their comparative employee and sales data as follows (ICOS Annual Report 2015):

Firm	Cooperative members	Employees	Sales, EUR million
Glanbia	17 837	3 418	3 221
Kerry	13 000	24 182	5 837
Dairygold	8 536	1 117	847
Lakeland Dairy	4 658	627	546

Compared with other EU dairy industries in Ireland, including firms such as Glanbia, Kerry, Dairygold and Lakeland Dairies the marketing cooperative Ornuu concentrates more on business-to-business sales.

Given a small population of less than five million consumers and a comparatively large dairy sector, the industry in Ireland is extremely export-oriented with close to 90% of all dairy manufactured products being shipped overseas. About 7% of milk supply is for liquid milk consumption in the domestic market. A small but rapidly growing and successful farmhouse cheese and products sector has also been developed in recent years for the domestic and increasingly international market. In value terms, exports accounted for EUR 3.25 billion in earnings in 2015, with products supplied to about 130 countries. Exports of cheese to European Member States as well as countries outside the EU, account for nearly 96% of total cheese production. Exports to countries outside the EU have particularly grown in the last three years, with exports of cheeses jumping from 23 000 tonnes in 2013 to almost 40 000 tonnes in 2015, and butter, from 5 600 tonnes to 21 400 tonnes. Particularly important are exports to EU Member States, which represent 77% of Irish cheese production and 7% of intra-EU trade.



3.1.3 The dairy market in Italy

Production of milk in Italy increased from 2004, when the level was less than 10 800 tonnes, until 2010 when it reached 11 400 tonnes (figure 3). In recent years, production has fluctuated, reaching 11 426 tonnes in 2015 (7% of the EU total).

Figure 3: Cow milk production in Italy (tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016

Butter production has declined from 133 000 tonnes in 2000 to 96 000 tonnes in 2015 as the Italian share of the European market fell from 6% to 4.1% over the period. The production of SMP is practically zero.²¹

The value of farm milk production was estimated by Istat (the Italian national institute of statistics) at EUR 4.7 billion in 2014, before a strong decrease in 2015. More than half the milk processed in Italy is used to make PDO cheeses²², with 40% used in Grana Padano and Parmigiano-Reggiano PDO cheese. This is the main strength of the Italian milk sector, as farmers and dairy companies do not compete simply through price (non-price competition). The value of these PDO cheeses is more than EUR 4.2 billion and most production is through farmer cooperatives. The entire Italian dairy industry produces about EUR 14.5 billion, as estimated by the association of private industrial enterprises (Assolatte²³), with exports of more than EUR 2 billion.

For the other 50% of farm and industrial production, price competition with imports is very strong. For fresh milk, a major cooperative, Granarolo, has successfully differentiated its fresh dairy products using innovation and a strong quality policy together with significant marketing expenditure.

Almost all other cooperatives produce PDO cheeses. It is important to note that the most important player is a French multi-national, Lactalis.²⁴ The Italian branch had sales of EUR 1.3 billion in 2015 with a 24% share of the Italian dairy market, by volume. For specific products, the market share of Lactalis is much higher.²⁵

Exports of cheese increased from 57.4 million tonnes in 2000 to 87.1 million tonnes (7% of total production) or 12% of total EU cheese exports in 2015. Italy is the third exporter in the EU after the Netherlands and France. A significant proportion of cheese exports is for the European market (23% of Italian cheese production), where Italy has a 7% of share of intra-EU exports. Exports of butter and SMP are practically zero.

21 Butter is not considered a major product in Italy. Production depends on specific market conditions, or market intervention, making it economically interesting. Italian butter production is not very competitive. When public support (the intervention price) decreased with policy changes, butter production decreased. For SMP, again Italy has never been interested because the main milk product has always been cheese which is more profitable.

22 Italy has 47 PDO cheeses and 1 PGI cheese.

23 See www.assolatte.it/it/home/chi_siamo

24 Lactalis owns the plants and brand of the Galbani group and the Parmalat group (including brands such as Invernizzi, Locatelli, Cademartori).

25 According to Coldiretti, 50% of the ricotta market.



Milk and dairy producers in Italy

Cows' milk is produced by more than 50 000 farms²⁶ with an average of 32 cows each, but there are large regional differences. For example, the average in Lombardy and Emilia-Romagna was (2010 Census) 65 and 58 cows per farm respectively. According to the same data, about 4 000 farms had more than 100 cows and their total of 720 000 made up about 45% of the national total.

About 80% of total milk production (11 million tonnes in 2015) is produced in northern Italy and about 42% in Lombardy. The reduced availability of land, particularly in the most productive areas, means that farmers apply intensive agriculture. This makes them dependent on fodder, which increases the cost for feeding livestock. The high cost of land and climate conditions are other disadvantages.

Farms generally have high quality management; technological innovations are widespread and livestock benefit from a long process of selection and genetic improvement. The seasonality of milk production is modest compared to most other EU countries.²⁷ Farms in mountain areas have limited accessibility and lower economies of scale, which increases their production costs.

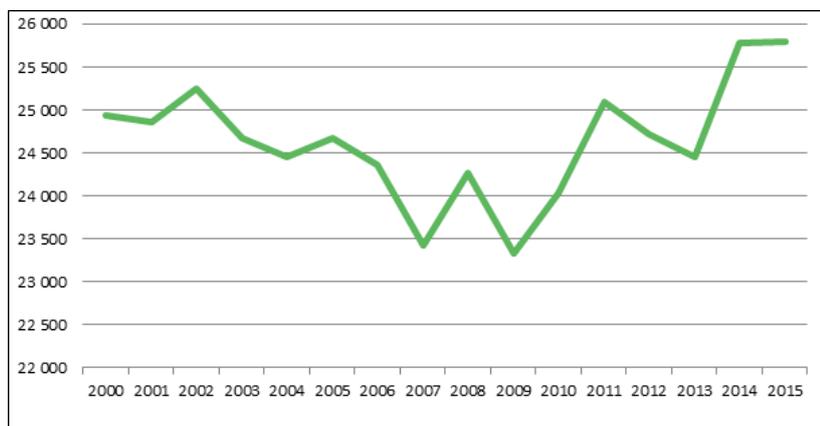
In 2015, in Italy there were 1 966 firms in the dairy industry and the total continues to decrease. 1 321 were cheese factories or firms collecting and selling fresh milk and fresh dairy products ('centrali del latte'). Of these, 82 are dairy plants annexed to a farm, 449 are plants operated by cooperatives and 114 are simply milk collection centres. However, including very small companies, i.e. artisan businesses, there were almost 6 400 firms in 2013. In addition to PDO cheese, diversification is another strength of the system, together with responsiveness to new nutrition and health styles of consumption, highlighting lightness, quality and local specialities.

Apart from the consortia of different PDO cheeses which promote the products and protect them from imitation, organisation in the sector is very low. However, at the end of 2015, a new and very important Association of Producer Organisations (APO) was established in Brescia, Northern Italy (Latte Italia). This already represents about 15% of milk produced in Italy²⁸ and should help to rebalance both bargaining power and added value along the supply chain.

3.1.4 The dairy market in France

With 16% of the EU's total production, France is the second milk producer by volume after Germany. In 2015, French milk production reached 25 million tonnes, 4% more than in 2000 (figure 4). Pre-2007, production decreased from nearly 25 to less than 23.5 million tonnes, while from 2009 to 2015 it increased by more than 10% (slowing down between 2011 and 2013).

Figure 4: Milk production in France (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory. 2016

26 Last census of the agricultural sector in 2010.

27 Pieri R. (2014), Il mercato del latte – Rapporto 2014, Franco Angeli.

28 APO founders are the POs: Agrilatte, Latte Indenne e Santangiolina (Lombardia), Agri Piacenza latte (Emilia Romagna), Piemonte latte (Piemonte).



A similar pattern is seen with butter, though by 2015 this had not recovered to its 2000 level (444 000 against 447 000 tonnes). Overall, the French share of EU butter production decreased slightly from 20% to 19%.

SMP production has increased since 2007, reaching 365 000 tonnes in 2015, which was 16% of the EU market (from 9% in 2000).

French milk production benefits from two competitive strengths. First, climatic conditions and second, land prices are low compared to other countries in Europe. An additional important advantage is that France has great potential for genetic innovation.²⁹ Farms with milking robots have doubled in a 5-year period, reaching 7% of dairy farms in 2014. The French model of milk production is based on high forage autonomy and hired labour that complements family labour. Farmers mostly feed livestock with food grown directly on the farm and pastures. However, forage autonomy increases costs for farmers especially in mechanisation and time.

Milk and dairy producers in France

In France around 63 600 farms employing 150 000 people produced milk in 2014. The number of dairy farms has halved over the last 30 years, but kept the same level of production, through greater efficiency. There are different models of dairy farms and breeds of dairy cows linked to geography. Even though milk is still produced across the country, 43% of dairy farms and 48% of volume is in north-western France (Brittany, Normandy and Pays de la Loire). The mountain regions (Alps and Massif Central) are also important producers, thanks to different know-how and ways of raising stock, particularly with milk production under PDO. Thus, dairy farms can be divided into five types³⁰: specialised lowland or mountain farms, mixed lowland or mountain farms (milk and meat) and poly-culture farms. With an average of 54 dairy cows per farm, French dairy farms are normally small.

With more than 760 processing sites³¹, diversity is extremely high. The dairy sector employs 56 000 people, against only 27 000 in Germany. Turnover was EUR 29.8 billion in 2013. A strength of the French dairy sector is the diversity of models. Five French groups are among the 25 dairy international leaders in terms of turnover (Lactalis, Danone, Sodiaal, Savencia, Bel). The proportion of small structures producing less than 1 000 tonnes per year is important but the trend is towards a concentration of firms, with smaller facilities being bought by larger cooperatives and private groups. Among the five international firms, only one is a cooperative (Sodiaal); the others are private companies.

The French dairy sector has many strengths that enable it to successfully compete in the international market and 40% of processed milk is exported. French processors offer a huge diversity of high value products such as cheese and yogurt. The local specialties and quality of French dairy products are well-known, through famous brands but also through traditional specialties, which are usually linked to local areas and know-how. Thus, 10% of milk is processed into 45 cheeses, 3 butters and 2 'crèmes fraîches' protected by PDOs, and 7 cheeses and 1 'crème fraîche' are under PGI labels.

While small operators specialise in differentiated and high value-added products, big groups also have a large product range for export. Recent French dairy industry investments are mostly for dry milk products, including high value ones such as infant milk powders. The quality of French dairy products is recognised worldwide and attracts foreign investors, including the Chinese.³²

Exports of dairy products to countries outside the EU have increased in recent years, especially exports of SMP since 2007. Cheese exports have also seen a significant increase, jumping from 77 000 tonnes in 2009 to nearly 108 000 tonnes in 2015 (5.5% of total production), following the general trend of EU cheese exports. France is the second largest exporter in the EU after the Netherlands with 15% of EU exports to third countries. In addition, 29% of French cheese production is exported intra-EU.

29 France has successfully integrated genomics into its selection programmes. In particular, the French Livestock Institute (Institut de l'Élevage) has been cooperating with dairies and farmers to accelerate the selection processes based on health, feeding efficiency and environmental impact.

30 French Livestock-breeders' Institute (Institut de l'Élevage), 2016. Dossier annuel bovin lait, Année 2015 et perspectives 2016, n°465, February 2016.

31 French Livestock-breeders' Institute (Institut de l'Élevage), 2016. Le secteur laitier français est-il compétitif face à la concurrence européenne et mondiale.

32 For example, Synutra has signed an agreement with Sodiaal and opened the biggest ever milk powder factory in Bretagne in October 2016.



3.2 Level and volatility of price

There are different reasons for price volatility in the dairy market.³³ Milk is perishable and seasonal, with supply largely depending on weather and climate conditions, while demand is inelastic. Moreover, a large proportion of milk is processed into a myriad of ever-expanding products, so the milk price is subject to various demand and supply dynamics. In addition, the price is often affected by crises that affect production or demand.

The following sub-sections explore the level and volatility of the milk price in the EU, and the Irish, Italian and French markets between 2000 and 2016. The comparative analysis focuses on 2007-2016 when, following the progressive removal of milk production quotas, milk prices in the EU rapidly converged with world prices. Specific causes of volatility at national level are also addressed.

Key findings from the analysis of milk price volatility

In the EU:

- The milk price was highly seasonal before 2007, with more cyclical effects from 2007 onwards; volatility has been higher since 2007.
- Since 2007, the EU milk price has become strongly connected to world milk prices.
- EU price volatility is now more influenced by world market dynamics and export opportunities than by internal demand.

In Ireland:

- From 2000 to 2015, the average milk price was below the EU, Italian and French averages.
- Volatility has been higher than the EU average, especially since 2007.
- Volatility can be explained by the greater concentration on storable dairy commodities, as these products suffer much more price volatility in commodity markets than short shelf life products supplied directly to retail and catering.
- A substantial fall in milk price in 2015 affected farm incomes less than previously, as farmers expanded production.

In Italy:

- From 2000 to 2015, the average price of milk was higher than the EU, French and Irish averages.
- The higher price is due to higher production costs which remain sustainable thanks to the higher value-added of manufactured dairy products.
- Italy has less price volatility than France, Ireland and the EU average which indicates the importance of milk supply for PDO cheese production, protecting farmers to a certain extent.
- Although volatility is higher in the post-2007 period, it remains much lower than in France and Ireland.

In France:

- The average price in the period 2000 - 2015 was very close to the EU average.
- The price of milk is more volatile than the EU average and similar to Ireland.
- The concentration of retailers is very high in France, making price negotiation particularly difficult for dairies.
- Large dairies ask farmers to accept international prices for a significant part of their production.

³³ See D. O'Connor, D. Bergmann, and M. Keane (2016), 'The challenges posed by price volatility in the EU dairy sector' and D. O'Connor and M. Keane (2009), 'Price Volatility in the EU dairy industry: causes, consequences and coping mechanisms'.

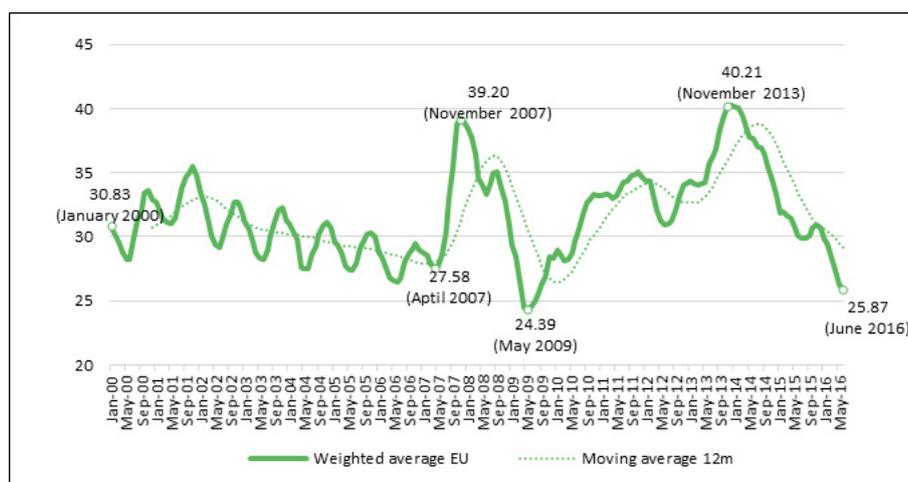


3.2.1 The volatility of milk price in the EU

As shown by figure 5, milk prices in Europe since 2000 has followed two distinct trajectories:

- Before April 2007: the milk price was more seasonal (due to the seasonality of production) with regular movements every six months and an overall average decrease of 0.1% per year, varying between 27.47 EUR/100 kg in June 2006 and 35.47 EUR/100 kg in November 2001;
- From April 2007, the movements are less regular, but greater, varying from 24.39 EUR/100 kg in May 2009 to 40.21 EUR/100 kg in November 2013.

Figure 5: EU average price of raw cow's milk (EUR/100 Kg)



Source: Elaboration on data from European Commission, Milk Market Observatory. 2016

In terms of volatility, the annualised standard deviation of monthly prices has increased from pre-April 2007 to post-April 2009, rising from 9.1% to 9.5% while the average yearly price increased from 30.2 EUR/100 kg to 32.6 EUR/100 kg. The highest volatility was between April 2007 and April 2009, peaking at 16.2%.

It should be noted that while price movements in the first period were more affected by seasonality (smaller in magnitude but more frequent), in the second period, price variation can be attributed more to the cycle (see box below) along with seasonal effects to a lesser degree.³⁴

Seasonality and cycles in dairy prices³⁵

Economic theory suggests that seasonality and cycles are common features in agricultural commodity prices. Seasonality is due to seasonal patterns in supply and demand. The timing of seasonal effects in commodity prices is thus usually highly predictable whereas the effect may be more random. For the dairy industry, seasonality is explained by livestock biology, seasonal production costs and demand changes during the year. Cycles in prices of agricultural commodities and the dairy industry in particular can arise because of lags between decisions to increase or decrease supply and when the commodity becomes available. Cycles can last much longer than one year and are not as predictable as the seasonal component, because neither the timing nor the effect on prices is precisely known.

34 D.Bergmann (2015), 'Seasonal and cyclical behaviour of farm gate milk prices', British Food Journal, Vol. 117, p. 2.

35 Reproduced from D.Bergmann (2015), 'Seasonal and cyclical behaviour of farm gate milk prices', British Food Journal, Vol. 117, pp. 2-3.



One popular explanation for cycles is that farmers set supply for the next period based on the price of the current period. For the dairy industry this implies frequent cycles in supply and prices. These may be the result of the lag between a decision to change milk supply, often based on current price, and the availability of this milk on the market because of the time it takes to expand or contract supply. It should be noted that milk supply in the short run can be adjusted to some degree by feeding and herd management. However, significant increases in production often require a relatively long time to bear results.

The higher influence of cyclical rather than seasonal effects in the second period indicates that EU milk prices became closely connected to world prices and volatility was strongly influenced by world market dynamics and export opportunities.³⁶ There is a strong positive correlation of 0.81 to 0.90³⁷ between EU milk prices and world market prices. Moreover, from January 2006 to August 2013 an increase in the world milk price of 1 cent per kg increased the EU milk price by 0.78 cents per kg on average.

So, EU prices are now closely aligned with world prices and for the first time in decades are experiencing the extreme price volatility of world commodities markets generally.³⁸ However, there are still persistent variations across EU Member States, and the level of variability within and across these Member States is also highly variable from month to month.³⁹

3.2.2 Milk price volatility in Ireland

Figure 6 describes the evolution of prices and price volatility in Ireland. The average price in the period is slightly below the EU level, EUR 30.7 EUR/100 kg against EUR 31.6. Volatility was higher than in the EU (16%), and significantly higher post-April 2007 compared to pre-April 2007 (19% against 13%).

Figure 6: Average price of raw cow's milk (EUR/100 Kg) in Ireland



Source: Elaboration on data from European Commission, Milk Market Observatory, 2016

Because of its greater concentration on major storable dairy commodities, the Irish dairy industry is more exposed to extreme price volatility than most other dairy industries. Prices for these products are much more volatile than short shelf life products supplied directly to retail and catering. This greater exposure to price volatility is reflected in greater volatility for farm milk prices overall in Ireland.

36 H.D.Thiele, E.Richarts, and H.Burchardi (2013), 'Economic analysis of EU dairy sector development beyond 2015: trade, exports and world market integration'.
 37 *Ibidem*, p. 31.
 38 M. Keane, D. O'Connor and D.Bergmann (2015), 'The challenges posed by price volatility in the EU dairy sector', p. 4.
 39 *Ibidem*, p. 5.

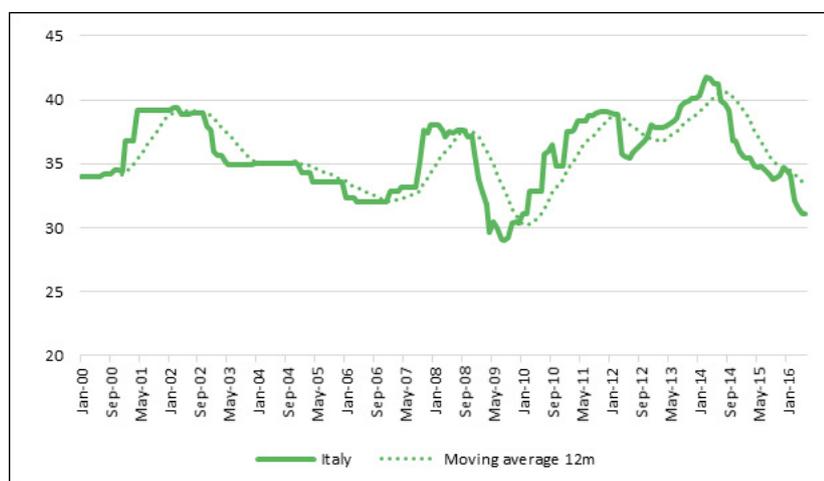


The average net dairy farm income in Ireland in 2015 was about EUR 62 500, associated with gross output of about EUR 180 000. This was a 6% decline in net income from 2014.⁴⁰ While there was a substantial fall in milk price of about 20% to approximately EUR 30/100 kg in 2015, this was partly compensated for by a 13% increase in milk output, an exceptionally favourable grass-growing season and lower animal feed, energy and fuel prices. The 13% increase in milk output in 2015 reflected the great restraint imposed on Irish dairy farming by the EU milk quota regime over 31 years, given the unique suitability of the country for efficient low-cost milk production from outdoor grazing.

3.2.3 The volatility of milk price in Italy

The milk price in Italy is higher and more stable than the EU, Irish and French averages (figure 7). The price was EUR 35.7 /100 kg on average over the entire period, EUR 4.1 more than the EU average and higher in all sub-periods, although the difference decreased over the period.

Figure 7: Average price of raw cow's milk (EUR/100 Kg) in Italy



Source: Elaboration on data from European Commission, Milk Market Observatory, 2016

Compared to the EU average (9.5%), Italy had lower volatility (7%) over the whole period. Italy has lower volatility than Ireland or France, respectively 16.2% and 16.3%. The price in Italy was particularly stable in the first period (pre-April 2007), with volatility of 4.6% against 9.1% in the EU. Italy also had higher volatility post-April 2009 (8.4%) compared to the initial period (4.6%).

The higher price in Italy reflects both the higher value-added of manufactured dairy products and the higher production costs for Italian dairy farmers. The quality of Italian products allows companies to reduce, but not completely avoid, strong competition from foreign producers. There is limited land available in Italy for extensive crops, so pastures are not available for cows and feed cost is generally higher than in other European countries. Therefore, the production cost of milk in Italy is higher and the same is true for the price of milk. The 50% of production not destined to make PDO cheese has very strong price competition with imports at both farm and industrial levels.

3.2.4 The volatility of milk price in France

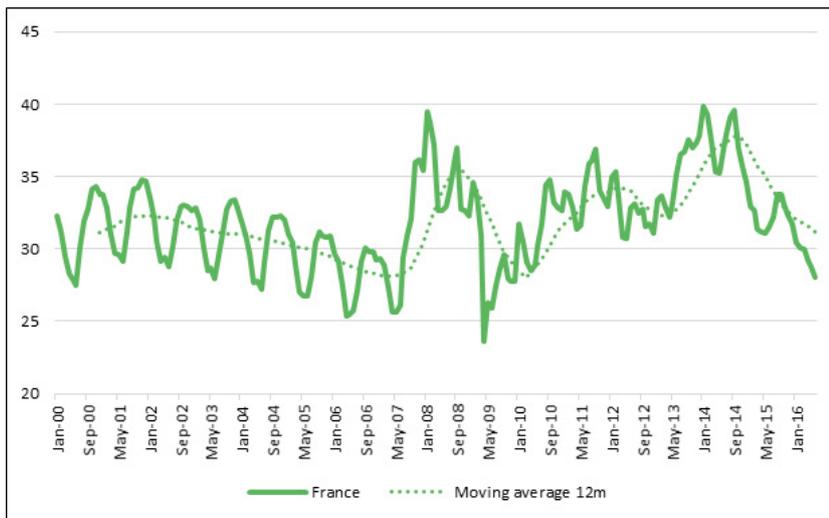
The average price over the whole period in France is very close to the EU level, only EUR 0.3 /100 kg higher. At the end of the period, the milk price was EUR 28/100 Kg, EUR 2.1 more than the EU level.

The price of milk in France is more volatile than in Italy and similar to Ireland. Over the period, it was 16% against 10% in the EU. The milk price was more volatile post-April 2007 than pre-April 2007 (18% against 14%). See figure 8.

40 Teagasc (2016), National Farm Survey.



Figure 8: Average price of raw cow's milk (EUR/100 Kg) in France



Source: Elaboration on data from European Commission, Milk Market Observatory, 2016

With an average of 380 000 litres per farm at an average price of EUR 365/1000 litres⁴¹ in 2014, the average turnover reached EUR 138 700. This compares to EUR 117 420 in 2015 with an average price of EUR 309/1000 litres.

The concentration of retailers is very high in France as four organisations cover 80% of purchases by French households. This makes price negotiation particularly difficult for dairies, as retailers want to keep their consumer prices competitive.

41 CNIEL (Inter branch National Centre of Dairy Economy), 2016, 'L'économie laitière en chiffre', 2016 edition.



3.3 Future trends in the EU milk market

This section investigates future trends for the dairy sector in the EU, Ireland, Italy and France by looking at the forecast for production and trade. It also analyses how EU farms will change, in terms of size, development and business model. It then analyses the evolution of dairy prices, describing three scenarios according to the evolution of world demand and production.

Key findings for the future evolution of EU dairy market

- In the next ten years, EU milk production will increase further.
- World demand for dairy products is driven mostly by developing countries.
- In the next few years, EU milk production will move towards France, Germany, Ireland and the UK and shrink in less competitive inland areas
- EU farms are expected to reduce in number, increase their herd size, be more efficient and automated, and will steadily move towards a more market-oriented business model.
- Production expansion will tend to be through automation in France, increased labour in Italy, and new entrants to dairy farming in Ireland.
- Ireland, Italy and France have different potential constraints to dairy expansion and development: fragmented ownership, price volatility and concerns about the implications of Brexit in Ireland, high production cost and a slow-down of demand for high-quality cheese in Italy, as well as price volatility and export dynamics in France.
- Dairy prices are expected to remain volatile in the next decade, as economic, environmental and political shocks will continue to disrupt the balance between demand and supply. Reliable forecasts for future volatility cannot be provided because short-term price changes are very difficult to predict.
- The prices of EU milk and dairy products are expected to recover from their current low levels driven by growing import demand.
- In the next five years, prices are expected to increase in Ireland, Italy and France, and volatility is expected to continue due to the link between EU and world prices.

3.3.1 Production

Globally, **the production of milk is expected to increase 20% by 2025**, or about 1.8% per year. Growth for the main dairy products (butter, cheese, SMP and WMP) should be similar to milk production. Dairy cow numbers are expected to decline in developed countries, while herd expansion in developing countries is projected to slow down. Yield per cow is expected to increase, mainly in developing countries.⁴²

The increase in world production reflects an expansion in demand due to continuing, albeit more modest, income growth and further globalisation of diets. Dairy is moving from a highly regulated, supply-driven market to being demand led.⁴³ The largest share of milk and dairy consumption is in the form of fresh dairy products, taking about 70% of milk production. This share should continue to increase in the next ten years with rising milk production in developing countries.

The total consumption of fresh dairy products in developing countries is expected to increase by 3.0% per year over the period, exceeding production growth by 2.7% per year. Per capita consumption in the developed world is already high per capita but is projected to increase between 0.2% and 1.0% per year, with the lower figure for butter, which competes with vegetable oil, and the higher figure for cheese. Nevertheless, butter should recover from the declining consumption of the last decade in developed countries.

42 OECD/FAO (2015), 'Dairy', in OECD-FAO Agricultural Outlook 2015, p.121.

43 FONTERRA (2013), 'International dairy outlook 2020: a Fonterra view'.



EU dairy production and trade should **continue to expand due to the expected increase in world and domestic demand**.⁴⁴ Milk production is expected to increase by 9% between 2015 and 2025, butter by 12% and SMP by 26%, while the positive trade balance will further increase.

