Study on the effects of exceptional market measures for the dairy sector during the 2014-2016 market disturbance

Final report

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Abstract - EN

Study on the effects of exceptional market measures for the dairy sector during the 2014–2016 market disturbance

The study examines the effects of the exceptional aid set out in Regulation (EU) No 2015/1853 and Regulation (EU) No 2016/1613, as part of exceptional adjustment measures implemented during the 2014–2016 market disturbances in the dairy sector.

The analyses were based on qualitative and quantitative data from various sources: information collected from EU and national databases; a literature review; and case studies carried out in 10 Member States, which included interviews with key stakeholders and a survey of dairy farmers.

The study shows that farmers' risk management strategies implemented to cope with the crisis helped make the dairy market more resilient. The exceptional aid delivered cash-flow support, which was appreciated by dairy farms but could not strengthen their overall financial viability in most Member States. Effects on dairy farmers' production decisions and on the stabilisation of the market were reported, but they remain limited. Eligibility criteria introduced by Regulation (EU) 2016/1613 were generally implemented by Member States, so that the support was accessible to most dairy farms rather than targeted to the most vulnerable farmers. The study reveals no inconsistencies between the exceptional aid and other CAP objectives on the environment or the long-term sustainability of livestock farmers.

Abstract – FR

Étude sur les effets des aides exceptionnelles pour le secteur laitier lors de la perturbation du marché de 2014-2016

L'étude explore les effets des aides exceptionnelles au titre des règlements (UE) n° 2015/1853 et le règlement (UE) n° 2016/1613, faisant partie des mesures d'ajustement exceptionnelles mises en œuvre lors des perturbations du marché dans le secteur laitier de 2014-2016.

Les analyses s'appuient sur des données qualitatives et quantitatives provenant de diverses sources : informations collectées à partir de bases de données européennes et nationales, revue de la littérature et des analyses approfondies issues de 10 études de cas nationales, comprenant des entretiens avec les principales parties prenantes et une enquête auprès des producteurs laitiers.

L'étude montre que les stratégies de gestion des risques mises en place par les agriculteurs pour faire face à la crise ont contribué à rendre le marché laitier plus résilient. Cependant, les aides exceptionnelles ont eu des effets très limités sur les décisions de production des éleveurs laitiers et sur la stabilisation du marché. En outre, les deux aides exceptionnelles ont joué un rôle limité dans le soutien des flux de trésorerie et de la viabilité financière globale des exploitations laitières dans la plupart des États membres. Les critères d'éligibilité introduits par le règlement (UE) 2016/1613 n'ont pas apporté d'améliorations significatives en raison de leurs faibles exigences. L'étude montre que les deux aides exceptionnelles étaient globalement cohérentes avec les objectifs environnementaux de la PAC, ainsi qu'avec l'objectif de durabilité à long terme des élevages. Enfin, l'allocation budgétaire entre les différents secteurs d'élevage a été jugée pertinente.

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LIST OF ABBREVIATIONS

AAEA	Agricultural Applied Economics Association
AECM	Agro Environmental Climate Measures
ANOVA	Analysis of Variance
CAP	Common Agricultural Policy
CMO	Common Market Organisation
CS	Case Studies
DG-Agri	Directorate General for Agriculture and Rural Development
ECA	European Court of Auditors
EDA	European Dairy Association
EIP	European Innovation Partnership
EMB	European Milk Board
ESQ	Evaluation Study Question
ESU	Economic Size Unit
EU	European Union
FADN	Farm Accountancy Data Network
FAO	Food and Agriculture Organization
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
FNVA	Farm Net Value Added
GAEC	Good Agricultural and Environmental Conditions
GHG	Greenhouse Gas
IKM/QFL	Integral Milk Quality Assurance
JRC	Join research centre
MMO	Milk Market Observatory
MS	Member State
NA	Not Available
NUTS	Nomenclature of territorial Statistical Units
OLS	Ordinary Least Square
PDO	Protected Denomination of Origin
PGI	Protected Geographical indication
PGI	Protected Geographical Indication
PMEF	Performance, Monitoring and Evaluation Framework
PO	Producers' Organisation
RDP	Rural Development Programmes
SMP	skimmed milk powder
SSRN	Social Science Research Network
STO	Short Term Outlook
UAA	Utilised Agricultural Area
UN	United Nations
USA	United States of America
USD	United States Dollar
VCS	Voluntary coupled support
WTO	World Trade Organisation

1. OBJECTIVE AND SCOPE OF THE EVALUATION STUDY

1.1 Objectives of the study

The present evaluation study focuses on the effects of exceptional measures provided during the 2014–2016 market disturbance in the dairy sector, due to a supply-demand imbalance caused by a global oversupply, the introduction of the Russian import ban, and the slowdown of imports in China. It led to the introduction of five exceptional measures aiming to stabilise the market and adopted on the basis of Article 219(1) of Regulation (EU) No 1308/2013 (CMO regulation).

The objectives of the evaluation study arise from the recommendations of the 2021 ECA study[1], which outlined the necessity to draw lessons from the 2014–2016 market disturbance with respect to the effects of the various exceptional measures on dairy farm behaviour and liquidity and on market stabilisation and the environment, together with the role of risk management by producers and dairies on crisis management.

1.2 Measures to be covered

Among the five exceptional measures for the dairy sector adopted to address the 2014–2016 market disturbance, only two applied to all Member States and allowed them to set specific rules and criteria for their attribution. The present evaluation study focuses on those two measures:

1) Temporary exceptional aid set out in Delegated Regulation (EU) No 2015/1853,
2) Exceptional adjustment aid set out in Delegated Regulation (EU) No 2016/1613.

1.3 Temporal and geographical scopes

The evaluation study covers all 27 EU Member States during the implementation period of both aid supports (from 2015 to 2017) and extra years before and after the implementation period to fully assess their effects.

In-depth analyses of the models implemented by Managing Authorities under Regulations (EU) No 2015/1853 and (EU) No 2016/1613 and the effects achieved were carried out in 10 case-study Member States: Belgium (Wallonia), Germany, Estonia, Ireland, France, Italy, the Netherlands, Poland, Romania and Finland.

[1] Recommendation 3 of the ECA in 'Exceptional support for EU milk producers in 2014-2016 – Potential to improve future efficiency'.

2. CONTEXTUAL BACKGROUND

This section provides all the necessary background information to understand the Evaluation Study Questions and the different aspects addressed. It describes the EU dairy market in size and characteristics, as well as the reasons and consequences of the crisis that led to the implementation of the studied exceptional measures. The year 2013 was chosen as a baseline to describe the situation of the European dairy market, before the occurrence of the 2014–2016 market crisis. The measures studied are then described, as well as their role inside the overall EU regulatory framework addressing market disturbance. Their intervention logic is put forward, highlighting the variety of implementation choices left to Member States. The various strategies implemented by Member States are also displayed, and a topology of the different choices is suggested at the end of the descriptive chapter.

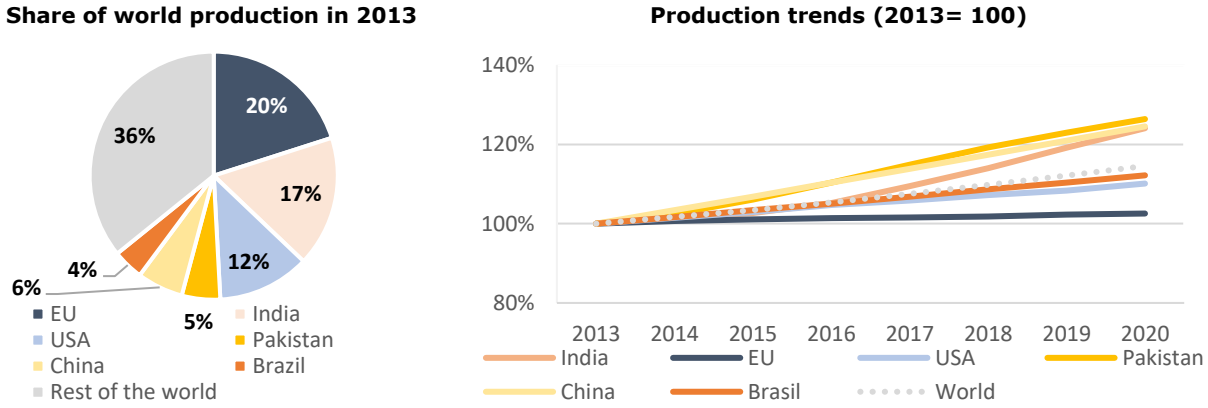
2.1 The dairy sector in the European Union

The European Union is one of the main milk-producing regions in the world. However, milk production and supply chain organisation varies from one Member State to another.

2.1.1 Milk production

For the past decade, the European Union has annually produced around 20% of the world's milk (all animal milks included)[2], making it the first-largest production region worldwide (Figure 1). It had a total production of 154 million tonnes of milk in 2020 (150 million tonnes in 2013). As shown in the figure below, EU milk production has constantly increased since 2012, at a much smaller rate than production in the other main producing regions, and especially India, China and Pakistan. As a consequence, global production increased faster than EU production over the 2012–2020 period (all animal milks included). Nevertheless, it should be noted that Pakistan and India do not significantly contribute to the international dairy market, their exports being very low[3].

Figure 1: World milk production (volumes) in the main producing regions



Source: OECD statistics: https://stats.oecd.org/?lang=fr

Global milk production is widely represented by cow milk (82% in 2013, 81% in 2020), and the European Union is the world's top production region for cow milk, representing 22% of global production from

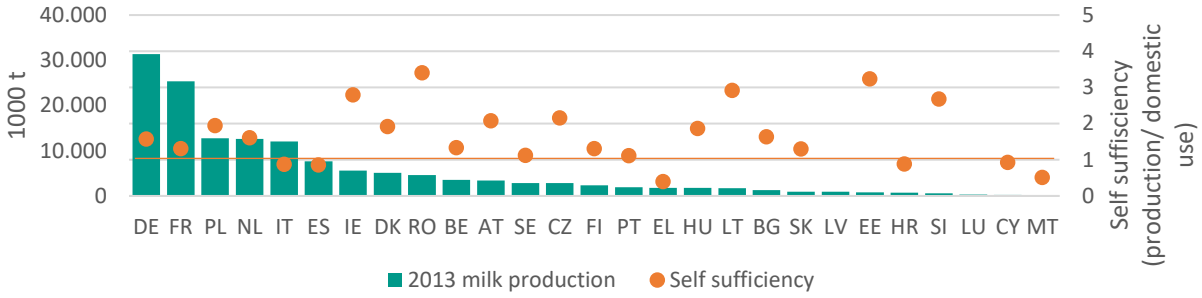
[2] OECD statistics: https://stats.oecd.org/?lang=fr.

[3] FAOSTAT 2013 - Export Quantity [5910] of Dairy products n.e.c. [22290].

2013 to 2020. The EU essentially produces cow milk (96% of EU milk production in 2020 and the remaining 4% left from ewes, goat and buffaloes)[4].

The dairy sector is the second biggest agricultural sector in the EU (European Parliamentary Research Service, 2018). Germany and France are by far the biggest milk producers in the EU, accounting respectively for 21.6% and 17.5% of total EU-27 milk production in 2013. That year, Germany, France, the Netherlands, Italy, Poland and Ireland[5] on their own represented more than 70% of the EU cow's milk production. As shown below, most EU Member States produce more milk than they consume, although among the main producer Italy and Spain were not self sufficient in 2013.

Figure 2: EU-27 milk production (total milk available on farm) and self-sufficiency by Member State in 2013

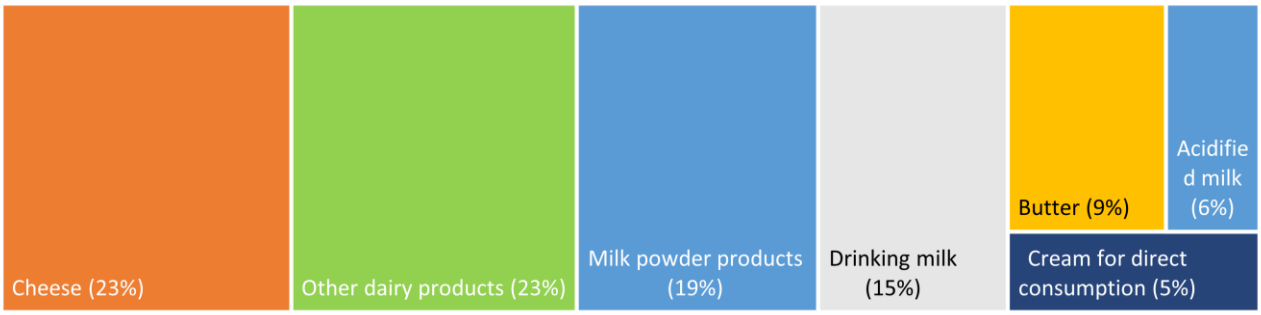


Source: Eurostat (APRO_MK_FARM__custom_3283404 – D1100A) for production and agridata portal for self sufficiency

2.1.2 Milk products

In the EU, milk is processed into cheese (23% of milk equivalents), butter (9%), cream (5%), drinking milk (15%), acidified milk (yoghurt and others) (6%) and powder products (19%)[6]. Cheese and some of the drinking milk or powders can be obtained using whole milk directly, but a processing step of skimming is necessary to separate the cream to make butter or cream, and the skimmed milk resulting from this process is used to make powder or recombined dairy products.

Figure 3: Dairy products obtained from raw milk of all Member States in 2013



Source: DG AGRI-JRC - Production, trade and apparent use (EU-27) in 2013

[4] Source: FAO stats.

[5] These Member States were selected for case studies, as shown in Section 3.2.

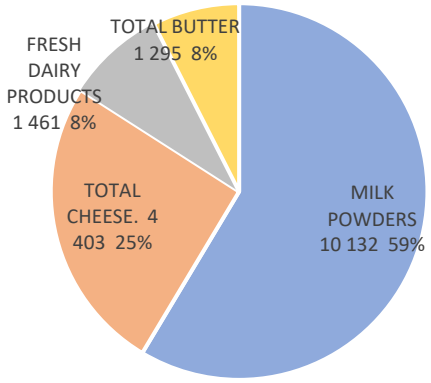
[6] DG AGRI-JRC - Production, trade and apparent use (EU-27) in 2013.

2.1.3 Exports and imports

The European Union has a milk self-sufficiency rate of 143%[7] (Self sufficiency = 100 × [domestic production/total consumption]), meaning that a significant share of the milk produced is exported to extra-EU countries or added to stocks. In terms of raw milk equivalent (i.e. volume of milk needed to produce one volume unit of the dairy products concerned, based on DG AGRI-JRC data), the main dairy products exported are milk powders (at more than one half), followed by cheese, butter and fresh dairy products.

Germany and France are the Member States that export the most dairy products in terms of value (EUR 8.47 billion and EUR 6.05 billion respectively in 2013) but Belgium and the Netherlands are also big dairy exporters relative to their production.

Figure 4: share of dairy products (in 1000 T milk equivalent) extra-EU exports in 2013



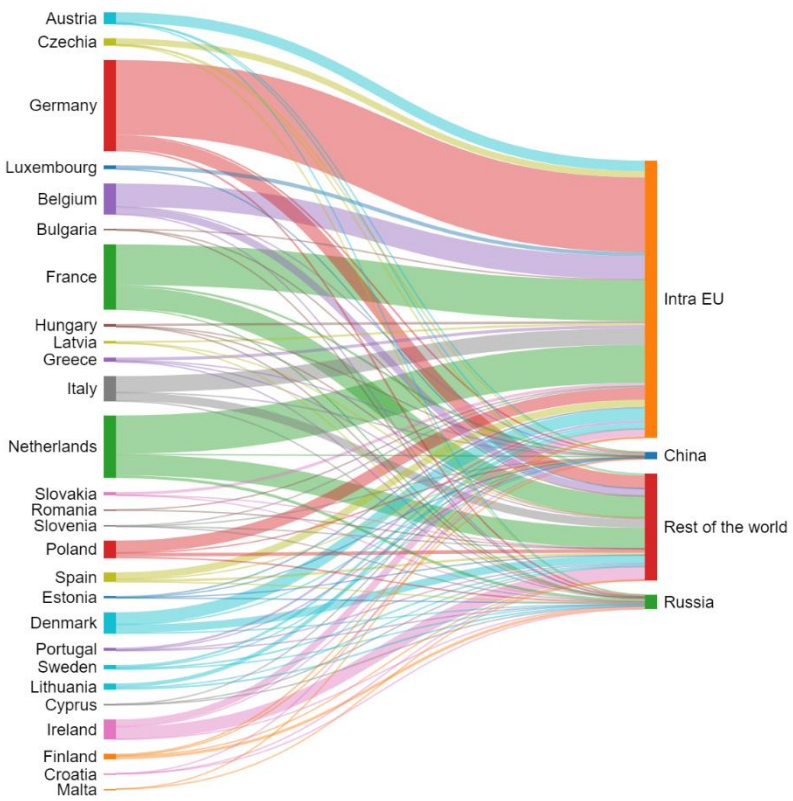
Source: DG AGRI-JRC - Production, trade and apparent use (EU-27)

As shown in Figure 5, more than half of the EU-27 Member States (14) relied on the EU market for more than 75% of their dairy exports in 2013. This trend was shared by Germany and Belgium, whereas France and the Netherlands significantly relied on the international market (as did Ireland, Denmark, and Sweden for example).

Except for Finland, Lithuania and Estonia, which relied on the Russian market for 49%, 27% and 25% of their dairy exports respectively, Member States exported less than 10% of their dairy products to Russia (which played a significant role in the dairy market disturbance as explained in the following sections), and most of them (19) relied on Russia for less than 1% of the value of their dairy products exports.

[7] DG AGRI-JRC - Production, trade and apparent use (EU-27).

Figure 5: Distribution of the value (EUR) of all MS dairy products* exports in 2013



Exports	Share Russia	Share EU
FI	49%	29%
LT	27%	61%
EE	25%	74%
LV	12%	81%
PL	9%	69%
NL	4%	61%
DK	4%	57%
IT	2%	65%
DE	2%	82%
FR	2%	62%
CZ	1%	85%
AT	1%	89%
BE	1%	74%
BG	1%	76%
PT	1%	69%
SE	1%	55%
SK	1%	91%
IE	0%	34%
HR	0%	21%
CY	0%	42%
ES	0%	75%
SI	0%	80%
EL	0%	71%
HU	0%	82%
LU	0%	99%
MT	0%	0%
RO	0%	86%

Legend: 0.00% – 100%

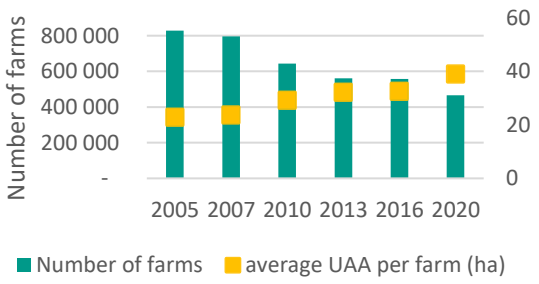
Source Eurostat - EU trade since 1988 by HS4. *product codes 0401; 0402; 0403; 0404; 0405; 0406

2.2 The dairy sector organisation

2.2.1 Dairy farm structure

From the beginning of the century, the number of dairy farms has decreased while their size has increased. Several factors contribute to this trend, including milk yield increases (reflecting technology improvements) (Zimmermann and Heckelei, 2012). Specialisation also plays an important role in milk yield increases, with 90% of the milk produced in Member States coming from specialised dairy farms (European Commission, 2018), half of which are large farms (total standard output > EUR 25 000) (European Parliamentary Research Service, 2018). The remaining 10% of milk comes from mixed crop and livestock farming systems. Specialisation enables better performance and effectiveness in milk production; however, it also increases risk, as most of the farm income depends on milk production and the corresponding market price.

Figure 6: Trends in numbers of dairy farms and average UAA (EU27)



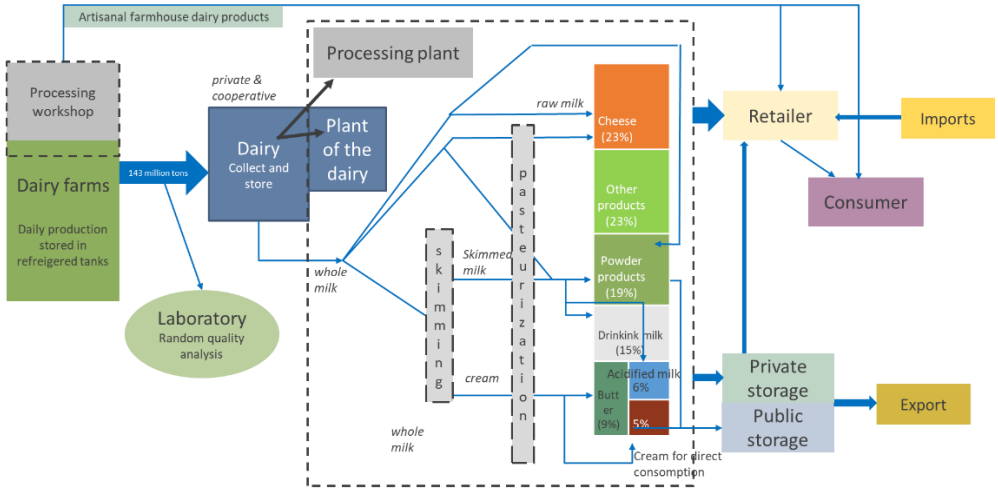
Source: Eurostat, type of farm, standard output (code EF_M_FARMLEG)

There is a significant disparity between the older EU countries and the most recent ones, in not only their share of specialised dairy farms but also their yields and herd size. For example, in most Member States, more than 80% of milk production comes from specialised milk farms, although in Romania this share only reaches 45% and in Czechia 50%. At EU level, the average number of dairy cows was 57 head per farm in 2013, with huge differences between countries. For instance, the average herd size at that time was 330 cows per farm in Denmark and 200 in Czechia, as compared to averages of 12 in Lithuania and only 4 in Romania[8]. In the Member States that joined the EU before 2004, the average herd size in 2013 was 55 head, and yields per dairy cow on specialised farms were 43% higher than in the countries joining in 2004 and later, where the average herd was 9 head (European Parliamentary Research Service, 2018). There is also a north/south divide, with higher production in northern Member States. European dairy farms have mostly dairy cattle but often also have suckler cows. Land use is mostly dedicated to produce forage to feed the cows, and the remaining part is dedicated to other crops like straw cereals. According to public FADN data, in 2013 EU dairy farms produced 28% of the feed for their grazing livestock (in terms of value). Although farms get most of their income from selling milk, they can also produce meat from calves, which are usually sent to other farms for calf fattening. Old cull cows go to slaughterhouses for herd renewal, after likewise being fattened.

2.2.2 Organisation of the supply chain

The supply chain plays a key role in the dairy sector, both for commercialising and enhancing the value of milk products. Milk is a raw product requiring proper storage under low temperatures to prevent the development of microorganisms. This storage starts on the dairy farms, where after the usual two milkings per day the milk is directly stored in refrigerated tanks. The milk is then generally delivered every other day to collection centres (cooperatives or private dairies) or directly to processing plants. Analyses are randomly performed to ensure it respects quality parameters before processing. Because raw milk is a perishable product, dairy farmers have very limited negotiation power in the short term if they disagree on pricing or the quality classification (European Parliament, 2017). Storing fresh products can be costly, and the stakeholders of the supply chain have to maintain stocks at the right level to be able to respond to consumer demand without having too many products to store.

Figure 7: Dairy sector organisation and main processing steps



Source: Agrosynergie based on DG AGRI-JRC - Production, trade and apparent use (EU-27) in 2013

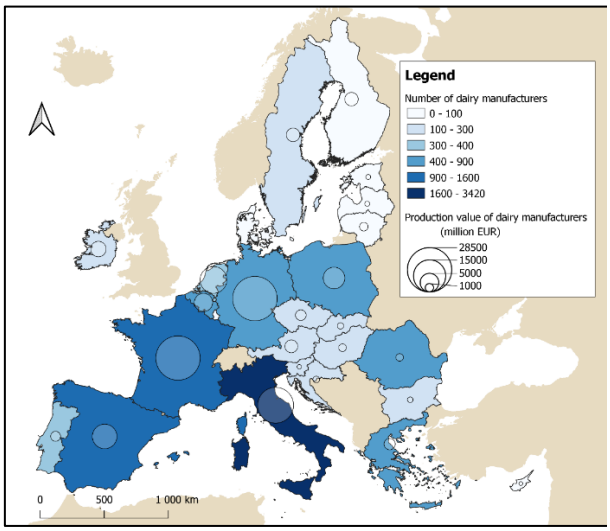
The end of milk quotas has been accompanied by EU legislation stipulating the introduction of written contracts specifying terms of sale, such as supply volume and payment methods. This model can create an imbalanced relationship between private dairies and milk producers, with total control by the milk

[8] Eurostat: Main livestock indicators by NUTS 2 regions [EF_LSK_MAIN], 2013.

collector of the volumes produced. Nevertheless, farmers can join a producer organisation to negotiate prices and to bundle their supply. This balances the negotiating power of producers, and both farmers and dairies can benefit from this relation (Lambaré, Dervillé and You, 2018). This model is unevenly spread through Member States, for instance, in 2015, 25% of the milk collected in France by private collectors came from producer organisations while the equivalent figure in Germany was 100% (You, 2015).

The number of milk-processing enterprises has been decreasing over the years, as large cooperatives and private dairy companies increase their market shares by purchasing declining smaller cooperative companies (Bórawski, Guth and Dunn, 2019). As a result, there is a process of concentrating capital in those large companies, thereby increasing their negotiating power. Nevertheless, large processing companies have helped many small farmers in countries where they faced difficulties staying competitive in the EU market, by providing them foreign investments and enabling them to enter modern marketing channels via direct collection on farm (Falkowski, Malak-Rawlikowska and Milkczarek-Andrzejewska, 2008). In 2013, the total number of dairy product manufacturers in the EU was around 11,700 with approximately one third of them in Italy alone and numerous others in France and Spain. Map 1 shows that the production value of these dairy manufacturers is not directly linked to their number, meaning that some Member States such as France and Italy include many small dairy manufacturers, and other Member States such as the Netherlands and Germany have mostly big ones.

Map 1: Number of dairy manufacturers and their production value per Member State



Source: Agrosynergie, based on Annual detailed enterprise statistics for industry (SBS_NA_IND_R2__custom_3503183 – V11110, V12120)

The biggest dairy cooperatives and private companies in the EU mainly originate from France (Lactalis, Danone, Sodiaal and Savencia), the Netherlands (FrieslandCampina), Denmark (Arla Foods), Germany (Müller, DMK) and Ireland (Tirlán). They play a big role in the milk export market, thanks to the high quantity of volumes they collect and their capacity to invest. Added value distribution along the supply chain varies between Member States. For example, in the organic milk market, farmers obtain a higher share of added value[9] in France and Germany, whereas processors obtain a smaller share compared to the other countries. However, in all cases, farmers in the EU obtain a smaller share of the gross added value of the final product than do the other operators (European Commission, 2016).

Organisations and institutions exist at different geographical levels to analyse, manage or support the dairy sector. In the European Union, the Milk Market Observatory provides market data and short-term analysis on prices, production and trade. There are also organisations such as the European Dairy Association (EDA), which focuses more on the dairy industry, and COPA-COGECA and the European Milk Board (EMB), which represent the interests of dairy producers. At Member State level, there are research institutions, unions and associations of producer organisations. During the last 10 years, producer organisations have grown in number, with their impact depending on the share of cooperatives (see box on next page) in the milk sector in each Member State.

[9] The term added value as used in this study (see reference at the end of the paragraph) is defined as product-related outputs valued at basic prices less product-related intermediate consumption valued at purchasers' prices.

Box 1: The role of cooperatives in the dairy sector

Dairy cooperatives are a specific form of producers' organisation which collect, store and sell milk, while often engaging in processing activities. They are very significant collectors in the supply chain, as they hold a 55% share of the EU dairy market. Cooperatives can be among the largest companies of the EU dairy sector, but there are also small micro-enterprises (European Parliamentary Research Service, 2018), and they are all obliged to buy all the milk delivered by their members. This type of organisation allows farmers to benefit from the profit made by the cooperative, which distributes it among its members, some of them being board members. It should nevertheless be noted that in large cooperatives, decisions made to the interest of the whole structure might not systematically benefit to each individual member (European Milk Board, 2012).

Source: Agrosynergie

2.3 Market disturbances in the dairy sector

Even if the EU dairy sector can be defined as a market, where demand and supply meet at a given price, some specific aspects must be noted (see table below).

Table 1: Characteristics of the dairy sector

Global dairy sector characteristics	Characteristics specific to the EU dairy sector
▪ The market price is very volatile and subject to seasonality, which is a major constraint for producers. ▪ Producers usually sell raw milk, so many other supply chain operators are included. In the specific case of the dairy sector, raw milk is mostly transformed into food products (Leeuwen **et al.**, 2009). ▪ Producers are very dependent on weather conditions for feed (mainly grass but also other crops for feed). ▪ Small dairy farms are very vulnerable to economic shocks, especially specialised farms, which rely entirely on milk production, and cannot diversify in the event of a price drop in the dairy market. (European Parliamentary Research Service, 2018)**.**	▪ Both intra and extra-EU exports represent a large portion of the demand, so that the dairy sector is highly dependent on international and European trade (Pouch and Trouvé, 2018). ▪ For over 30 years, the EU's dairy sector operated within the framework of milk quotas, which were introduced in 1984 to address problems of surplus production, but expired in April 2015[10]. ▪ Producers face strong requirements: they must meet high environmental and animal welfare objectives, while the price still remains the main decisive factor for dairy product demand.

Source: Agrosynergie

Over the 2014–2016 period, the dairy sector faced significant market disturbance due to a strong supply/demand imbalance. Whereas EU milk production had been increasing in 2014 due to good weather conditions and high milk prices over the previous years, global demand for milk products fell significantly. This led to a decline in raw milk price over this period, increasing the risk of cash-flow and treasury issues for farmers. This market disturbance was the result of the combination of several factors:

- **The Russian ban**. On 6 August 2014, Russian President Vladimir Putin signed a decree banning the import of a list of agricultural products from the United States, Canada, the European Union, Australia and Norway as a result of the implementation of economic sanctions against Russia due to events in the region. The ban included milk and dairy products (excluding lactose-free milk and lactose-free milk products) and other agricultural products (beef, pork, poultry, fruits, vegetables, fish, seafood and others). Originally valid for one year, the ban was renewed several times until 2020.
- **China imports**. China imports slowed down throughout 2014 and 2015, negatively impacting the global demand for milk and milk products.
- **Climatic conditions**. In 2014, livestock sectors were also impacted by unfavourable climatic conditions. High temperatures and drought affected yields of spring and summer crops in several Member States, increasing production costs for dairy farmers due to the scarcity of feed crops and pastures.

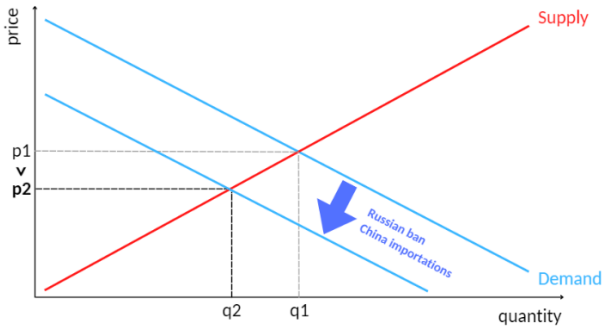
[10] Eurostat online publication: Milk and milk products - 30 years of quotas.

- During this period, the **abolition of milk quotas** also increased the risks for the EU dairy farms, as this instrument acted as a market regulation tool. The quota system limited the volume of milk produced, which limited the risk of oversupply and contributed to support market stability.

The increase in production observed toward the end of milk quotas, associated with the decrease in global demand for milk products, led to an excess milk supply on the European milk market, leading to a fall in prices. As we can see in Figure 11, the new equilibrium price (p2) is lower than the previous one (p1).

Figure 9 shows how the dairy crisis impacted milk prices over the 2014–2016 period. During this period, milk prices dropped by 21% on average at EU level, but this figure hides disparities (see the table below). Member States were impacted regardless of the volume of national production: Hungary, Czechia, Estonia and Slovenia were impacted severely (price drop of more than 26%), as were the Netherlands, Denmark and Germany, which are much bigger producers.

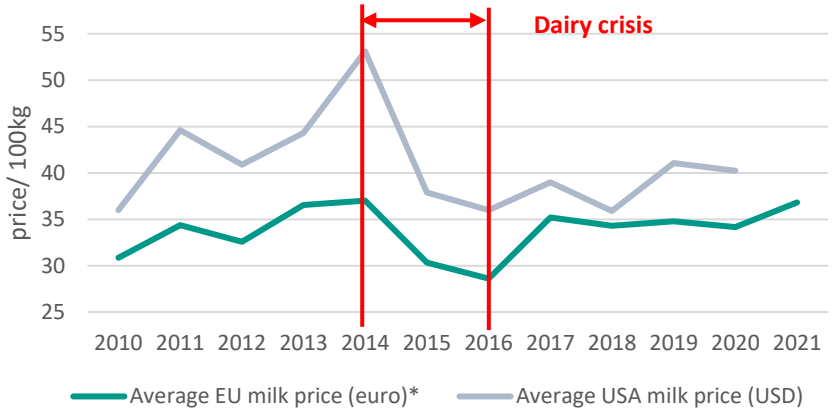
Figure 8: Representation of the demand decrease in the EU dairy market



Source: Agrosynergie

On the other hand, France, Spain, Croatia, Finland and Romania saw their milk prices drop by less than 18% and Greece, Malta and Cyprus by even less than 10%. Surprisingly, Finland did not suffer a significant price drop during this period, even though this was the Member State which relied the most on the Russian market in 2013.

Figure 9: Cow milk price change at EU level over 2010–2021 (graph) and at MS level between 2014 and 2016 (table)



Sources: Eurostat - farm gate price (TAG00070) – FAOSTAT; Agri-food Data Portal.

*Data not available for BG, CZ, CY and partially available for FI (not 2020), MT (2010-2015), FR (2012-2016), HR (2011-2021), RO (not 2021), HU (not 2021), IT (not 2021), LV (not 2021).

MS	Milk price change 2014-2016
HU	-29%
NL	-28%
CZ	-27%
EE	-27%
DK	-27%
DE	-27%
SI	-27%
BE	-26%
LV	-26%
LU	-25%
IE	-25%
SK	-25%
LT	-25%
BG	-21%
AT	-21%
SE	-21%
PT	-20%
PL	-19%
IT	-19%
FR	-17%
ES	-17%
HR	-17%
FI	-16%
RO	-16%
EL	-10%
MT	-3%
CY	-1%

2.4 EU regulation to address market crisis in the milk sector

The CAP framework

At EU level, the CAP provides different instruments to support farmers and protect them against market disturbance. They are presented in the figure below (Figure 10).

Figure 10: CAP instruments

Pillar 1 Reg (EU) 1307/2013	Direct Payments	Stabilise farm income and are not linked to production
	Voluntary coupled supports	Stabilise farm income and linked to the number of animals on farm
Pillar 2 Reg (EU) 1305/2013	Measures from rural development programmes: *Area with natural constraints* *Investment supports* *Other measures*	Voluntary measure that potentially offer significant protection against income variation depending the implementation of the RDP and farms characteristics (practices, location…)
CMO Reg (EU) 1308/2013	Safety net (part II, chapter 1) *Public intervention* *Involvement of producers organisations* *Private storage*	Additional tools to stabilise market through removing of surplus productions from the market, encouraging operators to store the production
	Exceptional measures (part V, chapter 1)	Measures that can be adopted by the EC through delegated acts to tackle market imbalance issues

Sources: Agrosynergie, based on European Court of Auditors, 2021; Regulation (EU) 1308.2013

Among these measures, CMO regulations are specifically designed to address market stabilisation issues. During the milk crisis, public intervention allowed dairy operators to sell their surplus production of butter and skimmed milk powder (SMP) to Member States, and the CMO also supported the private storage of butter, SMP and certain types of cheese. Quantities and prices concerned are set by the Council. Until 2013 this scheme was still put into place between March and September each year (period during which

prices dropped), but it was exceptionally extended to the whole year for the 2014–2016 period at the EU level combined with an increase in the ceiling of quantities purchase at fixed price. These instruments softened the deleterious effects of the fall in prices during the 2014 milk crisis. However, they did not stop the decrease in the prices of milk products and raw milk[11] and could not address the immediate need for liquidity in the livestock sectors, as they would have a medium-term impact at farm level. Therefore, this situation led to the implementation of exceptional measures, aiming at market stabilisation but most importantly supporting farmers with liquidity issues in the short term.

Exceptional market measures

Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets (CMO) in agricultural products, states in Article 219(1) that in the event of significant market disturbance, the Commission can adopt delegated acts to take exceptional measures necessary to address the market situation. On this basis, the European Commission adopted five exceptional measures over the 2014–2016 period to tackle the milk market disturbance (see Table 2). The two first of these measures (Regulation (EU) 1263/2014 and Regulation (EU) 1370/2014) were implemented in 2014 and targeted the Member States most dependent on Russian dairy imports after Russia introduced its ban on the import of milk products from the EU. In 2016, the European Commission also implemented Regulation (EU) 2016/1612 providing aid for the reduction of milk production. This aid targets farmers who agree to reduce their production over a three-month period, as compared to the same period during the previous year. The EU aid provided was EUR 14 for 100 kg of cow milk, capped at 50% of the total quantity of cow milk delivered to the first purchasers in the reference period, and at EUR 150,000,000 at EU level. This regulation did not leave room for manoeuvre for Member States to target specific sectors and to condition the attribution of the payment to specific criteria, unlike the regulations the present study focuses on: Regulations (EU) 2015/1853 and (EU) 2016/1613.

