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EU AGRICULTURAL OUTLOOK

FOR MARKETS, INCOME AND ENVIRONMENT
2020 - 2030

Agriculture
and Rural
Development

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While all efforts are made to provide sound market and income projections, uncertainties remain.

The contents of this publication do not necessarily reflect the position or opinion of the European Commission.

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NOTE TO THE READER

The report covers the EU in its current composition (EU-27), following Brexit, which took place on 31 January 2020. It presents the medium-term outlook for the EU agricultural markets, income and environment to 2030, based on a set of coherent macroeconomic assumptions deemed most plausible at the time of the analysis. Oil price and population forecasts (based on IHS Markit) were updated on 16 October 2020 and the exchange rate and GDP forecast (based on European Commission's forecast) on 5 November 2020.

The analyses of agricultural markets rely on information available at the end of September 2020 for agricultural production and trade and on an agro-economic model used by the European Commission. Projections assume a continuation of current agricultural and trade policies, and not the ones under discussion such as the post-2020 CAP reform, the next multi-annual financial framework or the European Green Deal. Only free trade agreements ratified at the end of September 2020 are taken into account.

The report is also accompanied by analysis of a selected set of market uncertainties in order to quantify the potential for variation in the results. Possible variations stem in particular from fluctuations in the macroeconomic environment and in yields of the main crops and milk. Specific scenarios are also presented for COVID-19 recovery pathways and for insects as a source of proteins for feed.

As part of the preparatory process, an external review of the baseline and the scenarios around market uncertainties was conducted at an outlook workshop organised online on 21-22 October 2020. During this event, valuable inputs were collected from high-level policy makers, European and international modelling and market experts, private companies and other stakeholders, as well as from international organisations such as the OECD and the FAO.

This European Commission report is a joint effort between the Directorate-General for Agriculture and Rural Development (DG AGRI) and the Joint Research Centre (JRC), DG AGRI being responsible for the content. While every effort is made to provide a robust outlook for agricultural markets, income and environment, strong uncertainties remain — hence the importance given to analysing uncertainties, particularly in the context of the aftermath of the COVID-19 pandemic.

In DG AGRI, the report and underlying baseline were supervised and/or prepared by Andrea Čapkovičová (overall coordination, and the outlook for milk, dairy products and olive oil), Vincent Cordonnier, François Chantret (macroeconomic outlook, agricultural income and labour), Andrea Furlan (environment outlook), Debora Gatelli, Magdalena Grzegorzewska (macroeconomic and meats outlook), Beate Kloiber, Barthélemy Lanos (land use, cereals, oilseeds and protein crops outlook), Dangiris Nekrasius (sugar and biofuels outlook), Jean-Marc Trarieux, Benjamin Van Doorslaer (environment and meats outlook) and Marijke van Schagen (wine, fruit and vegetables outlook). DG AGRI's outlook groups and market units helped prepare the baseline.

The JRC team that contributed to this publication included: for the outlook (baseline preparation and uncertainty checks), Thomas Chatzopoulos, Christian Elleby (COVID-19 recovery pathways scenario, uncertainty analysis), Hans Jensen (insects feed scenario), Ignacio Pérez Domínguez (supervision of scenarios); for the preparation of the workshop, Manuel Gómez Barbero, Patricia Roman Ramos; for the CAPRI baseline, Mariia Bogonos, Amarendra Sahoo, Mihaly Himics, Ignacio Pérez Domínguez; for the environmental analysis, Maria Bielza, Adrian Leip; Emanuele Lugato; and Franz Weiss. We also benefited from the valuable technical support and experience of Raul Abad Viñas, Giacomo Grassi and Jean-Michel Terres from JRC.

The technical support and expertise provided by Marcel Adenauer and Hubertus Gay from the OECD were most valuable too.

The text on the tomatoes and apples outlook at Member State level was prepared by the AGMEMOD consortium, represented by: Ana Gonzalez Martinez, Roel Jongeneel, David Verhoog, Myrna van Leeuwen (Wageningen Economic Research), Martin Banse and Petra Salamon (Thünen Institute).

We are grateful to the participants in the October 2020 outlook workshop and to many other colleagues for their feedback during the preparation of the report.

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HIGHLIGHTS

The report on the EU agricultural outlook for markets, income and the environment presents how EU agriculture can be expected to cope with opportunities and challenges in the upcoming decade. The preparation of this edition was affected in particular by the COVID-19 crisis. Several assumptions were made for the path to global and EU economic recoveries, and some scenarios were prepared to illustrate alternative recovery pathways.

Overall, the impact of the crisis on food markets has remained limited thanks to the resilience of the food chain. The emerging pattern seems to be one of reinforcement of some pre-existing trends rather than a complete overhaul of the food system, with for instance an increase in e-commerce food sales and greater demand for locally produced food and short supply chains. Nutritional value, origin and health concerns are prominent among drivers of consumer choice, together with environment and climate change. In this context, the sustainability aspects of EU farming and food production were strengthened in political discussions on the future of the Common Agricultural Policy and delivery of the European Green Deal objectives. As the trilogues on the CAP legislative proposals post-2020 are ongoing between the Parliament, the Council and the Commission, neither the CAP reform nor specific targets (and policy settings) are considered in this report. Nevertheless, some market assumptions are made to reflect on ongoing initiatives and publicised strategies in several sectors. Therefore, this report provides to the greatest extent possible a reliable measure of EU agriculture's contribution to sustainable food and farming, using the most plausible assumptions available.

Growth in EU production of arable crops is expected to be limited. Land competition, coupled with the expansion of forest and pasture areas, will limit the available land for arable crops. On the other hand, enhanced farming practices and continuous research and development will support growth in yields. Digitisation will increasingly be at the core of yield productivity gains, improved labour conditions and high environmental standards.

In the animal sectors, sustainability objectives are expected to be an integral part of production growth, with action to be taken all along the food chain. EU milk production could grow more slowly than in the past, with increasing presence of non-conventional production systems (e.g. pasture-based, GM-free fed, organic). Nevertheless, the EU is to remain the largest dairy exporter. On meats, consumers could prefer more poultry meat as it is perceived as being healthier than pigmeat and beef and more convenient to prepare.

In specialised crops too, health awareness and convenience are to drive increasing demand for fruit and vegetables. Consumers' preference for sparkling wine and wine with a lower alcohol content could limit the decline of wine consumption. In the olive oil sector, EU non-producing countries and export markets should increase their importance in an overall market balance.

Projections have been made based on a European Union of 27 Member States. Only ratified free trade agreements are taken into account.



EXECUTIVE SUMMARY

Main assumptions

This outlook covers the period from 2020 to 2030 and reflects on current agricultural and trade policies. Projections are based on the latest OECD-FAO Agricultural Outlook updated with the most recent global macroeconomic and market data.

According to macroeconomic assumptions, the **global economy** will rebound in 2021-2022 and level off at an annual average growth of 3% by 2030. The **EU economy** should recover to its pre-COVID-19 level by 2023. The **oil price**, after bottoming out at USD 41/bbl in 2020, is due to reach USD 83/bbl in 2030. A moderate appreciation of the **euro** is expected in the medium term, reaching USD 1.16/EUR by 2030. These assumptions are based on average economic trends, so they presume market developments to be relatively smooth. However, in reality markets tend to be much more volatile.

Recent **free trade agreements** (FTAs) are included if they have already been implemented (with Ukraine, Japan, Vietnam and Canada), while the ones only concluded are not (with Mercosur and the updated FTA with Mexico). Regarding the future relationship between the EU-27 and the UK, there is a purely technical assumption that duty-free/quota-free trading relations will continue.

As macroeconomic projections and crop yield expectations are by nature surrounded by uncertainty, a systemic **uncertainty analysis** has been carried out, which enables us to illustrate possible developments caused by the uncertain conditions in the economy and agricultural markets. This report presents possible price ranges around the expected baseline.

In addition, to address the implications of the uncertainties surrounding the post-pandemic recovery, specific **scenarios** look at alternative COVID-19 recovery pathways. Finally, a scenario about the use of food losses and food waste for insect farming to produce protein meal and oil for aquaculture is analysed and presented in the report.

Arable crops

The total EU agricultural area is projected to reduce slightly, mainly driven by reduced cereals and oilseed acreage. By contrast, the use of land for pasture, fodder and protein crops is expected to grow. The area dedicated to organic production should also increase and reach 10% of the total agricultural land by 2030 (in the absence of measures stemming from the CAP reform currently under negotiation and without reflecting the European Green Deal target of 25% of agricultural area under organic farming).

Total EU **cereal** production, thanks to increasing yields, is expected to remain stable at 277 million t. Better crop rotation systems, improved soil management and increased use of decision support tools should prop yields. The areas for barley and wheat are projected to decrease, while maize areas should compensate for this by meeting the demand for cereal feed. Domestic use, supported by higher food use, should also stabilise at 260 million t. In trade, the position of EU exports is due to strengthen thanks to converging EU and world prices and proximity to importing markets, primarily in the Mediterranean region and sub-Saharan Africa.

On **oilseeds**, the rapeseed area is expected to slow its decline, thanks to the value of rapeseed in crop rotation systems and a steady demand for its oil. Total EU production of oilseeds is projected to increase slightly thanks to rising sunflower and soy production. Coupled with a limited increase in oilseed imports, crushing volumes are expected to remain stable overall, driven by the sustained demand for EU oilseed oil. Consumption of vegetable oils (including palm oil) is projected to decline, driven by decreasing palm oil imports for non-food uses.

Strong growth is projected for EU **protein crops**. Production will be driven by a large increase in area and yield improvements, while the strong demand for innovative plant-protein products and for more locally-produced protein sources should result in a 30% growth in consumption.

The EU **sugar** area is due to stabilise in the medium term and EU production is expected to increase to 16.2 million t by 2030. The declining human consumption of sugar is expected to be only partially substituted by non-caloric sweeteners and a higher use of isoglucose in processed food. The increase in sugar exports for processed products should limit the decline in consumption, while competitive prices should allow the EU to become a net exporter of sugar.

Demand for **feed** from arable crops is projected to decrease slightly, mainly due to the decline in EU pigmeat production. Diversification of livestock and dairy production systems should increase demand for organic, non-GM and pasture-based feed and shorter supply chains. Feed prices are due to fall in the near term due to expected lower transportation costs.

Biofuels are also affected by the decrease in demand induced by the COVID-19 crisis. In the medium term, demand will be constrained by the decline in conventional fuel use, but increasing blending rates will mitigate the impact. Restrictions on the use of palm oil for biodiesel are expected to significantly reduce the supply of this feedstock. Ethanol production is projected to remain stable overall in the medium term, while the production of advanced biofuels is due to increase.

Milk and other dairy products

Sustainability objectives could translate into more moderate, annual growth in EU **milk** production (0.6%). The sector will also likely further improve farming practices, focusing notably on animal welfare through measures to prevent disease and injuries. Non-conventional production systems are expected to expand and prevent the dairy herd from being greatly reduced (-7% compared to the 2018-2020 average). Notably, the share of organic milk production is expected to reach 10% in 2030 (3.5% in 2018). Yields could continue to grow although at a lower rate than in the past with an increased segmentation of production systems. Longer lifespan of animals, higher carbon sequestration and better manure management are among the factors which are likely to reduce greenhouse gas (GHG) emissions per kg of milk produced by 2030.

At world level, population and income growth and expanding urbanisation could increase global import demand for **dairy products**, although less than before due to increasing self-sufficiency worldwide. The EU is projected to remain the World's largest dairy exporter.

The largest share of the increase in EU milk production is due to flow into **cheese** processing, driven by both domestic and global demand. **Whey** should benefit from the expansion in cheese production and be valorised more thanks to an ongoing shift to its use in the food industry. A slowing decline in EU **liquid milk** consumption should provide support for the production of fresh dairy products, including new products which are gaining interest among consumers. The EU **butter** market is due to be supported by stable prices projections, a shift from food service to retail sales and increasing exports. The production of **milk powders** should also gain support from being processed into both high value-added and basic products and, in the case of skimmed milk powder, from export demand in Asia and Africa.

Meat

Sustainability is expected to take a more prominent role in EU **meat markets**, among both producers and consumers. In the short term, the global disease situation, like the outbreaks and later recovery of African Swine Fever (ASF) in Asia or the current COVID-19 pandemic bring about a lot of uncertainty as regards the global demand for meat. As consumer dietary patterns, health considerations and convenience trends change, per capita EU meat consumption is projected to decline by 1.1 kg to 67.6 kg by 2030.

Environmental concerns, the risk of ASF and changes in consumers' preferences are likely to constrain EU **pigmeat** production. Strong international demand and high prices reduced domestic consumption recently, setting a trend for the medium term. On exports, the EU should continue to be a

dominant supplier, but is not expected to rebound to the record levels of 2019-2020.

Following the decline in the EU cattle herd, production of **beef** is also expected to continue to reduce, despite moderate export prospects and slightly decreasing feed prices. EU beef consumption is due to decline by 0.9 kg per capita, but export opportunities may improve in the medium term. Imports could also rise slowly, following the gradual increase of tariff rate quotas stemming from the entry into force of recent free trade agreements between the EU and certain trade partners.

The EU production and consumption of **sheep** and **goat** meat are projected to remain stable. Exports of live animals are due to decrease, while imports of sheep meat should remain stable and well below the total volume of tariff rate quotas opened by the EU.

The EU demand for **poultry** meat is projected to grow steadily as consumers see it as a healthy and sustainable product. Poultry production is expected to be the only meat category to grow. Exports should continue to benefit from the valorisation of specific bone-in cuts, while imports are expected to grow in line with the availability of tariff rate quotas.

Specialised crops

EU **olive oil** production is due to grow, driven by increasing yields. Domestic consumption is expected to be driven by sustainability and health awareness overall and by the non-producing countries in particular. At global level, strong demand fuelled by the post COVID-19 economic recovery should lead to an increase in EU exports.

The EU wine sector is adapting to changing lifestyles and preferences of consumers. These are expected to slow down the decline in consumption, while other uses (e.g. distillation) should slightly increase. EU exports should be driven by high demand for wine with a geographical indication (GI) and sparkling wines. These trends will result in a slight decline in EU wine production.

EU **apple** production is projected to remain stable thanks to increasing yields despite the size of its area shrinking. Health awareness among consumers and new apple varieties should help increase the consumption of fresh apples, while exports are due to stabilise after a decrease in the short term.