Table 1: Future trends in selected dairy variables, EU-28 (2015-2025)

	2015	2020	2025	% Change 2015-2020	% Change 2020-2025	% Change 2015-2025
Dairy cows (million heads)	23.3	22.4	21.5	-4%	-4%	-8%
of which EU-15	18.0	17.6	17.1	-2%	-2%	-5%
of which EU-13	5.3	4.8	4.4	-9%	-9%	-17%
Dairy cow milk production (million t)	158.6	165.4	172.2	4%	4%	9%
of which EU-15	132.0	137.9	143.8	4%	4%	9%
of which EU-13	26.7	27.5	28.4	3%	3%	7%
Production butter (thousand t)	2.336	2.468	2.609	6%	6%	12%
of which EU-15	2.040	2.135	2.233	5%	5%	9%
of which EU-N13	296	333	376	12%	13%	27%
Imports	3	20	20	697%	0%	697%
Exports	152	189	213	24%	13%	41%
Production SMP (thousand t)	1.492	1.622	1.881	9%	16%	26%
of which EU-15	1.260	1.358	1.575	8%	16%	25%
of which EU-13	232	264	306	14%	16%	32%
Imports	5	4	4	-13%	0%	-13%
Exports	690	776	902	12%	16%	31%

Source: Elaboration on data from EC (2015). 'EU agricultural outlook – Prospects for EU agricultural markets and income 2015-2025'

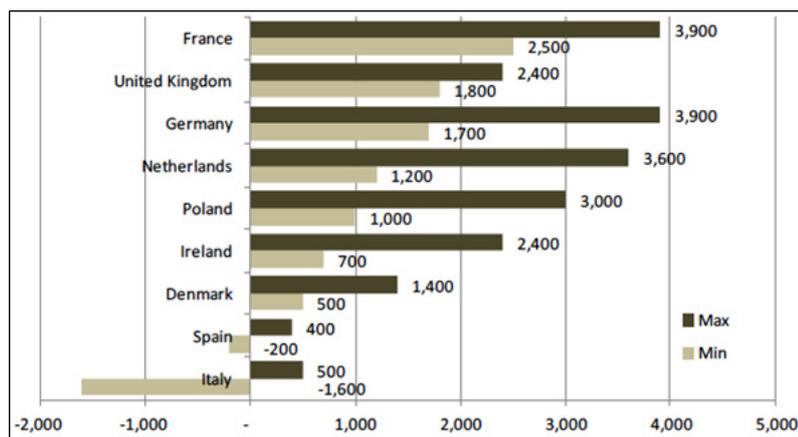
In this context, an analysis provided in 2015 by a specialised consultancy⁴⁵ offers a closer EU picture of estimates per country by 2020 (see figure 9). Overall, the study reveals that the top 14 milk producing countries in Europe will increase production by anywhere between 6.8 and 23.2 billion litres by 2020. Most growth will come from the nine largest producers, which should add between 7.6 and 21.5 billion litres. Apart from Spain and Italy, all these big producers are expected to increase milk production. Small producers like Sweden, Finland Austria, Czech Republic and Belgium are expected to decrease production.

44 EC (2015), 'EU agricultural outlook – Prospects for EU agricultural markets and income 2015-2025'.

45 Promar International (2015) 'The European dairy industry towards 2020 – European producer summary - Challenges, strategies and change'.



Figure 9: Potential milk production by 2020

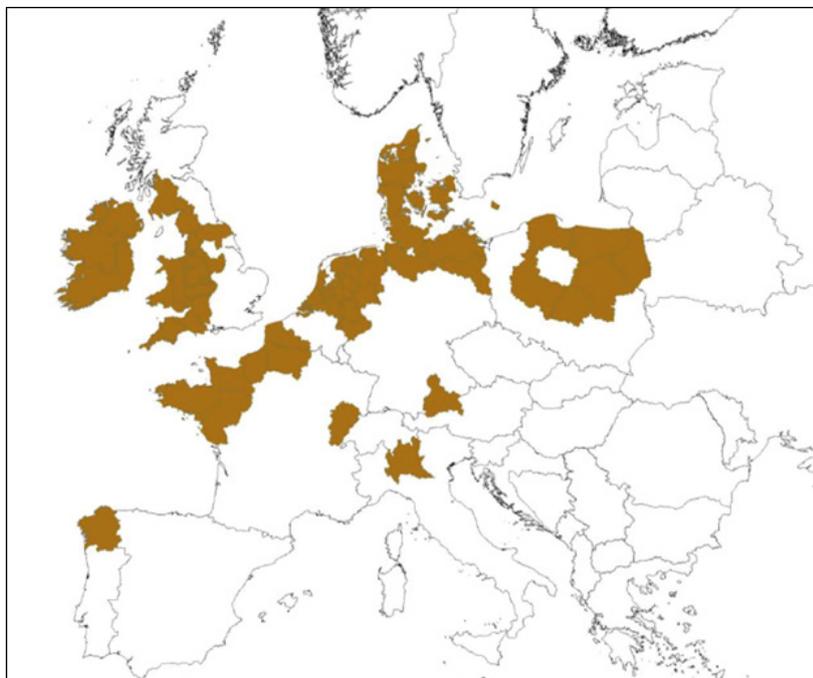


Source: Reproduced from Promar International (2015) 'The European dairy industry towards 2020 – European producer summary - Challenges, strategies and change', p. 4.

3.3.2 Geographical shift

In this context, there are indications that **EU milk production is moving to the Atlantic regions and Germany, while shrinking in less competitive areas.**⁴⁶ France and Germany should see the greatest internal changes, as production moves from the 'mountains or plains to the sea', or from low to high production density areas.⁴⁷ Across Europe, milk production, particularly for more stable products and commodities will increasingly move from high cost production areas, such as parts of Italy and Spain to lower costs areas, such as southern Ireland or Brittany.

Figure 10: European key dairy growth areas



Source: Reproduced from Promar International (2015) 'The European dairy industry towards 2020 – European producer summary - Challenges, strategies and change', p. 17.

46 EPRS (2015) 'The future of the EU dairy sector after the end of milk quotas', European Parliament Briefing.

47 See also GIRA (2012), 'World and EU dairy through 2016'.



Within the three Member States⁴⁸ under analysis:

- Ireland's milk production is expected to increase across the country, but much of the increase is expected to come from the south – with counties such as Cork and Waterford capable of increasing production by over 50%.
- In Italy, although milk production capacity is spread across the country, the majority is in the north. Forecasts anticipate less milk production in central and southern regions, particularly in areas with limited processing facilities and weak regional cheese brands.
- France has a very large and diverse production base, which is expected to see the most change regarding the location of milk production. Dairy farms should (unless there is a considerable shift in the price of grain relative to milk) continue to move from areas capable of high yield arable farming to hilly, or wetter areas, that are less suitable for arable production. In France, dairy farming is typically less intensive and therefore has more room to expand. However, as approximately 10% of production is for PDO products, it is linked to the territory and will not move. Additionally, in areas such as western Brittany, expanded dairy farms face competition from other intensive farming enterprises, such as pigs and poultry.

3.3.3 Farm structure development

The **number of cows will possibly decrease** by 4% in the EU by 2020, and 8% by 2025 (see Table 1). Among the three countries under analysis, only Ireland is expected to see cow numbers increase substantially. In France, the numbers could increase by less than 5%, while in Italy there could be 30% fewer.⁴⁹

In countries where there is more land and less intense production, the focus on productivity is likely to be lower in the short term. But from 2020 on, all producers will be under greater pressure to reduce the impact of milk production on the environment. Higher yields will in part be due to better genetics, but also to better management and feeding. Fewer cows in the EU will be accompanied by **fewer farms** all across Europe, leading to higher concentration in the sector, with lower average herd numbers. The reduction is expected to be high in France and Italy, with declines of some 30% by 2020, followed by Ireland (around 20%).⁵⁰

Fewer cows and fewer farms across Europe will require farmers to be more efficient to meet the expected increase in production. This means that **dairy farms should increase the level of automation⁵¹, adopt feed and breed innovations, and improve management systems**. Further innovation and restructuring is required in the EU dairy sector⁵² particularly in responding to climate change, conserving biodiversity, maintaining water quality, harnessing renewable energy, improving competitiveness, as well as cow health and fertility monitoring.⁵³ The removal of milk quotas in Europe has not only increased production potential, it will make it easier for more commercially focused farmers to grow and expand.

48 Promar International (2015) 'The European dairy industry towards 2020 – European producer summary - Challenges, strategies and change', pp.16-17.

49 Promar International (2015) 'The European dairy industry towards 2020 – European producer summary - Challenges, strategies and change', p.11.

50 *Ibidem*, p.13.

51 The capacity of EU dairy farmers to expand and compete on the world market will depend in their ability to use and exploit automation, which is increasingly not just milking robots but for a wide range of farm tasks. Automatic heat detection systems are becoming common on many farms, particularly second generation models with greater accuracy and data transmission capabilities. Technology is also common in manure management, irrigation, lighting and feeding systems. Moreover, a new range of sensors is being developed that will provide even greater information to farmers about their farm from soil temperature and rainfall in specific parts of the farm, to individual cow internal body temperature and health (see Promar International (2015) 'The European dairy industry towards 2020 – European producer summary - Challenges, strategies and change', pp.20-21).

52 EC (2009), 'Creativity and innovation in EU rural development'.

53 Individual animal monitoring with precise adjustments of feed and veterinary interventions through wireless systems are now in widespread use, with millions of monitor collars sold annually in the EU. See EIP-AGRI (2015), 'Precision farming'.



Among the three countries under analysis:

- **France should have a higher propensity for automation** and French labour laws encourage entrepreneurs to replace labour with new capital investment. This will also help farmers to expand productivity and improve feeding to maximise output;
- **In Italy, high land and infrastructure costs limit the resources of farmers to invest in automation.** Italian farms **tend to use more labour**, especially migrants to overcome skill shortages and expansion needs;
- **In Ireland, extensive grazing limits the adoption of automation systems.** Expansion of production is expected **via new entrants to dairy farming** (mainly existing sheep or beef farmers). The Irish Harvest 2020 strategy expects around 500 new dairy farms with an average of 130 cows. These farms should produce around 380 million litres of milk by 2020.

3.3.4 Business model shift

To compete on the international market and to meet increasing world demand, the EU dairy sector should not only adopt more efficient and innovative production systems, but also **embrace new business models**. The sector is gradually moving from the family business model towards more specialised and intensive industrial farming and this shift will be much more important in the coming years.⁵⁴

Family farming is the predominant business model in European agriculture, including dairy.⁵⁵ This model is largely characterised by small farmers who are often financially stable, as they own the land and have few debts. They have a 'day-to-day' focus and their aims and objectives are often more oriented to the way they want to farm or the things they want to achieve, such as the highest production in the district or best in class at the local show, rather than being focused on profitably or meeting the needs of their milk buyer or customers.⁵⁶ A more business like mentality would see farmers move beyond the 'doing' of dairy farming to more strategic thinking, to maximise profitability. They would put more focus on delivering financial as well as production outcomes, recruiting a better labour force, and developing skills to lead and influence others to ensure the sustainability of their business interests and the wider dairy industry. Under this scheme, only France seems to be geared towards a more efficient and managerial model, while Ireland and Italy lag behind (see Figure 11).

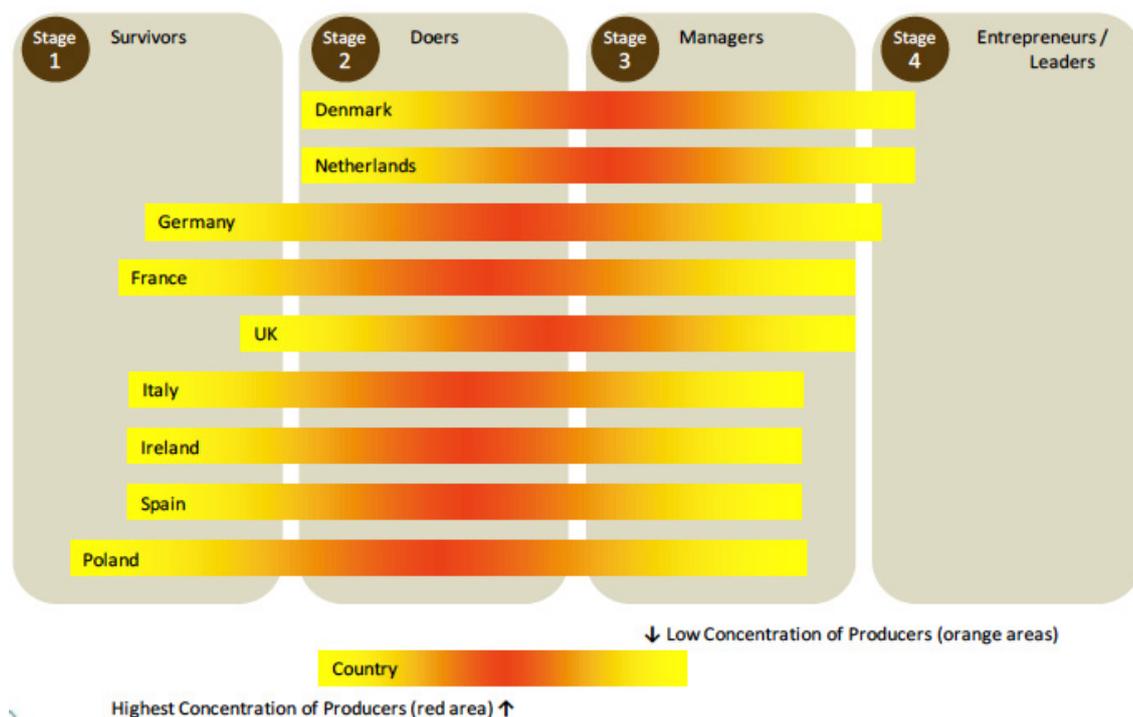
54 EPRS (2015), 'The future of the EU dairy sector after the end of milk quotas', European Parliament Briefing.

55 European Parliament (2014), 'CAP 2014-2020 tools to enhance family farming: opportunities and limits'.

56 See Promar International (2015) 'The European dairy industry towards 2020 – European producer summary - Challenges, strategies and change', pp. 20.21.



Figure 11: Farmer development model



Survivors – Stage 1	Managers – Stage 3
<ul style="list-style-type: none"> • Hands on, day to day focus • Limited, often inherited knowledge • Higher prices seen as way to improve profit • Limited engagement with supply chain 	<ul style="list-style-type: none"> • Evolving focus – skilled cow managers, then finance managers then people managers • Professional advice – vet, breeding, etc. • Increasing scale and efficiency seen as solution to improve profitability • High engagement with primary buyer
Doers – Stage 2	Entrepreneur/leader – Stage 4
<ul style="list-style-type: none"> • Hands on, day to day focus • Rely on suppliers such as feed reps for advice • ‘Working harder’ seen as solution to improving profitability • Some engagement with primary buyer 	<ul style="list-style-type: none"> • Focus on leadership/team building/innovation • Innovation and value creation for customer recognised as a solution to improve profit • Intense engagement with supply chain and beyond

Source: Promar International (2015) ‘The European dairy industry towards 2020 – Challenges, strategies and change.’

3.3.5 Main production constraints

While the drivers behind production expansion are fairly uniform across the EU and mainly affected by increased internal and world demand, the constraints tend to vary by country.⁵⁷ For the three Member States in this study these are:

57 Promar International (2015) ‘The European dairy industry towards 2020 – European producer summary - Challenges, strategies and change’, p. 7.



Ireland

- Land availability: land is expensive and ownership fragmented, making it hard to accumulate large blocks.
- Price volatility: high volatility has a big influence on the export-driven dairy sector.
- Climate: A focus on pasture-based dairy means that milk production is susceptible to the weather. Droughts are almost unheard of, but extended periods of cold, wet weather can depress production.

Italy

- Land availability: access to land in the main dairy areas is a key challenge as incomes are low and agriculture is small scale.
- Export demand: for many producers, milk demand is closely linked to export demand for PDO cheese – which has slowed in recent years.

France

- Price volatility: French farmers are unused to market price variations and export markets are seen as volatile. 'Why double production to halve your milk price' is a common attitude.
- Export market access: although the largest French companies have strong export channels, many are focused on orderly product marketing and are less willing to accept additional milk for which they do not have an existing market.
- Arable competition: Dairy production resources often directly compete with arable farming (and cattle farming in some regions). Better returns from arable farming decrease the resources available for milk production.

3.3.6 Price

As stated before, increasing incomes and globalised diets are expected to raise the demand for milk and dairy products in developing countries over the medium-term. Most of the growth will be satisfied by domestic production via larger dairy herds and rising yields. Increased import demand will support prices of dairy products during the next decade.

Milk and dairy products prices are estimated to recover from their current low levels⁵⁸, driven by growing import demand:

- EU milk producer price (real fat content) is expected to move from around EUR 30/100 kg in 2015 to more than EUR 37.4/100 kg in 2025, with average annual growth of 2.1%;
- Butter price is forecast to increase from EUR 300/100 kg in 2015 to nearly EUR 360/100 kg in 2025, with an average annual growth of 1.8%;
- SMP is expected to jump from EUR 190/100 kg to EUR 270/100 kg, with an average annual growth of 3.8%;
- Finally, cheese prices (cheddar) are forecast to raise from EUR 307/100 kg to EUR 388/100 kg, with an average annual growth of 2.4%.

Until 2020, the average EU milk price is expected to oscillate between EUR 32/100 kg and EUR 33/100 kg. This projection is lower than last year⁵⁹ but energy and feed costs are also expected to be lower. After 2021, the milk price might increase, along with dairy commodity prices, the oil price and feed costs. Moreover, since 2007, EU milk and dairy commodity prices have fluctuated significantly within and between years. Such variations might continue over the next 10 years, in response to impacts from weather, energy prices, exchange rates and animal health issues.⁶⁰

These price projections reflect the usual assumptions about weather stability as well as economic and policy

58 Data from European Commission (2015), 'Prospects for EU agricultural markets and income 2015-2025', table available at http://ec.europa.eu/agriculture/markets-and-prices/medium-term-outlook/2015/tables_en.pdf.

59 European Commission (2014), 'EU Agricultural Outlook – Prospects for EU agricultural markets and income 2014-2024'.

60 *Ibidem*, pp. 42-43.



conditions. Under ‘normal’ conditions, prices are therefore not expected to reach the peaks of 2007 and 2008, 2011 or 2013. However, actual prices are likely to vary significantly around the trend.⁶¹ Forecast prices are based on the following assumptions:

- In the longer-term, the **oil price** is forecast to rise again to USD 107 per barrel by 2025.
- It is assumed that the **Russian import ban**⁶² will remain in place until the end of 2016. However, the worsening financial and economic situation in Russia and the increased risks for operators in this market, mean trade is not expected to return to previous levels. In addition, Russia should succeed in increasing its food self-sufficiency over the next 10 years, with the exception of beef.
- For **GDP growth**, Brazil and Russia are expected to grow again from 2017 onwards but more slowly than in the 2010-2014 period. Although China’s is projected to grow only 4.2% p.a. by 2025, its size still makes it the engine of world economic growth, together with India, which is expected to be growing by 6.5% by 2025. The USA is expected to grow steadily by about 2.5 %. Finally, between 2018 and 2025, annual GDP growth is anticipated to be 1.8 % on average in the EU, significantly below the rest of the world. However, economic growth in the EU-13 (2.9 % in 2025), far exceeds the EU-15, where it is expected to be 1.6 % towards the end of the period.
- **The euro** is expected to appreciate against the US dollar (to USD 1.37/EUR in 2025) in line with the economic situation in both blocks. By contrast, other major agricultural exporter currencies are expected to remain relatively weak throughout the period, reducing the competitiveness of EU exports.

Variations in one or more of the above assumptions could cause milk price to vary from some EUR 33/100 kg to EUR 44/100 kg (see figure 12).

Figure 12: Scenarios for EU milk market price



Source: Reproduced from European Commission (2015), ‘EU Agricultural Outlook – Prospects for EU agricultural markets and income 2015-2025’, p.43.

61 OECD/FAO (2016), ‘Dairy and Dairy Products’, in OECD-FAO Agricultural Outlook 2016-2025, OECD Publishing, Paris, p.2.

62 As of December 2016, removal of the import ban, formally imposed by Russia until August 2017, is assumed to happen at the end of 2017.



2025 Forecast provided by IFCN

Other hypotheses for future dairy sector development are provided by IFCN (2016)⁶³ and include:

- Population growth and **higher per capita consumption** that would drive future demand. Until 2025, global population will increase by 12% up to 8.2 billion people, so almost 1 billion more consumers will demand milk products. Global per capita consumption will increase by 13 kg ME in the next 10 years (to 127 kg per person). The highest increase will be in South Asia (+30%), up to 174 kg per person.
- Looking at the next 10 years, **trade** is expected to increase by 51% up to 79 million tonnes of milk in 2025. This reflects the increasing importance of world dairy trade and shifting production to more competitive locations.
- The dairy world will have **new net importers and new net exporters**. In 2025, some countries will have changed their net trade status. While India and Iran are predicted to be net importers, with demand exceeding production, Romania will become a net exporter. However, some countries will strengthen their current position. While China, Africa and Pakistan will increase their net imports, the EU, New Zealand, Belarus and Argentina will increase their net exports.
- There will be 405 **million dairy animals** in the world in 2025. Globally the increase will slow from 13% (2005-2015) to 9% (2015-2025). However, South Asia will increase its number of dairy cows and buffalos to 177 million and Africa will have 80 million dairy animals. Together these will make up 63% of the dairy animal population in 2025. The EU will decrease its number of dairy animals by 3%. An additional driver for production growth is the yield per dairy animal. This is expected to increase by 14% globally, to an average of 2.5 tonnes per animal per year.
- Fewer farms, but **larger farm sizes** in 2025. In the next 10 years, the number of dairy farms will decrease to 103 million, so fewer farms will produce a more milk. However, in Africa, more dairy farms will be established (+11%). South Asia will lose 17% of its farms but increase its average milk yield by 31% per animal. Average world milk production per farm has been increasing by 16% in the last 10 years and it is expected to increase further by 47%.

63 IFCN (2016), 'IFCN long-term dairy outlook – The IFCN vision of the dairy world in 2025'.



4. THE DEMAND FOR INVESTMENT IN THE DAIRY SECTOR

Dairy farming requires costly long-term investment and adjustments cannot be made quickly. Farmers should be able to plan ahead which is harder with extremely sharp market fluctuations.⁶⁴ In the past, dairy markets have been relatively stable and predictable as the EU milk quota regime and intervention prices guaranteed a relative equilibrium between supply and demand as well as a balanced geographical distribution of milk production and dairy processing.

As analysed in chapter 3, EU dairy production is now more linked to world dynamics and expansion of the EU dairy sector will depend more on world consumption increases in the near future. At the same time, EU dairy prices are more closely related to world dairy prices and so, potentially, more subject to volatile price fluctuations. While output expansion may increase investment opportunities, a higher degree of uncertainty may constrain investments, especially for more risk-averse farmers. Higher risk will also increase the cost of finance. While public policies at EU, national and regional level will have a key role in shaping future developments, the investment behaviour of individual farmers will also depend on their specific characteristics and attitudes.

Key findings

- Among the three Member States, **the Irish dairy sector shows the clearest focus on expansion**. According to recent estimates, expected output growth should result in approximately EUR 1.5 billion of new investment between 2013 and 2020. Of this, more than EUR 1 billion is expected to be invested in new milking parlours and more dairy cows. EUR 230 million should be invested by new entrants. Apart from this, an additional EUR 140 million per year should be invested by dairy farmers in other machinery and/or land improvements.
- **Consolidation will underpin future dairy farm investment in Italy**, with an expected modest increase in milk production. Total investment could be from EUR 1.9 to 2.6 billion during the 2014-2020 period, with EUR 0.9 to 1.2 billion invested in land and EUR 0.8 to 1.1 billion for buildings. High land costs and limited availability of land, as well as high levels of debt due to past investments in land and infrastructure, could discourage new investment.
- **French processors, even cooperatives, prefer a controlled approach to production expansion**, which transfers almost all the risk of expansion onto suppliers that are looking to increase milk production. This is likely to discourage French farmers' appetite for growth.
- Increase of scale and efficiency, and **the movement of dairy production to the most favourable areas** will drive future farm investment in France. Total investment could be EUR 6.4 to 8.6 billion during the 2014-2020 period, with EUR 2.1 to 2.8 billion used for land, EUR 2.4 to 3.1 billion for buildings, and EUR 2.0 to 2.6 billion for equipment. Due to the low market share of specialist dairy farmers, the outlook for dairy versus other products will also affect investment.
- Foreign investment (Chinese in particular) is expected to support an increased capacity of French cooperative dairies to transform the additional milk produced;
- The **determinants of farm investment behaviour in the literature are technical, economic, or concern household characteristics and farmers' attitudes**.
- Such determinants include **market price and farm income levels**, as well as **individual risk aversion**.
- Study interviews confirm **that volatility can reduce investment demand**, by making the assessment of potential dairy investment proposals significantly more challenging or leading more risk-averse farmers to decide against additional investment.

64 COPA and COGECA (2010), 'First views on the future of the European dairy sector'.



- The impact that uncertainty of returns has on intentions to invest is confirmed by a JRC study of 2014. Based on this study, the **uncertainty of expected returns, combined with other factors, could reduce dairy farmer investment for 2014-2020 by EUR 3.5 to 4.8 billion in the three Member States.** In particular, investments could reduce by EUR 2.3 to 3.2 billion in Italy, by EUR 0.8 to 1.1 billion in France and by EUR 0.4 to 0.5 billion in Ireland. These results need to be interpreted with care, especially since uncertainty may reflect variable market conditions or specific farmers being unsure about their capacity to compete in an evolving market.
- **Milk price expectations can be factored in when assessing the repayment capacity of farmers applying for finance,** potentially reducing the supply of finance or lenders requiring more security in times of increased price uncertainty.

4.1 Future investment needs of dairy farmers

4.1.1 Ireland

The Food Harvest 2020 strategy in Ireland has set an objective of a 50% increase in milk production, as well as increases in exports and value added processing by 2020. The strategy has brought the Irish dairy industry together in an effort to maximise the opportunities presented by quota removal. By accepting all new milk, cooperatives effectively share any expansion risk between all members. Some of the planned additional output will be from increased cow productivity, which will be at no additional capital cost. However, the vast majority of farms will need to acquire additional cows, convert existing housing and milking facilities and/or build new facilities.

Against this background, some studies have considered the investment required to achieve the Food Harvest targets. These produce fairly consistent estimates. The Irish Farmers' Association, for example, has predicted that EUR 1.5 billion will be invested at farm level by 2020.⁶⁵ A study by Keane (2010)⁶⁶ estimated that an assumed 20 percent increase in yields by 2020 and a strong movement towards fewer and larger herds would require investment of EUR 1.9 billion by 2020. A subsequent study⁶⁷ assuming a more gradual movement towards larger herds resulted in an estimate of EUR 1.3 billion to achieve the national output growth target by 2020. Finally, a more recent study⁶⁸ estimates that the existing population of dairy farmers will invest EUR 1.24 billion in the 2014 to 2020 period, mainly due to new milking parlours (EUR 650 million) and the acquisition of dairy cows (about EUR 400 million). A further EUR 230 million would be invested by new entrants. This brings the total dairy farm investment to almost EUR 1.5 billion.

While this estimate is likely to encompass all investment in buildings and machinery associated with milking parlours, it does not include other 'normal' investment by dairy farmers in other machinery and/or land improvements. Based on past trends, this additional investment could be EUR 140 million per year.

4.1.2 Italy

Although Italy could have increased milk production to become self-sufficient after EU quotas were removed, minimal increases in milk production were expected after 2015. However, there could be a structural change within the industry. Cheaper milk from other parts of Europe underpins a trend towards increased scale and efficiency. However, the limited availability and high cost of land, as well as high levels of debt due to past investments in land and infrastructure could discourage new investment. A period of high, stable prices would give farmers confidence to make the larger capital investments in automatic milking systems.

65 Kiersey K., Bryan, J. (2013), 'Exciting times ahead', AIB (2013) Outlook Dairy.

66 Keane M. (2010), 'Potential investment costs in milk processing and transport to 2020', ICMSA.

67 Keane M. (2011), 'Capital investment in dairy farming'.

68 Teagasc and Bank of Ireland (2015), 'A review of the financial status of Irish farms and future investment requirements'.