Table 2: Exceptional measures applicable to the milk sector during the 2014–2016 market disturbance

Commission Delegated Regulations	Scope	Freedom left to MS on implementation choices	Measure examined in this study
Reg. (EU)1263/2014: Temporary exceptional aid for milk producers in Estonia, Latvia and Lithuania	EE, LV and LT	Broad	No
Reg. (EU) 1370/2014: Temporary exceptional aid for milk producers in Finland	FI	Not concerned	No
Reg. (EU) 2015/1853: Temporary exceptional aid for farmers in the livestock sector	EU-wide	Broad	Yes
Reg. (EU) 2016/1612: Aid for reduced milk production	EU-wide	None	No
Reg. (EU) 2016/1613: Exceptional adjustment aid for milk producers and farmers in other livestock sectors	EU-wide	Broad	Yes

Source: (European Court of Auditors, 2021)

Commission Delegated Regulation (EU) 2015/1853 of 15 October 2015 provides for temporary exceptional aid to farmers in the livestock sectors. This regulation consists of granting aid to Member States in the form of a one-time financial grant with a view to supporting livestock farmers who are experiencing the deepest price fall, the direct consequences of the prolongation of the Russian import ban and the impact of the drought on feed crops. The financial grant provided to Member States was calculated on the basis of 2014/2015 national milk quotas and national pig populations (the pigmeat

[11] According to EU Reg 2015/1853.

market also faced significant disturbances, see ESQ9) and was proportionate to the observed farm gate milk and pig carcass price decreases, the degree of dependence on the Russian market and the impact of the drought on feed crop production and price.

This regulation made a total of EUR 420 million available to Member States to provide targeted support to livestock sectors (beef, veal, milk and milk products, pigmeat, sheepmeat and goatmeat sectors), in order to alleviate the economic consequences resulting from market disturbance, on the basis of objective and non-discriminatory criteria. The economic benefits of the payment had to be passed on to the farmers in full, even when they were not the direct beneficiaries. In addition, Member States could grant top-up support up to 100% of the aid.

Commission Delegated Regulation (EU) 2016/1613 of 8 September 2016 provides for exceptional adjustment aid to milk producers and farmers in other livestock sectors. Due to the prolongation of the Russian ban and the market imbalance, this regulation provides another one-time financial grant to support milk producers and/or farmers in other livestock sectors (beef and veal, pigmeat, sheepmeat and goatmeat).

It made EUR 350 million available to Member States to provide exceptional adjustment aid to milk producers and farmers in other livestock sectors. Only farmers who engage in one or more of the following activities (depending on Member States' implementation choices) can benefit from this support:

- production reduction beyond that covered by Commission Delegated Regulation (EU) 2016/1612 or not increasing production (Art 1.1(a)),
- small-scale farming (Art 1.1.(b)),
- application of extensive productions methods (Art 1.1.(c)),
- application of environmental and climate-friendly production methods (Art 1.1.(d)),
- implementation of cooperation projects (Art 1.1.(e)),
- implementation of quality schemes or projects aiming at promoting quality and added value (Art 1.1.(f)),
- training in financial instruments and risk management tools (Art 1.1.(g)).

These activities aimed at fostering economic sustainability and market stabilisation, and Member States had the freedom to choose among these different criteria for the selection of the beneficiaries. Moreover, the economic benefits of the payment had to be passed on to the farmers in full, even when they were not the direct beneficiaries.

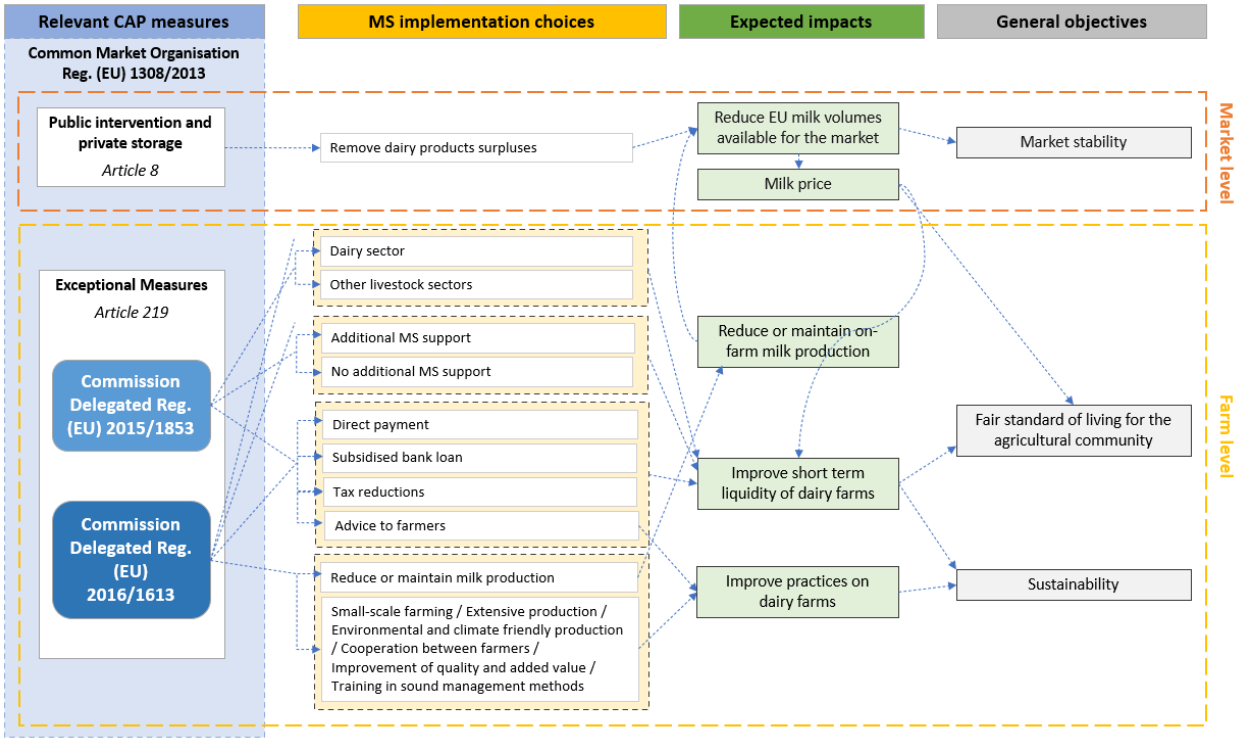
For both exceptional aids, Member States were allowed to grant top-up support up to 100% of the aid (under the same conditions as previously laid down) and had some freedom in the way they set the payment and condition its attribution to farmers (see Table 3). Therefore, Member States had to notify the European Commission of the measures taken; the criteria for their attribution; the intended impact of the measures; the measures taken to monitor the impact, to avoid distortion of competition; the level of additional support granted; and the total amount paid by measure.

Table 3: Legal instruments studied

	Reg (EU) 2015/1853	Reg (EU) 2016/1613
Purpose	Provide for temporary exceptional aid to farmers in the livestock sectors	Provide for exceptional adjustment aid to milk producers and farmers in other livestock sectors
Total amount	EUR 420 million	EUR 350 million
Amount to milk sector	EUR 308.3 million (73.4%)	EUR 281.1 million (80.3%)
Prerequisites	None except for livestock sectors concerned	Livestock sectors concerned + at least 1/7 activities targeted (fostering economic sustainability and contributing to market stabilisation)
Time frame	15/10/2015–30/06/2016	08/09/2016–30/09/2017
Implementation choices specific to Member States	Total freedom given in terms of: - distribution of the budget envelope between livestock sectors, - form of the support (for instance direct payment or other), - condition of attribution (for instance per farm, cow, or depending on certain practices such as milk production reduction).	Same freedom as in Regulation 2015/1853, but Member States had to design measures based on one or more of the following activities fostering economic sustainability and market stabilisation: *freezing or reducing production, small-scale farming, extensive production, environmental and climate-friendly production, cooperation between farmers, improvement of quality and added value, and training in sound management methods.*

The intervention logic of the EU regulations, focused on the two exceptional aids studied, is summarised in the following figure.

Figure 11: Intervention logic of exceptional market measures implemented in 2015 and 2016

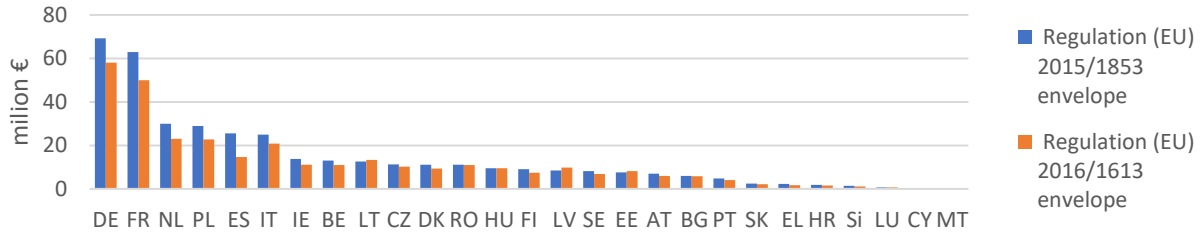


Source: Agrosynergie, based on EU regulations

2.5 Implementation of EU exceptional measures

The budget allocation between Member States for Regulation (EU) 2016/1613 considered criteria similar to those of Regulation (EU) 2015/1853 (see previous section) but also considered the weight of small farmers. This can explain why some Member States received a higher budget envelope in 2016 than in 2015 even if the budget of the aid was lower.

Figure 12: Distribution of the EU support between Member States for Regulations (EU) 2015/1583 and 2016/1613



Source: Member States notifications for Regulations (EU) 2015/1853 and 2016/1613

The budget allocation choice between the different livestock sectors was left to each Member States according to their own situation and difficulties. The pigmeat, sheepmeat, goatmeat and beef and veal

sectors were also in difficulty at the time of the implementation of the measures. African swine fever impacted some Member States, and the milk market disturbance also had a side effect on the beef and veal market. The question of budget distribution among the different livestock sectors is studied in detail in ESQ9.

National top-ups were mainly used for Regulation (EU) 2016/1613. Top-up budgets were used entirely when they were not necessary (this is the case for the Netherlands and France in 2016). Twelve Member States added a national top-up in 2015 for a total of92 million EUR, and 18 added a top-up in 2016, adding EUR 216 million to the initial budget.

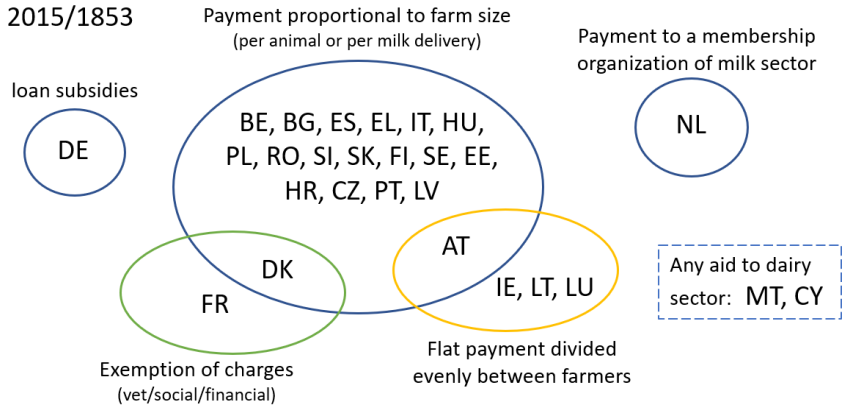
Figure 13: Additional support (top-up) granted by Member States in% of EU budget envelope

Source: Member States notifications for Regulations (EU) 2015/1853 and 2016/1613

2.5.1 Typology of various models implemented by Member States

The payment allocated to farmers depends on the choice made by the Member States to allocate the budget between sectors and the model implemented to distribute it to farmers. With Regulation (EU) 2015/1853, most Member States chose to set up direct payment to farmers either by allocating the aid to the number of cows (from EUR 15 per cow in SK to EUR 300 for some Spanish farmers) or to the quantity of milk delivery (from 0.2 c/kg in DK to 1.7 c/kg in LT) or with a flat payment divided evenly among farmers. Some Member States such as Austria had a mixed distribution: they allocated a base payment to all farmers in the selected livestock sectors and then added an aid per cow. Three Member States took different measures, such as France, which decided to exempt farmers from their social and financial charges for those in financial difficulties. Germany implemented a subsidised loan scheme so that only farmers who decide to take a loan can qualify for such aid.

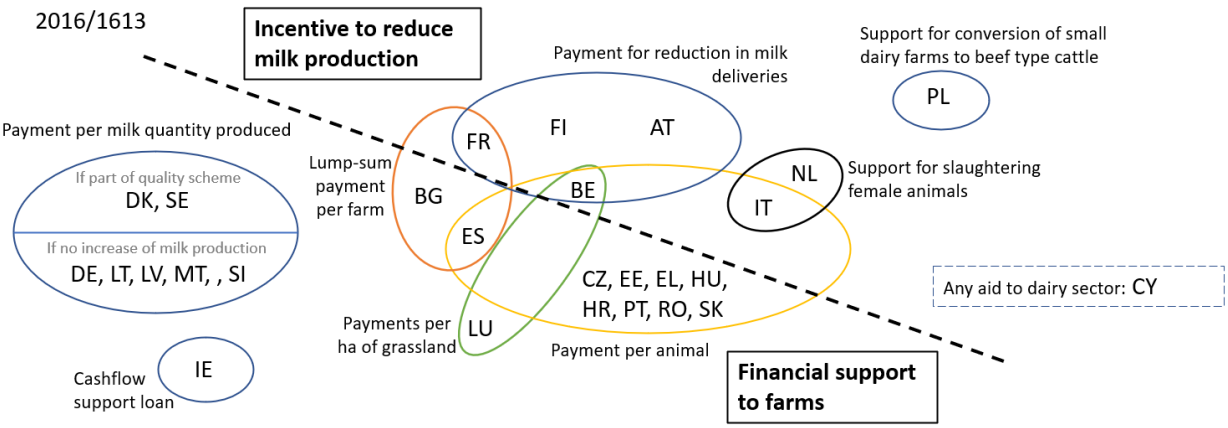
Figure 14: Typology of models implemented for Regulation (EU) 2015/1853



Source: Agrosynergie, based on notifications sent by Member States

For Regulation (EU) 2016/1613, more than half of Member States decided to allocate the aid depending on the number of cows or the quantity of milk delivery (with eligibility conditions). Poland supported small dairy farms to switch to beef production. On the other hand, Ireland included the budget of the regulation in a national cash-flow support loan scheme with a reduced interest rate.

Figure 15: Typology of models implemented for Regulation (EU) 2016/1613



Source: Agrosynergie based on notifications sent by Member States

For EU Regulation 2016/1613, a wider range of budget allocation models occurred through the introduction of eligibility requirements and the obligation for Member States to select at least one of them.

2.5.2 Simplified typology used for the study

The (above) analysis of the types of exceptional support granted under Regulation (EC) No 1853/2015 and 1613/2016 make it possible to distinguish two different types of support according to their approach.

1) Cash-flow support:

The payment is granted **to support short-term liquidity** and its amount can either be proportional to the size or production or be delivered as a lump sum. In this case, no change in production is required from the producers and it is considered that the payment will cover, partially or totally, the income loss induced by the drop in prices.

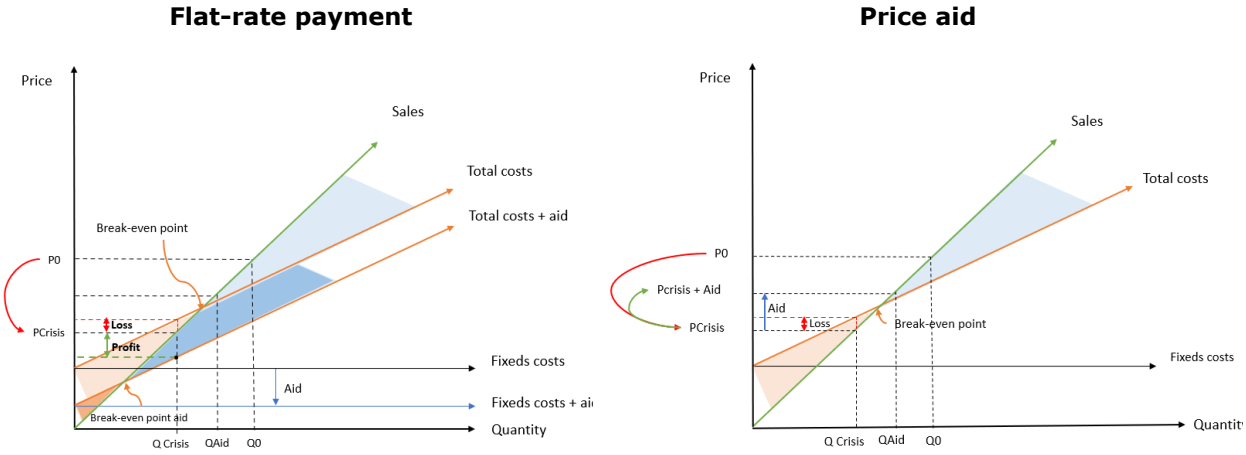
- If the gross margin of the farm is still positive despite the price decrease (price > costs of production), the farmer can decide to increase milk production in order to maximise its profit and compensate for the reduction of the added value gained on one litre of milk produced. In this case, **the payment of exceptional aid will improve farmers liquidity with very limited effects on production decision**.
- If the gross margin of the dairy farm has become negative because of the price decrease (price < costs of production), the farmer can decide to decrease or stop the production, as each litre of milk produced induced additional variable costs of production. Several strategies can be implemented by dairy farmers to reduce milk production, e.g. reduction of livestock units, change in feeding regime, longer period of lactation before cow's re-insemination. In this case, **the payment of exceptional aid will improve farmers' liquidity and can, to a certain extent, prevent or postpone the reduction of production that will have occurred otherwise**.

The graphics below shows the mechanisms induced by a drop in prices for a typical farm. The green sales curve represents the optimal quantity to produce for a given price (the higher the price, the more milk the producer is encouraged to produce). The total costs are based on the fixed costs and the variable costs, which depend on the quantity produced. Above the break-even point, the production sold is profitable, as the sales are above the total costs. Below this point, the costs are higher than the sales and the farmer does not cover their costs through the sales. This representation relies on different hypotheses, i.e. the farmer cannot change the sales function (e.g. modify its production capacities) or anticipate the changes in price and support.

In a crisis situation where the price drops, the farmer adapts their produced quantity to the change in price, to return to an optimal quantity. If the price falls under the break-even point, the production is not profitable anymore and the farmer may be forced to stop their production or continue to produce while running into debt (if they anticipate only a temporary drop in prices).

As demonstrated in section 2.5.1, the payment granted under exceptional measures to support short-term liquidity can be of different types, influencing farmers' behaviour. In the graph below, the aid granted per litre of milk produced is considered as an aid in milk price.

Figure 16: Aid in the form of a flat-rate payment and price aid



Source: Agrosynergie

When the Managing Authority decides to support the farmer through aid distributed as a flat-rate payment, a share of the fixed costs is covered, thereby reducing the total costs faced by farmers. If the aid amount is significant enough, it can allow the farmer to remain profitable despite the drop in prices. In this case, the producer can continue to produce. However, if the aid amount is not sufficient, the farmer remains under their break-even point and may either stop their production or continue to produce to cover part of the costs.

In the case of aid granted per litre of milk produced (price aid), the aid implemented by the Managing Authority is distributed as a payment proportional to the quantity produced. The aid allows a gain per quantity produced, which is higher than the crisis price. Depending on the amount of aid granted, it can allow the farmer to return over the break-even point and remain profitable. However, if the aid amount does not make it possible to cover the total costs, then the farmer stays under the break-even point and may cease their activity or continue to produce to cover part of their costs while not covering the totality of the latter.

These types of aid are not expected to change the production decision, but rather to impact the profitability of the holding. By supporting the farmer to cover a share of the loss induced by the drop in prices, the Managing Authority allows some the farmers suffering from the crisis to maintain their activity.

2) Complementary payment to EU milk production reduction scheme:

The payment is granted **to foster production reduction**, and its overall amount is calculated according to the quantity of milk not produced (or the number of cows removed from the herd). This mechanism was implemented under Regulation (EU) 2016/1612 and bolstered by Regulation (EU) 2016/1613 in some Member States (e.g. in the Netherlands). To understand the potential effect of this aid on production decisions, the unit amount of the aid must be compared to the unit margin on a litre of milk produced. Therefore, the effectiveness of the scheme is strongly linked to the unit amount provided, which explains the choice of Member States to complement the mechanism implemented under Regulation (EU) 2016/1612 with the EU funds available under Regulation (EU) 2016/1613.

- If the gross margin of the farm is still positive despite the price decrease (price > costs of production), the farmer will only decide to apply to the scheme if the unit amount is higher than the unit margin they gain on a litre of milk produced. In this case, **the payment of exceptional aid will help reduce milk production and improve farmers' liquidity**. Indeed, liquidity is improved not only by the payment, but also by the reduction of variable costs associated with the reduction of production.
- If the gross margin of the dairy farm has become negative because of the price decrease (price < costs of production), the farmer may have already decided to decrease production in order to reduce their production costs. In this case, **reduction in production does not result from the aid, but the farmer can benefit from the support and improve their liquidity**. In particular, by covering (even partially) the loss incurred, the aid can contribute to maintaining farmers who would have otherwise stopped dairy production.

3. GENERAL PRINCIPLES AND METHODS FOR THE EVALUATION

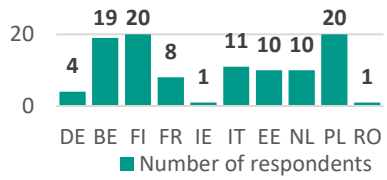
A consistent evaluation framework was established during the structuring phase to reply to the Evaluation Study Questions (ESQ). The method is summarised in an introductive section for each of the ESQ. The chosen methods are as rigorous, robust and transparent as possible. The framework builds on existing data sources, from EU and national databases as well as relevant literature, rounded out by primary data collected for the evaluation. Different analytical tools were also used to identify potential effects associated with the measures and to compare many information sources in order to obtain a comprehensive picture of the situation.

3.1 Data and tools used to answer the Evaluation Study Questions

For each ESQ, several data sources were used to provide relevant indicators in relation to the evaluation questions and judgement criteria. These sources provide either primary data gathered for the evaluation or secondary data from EU databases. They are described in the table below:

Table 4: Main data sources used for the study

Data source	Interest and use
Existing data	
Member State notifications	Member States had to notify the European Commission on the way Regulation (EU) 2015/1853 and Regulation (EU) 2016/1613 were implemented according to Articles 3(a) and 3(b) of both regulations. The detailed analysis of all these notifications constitutes the foundation of the work conducted, whether for the selection of case studies and their structure, or for the response to the different evaluation questions. The entire content of the notification files has been entered into a database enabling advanced analyses of the measures. The variables considered included the total amount of EU funds delivered to Member States, national top-ups, distribution of the support among livestock sectors, the form of the support, and eligibility conditions.
Eurostat	Data on the milk and dairy sector, in particular on the number of head (dairy cows), the farm milk production, milk deliveries and dairy product production. These data were used to set the context, select the case studies support and answer the evaluation questions needed. The Eurostat database also includes trade data that were also used to qualify each MS dairy market.
FAO stat	FAOstat is the Food and Agriculture Organisation database, which provides food and agriculture data for over 245 countries and territories. The advantage of FAOstat is that is provides quantitative data on milk production and the dairy market at the global level. It is therefore used to compare the market situation of EU Member States with the extra-EU situation.
Individual FADN data	The Farm Accountancy Data Network (FADN) provides accounting data at the farm level. It is an instrument for evaluating the income of agricultural holdings and the impacts of the Common Agricultural Policy. It provides data on the structure of holdings; their production; their level of subsidies; and their economic results for different farm types, Member States or Regions (each farmer is geo-references at NUTS 2 level). In the FADN database, each farm has a specific weight, calculated so that weighted averages properly represent EU agriculture. For this evaluation, variables available in the FADN allow for clear understanding of the situation and changes in a variety of economic indicators at the dairy farm level.
Other databases	Data of the EU Milk Market Observatory cover production, prices and margins, trade, and market interventions. Agendas and reports of Milk Market Observatory economic board meetings are also available from 2014. These outlooks are particularly interesting to better understand how the market situation was perceived year after year during the studied period and what were the key problems when the decisions were taken. Other databases (e.g. the Agri-food Data Portal, the estimated MS balance sheet prepared by DG AGRI and JRC, and the short-term and medium-term outlooks of EC market analysis) also provide a valuable source of information for quantitative analysis.
Literature review	Provides up-to-date knowledge on the dairy crises, its consequences at farmer level and the effects of regulations studied. Literature was notably used to assess risk management strategies, how they are linked to the economic viability of farms, as well as to better understand the dairy sector specificities of each Member State.
Data collected for the study	
Cases studies	In order to provide in-depth study of both regulations implemented by Member States, case studies were carried out in 10 selected Member States. Even though the scope of the evaluation is the EU-27, we did not carry out case studies in all of them. Therefore, the selection of case studies was very important for providing insight into the implementation and effect of the instruments (see Section 3.2). The cases studies involved interviews with

Data source	Interest and use
	stakeholders of the dairy sector, conducted in the case-study Member States, to gather in-depth qualitative information and the opinions of key stakeholders (e.g. Managing Authorities, farmers' representatives, dairies and researchers) on the context, the implementation choices of exceptional measures and their results. ➔ 91 interviews
Survey of farmers	To round out the results of the case studies and statistical analysis and to better understand how the support was used and perceived, the support beneficiaries were asked to fill out an online questionnaire. The diffusion of this online survey relied on the national experts in charge of the case studies, who usually solicited the help of local producers' organisations ➔ 104 answers. The answers are distributed amongst case study Member States as shown in the graph 

The table below describes the main analytical tools used for the study to process the available and collected data described in the above table.

Table 5: Analytical tools and ESQ concerned

Analytical tool	Description	ESQ concerned								
		ESQ1	ESQ2	ESQ3	ESQ4	ESQ5	ESQ6	ESQ7	ESQ8	ESQ9
Theoretical analysis	The expected effects were identified based on a theoretical microeconomic analysis and the intervention logic of the measures. The theoretical analysis helps establish the causal pathway between the measures implemented and their outcomes. It was especially used to identify farmers' behaviour in terms of production decisions in response to market situations or the logic of the exceptional aids provided. The theoretical analysis also contributed to assessment of the coherence of the exceptional measures' design with the CAP environmental and economic objectives.	x	x	x		x	x	x	x	
Descriptive or inferential statistics	Collection and interpretation of data in order to uncover patterns and trends. Descriptive statistics were used to describe different aspects of the statistical distribution of policy-relevant variables: frequencies and percentages, mean values, ratios, dispersion (e.g. standard deviation) and variability (e.g. coefficient of variation). Descriptive statistics are quite useful to describe or gauge problems, as they are easy to implement and effective for conveying basic information and making elementary comparisons. Such analyses were therefore performed on the relevant data extracted from the previously cited databases. On FADN specifically, statistics were key to assessing potential effects of the studied policies at farm level, notably through the assessment of average economic data linked to milk production.			x	x					x
Before/after comparison	Before/after comparison based on statistical analysis was particularly useful in this study, for assessing the potential effects of the regulation studied and the consequence of the crisis on dairy farmers' strategies.	x			x					
Modelling for microeconomic analysis	Part of the quantitative analysis performed relied on a basic microeconomic model representing the main economic variable linked to milk production at farm level (see below). This theoretical framework cannot represent the complex reality of all European dairy farmers, and it relies on the assumption that the market works according to pure and perfect competition. However, it helped in assessing the theoretical effects of the milk crisis and the support provided, from the farms' perspective.	x	x	x						
Scoring/synthesis matrices	Synthesis matrices have been used to gather all elements from the analyses and provide a comprehensive overview of the situation, helping to draw conclusions. Synthesis matrices were notably used to highlight potential correspondence between the strategic choices of Member States for the implementation of the exceptional support and the effects observed at Member State level, or to highlight coherence of the EU regulation framework and the various implementation models with environmental objectives of the CAP and the objective of long-term sustainability.					x	x	x	x	x

Modelling for microeconomic analysis: the profit function

The model relies on the assumptions that dairy farmers rationally seek to maximise their profits, which depend on quantity produced, market price and associated costs. This assumption leads to a definition

of an optimum quantity of produced milk to maximise their profit. The following equation represents the maximisation function of the farmer:

$$Max\ (\pi) = Max\ [(p_m y_m - c_{m,v} y_m) q_m - C_{m,f}]$$

Where:

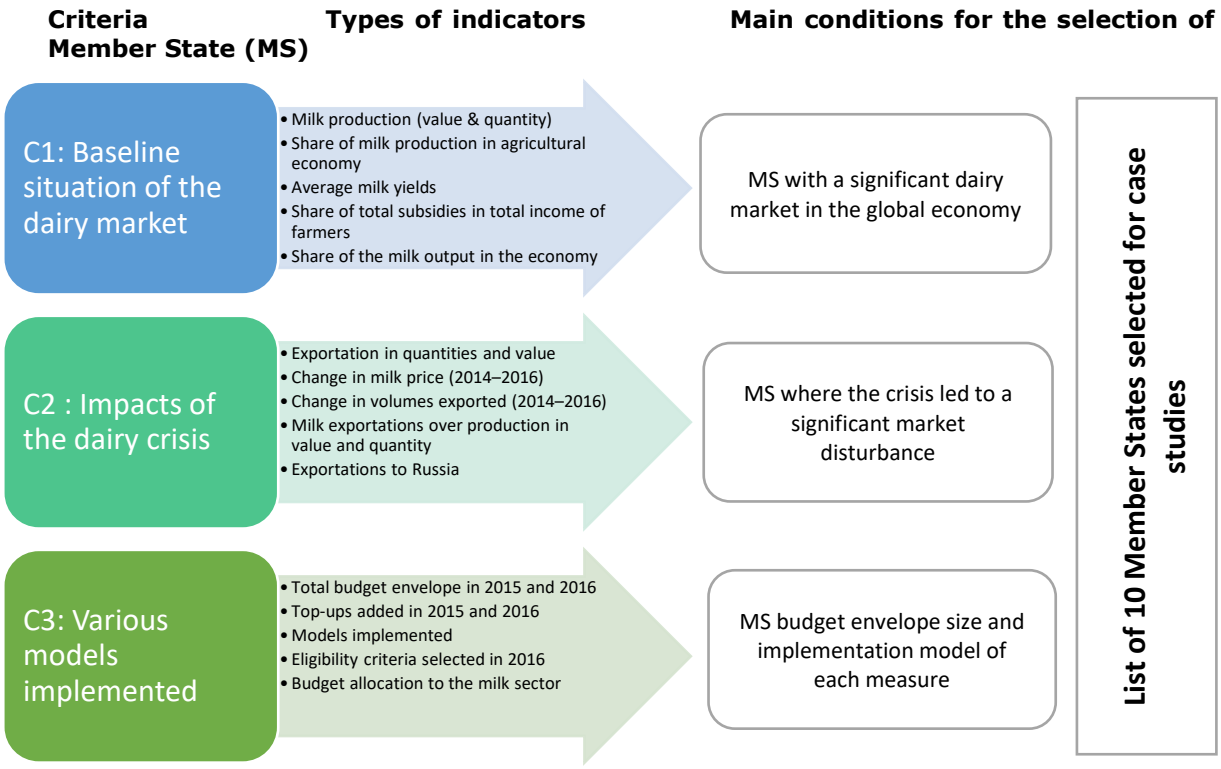
$\pi : farmer's\ profit$ *(euro)*
$p_m : price\ of\ one\ liter\ of\ milk\ (\frac{euro}{litre})$
$y_m : milk\ quantity\ per\ litre\ produced\ by\ one\ LU\ \left(\frac{litre}{cow}\right)$
$q_m : herd\ size\ (cows)$
$C_{m,f} : fixed\ costs\ of\ the\ farm\ (euro)$: independent of the volume of production. For instance, buildings, machines, or land lease are considered as fixed costs.
$c_{m,v} : variable\ cost\ per\ litre\ \left(\frac{euro}{litre}\right)$: depends on the amount of the production, in this study, they can be feed costs, labour or energy.

m refers to the milk activity

3.2 Methodology for the selection of case studies

The selection of the 10 case-study Member States was based on the three criteria shown in the following figure.

Figure 17: Proposed criteria and indicators for case-studies selection



Source: Agrosynergie

Criterion 1: Dairy market situation

This first criterion was used to select Member States based on the size and structure of their dairy sector. The indicators listed in the above figure were assessed and compared, and Member States where these indicators reached the highest value were given more importance – except for the milk yield and share of subsidies in total income criteria, for which more interest was given to the five highest and the five lowest values in order to capture the diversity of the dairy sectors' structure. Germany, France, the Netherlands and Poland were considered interesting because of the significant outputs of their dairy sectors, but Estonia was also considered interesting due to the relative importance of the dairy sector in its economic landscape. Voluntary coupled support, which was relatively significant in the output of Romanian dairy farms but absent in the dairy sector in Germany and the Netherlands, also contributed to the selection of case-study Member States.

Criterion 2: Impacts of the dairy crisis

The second criterion gave priority to Member States which were particularly dependent on Russian exports and on exports in general (ratio of the dairy export value over the total value of raw milk produced). Member States where domestic consumption was relatively significant compared to exports were also considered of interest. Priority was also given to the five Member States where milk prices decreased the most between 2014 and 2016, and to the five Member States where it decreased least. In this way, case study selection allowed for a rather representative overview of the different consequences of the crisis on the national dairy sector across the EU.

Criterion 3: Various models implemented

The third criterion aimed to provide a representative overview of the different models for both of the exceptional aids implemented across the EU. The most frequently used models were also considered with special interest. The different models are defined in Table 7.

The eligibility criteria used under Regulation (EU) 2016/1613 were also considered for the representativeness of the models selected. Lastly, the budget envelope of the aid and national top-ups also made it possible to give more importance to the biggest beneficiaries in case-study selection. The share of the budget allocated to the dairy sector was also considered.

Table 6: Different implementation models considered for case-study selection

Models
Payment per milk quantity produced with conditioning
Cash-flow support loan
Payment per animal
Aid per farm
Payment for reduction in milk deliveries
Support for conversion of small dairy farms to beef type cattle
Payments per ha of grassland
Support for slaughtering female animals
Payment transiting through a milk-sector organisation
Exemption of charges (veterinary, social, financial)
Loan subsidies

Source: Notifications sent by Member States

Final case studies selection

Based on these criteria, Member States were allocated scores, and the 10 Member States cumulating the highest overall scores were **Belgium (Wallonia)**, **Germany**, **Estonia**, **Ireland**, **France**, **Italy**, **the Netherlands**, **Poland**, **Romania**, and **Finland**. This selection allows for a representation of the multiple milk-market situations in the European Union during the Russian ban, as well as the various strategies associated with the implementation of the studied exceptional aids. This selection also provides representativeness on Member States location, size and entry period in the European Union. The following table summarises the reasons behind the choice of each case-study Member State according to the three main criteria considered.

Table 7: Interest of each Member State selected for case studies according to the criteria considered

Measures	Baseline situation	Crisis impacts	Implementation choices
Belgium (BE) – Wallonia	Significant milk production in quantity and value	Significant dairy exports in quantity and value, exports towards Russia, highest ratio of dairy export over raw milk in quantity and price. Prices very impacted during 2014–2016	Big budget envelope 2015 direct support to producer: per animal (other sectors) & aid on milk price per litre (milk sector), and in 2016 for the reduction of milk production
Germany (DE)	Biggest milk producer and significant share of milk in its agricultural output	Biggest dairy exporter in quantity and value, and significant price impact between 2014 and 2016	Big budget envelope 2015 subsidised loan and subsidies for milk prices in 2016 if production not increasing
Estonia (EE)	Smaller milk producer, but with a milk sector important in agricultural output and with significant average yield	Significant dairy exportation to Russia and significant decrease in the prices	Smaller budget envelope but big top-up 2015 and 2016 per animal
Ireland (IE)	Significant milk producer, significant share of milk sector in agricultural output, small average yield and small share of subsidies in the farmers income	Significant dairy exports in quantity and value, small change in quantity exported between 2013 and 2016	Significant budget envelope and top-up. 2015 flat payments to farmers and 2016 support loan scheme with reduced interest rate
France (FR)	2nd biggest milk producer in quantity and value, half of farmers' income made up of CAP subsidies	Significant dairy exports in quantity and value and to Russia	Significant budget envelope and top-up added. 2015 reduction of financial charges and aid in 2016 per reduction of milk delivered, per farm in need and per animal slaughtered
Italy (IT)	Significant milk producer with medium average yield and small share of total subsidies in farmer's income	Smaller dairy exports and small ratio of dairy export over raw milk in value and quantity	Significant budget envelope and top-up added. 2015 per milk delivery and 2016 per animal
Netherlands (NL)	Significant milk producer, dependent on the milk market, small share of subsidies in farmers' income	Significant dairy exports in quantity and value and towards Russia, significant exports in total raw milk production in price and quantity	Significant budget envelope and top-up added in 2016. 2015 through intermediate beneficiary and 2016 per animal slaughtered
Poland (PL)	Significant milk producer with medium average yield	Significant dairy exports in quantity and value and exports to Russia	Significant budget envelope and top-up added. 2015 per milk delivered and 2016 aid for conversion to beef production
Romania (RO)	Significant milk producer with a small average yield, small share of subsidies in farmers' income	Small dairy exports but increasing between 2013 and 2016, also small impact on price between 2014 and 2016	Significant budget envelope size. 2015 per milk delivered and 2016 per animal
Finland (FI)	Significant milk production value and share of milk in agricultural output very high, high average yield and farmers' income strongly dependent on subsidies	Significant dairy exports to Russia, no price change between 2014 and 2016 and exportation quantity increasing	2015 per milk delivered and 2016 according to milk production

Source: Agrosynergie

4. REPLIES TO THE EVALUATION STUDY QUESTIONS

4.1 ESQ1 - Causal analysis: To what extent did risk management strategies influence dairy farms' behaviour in terms of production decisions, and how did they contribute to the short-term liquidity of livestock farmers and market stabilisation?

4.1.1 Understanding and method

This evaluation question focuses on dairy farmers' behaviours and risk management strategies implemented before, during, and after the market disturbances, without considering the exceptional measures implemented by Member States at the same period. The aim is to understand whether risk management strategies implemented at farm level might have impacted the production decisions and contributed to guaranteeing minimum short-term liquidity throughout the crisis, with potential effects on market stabilisation. The analysis also considers how dairies' strategies have influenced farmers' behaviour and short-term liquidity, through potential changes in the overall volume of milk collected and price paid to farmers implemented during the dairy crisis.

The analysis distinguishes three periods: the first period (2012–2014) before the market disturbances; the second period (2014–2017) during market disturbances; and the period after the market disturbances (2017–2019).