The EU consumption of **peaches** and **nectarines** should decline due to stable production and competition from other summer or tropical fruits. EU exports, in particular of processed peaches, are expected to increase, driven by growing global demand and the EU's competitiveness on the world market.

Driven by yield increases, EU **orange** production is due to slightly grow. Increasing consumer preferences for fresh oranges and fresh juices over concentrates should put pressure on the demand for oranges for processing. Net EU imports should increase to cover the demand gap.

The EU production of fresh **tomatoes** is projected to decline slightly because of strong foreign competition and an increasing demand for smaller, more profitable varieties. Consumption of processed tomatoes should remain stable, but with a similar shift towards higher value-added products.

Agricultural income and labour

EU **farm income** is expected to increase due to a rising volume of production and appreciating prices. Crop production is expected to grow faster (1.9% per year) than animal production (0.9% per year). Nevertheless, costs are projected to rise at a similar pace, and the increase in nominal income should be limited to 1% per year.

The decline of the farm **workforce** due to structural changes at EU level is expected to slow down to 1% per year and should result primarily from technological progress in machinery and equipment. The real income per worker is due to increase by 0.5% per year, slowing down from 1.9% in the past decade.

Environmental and climate aspects

This report presents an environmental analysis of the medium-term developments of EU agricultural markets based on environmental and climate indicators, with a focus on GHG emissions and CO₂ removal from the atmosphere.

From 1990 to 2018, **GHG emissions** from the EU agricultural sector decreased by 21%. However, almost all of that change happened in the first half of this period. Emissions from land use, land use change and the forestry sector, which are negative because they are offset by CO₂ removal, have followed a similar trend.

Modelling projections for 2030 show that GHG emissions from EU agriculture would remain largely unchanged from current levels: the projected decrease in livestock herd is going to be balanced out by an increase in nitrous oxide emissions due to higher crop yields. For soil organic carbon budget, projections show a net increase corresponding to up to 2% of agricultural GHG emissions. Finally, the potential for different farming practices to sequester carbon is analysed, the most promising of which are to be found following organic soils, producing winter cover crops and increasing the share of leguminous plants on temporary grasslands.



ABBREVIATIONS

ASF	African swine fever	N ₂ O	nitrous oxide
AWU	annual working unit	NH ₃	ammonia
CAP	common agricultural policy	OECD	Organisation for Economic Cooperation and Development
CH ₄	methane	PDO	protected designation of origin
CO ₂	carbon dioxide	PGI	protected geographical indication
CPI	consumer price index	RRF	Recovery and Resilience Fund
CV	coefficient of variation	SMP	skimmed milk powder
EC	European Commission	SOC	soil organic carbon
ECB	European Central Bank	TRQ	tariff-rate quota
EEA	European Environmental Agency	UAA	utilised agricultural area
EFA	ecological focus areas	UK	United Kingdom
EU	European Union (of 27 Member States)	UNFCCC	United Nations Framework Convention on Climate Change
EU-27	EU Member States without the UK	US	United States of America
EU-ETS	EU Emissions Trading System	USD	US dollar
EUR	euro	WMP	whole milk powder
ESR	effort sharing regulation		
FAO	Food and Agriculture Organization of the United Nations	bbL	barrel
FDP	fresh dairy products	eq.	equivalent
FTA	free trade agreement	g	gram
GDP	gross domestic product	hl	hectolitre
GHG	greenhouse gas	ha	hectare
GI	geographical indication	kg	kilograms
GM	genetically modified	l	litre
ILUC	indirect land-use change	pp	percentage point
IPCC	Intergovernmental Panel on Climate Change	t	tonne
JRC	Joint Research Centre	t.o.e.	tonne oil equivalent
LUC	land-use change	w.s.e.	white sugar equivalent
LULUCF	land use, land-use change and forestry		
MTO	medium-term outlook		
N	nitrogen		



INTRODUCTION BASELINE SETTING

/1

This chapter presents the main assumptions used for the projections in the medium-term outlook for the EU's major agricultural markets and agricultural income to 2030. It includes assumptions on the policy and macroeconomic environment, as well as key results of the analysis carried out to assess possible developments caused by uncertain conditions.

The baseline is based on a set of coherent macroeconomic assumptions. It assumes normal agronomic and climatic conditions, steady demand and yield trends, with no particular market disruption (e.g. from animal disease outbreaks, food safety issues, or a geopolitical event). In addition, the medium-term projections reflect current agricultural and trade policies, including future changes already agreed upon.

The economic outlook takes into account changes in macroeconomic conditions, averted this year by the COVID-19 pandemic. COVID-19 will not only shape the world and the EU economies over the next 2 years. It will also likely lead to sluggish growth in the medium-term and bring unusual uncertainty to the recovery shape.

BASELINE SETTING AND POLICY ASSUMPTIONS

This edition has been prepared in a very uncertain environment. The work started when the second wave of COVID-19 was still in its early stages. It was finalised just after the first concrete announcements related to the vaccines under development were made. The negotiations with the UK on the future trade relationships with the EU-27 were also still ongoing.

This outlook covers the period from 2020 to 2030. The projections are based on the OECD-FAO Agricultural Outlook 2020-2029, updated with the most recent global macroeconomic and market data. The macroeconomic assumptions take into account the latest forecast and analysis available in early November 2020. The statistics and market information used to project the short-term market developments were those available at the end of September 2020.

As is common practice in a medium term outlook, market developments are assumed to move forward relatively smoothly. However, they are likely to be much more volatile each year depending on the exact production level and external shocks. Therefore, the outlook cannot be considered to be a forecast. More precisely, these projections correspond to the average trend agricultural markets are expected to follow should policies remain unchanged, in a given macroeconomic environment that was plausible at the time of analysis but not certain.

Macroeconomic forecasts and crop yield expectations are by nature surrounded by uncertainty, as confirmed this year. To reflect this, a systemic **uncertainty analysis** around the baseline has been carried out. Such analysis enables us to illustrate possible developments caused by the uncertain conditions in which agricultural markets operate. This report presents possible price ranges around the expected baseline. A more systematic representation of the variability in agricultural markets stemming from these uncertainties is summarised in the section on 'Uncertainty analysis' in this introductory chapter.

In addition, to address the implications of the uncertainties surrounding the post-pandemic recovery, **specific scenarios** looking at alternative COVID-19 recovery pathways have been developed. The impacts of a 'green recovery' scenario as well as a 'slow recovery' scenario are presented and analysed.

With the negotiations of the future Common Agricultural Policy (CAP) ongoing, and EU Member States yet to present their CAP Strategic Plans, our **policy assumptions** are that the 2013 CAP reform, which fully entered into force in 2015, will continue to be implemented. In the same vein, the objectives of the European Green Deal and the targets of the Farm to Fork and

Biodiversity Strategies¹ are yet to be reflected in current and future policies. As a consequence, for example, the projected development of the organic sector in the baseline is based on current trends and expert judgement on what to expect with the current support and incentive policies.

This baseline will provide a reference to assess the impact on agricultural markets of the different policy options that may be contemplated to implement the European Green Deal, the associated strategies and the related actions.

Crisis or market measures addressing severe market disturbances are not modelled: the baseline does not include unforeseen market disruptions and decisions to deploy those measures are taken on a case-by-case basis.

Given the geographical aggregation of the model, it is not always possible to account for how direct payments are distributed between and within EU Member States or the targeted allocation of coupled payments. Similarly, the impact of the capping of payments, specific schemes for small farmers and young farmers and the redistributive payment are only accounted for in the projections through expert judgement.

The analysis factors in the effects of the Nitrate Directive and other environmental rules on water and air quality. Other environmental policies are not explicitly taken into account in the model. The effects of 'greening' are also accounted for through its three components²: (i) crop diversification, (ii) permanent grassland maintenance and (iii) ecological focus area (EFA) requirements. Overall, these environmental measures have little impact on aggregate production levels.

Recent **free trade agreements** (FTAs) already entered into force (with Ukraine, Japan, Vietnam and Canada) are included in the baseline, while the others (with Mercosur, the updated FTA with Mexico) are not. The Russian ban on EU agricultural exports is prolonged until the end of 2021.

No specific assumption was made regarding the potential impact of ongoing trade tensions, e.g. between the US and China, although expert judgement partly accounts for assumptions regarding the latter. Regarding the future relationship between the EU-27 and the UK, a purely technical assumption of duty-free/quota-free trading relations was made.

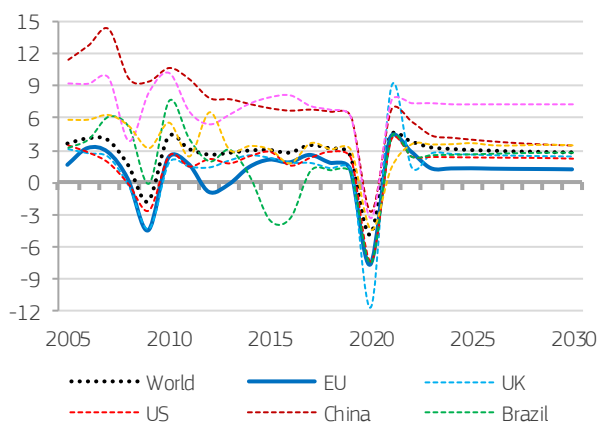
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¹ COM(2020)381 and COM(2020)380.

² European Commission (2016, 2017).

MACROECONOMIC ENVIRONMENT

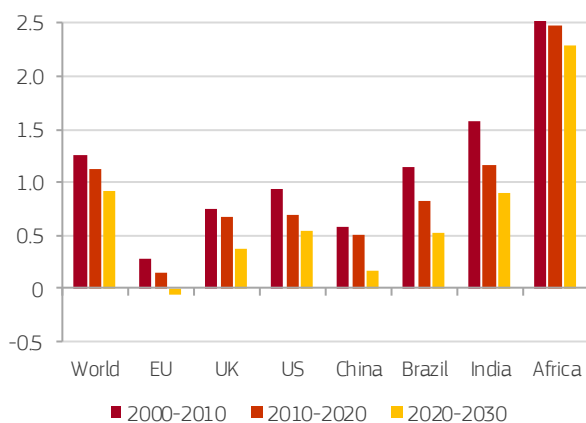
Macroeconomic assumptions for the EU are based on the European Commission's economic forecast for 2020-2022³ and IHS Markit⁴ macroeconomic forecasts for the longer term. The OECD provided the global agricultural outlook. Oil price and population forecasts (based on IHS Markit) were updated on 16 October 2020 and the exchange rate and GDP forecast (based on European Commission's forecast) on 5 November 2020.

GRAPH 1.1 Economic growth assumptions, GDP (%)



Source: DG Agriculture and Rural Development, based on AMECO, OECD-FAO, and IHS Markit.

GRAPH 1.2 Population annual growth assumptions (%)



Source: DG Agriculture and Rural Development, based on OECD-FAO and IHS Markit.

The COVID-19 pandemic is a major factor in shaping the development of the world economy over the next 2 years. It is a source of uncertainty for the recovery from COVID-19 in the medium term. The baseline scenario assumes that after 2 years of rebound (2021 and 2022), the global economic growth will

level off at an annual average of 3% by 2030 (3.9% in China, 2.4% in the US and 1.3% in the EU). The EU economy is expected back to the pre-COVID level by 2023, also with help from the Recovery and Resilience Fund (RRF). The subsequent modest GDP growth will be the consequence of a weaker labour market, subdued investment and higher debt accumulated during the time when fiscal policy measures were taken to mitigate the immediate threats of the COVID-19. This impact is only taken into account in macroeconomic assumptions. The scenarios on 'Alternative COVID-19 recovery pathways' describes two macroeconomic scenarios and their effects on agricultural markets.

The oil price drives agricultural commodity prices through production costs (the cost of energy, fertilisers and other inputs). It affects competitiveness and the biofuels market. The EU demand for oil will fall due to the combined effect of the level of economic growth and the shift towards renewable energy and gas. The slump in oil use during the COVID-19 pandemic is likely to be temporary only. On the supply side, oil production is not projected to fall before 2040, even if other tensions like those in 2020 (US-Iran tensions, Russia-Saudi Arabia price war) could occur. Assuming an average between the OECD and IHS Markit projections, the oil price, which is bottoming out at 41 USD/bbl in 2020, will rise to 83 USD/bbl in 2030.

Exchange rates directly impact the competitiveness of EU agricultural exports. Forecasts for the USD/EUR exchange rate are sometimes contradictory and may change quickly given geopolitical circumstances. The pace of the economic and labour market recovery in the US, global uncertainty and a loose monetary policy in the euro area are expected to strengthen the US dollar vis-à-vis the euro in 2021. In the medium term, it is assumed that the euro will appreciate moderately from 1.12 USD/EUR in 2021 to 1.16 USD/EUR in 2030, assuming a trend in-between the OECD and IHS Markit forecasts.

The 'Uncertainty analysis' describes potential divergencies in oil prices and exchange rates and their impact on commodity markets.

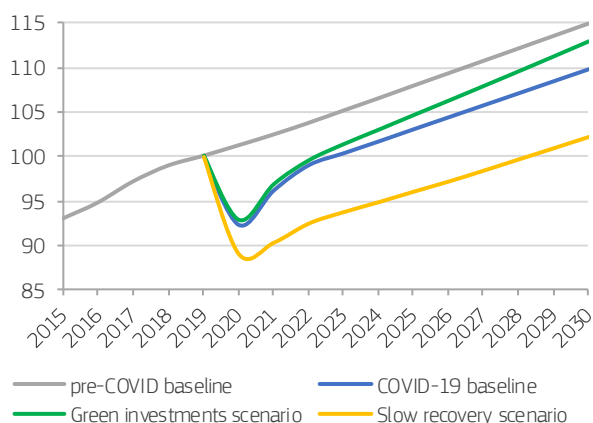
World population growth, despite slowing down to 0.9% per year by 2030, will remain a key driver of demand growth. The EU population will remain almost stable (slightly lower in 2030 compared to 2020), contrary to other countries and regions. In particular, the African population is expected to sustain a strong annual growth over the period (+2.3%) and is projected to overtake the Chinese and Indian populations by 2025 and reach 1.7 billion people in 2030. As food production in Africa is unlikely to keep up, food imports into the continent are due to continue rising. Income growth, although tempered by COVID-19, will lead to higher imports worldwide.

³ European Commission (2020).

⁴ <https://ihsmarkit.com/>.