There are no estimates of expected investment by Italian dairy farmers. However, a 2014 study by the JRC⁶⁹ estimates that 28% of these farmers intend to invest in the 2014-2020 period.⁷⁰ Based on the JRC study data, and in particular by combining:

- The number of dairy farmers in the country (between approximately 33 000 and 47 000, depending on whether non-specialised farms are included);
- The share of farmers with an intention to invest, ranging from 9% for equipment to 15% for buildings;
- The average investment in each type of asset⁷¹, ranging from approximately EUR 75 000 for equipment to about EUR 240 000 for land;

it is possible to estimate dairy farmers investing between EUR 1.9 to 2.6 billion. Most would go towards buying land (EUR 0.9 to 1.2 billion) and buildings (EUR 0.8 to 1.1 billion).

4.1.3 France

Unlike cooperative policies in Ireland, French processors, and especially the cooperatives, are less focused on production-led expansion. The French dairy sector prefers a controlled approach to increasing milk production, which transfers almost all the risk onto suppliers looking to produce more. This is likely to ensure that only the most confident and low-cost producers will increase supply, which should result in a stronger dairy industry. However, this is also likely to discourage French farmers' appetite for growth.

The low share of specialist dairy farmers should be factored in when estimating future investment, as many farmers are keen to maintain production diversity as a means of managing volatility. Thus, future investment will depend on the outlook for dairy versus other products and the milk-to-crop price ratio will be a large determinant of future industry growth. At the same time, the expected movement of production to the most favourable areas for producing milk and fewer, better managed farms, milking more cows, should require additional investment.

There are no estimates of the expected investment of French dairy farmers. However, a 2014 JRC study⁷² estimates that 67% of French farmers intend to invest in the 2014-2020 period.⁷³ Based on the JRC study data, and in particular by combining:

- The number of dairy farmers in the country (approximately 48 000 to 64 000, depending on whether non-specialised farms are included);
- The share of farmers with intending to invest in different assets, ranging from 18% for land to 56% for equipment;
- The average amount farmers intend to spend over the period on each type of asset⁷⁴, ranging from approximately EUR 75 000 for equipment to about EUR 240 000 for land;

It is possible to estimate dairy farmers investing a total of EUR 6.4 to 8.6 billion. Most would go towards buying land (EUR 2.1 to 2.8 billion), buildings (EUR 2.4 to 3.1 billion), and equipment (EUR 2.0 to 2.6 billion).

69 Lefebvre M, De Cuyper K, Loix E, Viaggi D, Gomez-y-Paloma S (2014), 'European farmers' intentions to invest in 2014-2020: survey results', JRC Science and Policy Reports, JRC Seville.

70 Lefebvre M, De Cuyper K, Loix E, Viaggi D, Gomez-y-Paloma S (2014) find that 57% of farmers intend to invest in the 2014-2020 period in the six countries covered by the study, i.e. Czech Republic, France, Germany, Italy, Poland and Spain. For farm specialisation, 54% of livestock farmers and 56% of with mixed production – the two categories that include dairy farming – intend to invest. Thus, at least at the general level of the six countries, there is little variation between farmers' intention to invest in general and the categories that best approximate dairy farmers.

71 Overall average for the six countries, as country specific data are not available.

72 Lefebvre M, De Cuyper K, Loix E, Viaggi D, Gomez-y-Paloma S (2014), 'European farmers' intentions to invest in 2014-2020: survey results', JRC Science and Policy Reports, JRC Seville.

73 Lefebvre M, De Cuyper K, Loix E, Viaggi D, Gomez-y-Paloma S (2014) find little variation between the farmers' intention to invest in general and the categories that best approximate the dairy farmers.

74 See footnote 71.



4.2 The determinants of investment

Farm investment can take the form of additional or better quality buildings, machinery and automation, livestock and land. Investment decisions are often based on cyclical interactions between business-level decisions and the external business environment.

The determinants of farm investment behaviour in the literature can be qualified as:

- **Technical**, including investment characteristics, farm characteristics, and technical change;
- **Economic**, such as product markets, factor markets and policy;
- **Household characteristics and farmers' attitudes.**

Determinants of farm investment behaviour⁷⁵

Technical determinants:

The literature usually only distinguishes investment characteristics by to their technical nature (land, buildings, and machinery) or 'on-farm' vs 'off-farm'. These distinctions are always relevant, although this is commonly determined by the survey design as different functions are estimated for different types of capital goods.

Farm characteristics may include size, location (for soil and climate), type of farming or specialisation (prevailing activities for different groups of farms), labour availability and existing capital stock. The literature on investment also points to the financial characteristics of farms, such as debt/asset ratios. All of these variables appear to be significant, although often with some contradictions. Location may affect investment in various ways, such as effects on yields or specialisation. Labour and land complement capital, as they are positively correlated with investment. In contrast, land appears to be negatively correlated with off-farm investment. The widespread availability of some capital goods tends to encourage some types of investment while discouraging others, so farms with high land availability invest in buildings and machinery, but not in land. Specialisation, debt asset ratios and yields may push investment in different directions. As expected, profitability generally tends to encourage investment.

Among other issues, technology plays a major role, with technical change encouraging investment. However, most studies have not considered this issue because it requires extended time series that are generally unavailable.

Economic determinants:

Higher prices encourage investment, as expected. Capital, labour, and land markets are relevant, especially their prices and availability, including whether they can be supplied by the household or from outside sources. Capital markets are also key, including the cost of capital, interest rates, equity yields, depreciation and replacement costs of capital. The literature mainly focuses on capital costs and interest rates, prices of land, renting buildings and machinery and variable inputs. In this case, the signs are all consistently negative, although with a number of exceptions that can to some extent be attributed to unsatisfactory features of the model.

Price support or single farm payments may encourage investment, as will saving and consumption decisions and general taxation.

Determinants concerning household characteristics and farmers' attitudes:

Household characteristics may include gender, age, education, any successor, and household wealth. Age and education appear to be the most relevant variables. The literature generally confirms that older farmers tend to invest less. Increasing levels of education appear to encourage greater investment, while off-farm income (labour) discourages investment.

Farmers' attitudes, mainly towards risk, savings, investment and specific technologies, are considered important in some of the literature on investment behaviour, but do not appear in most literature looking at past investment decisions.

75 Gallerani V., Gomez y Paloma S., Raggi M., Viaggi D. (2008), 'Investment behaviour in conventional and emerging farming systems under different policy scenarios', JRC Scientific and technical reports, EUR 23245 EN – 2008, pp. 22-25.



More recent international literature confirms that the same factors continue to determine investment decisions, also since the financial crisis. For example, Teagasc and Bank of Ireland⁷⁶ show that large dairy farms with higher family farm income and an off-farm income earned by the spouse are more likely to invest. The same report clarifies the importance of grants in explaining the investment decisions in specific periods.⁷⁷

Another study analysing Irish agriculture in the 1997-2010 period finds that farmers are market- and price-sensitive in making investment decisions and that financing constraints affect farmers' investment decisions.⁷⁸ Such constraints are higher for medium-sized farms compared to large farms and indicate a challenge in accessing the finance required for continued investment activities such as adopting productivity-enhancing technology.

4.3 Impact of volatility on investment behaviour

The existing literature addresses the influence of market prices on investment decisions by focusing on prices. However, some policy and sector studies confirm that price volatility also plays a role in determining investment. For example, the European Parliament notes that, in addition to putting the financial viability of farms in doubt, income uncertainty is a specific impediment to investment and innovation.⁷⁹ **Excessive volatility makes the completion of accurate cash flows significantly more challenging** when analysing a potential dairy investment proposal. In addition, excessive price fluctuations may also lead more risk-averse farmers to decide against additional investment. As a consequence, **farmers are less willing to invest in productivity-raising assets when prices are unpredictable**, and may lead them to making sub-optimal investment decisions in the long term⁸⁰, preventing the dairy industry from maximising its potential. Study interviews also confirmed that volatility can reduce investment demand due to dairy farmers' uncertainty about their future.

A 2014 JRC study⁸¹ provides insight into the impact of uncertain returns on intentions to invest in Italy and France. In particular, more than one-third of Italian farmers indicated that uncertain expected returns have had a role in their decision not to invest in the 2014-2020 period. The same applies to less than one-tenth of French farmers. **Multiplying this data by the average spending of farmers with an intention to invest in the respective Member States leads to an estimated EUR 2.3 to 3.2 billion of reduced investment demand in Italy, and EUR 0.8 to 1.1 billion in France. Adopting a similar approach for Ireland leads to an estimate of EUR 0.4 to 0.5 billion of reduced investment demand.**⁸²

These are rough estimates that assume removing the uncertainty of expected returns would lead to farmers investing. Instead, uncertain returns are often only one of the reasons hampering invest. More importantly, uncertain returns may be due not only to the variability of market conditions but also to specific farmers being unsure about their capacity to compete in an evolving market. So, the figures may overestimate the magnitude of sub-optimal investment decisions. However, the figures do not factor in the impact on reduced investment of expected returns being low (which may also be at least partially due to price volatility discouraging investment). Additionally, the figures only consider dairy farmers deciding not to invest but ignore reduced investment plans.

76 Teagasc and Bank of Ireland (2015), 'A review of the financial status of Irish farms and future investment requirements'.

77 This refers to the particularly high net new investment on dairy farms in 2007 and 2008 which was mostly driven by grants available through schemes such as the Farm Waste Management and Dairy Farm Hygiene schemes.

78 O'Toole C. M., Newman C., Hennessy T. (2014), 'Financing Constraints and Agricultural Investment: Effects of the Irish Financial Crisis', *Journal of Agricultural Economics*, Vol. 65, No. 1, 152-176.

79 See for example Committee on Agriculture and Rural Development of the European Parliament (2016), *Draft Report on CAP tools to reduce price volatility in agricultural markets (2016/2034(INI))*.

80 Madre Y & Devuyt P (2016), *How to tackle price and income volatility for farmers? An overview of international agricultural policies and instruments*.

81 See footnote 64.

82 This estimate assumes approximately 15 600 to 17 600 milk producers in Ireland, depending on whether non-specialised farmers are considered. Average spending in the 2014-2020 period by farmers with an intention to invest is assumed to be the same as for Italy and France, i.e. approximately EUR 200 000. The portion of dairy farmers that do not intend to invest is taken from the Allied Irish Banks Agri Financial Services Survey 2016 and refers to 2017 to 2019. The share of farmers not investing (also) due to expected returns being too uncertain is assumed to be the same as for France.



Financial constraints are usually addressed in the literature by looking at farm fundamentals. **Study interviews indicate that lending decisions are sometimes based on formulae that include milk price projections. Such formulae may include stress tests on how repayment capacity is affected by price fluctuations around an expected average. This suggests that price volatility may also negatively affect the supply of finance.**

Study interviews also indicated that milk price **volatility can have other knock-on effects on investment, which tends to be cyclical and typically happens during booms, when infrastructure is more expensive.** So, in practice farmers tend to drive up prices when expanding their facilities during boom periods. This can also create difficulties with repayments during the next downturn. Investments can be also much affected by the timing of public support for investment, especially EU grant schemes.

In addition, the literature⁸³ agrees that in periods where volatility is cyclical rather than seasonal, **there is a lag in production response to price change**, for example due to biological reasons. Product prices and quantities will both move in an opposing cyclical recurring pattern.⁸⁴ The time mismatch between production and price dynamics, coupled with the timing of public support for investment, can further raise the uncertainty about investments.

Lastly, it is worth mentioning that **even temporary extreme price volatility, can have broader negative effects on producers, beyond reduced investment demand. Extremely low prices can create financial problems for farmers with low margins, cash flow management and solvency issues, potentially leading to farms that would be viable in the long run defaulting. Additionally, high prices can cause product substitution, which may be difficult to reverse, leading to lower structural income.**

Additionally, dairy product buyers can be affected by price instability that may hamper business planning and customer relationships. Since dairy is both a commodity and an ingredient, it is an integral component of many supply chains, so many players can be affected by price volatility⁸⁵ significantly affecting a large part of the agricultural sector. Price volatility can also undermine the ability of branded players to follow a consistent consumer-investment strategy, meaning that the category develops less added value.⁸⁶

83 See M. Keane and D. O'Connor (2009), 'Price volatility in the EU dairy industry: causes, consequences and coping mechanisms', p. 14.

84 For example an initial high price in period 1 will result in a lagged production response in period 2 which in turn will cause the price to fall. The response will be a lagged cut in production in period 3, once more resulting in a high price, which then causes the whole process to repeat itself.

85 See D. O'Connor, D. Bergmann, and M. Keane (2016), 'The challenges posed by price volatility in the EU dairy sector', p. 7.

86 M. Keane and D. O'Connor (2009), 'Price volatility in the EU dairy industry: causes, consequences and coping mechanisms', p. 21.



5. PRICE DETERMINATION AND MILK PRICE DATA

The milk price in the EU is freely negotiated between farmers and processors, which is one element of milk supply contracts, as provided by the Milk Package.⁸⁷ Such contracts are increasingly made in writing in advance of delivery and, in addition to the price, contain specific elements such as volume, duration, details of payment, collection and rules for force majeure.

The price is most commonly reported as a value per volume or weight of milk e.g. cents per litre, and tied to quality parameters, such as fat, protein, bacteria count and somatic cells. Additionally, it may include rewards, bonuses and other adjustments, including for transport and seasonality. So, **milk price comparisons are fraught with multiple definition difficulties, necessitating precise specifications** including whether VAT is included or excluded, whether milk solids content (percentage of fat and protein) is standardised or variable, if milk collection costs are deducted and to what extent various premiums and levies are included or excluded.

The process of price determination is different in the three Member States, which also reflects the different size of their markets. **None of these three Member States has a price index that could be used as a basis for a financial instrument responsive to price variation.**

Key findings

- None of the three Member States has a price index that could be used as a basis for a financial instrument responsive to price variation.
- Milk price in the EU is freely negotiated between farmers and processors. Since milk prices reflect different quality parameters and precise specifications, comparisons are fraught with definitional difficulties.
- Ireland has a fully decentralised system, where peer comparison is key element in the price negotiation between cooperatives and farmers. A league table of milk prices is published each month in the Irish Farmers Journal that provides transparency and puts pressure on cooperatives to pay farmers a good price.
- A well-established audit of milk prices paid by dairies to farmers in Ireland is completed annually by the accountancy firm KPMG for the Irish Farmers Journal.
- In Italy, there is a clear division between the market for PDO cheeses and their chains, and the market for industrial use. Farmers supplying milk for PDO cheeses are less affected by spot milk prices, while the price for other milk is highly influenced by the bargaining power of the most important private buyers.
- The price agreed between Lactalis and farmers is used as a reference in Italy for setting the industrial price. Lactalis recently established a system of indexation to the German milk price.
- In France, the inter-branch organisation CNIEL provides indicators that can be freely used by producers and processors to determine milk prices. These describe the evolution of the milk market and the competitive position with Germany. However, prices agreed between Sodial and its members have recently been used as a reference by dairies and farmers.
- Differences in prices in different contracts are relevant and may be 10% or more in Ireland and Italy (even 20% or more in Italy if milk for PDO cheese production is compared to milk for industrial purposes). Prices paid to French farmers differ according to the dairy and the region.
- In each of the three Member States, new types of private contracts are developing to include indicators of milk production costs and product mix by dairy firms to guarantee more stability for their farmers.
- Dairies also use other tools to minimise falls in price during low price periods. These include, for example, incentives to adjust production volumes, or cooperative margin reductions.

⁸⁷ Under the Milk Package, Member States can make written contracts between farmers and processors compulsory and oblige purchasers of milk to offer farmers a minimum contract duration. See Article 148 of Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007 (OJ L 347, 20.12.2013, p. 671).



5.1 Price determination in Ireland

The Irish dairy supply chain is reasonably transparent as farm organisations focus on publicly quoted dairy commodity prices and calculate and publicise the minimum farm equivalent milk price that they claim should be payable by Irish dairies on a monthly basis.

The leading farm weekly magazine, the Irish Farmers Journal, publishes a milk price league table each month that compares prices paid by each dairy to dairy farmers. This league table is followed very closely by farmers who exert pressure on the lowest paying dairies to increase prices.

The Irish Farmers Journal also commissions a professional auditing firm, KPMG, to make an annual comparison of milk prices paid by dairies. This annual audit also provides greater transparency for the industry.

Additionally, Ireland has a marketing cooperative, Ornua, which has also developed a dairy market index reflecting market returns. Movements in the Ornua PPI index are also followed closely and linked to movements in farm milk prices by farm organisation representatives.

Dairies also improve stability of their suppliers with schemes that address the milk price directly. These include fixed price schemes through which farmers can hedge a significant share of their milk production.⁸⁸ Fixed price schemes have been operating in Ireland for several years⁸⁹, suggesting that farmers see them as long term. They assume that when one ends it will immediately be replaced with another; perhaps a slightly modified one, which in effect introduces some flexibility. Dairies work to have long-term contracts to supply their customers. This is the major element reducing risk exposure for dairies and enabling them to have fixed prices with farmers for a proportion of their milk.

During low-price periods, cooperative dairies may seek to minimise price falls through margin reductions⁹⁰, or by suspending or reducing any compulsory funding requirements for their members, including for minimum shareholdings.

5.2 Price determination in Italy

In Italy, there is a clear division between milk for PDO cheese and their chains, and milk for industrial uses, including milk to be sold for immediate consumption and milk to be processed for industrial products.

Industries not involved in the production of PDO cheese, or at least not depending on them, generally sign contracts with farmers for a few months, which can vary according to market uncertainty (from 3 to 12 months). The price is generally set for that period and in many cases can be adjusted with the evolution of international milk prices. Lactalis and their milk suppliers during price negotiations now reference the milk price in Germany with a premium that is a proxy for the cost of transportation to Italy.

In at least one case (Piedmont) a contract has been signed with an indexed price, between Ferrero (the multinational enterprise producing snacks and sweets) and two POs (Compral latte and Piemonte latte). In this case, the milk price is adjusted monthly based on an index combining prices of imported milk and dairy products, as well as a factor of production (components of feed like soybean and corn).

Differences in prices for different contracts may even be over 20% between milk for industry and for PDO cheese. Differences in milk prices for industrial purposes (about 10-15%) depend on the contract and reference prices (or indexing methods). Prices in southern Italy, a geographical area with a strong deficit, are higher than in northern Italy by about EUR 2-4/tonne.

88 For example, Dairygold adopted a scheme early in January 2016 setting a fixed price for milk delivered with referenced milk constituents. The scheme ran for 18 months and participation was voluntary. Suppliers could fix prices for up to 15% of their 2015 milk supply.

89 For example, Glanbia is currently operating their fifth scheme.

90 For example, study interviews indicated that Dairygold provided an extra EUR 20 million in 2015 and even more in 2016 to limit the fall in price.



Large retail chains play a significant role, especially in the market for fluid milk (UHT or from microfiltration), since they have private labels that compete with industrial products.⁹¹

There are also spot markets for liquid milk, in the cities of Lodi and Cremona, in Lombardy, and one in Verona, but the amount of milk traded is negligible, so these are not very representative. Farmers and buyers, however, look at this price to get hints about future market prices.

5.3 Price determination in France

In France, the inter-branch organisation CNIEL provides two indicators that can be freely used by producers and processors as a reference milk price.

CNIEL indicators are used as a basis to negotiate a standard milk price (38g fat/ 32g proteins). Price adjustments for milk quality and composition are published at regional level by CNIEL branches (sanitary quality, added rate of proteins and fat). Different kinds of bonuses can be added.

Since 2010, French law regulates trade relationships between milk producers and buyers by monitoring written contracts for at least 5 years. Producers delivering to private companies are allowed to regroup into producer organisations and 57 of these have been officially recognised, as well as APOs⁹², to negotiate contracts, prices and volumes. The same type of contract for all members of a producer organisation will soon be mandatory for more transparency. Producers delivering milk to cooperatives have both membership and delivery contracts which define volumes and prices. Unlike private processors, cooperatives transfer part of their earnings to members via dividends and refunds.

The main French distributors; Leclerc, Carrefour, Intermarché, Auchan and Casino are important in determining prices.

To improve price stability for farmers there are double volume/double price systems. For example, both Danone and Sodiaal have an A-price based on the internal market and a B-price based on the world market. This allows them to manage differences between suppliers, e.g. in terms of size, region, strategy, and to improve management of surplus milk.

Additionally, new types of private contracts are developing locally to include milk production costs and product mix in order to manage price volatility and to guarantee more stability for farm operations. For example, Danone recently agreed a new price formula with its suppliers where part of the variation depends on farm production costs. The formula takes into account the specificities of each of the four main regions where Danone operates. Sodiaal has been developing a milk price based on production costs and has just launched a contract with a margin guarantee similar to common practice in the US⁹³, but only for very small amounts.

91 Autorità Garante della Concorrenza e del Mercato, 'Indagine conoscitiva sul settore del latte: concentrare l'offerta e accentrare i servizi', 2016.

92 Only vertical APOs can negotiate with their dairy farm suppliers, e.g. AOP Sunlait with 12 producer organisations. APOs are not allowed to negotiate prices on a territorial level, e.g. APO Grand Ouest is a territorial APO with many producer organisations, each of these negotiates with their own suppliers.

93 The US initiative, included in the 2014 farm bill and known as the Margin Protection Program, helps protect dairy farmers against catastrophic losses. It does this by allowing farmers to use an insurance-style programme to cover the margin between national average milk prices and feed costs (see NMPF, 2016, 'Explaining the Margin Protection Programme').



6. THE MILKFLEX FUND

The MilkFlex Fund is a new and innovative financing vehicle, recently established to support the dairy sector in Ireland. The EUR 100m fund combines investment from the National Treasury Management Agency, Rabobank, Glanbia and the fund manager, Finance Ireland. The MilkFlex Fund has been developed to address issues negatively impacting farmers in the Glanbia Co-operative and to provide them with access to finance on a sustainable basis.

Whilst the MilkFlex Fund has not received European Structural and Investment Fund (ESIF) support, the fund design and its specific approach to address market volatility are potentially replicable in ESIF supported financial instruments, in other geographies and potentially in sub sectors such as pig farming.

6.1 Summary

The following table summarises the key features of the MilkFlex Fund.

Table 2: Key features of the MilkFlex Fund

Name of the Fund	MilkFlex Fund
Promoter	National Treasury Management Agency, Glanbia, Rabobank and Finance Ireland
Fund manager	Finance Ireland
Fund amount	EUR 100 million
Funding sources/investors	National Treasury Management Agency
	Glanbia
	Rabobank
	Finance Ireland
Type of financial products	Loans with built in volatility protection
EU leverage	No EU financing in current structure
Reinvestment	Not permitted
Thematic focus	Agricultural – dairy
Type of final recipients	Farming businesses, who are members of the Glanbia Co-operative
Stakeholders	As funding sources

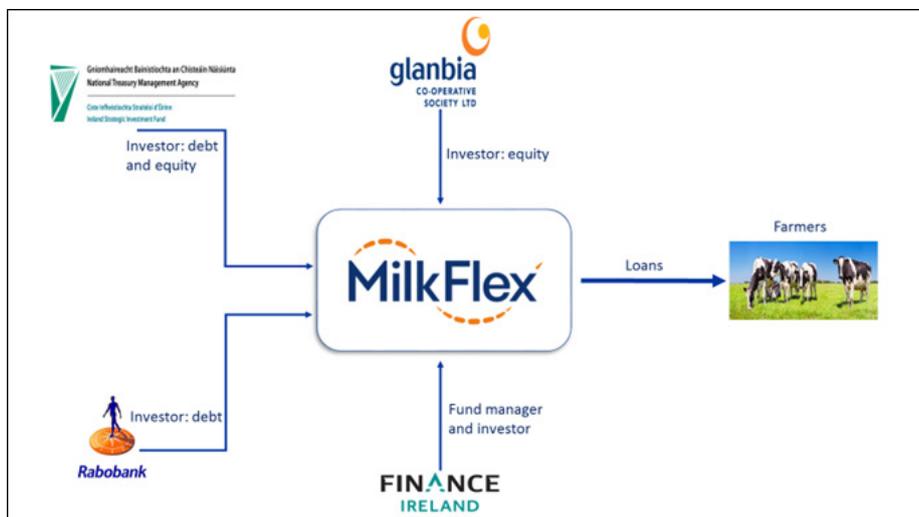


6.2 Background and objectives of the MilkFlex Fund

In the context of the market conditions and price volatility in Ireland as set out in chapter 3.2.2, the National Treasury Management Agency, Glanbia, Rabobank and Finance Ireland developed the MilkFlex Fund. This aims to provide a loan which with a direct link to the milk price and therefore Glanbia farmers' ability to service and repay the loan. It also seeks to be competitively priced and easily accessible. The following requirements/objectives were developed by fund stakeholders:

- The duration of the fund should match the financing needs of the underlying investment, or capital infrastructure/project;
- The interest rate should mean the proposition is economic at farm level, so the cost of finance and the related project is affordable for the underlying farmers;
- The repayment schedule should respond to dairy price volatility;
- There should be inbuilt protection for the dairy farmer in the event that milk prices drop below an economically sustainable price point;
- The application and administration process should reflect an efficient best in class approach; and
- The fund should have a first call on the dairy farmer milk cheques which are the cooperative payment obligations for the supply of milk, as opposed to other forms of standard security usually requested by banks and financial intermediaries.

Figure 13: Set-up of the MilkFlex Fund



Source: MilkFlex, 2016.

To address the volatility issues, the stakeholders sought to develop a solution which enabled the loans to adjust in line with the operating circumstances and therefore reflect cash flow variability. The MilkFlex Fund repayment parameters allow for the following tailoring/adjustments which may be considered under three situations:



Table 3: The three situations covered by the MilkFlex Fund

Situation	Trigger	Duration	Frequency
Reduction of loan repayment	Monthly loan repayments will be reduced by 50% when the milk price falls below a threshold for 3 consecutive months.	When activated, it will operate for 6 months, irrespective of the Glanbia milk price, unless the loan participant instructs otherwise.	The 'reduction on loan repayment' mechanism can only be activated 4 times for each loan.
Suspension of loan repayment	Loan repayments will be suspended when the milk price falls below a certain price for 3 consecutive months.	When the 'suspension of loan repayment' mechanism is activated, it will operate for 6 months, irrespective of the Glanbia milk price, unless the loan participant instructs otherwise.	The 'suspension of loan repayment' mechanism can only be activated 2 times for each loan.
Increase of loan repayment	Loan repayments will be increased by 20% when the milk price goes above a benchmark for 3 consecutive months.	When the 'increase loan repayment' mechanism is activated, it will operate for 6 months, irrespective of the Glanbia milk price.	The 'increase loan repayment' mechanism can only be activated 4 times for each loan.

Source: MilkFlex, 2016.

To address security requirements and also to facilitate a relatively simple administration process, individual loan applicants authorise Glanbia deduct their monthly loan instalments, i.e. interest and capital repayment, directly from their receipts under a Milk Supply Agreement. This Milk Supply Agreement contractually obliges the farmer to supply and Glanbia to process the milk it produces over a fixed duration, aligned to the term of the loan and it is mandatory for all. All loan applicants must sign a Milk Supply Agreement covering the duration of the loan. The fund also makes use of existing Glanbia IT systems which administer farmers' payments to service the loan repayments. This enables Glanbia to deduct individual loan repayments from the milk receipts and transfer these to the fund manager.

To address the competitive interest rate issue, the fund combines an equity investment from Glanbia and the National Treasury Management Agency with debt from the National Treasury Management Agency and from Rabobank. To ensure alignment of interest, Finance Ireland as fund manager must also invest in the structure.

**Table 4:** Investors in the MilkFlex Fund

Investor	Type
Glanbia	Equity
National Treasury Management Agency	Equity/Debt
Rabobank	Debt/ Liquidity facility
Finance Ireland	All

Source: MilkFlex, 2016.

6.3 Set up of the financial instrument

6.3.1 State aid

The public sector contribution to the fund is provided by the National Treasury Management Agency, this funding is provided on a commercial basis and on pari passu terms to the other private funding providers - Rabobank and Glanbia. Accordingly, no State Aid issue arises. As previously mentioned, there is no ESIF contribution to the fund.