The analysis determines whether:

- **In normal situations (i.e. before the market disturbances), risk management strategies implemented by dairy farmers influenced (or not) production decisions and contributed to the short-term liquidity of milk producers**. It builds on a literature review to establish a typology of the main risk management strategies and their corresponding influence on the production decisions and short-term liquidity of dairy farmers. Observations from case-study Member States (collected through interviews and the farmers' survey) complement the analysis and describe the risk management strategies implemented by dairy farmers in the EU before the milk crisis. A FADN analysis also helps determine the major trends in costs management and diversification.
- **During the market disturbance, risk management strategies carried out by producers and dairies changed (or not) to address the price drop, with subsequent effects on production decisions and short-term liquidity of milk producers.** As with the first analysis, the typology and observations from case-study Member States are used to describe the type of strategies implemented by dairies and dairy farms. Observations from the case studies investigate whether these strategies had an impact on market stabilisation.
- **After the dairy crisis, dairies and dairy farmers have (or not) learnt from the situation and adapted their risk management strategies**. It investigates whether risk management strategies implemented by EU dairies and dairy farmers changed after the crisis, based on information from the literature review, case studies and the farmers' survey. The gain in performance arising from farmers' decisions are also illustrated by an analysis of FADN data over the period.

4.1.2 Risk management strategies in the dairy sector

4.1.2.1 Presentation of risk management strategies available to dairy farmers

Farmers face different types of risks (Harwood et al., 1999a). Here, the analysis considers the price or market risks, which are generated by output and input price variability that farmers did not anticipate at the time of production decisions. The risk management strategies can be defined as **a set of tools and decisions implemented by farmers to address market price volatility and guarantee minimum income from the agricultural activities**. Risk management instruments can take place at farm level (on-farm strategies implemented by farmers) or at market level (market instruments, public

policies and support) (Bardají et al., 2016). Market risks are mostly managed at the farm level through a wide range of strategies (OECD, 2011; Duong et al., 2019).

At farm level, these risks are addressed by different strategies, e.g. relying on farm management or marketing decisions, varying according to the type of dairy farm and the risk management instruments available, which can be different among Member States. **The adoption of a risk management strategy depends on two principal factors: the cost of adopting the strategy and the associated benefits from reducing the risk** (Van Asseldonk et al., 2016). Hence, by adopting risk management strategies, dairy farmers and dairies try to reduce profit variability and increase profit certainty (Lelyon, Chatellier and Daniel, 2011). Therefore, risk management strategies used by farmers in a normal situation can change during market disturbance.

Examples of risk management strategies and tools implemented by farmers to face market and price risks are as follows:

Diversification: Diversification is a key risk management strategy in agriculture. It involves producing a range of products, using a variety of practices, selling at different times and through different channels, investing in a range of assets and economic activities, as well as working off-farm (OECD, 2009; Meuwissen, Huirne and Hardaker, 1999). The success of managing price risk through production diversification can be limited by high correlation between prices of the different outputs produced. Depending on the farm's situation, the costs of diversifying may also outweigh the benefits, and specialising may be the preferred strategy (Harwood et al., 1999a). Thorsøe et al. (2020) demonstrated that some dairy farming systems have limited opportunities to use risk management strategies based on diversification to cope with price volatility, because they cannot easily convert to other commodities like commercial crops. Milk is also perishable and requires continuous processing, and it is not easily stored, thereby limiting the spreading of sales over time.

Maintaining financial reserves and loans: Opportunities to smooth income from one year to the next via the tax system or through financial reserves, as well as borrowing and saving money in response to the financial results of the farm, are the on-farm strategies for price risk management (OECD, 2009; Chartier et al., 2018). Saving accounts are one form of risk management tool that can be supported by public support, where farmers can make deposits on a special account which will provide interest. The deposits can be withdrawn in case of need. Loans can enable the farmer to finance their operational costs when faced with liquidity issues. However, a high degree of indebtedness increases the likelihood of failure to meeting financial obligations in a year of low farm returns and exposes the farmer to a risk of bankruptcy. Thus, in general, highly leveraged producers operate in an environment of greater financial risk than do producers who choose a less highly leveraged farm structure (Harwood et al., 1999a).

Cooperatives: Farmers can join together to form a cooperative organisation, which is a specific institutional form of marketing contract. Cooperatives apply strategies to reduce member's risks, such as pooling of prices across time and markets. Cooperatives develop pay-out regimes to smooth fluctuations of member returns, contributing to the continuity of the level of income for members (OECD, 2011).

Forward contracting and marketing contracts: Forward contracting and marketing contracts are agreements between a buyer and a producer that set a price and an outlet for a commodity before harvest or before the commodity is ready to be marketed (OECD, 2009; Harwood et al., 1999a). Forward contracts ensure that production is planned and adjusted to demand, thus optimising production costs and stabilising producer prices. They also contribute to the concentration of supply and the marketing of products by farmers (Bardají et al., 2016).

Producer organisations: Producer organisations support the collective organisation of dairy farmers, thus boosting the position of producers in the dairy supply chain and improving market transparency (Bardají et al., 2016).

Mutual funds: Mutual funds are based on the establishment of financial reserves through participants' contributions, which can be distributed to members in the event of severe losses. The risk management principle is the spreading of risks within a pool of members with limited risk transfer (Bardají et al., 2016; Chartier et al., 2018). The scope of such a fund is limited to non-systemic risks because risks cannot be pooled with other types of producers (Parliament, 2011). One fundamental difference between mutual funds and insurance is that, while mutual funds group farmers according to their production and

region, revenue and income insurance are managed by governments or insurers and target all kinds of farmers (Bardají et al., 2016).

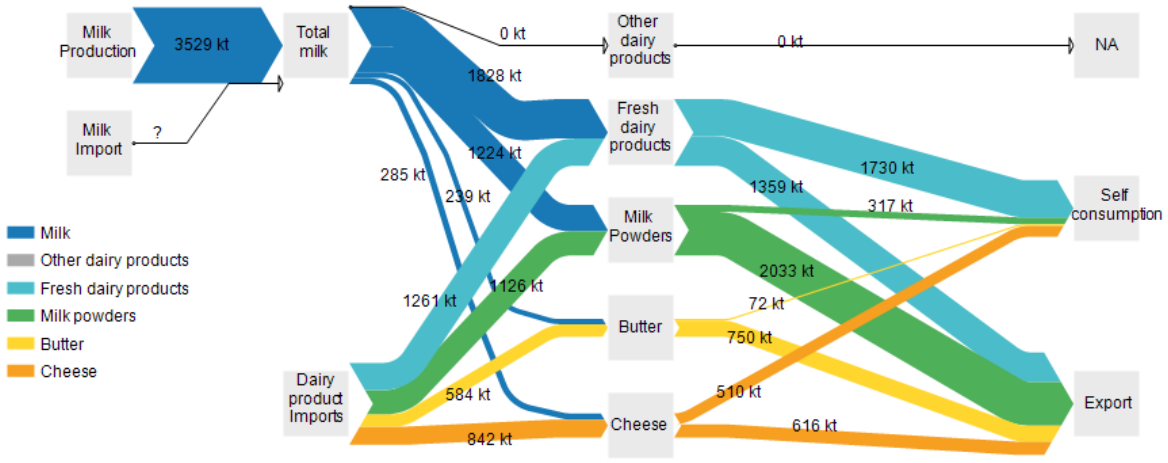
Private insurance: An insurance policy is based on a contract in which an insurer pays a premium and receives compensation from an insurance company for losses caused by specific risks. Farmers facing increased milk price volatility can seek to pay a specific amount of money to eliminate exposure to this risk. Insurance is part of risk-pooling techniques that consist of bringing together the risky returns of several farmers (OECD, 2009; Schulte, Musshoff and Meuwissen, 2018). In order to make premiums affordable, the insurance company has to be able to compensate risk by pooling farmers with different risk profiles. The most extended type of insurance is the single-peril crop insurance that covers specific risk, mainly hail or frost. Income and revenue insurances are less developed, except in the US and Canada (Bardají et al., 2016)

In this study, based on the interviews with stakeholders, strategies to improve the economic performance of dairy farms through the reduction of production costs were considered as reducing risks for farmers by increasing their ability to deal with a drop in prices.

4.1.2.2 Influence of the national dairy production system on risk management strategies

The structure of the milk sector varies among Member States with regard to the type and volume of dairy products produced and consumed on the national market, as well as the type and volume of dairy products imported and exported. **Internal-market oriented Member States are less exposed to price volatility**, as they target a large share of the milk produced to (more stable) national demand via products with more value added (e.g. fresh dairy products, cheese). Of course, these high value-added products are also often exported, as shown in the figure below (Figure 18) using the example of Belgium. Other Member States are more oriented towards the international market, producing mostly a high volume of dairy products with lower value added (e.g. milk powder), which will be subject to higher price volatility.

Figure 18: Production and distribution of milk products – example of Belgium



Source: Agrosynergie, based on JRC data from 2013[12]

The potential outlets for dairy products thus influence the production decisions taken by farmers in each Member State. The opportunity of increasing dairy product exports at the end of the quota encouraged dairy farmers to invest, with the aim of increasing their production capacities to deliver more milk to processors that wanted to gain market share on the international milk market. The case studies highlighted that, in Member States exporting a large share of their production to the international market as milk powder, dairy farmers had increased their production after the removal of quotas (see

[12] DG AGRI-JRC "4B – DAIRY - DETAILED TABLE"

§4.1.3.3) to fully use their production potential (e.g. Ireland). On the other hand, some Member States had the opportunity to develop high value-added dairy products, based on increasing national demand (e.g. development of organic milk in France).

As a result, **risk management strategies will vary depending on the potential volatility associated with markets where the production is sold**.

4.1.3 Risk management strategies existing before the dairy crisis

In many case-study Member States (BE, DE, EE, PL, RO, FI), the stakeholders interviewed generally highlighted that farmers did not implement risk management strategies before the 2014 crisis. At that time, the EU policy contributed to providing stability to dairy farmers, in terms of milk volume produced and income. As the former quota system set the milk production quantities, farmers tended to apply the conditions agreed with their collector. This situation did not leave much freedom for farmers to take decisions based on the market and adopt specific strategies on the volume or the types of dairy products produced. More often, the risk management strategies were left to the dairies and cooperatives, which deal with the market and its fluctuating demand. Moreover, the CAP payments granted to dairy farmers (direct payments), which represent a significant share of their income, brought additional stability to milk producers.

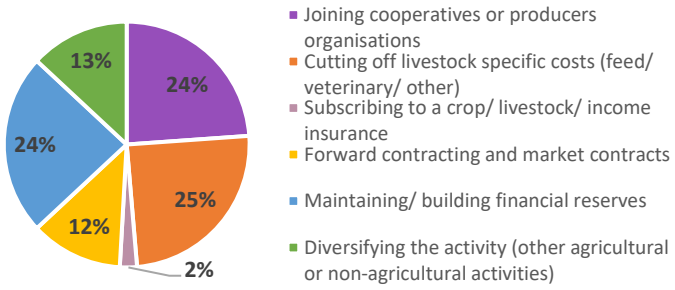
Therefore, before 2014, **main strategies implemented by milk producers were intended to promote their margin by reducing costs, get higher prices by joining cooperatives or producers' organisation and build financial reserves**. To some extent, farmers also diversified their sources of income to improve security and stability of the farm household.

4.1.3.1 Farmers' preference for cost management, financial reserves and cooperation

The period before the market disturbances (2012–2014) was mainly characterised by the approach of the end of the quota. The case studies revealed that very few risk management strategies were implemented at that time by dairy farmers, who were mostly seeking to reduce their costs and/or increase their production capacities.

The survey distributed among case-study Member States to 105 dairy farmers (Figure 19) clearly shows that **the most widespread strategy consisted in cutting off livestock-specific costs** (25% of the respondents). **Building financial reserves and joining cooperatives or producers' organisations were also very popular** (24% of respondents). On the other hand, forward contracts and diversification were less used (by around 13% of respondents), and subscription to an insurance (crop, livestock, income) was marginally used (around 2%).

Figure 19: Risk management strategies used before the market disturbances according to respondents of the survey (total = 105 respondents)

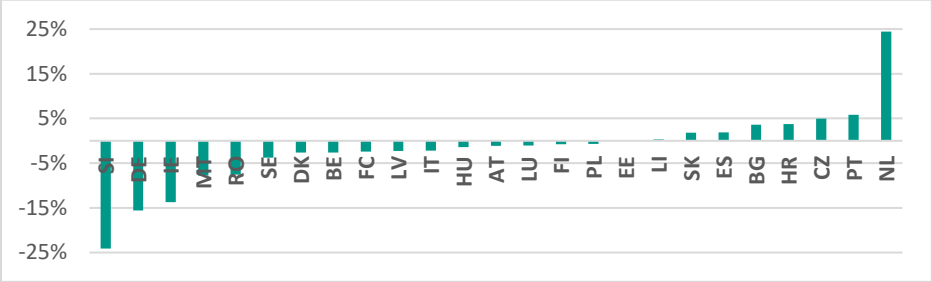


Source: Agrosynergie, based on the survey

Cutting off livestock-specific costs was also mentioned by the stakeholders interviewed in case-study Member States (e.g. BE, DE, NL, PL, FI). The analysis of the livestock costs in 2013 and 2014 based on FADN data confirms that in most Member States (15 out of 24), farmers saw their livestock specific costs reduced over this period. Among those, Slovenia stands out, with average livestock costs reduced by

almost 25%, followed by Germany and Ireland, with costs reduced by around 15%. On the other hand, nine Member States saw a rise in livestock costs borne by dairy farmers (see ESQ4), with a significant increase in the Netherlands, where the costs rose by almost 25%.

Figure 20: Variation of the livestock specific costs over the 2013-2014[13] period



Source: Agrosynergie, based on the FADN data

However, it is not sure how the cutting off of livestock-specific costs was achieved at farm level. Case studies suggest that dairy farmers invested to increase their production capacities and perform economies of scale, thus improving their general performance. Investments in specific equipment might also have improved the competitiveness of dairy farms (e.g. investments in milking parlours). The cutting off of livestock specific costs contributed to improving the capacity of dairy farms to face market volatility and a potential drop in prices.

Building financial reserves was mentioned as the second most used strategy by the farmers' surveyed but was less often mentioned by the stakeholders interviewed in the case-study Member States. Financial reserves increase the capacity of farmers to cope with a sudden drop in prices, as they provide short-term liquidities over a crisis period. In the literature, self-financing also appears as a significant financial strategy of farms: for example, possessing financial reserves makes it possible to avoid a loan (Van Asseldonk et al., 2016).

Joining cooperatives or producers' organisations was also among the risk management strategies that were mostly implemented before the market disturbances, as mentioned by stakeholders from case-study Member States (e.g. in DE, IE, IT and FI) and by almost a quarter of the survey respondents (notably in Estonia, where more than the half of the Estonian farmers who replied to the survey are members of cooperative or producers' organisations). However, dairy cooperatives are not widespread in all Member States. Private industries remain significant in some Member States (see §2.2.2), whereas cooperatives play a big role in the dairy sector in Germany, Finland and Ireland.

As explained in § 4.1.2.1, cooperatives apply strategies to reduce members' risks, such as the pooling of prices across time and markets. Cooperatives develop pay-out regimes to smooth fluctuations of member returns, thereby contributing to the continuity of the level of income for members.

In most of the case studies, the cooperatives must collect all the milk produced by their members at a given price. In FR and IE, it was instead **contracts between farmers and collectors** which set the volume of milk collected at a given price. These contracts enable farmers to secure a profitable price. The cooperative may also have an impact on the production decisions of the farmers, as they are a relatively secure way to sell their milk.

The cases studies also mentioned **producers' organisations** (POs) as a strategy to reduce market risks. In Italy, in addition to influencing the quantity of milk produced, POs gathered quality cheese producers and contribute to improving the quality of dairy products certified as Protected Designation of Origin and Protected Geographical Indication (PDO/PGI). In France, being part of a PDO is also considered as a risk management strategy, with a guarantee of higher return as most PDO products are sold with higher value added. Aside from establishing a common strategy to improve the quality of products with high value added, increased cooperation between farmers enable them to enhance their

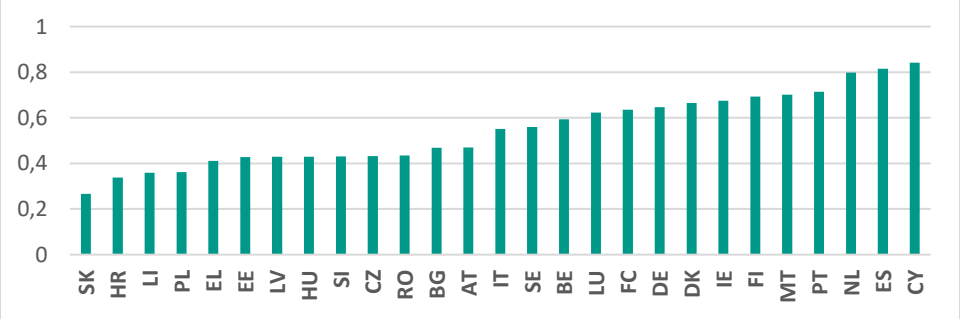
[13] Data used are costs faced by the Farm Type 45: specialist milk.

bargaining position in the food supply, thus improving their economic performance (Michalek, Ciaian and Pokrivcak, 2018). The effect on short-term liquidity is demonstrated by the literature and mentioned in case studies (IT, FI). Being part of POs makes it possible to pool the risks among farmers, by gathering individual farmers' capital into a common fund, or by spreading information on additional sources of financing. POs are also a way to obtain economies of scale in service provision.

Another quite common strategy observed before the crisis was the **diversification of activities and sources of revenues**, which ensures a minimum level of income if one activity has low returns, as the other activity can compensate through higher returns (Harwood et al., 1999). Diversification can be based on agricultural activities, but also on production related to agricultural activities. For instance, in Estonia, diversification to crop production enabled the farmers to switch to another activity (milk/crops) in case of price drops in a sector. Similarly, in France farmers could diversify their sources of revenue through biogas production from manure or by investing in real estate, and in Finland the stakeholders interviewed underlined that farmers rely on wood production. The farmers' survey shows that diversification is the fourth most quoted strategy, accounting for 13% of the respondents. It was mentioned in all the Member States, but not distributed equally (at least five respondents mentioned it in Belgium, Finland, Italy and Poland, whereas fewer than three respondents mentioned it in Germany, Estonia, France and Netherlands).

The analysis of the share of milk output in the EU farms' total output can reflect the level of diversification of dairy farm activities. The average share of the milk output in the total output of farms producing milk in 2013 and 2014 shows uneven situations in EU Member States, as it is higher in the Member States where farms are most specialised in milk. In the case-study Member States identified as significant milk producers and exporters (ie. DE, FR, IE, NL, FI), the average share of milk output in total output is higher than 60%. It must be noted here that the changes in the milk output are closely linked to the changes in the agricultural prices.

Figure 21: Average share of the milk output (value) in the total output – 2013/2014[14]



Source: Agrosynergie, based on the FADN data

4.1.3.2 Other risk management tools (insurance, forward contracts, etc.)

Other risk management tools, i.e. forward contracts and insurances, were not so widespread in 2012/2014. In Germany, the case study reveals that forward contracts were available at that time but that they were not really used by farmers. In Ireland, some cooperatives also provided 'fixed milk price contracts' from 2011 to some milk suppliers for a specific amount of milk during a set period, allowing those farmers to control their margin over a share of their production.

Insurance was not mentioned as a risk management tool used by dairy farmers in case studies. In the survey, only 2% of the respondents stated that they had contracted insurance. These five farmers (in FI, PL, DE, NL, IT) had relatively big farms (from 38 to 1200 LU). Of these five farms, three are specialised farms. The positive relationship between purchasing insurance and farm size can be seen in literature. Producers who contract insurance are better able to adopt riskier strategies; they can more

[14] Data used are milk output for all Farm Types producing milk.

easily engage in diversification for instance. However, the rate of contracting insurance is uneven among Member States, as it also depends on the availability of public aid (Van Asseldonk et al., 2016).

In addition, stakeholders interviewed in Poland mentioned mutual funds as a risk management tool they had implemented. This initiative makes it possible to share the risk among producers. The fund was made available by cooperative collectors, for farmers to allocate a small share of payment made to them by kilogram of milk collected. The money was to be used for partial compensation of lower prices in times of crisis (i.e. periods with lower prices).

4.1.3.3 Increase in production capacities

As highlighted by the stakeholders interviewed in case-study Member States, the removal of the milk quota planned for 2015 influenced the strategies of dairies and dairy farmers, who saw it as an opportunity to expand their production to reach their full potential. This was particularly mentioned in case studies from Belgium, Ireland and Finland. In these Member States, many farmers invested at that time to increase their production capacities. Examples reported in case studies depict farmers investing to increase their herd or acquire new machinery. This increase in production, more or less marked according to Member State, led to higher volumes of milk produced by farms (see ESQ4), enabling them to improve their performance via economies of scale.

Box 2: The end of the milk quotas

The end of the quota system in the EU was seen as an opportunity by milk producers in Member States selling their milk products on the international dairy market. As mentioned in the descriptive part, EU milk exporters felt constrained by the EU quota, which limited their capacity to expand. As shown with the example of Belgium (see Figure 18), milk exports were generally composed of milk powder, butter and cheese.

Hence, the end of the milk quota in the EU, after having been postponed several times since 2003, had a huge influence on dairy farmers' behaviours and strategies. Many of them made investments to increase their production capacity. When the Russian ban occurred in 2015, followed by a decrease in global demand, these farmers kept producing – though at lower prices – to cover their previous investments. As long as milk sales made it possible to generate a (small) profit, these producers would increase production to maximise their output and reimburse the loans they had contracted for their investments.

Sources: Case studies

Performing economies of scale is a common strategy in other farm sectors (and among entrepreneurs in general), which consists in increasing production to make it more efficient, as costs can be spread over a larger number of products. This strategy requires investments (machines, equipment, etc.) to increase production intensity. It was implemented in the above-mentioned Member States whose farmers waited for the quota system to end. In Poland, stakeholders explained that farmers took the risk to produce over the quota before its abolition, hoping that the revenues would cover the penalties for exceeding the quota. In Belgium, farms tended to expand through the acquisition of other farms. This was also the case in Germany, where the larger farms became more dependent on credit. Consequently, this decision put dairy farmers in a vulnerable position just before the beginning of the crisis, as **they needed to ensure sufficient liquidity to pay for their credit liabilities, by increasing their milk production, despite the drop in prices.**

4.1.4 Changes observed in risk management strategies during the dairy crisis

For many case studies, **this period revealed the need for the dairy farmers to adopt specific risk management strategies.**

4.1.4.1 Farmers' strategies affecting the volume of milk produced

Dairy farmers needed to compensate for the price drop by adapting their production to maintain their income: they kept on producing for as long as their profit margin by litre of milk produced remained positive. The farmers who did not make a profit anymore reduced their production level and/or diversified their sources of revenue (see § 4.1.3.1).

Many case studies mentioned the strategy of saving costs by reducing activity or production intensity. This strategy implies reduction of variable costs, using different levers:

- reduction in the number of cows (e.g. as mentioned by stakeholders in BE, EE, PL);
- production of animal feed on-farm (e.g. as mentioned by stakeholders in FR, EE or FI);
- reduction in feed concentrates (e.g. in FR, BE);
- reduction of labour costs, by hiring fewer people to work in dairy activity (e.g. in FI).

In the survey, cutting off livestock-specific costs was the most popular risk management strategy adopted by dairy farmers to deal with the dairy crisis. In Poland, 92% of the farmers who implemented a new strategy to deal with it reported cost reductions as their main strategy. The equivalent figure among the Italian respondents was 50%.

The dairy crisis especially affected farmers who had made significant investments in 2014 to increase their milk capacities with the end of the quotas. As mentioned above, in the Member States where the farmers were preparing and waiting for the end of the EU quota system, investments had been made to expand their production and fully use their production capacity. As long as the production margin remained positive, **these farmers continued increasing their production to cover their investment costs**. Many case studies highlighted the extremely difficult situation of those farms, which were facing strong borrowing costs that forced farmers to work more by reducing labour costs or getting additional job.

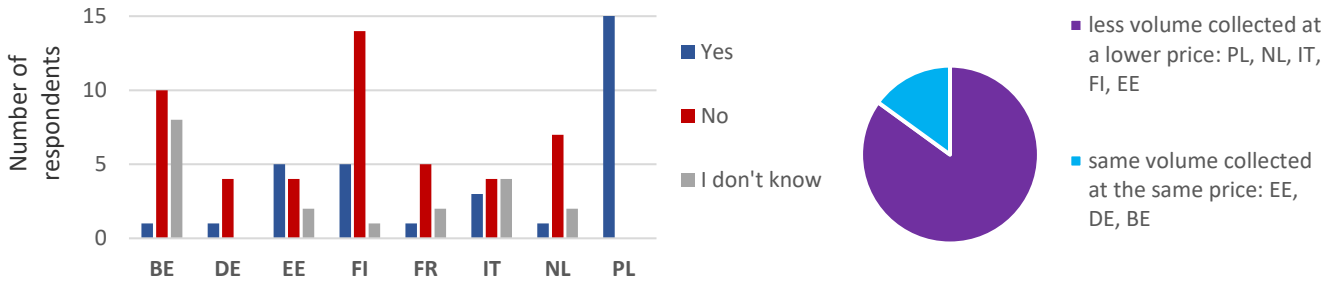
4.1.4.2 Changes in dairies' strategy and influence on producers' short-term liquidity

The dairies play a crucial role in the supply chain. They can influence the production decisions taken by farmers, either by setting the volume or by setting the price of the milk collected. Moreover, dairies can also implement strategies to manage risks at their scale. According to the case-study reports, the dairies coped with the market disturbances (i.e. lower demand and lower market prices) by adapting the volume or the price of the milk collected. Some dairies also changed their export strategies so as to be less dependent on the international market (e.g. as mentioned in DE, FR, EE).

Although the dairies passed on the drop in the price of milk to producers or encouraged them to reduce the volume of milk produced, they also provided support to dairy farms to protect them from the impact of crisis. Several examples were identified in the case studies. In some Member States (e.g. IE, BE), dairies smoothed out the milk price variations to protect the farmers from the market fluctuations. In Ireland, Finland and Germany, dairies also implemented a set-price scheme, offering forward contracts to producers setting both the quantity and the price of the milk, to offer some stability during the crisis. The leading dairy company in Finland, Valio, introduced this system and updated it during the crisis period. In several Member States, the cooperatives also provided loans to their members by selling inputs on credit, thus improving the working capital of farmers to some extent (e.g. in FR and IE).

In the survey, dairy producers were asked about a possible change in dairies' strategies during the crisis. The answers were mixed in all Member States, except in Poland. Farmers who reported a change experienced a lower volume of milk collected at a lower price (in PL, NL, IT, FI, EE).

Figure 22: Change in dairies' strategies during the market disturbances, according to the survey respondents



Source: Agrosynergie, based on the online survey

Hence, by controlling the volume and price of the milk collected, dairies had direct impact on farmers' revenues. On the other hand, case studies highlighted efforts undertaken by dairies to support their milk suppliers during the crisis, notably through the granting of credits aiming at reducing the pressure on farmers' short-term liquidity.

4.1.4.3 Potential effects of strategies on market stabilisation

In most of the case studies (i.e. DE, EE, IE, FR, NL, PL, RO) stakeholders interviewed reported **no or very little effect of the risk management strategies implemented by farmers on market stabilisation**. Although some of the milk collectors interviewed reported on how they tried to raise milk producers' awareness about the need to reduce the overall volume of milk produced, generally the strategies implemented by farmers did not intend to have an effect at larger scale on the market. Indeed, the strategies implemented at farm level aimed at reducing costs and/or maximising their income, which in turn resulted in a reduction or an increase in the volume of milk produced.

The case studies outlined that market stabilisation is a complex phenomenon, which depends on global markets. The farmers are seen as price takers, and powerless in facing the issue of market stabilisation.

However, in other case studies (BE, FI and IT), the stakeholders identified some aspects that could have positively influenced the market recovery. In Finland and Belgium, they mentioned that the disappearance of less profitable holdings as an effect of the crisis contributed to market stabilisation. In Italy and Finland, **the positive effects of dairies' strategies on overall milk supply were highlighted**: the regulations in the Italian quality cheese sector, representing 50% of milk production, protected it from market volatility (even if the other half of the milk production was still exposed to market volatility), and the introduction of quota-based contracts in Finland helped control the total amount of milk produced. Also, the creation of new market outlets through exports (notably the opening of the Asian market as mentioned in Italy, Poland and France), the transformation of milk (into milk powder notably) and other alternative marketing strategies contributed to distributing the milk produced with positive effects on prices according to stakeholders interviewed.

4.1.5 Building resilience after the dairy crisis

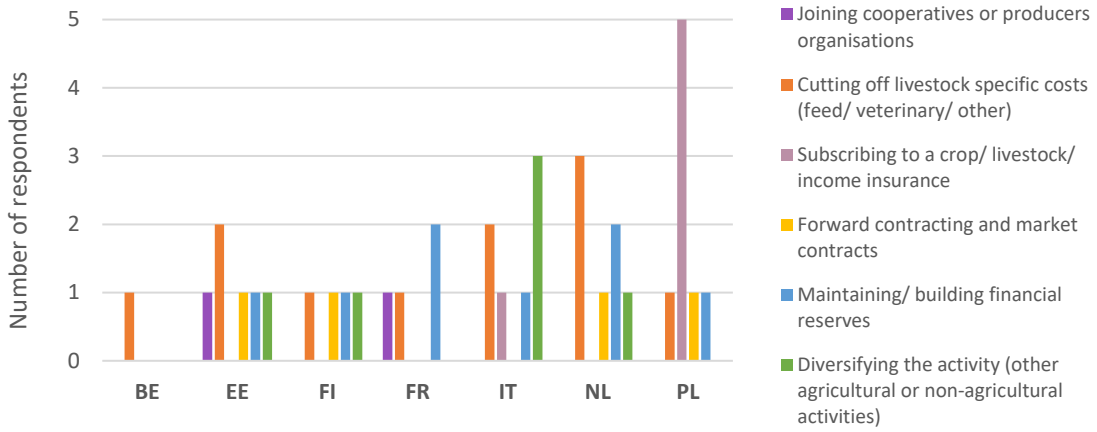
The period after the market disturbances is characterised by a strategic reorientation of EU dairy production. Now aware of market risks, EU dairy farmers have sharpened their positioning to become more resilient against the increased volatility.

4.1.5.1 New strategies implemented by the dairy farmers to improve their resilience

In most of the case studies, market disturbances challenged struggling dairy farmers and dairies to deal with the drop in prices. However, the response of dairy producers to address the situation and better manage the risks associated with increased price volatility differed among Member States. Some case-study stakeholders mentioned that the farmers' strategies did not change significatively in 2017 and that

the crisis resulted rather in reinforcing the ongoing trends related to the adoption of existing strategies (cost management, joining cooperatives, financial reserves). However, in other case-study Member States, **this crisis highlighted the need for farmers and all actors in the milk supply chain to adopt efficient risk management strategies to be better prepared in the event of a future price drop in the EU.** As demonstrated by the survey, 24% of the respondents decided to implement new risk management strategies, i.e. diversification, financial reserves or reduction of costs.

Figure 23: New risk management strategies implemented after the market disturbances (2017-2019)



Source: Agrosynergie, based on the online survey

The investments, as well as the increase in dairy farms' production capacity after the abolition of the quota, contributed to making them more efficient. Indeed, **the strategies implemented by farmers after the dairy crisis consisted in reducing the production costs to become more competitive (e.g. in IE, EE, PL)**, thereby improving their resilience, i.e. their capacity to cope with a sudden drop in prices. Farmers also developed the ability to react more quickly in the event of a milk crisis, having already gone through one, and activated a panel of solutions to reduce their costs and remain viable.

When possible, dairy farms have looked for outlets providing higher and stable incomes. They have shifted their production toward the national market or to meet the increasing demand for organic and/or PDO/PGI products. These qualitative outlets offer farmers a higher and less volatile price, while making them less dependent on the export market. Direct sales on farms or diversification of farming activities also contributed to reducing the vulnerability of farmers by providing them higher and diversified returns for their agricultural activities.

Some stakeholders mentioned that farmers strengthened their relationships with other farmers (e.g. in DE, EE, IT). Also, the cooperatives or dairies encouraged dairy producers to build financial reserves, to improve their resilience in this increased volatile context.

Most significantly, the period after the crisis showed the development of new types of risk management tools such as insurance and forward contracts. These tools were developed during the crisis by dairies or cooperatives in many Member States. The survey of dairy producers confirms that the use of insurance and of forward contracts increased after the dairy crisis. Subscription to insurance is relatively popular in Poland, where five farmers mentioned that they contracted insurance after the crisis. This was also mentioned by one farmer in Italy. The use of forward and market contracts can also be observed, as farmers mentioned using them in Estonia, Finland, the Netherlands and Poland (one farmer in each Member State).

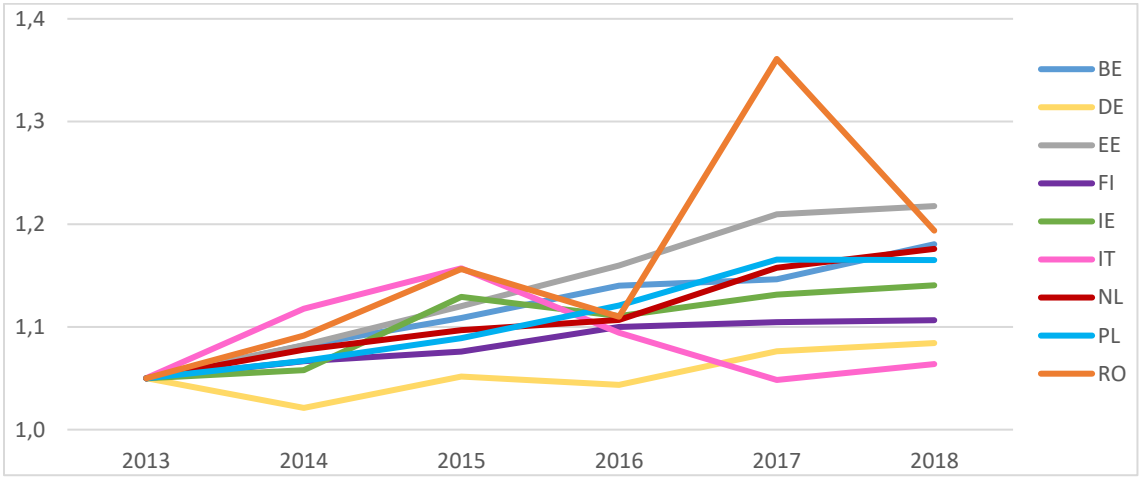
4.1.5.2 Improved performance of the dairy farms over the period

The improved performance of the EU dairy sector after 2017 was examined based on FADN data, looking at:

- the average volume of milk produced per LU from 2013 to 2018 in each Member State,
- the trends in livestock costs per litre of milk produced.

The figure below shows that **the volume of milk produced by LU remained quite stable over the period. In most of the Member States, a slight increase was registered between 2013 and 2018**, though some Member States registered a big increase in their productivity per LU over the period compared to the volume of 2013 (e.g. BE, RO, EE). It can be noted that some Member States, like Germany or Italy, saw their productivity per LU reduced from the 2013 level; however, from 2017 this volume recovered to the pre-crisis level (2013).

Figure 24: volume of milk (litre) per LU produced over the period (2013=1)[15]

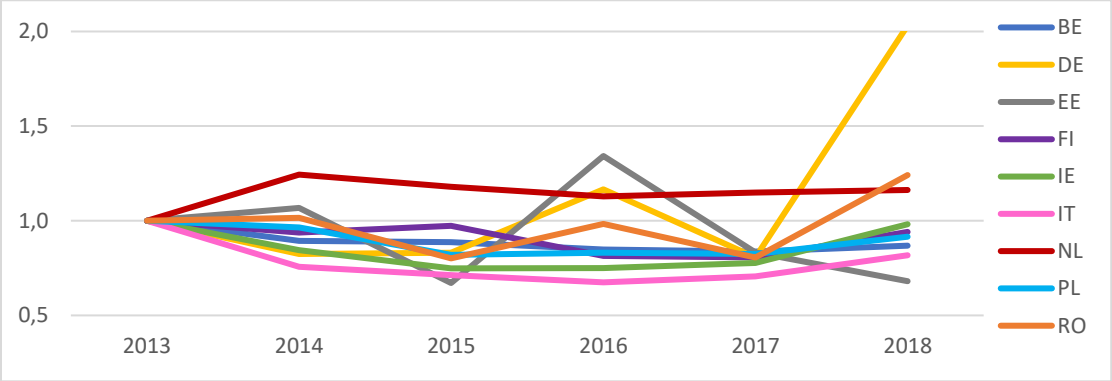


Source: Agrosynergie, based on FADN data

The figure below shows the period change of the livestock costs per litre of milk produced. **A tendency for a slight decrease in the costs per litre of milk produced can be observed in most Member States** over the period compared to the 2013 level, except for some Member States (e.g. NL, RO, DE), which registered significant increases in costs. It should be pointed out that, over the period considered, the overall livestock costs borne by dairy producers actually increased, driven by an increase in the cost of feed (see ESQ4), but this increase was compensated by productivity gains.

[15] Data used are costs faced by the Farm Type 45: specialist milk.

Figure 25: Livestock costs per litre of milk produced (2013=1)



Source: Agrosynergie, based on FADN data (specialist dairy farms, EL excluded)

The two previous graphs show a trend toward a better performing dairy sector over the period. Specialist dairy farmers performed better by litre of milk produced, with reduced livestock-specific costs compared to the 2013 level. This increased performance can also be observed in productivity per LU: the average amount of milk produced per LU over the period has increased compared to the 2013 level. These trends demonstrate that farmers were looking for a more efficient production system over the period, either by selecting the most productive cows or reducing livestock costs, notably by achieving economies of scale.

4.1.6 Summary of findings

This evaluation study question examines the changes in the risk management strategies implemented by dairy farms and dairies before, during and after the market disturbances that occurred over 2014–2016. The objective is to determine how these strategies affected farmers' behaviour, in terms of production decisions and of short-term liquidity. The analysis does not consider the potential role played by the exceptional measures implemented by the Member States on farmers' behaviours and production decisions, which is investigated in ESQ2 and ESQ3.