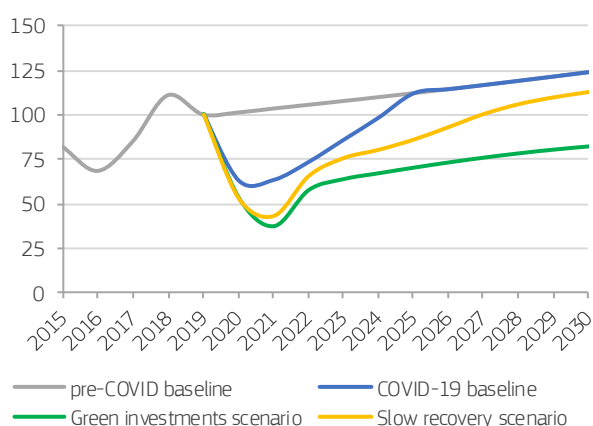
SCENARIO: ALTERNATIVE COVID-19 RECOVERY PATHS

GRAPH 1.3 EU GDP assumptions (2019=100)



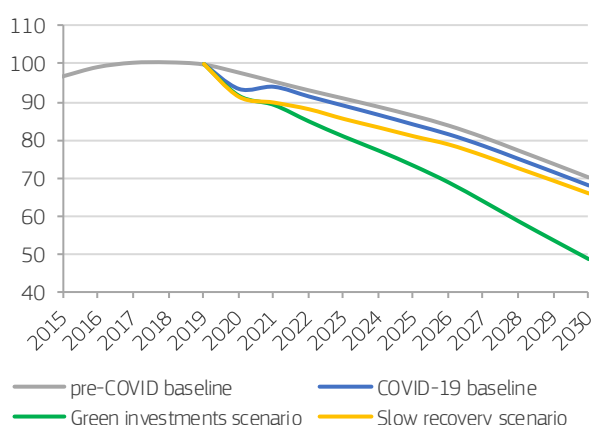
Source: JRC, based on OECD-FAO and IHS Markit.

GRAPH 1.4 International oil price (Brent) assumptions (2019=100)



Source: JRC, based on OECD-FAO and IHS Markit.

GRAPH 1.5 EU fuel consumption assumptions (2019=100)



Source: JRC, based on OECD-FAO, Global Energy and Climate Outlook 2019, and IHS Markit.

Assumptions for ‘slow recovery’ and ‘green recovery’ scenarios

The global economic contraction caused by the COVID-19 pandemic in 2020 is the sharpest on record. Policy measures introduced to contain the pandemic, including lockdowns in most EU Member States, led to short-term disruptions in local and global food value chains, including threats of shortage of labour and of trade frictions. However, the resilience of the EU food systems and the quick policy answers meant that the risk of adding a food crisis on top of the sanitary crisis was avoided. The medium-term impacts of COVID-19 are still uncertain and will depend on the economic recovery pathways.

The baseline projections for the EU agricultural outlook are based on selected macroeconomic and policy assumptions (see section on Macroeconomic environment). In light of the considerable macroeconomic uncertainty due to the COVID-19 pandemic, two scenarios were prepared based on alternative economic recovery pathways⁵. Both assume effective vaccines become widely available by the summer of 2021. In the first, ‘slow recovery’ scenario, a resurgence of COVID-19 infections leads to another round of lockdowns in Q4 of 2020 and Q1 of 2021, while fiscal support measures are assumed to be phased out gradually⁶, hampering the early stage of recovery. In the second, ‘green investments’ scenario, a policy shift is envisaged in the wake of the COVID-19 crisis, encouraging research and investments in energy efficiency and fuel switching. This lowers the demand for energy in general and fossil fuels in particular and puts downward pressure on energy prices. Both scenarios are global, i.e. based on specific projections for major world economies. In the results section we compare the two scenarios to the ‘COVID-19 baseline’ (the OECD-FAO baseline, which includes the same macroeconomic assumptions as this agricultural outlook, see section on Macroeconomic environment). The OECD-FAO ‘pre-COVID baseline’⁷ is for illustrative purposes in the charts on assumptions.

GDP- and oil price assumptions in the baseline and scenarios

Without COVID-19, the EU economy was expected to increase by 15% between 2019 and 2030. Due to the pandemic, the COVID-19 baseline has been revised downwards to 10% in the current baseline including the COVID-19 shock (an annual difference of 4.5 percentage points in 2022-2030). In the ‘slow recovery’ scenario, the contraction assumed in 2020 is steeper

⁵ Macroeconomic assumptions in the two scenarios are mainly based on macroeconomic and oil price projections supplied by IHS Markit.
⁶ Assumption made by IHS Markit in scenario of ‘green investments’.
⁷ OECD-FAO (2020).

than in our baseline, and the subsequent sluggish recovery brings GDP in 2030 to only a few percent higher than in 2019. The ‘green investments’ scenario, characterised by slightly higher growth (in oil-importing countries), results in an EU GDP level in 2030 slightly above our baseline (but still well below the pre-COVID baseline).

In the baseline, the international oil price in 2030 is projected at 82 USD/bbl (28% above 2019). In the ‘slow recovery’ scenario, lower demand, resulting from lower incomes, reduces this projected increase of the oil price to 72 USD/bbl (13% above 2019). In the ‘green investments’ scenario, the oil price reaches 52 USD/bbl in 2030 (18% lower than in 2019). This decline is mainly driven by demand for transport fuel, which in 2030 is 20% lower in the ‘green investment’ scenario than in the ‘slow recovery’ scenario⁸.

Impacts on agricultural markets

The higher the decline in the economy’s incomes (measured by GDP), the higher is the negative impact on demand and, subsequently, on prices. The production impact, including agricultural supply, depends on the level of the demand shocks in the EU and in other countries, as well as their relative difference (a higher drop in domestic demand improves EU competitiveness and increases foreign demand for EU exports). In some cases, the additional foreign demand offsets lower domestic demand, and EU production may increase.

Lower energy prices lead to lower production costs for agricultural commodities and thus to higher supply. However, lower conventional fuel prices make biofuels less competitive and reduce their demand, while lower fuel demand reduces the demand for biofuel used in blends.

The combined effect of the GDP, oil price and fuel consumption shocks in the scenarios translates into a price decrease in most agricultural markets and a large price decrease in the biofuels and feedstock markets.

As to the specific markets:

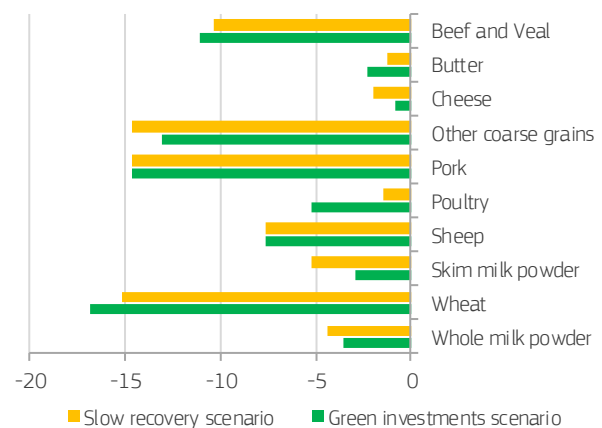
- The supply and demand shocks lead to significantly lower meat and grains prices in the two scenarios compared with the OECD-FAO baselines.
- Lower demand for fuel in the ‘green investments’ scenario, combined with lower oil prices and income, results in lower producer prices and lower production of biodiesel and rapeseed than in the baseline. Lower domestic demand for rapeseed causes imports to decrease strongly. The large domestic price fall

⁸ Fuel demand in the ‘green investment’ scenario is based on the 2°C scenario in the Global Energy and Climate Outlook 2019.

causes rapeseed exports to become more competitive, increasing by around 20%.

- Butter, cheese and poultry prices are less affected, but the cost of this is a decrease in net exports.
- The sizeable domestic price decrease on pigment, on the other hand, with diverse responses to shocks in various countries, leads to an increase in net exports.

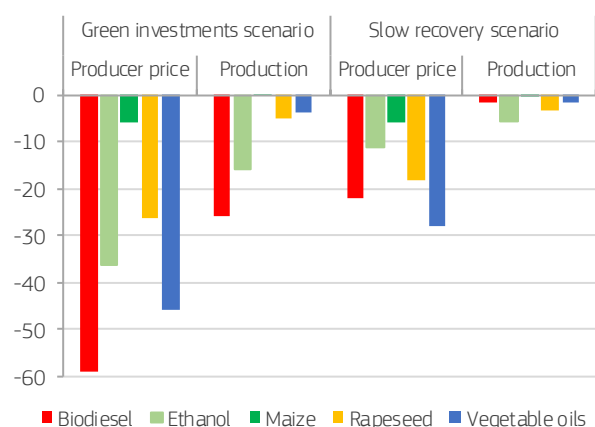
GRAPH 1.6 EU producer price impacts in 2030 – difference relative to COVID-19 baseline (%)



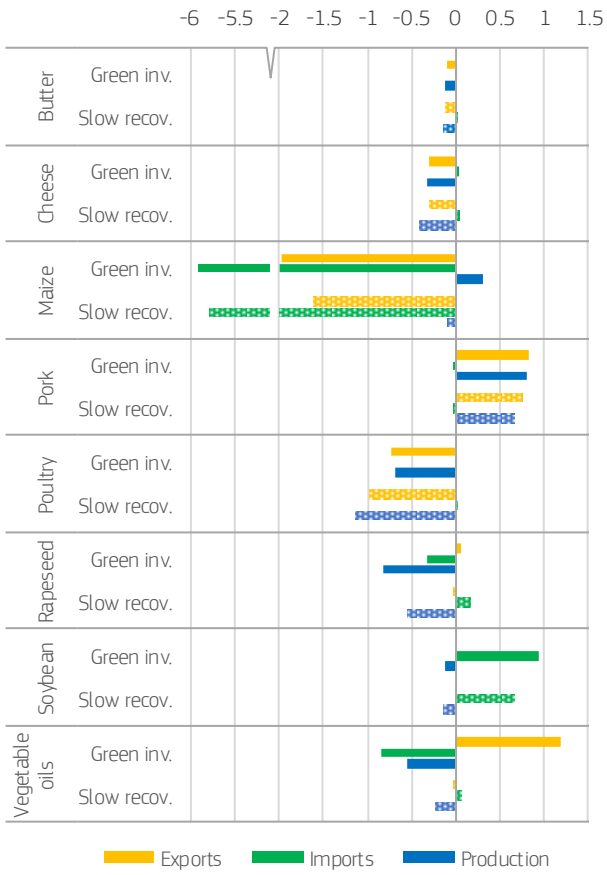
In general, market impacts are mostly driven by the macroeconomic shock, in particular the GDP contraction in 2020 (rather than the oil price and fuel consumption shocks). The main exceptions are biofuels and feedstocks in the ‘green investments’ scenario, where most of the market impacts are caused by changes in fuel consumption (see appendix).

Additional results about market and trade impacts can be found in the appendix, including a breakdown of the total impacts into their constituent parts as related to macroeconomic variables, the international oil price and fuel consumption respectively.

GRAPH 1.7 EU producer price and production impacts in 2030 – difference relative to COVID-19 baseline (%)

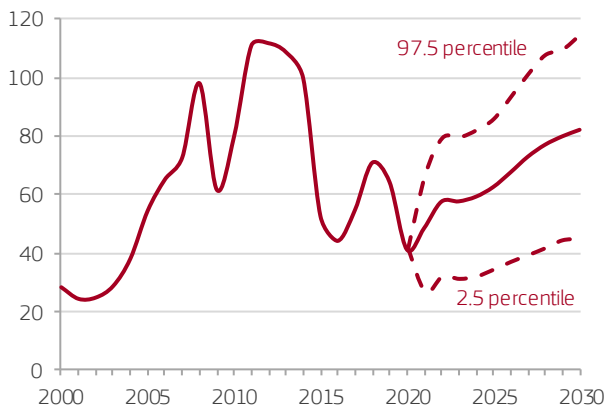


GRAPH 1.8 EU trade and production impacts in 2030 – difference relative to COOVID-19 baseline (million t)

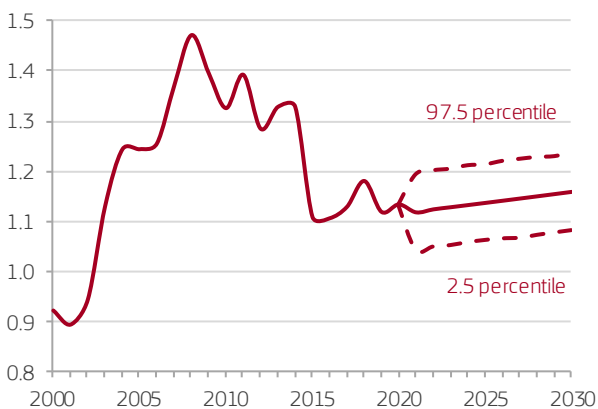


UNCERTAINTY ANALYSIS

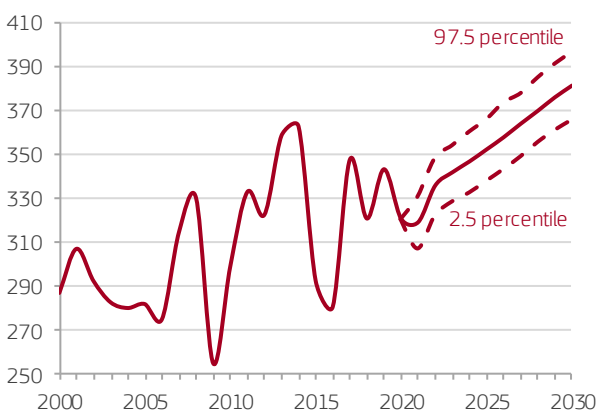
GRAPH 1.9 Oil price projection (USD/bbl) and uncertainty range



GRAPH 1.10 Exchange rate projection (USD/EUR) and uncertainty range



GRAPH 1.11 EU milk price projection (EUR/t) and uncertainty range



Sources of uncertainty

Every outlook exercise carries many uncertainties. This is especially evident this year, when the COVID-19 pandemic has led to a sharp drop in economic activity around the world. Moreover, the impact of the economic contraction observed this year is not just a short-term phenomenon. While COVID-19 is likely to have long-lasting consequences for the agricultural markets, the size of the impacts will depend on the economic recovery pathways, which, in turn, depend on political developments and other inherently unknown factors (see section on Macroeconomic environment).