6.3.2 Governance

The MilkFlex Fund is managed by an organisation called Finance Ireland, which is a privately owned fund management company. Finance Ireland initially focussed on providing auto financing products but has since expanded and recruited agricultural finance specialists to form a dedicated MilkFlex team. To ensure alignment of interest, Finance Ireland also invests in the MilkFlex Fund, both through equity and long and short-term funding.

The other stakeholders in the MilkFlex Fund are presented in the box below.

MilkFlex Fund's investors

Glanbia is a global dairy company which also operates a co-operative of Irish dairy farmers. Glanbia is investing in the fund and also supporting implementation through promotion amongst its co-operative members and through the collection of milk receipts and subsequent loan repayments. Glanbia sees large demand for dairy products in the future as a result of population growth and the westernisation of diets, for example in Africa consumption of enriched milk products has increased by 27%. Glanbia is focussing on developing high value added aspects of the dairy market to insulate it as much as possible from volatility, these include product areas such as infant nutrition, affordable nutrition for developing countries and clinical nutrition. Glanbia sees the MilkFlex Fund as a key instrument for continued support of the expansion of the Irish dairy market.

Rabobank is a major international European cooperative bank, offering retail banking, wholesale banking, private banking, leasing and real estate services. Rabobank has strong agricultural roots and is a leading financier for the agriculture and food industries. Rabobank was instrumental in the development of the MilkFlex Fund and is providing debt to the fund, both through a senior debt facility and a liquidity facility to support the short term operation of the fund.



National Treasury Management Agency provides a range of asset and liability management services to the Irish Government. These services include borrowing on behalf of the Irish Government and management of the National Debt, the State Claims Agency, NewERA, the Ireland Strategic Investment Fund and the National Development Finance Agency. The National Treasury Management Agency provides both debt and equity investment to the fund. It is also actively exploring opportunities to develop further iterations of the MilkFlex Fund, with additional co-operatives so as to ensure greater market coverage of the product.

Finance Ireland is the fund manager of MilkFlex Fund, it has contributed with equity and provides both long-term and short-term funding.

Source: Glanbia, Rabobank, National Treasury Management Agency, Finance Ireland, EIB, 2016.

6.3.3 Implementation

The MilkFlex Fund was launched in May 2016 and since then the Finance Ireland team has held a series of awareness raising meetings with Glanbia farmers not only to provide information on the fund, but also to support and guide farmers with their applications.

Once an application is received, the Finance Ireland team visits the farm to meet the farmer and collect the information necessary for the application process. The credit analysis takes into account historic financial performance and projected cash flows. The financial impact of the proposed new loan is assessed with assumptions for the cyclical nature of dairy farming and price volatility.

6.4 Investment strategy

The investment strategy defines eligible activity as investment in productive agricultural assets, with a view to enhance the returns generated by a MilkFlex applicant in carrying out their dairy business. This can include funding working capital to expand the dairy business but cannot include land acquisition, or the release of equity in an asset. Investment in non-farm assets is also excluded.

Typical eligible investment includes:

- Additional cows;
- Land improvement;
- Efficiency measures;
- Farm infrastructure; and
- Environmental compliance.

Refinancing is permitted but capped at 30% of the fund.

6.4.1 Financial products, terms and final recipients

The investment strategy defines the maximum and minimum loan that can be made to individual applicants, it also prescribes a maximum 8 year term, extending to 10 years if all the available flexibilities are exercised. Working capital can be funded for expansion but not land acquisition or the release of equity.

Applicants must have a track record of operating for two years and be members of the Glanbia co-operative with Milk Supply Agreements in place. The milk price which determines the repayments is established using the monthly Glanbia price.

In addition, loan applicants are allowed to use grants (designated to the financed investment) for early pre-payment of the loan if these are received subsequent to disbursement.



7. OPPORTUNITIES AND CHALLENGES FOR SETTING-UP A FINANCIAL INSTRUMENT PROVIDING FLEXIBLE LOANS

7.1 Rationale and scope of the instrument

The EU dairy sector is experiencing restructuring after policy reform reduced internal market protection and increased the exposure of EU producers to the volatility of international markets. On the basis of the study, it appears evident that this process impacts investments differently in different EU areas.

In particular, liberalisation after abolition of the quota system has seen an increase of investment by farmers in competitive areas trying to exploit their advantage over producers in areas with less favourable production conditions. Investment takes place along with permanent price volatility risk. **The study confirmed, on the basis of the literature and as a result of the interviews, that price volatility is likely to influence farmer investment behaviour, and may impact banks and financial intermediaries that factor price volatility risk into their lending decisions.**

On the basis of these elements, the development and implementation of financial instruments responsive to milk price dynamics, may help to mitigate the effects of uncertainty related to unpredictable volatility, and allow dairy farmers to better plan and manage investment.

Public support could be used to improve the conditions of any market-responsive financial instrument, or to make such instruments available to more farmers. **The study confirmed that such instruments may have a real market potential.** This is in particular evident as, in addition to the MilkFlex fund described in this study, other flexible financial products are already offered by private financial intermediaries in France and Ireland.

Key findings

- Study interviews indicated a strong interest in financial instruments that are responsive to market conditions.
- In France and Ireland there are already bank loans with repayments depending on the financial situation of dairy farmers, confirming the market potential for such instruments, but questioning the intervention need given existing supply.
- The use of automatic triggers may be more expensive to administer than more standardised financial products, and hence be an impediment for 'retail banks' that aim for low operational costs to stay competitive.
- The very nature of the automatic trigger will also remove the discretion of a bank to decline, revise or potentially seek further information from the farmer prior to the flexibility being granted. This may increase the perception of risk on the part of a bank and make it more reluctant to adopt such an automatic trigger-based model.
- Due to their stable and close relationship with their members, cooperative dairies are best suited to share the risk of a price volatility financial instrument. The most important cooperatives in Ireland have a track record of cooperation with financial intermediaries to provide better financing conditions to their members. However, their capacity to share risks may be constrained by other priorities.
- Farmers may be reluctant to accept finance from their processors if this reduces their ability to switch to other buyers (lock-in). This may be an impediment to a price volatility financial instrument developed with risk shared by private cooperatives.
- Producer organisation may also have an interest in developing this type of financial instrument, but only larger ones may have the scale required for risk sharing. Additionally, producer organisation stakeholders imply setting up the financial instrument at a sub-national level, which may create further complications and inefficiencies in terms of delivery.
- A broad range of financial products is already available, which may also meet certain needs and can help to manage price/income volatility (e.g. over-the-counter contracts, forward contracts, futures and insurance).



- Against an offer of financial tools that is rapidly developing, financial instruments responsive to market conditions could be part of a set of instruments that provide farmers with financing solutions that meet their diversified needs.

7.2 Available instruments and interest of banks and financial intermediaries

In addition to the usefulness for dairy farmers, the feasibility of a financial instrument to provide such support depends on the appetite of banks and financial intermediaries to participate. Perceived barriers to their involvement, together with the complexity and efficiency of channelling public and private funds through any such instrument will need to be considered by banks and financial intermediaries.

The development of a financial instrument not only depends on its usefulness for dairy farmers, but also whether it is attractive for banks and financial intermediaries and whether there are barriers to be overcome. The efficient channelling of public and private funds into a financial instrument adds further complexity.

Study interviews indicate a strong interest from banks and financial intermediaries, farmers organisations and other stakeholders in a financial instrument responsive to market conditions.

The interest of banks and financial intermediaries and the market potential for such a financial instrument, though not necessarily the market gap, is evident as similar financial products are already available from the private market in Ireland and France:

- In Ireland, the recent launch of MilkFlex by Glanbia follows an earlier initiative of Bank of Ireland, which in 2014 launched Agriflex. This is a long-term loan, providing farmers with the flexibility to reduce monthly repayments to interest-only in times of difficulty, e.g. caused by price volatility. The Agriflex loan can also be extended. Allied Irish Banks, the leading provider of finance to farmers in the country, also offers loan products with the possibility to change monthly instalments to interest-only during difficult periods and to postpone repayments.
- In France, all new loans by Crédit Agricole have a clause that allows producers to decide if they want to stop repayments for a few months until their financial situation improves ('prêts à piloter'). However, borrowers must provide a guarantee ('caution solidaire') until loan repayment is completed. This is a significant burden compared to the costs of the loan with current low interest rates.

Credit Agricole - Prêt à piloter

The 'prêt-à-piloter' (PaP) is a flexible loan provided by Crédit Agricole, the main commercial bank financing farmers and agri-businesses in France (with about 70% of the loan market according to various sources). Crédit Agricole is not the only bank network providing this type of flexible loan in France but given its role in agriculture and agri-business, the PaP is considered to have the largest potential impact on the market.

The main objective of the PaP is to reduce the insecure / unpredictable context for farmers and agri-businesses on a day-to-day basis. The loan which can be amended when certain conditions are met. This enables farmers/agri-businesses to reimburse the loan in advance or with a delay, and with upward or downward changes in reimbursements. These amendments are not automatic and are decided on the borrowers' request. Pauses are limited to 12 months (non-consecutive) for the whole life of the loan (i.e. reimbursements could be delayed for three months, four times during the life of the loan or twice for six months). Crédit Agricole is currently considering expanding this 12-month period to 24 months; potentially with the support of a publicly-supported guarantee.



PaP now represents about 70% of the loans provided by Crédit Agricole to agriculture and businesses are increasingly aware of its existence. The PaP is very adaptable and not devoted to the dairy sector. It was used a lot by cereal farmers in 2016-2017, when the sector was in difficulty in France. Overall, the PaP is mainly used for pork, cow and chicken production. Crédit Agricole consider that the product could be used in every sector with high price / context fluctuations. Due to its positioning as a standard Crédit Agricole product, with the associated delivery efficiencies and potential reach, the product is considered to be a very interesting alternative to a bespoke fund like MilkFlex. However, the lack of automatic flexibility and therefore assurance to borrowers may not fully address price volatility concerns which can constrain investment.

- This study did not identify any market-responsive financial products in Italy, suggesting that interest in this type of instrument is linked to the expected trend of investment and price volatility in a given country/region (the study found evidence of reduced investment potential in Italy compared with the other two Member States). More recently, the focus in Italy has been on developing an agreement between the Ministry of Agriculture, Food and Forestry and the Association of Italian Banks that provides temporary economic relief to dairy farms. Signed in January 2016, the agreement establishes a 30-month suspension of repayments.

7.3 Challenges and barriers

Any assessment of the role of public support to improve or extend the availability of market-responsive financial instruments should consider the following key findings of this study.

7.3.1 Differences in price volatility and structure of the dairy sector

Milk prices and volatility vary across EU Member States, from those, such as Ireland where the price is lower and more volatile, to those like Italy where prices are relatively high and more stable. Farmers experiencing a more volatile milk price can be expected require a price responsive financial instrument more, as study interviews confirm. This also implies that, if repayment flexibility is provided through automatic triggers, these should be adaptable to country-specific conditions (or potentially a lower geographic level) while ensuring that the expected repayment schedule is suitable to investors.

Differences in prices and how volatility affects the dairy sector reflect the different dairy production and trade specialisation patterns across EU Member States. From Ireland, where production is mostly oriented towards internationally traded commodities, to Italy where half the milk production is used for products with higher value added like PDO cheeses. These differences are reflected in different investment expectations in the medium run. Study interviews and existing products confirm that the interest for a market-responsive financial instrument is higher where increased investment is foreseen in the medium to long run.

In this context, a clearer picture of how both investment demand and milk price volatility is reducing on-farm investments in each market is a key requirement in understanding the need for a market-responsive financial instrument. In all cases, this would require a specific ex-ante assessment at the territorial level.



7.3.2 Potential promoters and investors

Due to their stable and close relationship with their members, cooperative dairies are best suited to share the risk of a price volatility financial instrument. Indeed, the most important cooperatives in Ireland have a track record of cooperation with financial intermediaries to provide better financing conditions to their members. However, their capacity to share risks may be linked to their size and the role they have in the value chain. While the Irish dairy market is substantially dominated by cooperatives, in France the presence of cooperatives is less important and there is more fragmentation. On the basis of study interviews, some cooperatives seem to be interested in a market-responsive financial instrument, but it is not clear whether other cooperatives would be interested in taking a leading role and setting up a relatively complex instrument like MilkFlex. Even in Ireland, other actors seem to be oriented towards lighter structures, where the role of cooperatives is more limited.

Other limits to a fund set-up directly by a cooperative are that it would be limited to the associated farmers who may be reluctant to apply for finance if this reduces their ability to switch to other buyers. The MilkFlex experience will be fundamental to understanding the potential for this kind of financial instrument.

Producer organisations can also have an interest in developing this type of financial instrument, but only larger ones may have the scale for risk sharing. Additionally, the financial instrument would have to be set up at a sub-national level, with limited participation and geographical coverage similar to cooperatives. Sub national structures may also prove more costly and less efficient in terms of delivery.

Financial intermediaries and banks, at least in Ireland and France, are interested in flexible financial products as an innovation to offer their client base but expressed an unwillingness to engage in instruments that may be perceived as being too complex and restricted to a single agricultural sector.

7.3.3 Availability of milk price data

The main challenge of an automatically market-responsive instrument is the availability of reliable indices on which triggers can be based. This is a major concern that emerges from the study interviews.

In addition, the study confirmed that none of the analysed Member States has an index that could be used to set up a financial instrument at regional or national level. In addition to a specific price index, automatic triggers may require more security than a bank normally holds. In particular, an automatic trigger would remove the discretion of a bank to decline, revise or potentially seek further information from the farmer prior to the flexibility being granted. This may increase the bank's perception of risk and could potentially reduce the flexibilities they offer and lead the bank to seek additional security from the farmer to compensate for this additional risk. Whilst a guarantee type financial instrument may help to address this, the need for a price index may tighten financing conditions for example through the potential impact of upward price movements, limit the advantages of such an approach.

The only instrument based on automatic triggers to date has been set up by a cooperative, where the organisation controls milk price data. A financial instrument confined to cooperative members would allow for longer term supply contracts that are needed for risk sharing. Under this, payment deductions could be made directly from the milk cheque, as with MilkFlex, reducing the risk of default. As explained above, this model depends on a willing co-operative and could be perceived as limiting farmers to that co-operative.



7.3.4 Other public or private instruments

Public and private initiatives have been recently developed to mitigate the effects of falls in milk price and to stabilise individual farmer incomes. In this regard, study interviews confirmed that market-responsive financial instruments can complement existing tools and help meet the diversified needs of the sector. However, it is important that any such instruments in the future consider the extent to which demand might be reduced by specific initiatives, in particular a deeper futures markets. Moreover, bodies in charge of designing and implementing a market-responsive financial instrument should be aware that it may require nurture and support in its initial stages, especially as demand for downside protection might be weaker during periods of expansion.

Milk price is just one of many variables affecting farmer repayment capacity and some study interviews indicated that a more fundamental assessment of farm finances might be a better option than linking financial instrument repayments solely to a milk price. However, the feasibility and cost of implementing alternative options, e.g. protecting farmers' margins, would need further analysis.

Demand for a price-responsive financial instrument will also **depend on the future development of other market-based risk management instruments**, such as OTC contracts, forward contracts, futures and insurance.

In particular, **study interviews indicated an interest of dairies in futures contracts**. These are still at a very early stage in Europe, partly because of the difficulty of developing a suitable reference price. However, traded volumes are increasing and future markets should reduce uncertainty in the sector in the medium term, even with continued volatility.

Futures contracts are available for dairy products like butter, SMP and whey powder, but not fresh milk which is less tradable. In principle, **a more stable market for processed products could enable dairies to offer more stable prices to their farmers**, reducing the added value of a price-responsive financial instrument.

However, a MilkFlex-type instrument would have the advantage of providing support directly to a party in the supply chain, dairy farmers, who struggle to maintain margins under extreme volatility but who mostly have a good long-term future. Support at other levels in the supply chain, for example through futures, can benefit dairy farmers only to the extent that there is **efficient and transparent price transmission through the supply chain**.

Finally, both France and Italy are setting up national funds to stabilise the income of individual farmers when this drops by more than 30% of their average annual income in the preceding three-year period, or a three-year average based on the preceding five-year period excluding the highest and lowest years. The funds set up pursuant to Article 36(c) and Article 39 of Regulation (EU) No 1305/2013⁹⁴, should not compensate more than 70% of the losses. In France, the funds will be established in each region by the end of 2018. According to European Commission data, there should be 495 000 and 90 000 farm holdings participating in income stabilisation tools in France and Italy respectively.

94 Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005 (OJ L 347, 20.12.2013, p. 487).



8. PROPOSED DESIGN

The study findings have indicated that volatility varies in each geographic market, depending on the destination of the milk. The findings also demonstrate the variation in investment demand in the three Member States and the different structures in operation, including the role of dairy cooperatives. This broad range of characteristics suggests that the need and role of any market-responsive financial instrument will be different per geographic market and also suggests that a **'one size fits all' financial instrument will not be feasible.**

To support the development of an appropriate financial instrument, the study has identified key success factors:

- **Level of price volatility** – a medium to high level of price volatility is necessary to both establish the market potential and justify the creation of a financial instrument and the associated set-up, management and monitoring requirements and costs.
- **Investment demand** – the study has identified both investment and consolidation activity. Robust underlying investment demand for EAFRD eligible expenditure will be essential in ensuring market and financing need for any financial instrument.
- **An index of milk prices** – is essential in enabling automatic triggers, this index ideally should already exist and be accepted by industry stakeholders. Any cooperative involved in a financial instrument could use the cooperative price. Where such a price index does not exist, the feasibility of creating an index would need to be considered and factored in cost/benefit analysis of the potential financial instrument.
- **Delivery efficiency** – critical mass or standardised delivery is needed to enable a cost effective and efficient means to channel funds to farmers. This may require a large enough co-operative to act as a bespoke aggregation vehicle as per the MilkFlex example or for a more standard loan product already offered by commercial banks, for example the PaP. Milk supply agreements could provide further assurance to both farmers and financiers by providing income assurance.
- **Pricing** – linked to delivery efficiency, costs associated with any new structure should not result in higher costs of finance for farmers. A bespoke fund is likely to involve set up costs and management fees associated with a dedicated fund manager. Economies of scale should therefore be maximised to ensure that these costs do not hamper investment or reduce the value of the initiative.

Based on these success factors and the review of models developed to date, two financial instruments are proposed in the following sections.

8.1 Option One – Bespoke Cooperative based fund (MilkFlex model)

Where the key success factors have been met, this option would involve a dedicated special purpose vehicle. The structure would seek to pool resources from EAFRD or other public sources, a dairy cooperative and potentially at least one senior debt provider to provide loans to farmers in the cooperative. A dedicated fund manager would need to be appointed to work with farmers and develop loan applications, would carry out the subsequent loan assessment and, where applicable, loan monitoring and reporting. Public funding would provide a portion of the equity funding in the structure, ideally on a *pari passu* basis alongside an equity contribution from the cooperative.

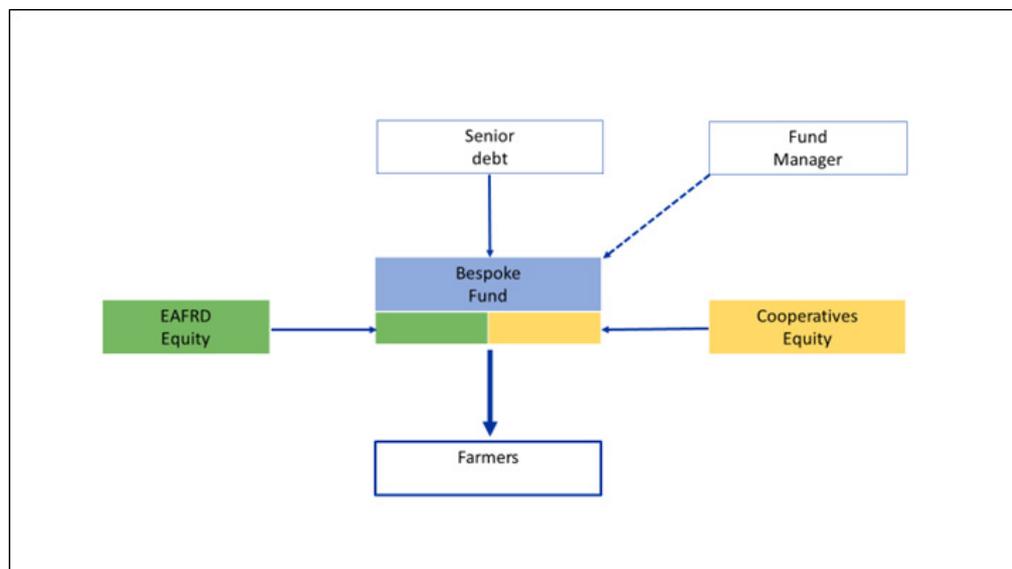
Because of the need to create a dedicated structure and appoint a fund manager, the dairy cooperative must be large enough to ensure critical mass. Alternatively, the structure should enable smaller cooperatives to come together and act as joint co-investors in such a structure and encourage their members to participate as borrowers. This potentially limits the replicability of this model.

The bespoke model should enable a degree of tailoring in the investment strategy, loan applications, assessment and contracting of the financial instrument, to maximise alignment with the existing strategies and administrative processes of the dairy cooperatives. This has the added benefit of using milk supply agreements to ensure income to



the farmer, offering confidence to proceed with an investment and to the financiers, to demonstrate reliable income to service the loan.

Figure 14: Bespoke Cooperative based fund model



Advantages	Disadvantages
Role of co-operative ensures structure is embedded within wider dairy operations and benefits from cooperative infrastructure, including milk supply agreements which provides certainty of income.	Requirement for a co-operative reduces the potential number of farmers that can benefit from the financial instrument.
The creation of dedicated fund, with fund manager expertise should provide greater assistance and 'hand holding' for farmers during loan applications.	The costs of fund management for such financial instruments are typically around 3% per annum of amounts under management. Such structures are therefore only economical where there is critical mass. This structure is best suited to large cooperatives as per MilkFlex. Alternatively, combining smaller cooperatives in a structure would require additional layers of governance and legal contracts.
The investment strategy can be tailored to the specific needs of a cooperative or region.	The overheads may increase the cost of financing for farmers.

8.2 Option Two – Guarantee Model with Financial Intermediary (PAP +)

Again, where the key success factors have been met, this option would seek to use a more standard capped guarantee model, in partnership with one or more banks.

The idea is to incentivise the use and enhance the features of existing products by providing risk coverage for financial intermediaries.

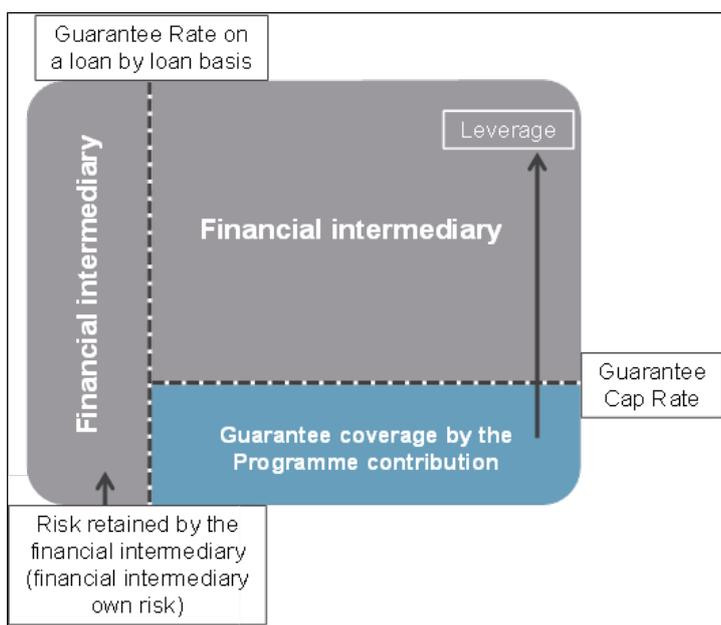
Public guarantees are generally considered effective instruments to promote bank lending to enterprises. Although the study did not find evidence that flexible financial products are perceived to be riskier than standard loans, risk coverage by a financial instrument could incentivise the use and enhance the features of flexible loans.



This mechanism would allow banks already offering flexible loans to apply better conditions for borrowers (in terms of interest rate or collateral requirements), to enable automatic triggers, removing a degree of uncertainty for the farmer, or to potentially extend the repayment delay (with an associated increased interest cost). At the same time, a public guarantee might incentivise new financial intermediaries to look to build up portfolios of loans with flexible repayments.

This model has the advantage of using a mainstream delivery channel, a bank, so it is a more standardised product than the bespoke fund and should reach more potential borrowers. A bank based delivery channel would also reduce the set up and delivery costs associated with a more bespoke approach. The model is illustrated in the diagram below. EAFRD or other public funding could potentially represent the programme contribution identified in blue, covering the first loss tranche.

Figure 15: Bespoke Cooperative based fund model



Advantages	Disadvantages
The collateral requirement for the borrower should be lower, the risk premium could also be reduced and there a repayment delay period could be extended beyond 12 months, providing more advantageous terms for farmers.	Automatic flexibility would require the definition of an index in advance, which would need to be populated with historic data. This would also require additional IT systems within the bank in question.
The public sector contribution would cover only a portion of the loans, generating a good leverage of public resources.	
The costs and set up process are likely to require less support than more bespoke funds.	A standard approach could mean reduced farmer engagement and less tailoring of the product to the needs of a given co-operative or region.
More easily replicable into other sectors suffering from volatility.	



9. CONCLUSIONS AND RECOMMENDATIONS

The study confirmed that financial instruments responsive to milk price dynamics may help mitigate uncertainty related to unpredictable volatility and allow dairy farmers to better plan and manage investment.

Study results indicate considerable interest from farmers' organisations and financial intermediaries in a financial instrument responsive to market conditions.

On the basis of the analysis, some key success factors for any development of market-responsive financial instruments have been outlined in the study, referring in particular to price volatility and investment demand, reliable price indexes, management costs and pricing.

9.1 Policy recommendations

One of the more interesting findings of the study is probably that the interest for market-responsive financial products seems to be already reflected in a real market potential, since there are already 'flexible' loans with different levels of specialisation and complexity. These products have been developed by co-operatives and commercial banks, with the majority being free of any EU support (MilkFlex benefits from public investment albeit on a market economy investor principle basis).

This does not exclude the potential for EAFRD supported financial instruments. On the contrary, the study findings suggest that public support may help improve the conditions under which existing market-responsive financial products are offered, or make such products available to more farmers, including in other Member States. In fact, all the identified experiences show limitations in terms of access and consequently in terms of impact (e.g. MilkFlex loans are available to cooperative associates only) or in terms of advantages for the borrowers (e.g. Pret-a-Piloter offers limited flexibility as the renegotiation of loan duration is not completely automatic and repayment delays are limited to a total of 12 months).

On the basis of these elements, the following policy recommendations can be made, also with a view to the post-2020 EAFRD framework:

- MilkFlex offers interesting advantages for borrowers, but this study highlights that it may not be easily replicable in other contexts. Instruments based on automatic triggers related to price volatility seem to be feasible only when a cooperative or similar structure is at the core of the governance. This means that feasibility depends on the existence and will of cooperatives and that the benefits would be limited to cooperative associates. In general, a complex and very specific structure such as MilkFlex cannot be considered as a policy option for a standard instrument supporting the dairy sector across the EU (nor agriculture in general). This should not exclude any EAFRD contribution to specific instruments similar to MilkFlex. The EAFRD regulation should be flexible enough to allow similar operations to be brought forward provided they are the most appropriate to address market failures and investment gaps and all eligibility conditions are met (including ex-ante assessment, public procurement and State aid).
- Although the study focussed on the dairy sector, most conclusions and the key success factors for a market-responsive instrument are probably applicable to many other agricultural sectors. This seems to be reflected in market practices, where instruments offered by banks, such as Pret-a-Piloter, are normally targeted to the entire agricultural sector. This choice seems also to be based on standardisation of the product, critical mass and delivery efficiencies. In general, support for sector instruments is not considered to deliver these key benefits and therefore does not seem to be advisable as a readily replicable approach under EAFRD.