The analysis reveals that, before 2014, in the context of the milk quotas, the risk management strategies were left to dairies and cooperatives, which deal with the market and its fluctuating demand. As the quota would fix the milk production quantities, farmers tended to apply the conditions agreed to with their collector. Therefore, the main strategies implemented by milk producers were intended to promote their margin by reducing costs, obtain higher prices by joining cooperatives or producers' organisation, and build financial reserves. To some extent, farmers also diversified their sources of income to secure and stabilise the farm household. At that time, the abolition of quotas planned for 2015 led producers and dairies to invest in view of expanding their production and increase their level of sales on the international market. Examples reported in case studies depict farmers investing to increase their herd or to acquire new machinery with a view to improved performance of their production system.

During the market disturbances (2014–2017), farmers adapted their production level according to their capacities, to cope with the impact of the crisis on their income. As mentioned in case-study Member States, dairy producers tried to reduce their costs (e.g. feed costs and labour costs) to remain profitable. Farmers kept on producing for as long as their profit margin by litre of milk produced remained positive, to write off their investments. This is especially the case of farmers who had invested to increase their capacity before 2014. The dairy producers who did not make a profit anymore reduced their production level and/or diversified their sources of revenue. Risk management strategies implemented by dairies had a direct effect on farmers' production decisions and short-term liquidity, as the volume and/or price of milk collected by dairies decreased, as reported by some of the farmers surveyed. However, in many cases, examples of dairies protecting farmers from the impact of the crisis were reported, notably through the granting of credits aiming at reducing the pressure on the short-term liquidity of farmers or through the implementation of forward contracts. These strategies implemented by dairy producers had no or very little effect on market stabilisation. However, some initiatives implemented by dairies contributed to market stabilisation, both through the control of the milk volumes bought and with the

creation of new outlets for EU milk products.

The period after the market disturbances is characterised by a strategic reorientation of EU dairy production and improved resilience of dairy producers. As reported by the stakeholders interviewed, the crisis highlighted the need for farmers and all the milk supply chain actors to adopt efficient risk management strategies to be better prepared in the event of a future price drop in the EU. Investments made to increase production capacities and to reduce production costs improved the competitiveness of the EU dairy producers. The FADN analysis highlights the average increased productivity per cow as compared to the 2013 level. When possible, dairy farms looked for outlets providing higher and stable incomes, by shifting their production toward the national or organic and/or PDO/PGI markets. Most significantly, new types of risk management tools such as insurance or forward contracts increased after the dairy crisis.

4.2 ESQ2 - Causal analysis: To which extent did the various models implemented by Member States for delivering exceptional aid impact dairy farms' behaviour, in terms of production decisions?

4.2.1 Understanding and method

This question focuses on the impact of Regulation (EU) 2015/1853 and Regulation (EU) 2016/1613 on dairy farms' production decisions and must distinguish the effects achieved by the various models implemented by Member States. It acknowledges that because the implemented models vary in terms of objectives, types of aid, eligibility criteria and unit amount, different types of models are expected to have different impact on production decisions on the volume of milk produced. This question is therefore built on the following evaluation criteria:

- **Models delivering direct financial support affected (or not) farmers' production decisions:** Based on the analysis of the different models implemented, and on information collected in case-study interviews and in the survey, this section assesses whether or not models focusing on direct financial support influenced production decisions.
- **Models aiming at stabilising/decreasing production influenced (or not) farmers' production decisions**: Microeconomic simulations make it possible to assess how the support provided is likely to foster a change in practices, taking into account average national values for farm costs, milk production and herd size in each Member State (FADN). Individual FADN data are also used to establish a counterfactual analysis, comparing the trends in practices for beneficiaries and non-beneficiaries, when possible. Qualitative information from literature and case studies also round out this analysis and were particularly important when quantitative analyses were not possible.
- **Other factors influenced (or not) farmer's behaviour**: Finally, based on case studies, the literature and the survey, the impact of other factors on farmers' production decisions were assessed, with an emphasis on dairies 'strategies.

4.2.2 Effects of models providing direct financial support to farmers with no requirement on production

As previously presented (see §2.5), the models implemented through Regulation (EU) 2015/1853 did not aim at influencing farmers' production decisions, as the objective was to alleviate the economic consequences resulting from the market disturbances on farmers in the livestock sectors. Moreover, despite the introduction of seven eligibility criteria through Regulation (EU) 2016/1613, the payments provided, when not linked to criterion (a) on production reduction, did not request farmers to change their practices. They were instead used to target financial support for farming systems characterised by given practices (i.e. grassland areas, quality schemes, small farms, etc.) **Therefore, no direct effects on farming practices are expected from models providing direct financial support to farmers**. As demonstrated in the descriptive section (see 2.5.1), exceptional income support granted to dairy

farmers, in the form of lump-sum or coupled with milk production, can indirectly result in maintaining or increasing milk production. Indeed, financial support might allow farmers to remain profitable and maintain production capacities that would have been reduced otherwise due to costs that could not be covered due to low milk prices.

Regulation (EU) 2015/1853

Case-study interviews confirmed that Regulation (EU) 2015/1853 did not influence farmers' production decisions. In most case studies[16] the stakeholders interviewed mentioned that **the support provided under Regulation (EU) 2015/1853 did not induce any change in terms of quantities of milk produced.** However, the Finnish Managing Authority considered that the measure contributed to maintaining the dynamics of increase in milk production. In Germany as well, stakeholders interviewed considered that the measure contributed to maintaining those same dynamics. This trend is also shown in the survey results (see next figure), in which respondents considered that the exceptional aid encouraged milk production increase more often than it resulted in milk production decrease (especially in BE-Wallonia, Finland, Italy and the Netherlands). As demonstrated in ESQ4, direct financial support has the potential to cover for production costs that would have not been affordable otherwise, in a context of sudden drop in prices. Nevertheless, the survey results mostly show that the payment received via Regulation (EU) 2015/1853 rarely affected production decisions of the respondents in the case-study Member States (40/59 respondents considered that they did not change their strategy). Only in France and Poland did some farmers consider that the aid influenced them to decrease their production, and in Belgium and Estonia a few farmers considered that the aid encouraged them to diversify their activity or to develop on-farm processing, even though the models implemented under Regulation (EU) 2015/1853 were not conditioned or linked to any change in production at all.

Beyond production decisions, in most case studies[17] stakeholders interviewed agreed that **Regulation (EU) 2015/1853 did not influence farmers' behaviour at all**. Nevertheless, in the Netherlands stakeholders consider that the support contributed to making **dairy farmers adopt more sustainable practices**. In this Member State, the share of the Regulation (EU) 2015/1853 budget envelope allocated to the dairy sector (EUR 10 million) was used to make the dairy sector more sustainable.

Regulation (EU) 2013/1613

In Member States where Regulation (EU) 2013/1613 was implemented with no requirement on the volume of milk produced[18] (Ireland, Italy, Romania), stakeholders agreed that the exceptional aid did not have any effect on farmers' production decisions. Nevertheless, it was considered by all stakeholders interviewed in Romania that the support encouraged the **reconversion of small dairy farms to meat production** (although this was not the main goal of the support).

4.2.3 Effects of models aiming at decreasing milk production

As explained in the notifications of the different models implemented, Regulation (EU) 2016/1613 was implemented by Member States to support farmers who reduced their milk production or their milk production capacities from one period to another. These models are expected to influence farmers' production decisions, as they condition the delivery of support to an observed reduction between two periods, usually following the same mechanism as Regulation (EU) 2016/1612. Other models set conditionalities for farmers not to increase their production over two comparable time periods. It is considered that such conditionalities also have the potential to influence farmers' production decisions. All these models are therefore considered for the analysis as a unique category standing for *models aiming at decreasing milk production*.

Member States which promoted the reduction of milk production through Regulation (EU) 2016/1613 are Austria, Belgium, Czechia, Finland, France, the Netherlands and Poland. They implemented models

[16] BE-Wallonia, Finland, Germany, Italy, Poland, Romania.

[17] BE-Wallonia, France, Finland, Germany, Ireland, Italy.

[18] i.e. criterion (a) on the reduction/non-increase of milk production was not used.

that mainly took the form of an aid per litre of milk not produced as compared to the previous period N-1, although other models were also implemented (see ESQ5). On the other hand, stabilisation (non-increase) of production was promoted through Regulation (EU) 2016/1613 in Germany, Spain, Hungary, Lithuania, Estonia and Slovenia.

4.2.3.1 Models promoting the reduction of milk production

This section focuses on the models providing a payment per litre of milk not produced (EUR per litre) over a certain period of the year compared to the equivalent period of the previous year (see 2.5.1 for more details). Among case-study Member States, France, Belgium-Wallonia, and Austria used Regulation (EU) 2016/1613 to increase the payment rate delivered under Regulation (EU) 2016/1612 promoting the reduction of milk production. Poland and Finland had a slightly different implementation, as payment per litre of milk not produced introduced through Regulation (EU) 2016/1613 was applied to a different period than the periods eligible under Regulation (EU) 2016/1612. Therefore, although in Finland the payment rate per litre of milk not produced was higher through Regulation (EU) 2016/1613 (EUR 0.3 per litre) than through Regulation (EU) 2016/1612 (EUR 0.14 per litre), it is not the case in Poland (EUR 0.13 per litre).

The following analysis examines the level of incentives provided by the exceptional aid and its capacity to influence farmers' behaviour. It relies on the profit function presented in Section 3.1. The main assumption considers that the exceptional aid can only impact the decisions of maintaining/increasing or reducing milk production, but at constant level fixed costs. Therefore, fixed costs are excluded from the equation[19], and the profitability of one litre of milk is determined by the milk price (annual average calculated from the FADN data), from which the variable costs are deduced (livestock specific costs). The FADN data therefore made it possible to assess the average profitability of one litre of milk by farm specialised in milk production, and then to compare this value to the payment rate of the exceptional aid supporting the reduction of milk production (under Regulation (EU) 2016/1613).

The payment is considered as susceptible to influence farmers' behaviour if it equals or exceeds the profit generated by one litre of milk. Indeed, in that case, the opportunity cost for farmers not to produce a litre of milk is compensated by the payment received. This was the case in all studied Member States (although not for all farm sizes in Poland), which confirms the capacity of Regulation (EU) 2016/2013 to foster production stabilisation or reduction in these Member States, although it only represented an average gain from EUR 1 to 6 cents per litre in France. It can be noted that the measure is generally more incentive for smaller farms (especially in Poland, where the payment rate does not appear attractive at all for big farms), although in France and Belgium the profitability of one litre of milk produced is on average higher on smaller farms.

However, when the profitability of one litre of milk was considered as negative (i.e. in this case, when the price is not high enough to cover variable costs), then farmers would most probably have to reduce or cease milk production, to minimise their loss. In this case, the delivery of exceptional aid as a payment per litre of milk not produced may have generated deadweight effects, the farmers having been paid even though they would have decreased their production anyway. As shown in the table below, this situation is observed in Finland and Poland for smaller farms. However, the compensation granted by the aid may help them to overcome the sudden loss of income generated by the drop in price and the reduction of production. As such, the exceptional aid may have contributed to supporting the maintenance of their activity over time, especially as the payment under Regulation (EU) 2016/1613 was applied to a different period than the periods eligible under Regulation (EU) 2016/1612.

[19] Furthermore, the introduction of fixed costs would introduce costs that are not related to the dairy activity.

Table 8: Incentives provided by Regulation (EU) 2016/1613 to reduce milk production

MS	Standard output (€k)	Profitablility per litre (A)*	Regulation (EU) 2016/1613 support - EUR/litre (B)	Regulation (EU) 2016/1612 support - EUR/litre (C)**	Potential gain Regulation (EU) 2016/1613 – EUR/litre (D=B-A)	Potential gain Regulation (EU) 2016/1612 – EUR/litre (E=C-A)
Regulation (EU) 2016/1613 is used to increase the payment rate under Regulation (EU) 2016/1612						
AT	[15-25]	0.06	0.23	0.14	0.17	0.08
	[25-50]	0.12			0.11	0.02
	[50-100]	0.15			0.08	-0.01
	[100-250]	0.15			0.08	-0.01
BE	[100-250]	0.16	0.24	0.14	0.08	-0.02
	[250-500]	0.14			0.10	0.00
	[500-750]	0.13			0.11	0.01
FR	[50-100]	0.23	0.24	0.14	0.01	-0.09
	[100-250]	0.21			0.03	-0.07
	[250-500]	0.19			0.05	-0.05
	[500-750]	0.18			0.06	-0.04
Regulation (EU) 2016/1613 is used to extend the eligible periods under Regulation (EU) 2016/1612						
FI	[50-100]	-0.03	0.30	0.14	0.33	0.17
	[100-250]	-0.02			0.32	0.16
	[250-500]	0.00			0.30	0.14
	[500-750]	0.07			0.23	0.07
PL	[8-15]	-0.03	0.13	0.14	0.16	0.17
	[15-25]	0.01			0.12	0.13
	[25-50]	0.06			0.07	0.08
	[50-100]	0.11			0.02	0.03
	[100-250]	0.14			-0.01	0.00
	[250-500]	0.16			-0.03	-0.02

*Calculated in 2015 for milk specialists (TF45) by size class using the FADN weighting coefficient
**Represents the amount that would have been granted without the implementation of Reg. (EU) 2016/1613

Colour scale: Highest gain / Highest loss

Source: Agrosynergie, based on FADN and notifications sent by Member States

Out of the four case studies where Regulation (EU) 2016/1613 was implemented to foster reduction of production, stakeholders interviewed in Belgium-Wallonia (farmers' representatives), Finland (researchers) and France (Managing Authorities) **considered that the measure might have encouraged farmers to reduce their production, although its level of incentive would vary depending on the farm performance**. Farmers' representatives in Belgium-Wallonia considered that the extra EUR 0.10 per litre made the Regulation (EU) 2016/1612 scheme have greater incentive. In Finland it was considered that **the payment provided sufficient incentive mostly for small farms with a lower unit margin per litre of milk produced, whereas big farms usually had lower variable costs per litre produced and had invested to increase their production before the crisis and therefore had to keep producing milk in order to pay their loans**. However, as mentioned by farmers' representative, the support can only have limited effects at national level, as other farmers could have benefited from these freed-up market shares and increased their milk production (Germany, Finland).

On the contrary, in Poland, the measure was reported as having had no effect, as the farmers' strategy was to increase milk production to compensate for low prices. In Poland and France, it was also considered that the measure came too late to have an impact on production decisions. The **deadweight effect** was also mentioned in Finland (researcher and farmers representatives) and France (most stakeholders), where it was mentioned that some of the beneficiaries had already intended to reduce their production or even stop their dairy activity.

4.2.3.2 Models promoting the stabilisation of milk production

In Estonia and Germany, stakeholders interviewed considered that the measure did not influence farmers' production decisions despite the obligation not to increase production over a given period. It

was mentioned in Germany that this measure came too late (due to the time it took to agree upon the reference period), after the market had already recovered and when it was more profitable to expand production volumes again. It should however be noted that, in Germany, 18 152 dairy farmers benefited from this measure according to the notification sent by Manging Authorities (i.e. around 30% of dairy farms), suggesting a potential deadweight effect of the support if the measure did not foster production changes. In Estonia, representatives of farmers and researchers agreed that the measure did not impact farmers' production decisions either and that, on the contrary, it might have benefited farmers who intended to quit the business. The survey results support these findings, indicating that the beneficiary respondents in Germany and Estonia considered that they did not change their production volumes to receive the support.

In Slovenia, the FADN reveal that some beneficiaries of the support maintained steady production by reducing their herd size while keeping their yield at a low increase, whereas non-beneficiaries increased their milk production over the same period (see box below).

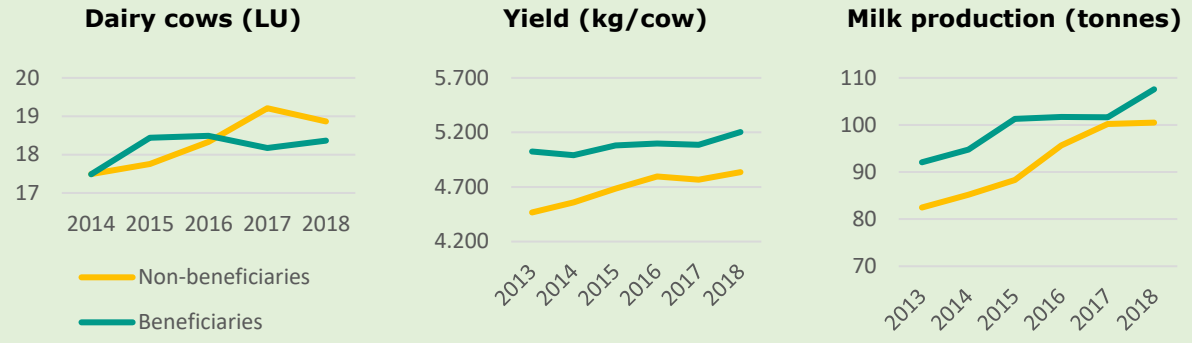
Box 3: Counterfactual analysis for beneficiaries of Regulation (EU) 2016/1613 in Slovenia

The FADN variables do not usually make it possible to distinguish beneficiaries of the exceptional aids studied. Nevertheless, in Slovenia, the FADN variable SOTHEXCPSUB_2_V (Other grants and subsidies of exceptional character – subsidy co-financed by the EU and the Member State) matches the pattern of the measure implemented under Regulation (EU) 2016/1613[20]. It was therefore assumed that in 2017 this variable stood for the payment received by Regulation (EU) 2016/1613, making it possible to perform a counterfactual analysis with constant samples of beneficiaries and non-beneficiaries over the 2013–2018 period. This constant sample is composed of 39 beneficiaries and 32 non-beneficiaries, all specialised in milk production (TF45). Results of the analysis also show that the farms of the beneficiaries and non-beneficiaries are comparable in terms of size (around 18 LU on average), but beneficiaries had on average higher yields (and therefore a higher milk production when the exceptional aid was implemented).

In Slovenia, the subsidy from Regulation (EU) 2016/1613 was provided to dairy farms by litre of milk produced, provided that farmers did not increase their production in the Jan-Mar 2017 quarter compared to the same quarter the previous year (Jan-Mar 2016). The constant sample analysis shows that as expected, the beneficiaries did not increase their production over the 2016-2017 period. It also shows that, on average, their production did not increase between 2015 and 2016. This may suggest that the farmers of this sample also benefited from Regulation (EU) 2016/1612 (which compared milk sales in 2015 and 2016). The graphs below also suggest that the stagnation in milk productions was achieved through a relatively stable yield and a decrease in the number of livestock units, whereas the yield and the herd size of non-beneficiaries increased more over the same period.

[20] This variable is mostly filled in specialized dairy farms (FT45), and the average value of the subsidy in the FADN matches what would be expected from Regulation (EU) 2016/1613.

Figure 26: Comparative analysis of change in production for beneficiaries and non-beneficiaries of Regulation 2016/1613 in Slovenia



Source: Agrosynergie, based on FADN data

4.2.3.3 Other models supporting the reduction of milk production

In the Netherlands, the exceptional aid consisted in a payment per cow or calf killed to encourage farmers to cease/change their activity or to reduce their herd size. In the Netherlands, the FADN shows that, in 2015, the average profitability of a dairy cow for an average farm specialised in milk production (TF45) was EUR 1 322 per cow and per year, whereas the aid provided represents EUR 1 200 per cow. These two amounts are very close and depending on the technicity and the yield obtained in non-specialised milk producing farm the amount provided by the subsidy could be theoretically an incentive.

In Poland, Regulation (EU) 2016/1613 was also implemented to help dairy farmers to convert to beef production, by financing the purchase of beef cattle (i.e. reimbursement of purchase costs of a bull for beef cattle breeding – between EUR 213 and 638 per head) in 2016 and 2017. However, as no financial support was provided to decrease the number of dairy cows, the theoretical incentive of the payment is hard to assess. Nevertheless, such conversion was confirmed by farmers' representatives and the representatives of the dairy industry interviewed, who considered that Regulation (EU) 2016/1613 might in some cases have encouraged farmers to diversify their activity or to implement agri-environmental schemes, through the transition from milk to beef production (mainly on small farms).

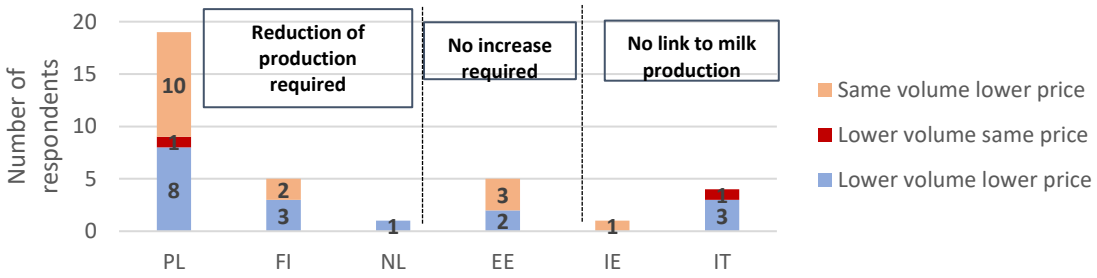
4.2.4 Other factors influencing production decisions in terms of quantity of milk produced

4.2.4.1 Dairies' strategies and the effects of the exceptional aids

A study of Thorsøe et al. (2020) suggests that the strategic response of dairy farms to a market crisis is strongly conditioned by the strategic response of the dairies that they supply. For instance, as a response to the crisis, in Denmark production was expanded to full capacity, thereby reducing marginal costs per unit produced, as opposed to France, where farming systems were restricted by a voluntary quota system coordinated by the dairies. The authors also highlight that the situation of the system varies between Member States, taking the examples of systems based on collective organisations for processing and selling products in France and Denmark (such as cooperatives), and farming systems in other Member States (such as Greece and Latvia) which are more associated with processors based on individual contracts. For instance, in France and Demark farmers usually have more long-running contracts allowing them to plan investments and to develop their production. In contrast, contracts in Greece usually last less than a year, but farmers have access to a wider range of different processors, allowing for more flexibility in choosing bulk buyers of their raw milk.

In almost all case-study Member States[21], the stakeholders interviewed agreed that **the studied exceptional measures did not influence the strategies of dairies.** It was instead emphasised in Estonia, Finland and Germany that the market situation had a much more significant impact on dairy strategies than the exceptional measures for farmers. This is reflected in the survey result in which half (53/104) of the respondents considered that dairies changed their strategies during the crisis (see figure below showing the nature of the change when a change in dairy strategy was acknowledged). These results show no link between the dairy strategy and any type of models implemented for Regulation (EU) 2016/1613. When respondents considered that there was a change in dairies' strategies, they acknowledged that milk was collected at a lower price, except in two cases (one in Italy and one in Poland), in which farmers mentioned that the price did not change but that the volumes collected were lower. Farmers in Estonia, Finland, Ireland and Poland also considered that lower volumes of milk were collected by dairies.

Figure 27: Farmers opinions on the change in dairies' strategies during the crisis



Source: Agrosynergie, based on results of the survey

In Finland, representatives of the industry and Managing Authority considered that the main Finnish milk collector acted in synergy with the Managing Authority in the effort to reduce the milk flow on the market. A quota-like system was introduced to plan the amount of milk that would be collected from each farmer. The main milk collector also tried to guide farmers toward the optimal level of milk of production, with the knowledge that Regulations (EU) 2016/1612 and 2016/1613 promoted milk production reduction. **The Regulation therefore contributed to the joint effort of the Finnish government and dairy industry to raise farmers' awareness of the management of their milk volumes and of the market situation**. The representatives of the dairy industry in Germany mentioned that similar schemes were being implemented.

It was also mentioned in the Netherlands that the implementation of Regulation (EU) 2015/1853 contributed to the overall sustainability of the dairy sector. Some dairies made the environmental schemes fostered by the exceptional aid ('*Kringloopwijzer*', 'Meadow birds and Outdoor grazing' and 'Animal health') mandatory for their suppliers, and they invested in training systems for their suppliers to meet these new environmental requirements.

4.2.4.2 Investments made at the end of milk quotas

According to most case-study interviews in BE-Wallonia, the Netherlands, Finland, Germany, Ireland, Poland and Estonia, the main factor that drove production decisions during the crisis is the investments made by some farmers to increase their production capacity before the crisis (also see ESQ1). **In these Member States, stakeholders mentioned that, with the opportunity provided by the end of milk quotas, some farmers made significant investments to increase their production capacity and achieve economies of scale, and that to finance these investments they had no other choice but to produce more milk (as long as the margin remained profitable)**. A study in the Netherlands (Samson, Gardebroek and Jongeneel, 2016) also shows that some Dutch dairy farmers had the potential to increase their production with limited investment after the end of milk quotas, as the occupancy of stable space in Dutch dairy farms was 71% in 2010. Farmers' representatives in Finland

[21] BE-Wallonia, DE, EE, FR, IE, IT, RO.

and Germany also mentioned that **production decisions are difficult to take for the short term and are rather dictated by long-term strategies**, as it takes two to three years before a newly born cow can produce milk, and as a consequence farmers must take the time to mature their strategy in terms of production decisions.

4.2.4.3 Low milk prices

In France and Romania, stakeholders interviewed mentioned that as **milk production costs were too high compared to the milk price**, some farmers were already decreasing their production regardless of the measures implemented by the EU. It was also mentioned in Italy and Germany that less competitive farms (IT) or farmers close to retirement with no successor (DE) ceased their activity sooner than planned due to the milk market situation. One study (Popescu and Agatha, 2017) further shows that in Romania milk production declined during the crisis due to low prices, and as a result milk processors had to buy milk from other countries.

4.2.5 Summary of the findings

During the crisis, farmers' production decisions were strongly affected by the drop in milk price and by the different cost structures of the farms, some heavy investment to increase production capacities having been made in the context of the removal of milk quotas. One of the main factors affecting production decisions was the strategies of the dairies, which reduced the volumes and/or prices of the milk collected over the period, forcing farmers to adjust their production. However, the analysis reveals that production decisions are usually taken for the long term and can only be adjusted in the short term in a limited way.

Nevertheless, based on the typology of the various models drawn up by EU Member States for the implementation of the exceptional measure, it was shown that the direct effects of both exceptional measures on farms practices could mainly be achieved when Member States conditioned the support to the reduction of milk production under Regulation (EU) 2016/1613. The payment rate for milk reduction through Regulation (EU) 2016/1613 was theoretically a greater incentive than the payment rate proposed under Regulation (EU) 2016/1612 when comparing it to the average profitability of milk production in concerned Member States, although its level of incentive varied depending on farm size and relative performance. This result was generally confirmed by the stakeholders interviewed. However, deadweight effects were also reported, as some of the beneficiaries experiencing negative margin had already intended to reduce their production or even stop their dairy activity. Models supporting a stabilisation of milk production were considered as less effective in fostering a change in production decision by stakeholders interviewed, and results from the survey also confirm this. However, the FADN analysis conducted in Slovenia reveals that beneficiaries of the support maintained steady production when compared to non-beneficiaries over the same period.

Case-study interviews and survey results confirm that, overall, Regulation (EU) 2015/1853 did not impact farmers' production decisions, as the models implemented were not conditioned or linked to any change of practice. On the other hand, they might have contributed to supporting the milk production dynamics at the time. However, the Netherlands provides a unique example of a model implemented under Regulation (EU) 2015/1853 to promote environmental practices. With the support of milk collectors that imposed new environmental requirements in synergy with the support provided, it is possible that Dutch dairy farmers changed their practices towards more sustainable ones. The exceptional aid through regulation (EU) 2016/1613 also encouraged farmers to switch from milk to beef production in Romania and Poland, through criteria not directly related to the reduction of milk production.

4.3 ESQ3 - Effectiveness: To which extent did the various models implemented by Member States for delivering exceptional aid contribute to the stabilisation of the EU market?

4.3.1 Understanding and method

This question focuses on the impact of Regulations (EU) 2015/1853 and 2016/1613 on the stabilisation of the EU dairy market and must distinguish the effects achieved by the various models implemented by Member States. As with ESQ2, it acknowledges that different types of models are expected to have different impacts on milk production, and as a consequence such support may also make diverse contributions to the stabilisation of the EU dairy market.

This question is therefore built on the following evaluation criteria:

- **The implementation models contributed (or not) to the reduction of milk production:** Based on the results of ESQ2, on the public data available on national milk productions over the crisis period and on literature and case-study interviews, a first step of the method consists in assessing whether the models implemented significantly contributed to a reduction of milk production in the different Member States.
- **The implementation models contributed (or not) to reducing farm gate milk price volatility**: This second criterion examines potential links between the different models implemented and a potential increase or stabilisation of farm gate milk price, as an indicator of market stabilisation. The analysis builds on the literature and stakeholders' opinions, as well as on available data to assess the relative impact of the models implemented in market stabilisation, among other factors, including other EU interventions.
- **There are other factors (or not) that have influenced the stabilisation of the EU dairy market**: A last criterion further explores what other factors contributed to the stabilisation of the EU market, through case studies and literature.

4.3.2 Effects of models on the volume of milk produced

Whereas ESQ2 focused on the effects of exceptional support on production decisions at farm level, this section aims to assess whether the models implemented had a significant impact on a larger scale, i.e. on national milk production.

4.3.2.1 Contribution of the different models to the reduction of milk production

As detailed in the previous evaluation question, the exceptional payments delivered through Regulation (EU) 2015/1853 and Regulation (EU) 2016/1613 aimed at alleviating the economic consequences resulting from the market disturbances experienced by farmers in the livestock sectors. The analysis of the different models implemented shows that the exceptional support provided can be divided in two main categories: **simple cash flow support** and payment to **encourage the reduction of milk production**. The first category gathers all the models implemented by Member States through Regulation (EU) 2015/1853, as none of them directly aimed at influencing farmers' production decisions.

With the introduction of conditionality in Regulation (EU) 2016/1613, some Member States chose to offer payments for the reduction of milk production, as part of the reduction scheme implemented by Regulation (EU) 2016/1612 (e.g. in FR, FI, AT, BE), as well as through support for slaughtering animals (NL) and support for conversion of small dairy farms to beef farms (CZ, PL and RO, although for this latter the official purpose of the aid was to support small-scale farming). Some other Member States conditioned the cash-flow support payments to non-increase of milk production[22] (EE, DE, HU, LT, SI,

[22] This model corresponds to the "simple cash flow support" category.

ES). As demonstrated in ESQ2, **these models can influence the volume of milk produced by the beneficiaries, and subsequent effects on the dairy market can be expected**.

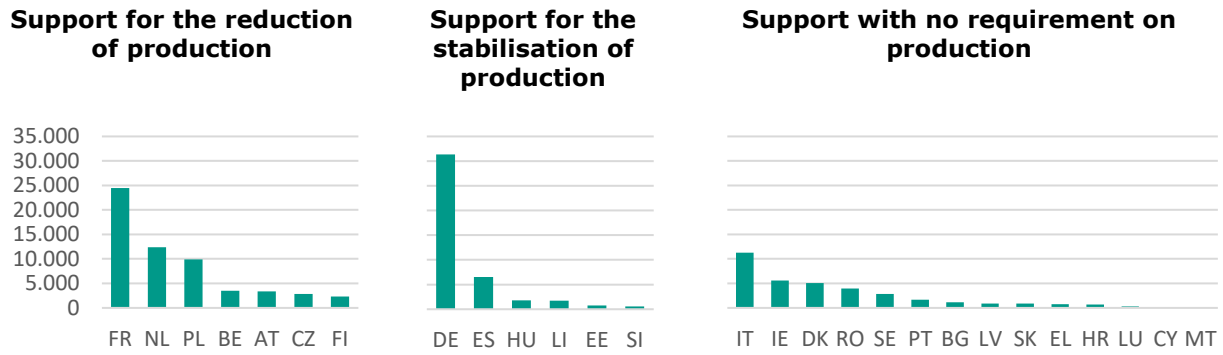
4.3.2.2 National milk production change in Member States according to models implemented

For this analysis, Member States were clustered into three categories depending on the way Regulation (EU) 2016/1613 was implemented:

- Member States that provided exceptional aids to farmers who reduced their milk production (i.e. AT, BE, CZ, FI, FR, NL, PL), although exceptional aids might also be delivered to farmers complying with other eligibility criteria depending on the Member States' choices;
- Member States that provided exceptional aids to farmers who did not increase their milk production (i.e. EE, DE, HU, LT, SI, ES); and
- Member States that provided exceptional aids to farmers without requesting any reduction/stabilisation in production (e.g. BG, HR, CY, DK, EL, IE, IT, LV, LU, MT, PT, RO, SK, SE).

The figure below shows that the EU's biggest milk producers decided to foster a reduction/stabilisation of milk production under Regulation (EU) 2016/1613[23], among other exceptional support measures, depending on the models implemented. Among the five Member States producing more than 10 million tonnes of milk in 2013 (i.e. DE, FR, NL, IT, PL), France, the Netherlands and Poland provided support to farmers who reduced their milk production, and Germany conditioned the attribution of the payment to stable production (no increase). Only Italy did not condition the support on any of these criteria.

Figure 28: Milk production from dairy cows (1000 T) in 2013 and models implemented under Reg. (EU) 2016/1613



Source: Agrosynergie based on notifications sent by Member States for Regulation (EU) 2016/1613 and JRC data on milk production

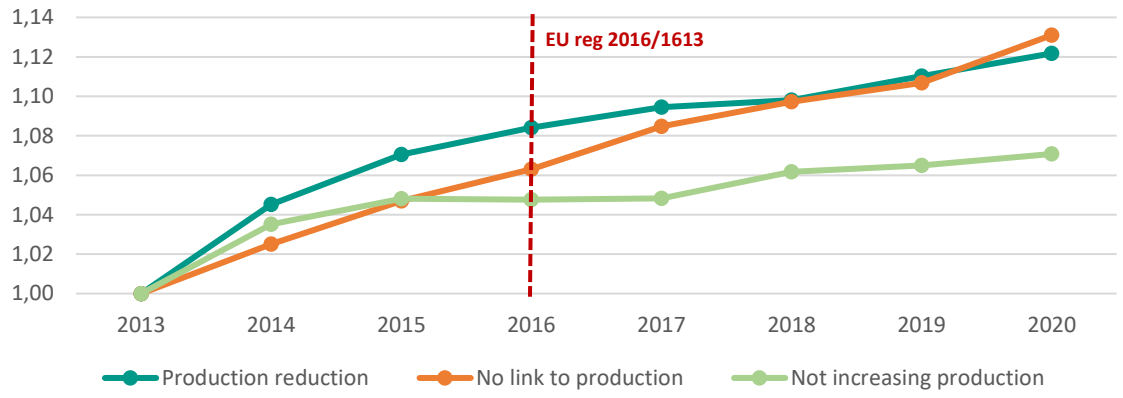
The reduction of milk production fostered by Regulation (EU) 2016/1613 was expected to have an impact on the EU market only if the volumes removed from the market were significant enough. It is thus considered as positive that the **major EU milk producers implemented such milk reduction/stabilisation schemes under Regulation (EU) 2016/1613**. As shown in the figure below, these Member States[24] did not increase the overall quantity of milk produced there as quickly as did Member States with no requirement on production/stabilisation of milk production. As a group,

[23] Using eligibility criteria (a): "production reduction beyond that covered by Commission Delegated Regulation (EU) 2016/1612 or not increasing production".

[24] Despite the fact that the possibility of reducing production was offered to all farmers, not all farmers took advantage of it, and it should be noted that most Member States proposed several different measures under Regulation (EU) 2016/1613, not all of which encouraged reduction in production.

Member States having implemented exceptional support for milk reduction saw their production increase by 2.4 points between 2015 and 2017, whereas production remained stable in Member States delivering the support to farmers who did not increase their milk production). In other Member States, the milk production increased by 3.8 points.

Figure 29: Relative change (2013=1) in the overall milk production from dairy cows (1000 T) depending on the models implemented for Regulation (EU) 2016/1613U



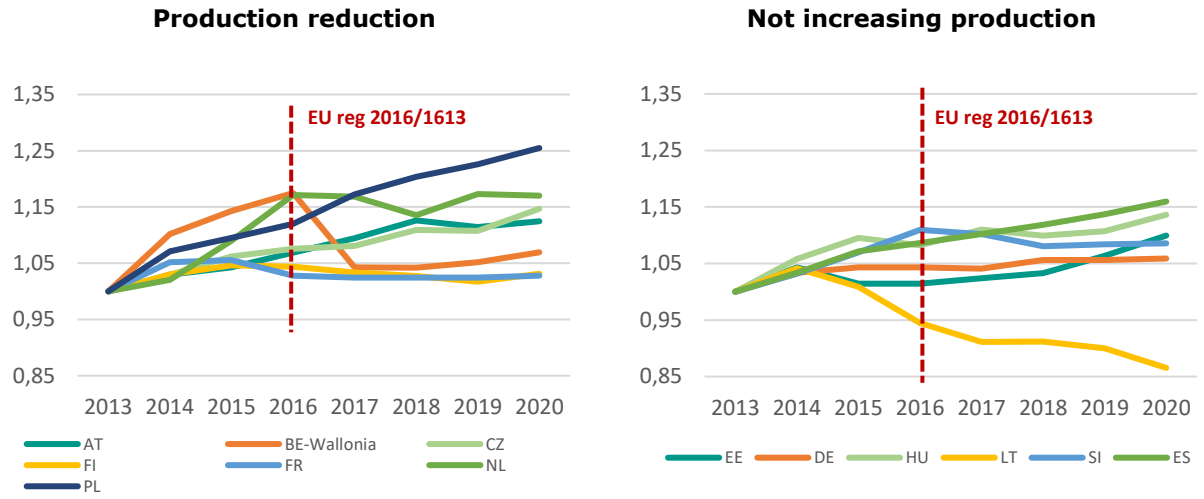
Source: Agrosynergie, based on notifications sent by Member States for Regulation (EU) 2016/1613 and JRC data on milk production

The graphs below show that **the trend observed for Member States having implemented exceptional support for milk reduction can mostly be explained by the reduction of the production that occurred in France and the Netherlands**, these two Member States being the biggest milk producers of the group. Finland and BE-Wallonia also show a decrease in national milk production from 2015–2016. In other Member States such as Austria, Czechia and Poland, national milk production did not decrease, despite the support implemented. **Finland is the only Member State where the exceptional aid was 100% allocated to a single measure aiming at reducing milk production**.