The baseline assumptions and projections are based on consultations with internal and external market experts, researchers and forecasters. They reflect the consensus view of market developments resulting from underlying market drivers and trends. While it is acknowledged that any projection represents just one out of infinitely many possible trajectories, not all of these possible outcomes are equally likely to occur. The results from the ‘uncertainty analysis’ quantify the likely range of market outcomes around the consensus view.

Factors that affect commodity markets can be grouped into those that mainly affect supply and those that mainly affect demand. In this report, market uncertainty is assumed to derive from macroeconomic and yield developments deviating from their baseline trajectories (deemed most plausible at the time of the analysis). The yields and macroeconomic variables can be considered as proxies for the numerous underlying drivers affecting supply and demand. More specifically, the assessed variables include gross domestic product (GDP), inflation, the exchange rate and the international crude oil price, representing the price of energy, as well as crop and milk yields.

Highly uncertain oil prices and exchange rates

The baseline assumes the oil price to be USD 83/bbl in 2030. However, oil price projections are notoriously uncertain and the range of likely values is between USD 44/bbl and USD 113/bbl (the methodology used to calculate this range is explained below).

Energy prices affect agricultural markets through several channels. They affect production costs, the purchasing power of consumers and biofuel demand. High oil prices, for example, drive up production costs (represented as an upward shift of the supply curve) and reduce the purchasing power of consumers (a downward shift of the demand curve). High oil prices also reduce demand for fuel in general, but increase the competitiveness of biofuels. The net effect on the demand for biofuel feedstocks depends on market specifics in different countries, including the biofuel policies in place.

The baseline assumes that the exchange rate will appreciate slightly from 1.12 USD/EUR in 2021 to 1.16 USD/EUR in 2030. Factoring in uncertainty, its value is likely to range between 1.08 USD/EUR and 1.24 USD/EUR in 2030. A higher exchange rate implies a stronger euro than in the baseline. A stronger euro reduces the competitiveness of the EU production – a higher price of EU products in US dollar leads to lower exports, while a lower price of foreign products in euro attracts higher imports.

Uncertainty of commodity price resulting from macroeconomic and yield uncertainty

There is a relationship between the uncertainty of the factors affecting supply and demand (oil prices, exchange rates, yields, etc.) and the uncertainty of agricultural commodity prices. As an example, in graph 1.12, the price uncertainty of milk results from the uncertainty of the underlying supply and demand shifters. Even if the market trends lead to a price that follows the solid line, this will probably not be the exact actual outcome. What we can say with reasonable certainty is that the price will end up somewhere between the two dashed lines, if our assumptions about the underlying market trends turn out to be correct.

Methodological background⁹

The uncertainty analysis in this report is based on the Aglink-Cosimo model, which is a mathematical representation of the global agricultural commodity markets and their interlinkages¹⁰. In this model, production costs and consumer demand are affected by macroeconomic country-specific variables, including real GDP, the domestic currency/dollar exchange rate, the consumer price index (CPI), the population size and the international crude oil price. A change in each of these variables will affect the markets for each commodity through model linkages. Agricultural commodity yields are endogenously determined within the model, with domestic and international prices acting as market-clearing variables. However, the model allows for changes to the equilibrium prices and quantities, as long as the market balances hold. This property is exploited in connection with the baseline work, as well as in connection with the uncertainty analysis.

A macroeconomic or yield time series that differs from the one going into the baseline will lead to market outcomes that are different from the baseline values. In the uncertainty analysis, the model is solved for a large number of alternative macroeconomic and yield time series and the resulting distribution of market prices is tabulated. As an example, the distribution of EU milk prices in 2030 resulting from this procedure ranges from 378 to >420 EUR/t. The dashed lines in the figures represent the 2.5 and 97.5 percentiles from these

⁹ See Araujo-Enciso et al. (2020).

¹⁰ For more details, see Araujo Enciso et al. (2015).

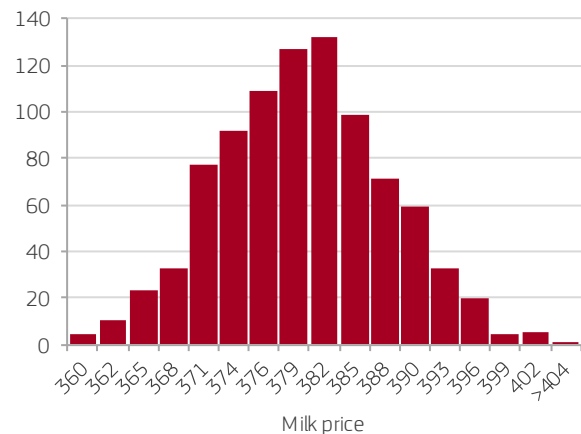
simulations, i.e. covering 95% of the outcome distributions in a given year.

The alternative macroeconomic and yield time series are generated from a statistical model used to separate random movements in the data over time from movements that can be predicted from trends or historically stable relationships between the variables.

An input variable with a high level of variation historically will also result in a large variation in market outcomes (prices, production etc.). Therefore, it is interesting to know which of the input variables are most variable (uncertain) – i.e. which are the main drivers of market uncertainty. One measure of variability that allows for comparison across variables measured in different units is the coefficient of variation (CV¹¹). Input variables with high CV values are thus more important drivers of market uncertainty than those with low CV values.

The main macroeconomic drivers of market uncertainty are the crude oil price (CV=21.2%) and the exchange rate (3.7%). In comparison, the EU GDP CV is 0.9. The crops with the most uncertain yields are rye, maize, sugar beet, soya bean and sunflower, although there are significant differences between Member States in Western Europe and Central Europe (see Appendix).

GRAPH 1.12 Distribution of EU milk price (EUR/t), 2030



¹¹ Coefficient of variation (CV) = 100 × standard deviation ÷ mean. The CV is a measure of the dispersion of a distribution that is independent of the units of the stochastic variable. In our case, the distribution is that of simulated values in a given year (e.g. the crude oil price in 2030 across 1 000 simulations).

ARABLE CROPS /2

This chapter provides an overview of the outlook for arable crops (common wheat, durum wheat, barley, maize, rye, oats, other cereals, rapeseed, sunflower seed, soya beans and protein crops) and a number of processed products (sugar, vegetable oils, protein meals, biodiesel and ethanol). It first considers land-use developments and continues with a closer look at biofuels, sugar, cereals, rice, protein crops, oilseeds and the feed complex.

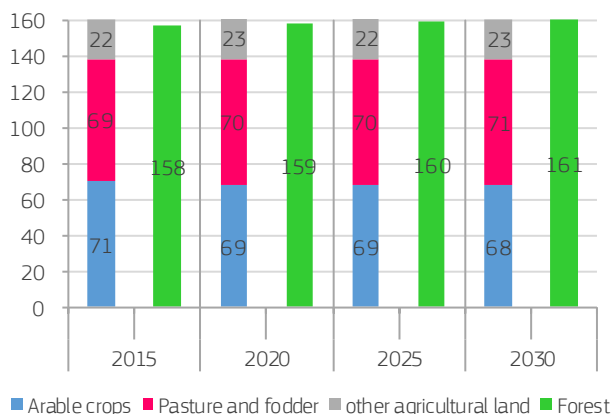
EU production of arable crops is expected to be limited over the next 10 years. Land competition in the EU coupled with the expansion of forest and pasture areas could reduce the amount of land available for arable crops.

Improved farming practices and continuous research and development should support yield growth. Digitisation will increasingly be the nexus of gains in yield productivity, improved labour conditions and high environmental standards. This should help cereal production to stabilise (compared to its average for 2018-2020) and oilseed production to slightly increase.

EU cereal prices are expected to converge towards world prices and benefit the EU competitiveness in its export markets. The domestic market, driven by demand for animal feed, is due to be affected by lower pig production and a reduced livestock herd. The EU oilseed market is expected to be driven by the increasing use of edible oils while the consumption of oil meals could decline.

LAND USE

GRAPH 2.1 EU agricultural and forest area (million ha)



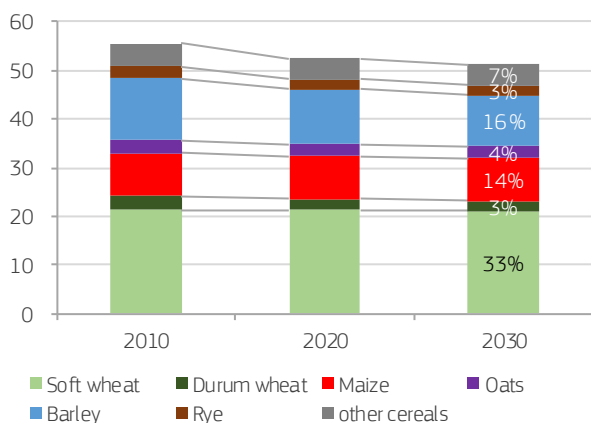
As much forest as agricultural area in the EU in 2030

Forest area in the EU has been steadily increasing since 2010 and gained 1 million ha in the last 5 years. It is expected that forests will continue expanding at a similar rate and could reach 161.0 million ha in 2030. Agricultural land will continue to face ongoing competition from afforestation, as well as from urban areas and roads. The agricultural sector underwent significant land consolidation in the past and agricultural land has been more stable since 2015. Between 2020 and 2030, a further 0.5 million ha reduction in agricultural land is expected, taking the total to 161.2 million ha.

EU pasture and fodder areas on the rise

Since 2012, pasture and fodder areas have been increasing in various regions in the EU, such as Germany, Spain and Italy. In 2018, EU permanent grassland area reached 50.1 million ha (+4% compared with 2012). Grassland area is expected to continue to increase to meet the demand for feed (see section on Feed), but at a slower pace than in previous years, partly because of the reduction in livestock herds of ruminants (see section on Meats and Milk). Grassland area could increase by 0.7% to 50.5 million ha by 2030. Similarly, EU fodder areas such as temporary grassland and silage maize could increase and reach 20.2 million ha to meet the demand for feed as well as the demand for feedstock for biogas production.

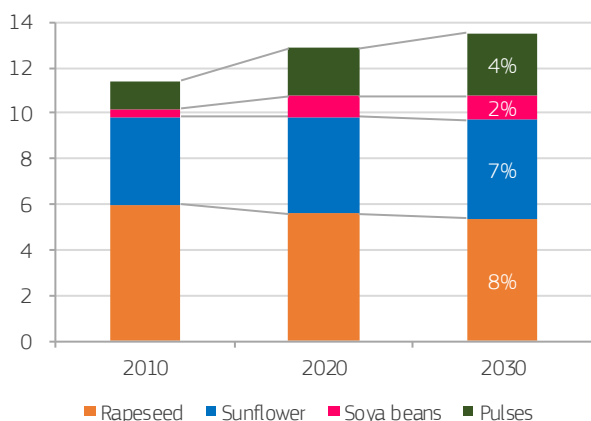
GRAPH 2.2 EU cereal area (million ha) and share in total area (%)



Declining trend for arable crops

Within a declining trend of EU total agricultural land, cereal and oilseed areas in particular should also decline in the upcoming decade. The cereals area could decline to 51.0 million ha (-2.8% compared with 2020¹²), mainly due to a downward trend in wheat and barley (see section on Cereals). As for oilseeds, total EU area could go down to 10.7 million ha (-0.4%), driven by a continuous decline in rapeseed (see section on Oilseeds).

GRAPH 2.3 EU oilseed and pulses area (million ha) and share in total area (%)



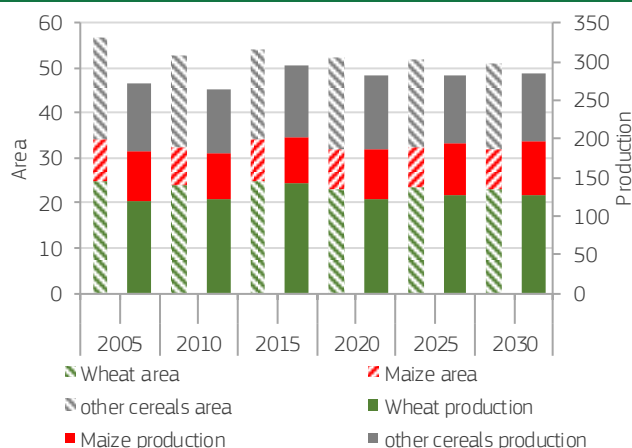
Share of land under organic farming on the rise

Under the current set of policy and market assumptions, it is expected that growth in organic land could remain strong in the 2020-2030 period. The share of organic land in total agricultural land increased from 5.5% in 2012 to 8% in 2018. By 2030, that share could increase by an additional 2pp and reach 10%, and possibly more with proactive policies and favourable market conditions. Permanent pasture and permanent crops already occupy the highest share of land under organic farming because they are easier to convert. However, it is expected that organic arable land will need to increase to meet the strong demand currently met by imports.

¹² 2020 represents the 2018-2020 average.

CEREALS

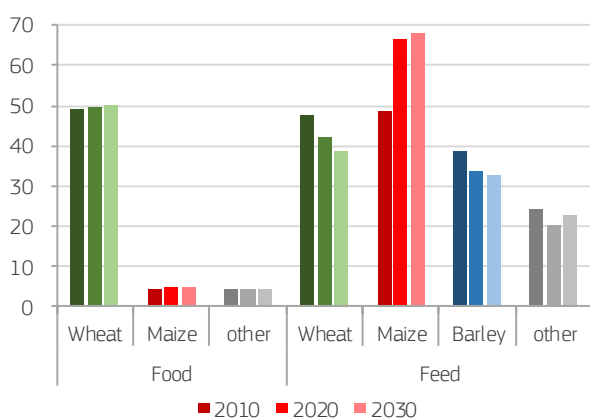
GRAPH 2.4 EU cereal area (million ha) and production (million t)



Farming practices on a transition path to lead to stable cereal production by 2030

Total EU cereal area is expected to decrease to 51.0 million ha in the 2020¹³-2030 decade. This is mainly driven by significant declines in durum and barley areas, where the downward trend continues. Soft wheat area is also expected to slightly go down. Total EU wheat area could reach 21 million ha in 2030 (-1.6% compared to 2020). The main producing countries have been reducing their share of wheat in the total cereals area in recent years (for example in France and Germany), while Poland is increasing its wheat area. Concerning maize, the total area should expand across the EU and could reach 8.8 million ha to meet the increasing feed and industry demand. The share of other cereals (oats, rye, sorghum and others) is expected to remain stable in order to meet the growing demand for food and feed purposes.