- As explained in the study, support for slightly adapted existing financial instruments which enable even greater flexibility should be considered as a reasonable policy option by managing authorities when implementing financial instruments under the EAFRD. A capped portfolio guarantee instrument, with elements of flexibility embedded in the underlying loans is a proposed option. It has to be noted that different types of instruments could achieve similar results (e.g. a risk sharing loan portfolio). The choice between a guarantee instrument and a loan instrument would depend on the specific market to be addressed. If risk is most limiting factor for financial intermediaries to lend, a guarantee would be preferable and if the banks have liquidity issues and demand higher interest rates, a loan instrument would be better.
- Knowledge of these types of instruments is still limited and apart from the general interest expressed in study interviews the appetite of financial intermediaries is difficult to estimate at this stage. So, future EAFRD rules should not foresee a specific design to be adopted by managing authorities. It should also not be adapted to specific financial intermediary demands. Publication of guideline documents and good practice case studies, along with experience transfer between stakeholders and administrations, is probably the best policy option at this stage.
- More general awareness raising should also be considered in parallel, addressing managing authorities, financial intermediaries and other stakeholders such as farm unions and associations.
- Finally, the study results suggest that any policy action to support market-responsive financial instruments should be well coordinated with other measures addressing market volatility for farmers. Such measures could include income stabilisation instruments under EAFRD or public support for the development of private risk management tools such as future contracts for agricultural commodities. A possible widening of the scope for working capital support under EAFRD should also be taken into account, since this might help farmers manage their cash flow and might reduce the need for specific financial instruments responsive to price volatility.

9.2 Further areas for review

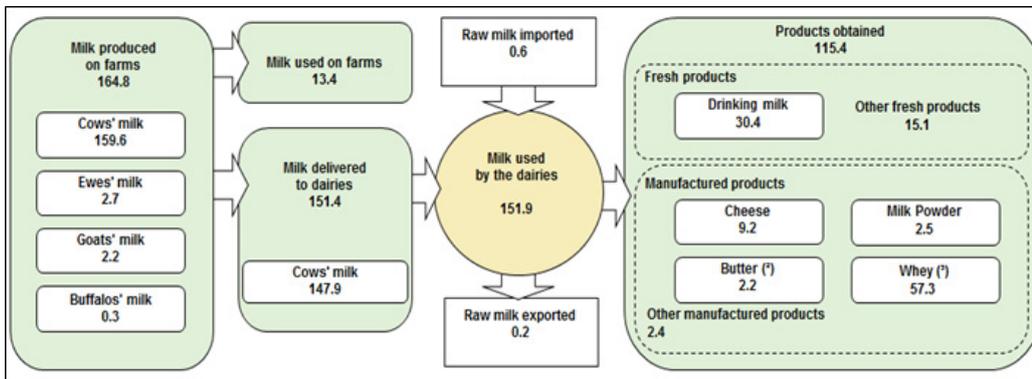
On the basis of the analysis, some recommendations can be made for the next phase of the assignment, in particular:

- The study found flexible financial products (loans) offered by banks in Ireland and France. A second phase could look to find other examples across the entire EU agricultural lending market. Any future findings may guide future policy actions for EAFRD supported financial instruments.
- The study found a general interest of financial intermediaries in market-responsive financial instruments for farmers. The next phase of the study should also estimate their concrete interest in a specific type of EAFRD funded financial instrument (to be supported by managing authorities nationally and/or regionally) offering loans with flexibility for borrowers. The capped guarantee model proposed in this study, further developed in terms of design, could be used as a reference to estimate the real appetite of financial intermediaries. In particular, the objective would be to understand how this instrument could improve the conditions of existing flexible loans for farmers or how the financial instrument could incentivise other banks to offer similar products to their clients.



ANNEX A.1: FIGURES AND TABLES

Figure A1: The EU milk production chain (2014)



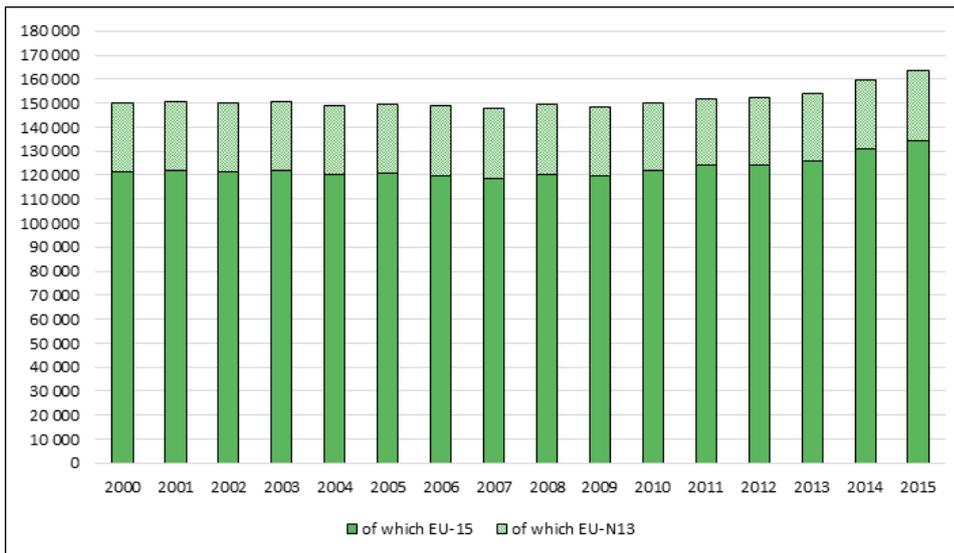
Note: ¹) 2013 for Croatia; only flows of raw milk are displayed; changes in stocks are not recorded;

²) Includes other yellow fat dairy products; expressed in butter equivalent;

³) In liquid whey equivalent

Source: Reproduced from Eurostat (2015). 'Milk and milk product statistics – Eurostat statistics explained'.

Figure A2: Cow milk production in the EU-15 and EU-13 (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

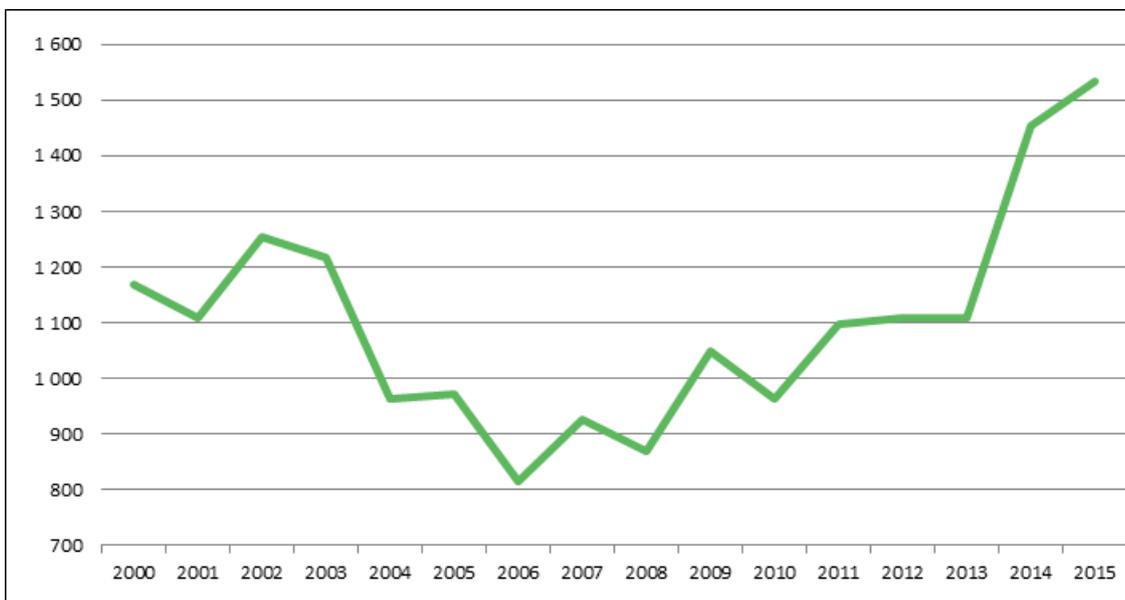


Figure A3: Milk yield (kg/dairy cow, 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

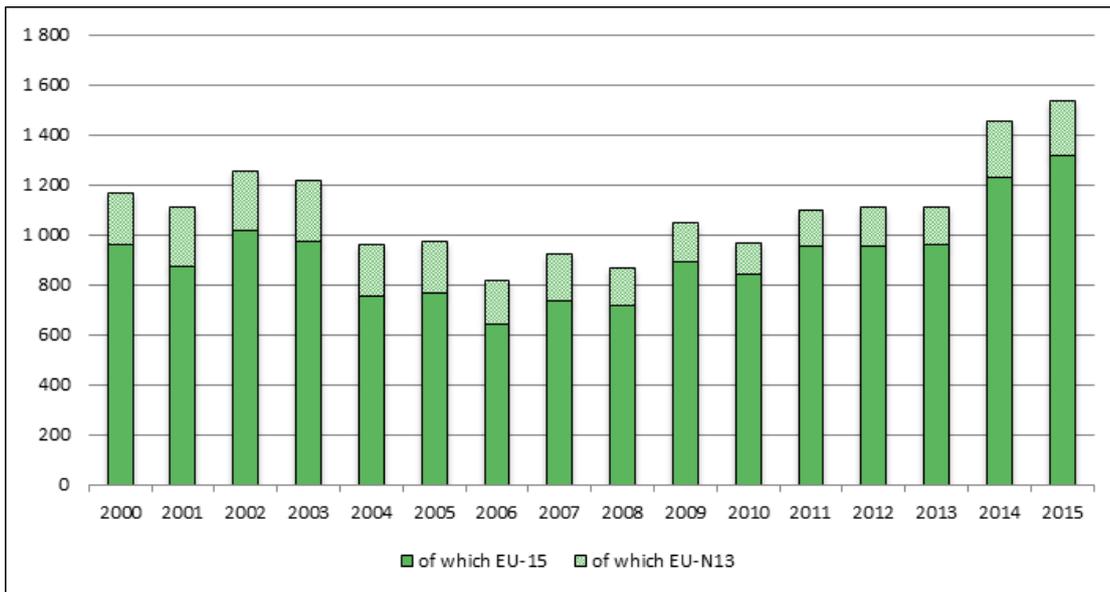
Figure A4: SMP production. EU-28 (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.



Figure A5: SMP production in the EU-15 and EU-13 (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

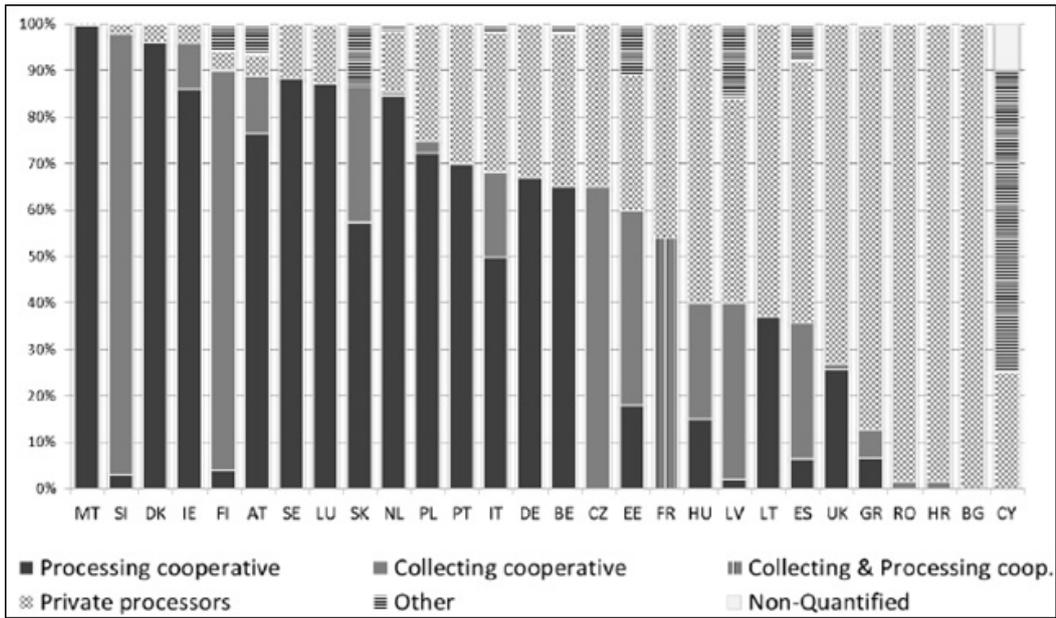
Figure A6: Total butter production. EU-28 (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

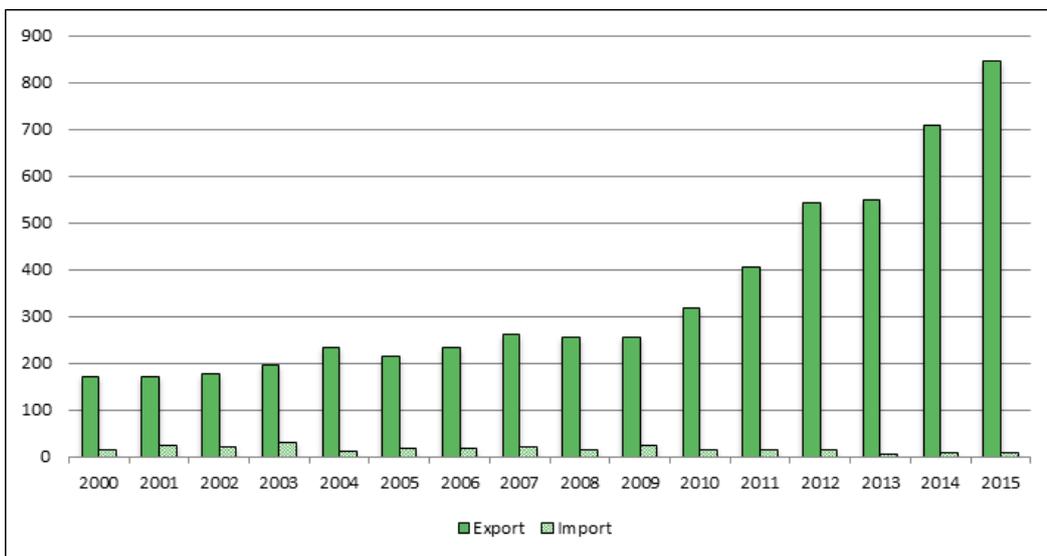


Figure A9: Share of cow's milk deliveries by type of contractual arrangements (2012)



Source: Reproduced from European Commission (2014), 'Development of the dairy market situation and the operation of the 'Milk Package' provisions', p.5.

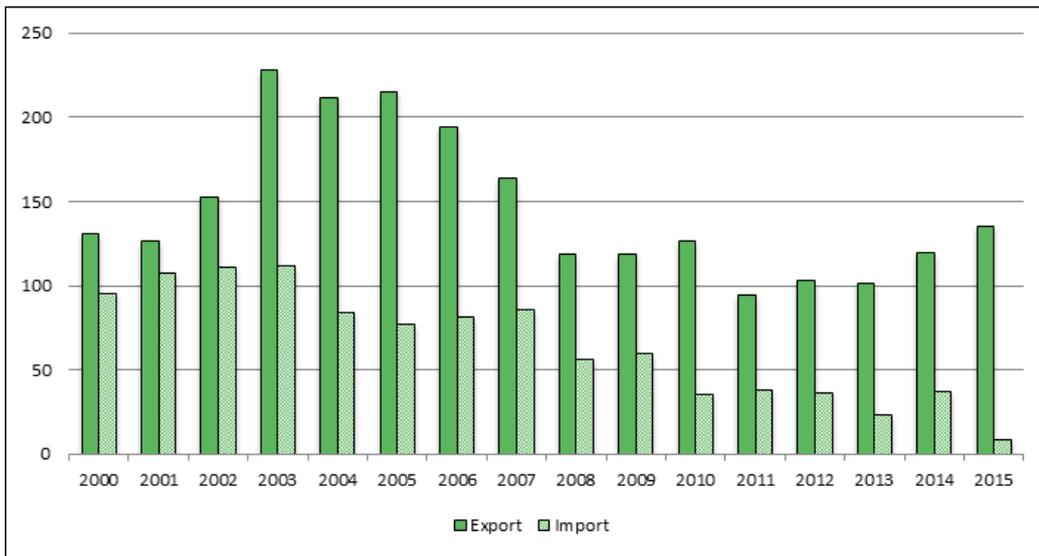
Figure A10: Import and export of fresh products, EU-28 (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

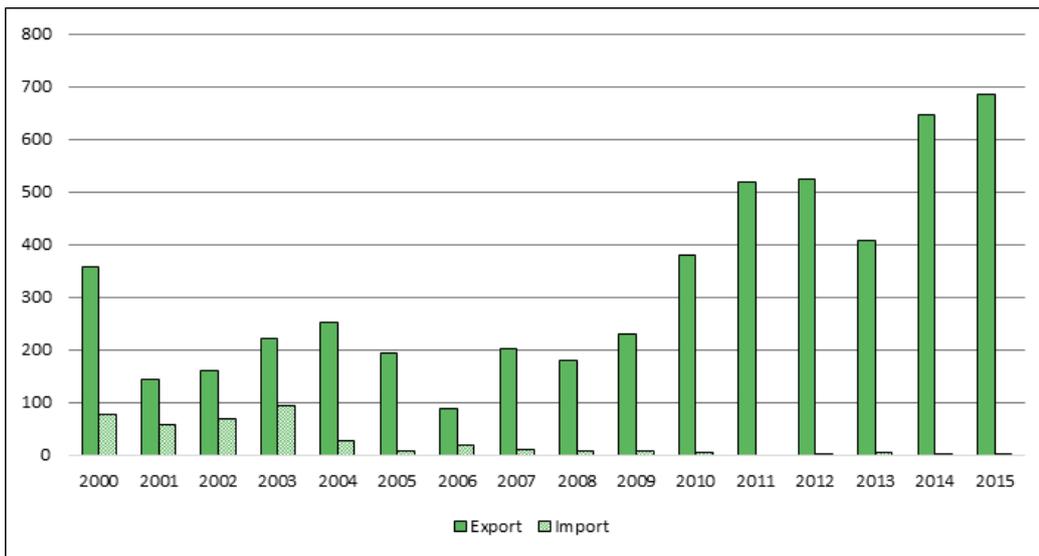


Figure A11: Import and export of butter, EU-28 (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

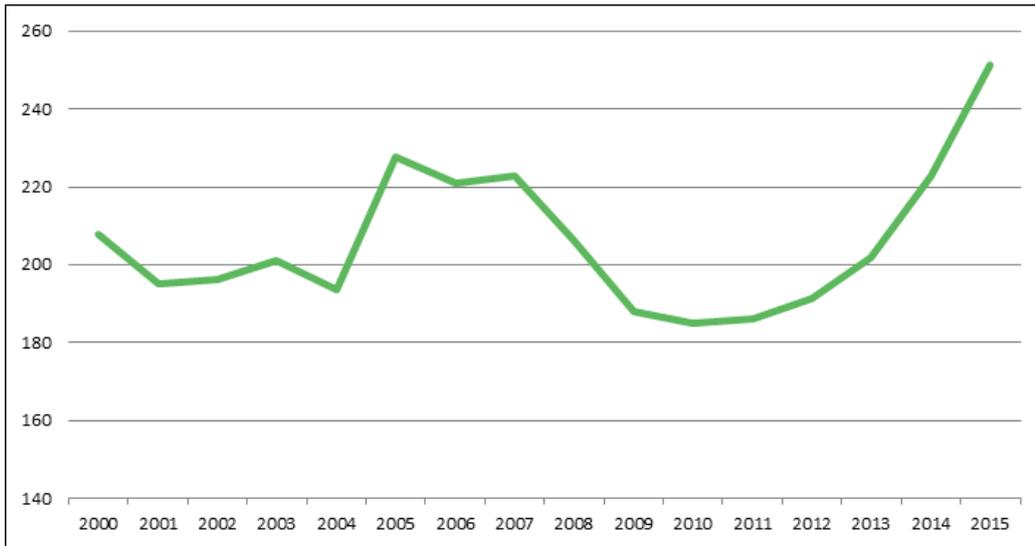
Figure A12: Import and export of SMP, EU-28 (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

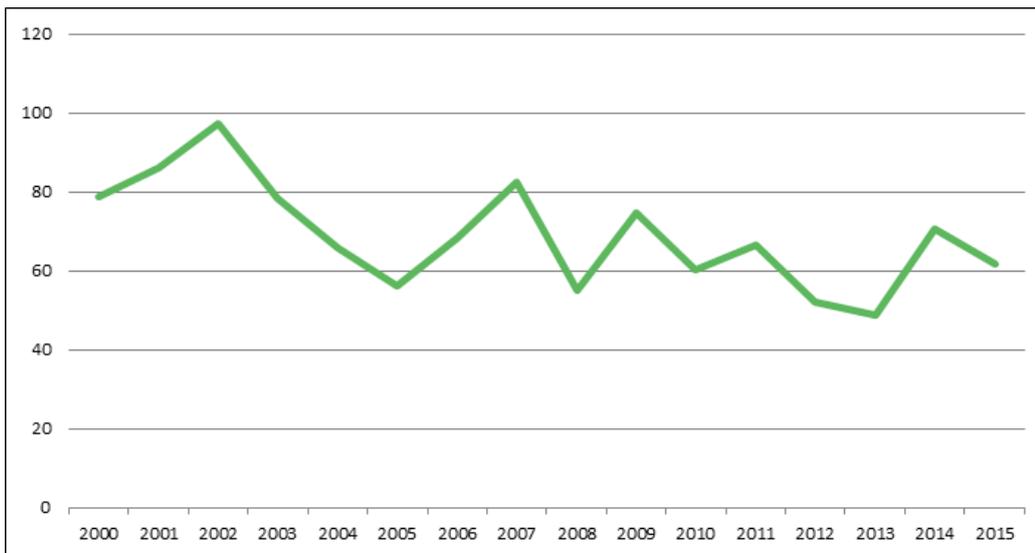


Figure A13: Total butter production in Ireland (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

Figure A14: Total SMP production in Ireland (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

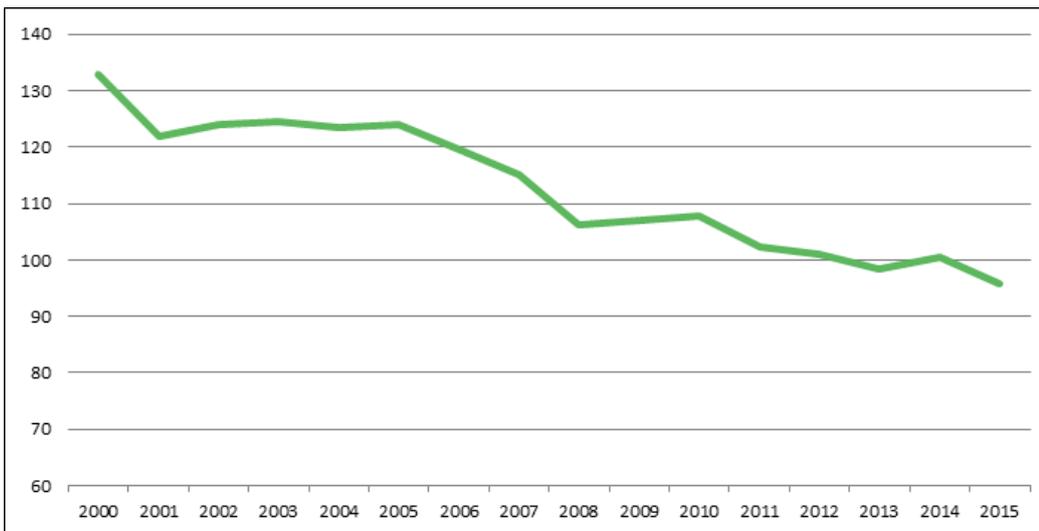


Figure A15: Exports of butter, SMP and cheeses from Ireland to third countries (1000 tonnes)



Source: European Commission, Milk Market Observatory, 2016.

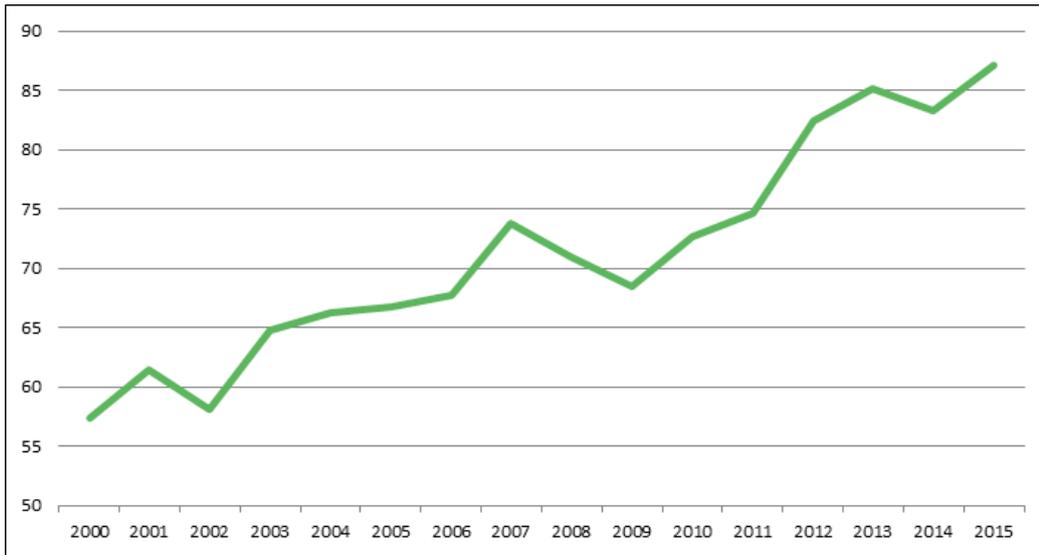
Figure A16: Total butter production in Italy (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

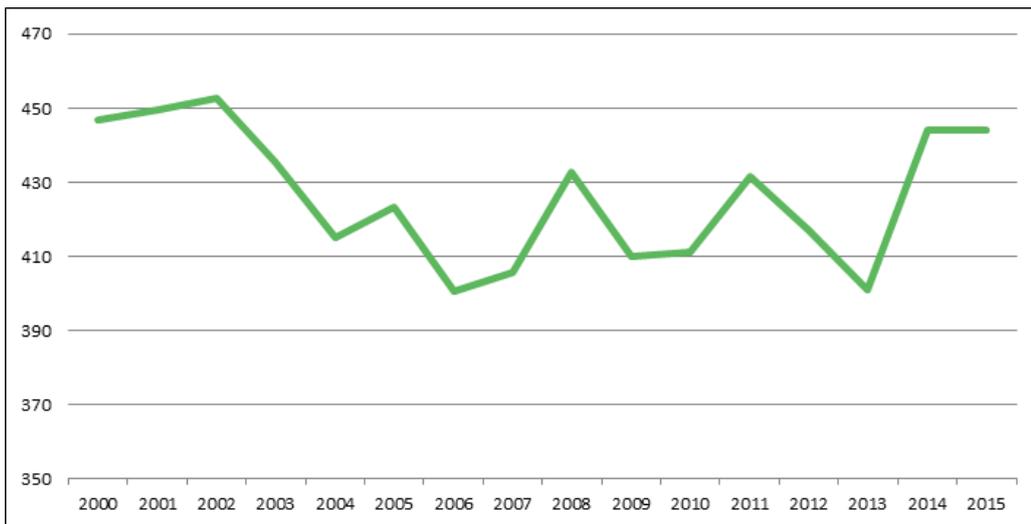


Figure A17: Exports of chesses from Italy to third countries (1000 tonnes)



Source: European Commission, Milk Market Observatory, 2016.