ESQ2 reveals that Regulation (EU) 2016/1613 might have contributed to the milk production reduction in Finland, France, the Netherlands and Belgium-Wallonia, as the payment granted was incentive, depending on the situation of the holding. However, it must be noted that the national trends in milk production are mainly influenced by other factors, including the crisis. Some stakeholders interviewed indicated that there were farmers who decreased their milk production in order to reduce their costs, ceased their activity, or retired earlier than planned (BE-Wallonia, Finland, Romania, Germany). Nevertheless, the remaining dairy farms generally filled these vacant market shares[25]. In fact, farmers who made investments before the crisis apparently continued to increase their production for as long as their margin remained positive, to compensate for the drop in prices.

[25] Interviews in BE-Wallonia (dairy industries), Finland (farmers representatives and dairy industries), Romania (farmers representatives) and Germany (Managing Authorities).

Figure 30: Relative change (2013=1) in Member States' milk production from dairy cows (1000 T) depending on the models implemented for Regulation (EU) 2016/1613 (1/2)

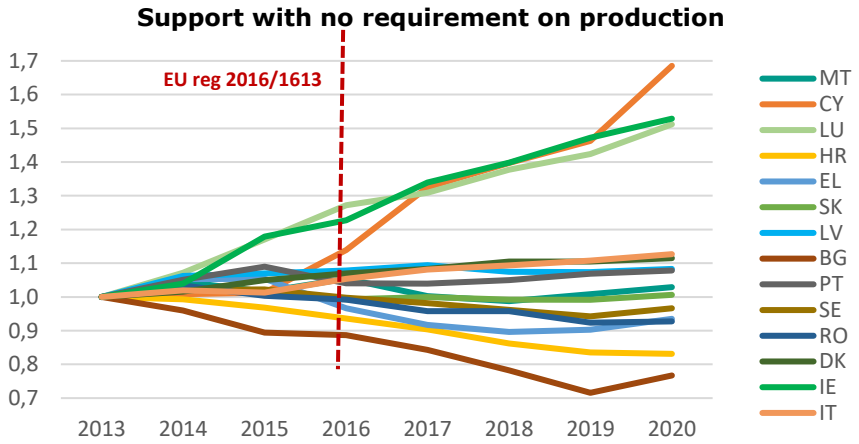


Source: Agrosynergie, based on notifications sent by Member States for Regulation (EU) 2016/1613 and JRC data on milk production

For Member States where Regulation (EU) 2016/1613 required farmers not to increase production, Slovenia shows a slight decline in its national milk production from 2016. **Germany, the biggest milk producer, had relatively stable production between 2015 and 2017, which influences the overall trend of the group of high-producing Member States**. In other Member States, national milk production trends vary over the 2013–2020 period. For instance, in Estonia and Lithuania the milk production started to decrease in 2014, and in Hungary and Spain the milk production kept increasing.

In Member States that implemented Regulation (EU) 2016/1613 by requesting reduction/stabilisation in production, the year 2016 does not mark a noticeable decrease in national milk production, despite the implementation at EU level of Regulation (EU) 2016/1612 promoting the reduction of milk production. Italy and Ireland, the two biggest milk producers of this group, kept increasing their milk production (50% increase in Ireland between 2013 and 2020), whereas other Member States such as Croatia, Bulgaria, Romania and Greece registered a constant decrease from 2013. **These data show that, overall, the dynamics of milk production in the EU Member States varied greatly, independently of the models implemented under Regulation (EU) 2016/1613. Nevertheless, the pattern of national milk production combined with stakeholders' feedback in case studies also suggests that the exceptional support could have contributed to the reduction of milk production in Finland, France and the Netherlands.**

Figure 31: Relative change (2013=1) in Member States' milk production from dairy cows (1000 T) depending on the models implemented for Regulation (EU) 2016/1613 (1/2)



Source: Agrosynergie, based on notifications sent by Member States for Regulation (EU) 2016/1613 and JRC data on milk production

4.3.3 Effects of models on farm gate milk price volatility

4.3.3.1 Potential positive effects on farm gate milk price…

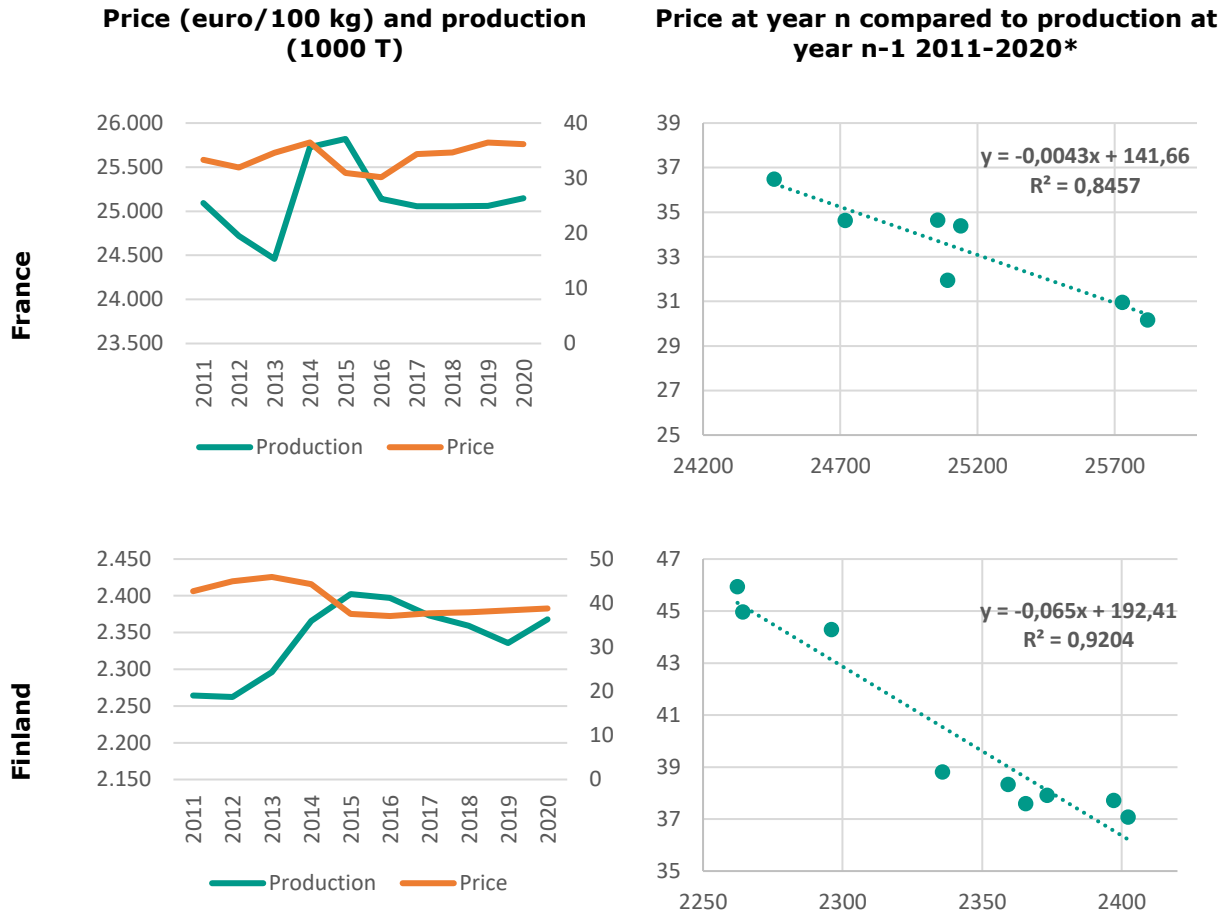
To have an effect on farm gate milk price, the models implemented must have significantly contributed to the reduction of milk production. Although in case studies stakeholders generally agreed that the recovery of the dairy market was multifactorial, in six Member States they consider that **the reduction of milk production, whether or not linked to the measures, contributed to the recovery of the EU market** (i.e. in BE-Wallonia, Italy, France, Finland and Ireland). In these Member States, stakeholders emphasised the role played by Regulation (EU) 2016/1612 on market stabilisation.

Therefore, in **Belgium-Wallonia**, **Finland** and **France**, some stakeholders think that **Regulation (EU) 2016/1613 could also have had positive effects on the market stabilisation**, especially when combined with Regulation (EU) 2016/1612[26].

The figure below illustrates milk production and milk prices in France and Finland, showing the positive effects of reduction of milk production on the market. Although one study (Kalliovirta, Niskanen and Heikkilä, 2019) notes the importance of the global market in Finland and highlights the limited influence of domestic milk supply on the farm gate milk price, one of the authors considered that the reduction of the milk production encouraged by Regulation (EU) 2016/1613 and Regulation (EU) 2016/1612 contributed to the recovery of farm gate milk prices.

[26] Although stakeholders often underlined that the support for reduction/stabilisation of the milk production came too late and generated deadweight effect (see ESQ2).

Figure 32: Milk production (million T-left axis) and milk price (EUR/kg – right axis) during the 2015 crisis period in France and Finland



Source: Agrosynergie, based on data from DG AGRI (STO) (production) and Agri-food Data Portal (prices).

* In France the plot graph excludes years 2019 and 2020 to strengthen the linear regression, as these years are no longer considered to belong to the crisis period.

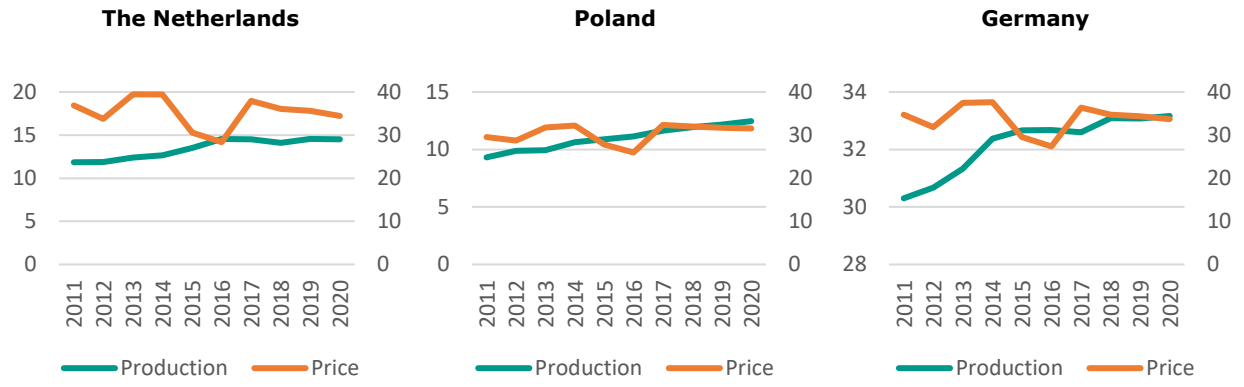
4.3.3.2 … can not be confirmed

However, no direct link between national milk production and farm gate milk price was observed in other case-study Member States. In the Netherlands, Estonia, Germany, Ireland and Poland, some of the stakeholders stated **that the reduction in domestic milk production (if there was one) was not significant enough to influence farm gate milk prices**. In Member States with significant exports (e.g. Germany and the Netherlands), the national milk market is considered to be fully integrated into the EU and world dairy markets. Furthermore, reduction of production by some farmers was generally compensated by increase in production by other dairy producers.

Comparison of national milk production and average national raw milk price (shown in the figure below) in Germany, Poland and the Netherlands reveals a sudden drop in price in 2015 and 2016 before recovering in 2017. However, it should be noted that milk production did not significantly decrease (when compared to France and Finland). Data also show that smaller producers such as Lithuania and Slovenia (not displayed here) have the same milk price trend as the one observed in France, Poland, Germany and the Netherlands, despite a completely different trend in production (i.e. in Lithuania, constant decrease in milk production and, in Slovenia, the significant increase in milk production already visible

in 2011 stopped in 2016). **Hence, production does not seem to have influenced the milk price in these Member States, which questions the nature of the link observed in France and Finland.**

Figure 33: Milk price (EUR/100 kg – right axis) and production (million T-left axis) around the 2015 crisis period in NL, PL and DE



Source: Agrosynergie, based on data from the JRC (production) and Agri food data portal (prices).

In Romania, Estonia and BE-Wallonia, **Regulation (EU) 2016/1613 might have contributed to the stabilisation of the EU market by supporting the sustainability of small farms**. In these cases, the opinions of stakeholders diverge, some considering that allowing smaller farms to maintain their activities is positive for the market, and others arguing that production should be concentrated in big farms more resilient to market imbalances.

Results also outlined the importance of the influence of the global market on national farm gate milk price. Therefore, it can be considered that the effect of the studied exceptional measures in the recovery of the EU dairy market is limited and can be better explained by other factors.

4.3.4 Other factors influencing the stabilisation of the EU dairy market

4.3.4.1 The global market

Stakeholders from Italy, Poland and France considered that the recovery of national farm gate milk prices was linked to the opening of the Asian market, highlighting the importance of the global market. Research in EU Member States shows that, in Poland, the milk price has mostly been determined by the EUR/PLN exchange rate, as its milk and dairy products are sold in the EU domestic market (Bórawski et al., 2021). Another study (Kalliovirta, Niskanen and Heikkilä, 2019) modelled that milk prices in Finland are shaped by world feed price, brent oil prices and previous milk prices. Other variables such as average EU milk price, world milk price, the price of exported milk outside EU, and China's growth rate also have a predictive power, but not domestic milk supply. **This shows how milk domestic markets can be integrated into bigger markets (EU and global), especially for those exporting a large share of their milk production.** It should nonetheless be noted that, as the top cow milk producer, the EU also influences the global market (Dong, Du and Gould (2011)).

4.3.4.2 Other regulatory instruments

The contribution of other EU interventions was key to the recovery of the market. Previous works (Agrosynergie, 2018) studied the effects of other EU instruments planned under the CMO regulation[27]

[27] Regulation (EU) 1308/2013.

implemented in 2014 to stabilise the milk market. According to their findings, private storage did not seem to have had a significant impact on price trends. A counterfactual analysis led to the conclusion that **the milk reduction scheme**[28] **certainly had an effect in the short-term but did not have long-term effects.** In the present study, stakeholders[29] interviewed also considered that the **other EU interventions on the dairy market** contributed to the recovery of the sector. The EU measures for purchasing skimmed milk powder reduced market pressure, providing a kind of safety net for the dairies, with some stabilising effects but to a small extent.

4.3.4.3 Strategies of the dairy industry

In case studies, the most mentioned factor[30] to have contributed to the recovery of the EU dairy market is **the strategies of the dairy industry**. The creation of new market outlets through exports (notably the opening of the Asian market as mentioned in Italy, Poland and France), transformation of milk (into milk powder in particular) and other alternative marketing strategies contributed to distributing the milk produced, with positive effects on prices according to the stakeholder interviewed. In Finland, products that could not be exported to Russia, such as cheese, were sold on national market, even with the Russian labelling, thanks to promotion campaigns, and all Finnish stakeholders interviewed agreed that the increase of the domestic demand peaked in 2015.

The organisation of the sector in cooperatives was also mentioned to be a significant contributor to the recovery of the dairy market in Estonia and Romania. In these Member States it was mentioned that, after the milk crisis, dairy farmers started operating as cooperatives and/or groups of producers, allowing them to better enhance their milk production and weigh more in negotiations on milk prices.

In Finland and Germany, **the strategy of the milk collectors** was also mentioned to have had an effect on the market, **through the control of the milk volumes bought** (see also ESQ1). It was mentioned in Germany that dairies and farmers are gradually implementing price and volume agreements which are closely linked to market developments. In Finland as well, most stakeholders agreed that the quota-like system implemented by the main milk collector contributed to the stabilisation of the national milk market after the crisis.

4.3.4.4 Other factors identified

Several research studies have already focused on the main factors influencing farm gate milk price through empirical approaches. At EU level, O'Connor, Bergmann and Keane (2015) linked milk price to butter and SMP prices through lagged regression analysis, showing the major role of the global market on which these products are exchanged. Other studies have established a link with the cereals/feed markets (Dong, Du and Gould (2011) and Rama et al., (2016)).

4.3.5 Summary of findings

The analysis shows that the EU's biggest milk producers implemented exceptional aid to foster a reduction/stabilisation of milk production under Regulation (EU) 2016/1613[31], among other exceptional supports depending on the models implemented. France, the Netherlands and Poland provided support to farmers who reduced their milk production and Germany conditioned the attribution of the exceptional support to a stabilisation of the production compared to the same period in N-1. As demonstrated in

[28] Regulation (EU) 2016/1613.

[29] BE-Wallonia, EE, DE, IE, PL.

[30] BE-Wallonia FI, FR, DE, IE, IT, PL, RO.

[31] Using the eligibility criteria (a): "production reduction beyond that covered by Commission Delegated Regulation (EU) 2016/1612 or not increasing production".

ESQ2, these models can influence the volume of milk produced by the beneficiaries, and subsequent effects on the dairy market can then be expected.

However, it is not possible to conclude that the various models implemented by Member States for delivering exceptional aid contributed to the stabilisation of the EU market, as overall the trends of national milk production in Member States cannot be linked to the models implemented under Regulation (EU) 2016/1613. However, despite the variety of trends observed, the analysis reveals that the overall production of Member States which implemented models associated with milk reduction/stabilisation schemes (among others) increased at a slower pace than did the overall quantity of milk produced by other Member States.

Case-study interviews confirmed the outcomes of the quantitative analyses of volumes of milk produced and milk-price fluctuations over the crisis period. It indicated that, in Finland and France, Regulation (EU) 2016/1613 might have had positive effects on market stabilisation, especially when combined with Regulation (EU) 2016/1612[32]. In particular, the support seems to have positively contributed to the stabilisation of the domestic dairy market in Finland, as part of a collective effort from the Managing Authority and the dairy industry to reduce the milk quantity delivered to the market. Data showed that in this case the reduction of milk production encouraged by the exceptional aid, amongst other factors, could have contributed to an increase in farm gate milk price.

More generally, the significance of other factors influencing the market situation was highlighted. Data, case studies and literature confirm that the national initiatives for reduction of milk production can only have a limited effect on milk-price variations in the global market. The recovery of the EU market can be explained by other factors such as other EU regulations aiming at market stabilisation implemented at EU scale (i.e. Regulation (EU) 2016/1612), but mainly through the ability of the dairy industry to find new outlets to increase the value of the EU milk on the global market.

4.4 ESQ4 - Effectiveness: To which extent did the various models implemented by Member States for delivering exceptional aid provide short-term liquidity to livestock farmers?

4.4.1 Understanding and method

This question focuses on the impact of Regulations (EU) 2015/1853 and 2016/2013 on the short-term liquidity of EU dairy farmers. The analysis considers the effects achieved by the various models implemented by Member States, as each model is expected to have different impact on short-term liquidity, depending on the type and amount of support provided to dairy farmers. This question is therefore built on the following evaluation criteria:

- **The financial situation of dairy farmers worsened (or not) during the crisis**. This first part of the answer to the evaluation study question is based on an analysis of indicators of the financial situation of dairy farmers extracted from FADN, on notifications by Member States and case study interviews.
- **The aid amounts provided were (or not) significant compared to CAP support and dairy farmers' revenue.** The analysis considers the average aid amount granted and the type of payments granted to farmers, and it compares it to overall CAP payments and farmers' Farm Net Value Added (FNVA) as a proxy for their revenue.
- **The implementation models contributed (or not) to improving dairy farmers' short-term liquidity**: The comparison of the loss gross value added with the amount of support distributed is used to provide insights into the impact of the exceptional aid on dairy farmers' short-term liquidity issues. Illustrations of the situations in Member States are provided by stakeholders' opinions obtained with the help of the case studies.

[32] Although stakeholders often underlined that the support for the reduction /stabilisation of the milk production came too late and generated deadweight effect (see ESQ2).

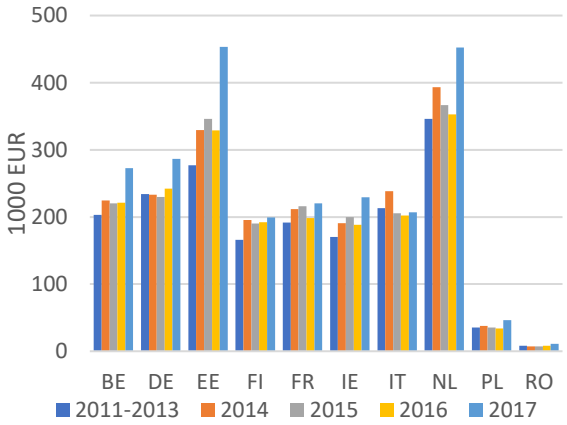
N.B.: The FADN sample used for the following analyses includes only specialised dairy farmers (code 45 in the TF14 classification), to have the least possible interference resulting from other agricultural productions on the farm when analysing economic and financial indicators.

4.4.2 Dairy farms' financial situation in case-study Member States

4.4.2.1 Output of dairy farms over the crisis period

The total output corresponds to the total value of sales of agricultural products by the farm (expressed in EUR). It is the product of the market price situation and the volume of agricultural goods produced by the farm. The analysis reveals that **on average dairy farms suffered from the drop in prices over 2014–2016 in all Member States, though not at the same time, before recovering in 2017** at a level higher than prior to the end of the quotas (except for Italy). The analysis highlights that average output already tended to stabilise in 2014 for some Member States (DE, RO) and decrease from 2015 for most case-study Member States (BE, FI, IT, NL, PL, RO). The data suggest that the impact of the dairy crisis on dairy farmers in Estonia was less significant. Trends in average output in Germany, where the crisis struck farmers as early as 2014, shows that, on average, German dairy farmers recovered faster than in other Member States, and that, as early as 2016, a similar analysis applies to Finland.

Figure 34: Weighted average output for specialised dairy farms in case-study Member States



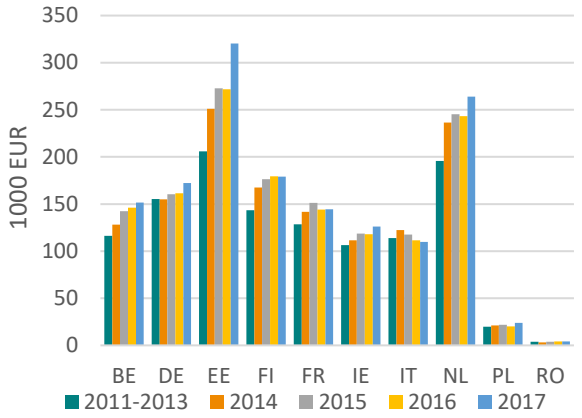
Source: Agrosynergie calculations based on FADN data.

4.4.2.2 Changes in intermediate consumption over the crisis period

The intermediate consumption reflects the production costs faced by dairy farmers, made of the specific supply costs, which include inputs produced on the holding and overhead arising from production in the accounting year.

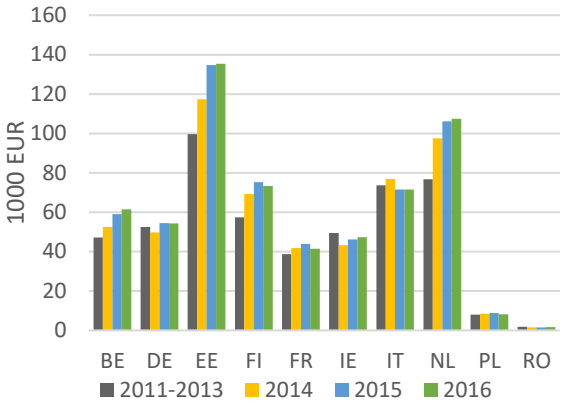
A clear upward trend for intermediate consumption can be observed in dairy farms over the period under consideration for all case-study Member States except Italy (Figure 35). In Italy the weighted average for intermediate consumption increased in 2014 but then decreased steadily as of 2015. Furthermore, **many case-study Member States saw their level of intermediate consumption jump in 2015 when compared to the average for 2011-2013** (France +18%, Belgium and Finland +23%, the Netherlands +25%, and Estonia +32%). The **increase in the cost of feed for grazing livestock helps to explain the surge in intermediate consumption**, as energy prices remained relatively stable during this period. Notably, the average costs for feed significantly increased in seven Member States in 2015 (BE, DE, EE, FR, FI, NL, PL) (Figure 36). Thus, the analysis of average intermediate consumption indicates that dairy farmers had to deal with increasing production costs as of 2015, while at the same time experiencing a high level of price volatility. Such a situation put dairy farmers at risk of facing insufficient prices to cover their production costs. It is likely that this contributed to a deterioration in the margin of dairy farms.

Figure 35: Weighted average intermediate consumption in case-study Member States



Source: Agrosynergie calculations based on FADN data.

Figure 36: Weighted average for costs of feed for grazing livestock in case-study Member States



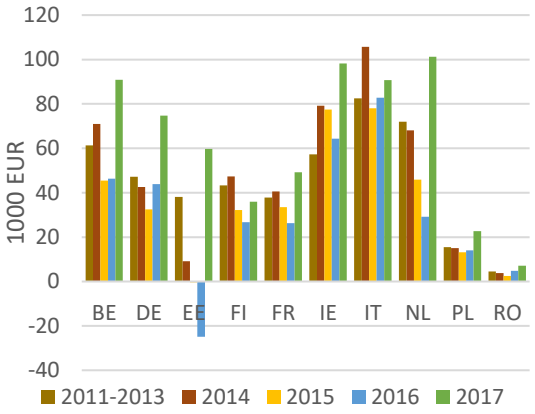
Source: Agrosynergie calculations based on FADN data.

4.4.2.3 Family farm income

According to FADN data, in 2015 and/or 2016, **the average family farm income of dairy farms reached significantly low levels in case-study Member States**, revealing the huge consequences of the crisis.

The average family-farm income in Estonia is negative for 2015 and 2016, indicating dairy farms in Estonia were significantly impacted by the dairy crisis. This may have resulted from the conjunction of the high level of production costs mentioned in Section 4.4.2.2 and the drop in milk prices. Meanwhile, the **decrease in average family farm income in Ireland and Italy was very moderate compared to the decrease in other Member States**, suggesting that Irish and Italian dairy farms were less affected and were able to remain profitable despite the price volatility. The intermediate consumption and feed costs were quite stable in Italy and increased moderately in Ireland. This could be the source of the moderate impact on dairy farmers in these countries when compared to other case-study Member States.

Figure 37: Weighted average of family-farm income for dairy farmers in case-study Member States

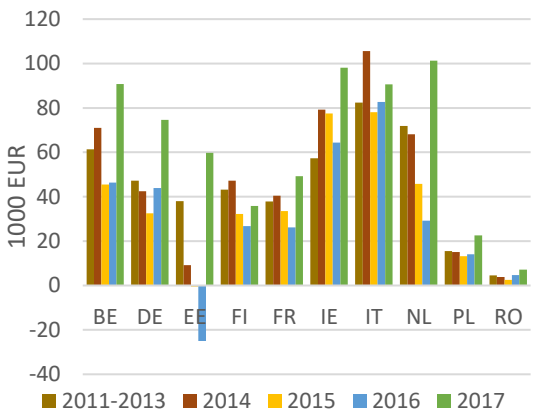


Source: Agrosynergie calculations based on FADN data.

The average family farm income reflects the different timeframes of when the crisis occurred in case-study Member States (decrease initiated in 2014 in DE, EE, NL, PL, RO and in 2015 in BE, FI, FR, IT).

The average family-farm income in Estonia is negative for 2015 and 2016, indicating dairy farms in Estonia were significantly impacted by the dairy crisis. This may have resulted from the conjunction of the high level of production costs mentioned in Section 4.4.2.2 and the drop in milk prices. Meanwhile, the **decrease in average family farm income in Ireland and Italy was very moderate compared to the decrease in other Member States**, suggesting that Irish and Italian dairy farms were less affected and were able to remain profitable despite the price volatility. The intermediate consumption and feed costs were quite stable in Italy and increased moderately in Ireland. This could be the source of the moderate impact on dairy farmers in these countries when compared to other case-study Member States.

Figure 37: Weighted average of family-farm income for dairy farmers in case-study Member States



Source: Agrosynergie calculations based on FADN data.

Gross value-added change for specialised dairy farms in selected Member States

The loss of revenue generated by dairy activity can be assessed by analysing the gross value added for milk, defined as below:

Gross value added = (milk production x milk price) – intermediate consumption

The difference in the gross value added for milk production on specialised dairy farms provides a relevant indication of the scale of the economic impact caused by the drop in milk prices during the dairy crisis. It should be mentioned that the values displayed below are national averages that do not reflect the diversity of structural characteristics and economic situations of dairy farms in the studied Member States.

The Member States selected for the analysis are Germany, Finland, France and Romania taking the year 2013 as a reference. Germany has a very export-oriented dairy sector, with average milk production per farm close to the EU average. In France, the dairy sector is also export-oriented, but to a lesser extent. Specialised dairy farms in France are also on average smaller than those in Germany but are close to the EU average. In Romania, the dairy sector is not oriented towards exports. Most Romanian dairy farms are very small, and the average production of specialised dairy farm is very low compared to the average EU milk production for specialised farms. It seems that in Finland the dairy sector is moderately oriented towards export, and its production of milk by specialised dairy farms is quite modest by EU standards as well.

Table 9: Average milk production and exports in the Member States of the analysis

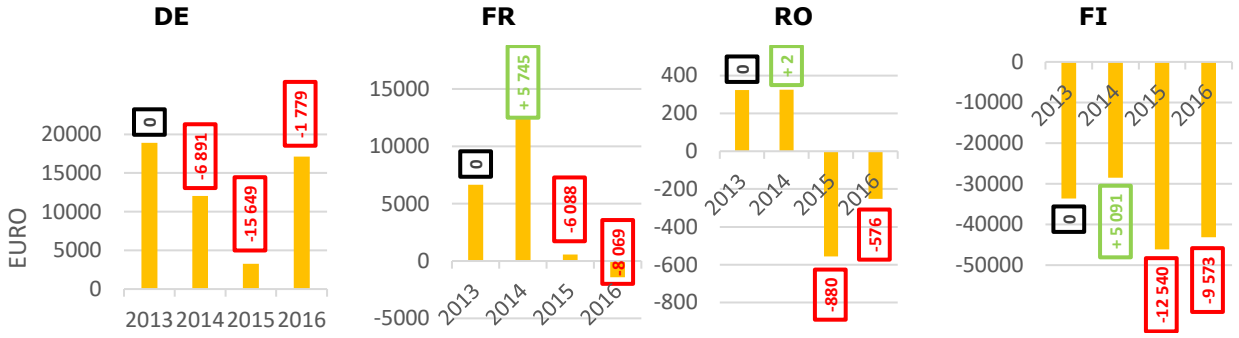
MS	Specialised dairy farms average milk production (2013) kg	Share of exported milk production %
DE	469 468	50%
FR	389 428	40%
RO	13 291	7–8%
FI	290 126	30–35%

Source: Agrosynergie calculations based on FADN data

The calculations for the national average gross value added and difference compared to 2013 are indicated in Figure 38. The decrease in gross value added in dairy farms in Germany is significant in 2014 and 2015 when compared to 2013, especially in 2015. In France, Finland and Romania, the decreases in gross value added in specialised dairy farms were significant in 2015 and 2016. This

corroborates the findings in the first paragraph of this section that indicate that dairy farmers in Germany were struck by the crisis earlier. The loss of gross value added is significant in 2015, but the situation tended to improve in 2016 for Germany, Romania and Finland. Meanwhile, the loss of gross value added worsened in 2016 for dairy farmers in France. As the direct CAP support is not considered in the calculations, the values for the gross value added can be negative (as observed in Finland, Romania and France), although this does not imply that income is negative. The **difficulty farmers had in covering production costs** because of the decrease in milk prices was outlined in case studies (e.g. in BE, DE, EE, IE, FR). For instance, a stakeholder in Estonia reported that for one tonne of milk produced the average purchase price was EUR 237 while the production cost was EUR 255.

Figure 38: Gross value added and difference in gross value added compared to 2013 in specialised dairy farms.

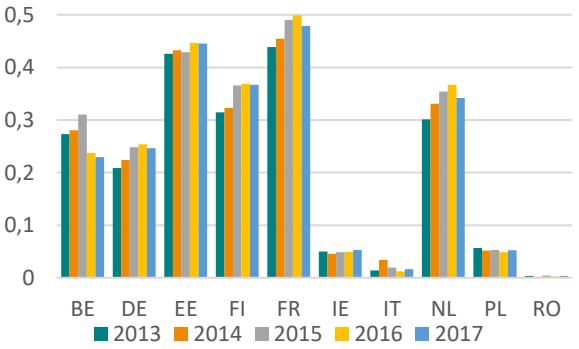


Source: Agrosynergie based on FADN data

4.4.2.4 Gearing ratio

The gearing ratio compares farm capital to funds borrowed and is here used as an indicator of indebtedness. **FADN data show that, on average, the level of indebtedness was particularly high in Estonia, Finland, France and the Netherlands, but also high in Belgium and Germany to a lesser extent**. These high indebtedness levels may reflect the tendency of specialised farms to rely on credit for investments aimed at optimising their performance. France had the highest level of gearing ratio among case-study Member States. **The increasing gearing ratio indicates a deterioration of the financial solvency of dairy farmers in most case-study Member States as of 2014** (Figure 39).

Figure 39: Weighted average of gearing ratio in case-study Member States (2013–2017)



Source: Agrosynergie calculations based on FADN data

According to the stakeholders, the dairy crisis affected all dairy farms, but to different degrees. Farmers reimbursing loans or with a significant share of external capital were severely affected (young farmers; farmers having invested before the crisis to increase production; farmers having to invest to comply with environmental, sanitary or animal welfare regulations) (BE, DE, IT, IE, FR), whereas farms enjoying a better financial situation (financial reserves, optimal management of production costs, low production costs) were able to cope with the decrease in prices. Depending on the Member State, different types of farms were highlighted as particularly vulnerable to a decrease in prices, e.g. specialised dairy farms (IT, PL) or small farms (EE, IE, RO).

4.4.3 Significance of the aid amount in CAP support and farmers' revenue

For the following analyses, **the average amounts granted per farm through Regulation (EU) 2015/1853 and 2016/1613 were calculated, when possible, based on the budgetary envelope allocated to the dairy sector divided by the number of beneficiaries** reported by Member States in this sector. This assessment was needed because the individual amounts granted were generally not available due to large variations of the aid depending on farm size (i.e. volume of milk produced or number of cows). Therefore, this average amount is purely indicative and aims at providing insight on potential average amount available by farmer. It should be noted that the following analyses focus on models supporting short-term liquidity and therefore exclude support provided to reduce milk production.

This simulation shows that the **average amount granted by farm is generally lower than EUR 1 000** (e.g. BE-Wal, BG, HR, IT, LT, NL, AT, PL, PT, RO, SI, FI) **but can reach significant level** (e.g. in 2016, the average amount reached EUR 2 697 in DK, EUR 3 978 in ES and EUR 3 122 in HU). The average amount tends to **increase with Regulation EU 2016/1613**. As a limit to the analysis, it must also be noted that most Member States have opted for a distribution based on the size of the production (payment per litre, payment per head), favouring large farms over smaller ones. A minority of Member States have opted for a payment per farm, which benefits smaller farms (ES, FR, LU, RO).

The analysis of the overall support granted to specialised dairy farms in 2015 and 2016 (Table 10) shows that CAP payments (Direct payments + Rural Development payments) received by these types of farms usually contribute to the Farm Net Value Added (FNVA)[33] of the dairy farms to a large extent (more than 50% of FNVA in 16 Member States). When compared to the total CAP supports, the average amount granted as exceptional support in 2015 and 2016 generally remains low: based on the available information (see Table 10), the average amount of aid granted under exceptional measures implemented in 2015 represents less than 5% of average CAP payments delivered to dairy farms in 11 Member States. It represents between 5 and 10% in five Member States and exceeds 10% in four Member States (among them, the rate registered in Romania is suspiciously high). In 2016, the exceptional aid represents less than 5% of average CAP payments in eight Member States, between 5 and 10% in three Member States and exceeds 10% in six Member States.

Table 10 highlights the extent to which CAP payments contribute to the financial results of dairy farms (considering their significant share in the FNVA) and reveals that, during the crisis, these subsidies must have significantly fostered the stability of dairy farmers. When compared to other CAP payments, **the amount of the exceptional aid remains low, thus reflecting its limited role in supporting cash flows and overall financial viability of dairy farms in most Member States**. As exceptions, Member States where the amount granted under exceptional aid is significant compared to the overall CAP support are Estonia (51% - where the average amount is very high as there were only 572 beneficiaries in 2016), Romania (46% - where the average CAP payments for dairy farmers are low) and 26% in Ireland (where the average amount reflects the budget allocated to establish a cash flow loan with reduced interest rate, and as a consequence does not reflect the actual amount received by dairy farms[34]).

[33] FNVA equals total output (total production value), plus balance of current subsidies and taxes, incl. direct payments minus intermediate consumption (specific costs and farm overheads) and depreciation.

[34] Moreover, it is calculated considering the budget allocated to all sectors, as well as beneficiaries from all sectors, not only the dairy sector.