GRAPH 2.5 EU food and feed use of cereal (million t)

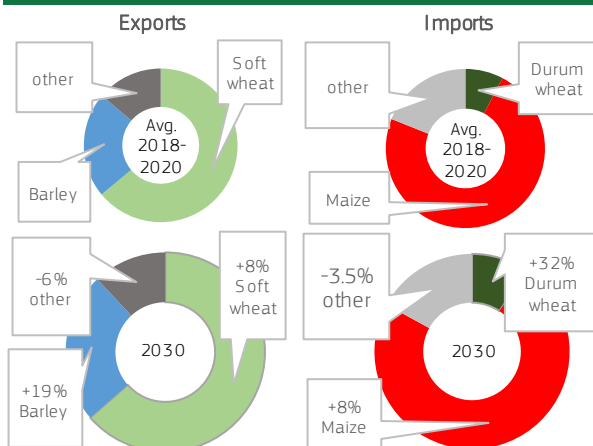


Cereal yields should continue to increase thanks to improved research and innovation, as well as enhanced farming practices and crop management. Crop rotation systems, improved soil management and increased usage of decision support tools should support yields. At the same time, growth in yields will be limited in regions where yields are already high and in regions facing environmental constraints. Owing to increasing yields, cereal production is expected to remain stable at 278.1 million t.

EU feed demand to weigh on the domestic market

EU domestic use of cereals is expected to stabilise by 2030 and reach 260.4 million t (-0.7% compared with 2020), while total feed use could decrease by 0.8 million t. The decrease will affect soft wheat (-8%), also due to producers producing more milling wheat. On the contrary, maize usage should grow in the feed rations (+2%) coming from both domestic production and imports. Other cereals, such as oats and rye, are expected to partially replace wheat and barley feed use with their similar protein content. On the food use, cereal per capita consumption should increase by 1.1% and reach 114.8 kg in 2030.

GRAPH 2.6 Shares in EU cereal trade (million t) and growth 2020-2030 (%)

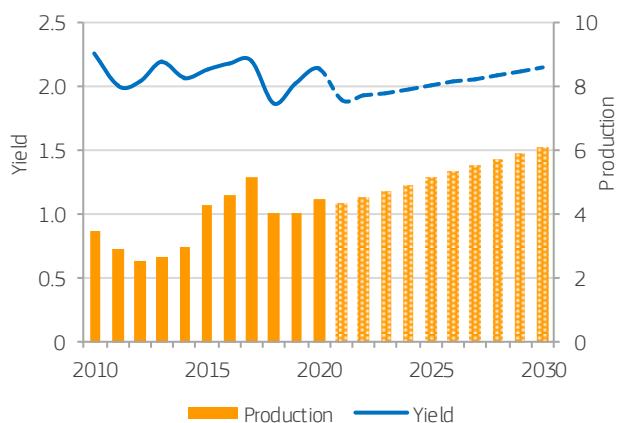


On the trade side, the EU is expected to increase international trade flows and strengthen its net exporter position (+10% compared with 2020) thanks to EU prices converging towards world prices. Specifically, EU wheat is expected to become more competitive thanks to improving yields and proximity to importing markets, for example in Africa. The gain in market shares will be limited due to competition from other exporting countries. Imports of maize should continue to grow from highly specialised and very competitive countries in the Americas, and also from Ukraine.

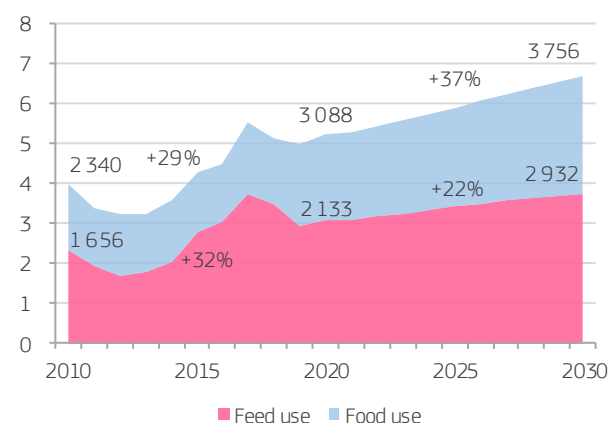
¹³ 2020 represents the 2018-2020 average.

PROTEIN CROPS AND RICE

GRAPH 2.7 EU protein crops yield (t/ha) and production (million t)

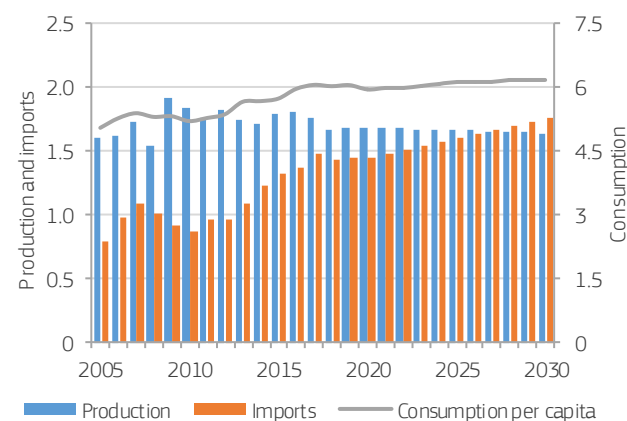


GRAPH 2.8 EU pulses consumption (million t)



Note: Percentage change corresponds to decade evolution.

GRAPH 2.9 EU rice production and imports (million t) and human consumption (kg per capita)



EU protein crops production still on the rise

Protein crops include peas and faba beans as well as lentils, chickpeas and other dry pulses. For the past 10 years, the EU area dedicated to these crops has increased. This has been driven by policy incentives, increasing domestic consumption, both through wider inclusion in the feed rations, and increasing popularity for human consumption. Furthermore, these nitrogen-fixing crops are used in crop rotation systems. In recent years, adverse conditions at the time of sowing and during crop development limited the expansion of these crops and imports made it possible to meet the continuously growing demand.

Between 2020¹⁴ and 2030, the protein crops area is projected to increase by 37% and reach 2.9 million ha. Thanks to a conducive policy environment and market prospects, further inclusion of these crops in the rotation should be favoured. As these crops continue to attract interest, yields are projected to benefit from research and innovation in genetics, as well as in farming practices and increasingly efficient rotation systems.

The domestic market is expected to grow by 31% in the upcoming decade to reach 6.7 million t in 2030. This would be a 31% increase compared with 2020 market volumes. Most of the growth should come from a significant increase in human consumption (+3.9% per year), with per capita food consumption possibly reaching 6.7 kg (+50%). This is projected to come from increasing consumption of raw products and from thriving food innovations in the use of plant-based proteins.

Increasing EU consumption of rice

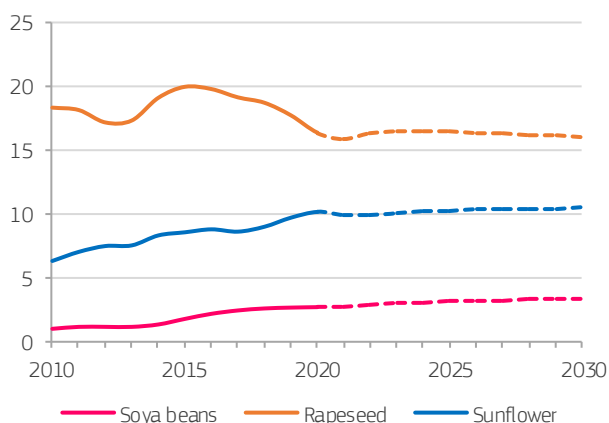
Global rice production has been steadily rising over the last decade. The biggest producers are also the biggest consumers: China, India, Thailand, Indonesia and Vietnam. Rice is a staple commodity in these and many other countries. Global annual per capita consumption is 54 kg, while in the EU the figure is just 6 kg. Global rice consumption is largely of the *Indica* type (long-grain) as opposed to the *Japonica* type (medium-grain), which is traditionally the preferred rice in the EU.

EU production consists mainly of *Japonica* rice, but farmers switch between types, responding to price incentives. EU production could decline slightly to meet consumer preferences. EU production faces difficult production systems in terms of weather conditions and land preparation for submerged crops. The increase in demand for *Indica* rice should drive imports, especially from countries that benefit from the 'Everything But Arms' regime. These imports are expected to increase by 4.6% per year by 2030. *Basmati* rice could also continue to be imported, from India and Pakistan.

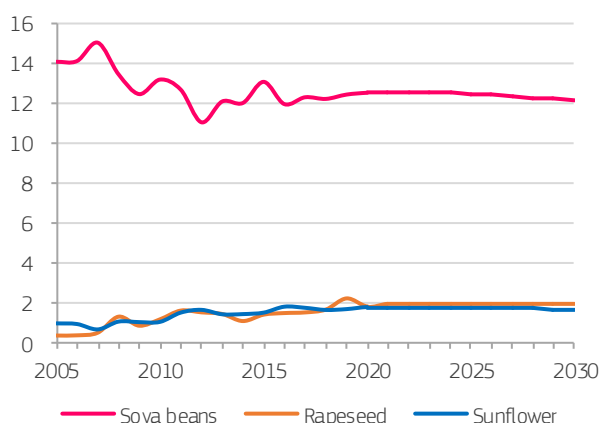
¹⁴ 2020 represents the 2018-2020 average.

OILSEEDS

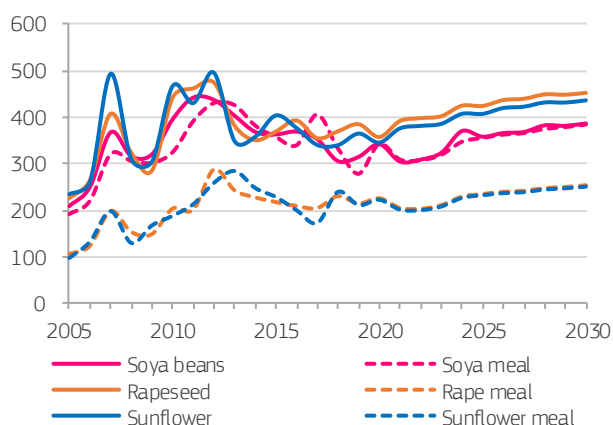
GRAPH 2.10 EU oilseed production (million t)



GRAPH 2.11 EU oilseed imports (including meals) (million t of protein equivalent)



GRAPH 2.12 EU oilseeds and oilmeals prices (EUR/t)



Stagnating EU oilseed production by 2030

The EU oilseed area is projected to slightly decline in the 2020¹⁵-2030 period, driven by a continuous downward trend in rapeseed, bringing the total oilseed area to 10.7 million ha.

The rapeseed area is expected to go down at a slower rate than in the previous decade, the projection being that it should reach 5.3 million ha in 2030 (-4% compared with 2020). In the period 2010-2020, the EU rapeseed area declined by 7%, with a rebound in 2015. However, this decline will be limited thanks to the usefulness of rape in crop rotation systems and good market prospects for rape meals and rape oil demand (see section on Oilmeals and Vegetable Oils). Nevertheless, plant health challenges encountered in recent years will not fade and uncertainties remain as to rapidly evolving climatic conditions and extreme events that hamper sowing and/or plant development. The ongoing evolution of the authorised phyto-sanitary products currently in use is also pushing operators to find alternative solutions that should make it possible to return to yield growth in the medium term.

Sunflower seed and soya bean areas are projected to continue expanding by 2030. Compared with 2020, the sunflower area should only slightly increase, by around 1%. In contrast, the soya bean area is expected to increase by 13.5% over the outlook period. It should benefit from an increasing use in the crop rotation system as an alternative to rapeseed and/or sugar beet. At the same time, it offers agro-environmental benefits. Moreover, a conducive policy environment and positive market prospects in the growing sectors of meat and dairy alternatives and domestic feed should boost soya production across the EU.

Total EU oilseed production should total 30.2 million t in 2030. Thanks to the positive yield development, particularly for soya beans, production should increase from the low levels in 2018-2020. Rapeseed, sunflower and soya bean production could reach, respectively, 16 million t (-2.2% compared with 2020), 10.6 million t (+6.6%) and 3.5 million t (+26.9%) in 2030.

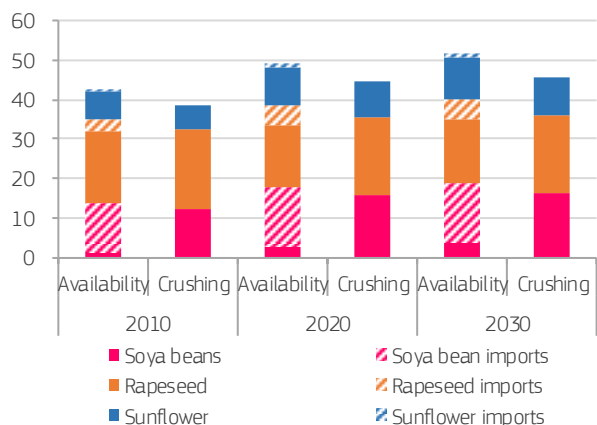
EU soya bean trade projected to stabilise

While EU oilseed trade is expected to slow down in the medium term, soya bean imports should stabilise to meet the demand for animal feed and, while soya meal imports should decline. According to the latest estimates from the OECD-FAO Outlook 2020-2029, global soya production will increase by 15.6% by 2029. With only a few countries highly specialised in soya production, global trade is expected to grow to meet the world feed demand.

¹⁵ 2010 and 2020 represents the 2008-2010 and 2018-2020 averages.

OILMEALS AND VEGETABLE OILS

GRAPH 2.13 EU oilseed availability and crushing (million t)

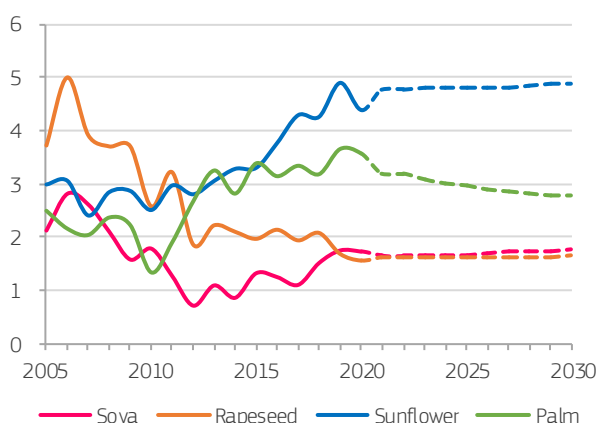


EU oilseed crushing should increase slightly

The oilseed sector has two equally important market outlets: protein and oil. When crushing oilseeds, protein meals and vegetable oils are produced. With the limited increase in oilseed production and imports, crushing volumes in the EU are expected to slightly increase.