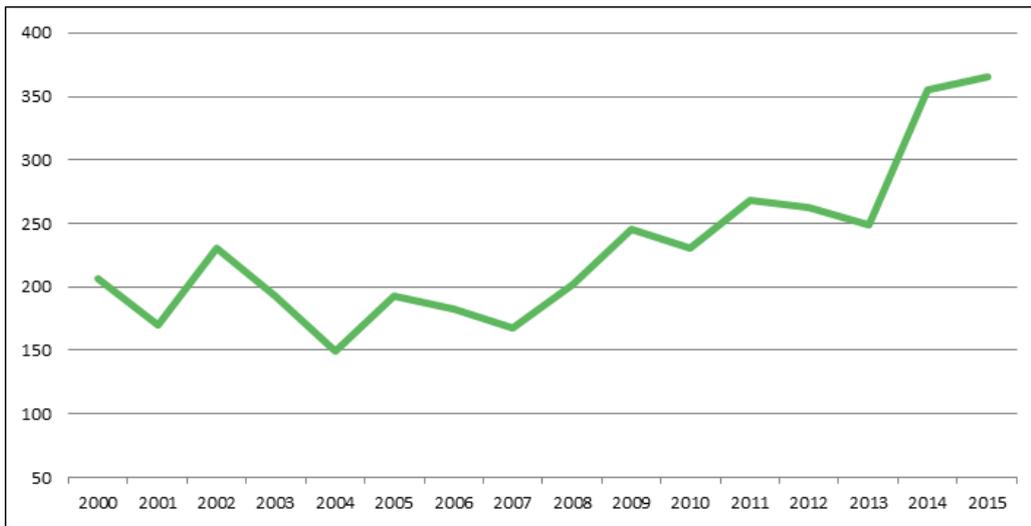
Figure A18: Total butter production in France (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

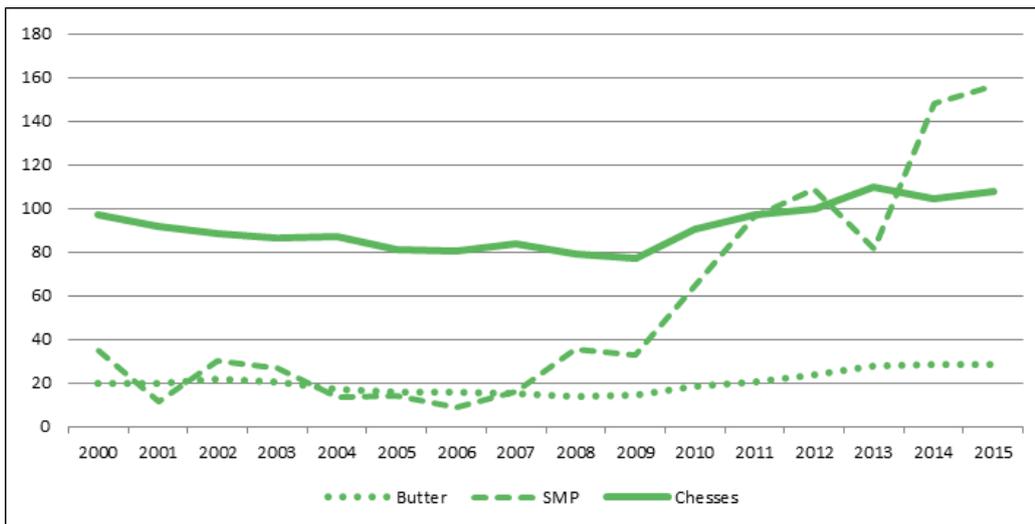


Figure A19: Total SMP production in France (1000 tonnes 2000-2015)



Source: European Commission, Milk Market Observatory, 2016.

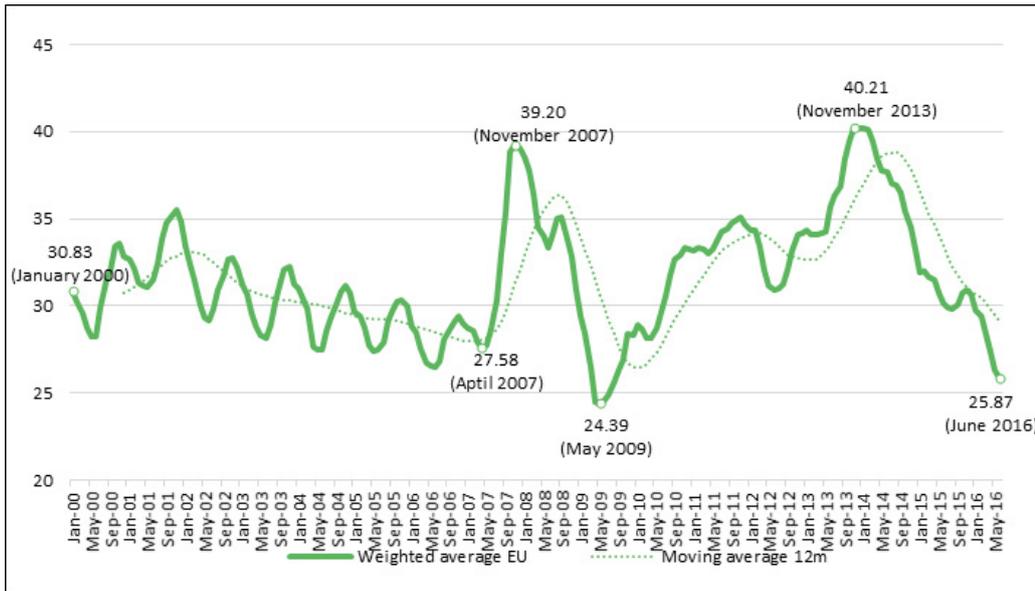
Figure A20: Exports of butter, SMP and cheeses from France to third countries (1000 tonnes)



Source: European Commission, Milk Market Observatory, 2016.

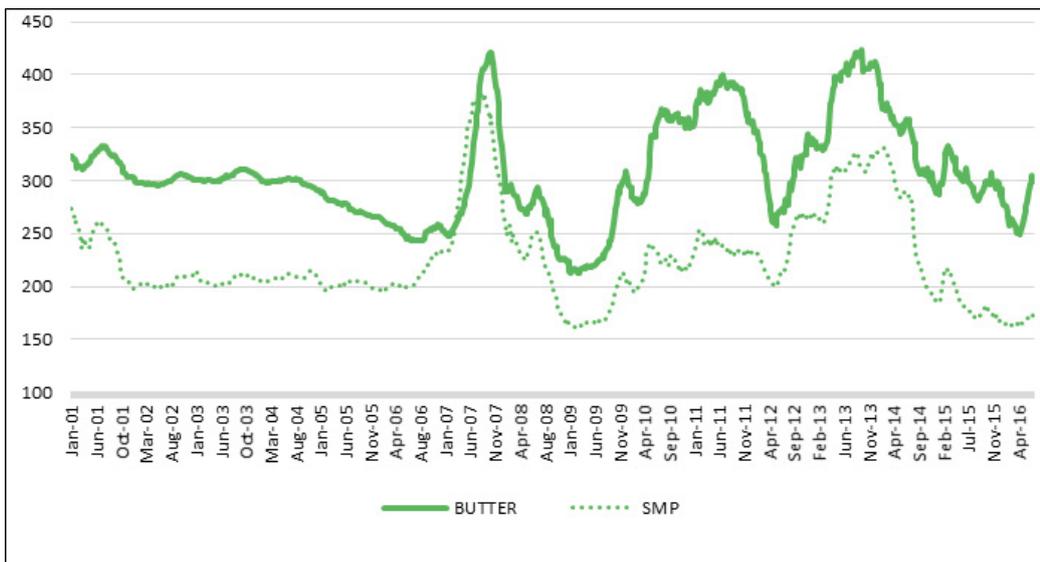


Figure A21: EU average price of raw cow's milk (EUR/100 Kg)



Source: Elaboration on data from European Commission, Milk Market Observatory, 2016.

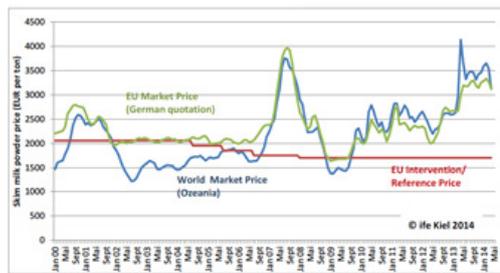
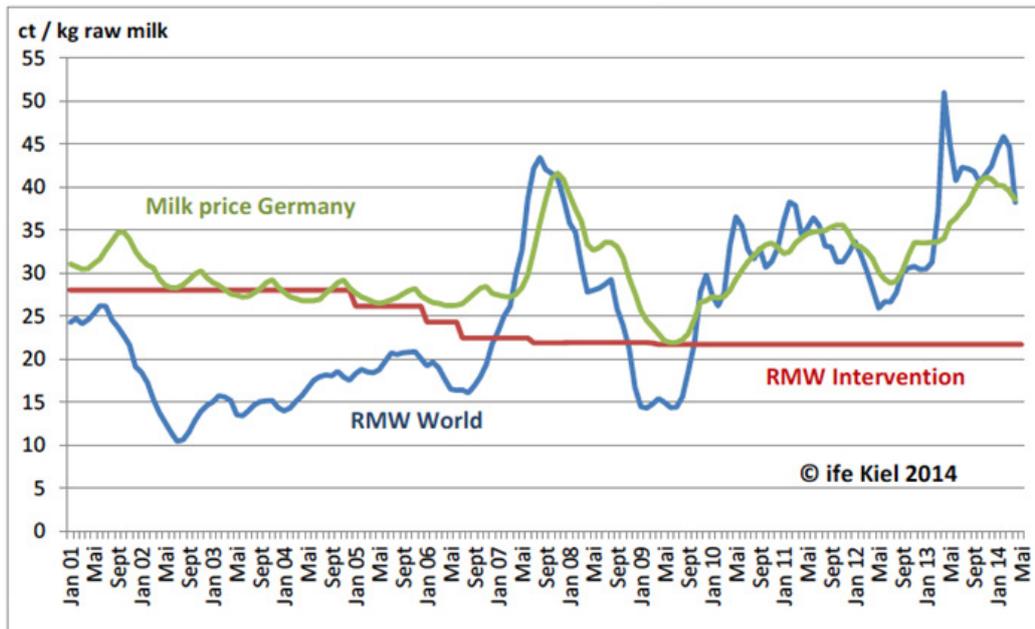
Figure A22: EU average prices of other dairy products (EUR/1000kg)



Source: Elaboration on data from European Commission, Milk Market Observatory, 2016.



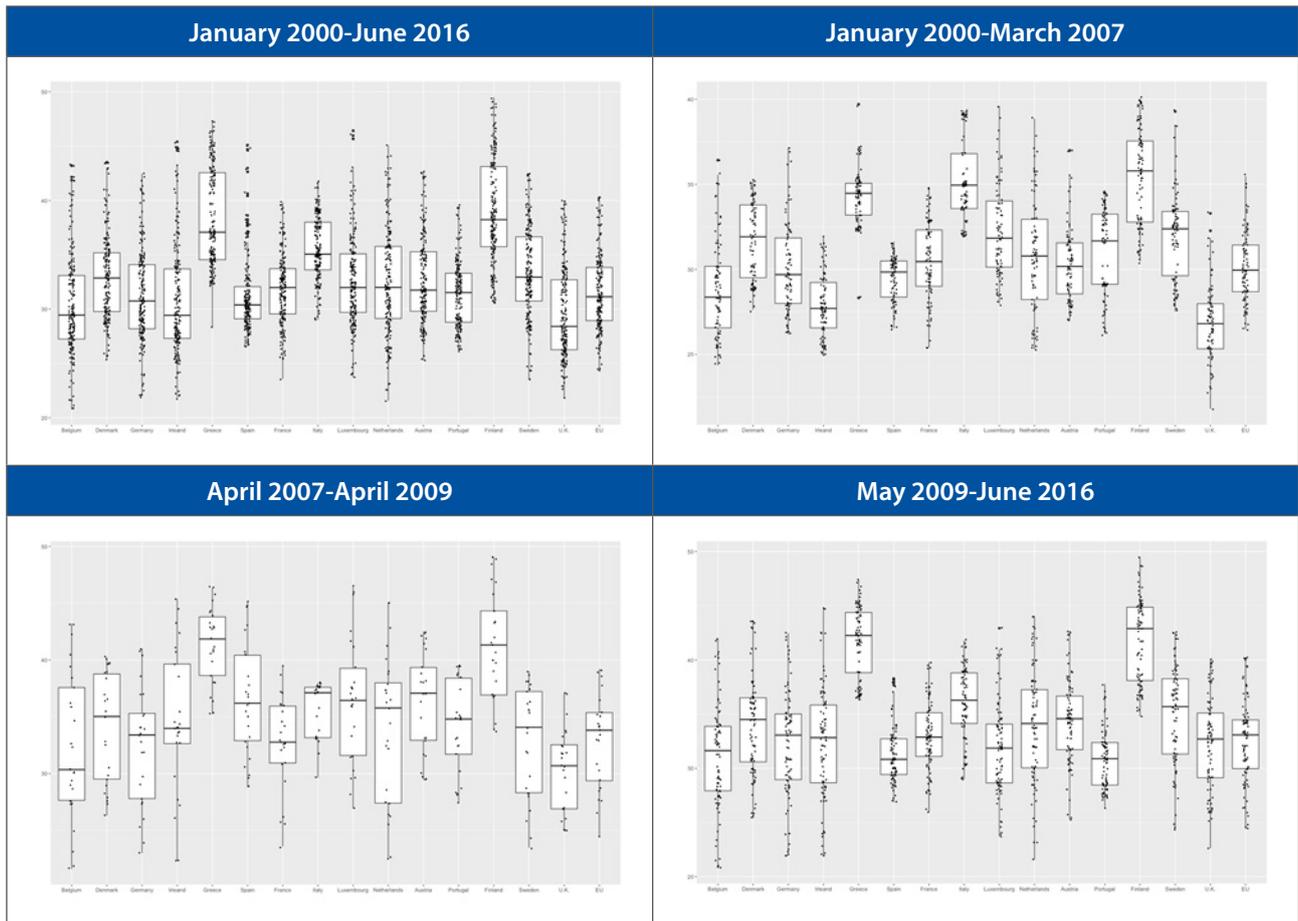
Figure A23: Convergence between world and EU prices (€ per tonne 2000-2014)



Source: Reproduced from H.D. Thiele (2014), 'European and international dairy market situation and how to deal with price volatility'; based on the Information and Research Center of Food Business Kiel's calculations on BLE, USDA, AMI, ZMB.



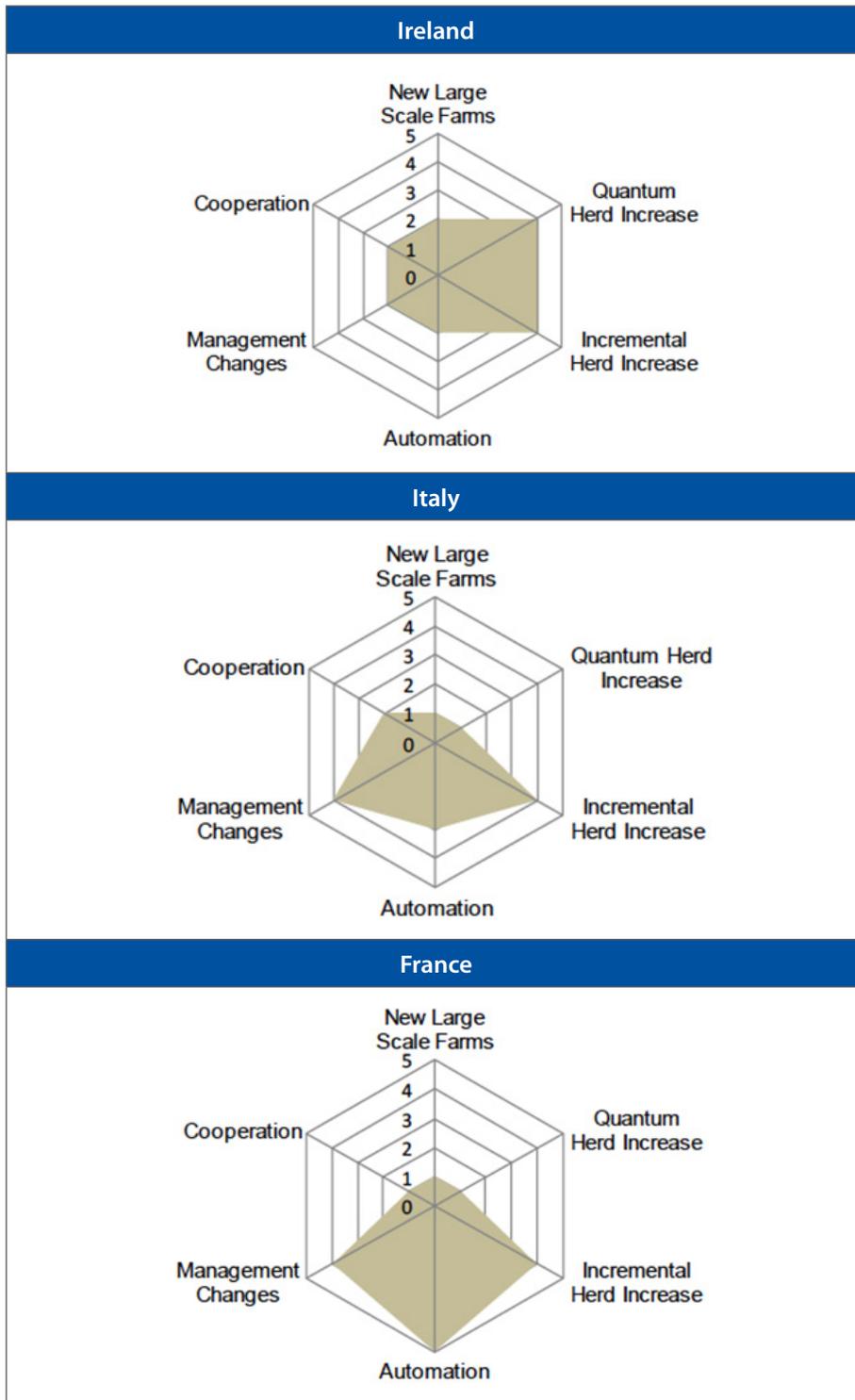
Figure A24: Boxplot of EU milk prices across different EU Member States



Source: Elaboration on data from European Commission, Milk Market Observatory, 2016.



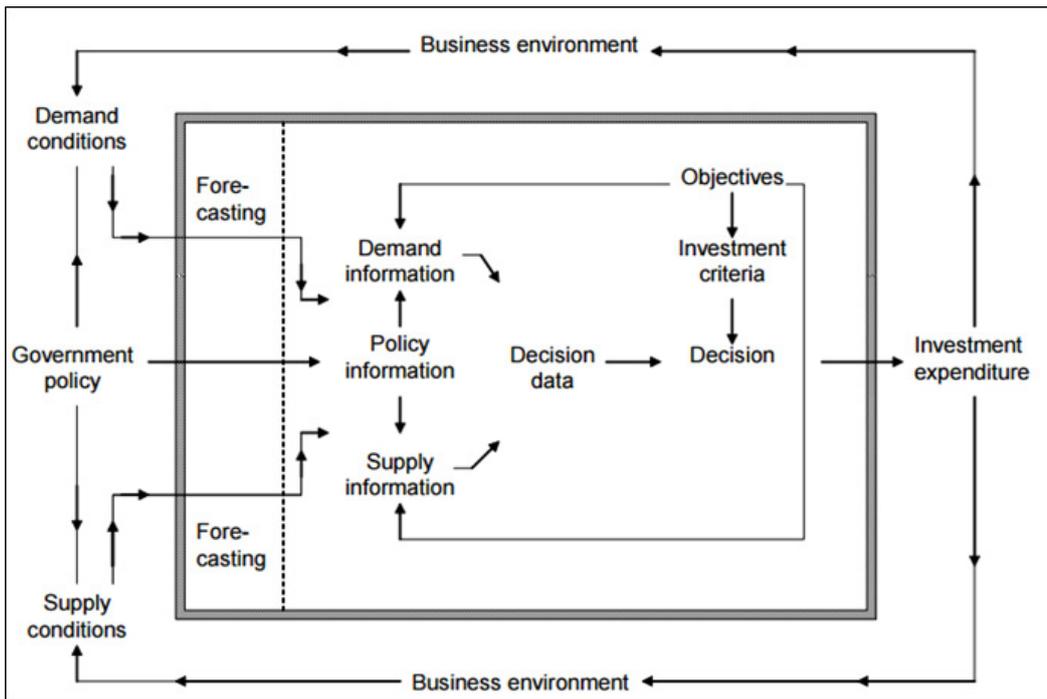
Figure A25: Farm development matrix



Source: Reproduced from Promar International (2015), 'The European dairy industry towards 2020 Country Profiles.'



Figure A26: The investment decision process



Source: Reproduced from Gallerani V., Gomez y Paloma S., Raggi M., Viaggi D. (2008), 'Investment behaviour in conventional and emerging farming systems under different policy scenarios', p. 18.

**Table A1:** Number of cows in EU Member States (thousand head)

	2000	2007	2015	% Change 2000-2015*
Austria	621	525	539	-13.2%
Belgium	629	524	529	-16.0%
Bulgaria	363	336	283	-22.0%
Croatia	-	225	152	-32.6%
Czech Republic	529	407	369	-30.2%
Denmark	644	551	570	-11.5%
Estonia	131	103	91	-30.8%
Finland	358	288	282	-21.1%
France	4 153	3 759	3 661	-11.9%
Germany	4 564	4 087	4 285	-6.1%
Greece	180	150	111	-38.3%
Hungary	355	266	251	-29.3%
Ireland	1 153	1,017	1,240	+7.6%
Italy	1 772	1 839	2 057	+16.1%
Latvia	205	180	162	-20.6%
Lithuania	438	405	301	-31.5%
Netherlands	1 532	1 490	1 717	12.1%
Poland	2 982	2 677	2 134	-28.4%
Portugal	329	269	243	-26.1%
Romania	-	1 573	1 191	-24.3%
Slovakia	243	180	139	-42.6%
Slovenia	140	117	113	-19.5%
Spain	1,141	903	844	-26.0%
Sweden	426	366	337	-20.9%
United Kingdom	2 339	1 977	1 918	-18.0%
EU-15	19 884	17 785	18,382	-7.6%
EU-28	-	24 287	23 600	-2.8%

*2007-2015 for Croatia, Romania, and EU-28.

Source: Elaboration from European Commission, Milk Market Observatory, 2016.



Table A2: Cows' milk price and volatility in the EU, Ireland, France and Italy

Period	Average price	Initial price	Final price	Min	Max	Average growth	Volatility
EU							
January 2000 - March 2007	30.19	30.83	27.88	26.47	35.47	-0.08%	9.1%
April 2007 - June 2016	32.64	27.58	25.87	24.39	40.21	-0.03%	9.9%
January 2000 - June 2016	31.56	30.83	25.87	24.39	40.21	-0.05%	9.5%
Ireland							
January 2000 - March 2007	27.89	26.91	25.64	25.01	31.92	0.01%	12.7%
April 2007 - June 2016	32.92	27.29	23.69	21.83	45.40	0.07%	18.6%
January 2000 - June 2016	30.72	26.91	23.69	21.83	45.40	0.04%	16.2%
Italy							
January 2000 - March 2007	35.27	34.00	32.80	32.00	39.33	-0.03%	4.6%
April 2007 - June 2016	35.97	33.16	31.07	29.02	41.79	-0.02%	8.4%
January 2000 - June 2016	35.66	34.00	31.07	29.02	41.79	-0.03%	7.0%
France							
January 2000 - March 2007	30.50	32.31	27.44	25.39	34.78	-0.11%	13.6%
April 2007 - June 2016	32.91	25.67	28.03	23.58	39.82	0.16%	18.2%
January 2000 - June 2016	31.85	32.31	28.03	23.58	39.82	0.04%	16.3%

Note: From monthly prices, monthly volatility is calculated as the standard deviation of price variations. The scaling method was applied in order to determine an annual volatility (by multiplying the monthly volatility by the square root of twelve).

Source: Elaboration from European Commission, Milk Market Observatory, 2016.



Table A3: Future trends in selected dairy variables, world (million tonnes, 2015-2025)

	2015	2020	2025	% Change 2015 - 2020	% Change 2020 - 2025	% Change 2015 - 2025
Milk	799.1	878.2	959.1	9.9%	9.2%	20.0%
Fresh dairy products	415.5	465.5	517.7	12.0%	11.2%	24.6%
Butter	10.5	11.5	12.5	9.6%	8.6%	19.1%
Cheese	22.6	24.4	26.0	7.7%	6.7%	15.0%
Skim milk powder	4.4	4.6	5.2	4.8%	11.8%	17.1%

Source: Elaboration on data from OECD-FAO Agricultural Outlook 2016-2025 Dataset.

Table A4: Investment requirements for existing Irish dairy farms

	Total investment (EUR million)
Acquisition of dairy cows	401
New milking parlour (on 2 900 farms)	649
Conversion of beef housing to dairy (for 176 000 cows)	76
Upgrading of existing milking facilities (on 8 000 farms)	63
Extension to existing housing (for 60 000 cows)	53
Total investment	1 241

Source: Teagasc and Bank of Ireland (2015).



ANNEX A.2: INTERVIEW TRANSCRIPTS

A.2.1: Ireland

Interview with Tadhg Buckley, Senior Agribusiness Lending Officer AIB Ireland, 29 September 2016

1. What is the scale of dairy-based investment requirements in on-farm productive assets to support existing or growing dairy farm enterprises? How is it affected by farm milk price fluctuations?

AIB carries out an annual survey of agriculture. The 2016 survey involved 559 face-to-face interviews with the person mainly responsible for running the farm. The survey shows that 57% of dairy farmers plan a farm investment in the next three years. Younger farmers are much more likely to invest (up to 34 years: 70%) than the older ones (61+ years: 15%). Of the dairy farmers planning an investment:

- 20% were envisaging an investment of up to EUR 30 000;
- 44% of between EUR 30 000 and 100 000;
- 16% of more than EUR 100 000.

Volatility does not limit lending per se but it limits demand due to dairy farmers' uncertainty about the future.

2. How is this investment activity currently being financed and what are the limitations to this current source of finance?

Funding of dairy on-farm investment is through:

- Bank borrowing: 71%;
- Own resources: 42%;
- Grant: 18%.

Bank lending is more likely to be required for larger investments.

3. Do you currently provide financial instruments that help in providing more farm milk price stability and overall dairy farm economic stability?

No. Overall farm stability? Yes, AIB assists in promoting farm income stability. Details have been provided. For example, AIB will change repayments to interest-only during periods of difficulty. This is agreed on a case-by-case basis with the dairy farmer.

AIB lends against repayment capacity, not assets. Detailed formulae are applied including milk price projections. Basically, AIB operates on a baseline milk price average of 30 cents per litre and then carries out stress tests. AIB takes account of various factors in its detailed formula, such as for example improvements in milk solids levels (fat, protein) over time. There are some limitations.

4. Which particular forms of financial instruments would you like to see developed that are currently not available/provided? Do you think a Milk-flex like financial instrument would attract demand?

They would as a matter of principle insist that a Milkflex type instrument was available to all suppliers in the country. Yes, there would be demand but there may be serious legal issues to be considered as the Glanbia constraints that limit risk exposure would not apply for some suppliers. The Glanbia constraints, for example, include the fact that the Milkflex scheme is confined to Glanbia co-op members that have signed a long-term milk supply contract and that they can deduct at source from the milk cheque. An objective milk price index would likely be required or at least be very desirable. AIB legal would have issues for example; what would happen if the dairy farmer switched supply to another dairy, reduced supply, sold the farm, became ill or died? There is also the issue of whether the Central Bank of



Ireland would find such a lending scheme acceptable. The legal division would ask such questions. While these issues could probably be resolved, it would take several months before an actual Milkflex type scheme could be developed.

5. What would be your requirements to be involved as fund manager and/or investor?

AIB would possibly have sufficient financial resources to launch a Milkflex-like financial instrument. However, further support would be desirable due to greater risk exposure with a Milkflex scheme arising from issues such as those mentioned in the previous answer. For example, Glanbia has security of contract and payments deduction at source. AIB would require some security about repayments, perhaps equivalent to Glanbia. It might take 3-6 months to design a product.

Other information: AIB expects the high milk price volatility experienced since 2007 to continue for the longer term. In an Irish context, the uncertainty is substantially increased, because of variable weather on an outdoor pasture-based milk production system.