Table 10: Contribution of CAP payments to the FADN and share of exceptional support in 2015 and 2016

	2015			2016		
MS	FNVA EUR	Total CAP support incl. direct payments (% of FNVA) EUR (%)	Share of exceptional aid in total CAP support %	FNVA EUR	Total CAP support incl. direct payments (% of FNVA) EUR (%)	Share of exceptional aid in total CAP support %
BE - Wallonia	65 163	23 317 (36%)	3.58%	67 090	26 441 (39%)	4.45%
BG	13 407	7 869 (59%)	5.16%	9 850	4 987 (51%)	13.23%
CZ	203 753	188 534 (93%)	NA	272 047	235 089 (86%)	NA
DK	70 643	75 529 (107%)	3.57%	218 981	77 662 (36%)	3.43%
DE	81 681	33 844 (41%)	27.74%	82 896	34 766 (42%)	18.38%
EE	60 578	53 902 (89%)	10.49%	55 606	43 070 (78%)	50.74%
IE	-	22 180	6.18%	77 230	21 958 (28%)	26.46%
EL	87 832	0	NA	-	0	NA
ES	-	19 231	20.69%	57 097	20 446 (36%)	4.97%
FR	56 908	34 174 (60%)	4.02%	47 983	34 777 (73%)	2.88%
HR	15 776	9 171 (58%)	7.14%	15 518	9 844 (63%)	6.51%
IT	15 362	16 892 (110%)	4.49%	96 269	16 684 (17%)	NA
CY	240 692	0	NA	-	0	NA
LV	77 610	14 970 (19%)	NA	16 069	15 905 (99%)	NA
LT	7 931	7 309 (92%)	11.18%	7 838	9 870 (126%)	9.98%
LU	84 968	75 998 (89%)	NA	60 295	59 295 (98%)	2.94%
HU	91 874	52 174 (57%)	5.98%	71 989	54 659 (76%)	0.00%
MT	33 971	19 658 (58%)	0.00%	40 407	19 065 (47%)	11.28%
NL	94 702	27 632 (29%)	2.71%	81 655	25 574 (31%)	0.00%
AT	29 063	17 967 (62%)	0.53%	29 137	19 073 (66%)	0.00%
PL	14 179	7 870 (56%)	4.02%	14 967	7 823 (52%)	7.55%
PT	29 183	14 904 (51%)	NA	23 689	15 233 (64%)	5.01%
RO	2 797	569 (20%)	92.62%	5 051	2 287 (45%)	46.39%
SI	117 557	9 833 (8%)	4.52%	12 869	12 766 (99%)	6.28%
SK	49 441	259 985 (526%)	NA	442 524	305 217 (69%)	1.74%
FI	10 414	79 450 (763%)	0.64%	45 859	77 066 (168%)	0.00%
SE	332 421	87 748 (26%)	2.28%	122 277	87 589 (72%)	2.34%

Source: Agrosynergie, based on FADN and notifications sent by Member States for Regulations EU 2015/1853 and 2016/1613

N.B.: it must be recalled that whereas all dairy farms benefit from CAP direct payments, only a portion of them received the exceptional support. Hence, exceptional support was not systematically part of the total CAP payments, contrary to what is suggested by the table.

According to case studies, the strategy implemented by Member States consisted in **distributing the EU budgetary envelope among all dairy farms**. The objective was to deliver the support quickly to show farmers that their situation had been acknowledged. Even when the average amount granted was small, the quick delivery of aid was welcomed by farmers, who felt supported. Some Member States decided to **target the aid to the most vulnerable farmers** (EE, IT, PL, RO), which contributed to increasing the amount delivered to each farm, or to **provide a premium to young farmers** who were particularly vulnerable at that time (e.g. BE, IE). Hence, **the average amount granted per farm was not calculated to compensate for the income loss during the crisis**.

4.4.4 Effects of the various models implemented on dairy farmers' short-term liquidity

This section provides insights into the effects of exceptional support by putting them in perspective with the impact of the drop in milk prices on dairy farmers. The impact of the drop in milk price is assessed through the change in gross value added presented in Section 4.4.2.3, and the average amounts of exceptional aid provided were calculated as described in Section 4.4.3. **This analysis can provide relevant insights into the magnitude of short-term liquidity issues experienced by dairy farmers** (approximated by the change in gross value added) **and the effects of the models implemented on dairy farmers' short-term liquidity.** The advantage of this approach is that the

impact on short-term liquidity issues should be considered with the smallest possible time scale, as dairy farmers were struggling with deadlines for payables. Indeed, the implementation strategy for the exceptional measures generally aimed at providing liquidity to dairy farmers as quickly as possible.

The results of the analysis in Table 6 indicate very uneven results. For Germany and Romania, the average exceptional aid represents a significant share of the average decrease in gross value added for 2015, and this despite the significant drop in gross value added, indicating that the effect of the exceptional aid may have been significant. Furthermore, the average value of the exceptional aid in 2016 exceeds the average decrease in gross value added in 2016 in these Member States, suggesting that the exceptional support provided liquidities which more than offsets the decrease in gross value added resulting from the market disturbance. **Hence, the results of the analysis indicate that exceptional aid might have offset the short-term liquidity issues experienced by dairy farmers in these Member States**.

However, it is worth mentioning that the unfolding of the dairy market disturbance in Germany impacted dairy farmers with a different pattern than in other Member States. Case-study interviews in Germany confirmed this hypothesis, as it was mentioned that the exceptional aid arrived too late. This is highlighted by the rebound of the value of the average gross value added there in 2016. In Romania, the value of the average exceptional aid for 2016, calculated in Section 4.4.3 was EUR 1 061 per dairy farmer, but if a farm corresponding to the average Romanian specialised dairy farm described in Table 11 is considered, the amount of the aid would have been EUR 240 per dairy farmer[35], which represents 42% of the calculated average decrease in gross value added for 2016. Meanwhile, the exceptional aid represented only a small share of the decreases in gross value added for France (2015 and 2016) and Finland (2016), **indicating that the mitigation effect of the exceptional aid on short-term liquidity issues of dairy farmers in these Member States was limited.**

Table 11: Share of exceptional aid in variation of gross value added for dairy farms in 2015 and 2016.

MS	2015			2016		
	Decrease of gross value added	Exceptional aid	Share of exceptional aid in decrease of gross value added	Decrease of gross value added	Exceptional aid	Share of exceptional aid in decrease of gross value added
	EUR	EUR	%	EUR	EUR	%
DE	EUR 15 649	EUR 9 390/farmer	**60%**	EUR 1 779	EUR 6 390/dairy farm	**541%**
FR	EUR 6 088	EUR 1 373/farm	**23%**	EUR 8 069	EUR 1 000/dairy farm	**12%**
RO	EUR 880	EUR 527/dairy farm	**60%**	EUR 576	EUR 1 061/dairy farm	**184%**
FI	EUR 12 540	EUR 511/dairy farm	**4%**	EUR 9 573	/	/

Source: Agrosynergie, based on FADN and notifications sent by Member States for Regulations EU 2015/1853 and 2016/1613

The stakeholders interviewed reported that **the aid was generally not effective in alleviating dairy farmers' short-term liquidity issues, notably because the amount granted was small** and did not compensate for the shortfall resulting from the drop in prices. In Belgium, a stakeholder illustrated how the amount of support was insufficient, indicating that a farm producing 300 000 litres of milk would lose EUR 30 000 due to the price drop of 10 cents that occurred during the market disturbance. The stakeholder highlighted that such a farm could obtain approximately EUR 2 500 from all the exceptional aids studied, **which does not even cover 10% of the loss**.

However, in some case-study Member States (FI, IE, IT, PL and RO), some stakeholders considered the support as effective, even if this opinion was not shared by all stakeholders interviewed. In Poland and Ireland, the positive effects were mentioned only by small dairy farms. Nevertheless, the general opinion

[35] In Romania, the aid provided by regulation (EU) 2016/2013 for dairy farmers delivering between 5 and 20 tonnes of milk was EUR 290.

was that even if the support was too low to really compensate for the loss incurred, **it was significant, as any help was welcome by farmers to address their situation**.

4.4.5 Summary of findings

The analysis of FADN data has shown that the financial situation of dairy farms in case-study Member States has been affected by the market imbalance. The analysis of the average output shows that all case-study Member States suffered from the drop in prices over 2015–2016, though not at the same time, before recovering in 2017. The timeframe of the crisis was not the same among Member States, some of them being able to recover from 2016. Despite a lower output in 2015 and/or 2016, the general trend indicates an increase in the average output of dairy farmers from 2014 in all case-study Member States but Romania, which may reflect the restructuring undertaken by the dairy sector to increase its production capacity. However, the scope of financial difficulties faced by dairy farmers varied from one Member State to another. Member States where the increase of production cost significantly rose in 2015 (e.g. BE, EE, FI, FR and NL) were also those where the average farm income of dairy farms reached significantly low levels in 2015 and/or 2016. The increase in the cost of feed for grazing livestock helps to explain the surge of intermediate consumption. Member States where the increase in production costs was moderate were better off throughout the crisis (e.g. DE, IE, IT, PL et RO). In the case studies, small-scale and young dairy farmers were often reported to have been struck significantly by short-term liquidity difficulties. However, in some Member States, large, specialised farms were reported to have suffered most from short-term liquidity issues, notably when they had invested to optimise their performance.

The exceptional aid provided did not exceed 10% of CAP support granted to dairy farms in most Member States. This reflects its limited role in supporting cash flows and overall financial viability of dairy farms in most Member States, as opposed to other CAP payments (including direct payments) that represent a significant share of the FNVA of dairy farms. The interviews with stakeholders in case-study Member States confirmed that the strategy implemented by Member States consisted in distributing the EU budgetary envelope among all dairy farms and that the average amount granted per farm was not calculated to compensate for the income loss during the crisis.

The comparison of the decrease in average gross value added with the average aid amount further outlines the uneven outcomes for the effect of the support. On the one hand, the results indicated a significant effect by the exceptional support on farmers' short-term liquidity in some Member States (e.g. DE, RO). However, it is questionable whether the support was timely enough to alleviate the short-term liquidity issues in Germany, where the gross value added was already low in 2014. On the other hand, the results suggested that the effect of the exceptional support on farmer short-term liquidity in France and Finland was limited. Thus, the analysis outlines situations where the support was significant but also in other cases had limited capacity to alleviate short-term liquidity.

Case-study interviews highlighted the unevenness of opinions on the effectiveness of the support in alleviating short-term liquidity. In several Member States, stakeholders reported that the support was not significant with regard to the short-term liquidity issues faced by dairy farmers. However, the opinion of stakeholders has to be put into perspective with the fact that implementation models for the exceptional measures varied widely among all Member States.

4.5 ESQ5 - Effectiveness: Regulation 2016/1613 introduced certain conditionality for farmers to be eligible for financial support. Did that conditionality bring any advantage in terms of effectiveness of the measures implemented?

4.5.1 Understanding and method

The introduction of conditions through Regulation 2016/1613 for the granting of exceptional support to milk producers may have enhanced the effects achieved, by requiring specific efforts from the

beneficiaries (e.g. reduction of milk production) or by targeting the aid towards specific farmers or production practices of interest regarding the objective. As highlighted by the Regulation (recital 10), "*to improve farmers' resilience, that aid should be confined to more sustainable farming methods*". According to Regulation (UE) 2016/1613, Member States could design measures adapted to their specific situation (i.e. taking into account the particular situation of milk producers and farmers in other livestock sectors) targeted toward specific activities based on the seven eligibility criteria imposed. The resulting effects thus depend on the conditionality introduced by Member States for farmers to be eligible for exceptional aid.

The following analysis examines the effects of this conditionality on farmers' production decisions and on the short-term liquidity of dairy farms. For that purpose, it describes the eligibility criteria implemented by Member States under Regulation (EU) 2016/1613 to highlight the potential advantages brought by the conditionality. This chapter also assesses whether the introduction of these targeting criteria was efficient, as the distribution of support may have been more complex for Managing Authorities. Therefore, the analysis considers if the advantages brought by the conditionality were proportional to the complexity of implementation. It should be noted that only the measures targeting the dairy sector are studied in this chapter. The analysis is based on Member States' notifications of the concrete measures taken, the eligibility criteria implemented, as well as the effects achieved compared with findings from previous ESQ considering the effectiveness of the exceptional measures.

4.5.2 Eligibility criteria implemented under Regulation (EU) 2016/1613

As described in the descriptive part (section 2.5), eligibility criteria were introduced by Regulation (EU) 2016/1613 to foster the targeting of the exceptional aid towards the most resilient farming methods and to support producers and farmers suffering most from market disturbances. For each of the measures implemented, Member States needed to set one or multiple criteria out of the seven presented in the Regulation. As the table below shows, the combination as well as the number of criteria implemented differ between Member States. A typology based on the different targeting strategies (i.e. combination of criteria and measures) was established to provide a better understanding of eligible conditions for farmers to access the support:

- **OP:** Member States implemented a single measure accessible under a wide variety of criteria. Farmers had to choose or fulfil at least one criterion to be eligible for the aid. The targeting is therefore considered to have been not very selective. (5 Member States: CZ, EE, IE, LV, LT)
- **CAT:** Member States implemented different measures, each of them accessible under a specific criterion. Farmers could cumulate different measures if they fulfilled the eligibility conditions. This targeting may have been more selective, as the level of support increased with the number of criteria met but depended on the range of the criteria and measures implemented. (7 Member States: BE, BG, ES, FR, HR, PL, PT)
- **ONE:** Member States implemented a single measure accessible to farmers complying with one criterion and sometimes complemented that measure with a second one. This targeting is considered to have been more selective, as the support was delivered to one category of farmers only. (14 Member States: DK, DE, EL, IT, LU, HU, MT, NL, AT, RO, SI, SK, FI, SE)

Some Member States also established additional criteria than the ones included in the Regulation, in order to improve their targeting strategy.

Table 12: Eligibility criteria implemented by Member States for measures targeting the dairy sector

Criteria	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE
(a) production reduction beyond that covered by Commission Delegated Regulation (EU) 2016/1612 or not increasing production	x		x		x	x			x	x				x	x		x	x	x	x	x	x		x		x	
(b) small-scale farming		x				x		x	x	x				x	x	x					x	x	x				
(c) the application of extensive production methods	x	x	x			x		x				x			x	x											
(d) the application of environmental and climate-friendly production methods	x	x	x			x	x			x	x			x	x												
(e) the implementation of cooperation projects	x		x				x		x	x				x	x		x										
(f) the implementation of quality schemes or projects aiming at promoting quality and value added	x		x	x			x				x			x	x										x		x
(g) training in financial instruments and risk management tools			x				x																				
Type of strategy	CAT	CAT	OP	ONE	ONE	OP	OP	ONE	CAT	CAT	CAT	ONE		OP	OP	ONE	ONE	ONE	ONE	ONE	CAT	CAT	ONE	ONE	ONE	ONE	ONE
Total number of criteria selected	5	3	6	1	1	4	4	2	3	4	2	3	1	5	6	2	2	1	2	1	2	2	2	1	1	1	1

Source: DG Agri

N.B.: Some Member States decided to allocate a share of the budget to other livestock sectors and implement other measures under specific criteria. These measures for other sectors are not included in this analysis, which focuses only on dairy farming. Therefore, the amounts of the budget, number of beneficiaries and models implemented reflect only the aid allocated to the dairy sector. It should be noted that in some cases the amount of the budget or number of beneficiaries in the dairy sector could not be differentiated from those of other sectors, and that for some Member States the amount of budget / number of beneficiaries concern all the targeted sectors. These specific situations have been highlighted.

Among the Member States of the ONE category, most selected criterion (a) to require farmers to reduce or not increase production (5 MS) or criterion (b) to target small-scale farmers (4 MS) or criterion (f) on quality schemes as a single criterion to apply for the measure (3 MS). Amongst the Member States of the OP category, two Member States implemented four eligibility criteria, one five eligibility criteria and the two others six eligibility criteria. The combination of criteria selected was very similar among Member States, with the main criteria being criterion (d) on the environmental and climate-friendly production methods, followed by the reduction scheme (a) and the quality scheme (f). Finally, the CAT category reflects uneven implementation choices, although five of the seven Member States implemented criterion (a).

It should be noted that Member States implemented specific conditions in addition to the eligibility criteria listed in the previous table, to further refine their targeting strategies. In Italy, the Managing Authorities decided to specifically target the farmers in the region where the earthquake occurred in 2016. In France, an additional condition was added to receive the support: farmers who had experienced a drop of 20% or more of their gross operating surplus were eligible for the aid. In Wallonia, the Managing Authorities added a premium for young farmers applying to support accessible through the quality scheme (f) and the extensive production methods (c). This premium was not one of the eligibility criteria, however Managing Authorities noted that this category of farmers was particularly vulnerable to the crisis and had to be supported.

4.5.3 Effects of conditionality on production and market stabilisation – criterion (a)

It was demonstrated in ESQ2 that only models implementing criterion (a) - production reduction beyond that covered by Commission Delegated Regulation (EU) 2016/1612 or not increasing production – had affected farmers' production decisions to some extent (see the conclusions of ESQ2). As shown in Table 12, criterion (a) – reducing/not increasing milk production – was the most frequently implemented criterion by Member States (16/27). It was generally implemented with complementary measures or as one criterion among a range of other eligibility conditions to receive the aid (usually under criterion (b) for small-scale farmers and criterion or (d) environmental and climate-friendly production methods). Only five Member States used it as a single criterion/measure (DE, MT, NL, AT, FI). Based on the findings of ESQ2, the introduction of eligibility criterion (a) brought a significant advantage in terms of changes in production decisions compared to Regulation (EU) 2015/1853. Similarly, it was demonstrated in ESQ3 that only measures implemented through criteria (a) could have contributed to market stabilisation, although to a limited extent. This also shows that the introduction of eligibility criterion (a) provided a significant advantage in terms of contribution to market stabilisation, although this contribution was modest. It should however be noted that other eligibility criteria did not bring significant additional effects on production changes and market stabilisation.

4.5.4 Implementation of other criteria with potential effects on short-term liquidity

This section considers whether the conditionality introduced under Regulation (EU) 2016/1613 increased the effectiveness of measures implemented to foster the short-term liquidity of dairy farms. Although it depends on the Member State's strategy, it is assumed that **the effectiveness of measures can be improved when a larger amount of aid is delivered to a smaller number of farms**. Hence, the targeting strategy implemented by Member States and the selection of criteria available under Regulation (EU) 2016/1612 should have contributed to direct the support to the most resilient farming methods and support producers and farmers who suffer most from market disturbances as defined in the regulation. This section focuses on criteria (b), (c), (d), (e), (f) and (g).

4.5.4.1 Criterion (b) small-scale farming

Table 12 shows that small-scale farmers – criterion (b) – is the second most frequently used eligibility criterion (11/27 Member States). Its implementation is based on a maximum number of cows, varying between 9 and 200 cows depending on the Member State. Except for Romania, where (b) was the only criterion implemented, Member States targeting small farms generally implemented other measures/eligibility criteria to enable other types of farms to access support. Table 13 below shows the diversity of models implementing this criterion.

Table 13: Various conditions implemented by Member States under criterion (b) of Reg. (EU) 2016/1613

Models implemented	MS	Definition of the condition	Other eligibility criteria implemented for farmers to access the support
Payment per cow	BG	(b) Farms with max. 20 dairy cows	Farmers must comply with at least one criterion among (b), (c) and (d)
	EE	(b) Farms with max. 200 dairy cows	Farmers must comply with at least one criterion among (b), (a), (c) or (d)
	EL	(b) Farms in the Aegean Islands	This eligibility condition is also required under criterion (c)
	ES	(b) Farms with max. 75 dairy cows or mountain/islands farms	Other specific support made available under criteria (a) and (e)
	LV	(b) Farms with max. 50 dairy cows	Farmers must comply with at least one criterion among (b), (a), (d), (e) or (f)
	PT	(b) Farms with max. 75 dairy cows	Farms with >75 cows can be eligible for the aid if they have not increased production (a)
	RO	(b) Farms with between 3 and 9 dairy cows	No
Lump-sum payment to farmers	FR	(b) Farms with fewer than 30 cows	Farmers must comply with at least one criterion among (b), (d) or (e)
Reimbursement of purchase costs for heifers	PL	(b) Farms with max. 30 dairy cows	This support also complies with criterion (a) for reduction, as the measure encourages the diversification to meat production
Payment per hectare of land	LU	(b) Farms with max. 25 hectares of land	This support also corresponds to criterion (c)
Payment per kg of milk	LT	(b) Farms with max. 30 dairy cows	Farmers must comply with at least one criterion among (b), (a), (c), (d), (e) or (f)

Source: Notifications sent by Member States, DG Agri and case study

As demonstrated in ESQ4, small farms faced specific challenges during the crisis, as their productivity was lower and their costs of production sometimes higher than larger specialised farms. Therefore, it might have been more difficult for them to remain profitable when price declined. This situation shows that delivering support for short-term liquidity specifically to small farms is relevant to support farmers who suffer most from market disturbances as defined in the regulation. Nevertheless, some Member States decided to choose multiple conditions, which significantly broadened the distribution of the aid and potentially lowered its impact.

4.5.4.2 Criterion (c) the application of extensive production methods

Seven Member States selected criterion (c) on extensive production methods, targeting similar sectors and farming methods as criterion (d). Some Member States considered that the extensive methods (c) and environmental and climate-friendly methods (d) were both targeted through a single measure (BE, EE, LT). Similarly, a single measure addressed both criteria (b) and (c) in Luxembourg. Indeed, Regulation (EU) 2016/1613 does not define the eligible extensive practices, so Member States were free to determine which practices would be eligible under this criterion. A few Member States chose to support

farms with organic farming and other labels, and other farms with permanent and temporary grasslands. Member States also chose to support farmers who had already benefited from CAP support associated with other environmental practices (e.g. VCS, Animal welfare, agri-environment-climate measures (AECM), etc.).

Table 14: Various conditions implemented by Member States under criterion (c) of Reg. (EU) 2016/1613

Models implemented	MS	Definition of the condition	Other eligibility criteria implemented for farmers to access the support
Payment per cow	CZ	(c) Farms that implement organic farming	Farmers must comply with at least one criterion among (c), (a), (d), (e), (f) and (g)
	EE	(c) RD support received in 2015 for Animal welfare, Natura 2000 or organic production	Farmers must comply with at least one criterion among (c), (a), (b) and (d)
	EL	(c) Farms in Aegean Islands	This eligibility condition is also requested under criterion (b)
	IT	(c) Farms in mountain areas and the earthquake region	No other criteria
Payment per hectare of grassland	Wal (BE)	(c) Farmers eligible for VCS in 2016	Other specific support made available under criteria (a) and (f)
	LU	(c) Farms with max. 25 hectares of land	This support also corresponds to criterion (b)
Payment per kg of milk	LT	(c) Farmers with extensive grassland management	Farmers must comply with at least one criterion among (c), (a), (b), (d), (e) or (f)

Source: Notifications sent by Member States, DG Agri and case study

Distributing the support towards farms with extensive farming methods may have contributed to targeting the most resilient farming methods as defined by the regulation.

4.5.4.3 Criterion (d) the application of environmental and climate-friendly production methods

Criterion (d) for the application of environmental and climate-friendly production methods was frequently implemented (9/27 Member States - Table 12) through various models according to specific needs or opportunities. For instance, support through this criterion targeted permanent grasslands (BE-Flanders), organic farming (CZ, LT, LV), the reduction of emissions (HR), biogas production (BG, LV) and several other schemes (EE, FR, IE). As for criterion (c), some Member States relied on the existing CAP subsidies to identify farmers eligible for the support, and some Member States implemented selection criteria (c) and (d) to target the same production methods (such as Belgium and Czechia).

Table 15: Various conditions implemented by Member States under criterion (d) of Reg. (EU) 2016/1613

Models implemented	MS	Definition of the condition	Other eligibility criteria implemented for farmers to access the support
Payment per cow	BG	(d) Farms with biogas production installations	Farmers must comply with at least one criterion among (d), (b) and (c)
	CZ	(d) Farms which implement organic farming	Farmers must comply with at least one criterion among (d), (a), (c), (e), (f) and (g)

Models implemented	MS	Definition of the condition	Other eligibility criteria implemented for farmers to access the support
	EE	(d) RD support received in 2015 for Animal welfare, Natura 2000 or organic production	Farmers must comply with at least one criterion among (d), (a), (b) and (c)
	HR	(d) Farms which implement optimisation of ammonia emissions	Farmers must also comply with criterion (f) to receive the support
	LV	(d) Farms which implement organic farming or production of biogas on the dairy farm	Farmers must comply with at least one criterion among (d), (a), (b), (e) and (f)
Payment per hectare of grassland	BE-Flanders	(d) Farmers eligible for VCS (direct payments) in 2016	Other specific support made available under criteria (a), (e) and (f)
Lump-sum payment to farmers	FR	(d) Farms which implement leguminous forages or protein crops	Farmers must comply with at least one criterion among (d), (b) or (e)
Payment per kg of milk	LT	(d) Farms which implement organic agricultural production and crop diversification	Farmers must comply with at least one criterion among (d), (a), (b), (c), (e) and (f)
Cash-flow support loan scheme	IE	(d) Participate in an agri-environment scheme as part of Irelands' RDP	Farmers must comply with at least one criterion among (d), (e), (f) and (g)

Source: Notifications sent by Member States, DG Agri and case study

4.5.4.4 Criterion (e) the implementation of cooperation projects

Eight Member States implemented criterion (e) targeting cooperation projects, for farmers that were already part of a producer organisation or member of a cooperative. Through this condition, Member States could target certain groups of farmers with a stronger position in the supply chain and strengthened market opportunities.

Table 16: Various conditions implemented by Member States under criterion (e) of Reg. (EU) 2016/1613

Models implemented	MS	Definition of the condition	Other eligibility criteria implemented for farmers to access the support
Payment per cow	CZ	(e) Members of POs	Farmers must comply with at least one criterion among (e) or other criteria (a), (c), (d), (f) and (g)
	LV	(e) Members of cooperatives	Farmers must comply with at least one criterion among (e), (a), (b), (d) and (f)
	HU	(e) Members of POs	If farmers are complying with criterion (e), they receive 30% additional support for the measure implementing criterion (a)
Payment per kg of milk	LT	(e) Members of cooperatives	Farmers must comply with at least one criterion among (e), (a), (b), (c), (d) and (f)
Cash-flow Support Loan Scheme with reduced interest rate	IE	(e) Members of farm partnerships	Farmers must comply with at least one criterion among (e), (d), (f) or (g)
Lump-sum payments to farmers	FR	(e) Member of a producers' organisation or cooperative	Farmers must comply with at least one criterion among (e), (d) or (b)
	ES	(e) Farms with max. 75 dairy cows or mountain/island farms	Other specific support made available under criteria (a) and (b)

Models implemented	MS	Definition of the condition	Other eligibility criteria implemented for farmers to access the support
Payment per operational group	BE-Flanders	(e) EIP cooperation projects	Other specific support made available under criteria (a), (d) and (e)

Source: Notifications sent by Member States, DG Agri and case study

Farms involved in a producers' organisation can be considered as more resilient, and Member States might want to foster further structuring among the milk suppliers to better adapt the production to market demand. Cooperation projects in the milk sector can also increase the capacity of farmers to negotiate higher sale prices with milk processors, thereby strengthening their long-term sustainability.

4.5.4.5 Criterion (f) the implementation of quality schemes or projects aiming at promoting quality and value added

The targeting of farmers involved in quality schemes through criterion (f) was selected by nine Member States. Except for Slovakia, all other Member States targeted farmers which are already involved in a quality scheme. The table below shows the variety of implementation models under this criterion.

Table 17: Various conditions implemented by Member States under criterion (f) of Reg. (EU) 2016/1613

Models implemented	MS	Definition of the condition	Other eligibility criteria implemented for farmers to access the support
Cash-flow Support Loan Scheme with reduced interest rate	IE	(f) Members of a Quality Assurance Scheme	Farmers must comply with at least one criterion among (f), (d), (e) or (g)
Payment per cow	BE (Wal; Fla)	(f) Members of the IKM/QFL quality scheme	Other specific support made available under criteria (a), (c) and (d)
	CZ	(f) Accredited quality scheme	Farmers must comply with at least one criterion among (f), (a), (c), (d), (e) and (g)
	LV	(f) Thresholds for somatic cells and bacteria in milk	Farmers must comply with at least one criterion among (e), (a), (b), (d) and (f)
	HR	(f) Farms which implement milk collection recording system	Farmers must also comply with criterion (e) to receive the support
	SK	(f) Participation in performance testing	No other criteria
Payment per kg of milk	DK	(f) National quality schemes also involving milk composition, food safety, animal welfare, environmental considerations, milk collection	No other criteria
	LT	(f) Control of dairy cows' productivity	Farmers must comply with at least one criterion among (f), (a), (b), (c), (d) and (e)
	SE	(f) Animal welfare, Environmental consideration, Food safety, Milk composition	No other criteria

Source: Notifications sent by Member States, DG Agri and case study

4.5.4.6 Criterion (g) training in financial instruments and risk management tools

Finally, only two Member States used criterion (g) for training in financial instruments and risk management tools: support was provided in Ireland to farmers who had already participated in training and in Czechia to farmers who undertook to participate in training. In both these Member States, farmers could also access the support through other eligibility criteria ((d);(e) or (f) in Ireland and (a); (c); (d);(e) and (f) in Czechia).

4.5.5 Analysis of the complexity and advantages induced by the conditionality

This section considers whether the advantages provided by the conditionality were proportional to the complexity of implementation. Indeed, the implementation of eligibility criteria increases the administrative costs associated with the processing of applications, the control, and the delivery of the aid for Managing Authorities and payment agencies. The ability to easily check the eligibility of applicants can therefore be key in the design of the aid implemented. For this reason, Member States have sometimes opted for simplification, e.g. by targeting the support towards beneficiaries of specific CAP support.

The previous ESQ (ESQ4) already provides a detailed analysis of the effects of such aid on farmers' liquidity issues. It concludes that under Regulation 2016/2013, despite the introduction of eligibility criteria, the amounts distributed were generally too low to cover short-term liquidity issues. Furthermore, stakeholders had divided opinions on the vulnerability of dairy farms, some of them considering that small farms suffered the most from the crisis while others outlined that the big, specialised farms, which had invested before the crisis, were those most suffering from the crisis. Furthermore, case study interviews outlined that the targeting of specific production decisions (e.g. no increase of milk production) or specific farm types (small-scale, extensive farms, members of producers' organisation, etc.) **did not bring significative advantages in terms of effectiveness of the measures implemented**, except when the budget envelope was partially or fully allocated to complement the reduction scheme covered by Commission Delegated Regulation (EU) 2016/1612. Notably, **the measures aiming at fostering the short-term liquidity of farms only rarely targeted a limited number of beneficiaries**. In many Member States, the general approach favoured by the Managing Authority was **to distribute the aid among a large proportion of dairy farmers**, and there was actually no real conditioning strategy (see ESQ4). From this perspective, the introduction of conditionality under Regulation (EU) 2016/1613 led to additional administrative complexity, with limited additional effects on farmers' liquidity issues.

4.5.6 Summary of findings

Eligibility criteria were introduced by Regulation (EU) 2016/1613 to foster the targeting of the exceptional aid towards the most resilient farming methods and support producers and farmers who suffer most from market disturbances. The analysis of Member States' conditioning strategy reveals various choices regarding the number and combinations of the eight criteria introduced by the Regulation to deliver exceptional support oriented towards the dairy sector.

At EU level, 14 Member States decided to implement one single measure with one or two eligibility criteria to be met by farmers to receive the aid. Other Member States implemented multiple eligibility criteria, distributing the exceptional support to a broader share of dairy farmers. Some of them implemented different criteria under different measures that farmers could cumulate if they complied with each eligibility criteria (BE, BG, ES, FR, HR, PL, PT). Others implemented measures accessible under a wide variety of criteria, by farmers complying with at least one of the different criteria (CZ, EE, IE, LV, LT).

Eligibility criterion (a) – reduction of milk production – may have increased the capacity of the exceptional aid's effect on farmers' production decisions and market stabilisation. Sixteen Member States

decided to select this criterion (a) under Regulation (EU) 2016/1613, either to complement Regulation 2016/1612 and increase the amount paid by litre of milk reduced, or as a payment per litre produced under the condition not to increase milk production. As seen in ESQ2 and 3, this might have had a positive effect on the reduction of milk production, and it may have contributed to market stabilisation.

The targeting of exceptional aid towards specific farm types may have increased the effectiveness of the measures supporting the short-term liquidity of farmers by delivering a larger amount of aid to a smaller number of farms. Among the criteria most often selected, 11 Member States decided to support the small-scale farmers, with various ceilings and payment models. As demonstrated in ESQ4, it was sometimes more difficult for small farms to remain profitable when prices declined, as small farms faced specific challenges during the crisis. Therefore, the choice of delivering support for short-term liquidity specifically to small farms is relevant to supporting farmers who suffer most from market disturbances as defined in the regulation. Nine Member States targeted farms applying environmental and climate-friendly production methods, and eight Member States decided to target farms applying extensive production methods (five Member States targeted both farms with extensive methods and environmentally friendly methods). Delivering the support to farms implementing environmental and climate-friendly production methods may have enabled them to overcome the difficulties associated with the dairy crisis and improved their long-term sustainability, thereby helping to supporting the most resilient farming methods as defined by the regulation.

However, the stakeholders interviewed reported that the targeting of specific farm types (small-scale, extensive farms, members of producers' organisation, etc.) introduced by Reg. (EU) 2016/1613 did not bring significative advantages in terms of effectiveness of the measures implemented, as the measures aiming at fostering the short-term liquidity of farms were generally implemented so as to grant access to the aid to a large range of dairy farmers. Considering that the implementation of eligibility criteria increases the administrative costs associated with the processing of applications, the control, and the delivery of the aid, the introduction of conditionality under Regulation (EU) 2016/1613, even if theoretically relevant, was deemed as not efficient.

4.6 ESQ6 – Coherence: To what extent were the two exceptional measures coherent with the general CAP objective on the sustainable management of natural resources?

4.6.1 Understanding and method

This question assesses whether the EU framework set by Regulation (EU) 2015/1853 providing for temporary exceptional aid to farmers and Regulation (EU) 2016/1613 providing for exceptional adjustment aid to milk producers and farmers in other livestock sectors, is coherent with the environmental objectives of the CAP on the sustainable management of the natural resources. It considers only the coherence of the support granted to the dairy sector. Regulation (EU) 2015/1853 left flexibility to Member States to implement the models they considered most adapted to the needs of farmers, whereas Regulation (EU) 2016/1613 introduced conditionality with a list of eligibility criteria to be selected by Member States. The coherence of the models implemented by Member States is assessed in ESQ7.

The analysis considers Regulations (EU) 2015/1853 and 2016/1613 separately, to highlight potential differences arising from the introduction of conditionality in Regulation (EU) 2016/1613 and address the following judgement criteria:

- Regulation (EU) 2015/1853 includes provisions that are coherent (or not) with the environmental objectives of the CAP.
- Regulation (EU) 2016/1613 includes provisions that are coherent (or not) with the environmental objectives of the CAP.

Several CAP instruments and measures were provided by the overall CAP framework in the 2014–2020 programming period to support sustainable practices and limit any negative impact of dairy production on the environment (e.g. conditionality, greening measure and AECM). However, the main objective of the exceptional measures implemented by the European Commission was to provide economic support to dairy farmers. It is thus necessary to examine the coherence of this exceptional aid with the environmental objectives of the CAP. For this purpose, the analysis considers the provisions set in the EU framework and assesses their potential effects on the environment based on a literature review and the opinion of the stakeholders interviewed.

4.6.2 Coherence of Regulation (EU) 2015/1853 with the CAP objective on sustainable management of natural resources

4.6.2.1 Analysis of the EU framework

Regulation (EU) 2015/1853 was designed by the European Commission to allow Member States to address the '*economic consequences resulting from the market disturbances on farmers in the livestock sectors'* (Art.1). The main objective was therefore to provide financial support to farmers in the livestock sectors concerned by the market crisis. There was **no specification on the environmental and sustainable management of natural resources** in the regulation, and Member States were not forced to address this aspect when establishing their implementation choices. Moreover, the **significant flexibility left up to Member States regarding the implementation of the aid does not offer sufficient guarantee for the models implemented to align with the environmental objectives of the CAP**.

Indirect effects on the environment depend on the type of farmers receiving the support and farming practices implemented. If farmers are supported to maintain their production, the impact on the environment emerging from this production is expected not to change. As **the aid was mostly distributed in the form of a direct payment to farmers, without consideration of their size, practices or impact on the environment**, the potential impact on the environment depends on the type of farms that were supported.

4.6.2.2 Expected effects on the environment

As demonstrated in ESQ2, **providing financial support to farmers did not affect their production decisions and farming practices.** No direct impact on the environment is expected, as no specific provisions fostered environmental practices. As a result, a large variety of dairy farm types were supported, with various potential impacts on the environment.

Dairy farming is known to be a major source of greenhouse gas emissions in the agricultural sector. It particularly produces methane, resulting from enteric and manure fermentation, and nitrous oxide, emitted through manure storage and spreading (Rotz, 2018). Depending on the farming methods, as well as the quantity of milk produced, the quantity emitted may vary. Regarding water pollution, dairy farming constitutes a significant source of nitrate emissions (especially ammonia), which occur during the production, storage and spreading of manure and mineral fertilisers. These nitrate emissions cause acid deposition and intensive acidification of soil and water (Guerci et al., 2013a). One of the main impacts of the dairy sector is water eutrophication, resulting from nitrate leaching, phosphate run-off and volatilisation of ammonia, which is then present in groundwater. Intensive dairy farming, especially, is found to be a significant cause of water eutrophication (Bignal, 2000). The intensification of agriculture has also contributed to significant declines in biodiversity, especially with some of the biggest drivers being habitat change and land use (Sizemore, 2015). However, dairy farms also contribute to the preservation of biodiversity and carbon sequestration through the maintenance of pastures and landscape features (Müller-Lindenlauf, Deittert and Köpke, 2010). **Theoretically, the granting of support to all dairy farms can contribute to maintaining farms with both higher and lower**

impact on the environment. Thus, a status quo of the situation can be expected. This opinion was shared by most stakeholders interviewed.

It should be noted that farmers using environmentally friendly practices are more likely to be vulnerable to price drops since they usually experience lower productivity and/or more significant costs. **If holdings with beneficial practices for the environment ceased their activity due to the crisis, this would negatively impact the environment**. Moreover, it can be considered that the maintenance of less profitable holdings contributed to preventing further concentration of dairy production. Hence, as reported by some stakeholders, the granting of financial support may have helped **prevent the geographical concentration of pollution generated by intensive dairy farming in smaller areas.**

4.6.3 Coherence of Regulation (EU) 2016/1613 with the CAP objective on sustainable management of natural resources

4.6.3.1 Analysis of the EU framework

Regulation (EU) 2016/1613 came a year later than Regulation (EU) 2015/1853, with the broader objective of alleviating the market disturbance. As stated in the regulation, this exceptional aid was also designed to target specifically '*more sustainable farming methods*' (Recital (10) in order to improve farmers' resilience. The objective of support for sustainability was therefore explicitly stated in this regulation, although it was mostly a question of economic sustainability (Art. 1). By requesting Member States to support milk producers who engage in activities listed in the regulation, the framework gave less flexibility to Member States. Some of the eligible activities address environment-friendly farming methods and are therefore expected to contribute to the environmental objectives of the CAP. Especially, activities reported under (b) small-scale farming, (c) application of extensive production methods, (d) application of **environmental and climate-friendly practices and (g) implementation of quality schemes or projects aiming at promoting quality and value added** can generate environmental benefits. Other activities listed in the Regulation are not related to the environment (e.g. training in financial instruments and risk management tools). It should however be noted that **Member States had the freedom to target one or several activities, all of which could not be directly linked to environmental-friendly practices**.