The slight rebound from the low 2020 levels could come from an increasing share of soya beans in the crushing mix. Total EU crushing volumes could reach 46 million t in 2030. It is projected that 16.2 million t of soya beans could be crushed, a 3.6% increase compared with 2020¹⁶. Similarly, the expectation is that there will be increased crushing of sunflower seed; the total volume could reach 9.7 million t. By contrast, rapeseed crushing, driven by declining EU rapeseed production and moderate imports, could decrease to 20.1 million t.

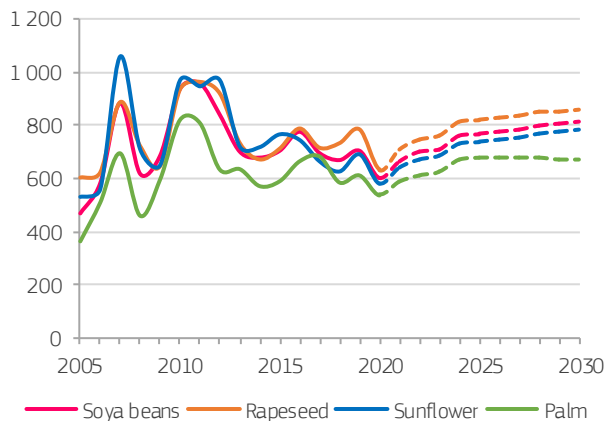
GRAPH 2.14 EU food use of oil (million t)



Soya meals imports are expected to increase slightly in the short term and decline in the longer term. This would be the result of mixed trends. On the one hand, global production should continue to grow and enable competitive prices for this protein source. On the other hand, domestic soya bean production is also expected to rise. Furthermore, a significant decline in pigmeat production in the EU, together with a reduction in the livestock herd, could limit market prospects for the proteins (see section on Feed).

Overall, protein meal imports should also be limited in the 2020-2030 period. It is projected that EU total oil meals imports could go down to 19.3 million t in 2030. This would represent a 5% decline compared with 2020, mainly coming from a continuous decrease in soya meal imports (-6.5%).

GRAPH 2.15 EU vegetable oil prices (EUR/t)



Positive prospects for EU vegetable oils

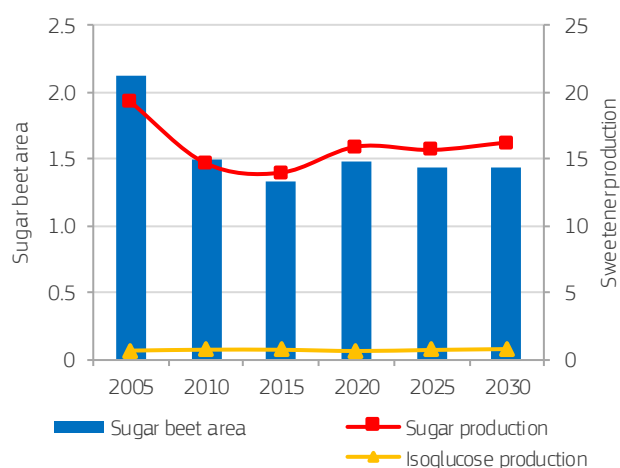
Consumption of vegetable oils in the EU is largely driven by the decline in palm oil usage, for both biofuel production (see section on Biofuels) and human consumption. Use in food products is projected to continue to decline slightly and stabilize afterwards. It is projected that palm oil will be limited to functional use in food processing.

As for oilseed oils, it is expected that total use could increase by 0.3% compared to 2020, reaching 16.7 million t. It is expected that the use of rape oil will recover from the low levels in recent years but could decrease in the medium term, especially as a result of biofuel use. Domestically produced soya and sunflower could provide oils to be increasingly used in the recipe of processed food items.

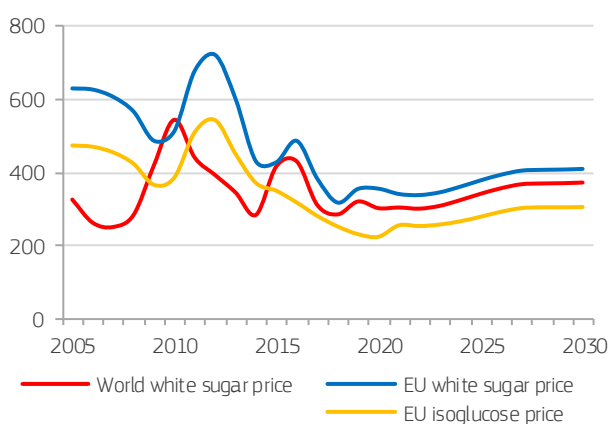
¹⁶ 2020 represents the 2018-2020 average.

SUGAR

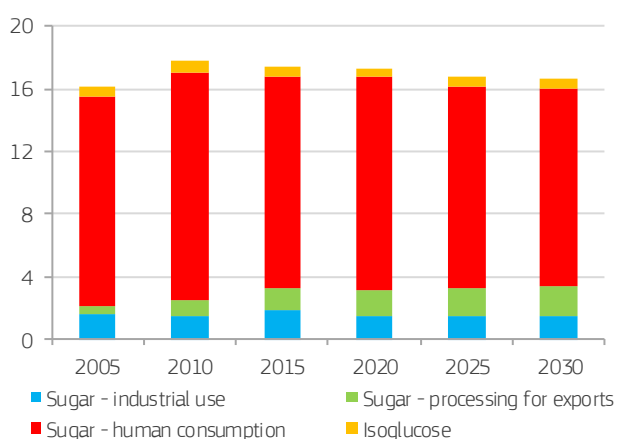
GRAPH 2.166 EU sugar beet area (million ha) and caloric sweetener production (million t)



GRAPH 2.17 EU and world sweetener prices (EUR/t)



GRAPH 2.18 EU sweetener use (million t)



Slow increase in yields due to limit production growth

In the last 3 years, EU sugar beet producers have witnessed adverse weather conditions, while having to adapt to growing limitations on the use of certain plant health substances. These challenges are likely to persist in the near term, but are expected to be overcome in the longer run. Yields could grow from 72 t/ha in the last 3 years (average 2018-2020) to 75 t/ha by 2030.

Higher yields, coupled with a small increase in sugar prices, should improve the economics of the sector and help stabilise the sugar beet area at above 1.4 million ha for the majority of the outlook period. Stable area and slow growth of yields are expected to result in a small increase in EU sugar production, which is projected to reach 16.2 million t in 2030.

Low sugar prices and competition from non-caloric sweeteners as sugar substitutes are expected to limit EU isoglucose production. As a result, production is due to increase modestly to 0.8 million t in 2030.

The EU on the path to self-sufficiency in sugar

With limited sugar availability in the near term, the EU remains a net importer with stable imports and exports. In the medium term, sugar production is expected to pick up and consumption is expected to continue to decline. This in turn would lead to an increase in exports and a decrease in imports, making the EU self-sufficient and potentially a net exporter of sugar.

EU sugar prices have been well aligned with world prices in the last few years, maintaining a premium of around EUR 40/t. With both world and EU prices increasing slightly, this margin is expected to be preserved throughout the projection period.

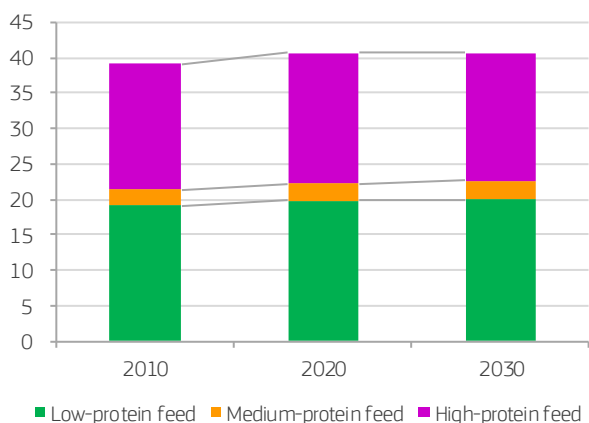
Declining food use puts pressure on sugar consumption

Direct human consumption corresponds to 85% of the total EU domestic consumption. A declining trend in sugar consumption for food uses, mainly driven by health concerns and affecting the soft drinks and confectionary markets, is set to continue in the outlook period. The sugar price increase is expected to make isoglucose and especially non-caloric sweeteners more competitive and help increase their consumption.

Sugar for non-food uses, which has a share of about 15% of total sugar consumption, would see different developments: sugar exports in processed products will continue to grow, while industrial use will be stable. Overall, the total use of sugar is projected to decline to 16.0 million t by 2030 (-0.4% per year).

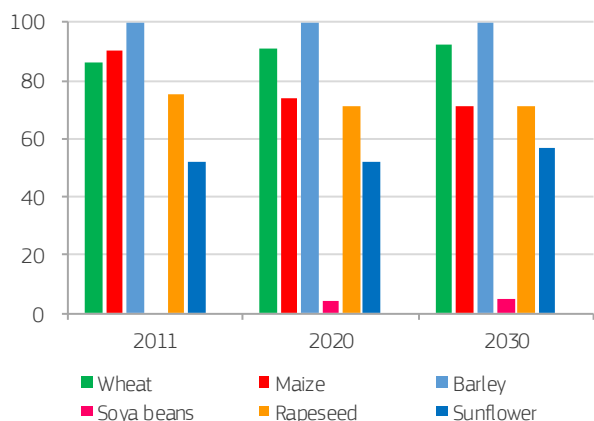
FEED

GRAPH 2.19 EU total feed demand (million t of protein equivalent)



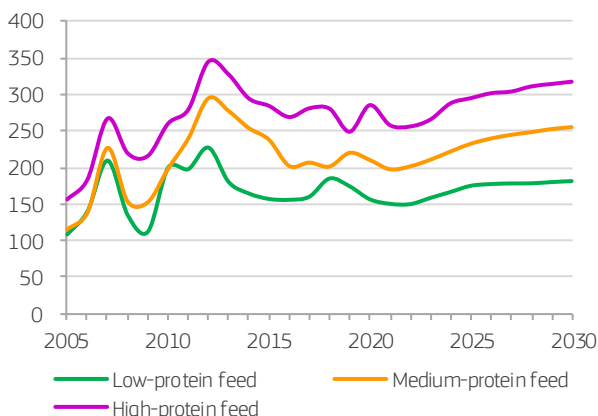
Note: Protein content of feed material in average: 10.7% for low, 27% for medium, 37% for high protein feed.

GRAPH 2.20 EU feed self-sufficiency (% in protein equivalent)



Note: Based on the methodology of feed protein balance sheet¹.

GRAPH 2.21 EU nominal feed prices (EUR/t)



Transition ahead in EU feed demand

Feed is the primary outlet for EU cereals and is expected to face some changes in the next 10 years. It is projected that overall feed demand (without grass) could slightly decline, by 0.5% in the outlook period.

With the expected decline in the EU pigmeat production (-4.6% by 2030), feed demand should drop in this sector. By contrast, the poultry sector should grow and could boost feed demand. For ruminants, even if suckler cows and the dairy herd are projected to decrease in numbers, further production growth in milk should sustain the feed demand. The ongoing restructuring of the dairy sector will continue, and EU Member States with lower productivity should further close the gaps with more efficient and intensive production systems. At the same time, extensification and diversification of production systems will expand in certain regions of the EU, favouring some specialised systems along the value chain (organic, pasture-based, GM-free, short supply chains) (see section on Milk). In 2019-2020, 45% of the proteins for livestock feed already come from grass.

High-protein meals usage to decline

Low-protein feed (less than 15% protein content, mainly cereals) is the largest contributor of EU feed rations in volume and represents 76% of the feed mix¹⁷. The overall use of cereals in feed is projected to slightly decline to 162.2 million t (-0.2% compared with 2020¹⁸). High-protein feed (over 30% protein content) includes oilseed meals, fish meals and skimmed milk powder. It is projected that the use of high-protein feed, particularly of oil meals, could slightly decrease by 2030 (-0.2%). The decline in pig and other livestock herds will contribute to the downward trend in 2030, as will the fall in rapeseed availability and environmental and climatic concerns vis-à-vis soya utilisation in feed rations. By contrast, the use of medium-protein feed (between 15-30% protein content, such as protein crops) is expected to increase by 2030. Protein crops' usage in feed rations could grow by 18.7% compared to the 2020 and partially replace oilseed meals.

Prices to appreciate in the longer run

With ample global availabilities and low fuel prices (and thus low transportation costs), feed prices should decline at the beginning of the outlook period. Prices in nominal terms are expected to increase once the economy is assumed to have recovered from the dip in GDP growth resulting from the COVID-19 crisis.

.....

¹⁷ EU feed protein balance sheet.

¹⁸ 2020 represents the 2018-2020 average.

SCENARIO: INSECT PROTEIN MEAL & OIL PRODUCTION

The transition towards a sustainable food chain is key to the Farm to Fork Strategy, which envisions a circular bio-based economy. Insect farming could contribute to achieving a more sustainable food chain, by transforming food losses and waste into an additional supply of protein feed provided this is considered safe. In the EU, roughly one fifth of food production for human consumption is lost or wasted, reaching 129 million t of food waste per year. The EU regulatory environment restricts former foodstuff or catering waste from being used as insect feed for pig or poultry production. Nevertheless, the use of insect-based proteins is already authorised in aquaculture production.

Given that insect farming is a global enterprise, this scenario looks at what if the insect farming industry, worldwide, were allowed to utilise food waste as insect feed with all existing restrictions lifted. What impact would this have on agricultural markets?

Scenario assumptions

At global level the FAO estimates that roughly one third of food production for human consumption is lost or wasted, which gives a potential base for insect farming. The amount of food waste by country and region has been calculated using the FAO's estimated waste percentages for seven commodity groups in five steps of the food supply chain¹⁹. For the EU food waste estimates, a more recent publication (2019) was used²⁰.

The assumption taken is that 50% of global food waste is economically viable to be collected and fed to the black soldier fly by 2030²¹. Their larvae would be crushed to produce a protein meal with a low fat content suitable for aquaculture feed. The extracted insect oil is used in biodiesel production.