Interview with Anne Randles, Company Secretary and Ciaran Aylward, Ornuia (formerly the Irish Dairy Board), 29 September 2016

Preamble:

Milk production in Ireland is heavily seasonal, peaking in May and reducing to 10-15% of that volume per month for December and January. Some dairies offer individual subsidies to produce milk in this off season to ensure a supply of milk and cream for Christmas!

The Irish dairy market is closely connected to New Zealand as they have similar climates, though the New Zealand peak is November and December. There is a constant interchange of people and research between the two countries.

International trading is increasing with about 85% of all Irish output of dairy products being exported. Because of seasonal supply of milk, Irish dairies mainly produce long-term storable products. Butter, hard and semi-hard cheeses and milk powders will keep for a very long time if kept cool.

Ornuia buys about 60% of the milk products processed by Irish co-ops.

Customers are global. Ornuia normally tries to sell ahead for up to 12 months, but mainly buys from co-ops over 9 months in accordance with seasonal production.

Anne Randles was just back from a Brussels meeting of Eucolait (European Association of Dairy Trade) where the latest Commission support program for the industry, which includes EUR 150 million to pay 14 cents/litre to dairy farmers to reduce milk production. In Anne Randles' opinion this measure is badly timed. It would have been welcomed earlier but now will probably increase volatility as prices are now rising and milk supply is decreasing anyway.

The Netherlands and to some extent France and Belgium, have excess product, so they will take advantage of this support.⁹⁵

The end of quotas in April 2015 unleashed opportunities for Irish dairy farmers who continue to increase production, with an ongoing industrialisation of dairy farming. Production was up 14% last year and will probably rise another 7% this year.

As well as exporting about 85% of production, Ireland imports about 10%, mainly fresh milk from Northern Ireland. Ireland's retail chains including Tesco for example also import some cheeses, yogurts, etc.

1. How is price determined?

The milk price is determined monthly, in arrears, by co-operatives who pay farmers each month through the 'milk cheque'. There is a league table of milk prices paid by co-ops published each month in the Irish Farmers Journal, which is purchased weekly by most farmers and is also available online through subscription.⁹⁶ Farmers can also change co-op, though this is cumbersome as the farmer must give written notice to change and there is an extended waiting period. In practice, most farmers remain with their co-op through the generations and have a degree of loyalty to it. However, the league table provides transparency and puts pressure on co-ops to pay a good price to farmers, as the farmers associations are vocal.

Ornuia has developed a Purchase Price Index (PPI) which is published monthly, this is the basis for their negotiations with co-ops. The PPI is a monthly indicator of market returns on dairy products sold by Ornuia (typically butter, cheese, whole milk powder and protein products), relative to comparable returns generated in a base year (2010). The PPI has increased transparency and therefore market efficiency.

95 Based on Commission data Ireland seems to have the highest participation rate in the milk production reduction scheme as of end of September.

96 See for example on the August milk league: www.farmersjournal.ie/august-milk-price-rally-lifts-september-hopes-229085



2. How large are the differences between each?

This information was provided separately in Michael Keane's report.

There is no current study on the correlation between Ornu's PPI and the Central Statistics Office (CSO) price, but this is expected to be highly correlated. The CSO is the official state agency that collects and publishes milk prices within Ireland. However, price communication to Brussels agencies comes mainly from the Irish Department (Ministry) of Agriculture, Food and the Marine, which gets its price data in the first instance from the CSO and then forwards it.

The co-ops normally have a good idea of each other's prices, so there is little variation in a local area. The variation in price between co-ops has already been outlined.

3. What is the most commonly used?

The monthly milk price between co-ops and farmers is published by the Irish Farmers Journal, PPI between Ornu and the co-ops and the CSO published price. Only the Irish Farmers Journal prices show the variation in price between co-ops as the CSO and Ornu are aggregate prices. Most farmers focus on the Irish Farmers Journal price.

4. How relevant are each?

As above.

5. How do you see the evolution of price volatility?

EC competitive reform will help reduce volatility but it will remain high. In the short term, it will probably increase with the new EC measures.

Short-term volatility is here to stay, without a better futures market handling that will remain difficult. Dairy is now a commodity, like iron ore.

Prices are now global and many people watch, and some even trade, on the Global Dairy Trade New Zealand index.⁹⁷ The US Chicago Mercantile Exchange (CME)⁹⁸ prices are less used.

A reference price is needed but even with this there will still be volatility due to the weather. In the context of developing a futures market, a reference price is essential for trades to occur. The Ornu PPI is one possibility, but they account for just 60% of the overall Irish market. Progress is being made in the development of a more comprehensive Irish reference price. For European Energy Exchange (EEX) futures market trading at present, the quoted prices for butter and skimmed milk powder in Germany, France and the Netherlands are used with an equal weighting for each.

Globally, only 7% of world milk production is traded in the form of milk products as milk is a highly perishable raw material and is mainly consumed in the country of production.

International market share among the suppliers is 30/30/10%/8% approximately for the EU, New Zealand, the USA and Australia. However, the buyers are far more diverse globally.

6. How is investment financed?

There is a consortium of six banks to finance Ornu's significant working capital requirements, due to seasonal production, but stable sales.

Rabobank finances Ornu's purchases off the production line, similar to discounted invoicing.

Rabobank is heavily involved with Friesland Campina in the Netherlands.

⁹⁷ See www.globaldairytrade.info

⁹⁸ See www.cmegroup.com



7. What are the limitations?

An underdeveloped futures market is problematic. We can talk to the Ornuá treasury department for more information.

8. Are you aware of financial instruments that could help price/economic stability?

Ornuá does not have direct contact with farmers. It is very aware of Milkflex. Glanbia is seen as the most advanced co-op for this type of product.

There are also fixed price milk schemes provided by the co-ops for a proportion of the milk purchased from farmers.

Other products include the very recent (September 2016) Dairygold product where individual farmer loan terms were negotiated by the co-ops with the two large banks, AIB and Bank of Ireland.⁹⁹

The Federal US Market protection insurance scheme introduced in the most recent US Farm Bill has not been regarded as a success to date. Farmers do not like paying for possible returns. Sometimes private offerings are better.

Interestingly the latest milk price downturn in 2015/16 did not affect Irish farmers as much as the previous one in 2009. In 2009, Irish farmers were constrained by quotas and experienced very poor weather conditions. Weather conditions are always important for Irish farming, since it is a pasture-based industry. Irish farmers have low gearing, unlike Denmark, which is over leveraged.

9. What financial instruments would you like?

Although there is no direct contact with farmers, any product that assists long-term stability is welcome.

For Ornuá, the challenge is to develop stability at the macro level, encouraging longer term trading between producers and large customers. In this respect, the futures market is the logical way.

10. Would Milk flex work?

Any instrument of this type should be welcomed, but how does the financial intermediary hedge? Futures are a good prospect in the longer term.

11. Would you contribute to a similar scheme to Milk flex?

Not if it is direct with farmers. Ornuá does not engage directly with farmers.

12. Are you aware of financial instruments that could help price/economic stability?

Ornuá does not have direct contact with farmers. It is very aware of Milkflex. Glanbia is seen as the most advanced co-op for this type of product.

There are also fixed price milk schemes provided by the co-ops for a proportion of the milk purchased from farmers.

Other products include the very recent (September 2016) Dairygold product where individual farmer loan terms were negotiated by the co-ops with the two large banks, AIB and Bank of Ireland .

The Federal US Market protection insurance scheme introduced in the most recent US Farm Bill has not been regarded as a success to date. Farmers do not like paying for possible returns. Sometimes private offerings are better.

Interestingly the latest milk price downturn in 2015/16 did not affect Irish farmers as much as the previous one in 2009. In 2009, Irish farmers were constrained by quotas and experienced very poor weather conditions. Weather conditions are always important for Irish farming, since it is a pasture-based industry. Irish farmers have low gearing, unlike Denmark, which is over leveraged.

⁹⁹ See <http://www.agriland.ie/farming-news/dairygold-negotiates-lower-cost-milk-supplier-loans/#>



13. What financial instruments would you like?

Although there is no direct contact with farmers, any product that assists long-term stability is welcome.

For Ornu, the challenge is to develop stability at the macro level, encouraging longer term trading between producers and large customers. In this respect, the futures market is the logical way.

14. Would Milk flex work?

Any instrument of this type should be welcomed, but how does the financial intermediary hedge? Futures are a good prospect in the longer term.

15. Would you contribute to a similar scheme to Milk flex?

Not if it is direct with farmers. Ornu does not engage directly with farmers.



Interview with Liam Fenton, Branch Manager INTL FCStone, 29 September 2016

INTL FCStone was formed from 550 US co-ops getting together to find a way to stabilise prices and realising the futures market was the best solution.

1. What dairy investment requirements are there? How are they affected by price volatility?

The requirements are to stabilise income for farmers, even with price volatility. This can be done through futures hedging, fixing prices longer term.

In addition to variable income, volatility has knock-on effects as investment typically happens during booms when infrastructure supply is more expensive. Thus in practice those farmers who do not hedge drive up prices when expanding their facilities during the boom periods when they invest, whereas those who hedge can get facilities at cheaper prices during the periods of low prices. Without hedging, investment is cyclical in line with price volatility. However, investment is also very much affected by the timing of EU grant schemes.

There is a lot of wasted infrastructure where there are many facilities built with grants that now lie idle. These farms can lease land and facilities to expanding farmers, but these farmers mainly use their own facilities more productively. In addition, co-ops will invest in new dryers during booms and struggle with repayments during the next downturn. With good price transmission along the supply chain hedging allows a farmer to obtain a more stable income, making loan terms better.

2. How is investment financed? What limitations are there?

Currently the EU has an underdeveloped futures market but it is gradually growing, e.g. EEX. However, only a very small proportion of dairy production in the EU is currently hedged.

3. Do you provide financial instruments for price/economic stability?

Not to farmers, or even co-ops. INTL FCStone provides the facility to trade, but there is more interest on the buying side (food companies, fast food chains) than the selling side (co-op senior and middle managers do not understand the idea very well).

INTL FCStone provides OTC deals, especially for large customers. These are getting larger; 25 tonnes is now a normal amount. We need a 500-tonne deal to break out the bubbly!

Activity commenced in 2007/2008 when a very large customer was faced with cheese price volatility. They had a major promotion in Europe all lined up, toys made, kids meal boxes printed, then the cheese price doubled.

A recent example concerns butter. The price in April was EUR 2100/tonne and by August it was 4100. How can you handle such volatility?

4. What financial instruments would you like?

A futures market with established reference prices would be nice. Currently data is slow and unreliable.

The Eucolait conference in September only had data up to July. Even those numbers were not based on a standard. While the EU Milk Market Observatory has been helpful in improving price reporting, there is room for further improvement both in timing of data availability and specification of standard reporting procedures for milk and dairy products across the EU.

There is a need to develop reliable indices along the line of that achieved by the USDA.

Basis risks already sorted out by the CME and indices are based on up-to-date prices published by the US Department of Agriculture.

CMA and Euronext take physical delivery in settlement of futures trades, which can be a problem. EEX is settled in cash, making it easier.



With physical settlement, there is no guarantee of accredited suppliers or product quality. Customers want minimal hassle. In addition, these are food products that are perishable, with safety standards.

Settlement is based on German, Dutch and French weekly prices. Futures settle on the price of the last week of the month. There are OTCs based on a weekly price.

5. Is Milkflex good?

Yes, but it is not a product for INTL FCStone to get involved with as they operate at the opposite end of the supply chain from farmers. Some co-ops could offer stable pricing to farmers, but hedging is slow to develop. It is growing gradually, however. The CME dairy futures market also took time to fully mature. Gambia's scheme as it is structured limits risk exposure as it is confined to Glanbia co-op members that have signed a long-term milk supply contract and the repayments are deducted by Glanbia from the monthly milk cheque. It is a good template for situations where it can be applied.

6. Would you invest in an FI?

We have no direct dealings with farmers. However, we would provide training to co-ops.

7. What would your requirements be as a fund manager or investor?

INTL FCStone does not expect to be in the business.



Interview with Jim Woulfe, Dairygold CEO and Tim Healy, Head of Operations, plus Michael Keane, 7 October 2016

1. How is milk price Determined?

Revenue comes firstly from the market, brand, food service, ingredients.

Costs are then covered plus a margin. There is a lot of emphasis now on lean manufacturing and efficiency. The final milk price decision is complex at co-op level. Prices paid by peers are important. Additionally, during low price periods, the co-op may seek to minimise falls in price. For example, Dairygold provided an extra EUR 20 million in 2015 and even more in 2016 to limit the fall in price through reductions in the co-op margin. However ultimately the market dictates.

2. Price differences

This was answered separately.

3. Milk Price Volatility?

If anything the extremes may become more extreme and occur over a shorter time period, driven in part by unanticipated events that can impact supply, extreme weather, etc.

4. Investment Activity

Dairygold's current financing is as follows:

- banks: a consortium of five banks;
- internal cash flow;
- member contributions: Dairygold currently has two member contributions: a revolving fund whereby suppliers contribute, get an interest rate and have the contribution returned some years later; and sharing up, whereby suppliers purchase additional co-op shares in accordance with their increasing milk supply. Both schemes were suspended when milk price dropped below 30 cents a litre as a means of support for suppliers, thus lessening volatility at farm level. The total not collected is EUR 7 million.

Irish bank interest rates are high versus other EU banks, due partly to the Irish banking crisis, so any support is very welcome.

5. Financial Instruments

- Futures: Ireland is playing catch-up. It is not easy to become involved. There is a learning curve, but futures will be used more in upcoming years. Dairygold has been learning and will be trading shortly. It will not happen at farm level for a generation.
- Insurance: This should be considered but our recent US experience was not entirely positive.
- The methodology of the Irish fixed price guarantee schemes for a proportion of the supply is attractive to farmers.
- Government taxation can help with income averaging, etc. It is being permitted to avoid high taxation, e.g. in Australia.
- Dairygold scheme: There are co-op leveraged lower interest rates from the two main banks plus interest only payments if it is a difficult period, etc. The scheme has just been launched and it is too early to discuss demand. The lower the interest rate, the more attractive the financial instrument is.

6. Milk flex-type scheme

Glanbia underwrote this scheme. At the moment, this is not a major priority for Dairygold as it has more urgent issues to deal with.



Interview with John Fitzgerald, Head, Agribusiness plus Michael Keane, 13 October 2016

1. Milk Price Volatility?

Since 2007, milk price has varied from 22 to 38 cents/litre, a difference of 16 cents.

This volatility is expected to continue. It is based on supply and demand mismatches. Prices will have periods of sustained growth and short, severe corrections.

2. Investment Activity

Capital: For a farmer who has no collateral the bank may lend up to EUR 65 000 at present but then collateral is required. If external support was available this facility could be extended.

Interest rates: Irish banks are benchmarked against other EU banks and Irish interest rates can be up to 2% higher. The Strategic Banking Corporation of Ireland could have a role in helping provide lower rates.

3. Financial Instruments

- Bank Of Ireland offers Dairyflex with Dairygold, launched in September 2016 (as already discussed). The interest rate is 4.5%, but if SBCI criteria are met it can be 4.1%.
- Agriflex was launched in 2014. All existing and new farm long-term loans can access interest-only repayment periods in times of difficulty, e.g. caused by volatility, and accelerate repayments during times of surplus farm cash flow. The term of the loan can be extended for a period. The farm circumstances are evaluated in each case before agreement.

4. Milkflex-type scheme

This scheme has specific triggers and has great security with repayments being deducted directly from the milk cheque. A bank does not have same levels or payment guarantee. Can a structure be put in place that would enable the bank to have same security?

Milk price is just one of the many variables affecting farmer repayment capacity and perhaps a more fundamental assessment of farm finances would be a better option, rather than just linking it solely to the milk price.



A.2.2: Italy

Interview with Mauro Conti, Director BIT-BCC (Financial Intermediary), 3 October 2016

1. What is the scale of dairy-based investment requirements in on-farm productive assets to support existing or growing dairy farm enterprises? How is it affected by farm milk price fluctuations?

The minimum size of investments in the milk sector is about EUR 200 000 when the investment is required to adapt farm to new technologies or to increase the number of milking cows in order to optimize the size of the farm (and to reach economies of scale). This value, however, may increase several times in specific conditions, i.e. in the case of new major investments in large farms. High price volatility as well as low prices in the last period are negatively affecting investments of milk producers. The propensity to invest in this sector is now very low. Farmers who have made investments in the last few years are experimenting many difficulties in paying back their loans.

2. How is this investment activity currently being financed and what are the limitations to this current source of finance?

Due to the high market uncertainty, it is now very difficult for farmer to find external sources of financial support for their investments in this sector. Therefore, they can only invest if they have internal financial sources and/or a very good rating with respect to credit institutions. Banks are particularly risk-averse in the case of investments in the milk sector. For this reason, in the last few months many farms have run into big financial trouble due to credit restrictions and/or limitations.

3. Do you currently provide financial instruments that help in providing more farm milk price stability and overall dairy farm economic stability?

We have developed a specific programme of technical and financial assistance for farmers in this sector, in order to help them to get the credit they need, but only if they agree to be followed by external technical advisors. In this programme, technical support is given together with financial support in order to agree on a specific (and revised) loan programme with banks and creditors. Up to now this programme, which is very flexible and tailored specifically for each farm, has been very demanding but it seems to generate positive results.

4. Which particular forms of financial instruments would you like to see developed that are currently not available/provided? Do you think a MilkFlex-like financial instrument would attract demand?

There could be specific insurance policies to help farmers to face market crises (income insurance) but up to now there have been many documents but no specific policy tools (at the EU level). Insurance policies with respect to specific animal diseases like epizootic diseases could also help to manage some of the possible sources of risk. Mutualisation funds for producer organisations could play an important role but up to now regulations are too poor to allow and promote the development of these tools. Another issue is related to the difficulties in properly evaluating credit risk for each single farmer in the new, very uncertain market conditions characterised by this price volatility.

5. Would you be interested in investing / managing a financial instrument providing increased dairy farm economic stability?

Yes, our interest is showed also by the fact that we have already tried to develop a tool to help milk producers to face the present critical market scenario with extra support in terms of technical and financial consultancy services. The objective is twofold: help farmers to cope successfully with market uncertainty, and to help banks reduce credit risk and losses due to possible defaults.



6. What would be your requirements to be involved as fund manager and/or investor?

We would need to participate in defining the methodology to be applied in this case. It is essential to create confidence in the new tool and to motivate a potential manager and/or investor to participate. It could be a good idea to evaluate ways to also involve companies selling inputs to farmers since they are now providing important support in terms of commercial credit, i.e. quite long delays in payment.



Interview with Giorgio Apostoli, Director of the animal production office, Coldiretti, the most important Italian farmers' organisation, 3 October 2016

1. How is the milk price determined?

The milk price is determined in different ways. With the exclusion of the milk used for production of PDO cheeses (about 50% of total production), and in particular Grana Padano and Parmigiano-Reggiano, the remaining part is highly influenced by the bargaining power of the most important private buyers, and in particular the Lactalis group. They control Galbani and Parmalat and they buy slightly less than 1 million tonnes of Italian milk. A national framework contract is signed between farmers' organisations and dairy industry representatives. Generally, the contract fixes the price for 1 year. The last one lasted from April 2016 to March 2017. Generally, the price is fixed. However, there are also many contracts with different approaches. The price can be fixed for 3 to 4 months, and it can be adjusted according to the evolution of international milk prices or, in very few cases, according to a complex index considering feed prices, international milk prices (import price), and prices of main products obtained from processing.

2. How great are differences between the individual prices agreed in the sector? Which is the most commonly used reference milk price in the country and to what extent does it take account of the individual price differences?

Differences among prices in different contracts are relevant and they may reach even 20% or more if we compare milk for the industry and milk for PDO cheese production. Differences among prices of milk for industrial purposes (about 10-15%) depend upon the structure of the contract and reference prices (or indexing methods). Generally, the price is determined starting with a mix of EU prices and adding a premium (calculated as a proxy of the transportation cost from abroad to Italy) of EUR 3-4/tonne. The prices in southern Italy, a geographical area with a strong deficit, are higher than the ones in northern Italy of about EUR 2-4 /tonne.

3. How would you expect milk price volatility to evolve in the short and medium term?

Price volatility is not expected to decrease over time. Some increase in price is expected, but not a decrease in volatility. And farmers are very worried about it.

4. How is this investment activity currently being financed and what are the limitations to this current source of finance?

Whenever possible, farmers tend to finance their investments with their own financial resources. Now that the new rural development programs have started in all the regions, they are quite often used to access public resources to support investments, even if it is quite difficult to justify further investments in the Italian milk sector.

5. Are you aware of financial instruments that could be helpful in providing more farm milk price stability and overall dairy farm economic stability?

The only financial instruments mentioned is the extraordinary decision taken by major Italian banks, to suspend the payment of interest for a few months on farmers' loans due to the decrease in the milk market price.

6. Which particular forms of financial instruments would you like to see developed that are currently not available/provided? Do you think a MilkFlex-like financial instrument would attract demand?

I was not aware of the MilkFlex instrument. After having received a synthetic explanation of the MilkFlex programme, I would have a strong interest in this kind of tool. The only critical point is the direct payment of the financial institution by milk buyers: there should be some flexibility.



7. Would your organisation have sufficient financial resources to contribute to a Milkflex-like scheme and be willing to bear the risk?

In Italy, it is extremely unusual for farmers' organisations to participate directly in financial operations. This sort of activity could be feasible, perhaps, with producers' organisations; not with a Farmers' Union like Coldiretti.



Interview with Marco Ottolini, Director APO (Association of Producer Organization) Latte Italia and Producer Organization Agrilatte, the most important APO in the milk sector in Italy, 12 October 2016

1. How is the milk price determined?

Generally, the price is determined in an annual contract signed between the PO or APO (or single farmers if they are not associated) and each dairy industry. The contract fixes the reference price for 1 year and it can also include an adjustment mechanism on a monthly or quarterly basis. The indexing methodology can vary from case to case, and also from buyer to buyer, according to their specific needs and productions. For example, a large, private company producing mainly Grana Padano is calculating the price, giving to the price of this cheese the highest weight.

2. How large are differences between the individual prices agreed in the sector? Which is the most commonly used reference milk price in the country and to what extent it gives account of the individual price differences?

Thanks to the organisation, the APO is able to bargain better economic conditions with buyers, obtaining a price which is generally higher, with respect to the national average, of at least 10%. The APO has different contracts with different buyers, according to their different requirements. In few cases, they use the prices of Grana Padano and/or Parmigiano-Reggiano as references. In other cases, they use a weighted average of the prices of butter, SMP, and the spot milk price, i.e. the two prices of Lodi and Verona, in Italy. According to their experience, it is very difficult (or almost impossible) for a small dairy plant to apply an indexed methodology to define milk price.

3. How would you expect milk price volatility to evolve in the short and medium term?

Price volatility is very high and it is expected not to vary significantly over time. They are working hard to negotiate better contractual conditions and more flexible approaches to price fixing in order to reduce risk for associate farmers. This is one of the more useful reactions to price volatility in the given market condition.

4. How is this investment activity currently being financed and what are the limitations to this current source of finance?

Farmer associates to the APO can easily obtain loans due to the high rating of the APO itself. Farmers tend to self-finance their investments when possible, and apply for support measures available in rural development programs.

5. Are you aware of financial instruments that could be helpful in providing more farm milk price stability and overall dairy farm economic stability?

No.

6. Which particular forms of financial instruments would you like to see developed that are currently not available/provided? Do you think a Milkflex-like financial instrument would attract demand?

I was not aware of the Milk-Flex instrument. However, after I received a synthetic description of the MilkFlex programme, I feel that this tool could be of some interest.

7. Would your organisation have sufficient financial resources to contribute to a Milkflex-like scheme and be willing to bear the risk?

The APO (and also the PO) could be available to co-finance a financial instrument like Milkflex. Of course, we would need to have clear information and specific rules to apply this tool without prejudice in terms of taxation. Now the APO is helping the associated farmers by anticipating payments for milk with respect to common delays in commercial payments.



Interview with Mediocredito Italiano, Banca del Gruppo Intesa San Paolo (Financial Intermediary), 11 November 2016

1. What is the scale of dairy-based investment requirements on-farm productive assets to support existing or growing dairy farm enterprises? How is it affected by farm milk price fluctuations?

You can see that investments are currently led by farmers attempting to move towards more value-added production and traceable products. We do not have any figures on the ongoing or expected investment amount.

2. How is this investment activity currently being financed and what are the limitations to this current source of finance?

Although volatility is certainly an issue, also in Italy, the moratorium agreed by the Associazione Bancaria Italiana seems to provide sufficient relief to farmers.

3. Do you currently provide financial instruments that help in providing more farm milk price stability and overall dairy farm economic stability?

No, we do not. Banca Intesa San Paolo provides financial products for the agro-industrial sector through the Banca dei Territori local branches, which have closer relations with local enterprises and individual clients. Mediocredito Italiano is in charge of medium/long-term financing, leasing and factoring products. Moreover, Mediocredito Italiano manages the EIB funds for small and medium-enterprises.

Our strategy is to require agreements with the leading enterprise of the production chain which, in turn, disseminates the products among the suppliers and producers within the chain. Such an approach is helpful for both the bank and the farmers. The bank obtains the qualitative information it needs for better decisions on funding. The individual farmers can improve their creditworthiness by being considered as part of their supply chain. In general, we offer products with high coverage, e.g. 100% of the invested capital plus 40% of cash flows. We are currently working on products based on non-possessory collateral (pegno non possessorio) to finance the costs sustained during the different phases of the production process, e.g. storage, ageing, which ensure product quality. We are also working on the supply chain by offering an online platform to the leading organisations, where they are linked to their producers and from which they can, for example, pay advances to their farmers.

We do not offer income insurance. We offer insurance for civil liability and emergency situations. It is difficult to imagine that such solutions can be developed at the individual financial intermediary level; it is more likely to be developed at country level.

4. Which particular forms of financial instruments would you like to see developed that are currently not available/provided? Do you think a Milkflex-like financial instrument would attract demand?

It can surely be a useful financial tool. Cooperatives may be more ready to share the risk and also help with improving the operational efficiency of such an instrument. However, a large private enterprise chain can also have an interest in this type of financial product now that they are trying to establish a more stable relationship with their suppliers to ensure a high quality, trackable and continuous supply. It is also important to have a key player in place as 'first mover', as it could encourage other players in the sector to follow.



5. Would you be interested in investing / managing a financial instrument providing increased dairy farm economic stability?

Yes, in general we would be open to consider developing such a product. However, it should be understood how these could be developed in a national context, considering that, for example, portfolio guarantees are not really developed in Italy and managing individual guarantees is quite demanding.

6. What would be your requirements to be involved as fund manager and/or investor?

It really depends on the form in which the financial instrument would be established. There might be, for example, difficulties in terms of the administrative burden related to reporting. Additionally, if the instrument required different operational procedures from the ones that are already being used, this may raise investment costs, e.g. IT, that need to be considered when assessing the feasibility of the initiative.



A.2.3: France

Interview with CREDIT AGRICOLE - Laurent BENNET, Agriculture, Food and Specialised Markets Director - Directeur de l'Agriculture, de l'Agroalimentaire et des Marchés spécialisés, Jean-Christophe ROUBIN, Agriculture Director - Directeur de l'Agriculture, and Baptiste LELYON, Expert in animal productions - Expert filière productions animaux

1. What is the scale of dairy-based investment requirements in on-farm productive assets to support existing or growing dairy farm enterprises? How is it affected by farm milk price fluctuations?

We are experimenting a new world with the end of the quotas, with no more security net (filet de sécurité).

Moreover, only 30% of dairy farmers are able to understand this new situation, to be real 'entrepreneurs'. There is no standard farming model in France and the farmers' typology is quite large. We work with the management centres (centres de gestion) in each region to have more information regarding the farmers.

Today, dairy farmers have to produce milk for targeted markets. The markets should drive the production.

You must consider that there are many differences between the different French regions, territories which are not sensitive to this new world in the same way.

Up to now, we have not had any regulation systems enabled to minimise the market factors.

Whatever new system settled, it doesn't replace the market and market reality does the farmers income

The strategy of each dairy farmer must be linked with the strategy of his dairy. Producers depend on his dairy's product portfolio: FMCG or industrial products, own labels or private labels, domestic market or abroad.