4.6.3.2 Expected effects on the environment

The targeting of extensive production methods, environmental and climate-friendly practices or quality schemes such as organic farming is supposed to bring positive advantages to the environment, as demonstrated by the literature. There is a consensus on the fact that crop and especially grasslands have positive impacts on the reduction of greenhouse gas emissions. Extensive dairy farms, characterised by low levels of inputs and grazing herds, tend to be less emitting than intensive farms (Crosson et al., 2011). Reduction of the intensity of milk production is known to reduce greenhouse gas emissions (Casey and Holden, 2005) (Guerci et al., 2013b). Changes in feed management (forage quality) (Ouatahar et al., 2021) and methane capture from manure storage can also contribute to reduction (Calvet et al.).

Carbon storage of grasslands is also a factor contributing to emissions reduction (Crosson et al., 2011) (CELAGRI, 2021). Extensive farming and especially grazing are found to reduce global carbon emissions linked to dairy farming, via sequestration (Alan Rotz et al., 2009). Grasslands sequester more carbon than do crops, which means dairy farms with permanent or temporary grasslands have a positive impact on carbon sequestration. **Support to extensive grazing dairy systems may help farmers overcome the crisis and maintain their positive impact on carbon sequestration**. Low-input farm types, especially with grasslands, are moreover found to reduce ammonia emissions and therefore water pollution (Guerci et al., 2013b) (Müller-Lindenlauf, Deittert and Köpke, 2010).

Extensive and organic farms are also thought to reduce the negative effects of dairy farming on groundwater. On extensive farms, specific dairy farming practices putting high value on nature, such as the use of grasslands and non-productive areas, may also contribute to enhancing biodiversity (Kok et al., 2020). Organic farming and environmentally friendly behaviours are likewise found to benefit the preservation of biodiversity (Power, Kelly and Stout, 2013) (Guerci et al., 2013b). Regulation (EU) 2016/1613 also enabled to target other **environmental and climate-friendly production methods, such as biogas production, grazing, crop diversification, etc.** that can reduce the impact of dairy farming on the environment. By allowing farms implementing such methods to stay active through the crisis, the environmental benefits should be maintained. The stakeholders also confirmed the coherence of exceptional support targeting these activities and the environmental objectives of the CAP.

The potential benefits of small-scale farming on the environment are more difficult to assess. While small farms are expected to have smaller herd sizes and use more traditional farming methods, such as grazing, they do not systematically implement environmentally practices. **However, the support of small farms, notably in remote areas, may contribute to slowing the concentration process of the dairy market, with favourable effects on the environment.** Small-scale farming has also been found to be a potential sink of carbon sequestration if based on a grassland system (Salvador et al., 2017). It also has potentially positive action on water pollution associated with dairy farming, as the herd size generates smaller quantities of manure. Helping small farms may therefore contribute to keeping low-impact farms active.

The other targeted activities do not have environmental benefits, but their overall coherence with the environmental objectives of the CAP is considered as neutral or positive. For instance, the **reduction of milk production was sometimes achieved by reducing the use of concentrates in feeds** so as to reduce the yield per cow (Cniel, Jurquet and Roussel, 2020). As on-farm feed production as well as commercial feed imports contribute to the increase of greenhouse gas emissions, reducing feed to reduce milk quantity produced could result in a decrease in GHG emissions as well as in ammonia emissions which would reduce water pollution. **The targeting of cooperation projects may promote producers' organisation, members of cooperatives and farmers in PDO or PGI** with a variety of farming practices, some of them more virtuous, with positive impacts on biodiversity or water pollution. However, the targeting of **farmers engaged in risk management and financial instrument training does not show any link** with the environmental aspect. Generally, the stakeholders interviewed consider that these other activities have no impact on the environment.

4.6.4 Summary of findings

The analysis of the EU framework set by Regulations (EU) 2015/1853 and (EU) 2016/1613 reveals a general coherence with the objective of the CAP on the sustainable management of natural resources, although the main objective of the exceptional measures implemented by the European Commission was to provide economic support to dairy farmers.

Notably, Regulation (EU) 2015/1853 integrated no specification on the environmental and sustainable management of the natural resources. Moreover, it left significant flexibility to Member States to implement the exceptional aid and enabled them to distribute the exceptional support in the form of a direct payment to farmers, without consideration of their size, practices and impact on the environment. Theoretically, providing financial support to farmers does not affect their production decisions and farming practices. Hence, no positive or negative impact can be expected from the support, aside from the externalities generated by the type of farms that were supported. The aid aimed at supporting farmers during the crisis, especially those experiencing the sharpest fall in price. As a result, it contributed to maintaining farms with higher and lower impact on the environment, favouring a status quo (the situation prior the crisis). However, considering that farmers using environmentally friendly practices are more likely to be vulnerable to price drops since they usually have lower productivity and/or more significant costs, the granting of support to those types of farms potentially helped them to maintain their production. The exceptional aid may also have helped prevent the geographical concentration of pollution generated by intensive dairy farming in smaller areas. Therefore, Regulation

(EU) 2015/1853 is considered as coherent with the CAP on the sustainable management of natural resources.

By requesting Member States to support milk producers engaged in a list of activities, Regulation 2016/1613 offered less flexibility to Member States. Moreover, among the eligible activities were environment-friendly farming methods contributing to the environmental objectives of the CAP. It should however be noted that Member States had the freedom to target one or several activities, not all of which could be directly linked to environmental-friendly practices. The impact on the natural resources and environmental objectives of the CAP, therefore, mostly depends on the implementation choices made by Member States. Hence, exceptional support could be granted to farmers engaged in activities such as application of extensive production methods, application of environmental and climate-friendly practices and implementation of quality schemes or projects aiming at promoting quality and value added. As the literature and most of the opinions emerging from the case studies show, these activities should have positive effects on greenhouse gas emissions, carbon sequestration, water pollution and biodiversity. Therefore, they were considered by most stakeholders in the case studies to be the most coherent with the environmental objectives of the CAP. Small-scale farming was also designed by the regulation as eligible for the exceptional support. The granting of support to small farms may have contributed to maintaining them, especially in remote areas. As small farms are generally less intensive, especially when based on a grassland system, and generate lower amounts of manure, this aspect of the regulation is considered to be coherent with the objective of sustainable management of natural resources. On the other hand, other eligible activities, such as production reduction, cooperation projects, and financial and risk management training are not expected to generate significant effects on the environment, and their overall coherence with the environmental objectives of the CAP is considered as neutral. The stakeholders confirmed the increased coherence of Regulation 2016/1613 supporting specific activities contributing to the environmental objectives of the CAP.

4.7 ESQ7 – Coherence: To what extent were the various models implemented by the Member States for delivering exceptional aid coherent with the environmental objectives of the CAP?

4.7.1 Understanding and method

This question focuses on the coherence of the models implemented by Member States with the environmental objectives of the CAP. Indeed, Regulations (EU) 2015/1853 and (EU) 2016/1613 left flexibility to Member States to implement the exceptional support and to target the aid toward specific farm types and/or activities in the dairy sector. Depending on the type of support implemented and the type of activity supported, different effects on the environment can be expected.

In particular, as demonstrated in ESQ6, Regulation 2016/1613 requested Member States to deliver the exceptional aid to farmers engaged in different activities, among which environment-friendly farming methods contributing to the environmental objectives of the CAP. However, Member States could target one or several activities, not all of them with environmental-friendly practices. The implementation choices made by Member States thus determine the degree of coherence of the support with the environmental objectives of the CAP.

The analysis considers Regulations (EU) 2015/1853 and 2016/1613 separately, as they provide different regulatory framework and provisions for Member States. The following judgement criteria are examined:

- **Models implemented under Regulation (EU) 2015/1853 were (or not) coherent with the environmental objectives of the CAP.**
- **Models implemented under Regulation (EU) 2016/1613 were (or not) coherent with the environmental objectives of the CAP.**

The analysis examines the different models implemented based on Member States' notifications. For Regulation (EU) 2016/1613, particular attention is granted to the implementation of models supporting small-scale farming (b), extensive production methods (c), environmental and climate-friendly production (d) or quality schemes (g) to draw up the list of Member States supporting those activities expected to have positive effects on the environment. This information is then complemented with opinions from stakeholders interviewed in case-study Member States.

4.7.2 Coherence of models implemented under Regulation (EU) 2015/1853

The models implemented by Member States under Regulation (EU) 2015/1853 consisted in financial support granted to dairy farmers, without consideration **of their size, practices or impact on the environment**. Only the Netherlands decided to use the exceptional aid to improve the environmental effects of its dairy production.

Hence, **most support was intended to alleviate the short-term liquidity issues** of farmers. As presented in section 2.5.1, different types of payments were implemented to distribute the aid among the dairy farmers: payment per litre produced or per dairy cow, lump-sum payments per holding, exemption of charges and loan-related instruments. The potential impacts of each type of support on the environment depend on the type of farms supported and corresponding farming practices implemented. According to the stakeholders interviewed in case-study Member States, the exceptional aid had no intended effect on the environment, and the coherence of the models implemented was generally considered as neither positive nor negative.

Nevertheless, it can be argued that a **payment coupled with milk production (i.e. per litre produced) with no capping may not be coherent with the environmental objectives of the CAP**, as this support results in bigger farms receiving higher amounts. It was demonstrated in ESQ6 that smaller, less intensive farms usually have a higher environmental value; therefore, this form of support that benefits the biggest farms may not provide sufficient support to small farms that guarantees they can maintain their activity.

The **payment per number of dairy cows with no capping also represents an allocation proportional to the size of the farm, with no regard to the impact of the practices implemented and potential effects on the environment**. However, by supporting the number of cows and not the quantity produced, farms with lower yields per cow should receive a relatively higher amount than if the payment had been granted per litre. This could therefore benefit extensive farms generally associated with lower yields and exert more positive impact on the environment (especially regarding water quality and biodiversity).

On the other hand, **flat payments delivered to each farm benefit small extensive farms** with lower costs and total output relatively more.

The loan-related instruments intended to provide higher cash-flow access to farmers. As there was **no specific targeting imposed by the regulation**, the impact on the environment depends on the type of farms that were supported through this model.

In the Netherlands, **the model implemented under Regulation (EU) 2015/1853 was specifically designed to address the environmental issues of the dairy sector**, revealing the possibility for Member States to use Regulation (EU) 2015/1853 to implement environment-related measures. This interesting example of a model designed in complete synergy with the environmental objectives of the CAP is described in the box on next page.

Box 4: Example of an implemented measure targeting specific environmental practices

In the Netherlands, the model implemented under Regulation (EU) 2015/1853 aimed at improving the environmental sustainability of dairy farms. The notifications, complemented by the Dutch case study, describe the rationale of the measure.

In 2015, EUR 9.98 million was allocated to the dairy sector through exceptional aid, with three different purposes:

1) To build a database on farmers' use of minerals and to provide a discount to farmers undertaking analyses of their silage and soil samples;
2) To improve animal health and reduce the use of antibiotics in dairy farms;
3) To provide compensation to farmers allowing their cows to graze day and night, and to farmer groups participating in a meadow bird package in the context of agricultural nature management.

By improving mineral management of farmers on dairy farms, increasing the number of farms implementing outdoor grazing, and improving animal health on dairy farms, the government expected to improve the environmental impact of dairy farming.

The different representatives of the dairy industry and farmers interviewed revealed that this measure had contributed to making dairy farmers more aware of the benefits of environmentally friendly practices. It also helped lower greenhouse gas emissions and enhance biodiversity. However, the impact of the measure was difficult to quantify according to stakeholders interviewed.

Source: Notifications sent by the Dutch Government, Dutch Case-Study

4.7.3 Coherence of models implemented under Regulation (EU) 2016/1613

By requesting Member States to support milk producers who engage in given activities, Regulation (EU) 2016/1613 provides less flexibility to Member States. Some of these activities address environment-friendly farming methods and are therefore thought to contribute to the environmental objectives of the CAP. However, Member States could decide which activities to support. Small-scale farming was supported by 11 Member States, environmental and climate-friendly practices by 9 Member States and extensive production methods by 8 Member States (see ESQ5).

The analysis in ESQ6 concluded that the other activities have no intended effects on the environmental objectives of the CAP. Depending on the implementation choice of the Member States or the types of farms supported, some may have positive impacts, but the overall coherence of these activities with the environmental objectives of the CAP was not clearly demonstrated.

Small-scale farming

Regulation (EU) 2016/1613 does not provide a precise definition of small-scale farming. As shown in ESQ6, small-scale farming is not directly associated with extensive, more virtuous practices, however small farms contribute to maintaining milk production spread over a larger area, including in remote areas, which is expected to have a positive impact on the environment. When small farms rely on grazing and traditional production methods, the impact on biodiversity, water pollution, greenhouse gas emissions and carbon sequestration is expected to be positive.

The ways this activity was supported varied among Member States. The herd size was the main criterion for small farms to be eligible, which determined the eligibility of farms to the exceptional aid. **Among Member States, the maximum number of cows was generally set around 30, with only Estonia having a higher maximum number of cows (200) and Romania having the lowest (9).** The model implemented in Poland targeted small farmers by giving them support to convert from milk production to extensive beef production. According to the different stakeholders interviewed, this scheme was coherent with the objective to reduce the greenhouse gas emissions and the water pollution arising from dairy production. As a significant share of small-scale farms is concentrated in Bulgaria, the Managing Authority considered the targeting of small-scale farmers relevant in terms of economic

sustainability as well as environmental sustainability. In its notifications, it underlined the importance of preserving biodiversity by supporting small-scale farms. **In Greece, Luxembourg and Romania, the models implemented targeted the exceptional support to small farms only**. In Greece, the support targeted farms in a specific geographical region, which were considered to be small and extensive or semi-extensive by the Managing Authorities. In Luxembourg, the eligibility was determined by the number of temporary or permanent hectares of grassland owned, which benefited small extensive farms. The Romanian Managing Authority chose a maximum of nine cows to be eligible for the aid, arguing during the interview that the dairy sector was characterised by family-based and traditional systems, with about a third of milk production used for self-consumption. **The holdings supported were therefore expected to have a lower impact on the environment than larger dairy farms, as stated by the Managing Authority, which considers that it is coherent with the environmental objectives of the CAP**. In contrast, in Spain and in Portugal support for small-scale farming was not justified by the environmental benefits associated with that type of farm.

It can therefore be concluded that the different models chosen by Member States when supporting small-scale farming may have had **various environmental impacts, depending on the way small-scale farming was defined by Managing Authorities and the decision rationale behind the implementation choice**.

Extensive production methods

As demonstrated in ESQ6, extensive dairy systems are considered as contributing the most to the reduction of the environmental impact of dairy production, by preserving biodiversity, reducing water pollution and greenhouse gas emissions, and improving carbon sequestration. Eight Member States decided to support extensive production methods in the dairy sector, through multiple implementation choices (i.e. BE, BG, CZ, EE, EL, IT, LT, LU).

In Belgium-Wallonia, the Managing Authority implemented **support proportional to the number of permanent or temporary grasslands** owned by cattle and dairy farmers. Stakeholders interviewed consider this model as coherent with the environmental objectives of the CAP, because of the benefits brought by permanent grasslands on the environment. Providing support dedicated to farms with permanent or temporary grassland may have helped them face the market disturbance and was also expected to give a positive signal to farmers owning grasslands. Two other Member States supported farms with temporary and permanent grasslands. In Lithuania, farmers with permanent or temporary grasslands representing over 80% of their land could receive a payment of EUR 0.03 per litre of milk produced. In Luxembourg, the support took the form of a premium for the first 25 hectares of permanent and temporary grasslands.

The Estonian Managing Authority was targeted **farmers who benefited from different measures from the Rural Development plans** (over 2007–2013 and 2014–2020): Animal welfare, Natura 2000 for agricultural land and support for organic production. These measures foster practices beneficial for the environment, contributing to the environmental objectives of the CAP. Hence, granting exceptional aid to these holdings enhances the coherence of exceptional aid with the environmental objectives of the CAP. In Estonia, the exceptional aid was also delivered to farms engaged in other activities, i.e. production reduction, small-scale farming and the application of environmental and climate-friendly methods.

In Bulgaria, the model supported **farms with more than 20 cows, eligible for the voluntary coupled support, located in nitrate-vulnerable zones**. As specified by the Managing Authority, holdings in nitrate-vulnerable areas are required to have manure storage facilities, which reduce agricultural pollution on water. Hence, the delivery of exceptional support to these farms is coherent with the environmental objectives of the CAP.

In Italy and Greece, the exceptional support was delivered only to farms with extensive production methods. In Greece, the model specifically targeted small farms with extensive production methods, located in the Aegean Islands. As stated in the notifications, these islands are economically

vulnerable due to the refugee crisis and are mostly extensive farms. In Italy, the support was provided to mostly extensive or semi-extensive farms in mountainous areas and to farms in central regions having suffered from an earthquake in 2016. The researcher interviewed pointed out that the support mostly aimed at maintaining milk production in these areas. Hence, the real impact is hard to assess, as the model based on the geographical location of farms does not make it possible to determine the farming system supported.

For most case-study Member States, **the models implemented were considered as coherent with the environmental objectives, even if the interviewees stressed that the improvement of environmental practices was not the primary objective of the exceptional aid**. Indeed, depending on the Member States (e.g. in BE, CZ, EE, LT), the aid could be accessible to farms engaged in other activities as well, with no particular benefit for the environment (i.e. production reduction, implementation of cooperation projects, etc.).

Application of environmental and climate-friendly production methods

This activity was supported by nine Member States, through models targeting support for several activities. Hence, farmers could access the exceptional support if they fulfilled another criterion. There is no information on the share of beneficiaries engaged in environmental and climate-friendly production methods in these Member States.

Generally, the support for environmental and climate- friendly production methods targeted organic farms (CZ, LT, LV), agri-environmental schemes (EE, IE) and biogas production (BG, LV). Other activities were also supported, such as crop diversification, optimisation of ammonia emissions, protein crops or hectares of grasslands.

In Czechia, Lithuania and Latvia, Managing Authorities implemented **models supporting organic farms** (among other activities). According to the literature, organic dairies have a positive effect on biodiversity by conserving wildlife and landscapes because of their diversified farming conditions. Studies show that organic farming also results in lower nitrate leaching and lower emissions than conventional farms, although opinions differ in the literature according to the type of calculation and factors included (Stolze et al., 2000), (Power, Kelly and Stout, 2013), (De Boer, 2003). Models supporting organic dairy farms may have therefore benefited to the environment.

The Lithuanian Managing Authorities also targeted **holdings where at least four different crop productions were combined with the milk production**. Crop diversification has been acknowledged to improve numerous environmental indicators, especially biodiversity, water quality, as well as greenhouse gas emissions (Beillouin et al., 2020), (Alletto, Vandewalle and Debaeke, 2022). These studies show that crop diversification has a beneficial impact on the environment as well as on the economic sustainability of farms – impact which is coherent with the environmental objective of the CAP.

The Bulgarian government targeted farms with **biogas-producing installations**. Biogas production from plant crops in dairy farms enables reduction of greenhouse gas emissions emitted by the traditional use of fossil fuels (Torquati et al., 2014). The impact of this model may thus have been positive on the greenhouse gas emission reduction objective of the CAP.

In Croatia, the exceptional aid was implemented to **enhance the resilience of milk production by reducing feed costs, upgrading milk quality and rationalising ammonia emissions linked to feed** (as stated in the notifications). Reduction in the use of concentrates, as well as the introduction of coarse fodder and the reduction of metabolic disorders, might have favoured more sustainable and qualitative milk production with less ammonia emission.

In France, Estonia and Ireland, the support targeted **beneficiaries of other CAP measures, e.g. AECM and coupled support to fodder-legume production, etc.** As these measures contributed to the implementation of farm practices beneficial for the environment, these models should theoretically be considered as coherent with the environmental objectives of the CAP. However, the targeting strategy of these Member States was not very selective, as the support was also accessible to other types of

farms with no demonstrated environmental benefits, which diminishes the overall coherence with the environmental objectives of the CAP.

Environmental effects of other activities supported

The other activities supported by Member States through the exceptional aid are not related to the environment. Therefore, their coherence with the environmental objective of the CAP is considered as neither positive nor negative.

However, in the opinion of several stakeholders interviewed (in BE, FR, FI), the reduction of the production was coherent with the environmental objective of the CAP, as it might have contributed to lowering the environmental impact from dairy production, notably by reducing greenhouse gas emissions. In the Netherlands, the stakeholders explained that **the scheme for herd reduction was intended to reduce phosphate production, by improving mineral efficiency in dairy farms**. In Belgium-Wallonia, the farmer representatives were certain that participation in the quality scheme had positive impacts on the environmental objectives, as **the quality standards also rely on the implementation of farming practices beneficial for the environment**.

4.7.4 Summary of findings

The analysis reveals that the various models implemented by the Member States for delivering exceptional aid were generally coherent with the environmental objectives of the CAP. More specifically, the provisions introduced under Regulation 2016/1613 led Member States to implement a variety of strategies benefiting farms engaged in environment-friendly farming methods.

The models implemented by Member States under Regulation (EU) 2015/1853 consisted in financial support granted to dairy farmers, without consideration of their size, practices or impact on the environment. Hence, the potential impact on the environment depends on the type of farms supported and the corresponding farming practices implemented. According to the stakeholders interviewed in case-study Member States, the exceptional aid had no intended effect on the environment, and the coherence of the models implemented was generally considered as neither positive nor negative. However, the type of payment implemented by Member States must be carefully considered. As coupled payment linked to the volume of milk produced or the number of dairy cows would benefit the bigger farms, flat payments can support smaller extensive farms, characterised by lower costs and smaller total output. Only the Netherlands implemented the exceptional aid to improve the environmental effects of dairy production, revealing the possibility for Member States to use Regulation (EU) 2015/1853 to implemented environment-related measures.

Models implemented under Regulation (EU) 2016/1613 were much more oriented toward activities addressing environment-friendly farming methods and therefore show greater coherence with the environmental objectives of the CAP. Models supporting dairy farms engaged in activities beneficial for the environment (e.g. extensive small-scale farming, pasture-based dairy systems, organic farming, etc.) were identified in 16 Member States. These models are expected to have positive impacts on greenhouse gas emissions, carbon sequestration, water quality and/or biodiversity. In some cases, Member States granted eligibility to holdings that had benefited from other CAP measures fostering environmental practices, thus enhancing the coherence of the exceptional aid with the environmental objectives of the CAP. However, the models were more or less oriented towards environmentally friendly activities depending on the Member States' implementation choices. Hence, some Member States in fact focused the aid on one type of beneficiary, e.g. small extensive farms in Greece and Luxembourg. However, most Member States also made the support accessible to farms engaged in other activities, thereby lowering the overall coherence with the environmental objectives of the CAP. Indeed, the other activities supported were not related to the environment, although some stakeholders considered that the support for the reduction of the production may have brought positive advantages to the environment.

4.8 ESQ8 – Coherence: To what extent did the various models implemented by Member States for delivering exceptional aid, as part of the entire set of CAP measures, contribute to the overall long-term sustainability of their livestock farmers?

4.8.1 Understanding and method

This question focuses on the coherence of the various models implemented by Member States under Regulation (EU) 2015/1853 and Regulation (EU) 2016/1613 with the CAP objective of supporting the overall long-term economic sustainability of the EU agricultural sector, and especially dairy farmers. The evaluation question considers the long-term sustainability of livestock farmers as deriving from farm overall profitability and farm income and its stability. To evaluate whether the models implemented by Member States were coherent with the overall long-term sustainability of livestock farmers, the evaluation question is built around the following judgment criteria:

- **The various models implemented by Member States are coherent (or not) with the objective of supporting farm profitability.**
- **The various models implemented by Member States are coherent (or not) with the objective of supporting farm income and income stability.**

This coherence evaluation study question builds on a theoretical analysis of the effects of the models implemented, based on the typology presented in the descriptive section. When relevant, a literature review backs up the analysis. The assessment of coherence also relies on the opinions of stakeholders (i.e. researchers and farmers' representatives) interviewed in case-study Member States.

The typology of the various models shows that the configurations implemented can be divided into two main categories: models aiming at decreasing milk production and models providing financial support to farmers. The models providing financial support to farmers were sorted into the following sub-categories:

- payment per cow;
- payment per volume of milk produced;
- lump-sum payments to farmers;
- exemption of charges and coverage of specific expenses;
- loan-related instruments;
- others (e.g. payment per ha of grassland in BE-Wallonia).

It should be noted that the category 'others' includes the payment per hectare of grassland in Wallonia and support to environmental schemes in the Netherlands. It should also be mentioned that some case-study Member States have implemented several types of models providing financial support to dairy farmers, and the exceptional support in these Member States corresponds to several of the previously mentioned sub-categories. The following analysis is therefore based on the theoretical contribution of these types of support to long-term sustainability, acknowledging that such support was delivered as exceptional aid.

4.8.2 The various models implemented by Member States are coherent (or not) with the objective of supporting farm profitability.

In the agricultural sector, profit is assumed to be compensation for the production factors provided by the farmer (labour, land, and capital) and the risk associated with the activity. Thus, profitability measures the ability of the farm to generate value added from the goods sold. It assesses to what extent the activity of the farm creates new value. The farm net income then compensates the farmer for the provision of the fixed factors of production and the associated risk (Coppola, Scalera and Tosco, 2013).

4.8.2.1 Theoretical contribution of the models implemented to farm profitability

Models aiming at decreasing milk production

The primary aim of this type of support is to stabilise the milk market (also see ESQ3) much more than to improve dairy farmers' profitability. The production reduction scheme delivers a payment by litre of milk reduction. As this scheme is implemented on a voluntary basis, dairy farmers are likely to enter into the scheme only when the payment per litre exceeds the unit margin of a litre of milk produced. **As a result, strategies aimed at decreasing milk production should have a positive contribution to the profitability of dairy farms.** Moreover, such models can also be expected to contribute to encouraging farmers to change or diversify their farming activities for more profitable productions.

Model providing direct financial support to farmers

According to an econometric analysis (see Box 5) conducted by Kryszak, Guth and Czyżewski (2021), **profitability is positively correlated with the subsidy rate, depending on the farm size categories defined by farm output**. For farmers, subsidies represent a direct source of income.

Box 5: Method and relevant findings of the study 'Determinants of farm profitability in the EU regions. Does farm size matter?'

Using FADN data, Kryszak, Guth and Czyżewski (2021) studied the determinants of farm profitability for six panels of EU farms representative of the Farm Accountancy Data Network (FADN) regions. The authors carried out an econometric analysis based on a fixed-effects model and a dynamic panel model. The authors define a function estimating profitability, assessed by the value of the return on assets. The authors distinguish between six categories of farms based on their standard output. They estimate the correlation of 10 variables with profitability, including the subsidy rate. Profitability was correlated with the subsidy rate of farms in the EU for all farms except those with a standard output between EUR 8 000 and EUR 25 000, where the correlation was observed with a fixed-effects model, but not with a dynamic panel model. A positive correlation was observed between profitability and the subsidy rate for farms with a standard output between EUR 2 000 and EUR 8 000 and with a standard output between EUR 25 000 and EUR 500 000. For farms with an output higher than EUR 500 000, the correlation was negative, suggesting that increasing subsidies reduced the profitability of the largest farms. The authors suggest this is a result of degressive mechanisms introduced in the CAP, which requires Member States to reduce payments for farms receiving more than EUR 150 000 of subsidies.

Source: Kryszak, Guth and Czyżewski (2021)

These results indicate that the exceptional measures, by increasing the subsidy rate of farmers, can improve profitability of dairy farms when implemented. However, as the exceptional measures were delivered as a one-time single payment, their contribution to farm profitability might be effective only in a short-term perspective.

Synthesis of the theoretical effects of the models implemented

The implementation models aiming at reducing production should contribute positively to the profitability of dairy farms, coherent with the objective of supporting profitability. Likewise, the results of the literature review have suggested that all implementation strategies providing direct financial support to dairy farmers are coherent with the objective of supporting profitability. However it should be noted that coherence with long-term profitability is unclear. In conclusion, **both models aiming at decreasing milk production and models providing direct financial support to farmers have a theoretical synergistic relationship whose objective is to support the profitability of dairy farms.**

4.8.2.2 Obseved impacts of the exceptional support on profitability in selected Member States

Coherence of the form of support

In all case-study Member States, **the stakeholders agreed that the form of support did not contribute to boosting profitability**. The measures acted as support to help farmers deal with short-term financial difficulties rather than enhance their profitability in a long-term perspective. In France, the support consisted of cash injections for dairy farmers via loans. Several stakeholders reported that this can have a negative impact on profitability in a long-term perspective because of increased indebtedness. Thus, the case studies highlighted that the contribution of the form of support to improving the profitability of dairy farmers was very limited.

Coherence of the targeting strategy

There was general agreement by stakeholders in all case-study Member States that the targeting had no or a limited positive contribution to boosting profitability. The measures were reported to be aimed at helping farmers deal with short-term financial difficulties rather than enhancing their profitability in a long-term perspective. In France, Ireland and Italy, **the targeting strategy was reported to be responsible for ineffective support because the targeting was very broad. This resulted in low amounts of support being distributed to dairy farmers, which were thus insufficient to contribute to boosting their profitability**. In these Member States, relatively low average amounts of aid were generally obtained in the analysis performed previously (see ESQ4). The average amounts of aid represented less than 5% of the average CAP support in France and Italy for both exceptional aids. In Ireland, the average amounts of aid represented less than 6.5% of the average CAP support for Regulation (EU) 2015/1853 and 26.5% for Regulation (EU) 2016/1613, a more significant figure. Additionally, stakeholders in Ireland mentioned that the targeting of young farmers, who were reported to be affected more significantly than other dairy farmers, contributed positively to boosting their profitability. In several Member States (BE, DE, EE, PL, RO), **stakeholders emphasised that the purpose of the subsidies was essentially to support farmers through the crisis. The support provided only a one-off additional income, enabling farmers to overcome the crisis**, **but it did not improve their profitability, either in the short term or the long term**. As a result, **the outcomes of the case studies point toward a limited or absence of contribution of the targeting to supporting the profitability of dairy farmers**.

4.8.3 The various models implemented by Member States are coherent (or not) with the objective of supporting farm income and income stability

Farm income and income stability go beyond farm profitability (i.e. capacity to generate added value), as this latter is not solely dependent on revenue from milk sales but also relies on the financial management of the farm. Income level and income stability can depend notably on investments, loans, and/or workforce management. As income stability is a key element of farm sustainability, the coherence of the different models implemented with income stability is further analysed in this section.

4.8.3.1 Theoretical contribution of the models implemented to income and income stability

Models aiming at decreasing milk production

In theory, models aiming at decreasing milk production do not contribute to increasing the long-term income stability of dairy farms, as their primary goal is rather to stabilise the milk supply for the market to recover (see ESQ3). As previously stated, dairy farmers are likely to enter into the scheme only when the payment per litre exceeds the unit margin of a litre of milk produced. Since the value added generated by the production of milk is a component of the farm income, the impact on income should

be positive. **As a result, strategies aimed at decreasing milk production should have a positive contribution to the income of dairy farms as well.** It should however be noted that the exceptional measures were one-time single payments (by definition) and might not have contributed significantly to income stability. Nevertheless, such models can be expected to positively influence farmers' income when they encourage farmers to change or diversify their farming activities for more profitable types of production.

Model providing direct financial support to farmers

The evaluation study of the impact of the CAP measures on the general objective 'viable food production' (2018) indicates the positive effects of annual CAP support (direct payments and rural development policies) on farm income. It highlights that the CAP support provided by annual payments have a direct positive effect on farm income level. The study further shows that CAP support also positively affects farm income level indirectly, by supporting farmers making investments and increasing capital availability. Both coupled and decoupled direct payments contribute to supporting farm income. **Therefore, exceptional aid delivered both in the form of coupled support (i.e. payment per cow or per litre of milk produced) and of payments that are not linked to production (i.e. lump-sum payments to farmers) are expected to be coherent with the objective of supporting farm income.** Furthermore, the study demonstrates that decoupled support, regardless of its absolute amount, has a higher transfer efficiency (the net impact of an additional unit of support) than does coupled payment. This suggests that among the models implemented under the exceptional aid studied, **lump-sum payments to farmers may better support farm income**.

In the CAP, direct payments are the instruments more directly aimed at enhancing and stabilising farm income. Agrosynergie (2018) demonstrated the existence of a positive and robust contribution of direct payments to the stability of farm income. **It should however be noted that, unlike this type of support, the exceptional aid studied here are one-time single payments (by definition) and might not be of significant importance for income stability in the long term.** Another study, by Guth et al. (2020), assesses the impact of the CAP on the level of economic sustainability of agricultural holdings in the European Union. **The findings of this study back up the hypothesis that payments in the form of investment support and exceptional aid contribute to income increase**. The positive impact of both payments seems particularly significant in farms of medium to small economic sizes. The study also shows that payments for public goods (such as environmental practices) are positively correlated to income on low-income farms but that the correlation becomes negative on medium farms, as these measures impact the production factors according to the authors (see box below).

Box 6: Method and relevant findings of the study 'The Economic Sustainability of Farms under Common Agricultural Policy in the European Union Countries'

This study aims to determine which group of payments and subsidies had a significant impact on the income of farms from different size categories in the EU Member States under the CAP between 2005 and 2015.

As the distribution of the support between small, medium-sized, and large holdings is very uneven, the authors distinguish between six categories of farms based on their standard output. They establish six categories of CAP payments: 'Payments for public goods', 'Payments to plant and livestock production', 'Decoupled payments', 'Payments to intermediate consumption', 'Payment to investments' and 'Additional support'. This last category of 'Additional support' represents support delivered under Article 68 of Regulation (EC) No 73/2009 and includes grants and subsidies for losses and extraordinary payments.

The results of the panel regression show that, depending on the category of economic size, the categories of subsidies under the CAP that contribute to the income are not the same. For instance,

on the one hand, the payment category for 'Public goods' (the total of set-aside payments, agri-environmental payments, support to Less-Favoured Areas, and other payments under rural areas support programmes) contributes to increasing the income for farms with a standard output between EUR 8 000 and EUR 25 000 and between EUR 100 000 and EUR 500 000. On the other hand, payments for public goods negatively impact the income of farms with a standard output between EUR 25 000 and EUR 50 000, between EUR 50 000 and EUR 100 000, and above EUR 500 000. According to the authors, the negative impact of payments for public goods results from the fact that gaining such support involves giving up some production.

The results indicate that beside payments for public goods, the payment categories 'Additional support' and 'Investments' are two categories of payment which contribute to the income of farms quite broadly. It should be noted that, contrary to the payment category 'Public goods', CAP payments for additional support and investments always impact income positively when statistically significant. Indeed, the payment category 'Additional support' positively contributes to the income for all economic size categories of farms except the two above EUR 100 000 in standard output, while the payment category 'Investments' contributes positively to income for all economic sizes categories of farms except for the categories of farms with a standard output between EUR 25 000 and EUR 50 000 and above EUR 500 0000.

Source: Guth et al. (2020)

Synthesis of the theoretical effects of the models implemented

The implementation models aiming at reducing production should contribute positively to the income and income stability of dairy farms. The results of the literature review for implementation strategies providing direct financial support to dairy farmers indicate that these are also coherent with the objective of supporting income and income stability of dairy farmers. In closing, **both models aiming at decreasing milk production and models providing direct financial support to farmers have a theoretical synergistic relationship with the objective of supporting income and income stability of dairy farms**. Yet, it is uncertain that the positive contribution of both types of implementation models is long-lasting, as they consist of a one-time payment only, contrary to CAP income support, which provides a continuous source of income.

4.8.3.2 Observed impacts of the exceptional support on farm income and income stability in case-study Member States

Coherence of the form of support

In most of the case-study Member States[36] (9/10) it was indicated that the unitary amounts provided through the exceptional measures studied were not high enough to boost farms' income in the long term. On the other hand, in 7/10 case-study Member States[37], it was agreed that the form of support helped farmers to overcome the crisis or to stabilise their income in the short term. However, stakeholders reported that **the measures were by nature temporary and did not create a basis for long-term stability**. The Italian researcher interviewed highlighted that structural measures would have been more appropriate to improve revenue and its stability. In BE-Wallonia as well, Managing Authorities considered that other CAP subsidies have more influence on farmers' economic management.

In Ireland, according to all types of stakeholders interviewed, **the cash-flow loan scheme introduced a change in mindset of dairy farmers and banks to focus on financial schemes.** According to the

[36] BE-Wallonia, Germany, Finland, France, Ireland, Estonia, the Netherlands, Poland and Romania (all except Italy).

[37] All except Italy, France, and Poland.

representative of the banking sector in Ireland, the scheme enabled a shift from cooperatives to banks for the financing of working capital. On the other hand, in France, **stakeholders considered that such exceptional aid can have negative effects on farms' sustainability in the long term.** Several researchers as well as farmers' representatives stressed that measures based on loans to inject short-term liquidity into dairy farms have major downside effects. They indicated that some dairy farmers permanently rely on loans to access short-term liquidity in situations of market difficulties, thus deteriorating their financial situation and ability to generate sufficient income. Indeed, providing such support to farms which are economically non-sustainable may only worsen their economic situation in the future.

Coherence of the targeting strategy

In BE-Wallonia, Finland, France, Ireland and Italy, **stakeholders interviewed considered that the lack of targeting resulted in insufficient amounts of support distributed, and that as a result the impact of the support on the income and income stability of dairy farms was limited**. In several Member States[38], the purpose of the support was essentially to help farmers to cope with short-term liquidity issues and to maintain the dairy activity during the crisis. In these cases, the contribution of the targeting to improving the income and income stability of dairy farms was limited. For instance, the managing authority in BE-Wallonia emphasised that this type of support did not help farmers who had difficulties prior to the crisis in maintaining their activity, leading to a rise in the percentage of farmers who ceased their activity. This view is shared by Estonian farmers' representatives. In Estonia, smaller farms suffering more from the crisis (and therefore more likely to cease their activity) were targeted. Despite this targeting, the support could not enable them to overcome the crisis, indicating that the amount was insufficient or that the form of the support was not effective. **The measures were considered to have a better effect on farmers' income due to selective targeting strategies applied in the Netherlands and Romania**. In the Netherlands, the support implemented by Regulation (EU) 2016/2013 targeted farmers who committed to reducing their dairy herd. In addition, the model implemented under Regulation (EU) 2015/1853 introducing more sustainability allowed farmers to increase the value of their milk and to strengthen their market positions, according to stakeholders interviewed. In Romania, the support implemented by Regulation (EU) 2016/2013 targeted small-scale farming. The targeting of vulnerable farmers (e.g. young farmers) was also considered relevant in BE-Wallonia and Ireland, to help their holdings to overcome the crisis (e.g. with a support premium).