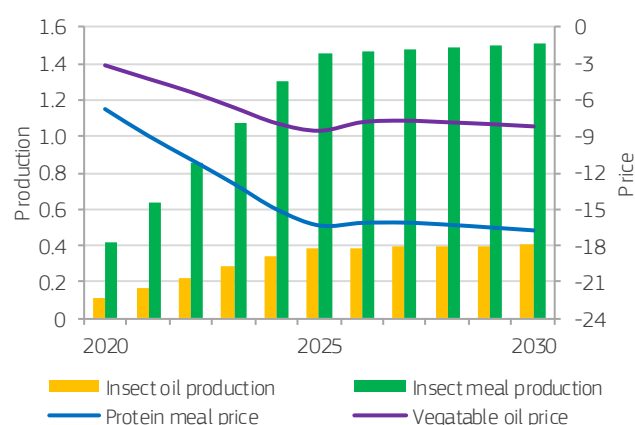
Impacts on the protein meal and vegetable oil markets

It is assumed that the global insect farm industry utilises 15% (220 million t) of food waste in 2020, which increases to 50% (1 000 million t) in 2030 as insect farming capacity grows over time. By 2030, the insect industry is expected to produce 23 million t of protein meal and 6 million t of oil, equivalent to 5.4% of protein meal and 2.5% of oil world consumption. The insect farming industry is assumed to be a price-taker, following the market price of protein meals and vegetable oils, which would decline by 18 and 7% respectively in 2030 (compared to

the baseline) as global markets adjust to the increased supply of insect meals and oil.

The EU agricultural market would also adjust to the new world insect meal and oil market prices as well as to domestic production. It is assumed that the EU insect farm industry utilises 15% (18 million t) of waste in 2020 and could increase to 50%² (65 million t) in 2030, producing 1.5 million t of protein meal and 0.4 million t of oil. EU producer prices would follow world market prices for protein meals and vegetable oils.

GRAPH 2.22 EU insect meal, insect oil production (million t) and producer price (%) – difference relative to baseline



Impacts on crop markets

The increased production of domestically produced insect meal would help the EU protein meal self-sufficiency ratio increase marginally by 1.8%. Even though the area with cultivated oilseeds and soya beans would decline, reducing protein meal produced from domestically grown bean/seed by 0.3 million t, this is outweighed by the reduction of 0.4 million t in imported meals and the increased production of insect meals totalling 1.5 million t in the EU by 2030.

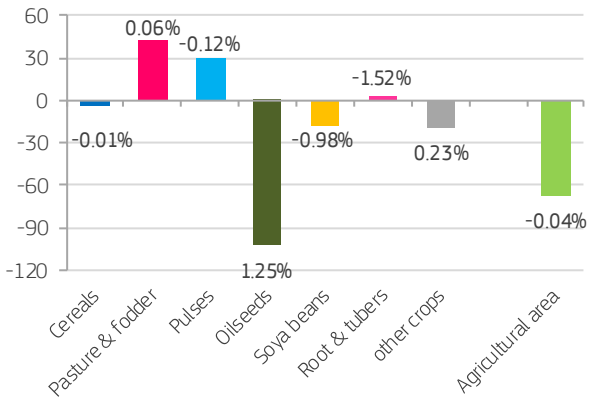
The reduction in demand for oilseed crops would favour an increase in the area devoted to pulses and fodder production, and could result in a slight reduction of total EU agricultural land. Cereal prices are expected to decline by 5%, while soya bean prices would fall by 11% in 2030.

¹⁹ FAO (2011).

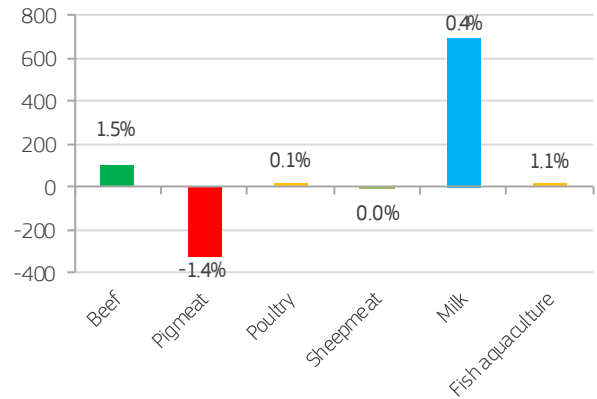
²⁰ Caldeira et al. (2019).

²¹ Sustainable Development Goal 12 of the United Nations on 'responsible production and consumption' states that by 2030 food losses and waste, should be reduced by 50%. Given this, the scenario presented here is the upper limit of food waste that could possibly be a feed to insects.

GRAPH 2.23 EU land use in 2030 – difference relative to baseline (1 000 ha and %)



GRAPH 2.24 EU production in 2030 – difference relative to baseline (1 000 t and %)



Production impacts

Under this scenario, lower feed prices would incentivise the production of fish, milk and meat in the EU. Biodiesel production would increase by 1.5% due to the lower vegetable/insect oil price, reducing the price of biodiesel by 4% in 2030 increasing demand. The only meat production to decline would be pork, for which EU exports would decline due to the relatively larger decline in world market prices -6% than the EU domestic price -5% in 2030.

Aquaculture production is expected to increase by 1.1%, driven by the increased supply of insect meal, reducing the price of fishmeal by 28%. This would mainly expand the production of carp and salmonids.

Concluding remarks

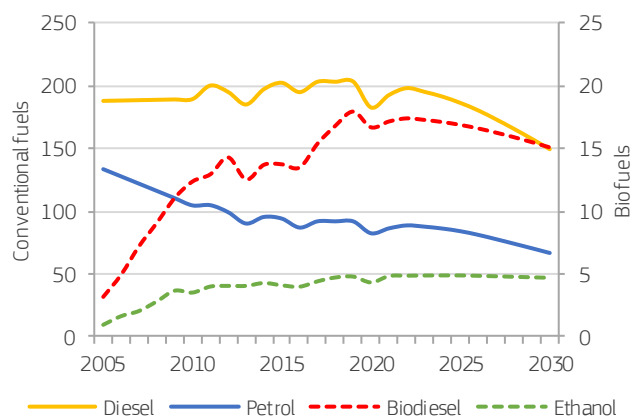
Insect farming could significantly contribute to the circular economy, reintroducing nutrients from food waste directly into the feed chain. At the same time, it provides an opportunity to slightly improve the protein deficit in the EU. Nevertheless, even though the insect farming industry does not compete directly for land resources, it does have an impact on crop prices and land allocation within the EU, reducing feed costs and supporting livestock production, resulting in a slight increase in greenhouse gas emissions. Moreover, issues relating to safety and sustainability issues have to be addressed.



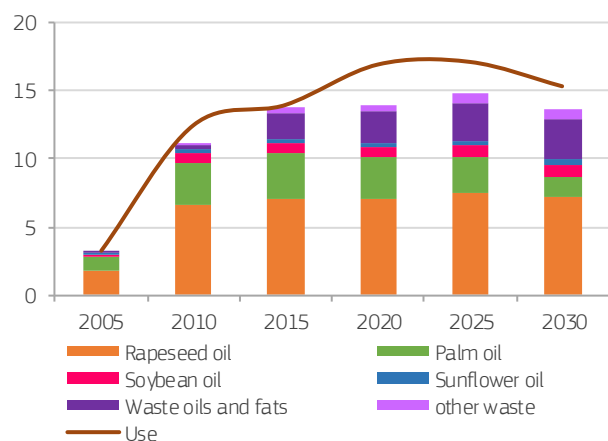
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BIOFUELS

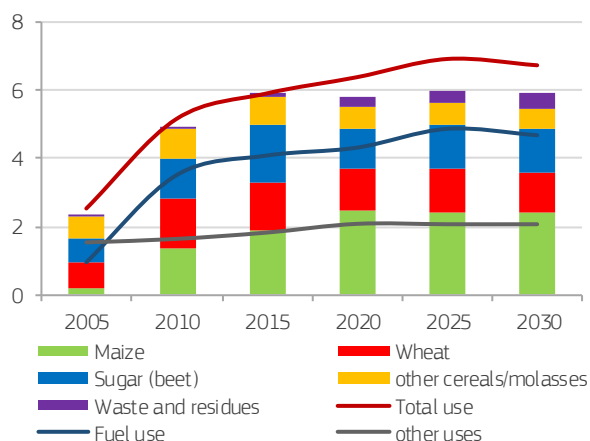
GRAPH 2.25 EU conventional fuel and biofuel use (billion l)



GRAPH 2.26 EU biodiesel feedstock and use (billion l)



GRAPH 2.27 EU ethanol feedstock and use (billion l)



Fuel demand to decrease, with biofuels less impacted than conventional fuels

National lockdowns and travel restrictions in response to the COVID-19 pandemic resulted in a sharp decrease in demand for transport fuels. Total fuel use, estimated to fall by 10% in 2020, is expected to rebound in the near term. In the medium term, however, the decline in the fuel use is expected to become apparent due to a combination of improving fleet efficiencies, green recovery policies and consumer shift to alternative modes of transportation.

The decline in fuel use will affect the demand for biofuels, but increasing blending rates will mitigate the impact. By 2030, when conventional fuel demand will be facing a decline of 19% compared to 2020, biodiesel demand could decline by 10%, while demand for bioethanol should remain 8% above the 2020 level.

Palm oil the most affected biodiesel feedstock due to certification woes

Declining biodiesel use will have varied effects on the different feedstock used for biodiesel production. Rapeseed oil will maintain its status as the primary source, whereas the share of palm oil share will significantly decline – from 23 % in 2020 to 11% in 2030 – due to difficulties in certifying it as a low indirect land use change (ILUC) biofuel feedstock. With the ongoing shift to renewable biodiesel and maturation of technologies for production of advanced biofuels, waste-related feedstock should expand, although with a limited impact on total biodiesel production.

For bioethanol production, waste and residues will be the fastest growing feedstock, albeit with limited overall impact. Use of sugar beet is also expected to increase slightly due to improved competitiveness, while the shares of the main bioethanol feedstock – maize and wheat – are expected to remain stable.

Lower imports due to tariff measures, shift in feedstock structure

The EU will remain a net importer of biofuels throughout the projection period, although imports are expected to decrease in line with lower fuel use. In the near term, biodiesel imports will be constrained by ongoing countervailing duties applied to certain imports from Argentina and Indonesia, while in the longer term this trend is likely to be prompted by decreasing use of palm oil as a biodiesel feedstock. For ethanol, the rebound in biofuel use and increase in demand for pharmaceutical purposes should provide a short-term import boost.



MILK AND DAIRY PRODUCTS

/3

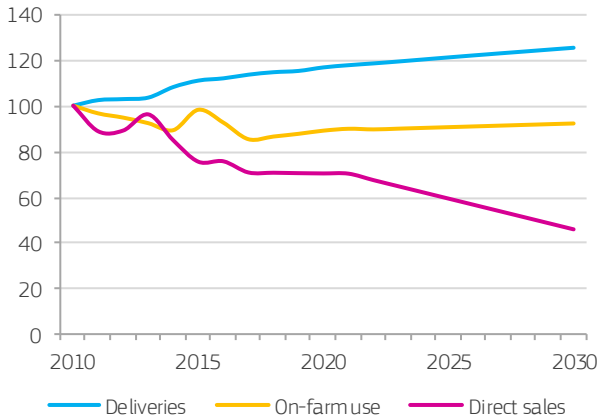
This chapter presents the projections for milk and dairy products.

Sustainability strategies adopted in the dairy value chain, as well as varying consumer demands, are expected to drive growth in EU milk production by 2030. The growth rate could be slower than before due to higher segmentation of production systems. While yields are to increase further, segmentation should prevent a steep reduction in the dairy herd.

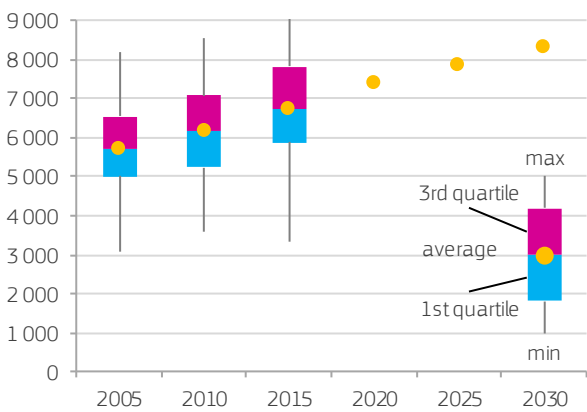
The increasing world demand for skimmed milk powder is expected to help close the gap with stable butter prices, supporting an increase in the price of raw milk in the EU. At the same time, higher returns are expected from a better valorisation of the whey production stream and a strong demand for EU cheese. Overall, nutritious values and the positive health image of dairy products as regards diets are expected to support demand growth for EU dairy products. As a result, the EU is expected to remain the world's largest dairy exporter.

MILK

GRAPH 3.1 Changes in EU milk collection, on-farm uses and direct sales (2010=100)

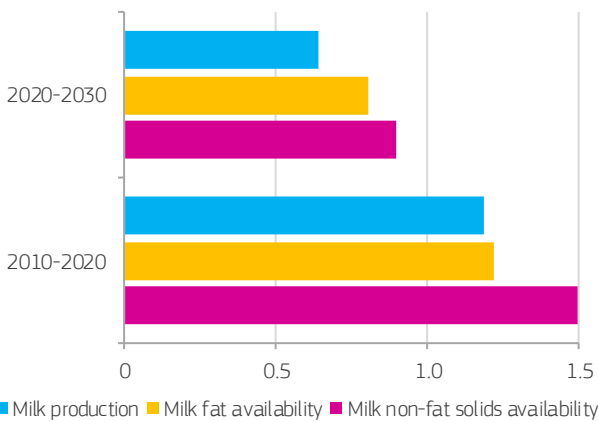


GRAPH 3.2 Development and distribution of EU milk yields in EU Member States (kg per cow)



Source: DG Agriculture and Rural Development based on Eurostat (Farm Structure Survey).

GRAPH 3.3 Annual growth rates of EU milk production, fat and not-fat milk solids availability (%)



EU milk production growth slowing down

EU cow milk production is expected to reach 162 million t by 2030 (+0.6% per year). An increasing trend for milk deliveries should continue, contributing to further consolidation of the sector. Demand for short supply chains and local food systems is expected to support direct sales.

Sustainability objectives should be an integral part of the EU dairy sector growth, with action taken in the whole supply chain, from feed sourcing, transport and packaging to delivery of final products. Shorter and local supply chains could further strengthen the economic and social pillars of sustainability. At farm level, disease- and injury-prevention measures are expected to improve animal welfare. Assuming longer lifespans and increasing productivity per cow, GHG emissions per kg of milk should be reduced. In addition, carbon sequestration and manure management should also contribute to a reduction in GHG emissions while providing sustainable solutions for energy inputs (e.g. biogas production for transport and heating in stables), thus also addressing environmental sustainability.