With regard to volatility, there are two different time periods: a short time period with volatility and a long-time period (8, 10 or 15 years) corresponding to farm investments. The problem is that these two time periods interact. Dairy farmers must have economic indicators to follow the economic situation of their farm.

The dairy chain (filiale laitière) delivers products without knowing at which price the products will be bought: There are no futures markets or auction markets (marchés au cadran), which create tensions.

The dairy chain is in mutation. The quotas were linked to the land (foncier) with no migration from one territory to another. With no quotas since April 2015, this migration is possible. In France, around 10% of the milk is used to produce Appellations d'Origine Protégée linked to their territories, i.e. 90% may migrate from one place to another.

Otherwise, the French state was aiming to encourage medium-sized farms. Nowadays, the concentration is on and farm size is increasing rapidly.

Another point to consider is that in 10 years, 50% of the volumes will change from property with high investment into the farms to follow the milk demand.

Up to now, there have been two means of obtaining of farm funding (financements); through loans and auto-financing.

If you take into account the land (foncier) French dairy farmers are not over-indebted (surendettés), as compared with north European dairy farmers.

A main difference in France as compared to the other north European countries is that 60% of the French dairy farms are diversified, whereas the German ones are very often specialised in milk and the Dutch ones completely specialise in milk. The consequence is that there are more investments made in France due to this diversification. On top of that, there is more diversity in France between the different dairy farmers as compared with the north European farmers.



2. How is this investment activity currently being financed and what are the limitations to this current source of finance?

The investment activity is financed by loans and auto-financing.

In Brittany, we have conducted what we call a 'Stress test' on different farms projects. We analyse the project with its financial plan and we make it run with the lowest milk prices of the past five years to see the impact on the farm's economy and the capacity of the project under such hard conditions. These 'Stress tests' were used by pig farms. They are now also used on dairy farms.

You have to take into account the wide diversity of French dairy farms: regional diversity, lifeline (ligne de vie): it takes around 30 years to establish the farm. After 40 years, the dairy farmer begins to be in a better situation. He has paid back a large part of his investment. Between 40 and 50 years, he starts to increase the size of his farm. After 50 years, he does not invest anymore and 'takes the value; or he invests again and increases the size of his farm, thinking about his successors. After 65 years, it is time to transfer the farm to the next generation.

On top of that, you must consider the dairy farm's chain strategy (stratégie de filière). Does he sell to his dairy or does he transform part of his milk production and sell directly around his farm, to consumers, retailers, caterers etc. with a better margin?

We pay attention to the young farmers and the new investors, who have recently invested and have a (fragile) situation.

What do we do regarding our support to the dairy farmers?

- We have, in a manner of speaking, an analog system like MilkFlex.

- We offer loans with a flexibility clause, to increase or reduce the repayment period. We call them 'prêts à piloter' – loans to be managed, where the producer decides if he wants to stop the loan payment for a few months and pay it again, when his financial situation is better. A limit to this process is the guarantee (caution solidaire), which will stop at the end of the loan.

All our new loans are 'prêts à piloter' loans, with an option to implement the process.

If you lengthen the loan repayment period, you will reduce your future debt capacity.

- Our regional agencies have settled new supports with recovery due (reprise d'échéance) and loan extensions.

We have launched an instrument called the Flexilait loan.

With the very low interest rate, and financial costs (charges) at a low level, the loan guarantee (the one offered by BPI) is more expensive than the loan itself.

The interest rate is much higher in Ireland. Glanbia tried to find Irish banks to take part in the project but it did not succeed in and so in the end asked Rabobank.

3. Do you currently provide financial instruments that help in providing more farm milk price stability and overall dairy farm economic stability?

MilkFlex is a good product. However,, for us, it would be very expensive to implement it for data processing reasons. Our data processing tools are not able to develop such a product and it would need at least 2 years to develop it.

Our business model is very industrial because we are a 'mass bank' and we need very low cost productions to stay competitive.

We are able to manage loans on index but we never considered market prices. Most importantly, there are a lot of legal problems directly linked with this instrument.

Additionally, we are not a fund manager.



4. Which particular forms of financial instruments would you like to see developed that are currently not available/provided? Do you think a MilkFlex-like financial instrument would attract demand?

MilkFlex is not a tool to manage volatility and risk; it will improve the financial situation of the farmer.

Its advantage is the automatic system that increases or decreases the monthly payment.

5. Would you be interested in investing / managing a financial instrument providing increased dairy farm economic stability?

No, not interested. We are not a fund manager.

We could distribute the product, with a commission.

Financing the fund would depend on the rate and remuneration.

In Ireland, the rate is very high: 3.8%.

6. What would be your requirements to be involved as fund manager and/or investor?

We are not a fund manager.

There are the futures markets that have two milk powder products and one butter product. At the moment, there are no movements on these markets. Moreover, the main European dairy groups like Friesland Campina in the Netherlands and Arla in Denmark do not want these markets.

In order to be active on these future markets the cooperatives could buy contracts to cover their position and then mobilise the producers to deliver the milk or alternatively, the cooperatives could ask the farmers if they are interested with volumes at these prices and if the answer is in the affirmative, the cooperatives will contract on the markets.

We can imagine loans to the farmer, based on the milk price or based on a milk price linked with a contract that the dairy signed with its customer.



Interview with Jean CORDIER, Professor, Agrocampus school in Rennes (Brittany). Expert in Management of Risk for Markets and Price volatility/Raw Materials Expert en gestion des risques marchés & matières 1ères, 29 September 2016

1. How is the milk price determined?

The basis milk price was fixed, until recently, through national indicators published by CNIEL. Onto this base price, the following were added: quality premium, the composition (fat and protein content), the season, with regional modulation based on the annual average of prices paid.

This practice is no longer allowed and following the 'paquet lait' (milk package), each dairy producer is now free not to follow these rules. Today, dairies pay based on market value and the milk producers are asking for a bigger part of the added value obtained by dairy farmers.

For example, the cooperative Sodiaal has established milk prices A and B. These are based on the domestic market and the international market, notably for industrial products. There are substantial price differences between the targeted markets.

Today, the milk producers want to be paid based on the value of the processed products on the different markets.

Public authorities can intervene to adjust volumes, like the recent decision to reduce the volume of milk produced taken by the European Commission and followed by the different states, with a bonus given for 1000L that should increase the price paid to the dairy farmers. Private dairies, like Danone or Savencia, have also proposed a bonus per 1000 L for a reduction of 5% in milk production (compared to the annual objective).

2. How great are the differences between the individual prices agreed in the sector? Which is the most commonly used reference milk price in the country and to what extent does it take account of the individual price differences?

The dairy farmer asks to be paid according to the value of the processed products and this price must cover production costs. That brings into question of margin and input costs.

Are we talking about the margin or the milk price? See what is done in the USA and in Ireland.

Sodiaal just launched a contract with a margin guarantee but only with very small volume.

3. How would you expect milk price volatility to evolve in the short and medium term?

We know the volatility of international industrial products. The question is if fast-moving consumer goods (FMCG), which are very stable nowadays in France, will begin to fluctuate tomorrow. My opinion, as an expert in market risk management, is that they will fluctuate; the farmers do not have the same opinion.

The fluctuation of indicators is very important and this will not change in the future.

Milk prices were homogenised by the indicators during the quota period. Tomorrow will there be price homogenisation by the dairies?

Tomorrow, the dairies will propose different contracts to the farmers.

4. How is this investment activity currently being financed and what are the limitations to this current source of finance?

MilkFlex is a new tool at the individual farmer level.

Today, dairies try to help their farmers through different tools; loans for young farmers, help for start-ups, for new investors, investment This allows farmers to get a better price.

A big question concerns the production structures, the farms. Which structures will be profitable? Farm sizes are increasing. When a farm moves to another level, it might reduce its profitability for a while.



The banks closely watch the financial situation of farmers.

5. Are you aware of financial instruments that could be helpful in providing more farm milk price stability and overall dairy farm economic stability?

There are a few financial tools: insurance, futures markets with derivative products, credit instruments, and precautionary savings with possible tax exemptions.

In France, there is no insurance instrument now, apart from fodder insurance for production costs.

Currently, there are no future markets on the main products, the industrial products. Eurex in Frankfurt just started with these new tools but we have no idea if they will be a success. The main dairy groups like Lactalis are against these tools

A transparent reference market that fixes a price on a few main products would be a big help.

Sodiaal is making a trial but for a very small amount. Without the futures markets, we need derivative contracts.

There are no classical financial tools but they are really needed in France. There are a few trials to implement derivative contracts like Gambia's and Sodiaal's.

In the second pillar of the CAP, there are four items regarding risk management and among them, two concern the dairy sector.

Professionals are willing to look for stabilisation tools, through tools proposed by the CAP.

A combination of financial tools will be needed.

6. Which particular forms of financial instruments would you like to see developed that are currently not available/provided? Do you think a MilkFlex-like financial instrument would attract demand?

Instruments that stabilise the loans would be useful. These are the most efficient and the less expensive option that should be developed.

The people who define public support do not really know the situation of the dairy market.

The product, MilkFlex, goes in the right direction.

The different tools that will be proposed have to work together. Thus the farmer will have in front of him the different ways to obtain his objectives and meet his needs.

7. Would your organisation have sufficient financial resources to contribute to a Milkflex-like scheme and be willing to bear the risk?

You have to take into account the diversified portfolio of products / activities of the various dairy groups. For example: Danone produces mainly FMCG and a few industrial products.

I work on risk management; your project is supplementary to the projects I am working on and this project will come in addition to other tools.

The farmers have diversified demand; the industrial tools should be diversified as well.



Interview with Christian LE NAN AOP Grand Ouest President, 30 September 2016

President of the Association of Dairy Farmers' Organisations (AOP in French) Grand Ouest, which includes around 5000 dairy farmers, in the Ouest regions of Brittany, Pays de Loire and Normandy

President of the dairy farmers' Organisation (OP) Rolland, part of AOP Grand Ouest

At the end of September, AOP Grand Ouest was the first horizontal, territorial AOP to be recognised by the French state.

Its objectives are to make the AOP recognised (done), to increase the number of dairy farmers in each member OP and to work with cooperative organisations like Sodiaal, Agrial for example (today, the OP within the AOP deliver their milk only to private dairies).

Its goal is to reach 75% of the farmers in the Ouest region, which produces 65% of the milk in France, so the AOP Grand Ouest may cover around 50% of milk produced in France.

The second pillar of the Common Agricultural Policy will be managed by the regions, notably for financing, so it is very important to work on a regional or multi-regional basis.

The AOP missions are: to improve dairy farmers' image, to improve crisis management and crisis anticipation tools such as storage by dairy farmers, to work on humanitarian actions that take effect on decrease of the processed products, to improve saving plan projects for the farms.

AOP produces 1.2 million litres of milk, which it sells to two customers: 800 kl to Rolland (ice cream producer belonging to the UK group, R&R ice cream) through OP Rolland and 400 kl, sold directly to a pancake maker, with very different prices between the two customers.

Today, the price differences change the dairy turnover by 50%, with prices going from EUR 220 to 420, due to the high price volatility. This revenue volatility has deep consequences for dairy farmers.

1. How is the milk price determined?

Negotiation is done at OP, not AOP level, notably because we want to integrate the cooperatives in our AOP Grand Ouest and we need the same negotiation basis, between cooperatives and private dairies. Dairies must compete and a difference in the milk price will allow this.

For OP Rolland, price negotiation is based on the inter-branch indicators. We follow the ice cream market and industrial products prices.

The level of the indicators is disconnected from the markets, from the prices on the different markets. It is slowly changing, taking into account differentiated prices according to the product mix of the different dairies.

The number of French farmers will significantly decrease, by 50%, in the next ten years. This is why dairies must ensure their milk supplies and take into account the type of dairy farmer.

R&R ice cream has 5 industrial sites in Europe; only one collects milk, Rolland in France. The four other sites buy on the spot market with the associated risks. Rolland in France can secure its supplies for volumes and price.

2. How large are differences between the individual prices agreed in the sector? Which is the most commonly used reference milk price in the country and to what extent it gives account of the individual price differences?

The different ways to improve revenue are to manage the costs better and to increase the products, by volume or by research into new channels that pay more, like direct sales.

There is less opportunity to reduce feed costs; on the other hand, the reduction may be important for financial costs.

There are bank loans with advance repayments and repayments that depend on the financial situation of the dairy farmers.



Concretely, when I finish a financial year, I work on provision for the coming years. I try to anticipate the crisis and if my situation looks difficult, I ask my bank to change the repayments, e.g. on a 15 year loans for farm buildings.

Credit Agricole has loans with variable repayments, including for capital and early repayments.

3. How would you expect milk price volatility to evolve in the short and medium term?

It is important not to disconnect the milk prices from European market prices. This disconnection occurred in the pig market with the French state fixing the market price around 1.20€/kg, disconnected from the European market with very lower prices .

The volatility will be difficult to manage. It will be important to develop futures markets in order to have visibility over a one-year period. It will be necessary to define a futures market for basic milk and to give medium and long term prices. The dairies know, six months or one year before, at what price they will buy their milk. For breeding activities, we are on a long cycle; if the milk price is low, it is possible to reduce milk production to increase prices

We also have to work directly with retailers. For example, my OP delivers its milk to Rolland dairy and we could fix a contract between my OP, Rolland dairy and a retailer. There are a few similar experiences in France at the moment.

It's important for farmers not to have only one customer, to develop competition.

Till now, during the "quota" period, farmers didn't take the dairy markets into account, prices were directly linked with volumes. Today, in Europe the volumes are liberalised; less in France than in the other countries due to the contracts in France.

It's very important for the farmers, for the OP to know the markets better. This economic intelligence has to be asked by farmers' organizations to CNIEL, the inter-professional dairy organisation.

In future, we will have commercial OPs where the milk belongs to them and no longer to the individual farmers, allowing the OP to sell its milk to different customers, dairies or others, retailers...Till now, the producers don't have bargaining power with the dairies.

4. How is this investment activity currently being financed and what are the limitations to this current source of finance?

Farmers should be financed by the banks, not by the dairies. If my OP is financed by my dairy, it will be stuck with it but I want to stay free, to keep my freedom. A lot of cooperative dairies bring financial aid to ensure their cooperation.

Private dairies place more value on the milk price. For example, during the 2009 milk crisis, our OP refused financial aid from our Rolland dairy to stay free. Our idea was to see our bank to negotiate a collective loan but this did not happen because the milk crisis was very short, only around six months.

The cooperative gives farmers an advance payment for the milk supplied and settles depending on the profits of the cooperative dairy and this settlement is agreed on by the board of directors.

5. Are you aware of financial instruments that could be helpful in providing more farm milk price stability and overall dairy farm economic stability?

Flexible loans from banks, like the one from Crédit Agricole.

Financial advances through CAP: I know in May, the amount CAP will pay at the end of the year and the bank can, according to my financial situation, decide whether or not to offer a loan.

There is no mutualisation fund, no equalisation fund (caisse de péréquation). In the fruits and vegetables sector, there is an equalisation fund.



6. Which particular forms of financial instruments would you like to see developed that are currently not available/provided? Do you think a MilkFlex-like financial instrument would attract demand?

Our investments are very important, for farm buildings, land, with the cost of land increasing very rapidly, from, in our region Brittany, EUR 6 000/7 000 / hectare (ha) to EUR 10 000/Ha in the last few years, and even EUR 12 000/13 000/ ha for a few plots.

It will be more and more difficult to make investments if there are no appropriate financial tools. MilkFlex is interesting as my repayments vary. If my turnover varies from 50% (increasing or declining), my repayments cannot be the same.

How do you coordinate the different tools?

If the milk crisis is severe, I can manage with loans; if the crisis is long, more than two to three years, I will try to negotiate long-term loans.

On my farm, I have two different products: milk and lettuce. The diversification in production is a real advantage; specialisation makes you more vulnerable.

We could also develop insurance to protect farmers' margins. The cost of implementation would have to be analysed. AOP Grand Ouest could take a part of this insurance cost.

There are relatively flexible financial sources used today for business management.

We could implement a fund for private storage of dairy powder and launch a tender for the different dairies. This could let us be active directly in the market to find higher prices, and here, the EIB could help us. French regions could also help us through EAFRD but there would need to be harmonisation at regional level.

7. Would your organisation have sufficient financial resources to contribute to a Milkflex-like scheme and be willing to bear the risk?

Rolland OP alone does not have the capacity to position itself on this project. At AOP Grand Ouest level, we want to keep a light structure. But we can work at AOP level and see, among our OPs, which ones might be interested.

Would your AOP Grand Ouest be interested in investing in this project?

It would depend on the cost.

Who can share the risk in this instrument?

The bigger the structure the less the risk.

We have no idea about the size of this project but we imagine it would be implemented at a national level

I would prefer it to stay at a regional, territorial level. The financial tool must be defined at a specific territorial level.

Can a future beneficiary (like AOP) invest in the project?

What territorial area will the tool cover?

Grand Ouest region has the greatest volatility in milk prices.

There is some legal criteria consider: a structure like an AOP cannot represent more than 33% of the national milk volume or more than 3.5% at the European level.



Interview with DANONE - Sophie GODET, Director of the milk supply, Dominique NOUVELLON: Responsible for relationship with the farmers, Noelle POISSON, Communication Manager (Producers), DANONE, 12 October 2016

Processor Dairy - private: DANONE

1 billion litres of milk collected; 4% of the total French collect

6 Producer organisations – 4 main regions and in each region, one manager of the relation with the producers and two technicians

Danone is very involved in establishing contracts with the producers

1. How is the milk price determined?

Since 2011, establishing contracts with the producers has been obligatory and each dairy must offer a contract to each of its producers. Each of them can accept or refuse. This contract will contain and define volumes, prices, quality, seasonality, etc.

Since April 2015, when the quotas ended, each private dairy has had its own price formula, based completely or part of it, on the quarterly inter-professional indicators. For the cooperatives, it is an advance payment with supplement at the end, according to the results of the cooperative

We are very involved in what we call: sustainable milk: economically competitive, giving visibility to the producers – the price volatility is harmful for the two parties. We are very sensitive to this last point because we are a quoted firm.

We recently launched some innovations regarding this price formula and decided to introduce part of the variation of the production costs on the farm to regulate the volatility. This innovation already exists in a few European countries and in the USA.

We have managed this evolution by maintaining close contacts with the producers and in agreement with them.

Our goal is to have a balanced formula with a mix between inter-professional indicators and production costs.

This job has been carried out in all four main regions, taking into account the specificities of each region.

On top of that, we are working with the dairy farmers to improve and reduce production costs

In each region, Danone with its OP decides together with which breeding organisation they will work, to collect correct indications regarding the production costs. Some examples: are :Institut de l'Élevage (Breeding institute), France Conseil Elevage (Performance Control). The aim is to define the best producer sample on the analysed territory.

They are important price formulae among the four regions, due to different producers' typology. For example, in the north of France, the farmers are used to fixing positions on futures market for their cereals' activities and therefore can accept higher volatility. It is completely different in the eastern region.

2. How large are differences between the individual prices agreed in the sector? Which is the most commonly used reference milk price in the country and to what extent it gives account of the individual price differences?

The reference price was the basis price until the end of the quotas. Since April 2015, the basis price has been calculated in different ways, according to the different dairies.

However, the basis price, between the main dairy producers (Lactalis, Danone, Savencia, Sodiaal...) may not be very different on an annual basis. It may vary, according to the different dairies, from one month to another. For the price comparison between the dairies, the annual average price is looked at; to process price simulations, monthly prices have to be worked on.

3. How would you expect milk price volatility to evolve in the short and medium term?

The volatility will continue for the next few years. There are no more quotas; no more regulation tools. With the exception of milk powder, the products are not easily stored.



The CAP subsidies were able to improve the financial situation of the producers and today, there is a decrease in these subsidies.

In the USA, the subsidies are counter-cyclical. In Europe, these subsidies are not flexible.

4. How is this investment activity currently being financed and what are the limitations to this current source of finance?

We do not invest. That is the role of the banks and the dairy farmers are not interested in financial support from their dairies.

The contract between dairy farmers and the dairy lasts five years, which is a guarantee for the bank.

5. Are you aware of financial instruments that could be helpful in providing more farm milk price stability and overall dairy farm economic stability?

There is the Glanbia system, which is a contract with indexed prices.

There is margin insurance in the USA.

The banks can cover risks like operating losses (pertes d'exploitation) through insurance.

Tripartite contracts between: the OP, a dairy and a distributor / example: OP APLBC + LSDH (Dairy) + Auchan (distributor) are mainly developed for own labels. In this case, the dairy is like a sub-contractor.

6. Which particular forms of financial instruments would you like to see developed that are currently not available/provided? Do you think a MilkFlex-like financial instrument would attract demand?

I have no idea. We do not know enough about all these mechanisms.

We are convinced that the price volatility must be managed. We looked after the two new products developed by Glanbia: the contract with indexed prices and the MilkFlex.

The solutions will differ from one country to another and from one territory to another; from one dairy to another and according to the producers' typologies.

7. Would your organisation have sufficient financial resources to contribute to a Milkflex-like scheme and be willing to bear the risk?

No. We already invest a lot of time and money, to improve the relations between our dairies and the OP / producers and this is one of our top priorities for the next five years.



Interview with SODIAAL - Patricia VIVIER, Financing and Group Treasury Director – Directeur Financements et Trésorerie Groupe / Direction Administrative & Financière, and Pierre BERNOUX, Director of « Valorisation » / Directeur de la Valorisation matière, 13 October 2016

Here are a few facts: End of the quotas in April 2015, willing from China / Asia to be less dependent from New Zealand, Russian embargo due to the American pressure, modification in the Chinese rules in order to reduce the power of Danone and Nestle on its market at a time where the Chinese consumers don't trust any more the quality of the Chinese dairy products. Only 8% of the dairy products are sold on the international markets and a big part of it by New Zealand, what means that a main evolution (increase / decrease) in New Zealand (it exports 90% of its dairy production) may strongly affect the milk market, worldwide.

The dairy model in France is less affected by milk crises, due to its farm structures. There are a lot of small and average farms and fewer big farms. Land costs less as compared with north European countries. That is why French farmers have less debt than their European neighbours. On top of that, small and average farms may be more flexible than bigger ones.

The volatility is back and a volatility regulation has to be settled to improve the situation of all partners. Recently, the European Union launched a fund of EUR 500 million, EUR 150 million for the dairy sector and EUR 350 million for the meat sector to reduce the global European milk production and to avoid a big crisis for the meat sector.

The dairy market is improving again, with prices of dairy products increasing, e.g. for cream and butter. It will last more time for milk powders due to the actual stocks. The dairy farmers expect a rapid price increase but the main dairies have to fight against the main French distributors (Leclerc, Carrefour, Intermarché, Auchan, Casino, Système U...), which are very reluctant to increase their retail prices. At Sodiaal, we succeed in getting price increases by the BtoB customers, catering, discount, but it remains very difficult with the main retail players.

In north Europe, the dairy industry is very concentrated with major groups like Campina Melkunie in the Netherlands or Arla in southwestern Denmark exerting strong pressure on the different retail chains like Albert Heijn in Netherlands. The farmers are today slightly less interested in new financial tools due to the slight milk price increase and we, Sodiaal, must prepare for the next step.

We have eight regions, with a technical-economic follow-up by different organisations like the Bureau Technique de Promotion Laitière, an organisation that helps the producers linked with cooperatives.

Products Mix and price paid. We are active on three different markets: France, Europe, outside Europe with different prices and different portfolio: FMCG or industrial products, national brands or own label We try to push our main brands (Candia Yoplait, Riches Monts...) on the different markets in order to get more value from them and reassign part from this value to the producers, through the supplementing prices paid. We also tried to develop ourselves in other value markets like bio products and AOP products.

1. How is the milk price determined?

With cooperatives, we have an advance payment and a supplement, either in cash or in social capital.

We get a lot of pressure from the dairy farmers to fix the advance payment at a level not very far from the prices paid by the other dairies.

It is common to say that Sodiaal gives the price and the other dairies follow the direction. Sodiaal is the market / price reference.

2. How large are differences between the individual prices agreed in the sector? Which is the most commonly used reference milk price in the country and to what extent it gives account of the individual price differences?

See above.

3. How would you expect milk price volatility to evolve in the short and medium term?



You must consider some market evolution like: increase of the worldwide demand which will last for the next years, strong demand for proteins, nice new image for butter.

4. How is this investment activity currently being financed and what are the limitations to this current source of finance?

We have the mechanism of double volume / double price.

We also invest a lot in young dairy farmers, who are given a production right of 300 000 litres with an A price.

Sodiaal developed the Sodiaal Box, with a value of EUR 10 000, which allows the dairy farmer to go on training courses.

5. Are you aware of financial instruments that could be helpful in providing more farm milk price stability and overall dairy farm economic stability?

We follow everything going on regarding the subject of price volatility management.

At Sodiaal, we have a new system with double volume (A/B) and double price (A/B). The A price is more for the domestic market; the B price is more for export markets with industrial products (butter and powder).

The A price is used for almost 90% of the milk collected. We had a flexibility index (according to the proportion of industrial products – butter and powder - in the products portfolio of the group) and when we settled our A/B system, we decided to withdraw this index and so we had a price near the one paid by a dairy group less involved in industrial products.

When a farmer decides to develop his B volume, he takes the risk and it is our role to propose new tools to manage the price volatility.

However, our objective is to find new markets with volume and fixed prices.

The B price is used for 10% of the milk collected. Around 50% of the dairy farmers have more than 10% of their milk with B price and 25% of them have more than 25% with B price.

We also just launched a contract with securitised margin adjusted according to the production costs (contrat à marge sécurisée avec ajustement selon les coûts de production – IPAMPA). We are making the trial, on a very small scale: 80 dairy farmers and 20 to 30 ml. The objective for Sodiaal is to negotiate a new contract with a fixed price over a long period with a customer and this will give the dairy farmer the possibility to partially securitise his B volume (10 to 50% of this B Volume with a fixed price). In average, each Sodiaal dairy producer has roughly 10% of his milk that is B volume.

The way to develop this experience is to find new contracts. Over the long term, there will not be a big difference in the milk price paid to the producers, but on a short-term basis, the milk price may vary a lot

Regarding the MilkFlex product, it is more adapted to dairy farmers, with a main B volume and who are more exposed to price volatility.

We are also active on the futures markets. We are active in milk (Candia activity) and milk powder (Eurosérum activity), with a budget of EUR 15 million. We have our own trader and the transactions are done by an Irish broker. We started in 2010 and we have been participating since 2014. The market is not liquid at the time.

One weakness of this system is that you must be registered. It takes months and months to get your registration, in order not to engage the responsibility of the operators.

For Sodiaal, the future markets are interesting. It is important to have a place where the prices are settled and where you can decide whether to position yourself.

Sodiaal thinks that a few dairy groups like Lactalis do not want the futures markets to develop. Lactalis has various possibilities to send milk or industrial products towards its different European and worldwide subsidiaries, and to make margins with that. For Sodiaal, Lactalis may think that the cooperative may earn more with these futures markets.



As regards margin insurance in the USA, I understand that insurance for a cereal harvest exists but developing insurance to cover a price in a volatile market could not be settled by a bank or by insurance. You need support from the countries, from Europe to insure such a risk.

The tools could be different between private or cooperative dairies. The private dairies contract with their producers for around 80% of their needs and buy the rest on free markets. The cooperative dairies are obliged to take all the volumes produced by the farmers.

6. Which particular forms of financial instruments would you like to see developed that are currently not available/provided? Do you think a MilkFlex-like financial instrument would attract demand?

Sodiaal is very interested in offering new financial tools to our dairy farmers, especially to regulate the price volatility. However, the question is: who will support these new tools: private or cooperative firms, financial organisations, the different European states, the European Union?

There could be an insurance system like in the USA but with the participation of banks and insurance companies

There could be contracts with indexed prices.

New tools by the CAP 2020. How do operators want to have them developed?

7. Would your organisation have sufficient financial resources to contribute to a Milkflex-like scheme and be willing to bear the risk?

We cannot act as a bank but we try to encourage Crédit Agricole and other banks to implement new financial tools.

Glanbia brings its producers but the funding is done by the funds.

Sodiaal would be happy to offer this new tool to its producers, with a small financial commission.

It is very important to replace subsidies with financial tools. The financial tools may stay in the future. The subsidies could rapidly decrease.