4.8.4 Summary of findings

Measures supporting reduction of production have a positive theoretical contribution to the objective of supporting profitability. The literature indicates that the category of support providing direct financial support also has a theoretical positive impact on the profitability of dairy farms. However, the case-studies revealed that there was a consensus that the form and targeting of the support provided limited or no contribution to the objective of supporting profitability. In particular, the broad targeting of the support was often reported to be responsible for the limited impact of the support. It was also emphasised that the measures were aimed at enabling dairy farmers to maintain their activity through the crisis rather than boosting their profitability.

The analysis of the literature shows that both models supporting the reduction of production and models providing direct financial support to farmers can be expected to contribute positively to farm income and income stability. Stakeholders in several Member States indeed reported that the form of the support contributed to enabling dairy farmers to overcome the crisis or to stabilise their income in the short term. As a result, the form of the support can be considered to have contributed to the sustainability of the dairy sector by preventing dairy farmers from quitting their activity. The targeting of the support in some Member States may have also enabled the most vulnerable dairy farmers (e.g. small dairy farms

[38] BE-Wallonia, Germany, Estonia, Finland, Italy and Romania.

and young farmers) to maintain their activity, as the support sometimes targeted them or a premium was implemented. In this perspective, the targeting of the support in some case-study Member States such as Romania contributed to the long-term sustainability of dairy farmers. The case-study results in some Member States nevertheless revealed that the form of support provided a limited contribution to the objective of supporting farm income and income stability. Indeed, because the payment amount was often considered insufficient and the support only one-off, it did not create a basis for long-term stability. Furthermore, the case-studies highlighted that the poor targeting of beneficiaries was often responsible for insufficient amounts of support to ensure a suitable income and long-term economic sustainability. Possible reasons for the poor targeting strategies were the time constraints to implement the measures and because it was often decided to implement the support in the most efficient way. It was also emphasised that the measures were aimed at relieving short-term liquidity issues, which does not match the objectives of supporting long-term income and income levels of dairy farmers.

4.9 ESQ9 - Relevance: To what extent was the targeting of sectors by Member States adequate, in view of the type and magnitude of the market disturbance?

4.9.1 Understanding and method

Regulations (EU) 2015/1853 and 2016/1613 allowed Member States to target other livestock sectors than the dairy sector (i.e. pig, cattle, sheep and goat). The budget allocation between livestock sectors was established by national Managing Authorities. This evaluation study question therefore investigates how relevant Member States' choices on budget allocation were, regarding the market disturbances in each livestock sector, as well as the relative importance of these sectors in national agricultural production.

This question is therefore built on the following evaluation criteria:

- **Market disturbances significantly affected (or not) other livestock sectors at Member State level.** The assessment of the scale of market disturbance in other livestock sectors is based on the analysis of price data from the Agri-food Data Portal, on a review of the literature and on case-study interviews. The relative weight of each livestock sector in the national agricultural economy is also assessed based on Eurostat data.
- **The milk sector and other livestock sectors were (or not) significantly targeted by the Member States**. Notifications sent by Member States associated with both regulations studied describe budget allocations among sectors.
- **The amount of support granted was (or not) appropriate to the relative importance of the market disturbance in the sectors affected**. Finally, the scale of the market disturbance (significance of the price drop and relative importance of the sector in the agricultural economy) in each sector for each Member State is compared to the share of budget allocated to assess the relevance of the Member States' choices. Case-study interviews and notifications are used to investigate the justifications of the budget allocation when it does not appear correlated to the scale of the disruption observed.

4.9.2 Market disturbances in livestock sectors

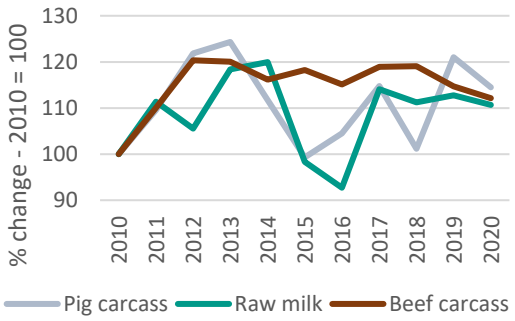
4.9.2.1 Trends in national prices for milk, beef and veal, pigmeat, and sheepmeat and goatmeat

Data at EU level (Figure 40Figure 40) show that both the dairy and the pig sectors suffered a drop in farm gate prices in 2014/2015. While the pig sector saw carcass prices decrease in 2014, farm gate milk

prices started decreasing in 2015. This one-year time lag is also observed for the recovery of the markets, as pig carcass prices started to increase in 2016 whereas milk prices started to recover in 2017. The beef market, on the other hand, was relatively stable over the 2012–2020 period. The changes in price for sheepmeat and goatmeat are not available.

As the exceptional measures studied were implemented in 2015 and 2016, it appears relevant to look at the extent to which the different livestock sectors were impacted by the crisis between 2014 and 2015 and between 2015 and 2016. Therefore, the following table compares the changes in the prices of raw milk, pig carcasses and beef carcasses over these periods.

Figure 40: Trend in EU average annual prices in the pig, dairy and beef sectors



Source: Agri-food Data Portal

In all Member States, the pig and dairy sectors suffered a drop in farm gate prices between 2014 and 2015, whereas the cattle sector did not register significant price decreases over the same period (Table 18). In six Member States (EL, ES, HR, IT, CY, MT), the price drop in the pig sector was higher than in the milk sector, but in all other Member States the drop in milk price was more severe. The table also shows that the pig sector started to recover between 2015 and 2016 (prices kept decreasing only in Bulgaria, Malta and Finland) whereas milk prices kept decreasing in all Member States except Estonia, Latvia and Lithuania.

Case-study interviews further outlined how other livestock sectors suffered from the crisis. In Estonia, Ireland, Germany, France, Poland and Finland, stakeholders mentioned that the pig sector was also strongly impacted by the crisis. Stakeholders emphasised that the situation of pig farming was very difficult due to the Russian ban (e.g. in EE, IE), to African swine fever (e.g. in EE, PL), as well as because of a sharp increase in feed prices (e.g. in EE, PL).

Table 18: Comparison of farm gate prices for the main livestock sectors eligible over the 2014–2016 period

MS	2014–2015 change			2015–2016 change		
	Pig	Cattle	Dairy	Pig	Cattle	Dairy
BE	-11%	7%	-22%	7%	-3%	-4%
BG	-13%	-4%	-17%	-1%	-5%	-5%
CZ	-11%	3%	-18%	4%	-1%	-12%
DK	-10%	2%	-22%	5%	-2%	-7%
DE	-10%	5%	-21%	7%	-3%	-7%
EE	-11%	1%	-27%	0%	4%	0%
IE	-10%	10%	-21%	3%	-7%	-6%
EL	-14%	0%	-3%	5%	-2%	-8%
ES	-15%	-1%	-14%	0%	0%	-3%
FR	-7%	3%	-15%	3%	-4%	-3%
HR	-12%	1%	-8%	3%	-1%	-9%
IT	-23%	0%	-13%	8%	-1%	-8%
CY	-17%	NA	0%	2%	NA	-1%
LV	-11%	2%	-26%	7%	-1%	0%
LT	-11%	1%	-24%	6%	0%	0%
LU	-9%	-1%	-21%	7%	0%	-6%
HU	-10%	-2%	-22%	5%	-7%	-8%
MT	-3%	0%	0%	-4%	-9%	-2%
NL	-11%	7%	-22%	9%	-7%	-7%
AT	-9%	6%	-14%	4%	-3%	-7%
PL	-11%	4%	-14%	6%	-3%	-7%
PT	-12%	-2%	-15%	2%	0%	-6%
RO	-12%	-6%	-13%	1%	-7%	-2%
SI	-5%	2%	-18%	1%	-4%	-11%
SK	-11%	0%	-17%	5%	0%	-9%
FI	-8%	-4%	-15%	-3%	-2%	-1%
SE	-2%	12%	-18%	3%	11%	-3%

Colour scale: Highest price increase / Most significant price decrease

Source: Agrosynergie, based on Agri-food Data Portal. Prices used are for dairy: raw milk, for pig: pigmeat class E, and for cattle: adult male indicative price. Data not available for sheep and goats.

In Belgium and the Netherlands, stakeholders indicated the **long-term challenges faced by the pig sector**. However, despite the big decline in pig carcass prices between 2014 and 2015, the Managing Authority in Italy considered that **the milk sector was more impacted by the crisis than other livestock sectors**. This opinion was shared by the Managing Authority in Romania.

In Belgium-Wallonia and France, **stakeholders interviewed reported the difficulties faced by the beef sector**. The difficulties worsened with the dairy crisis, because of the increase in the slaughtering of dairy cows.

4.9.2.2 Relative weight of affected sectors in Member States' economy

The relative importance of the livestock sector in each Member State is assessed by its national output (EUR) in 2014, divided by the sum of the outputs of other eligible livestock sectors. The table opposite shows that, in the EU Member States, **the milk sector generally has a higher economic weight than the other livestock sectors eligible for the exceptional aids studied**. It can however be noted that in four Member States (Belgium, Denmark, Spain and Hungary), the pigmeat sector has a higher economic weight than the dairy sector. Overall, the cattle sector's importance is comparable to the pigmeat sector, although it varies greatly among Member States. In Ireland, France, Luxembourg, Austria, Portugal and Slovenia, the cattle sector has relatively significant weight (more than 30% of eligible sectors' total output).

In almost all Member States, the output of the sheep and goat sector is very low compared to the other eligible sectors. Only in Bulgaria, Greece, Cyprus and Romania is its relative importance above 10% of eligible sectors' total output.

Table 19: Relative importance of the eligible livestock sectors by Member States in term of national output - 2014

MS	Pigmeat	Dairy	Cattle	Sheep and goat
BE	38%	34%	28%	0%
BG	18%	54%	15%	13%
CZ	22%	62%	15%	0%
DK	55%	37%	7%	0%
DE	31%	50%	19%	1%
EE	23%	66%	10%	1%
IE	10%	43%	42%	5%
EL	10%	61%	8%	21%
ES	47%	25%	21%	7%
FR	14%	45%	36%	4%
HR	28%	37%	29%	6%
IT	26%	45%	28%	2%
CY	33%	49%	7%	11%
LV	18%	70%	11%	1%
LT	19%	66%	15%	1%
LU	12%	54%	33%	0%
HU	46%	40%	10%	4%
MT	38%	53%	8%	1%
NL	28%	55%	16%	1%
AT	27%	42%	30%	1%
PL	32%	52%	16%	0%
PT	26%	38%	30%	6%
RO	35%	44%	11%	10%
SI	12%	50%	35%	2%
SK	22%	51%	26%	2%
FI	15%	64%	20%	0%
SE	19%	54%	25%	1%

Colour scale: Highest share / Lowest share

Source: Agrosynergie, based on Eurostat data – PROD_BP

4.9.3 Budget allocated to the different livestock sectors

The total budget allocation (including national budget envelope) between the different livestock sectors (shown in Table 20) shows that, overall, **the dairy sector was the main beneficiary of the support under both Regulations**, with 54% of the total budget allocated under Regulation (EU) 2015/1853 and 72% under Regulation (EU) 2016/1613. **The pig sector was another significant beneficiary of the exceptional aids** (13% of the total budget allocated at EU level in 2015 and 7% in 2016).

Some of the measures implemented are cross-sectoral, as they apply to different livestock sectors at once (including sometimes the sheep and goat sectors), and **these cross-sectoral measures represent a significant share of the total budget for both exceptional schemes** (31% in 2015 and 17% in 2016).

Table 20: Total budget (EU + national budget envelope) allocated to livestock sectors for Regulation (EU) 2015/1853 and Regulation 2016/1613 *(million EUR)*

	Regulation (EU) 2015/1853						Regulation (EU) 2016/1613					
MS*	**Dairy**	**Pigmeat**	**Beef**	**Mix**	**Total**	**% Dairy**	**Dairy**	**Pigmeat**	**Beef**	**Mix**	**Total**	**% Dairy**
BE-Wallonia	5,4	0,64	4	0	**10,04**	54%	3,8	0	0	4,2	**8**	48%
BE-Flanders	0	7,73	3,87	0,5	**12,10**	0%	2	1	0	6,6	**9,6**	21%
BG	6,7	0	0	0	**6,7**	100%	11,6	0	0	0	**11,6**	100%
CZ	8,06	3,02	0	0	**11,09**	73%	12,38	8,22	0	0	**20,6**	60%
DK	8,66	0	0	2,44	**11,1**	78%	9,3	0	0	0	**9,3**	100%
DE	0	0	0	69,2	**69,2**	0%	116	0	0	0	**116**	100%
EE	11,95	2,65	0	0	**14,6**	82%	12,5	3,4	0	0	**15,9**	79%
IE	26,35	1,05	0	0	**27,4**	96%	0	0	0	22,2	**22,2**	0%
EL	0	0	0	2,3	**2,3**	0%	1,7	0	0	0	**1,7**	100%
ES	45,5	0	0	0	**45,5**	100%	14,7	0	0	0	**14,7**	100%
FR	0	0	0	62,9	**62,9**	0%	45	0	18,4	0	**63,4**	71%
HR	3,6	0	0	0	**3,6**	100%	3	0	0	0	**3**	100%
IT	25	0	0	0	**25**	100%	0	0	0	41,8	**41,8**	0%
CY	0	0,35	0	0	**0,35**	0%	0	0,3	0	0	**0,3**	0%
LV	7,23	1,28	0	0	**8,5**	85%	9,8	0	0	0	**9,8**	100%
LT	24,42	0,78	0	0	**25,2**	97%	25	1,6	0	0	**26,6**	94%
LU	0	0	0	1,37	**1,37**	0%	1,2	0	0	0	**1,2**	100%
HU	9,5	0	0	0	**9,5**	100%	19	0	0	0	**19**	100%
MT	0	0,24	0	0	**0,24**	0%	0,2	0	0	0	**0,2**	100%
NL	9,87	9,87	0	9,87	**29,60**	33%	33,6	2,9	0	0	**36,5**	92%
AT	3,99	3,01	0	0	**7**	57%	5,9	0	0	0	**5,9**	100%
PL	28,95	28,95	0	0	**57,9**	50%	5	5,9	0	11,8	**22,7**	22%
PT	4,8	0	0	0	**4,8**	100%	4	0	0	0	**4**	100%
RO	8,77	2,33	0	0	**11,1**	79%	10,8	10,8	0	0	**21,6**	50%
SI	2,21	0,59	0	0	**2,8**	79%	2,2	0	0	0	**2,2**	100%
SK	4,4	0,6	0	0	**5**	88%	2	2	0	0	**4**	50%
FI	5,04	3,96	0	0	**9**	56%	15	0	0	0	**15**	100%
SE	8,2	0	0	0	**8,2**	100%	6,9	0	0	0	**6,9**	100%
Total budget	**258,62**	**66,38**	**7,85**	**148,60**	**481,45**	54%	**372,56**	**36,12**	**18,4**	**87,14**	**514,22**	72%

*Wallonia and Flanders are considered independently, as they implemented a different model for both regulations

Source: Agrosynergie, based on notifications sent by Member States

The budget allocation between sectors varies greatly across Member States. In 2015, 9 Member States[39] targeted 100% (or close to 100%) of their budget to the dairy sector, compared to 15[40] in 2016. Cases where the dairy sector was not or was poorly targeted are rare. In 2015, Belgium-Flanders, Germany, Greece, Cyprus, Luxembourg and Malta allocated no budget directly to the dairy sector (although only in Cyprus and Malta did the dairy sector not benefit from the support at all). In 2016, Ireland, Italy and Cyprus did not target the dairy sector directly. However, Ireland and Italy allocated the entire budget to a single measure targeting several sectors, including the dairy sector.

It can therefore be concluded that the dairy sector benefited extensively from the exceptional aid, particularly under Regulation (EU) 2016/1613, although the share of budget allocated to the dairy sector varies among Member States.

[39] BG, IE, ES, HR, IT, LT, HU, PT, SE.

[40] BG, DK, DE, EL, ES, HR, LV, LU, HU, MT, AT ; PT, FI, SI, SE.

4.9.4 Correspondence of budget allocated and scale of the market disturbances

In each Member State and for each Regulation, a 'crisis indicator' was calculated based on the fall in price registered in each sector, weighted by the relative importance of the sector (see §4.9.2). The analysis does not consider the sheep and goat sector, as data on prices changes were not available on the Agri-food Data Portal. It must be recalled that the relative weight of the sheep and goat sector was very low compared to the other eligible sectors. Moreover, the sheep and goat sector was not targeted in 2015 and in 2016; only Italy allocated around 20% of the budget to sheep and goat producers. Ireland and Belgium also allocated a significant share of their budget to sheep farmers, but through one cross-sectoral measure targeting several sectors.

High values associated with the 'crisis indicator' reveal the significance of the crisis for the given sector and its relative importance compared to other livestock sectors in the Member State:

Crisis indicator (2015) Sector MS = [(price product **2014** MS – price product **2015** MS)/ price product **2014** MS] x (National sector output 2014 MS/National sum of sectors concerned output 2014 MS).

Crisis indicator (2016) Sector MS = [(price product **2014** MS – price product **2016** MS)/ price product **2014** MS] x (National sector output 2015 MS/National sum of sectors concerned output 2015 MS).

For both indicators (2015 and 2016), the price fall is compared to the prices in 2014. This makes it possible to avoid interpreting a small price increase between 2015 and 2016 as a total recovery of the sector. When the price was higher in 2015 or 2016 than in 2014, then the 'crisis score' is negative and arbitrarily set to 0 for the next steps of the analysis.

As a second step, the 'crisis indicator' is compared to the share of budget allocated to the different livestock sectors. In all Member States, the crisis indicator of each sector is converted to a percentage of the sum of crisis indicators of all livestock sectors. The highest percentage of crisis indicator would thus reflect that the sector is both facing a significant drop in prices and that it represents a major livestock sector for the agricultural economy of the Member State. Therefore, it should get a significant share of the budget available under Regulation (EU) 2015/1853 and Regulation (EU) 2016/1613. These relative crisis indicators can thus be considered as a theoretical budget distribution, which is then compared to the actual distribution of budget allocated to each sector. By considering the differences between theoretical budget allocation and actual budget allocation, a relevance indicator is calculated:

Relevance indicator = |% Dairy crisis indicator - % Dairy budget share|+ |% Pigmeat crisis indicator - % Pigmeat budget share|+ |% Beef crisis indicator - % Beef budget share|

The result gives an indicator which can range between 0 (perfect appropriateness between the relative indicators and the actual budget allocation) and 200 (no appropriateness between the relative indicators and the actual budget allocation).

Table 21: Budget allocation calculated for Reg. (EU) 2015/1853 and 2016/1613

2015	Theoretical budget allocation (%)			Actual budget allocation (%)			Relevance score
MS	Dairy	Pig-meat	Cattle	Dairy	Pig-meat	Cattle	
ES	33	65	3	100	0	0	135
EL	57	43	0	40	0	60	120
HR	48	52	0	100	0	0	104
IT	49	51	0	100	0	0	102
FR	88	12	0	47	5	48	96
LU	89	9	2	54	2	44	84
PT	60	34	6	100	0	0	81
BE	65	35	0	26	36	38	77

2016	Theoretical budget allocation (%)			Total budget allocated (%)			Relevance score
MS	Dairy	Pig-meat	Cattle	Dairy	Pig-meat	Cattle	
MT	31	54	15	100	0	0	138
ES	36	61	3	100	0	0	128
PL	81	19	0	22	27	51	118
IE	93	7	0	49	1	50	100
SK	88	12	0	50	50	0	77
BE	81	19	0	60	6	34	68
PT	67	27	7	100	0	0	67
BG	68	19	12	100	0	0	63

2015	Theoretical budget allocation (%)			Actual budget allocation (%)			Relevance score
MS	Dairy	Pig-meat	Cattle	Dairy	Pig-meat	Cattle	
HU	65	33	2	100	0	0	70
FI	82	11	7	56	44	0	67
DK	59	41	0	86	8	6	66
DE	78	22	0	59	13	28	56
BG	76	20	5	100	0	0	49
NL	80	20	0	56	44	0	48
RO	55	39	6	79	21	0	48
PL	66	34	0	50	50	0	32
AT	71	29	0	57	43	0	28
EE	88	12	0	75	25	0	26
SI	94	6	0	82	18	0	24
MT	12	88	0	0	100	0	23
CZ	82	18	0	72	27	0	19
SK	79	21	0	88	12	0	18
LT	89	11	0	97	3	0	16
LV	90	10	0	85	15	0	11
IE	91	9	0	96	4	0	11
SE	97	3	0	100	0	0	7
CY	0	100	0	0	100	0	0
EU	**68**	**31**	**1**	**71**	**21**	**8**	**53**

2016	Theoretical budget allocation (%)			Total budget allocated (%)			Relevance score
MS	Dairy	Pig-meat	Cattle	Dairy	Pig-meat	Cattle	
CZ	90	10	0	60	40	0	60
HR	70	30	0	100	0	0	60
HU	70	17	12	100	0	0	60
FR	92	7	2	71	0	29	55
DK	76	24	0	100	0	0	49
FI	77	13	10	100	0	0	46
RO	56	31	13	50	50	0	38
EL	84	13	3	100	0	0	32
AT	85	15	0	100	0	0	29
SI	90	3	7	100	0	0	20
IT	66	33	1	60	29	11	20
CY	9	91	0	0	100	0	18
EE	87	13	0	79	21	0	18
DE	91	9	0	100	0	0	17
LU	95	2	3	100	0	0	11
LV	95	5	0	100	0	0	10
NL	94	6	0	92	8	0	4
LT	93	7	0	94	6	0	2
SE	100	0	0	100	0	0	0
EU	**76**	**20**	**3**	**81**	**13**	**6**	**48**

When measures concerned several livestock sectors, the budget allocation to the different sectors targeted was estimated based on the relative number of specialised farms in each livestock sector given by Eurostat. In 2015 it concerned FR (all sectors); LU (all sectors); DK (22% of the budget to all sectors); DE (all sectors), NL (33% of the budget to diary and pigmeat sectors); EL (cattle and milk). In 2016, it concerned IT (24% of the budget to dairy and cattle sectors).

Source: Agrosynerie, based on Agri-food Data Portal and Eurostat

At EU level, the dairy sector was the sector the most in need both in 2015 (68% of the theoretical budget allocation) and 2016 (76% of the theoretical budget allocation). This sector also received the highest share of the budget for Regulation (EU) 2015/1853 (71%) and Regulation (EU) 2016/1613 (81%). **Hence, the targeting of the dairy sector by Member States seems to be appropriate compared to the relative needs of the sector.**

However, the EU average hides disparities among Member States. The comparison of the theoretical and actual budget allocation provided in Table 21 reveals that approximately half of Member States targeted the budget in coherence with the indicator. Other Member States followed an alternative approach for the targeting of the livestock sectors. For instance, Spain and Italy granted 100% of the budget to the dairy sector in 2015, despite some needs from the pigmeat sector revealed by the high 'crisis indicator'. According to the notifications sent by Managing Authorities in these Member States, the crisis was considered as more significant in this sector, which is particularly vulnerable to market disturbances and imbalances. In contrast, in France the dairy sector was not targeted to the extent suggested by the crisis indicator. In this Member State, the Managing Authority aimed at targeting livestock farms in difficulty through different criteria such as degree of specialisation, debt ratio and economic losses experienced on farms. Therefore, in this case the budget allocation appears relevant despite the results shown by the 'crisis indicators' provided in Table 21Table 21.

In 2016, Poland, Ireland and Belgium (among other Member States) did not target the dairy sector to the extent suggested by the crisis indicator, as a significant share of the budget was allocated to the cattle sector, in which the price did not drop between 2014 and 2016. The Irish Managing Authority confirmed during the interview that the budget allocation was made **considering the relative size of the sectors, which could explain why a significant share of the budget targeted the cattle sector**. In Belgium-Wallonia as well, a significant share of the budget was allocated to the beef sector,

which was also in need according to the Managing Authority. Hence, this reveals the limits of the calculated indicators, as the rationale behind budget allocation was also driven by the economic difficulties faced by the targeted livestock sectors, that do not appear in the price-based analysis provided in section Trends in national prices for milk, beef and veal, pigmeat, and sheepmeat and goatmeat4.9.2.14.9.2.1. In Poland's notification, the Managing Authority mentioned that a large share of the support was targeted to limit the decline of the pig sector, and particularly to help the farms that suffered from African swine fever. In Italy, part of the support under Regulation (EU) 2016/1613 **target livestock farmers impacted by an earthquake, regardless of the market situation**. In the Netherlands, the support instead targeted the **dairy and pig sectors to increase manure processing capacities** and therefore to reduce the total environmental burden related to both pig and dairy farming.

4.9.5 Summary of findings

This question examines the targeting by Member States of the different sectors for allocating the budget available under Regulation (EU) 2015/1853 and Regulation (EU) 2016/1613.

The analysis of the national price fluctuations in the dairy, cattle and pig sectors reveals that both the dairy and the pig sectors suffered from a drop in farm gate prices in 2014/2015. Market disturbances were particularly severe in the dairy sector, although in 2014 the price drop was severer in the pig sector in six Member States (EL, ES, HR, IT, CY, MT). In contrast, the beef market was relatively stable over the 2014–2016 period. The analysis of the output of the dairy sector compared to other livestock sectors highlights its relative importance in most EU Member States. The pig sector has, however, greater importance than the dairy sector in Belgium, Denmark, Spain and Hungary. Overall, the cattle sector's importance is comparable to the pigmeat sector, although it varies greatly among Member States.

At EU level, the dairy sector was the main beneficiary of the support under both Regulations, with 54% of the total budget allocated under Regulation (EU) 2015/1853 and 72% under Regulation (EU) 2016/1613, although the share of budget allocated to the dairy sector varied among Member States. In 2015, 9 Member States[41] targeted 100% (or close to 100%) of their budget to the dairy sector, compared to 15[42] in 2016. The pig sector was also targeted by the Member States, especially in 2015 (13% of the total budget allocated at EU level in 2015 and 7% in 2016). The analysis of pigmeat prices indicates that the sector started to recover between 2015 and 2016, thus reducing the need for exceptional aid.

To assess the relevance of the budget allocation compared to the scale of the market disturbances observed in each sector, an indicator was calculated to reflect the needs of the different livestock sectors based on the significance of the price drop and relative importance of the sector in the agricultural economy. This indicator was then compared to the actual share of budget allocated by Member States to the different livestock sectors. It shows that the exceptional aid seemed to have been appropriately targeted to the needs of the dairy sector in a majority of cases, i.e. the actual budget allocation was relevant to the needs of the dairy, pigmeat and cattle sectors in view of the scale of the market disturbance and relative importance of the sector for the Member State.

Yet, some Member States made budget allocation choices that would not fully reflect the market disturbance and relative importance of the sector in the agricultural economy. In some cases, the notifications from Member States also reflected the need to target specific sectors based on other criteria, such as degree of specialisation, debt ratio and economic losses experienced by farms, which are also coherent with the purpose of the exceptional aid. Local situations regarding catastrophic events such as earthquakes (Italy) or diseases (African swine fever) were also taken into account in the allocation of the aid.

[41] BG, IE, ES, HR, IT, LT, HU, PT, SE.

[42] BG, DK, DE, EL, ES, HR, LV, LU, HU, MT, AT ; PT, FI, SI, SE.

5. CONCLUSIONS

Risk management strategies implemented by the dairy sector

The dairy crisis (2015–2016) particularly affected farmers who had made significant investments to increase their milk capacities in the years preceding the end of the milk quotas and in the light of the exceptionally high market prices reached in those years.

To cope with the price loss and maintain their income, farmers adapted their production level. In particular, farmers who had invested before the market disturbances kept on producing for as long as their profit margin per litre of milk produced remained positive, so as to write off their investments. Other farmers reduced their production level or diversified their sources of revenue.

The strategies implemented by the dairy producers to cope with increased dairy price volatility helped make the EU dairy sector more resilient. Dairy farms have become better performing, having reduced their production costs and/or improved milk quality, thereby improving their profitability. Financial reserves remain essential to cope with potential price drops, whereas risk management tools such as the use of insurance and forward contracts, which were not popular before 2015, started to be implemented after the crisis.

Effects of the measures on production and market stabilisation

The dairy crisis was characterised by an oversupply of milk in the global market and a collapse in milk prices. In this context, exceptional measures implemented by Member States under Commission Delegated Regulation (EU) 2015/1853 and Commission Delegated Regulation (EU) 2016/1613 consisted in either cash-flow support or support to reduce milk production.

These measures had limited effects on the production decisions of dairy farmers. Regulation (EU) 2015/1853 mostly consisted in cash-flow support and did not impact farmers' production decisions in other ways than through supporting the milk production dynamics at that time, as the models implemented were not conditioned or linked to any change of practice. Regulation (EU) 2016/1613 might have encouraged some farmers to reduce their milk production when Member States conditioned the support to the reduction or freezing of milk production. Some Member States used the budget envelope to increase the payment per litre of milk production reduction, under Regulation (EU) 2016/1612 (i.e. the EU scheme implemented at that time to reduce the EU milk production), although the incentives of the support depended on farm characteristics such as variable costs per litre produced.

The various models implemented by Member States for delivering exceptional aid contributed to a limited stabilisation of the EU market. Observed trends in milk production in Member States cannot be linked to the models implemented for Regulation (EU) 2016/1613. Instead, the analysis suggests that the national and EU dairy markets are integrated in a global market where national initiatives for the reduction of milk production have no direct effect on milk price variations. The recovery of the EU market can be explained by larger initiatives coordinated at EU level, which have greater impact on market stabilisation than national initiatives (e.g. Regulation (EU) 2016/1612). Also, the ability of the dairy industry to find new outlets after the crisis helped restore market balance.

Effects of the measures on short-term liquidity

The dairy crisis significantly affected the financial situation of dairy farmers over a two-year period before recovery in 2017. However, impact did not necessarily occur at the same time: some farmers (e.g. in DE) appear to have been struck by the crisis earlier than others and able to recover from 2016.

The extent of financial difficulties of dairy farmers varied from one Member State to the other. In particular, Member States where production cost rose significantly in 2015 (e.g. BE, EE, FI, FR and NL)

were also those in which the average family farm income of dairy farms reached significantly low levels in 2015 and/or 2016. The increase in the cost of feed for grazing livestock helps to explain the surge of intermediate consumptions. Small-scale and young dairy farmers were often reported to have been significantly impacted by short-term liquidity difficulties. However, in some Member States, large specialised farms were reported to have suffered the most from short-term liquidity issues, notably when they had invested to optimise their performance.

Although it could reach significant levels in some Member States (e.g. DK, ES and HU), the average aid amount granted to farmers under Regulation (EU) 2015/1853 and Regulation (EU) 2016/1613 was generally low. It represented less than 10% of the total CAP support granted to dairy farmers in most Member States. This reflects its limited role in supporting cash flows and the overall financial viability of dairy farms in most Member States, as opposed to other CAP payments (including direct payments) which represent a significant share of the Farm Net Value Added of dairy farms.

The strategy implemented by Member States consisted in distributing the EU budget envelope among all dairy farms, and the average amount granted per farm was not calculated to compensate for income loss during the crisis.

Advantages provided by the conditionality introduced by Regulation (EU) No 2016/1613

Eligibility criteria were introduced by Regulation (EU) 2016/1613 to foster the targeting of the exceptional aid to the most resilient farming methods and to support producers and farmers who suffer most from market disturbances. Analysis of Member States' targeting strategies reveals various choices regarding the number and combinations of criteria introduced by the Regulation to deliver exceptional support in the dairy sector that could have increased the effectiveness of measures, either by fostering reduction in milk production, or by delivering a larger amount of aid to a smaller number of farms with stronger needs for support.

For Regulation (EU) 2016/1613, making the exceptional support conditioned on specific production decisions (e.g. production reduction or not increasing milk production) or on specific farm types (e.g. small-scale or extensive farms, members of producers' organisations, etc.) did not provide significant advantages in terms of effectiveness of the measures implemented. Notably, the measures seeking to foster the short-term liquidity of farms were generally distributed among a broad proportion of dairy farmers despite the introduction of conditionality. Only the complementary payment to the EU milk production reduction scheme, implemented with eligibility criteria targeting reduced production, encouraged farmers to reduce their production while maintaining their activity.

Coherence with the environmental objectives of the CAP

In 2015, Regulation (EU) 2015/1853 did not integrate specific environmental aspects. Instead, it provided direct support to farmers, without consideration of their size, practices and impact on the environment. Some types of payment may have theoretically benefited larger farms (i.e. payment per litre of milk or payment per cow) or smaller farms (i.e. flat payment), which could have influenced production concentration and increased the environmental pressures from intensive dairy systems[43] (e.g. direct point source pollution, diffuse pollution and loss of marginal habitats and landscape features). However, the study shows that the payments granted were generally too low to have an effect on production and farmers' short-term liquidity.

In 2016, Regulation (EU) 2016/1613 introduced three eligibility criteria to target sustainable farm types (among other criteria), i.e. small-scale farming, extensive production methods or/and environmental and climate-friendly production methods. Although positive impacts could be expected on the

[43] https://ec.europa.eu/environment/agriculture/pdf/dairy_xs.pdf.

environment, the theoretical effects would depend on the selectivity of the targeting strategy implemented (e.g. farmers' ability to access the aid by complying with a range of other non-environmental criteria).

The analysis reveals that the various models implemented by Member States for delivering exceptional aid were generally consistent with the environmental objectives of the CAP or considered as 'environmentally neutral'.

Coherence with the objective of long-term sustainability of livestock farmers

Direct financial aids granted under Regulation (EU) 2015/1853 and (EU) 2016/1613 were generally consistent with the objective of supporting farm profitability and income stability, although the measures aimed at relieving financial difficulties only in a short-term perspective and their actual effect was limited. The wide targeting of beneficiaries led to insufficient amounts of support to ensure a suitable income and long-term economic sustainability. However, in specific cases, this support might have helped some dairy farmers to maintain their activity, in particular in small dairy farms.

Relevance of the targeting of sectors by Member States

The targeting of the sectors by Regulation (EU) 2015/1853 and Regulation (EU) 2016/1613 was suitable in view of the type and scale of the market disturbance. Indeed, the dairy sector, which has high economic importance compared to other sectors and was facing significant disturbances, was heavily targeted by EU Member States. The pig sector, which suffered from a drop in prices at the same time as the milk crisis, was also targeted but to a lower extent. The other drivers that led Member States to target specific sectors were the degree of specialisation, the debt ratio and economic losses of farms in the sector, and local situations (e.g. earthquakes in Italy or worrying sanitary contexts due to African swine fever).

6. RECOMMENDATIONS

Based on the findings, the evaluation study recommends the following actions to improve the effectiveness of the CAP exceptional measures implemented to tackle market imbalance issues:

- **Require Member States to further document the rationale for the delivery of the exceptional support**. Member States should describe the specific needs of farmers and how their strategy for implementing the exceptional support will address those needs. In particular, the eligibility criteria and the type of payments (e.g. flat-rate, per cow, per litre/kg of milk) will determine (i) which farmers will access the support and (ii) the capacity of the aid to tackle the specific issues faced by the farmers. The intervention logic must thus be clearly demonstrated by Member States as a prerequisite for the implementation of the support.
- **Improve effectiveness via better-targeted strategies implemented at Member State level**. Exceptional measures aim at supporting farmers experiencing the sharpest price fall and should alleviate the economic consequences resulting from market disturbance. Therefore, Member States should use the EU budget made available to target the most vulnerable farmers and ensure a sufficient amount of aid to reinforce farmers' resilience to market disturbance.
- **Set more stringent conditions/commitments at EU level for the delivery of the aid in Member States**. As the purpose of exceptional support is to tackle the specific difficulties faced by farmers depending on their size or other characteristics (e.g. location, specialisation, financial situation, etc.), access to the aid should be conditional on specific eligibility criteria clearly set out in the EU regulation. Member States should not be given the possibility to implement the eligibility criteria provided for in the EU regulation loosely, in a way that enables all farmers to be eligible. Specific provisions should require Managing Authorities to select fewer eligibility criteria and adopt a more selective approach.
- **Consider financial indicators for Member States to identify the farmers most affected by market disturbances.** Specific ratios could be calculated, based on farm accountancy data, to target the aid to farmers with higher risks of bankruptcy. They should reflect the working capital needs, the level of indebtedness or the loss in farm net income.
- **Provide different types of support to improve long-lasting benefits of the support**. The EU budget was generally delivered in the form of income support, as Member States were looking for efficient and prompt ways of distributing it to farmers. However, other types of support could have been of interest depending on the difficulties faced by farmers. The EU budget could serve as leverage to grant subsidised loans to farmers. When needed, it can take the form of support for the diversification of activities or a premium for broader use of risk management tools in order to improve farmers' resilience to market volatility and long-term economic sustainability. In the case of the dairy crisis, specific aid to alleviate debt burden on farmers' financial situations would have proven to be very relevant.
- **Make aid conditional on strict compliance with the GAEC or other environmental commitments.** Although the objective of the aid should determine the type of support provided, any negative side effects on the environment must clearly be avoided. From this angle, exceptional aid aiming at supporting the financial situation of farmers can be made conditional on specific environmental indicators, i.e. GHG emissions or any other environmental commitment. In any event, compliance by the beneficiaries with GAEC/SMRs must always be ensured.
- **Require Member States to monitor specific indicators associated with the implementation of exceptional support, to enable evaluation of these schemes at EU level**. Although Member States are required to notify the European Commission about the implementation of the measures and the effects achieved, there was generally a lack of data on the characteristics of beneficiaries who benefited from the support (e.g. size of the herd, production volume, specialisation), as well as on the share of dairy producers concerned. Harmonised monitoring based on templates provided to Member States could be included in the Performance and Monitoring Framework, notably on the size and characteristics of beneficiary holdings, the average amount granted and the share of dairy holdings concerned.

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