Non-conventional production systems to gain

Between 2005 and 2016, the EU average dairy farm size increased by 53% (47 cows per farm in 2016). This led to higher efficiency. In 2010-2020²², the yield increase is estimated to be around 20% (7 400 kg/cow in 2020). By 2030, EU average yield should grow further to reach 8 300 kg/cow as productivity gaps between EU Member States continue to close.

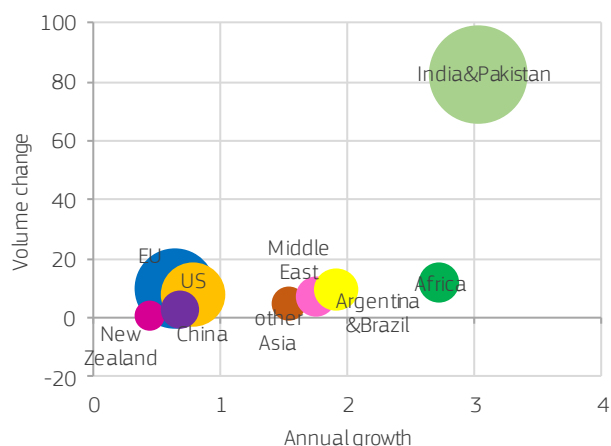
The projected yield growth (1.4% per year) is lower than in recent years, to some extent due to further segmentation. The share of organic milk production is expected to be 10% in 2030 (3.5% in 2018), but other systems could also gain (e.g. pasture-based, hay-based, GM-free fed). This should prevent a stronger decline in the dairy herd. Nevertheless, by 2030 the dairy herd could be reduced to 19.2 million heads (7% below 2020).

Milk solids availability continues increasing

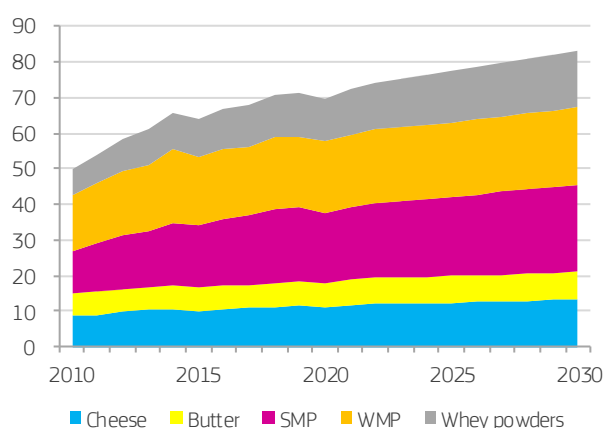
Despite lower EU milk production growth, increasing milk fat and milk non-fat solids contents should provide enough milk solids to sustain growth in processing. They also add value to the milk produced. The main drivers are genetics and targeted feed strategies. In addition, growth will depend on the structure of dairy herd in expanding EU Member States and could vary from year to year, depending on weather conditions and feed affordability. By 2030, milk fat availability is expected to grow by 0.8% per year and milk non-fat solids availability by 0.9%.

²² 2010 and 2020 represent the 2008-2010 and 2018-2020 averages.

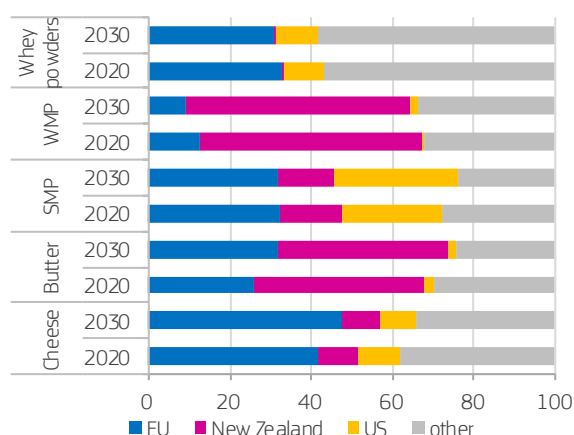
GRAPH 3.4 World milk production change (million t) and annual growth (%) in 2020-2030 in selected regions



GRAPH 3.5 World imports of selected dairy products (million t of milk equivalent)



GRAPH 3.6 Trade shares of main dairy exporters in selected dairy products (%)



Increasing production outside EU

By 2030, in New Zealand milk production growth will be limited (0.4% per year), supported by increasing yields. Sustainability will be an important production driver. In the US, production could grow by 0.8% per year. The EU's contribution to growth in world milk production is set to be the strongest among the three (around 7%).

Global dairy production is expected to grow by more than 15 million t per year, mainly in developing countries. More milk should be collected through formal channels, while processing capacities are set to increase and farm investments should support yield growth. Africa, China, Russia, Brazil and Argentina could overtake their past growth rates, whereas Australia and Ukraine are not likely to reverse their declining trends.

Global dairy imports to grow less and segment more

By 2030, growing production in developing countries should improve their self-sufficiency. Nevertheless, population growth, increasing income and expanding urbanisation will still support import growth in commodities for processing and in dairy products of higher value added. The latter are expected to satisfy increasing demand for specialised nutritional products, westernisation of eating cultures and lifestyle changes. In addition, further segmentation of demand is to take place.

Global import demand growth is expected to slow down to 1.3 million t per year by 2030 (compared with 2.3 million t in last 10 years). Annual growth could halve for skimmed milk powder (SMP) and could be only 65% for whole milk powder (WMP) compared with last 10 years, while some substitutes (e.g. fat-filled powders) should gain. By contrast, cheese, butter and whey powders are expected to lose less.

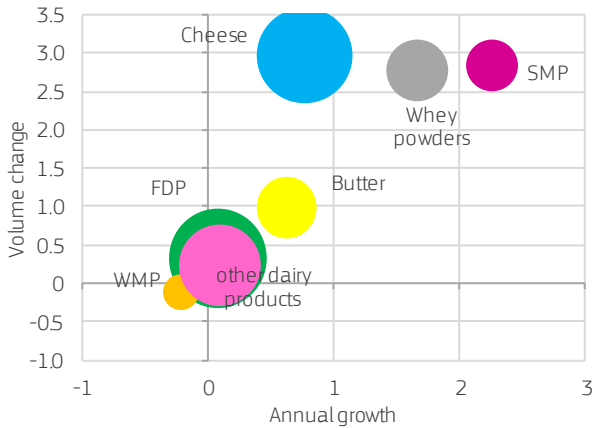
EU exports to gain in volume and value

With an expected slowdown in global import growth, EU export growth by 2030 is to be slightly lower than in the last 10 years (around 2% per year). Nevertheless, the EU is expected to remain the largest dairy exporter (28% of world dairy trade in 2030). New Zealand is set to lose some share (2pp), while the US is expected to gain the most (2pp). At the same time, the value of EU exports should grow at around 3% per year, 50% of which should come from cheese trade, followed by SMP (32%).

In the next 10 years, more exports are expected to come from other regions (e.g. South America). These are likely to compete on strongly price-driven dairy commodities markets (e.g. milk powders), whereas markets of value-added products (notably cheese and butter) are set to be dominated by the EU, New Zealand and partially also the US. This is due to newcomers facing higher entry costs in order to be able to compete with their already high existing standards and sophisticated production streams.

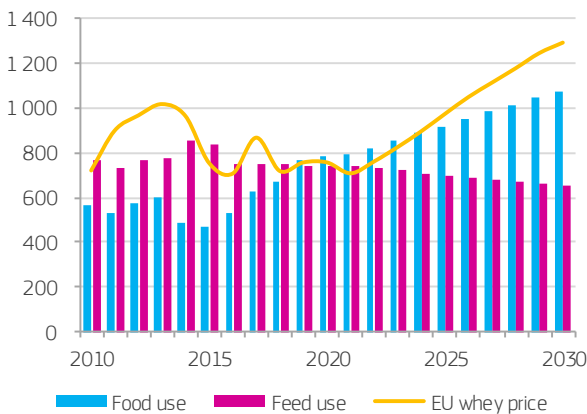
DAIRY PRODUCTS

GRAPH 3.7 EU production of selected dairy products change (million t of milk equivalent) and annual growth (%) in 2020-2030

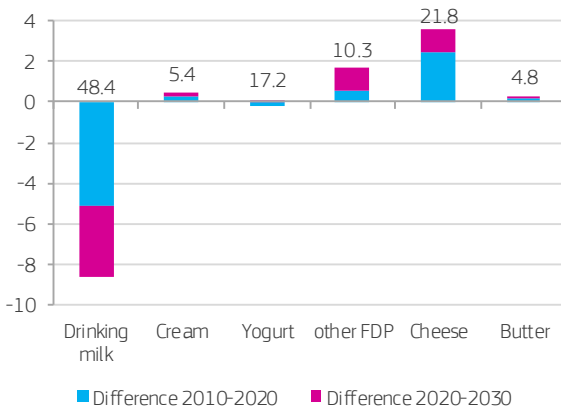


Note: The size of bubbles illustrates average 2018-2020 volumes in milk equivalent.

GRAPH 3.8 EU food and feed use of whey (1000 t) and whey price (EUR/t)



GRAPH 3.9 EU consumption of selected dairy products in 2030 (above bars) and change in selected periods (kg per capita)



Note: Pink and blue bar together illustrate absolute change between 2010-2030.

EU cheese to gain in domestic and world market

Cheese is to benefit the most from the additional EU milk produced (30%). In recent years, the EU has expanded processing capacities, notably in cheeses directed to foodservice and ready meals. In the future, more flexible production streams could improve production adaptability and help reduce waste and cheese downgrading. By 2030, a cheese’s nutritional value, its much-appreciated taste and health-conscious consumers’ preferences could lead to higher per capita consumption (21.8 kg, +1kg compared with 2020²³).

The EU should remain the largest cheese exporter (49% of global cheese exports in 2030). Following a path to expected economic recovery by 2030, demand is set to grow in Asia (in particular Japan and China) and the Middle East, driven by an expansion in foodservice. Increasing personal incomes in those regions should also support demand for EU quality cheeses. This should help EU exports to grow by 3% per year by 2030.

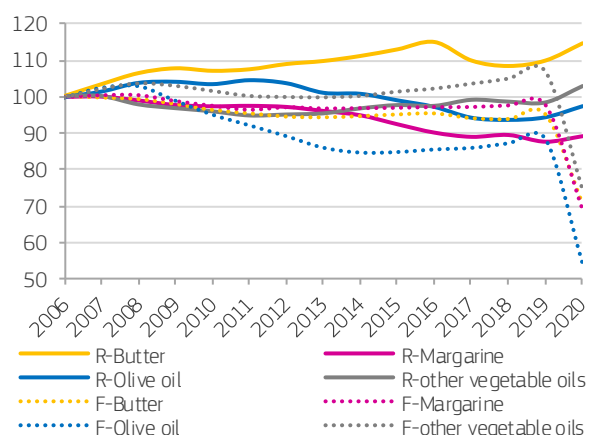
Stronger valorisation of EU whey stream

Investments in cheese result in greater potential to valorise the whey stream, its by-product. Over the years, whey has been transformed into a more technical and nutritious commodity, changing the proportions of EU whey used for food and feed. By 2030, 62% is likely to be processed into food products (+11pp compared with 2020), mainly for clinical, sport and infant nutrition. With growing health concerns and an ageing population in some parts of the world, EU whey exports for food should continue growing by 2030 (1.7% per year). In addition, the EU should also remain competitive in whey exports for feed.

Increasing EU demand for new fresh dairy products

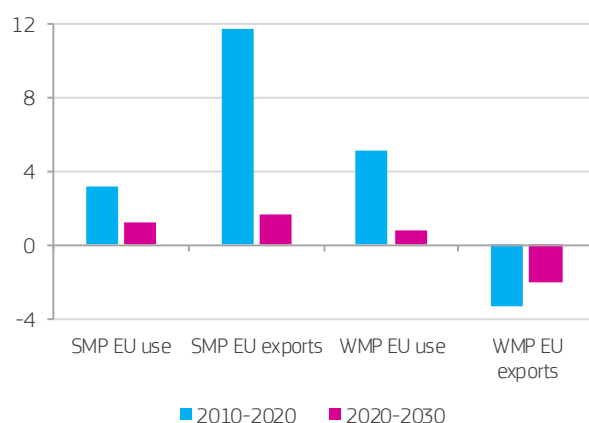
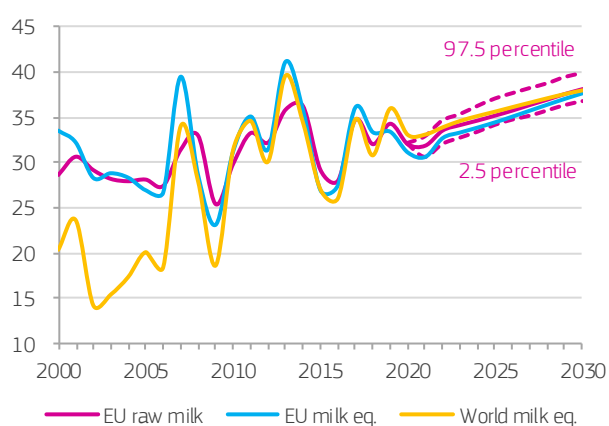
By 2030, EU consumption decline of fresh dairy products (FDPs) could slow down. The market for drinking milk is expected to benefit from further segmentation. In addition, during the COVID-19 pandemic, it proved to be an essential part of the basic nutrition mix, in particular for home cooking. This should support a lower annual decline by 2030 (-0.7%). Yoghurt per capita consumption should be stable, with consumption of other fresh dairy products as its alternatives (e.g. skyr) is increasing. In addition, per capita cream consumption should also grow thanks to home cooking and processing use (+0.2 kg by 2030). FDPs’ quality and nutritious image and the progress made in keeping products fresh in long-distance transport should contribute to increasing EU net exports of FDPs by 2030 (7% per year).

²³ 2020 represents the 2018-2020 average.

GRAPH 3.10 Retail and foodservice use change of butter and other fats (2006=100)

Note: R-retail, F-foodservice

Source: DG Agriculture and Rural Development, based on Euromonitor.

GRAPH 3.11 Annual change of EU use and exports of SMP and WMP (%)**GRAPH 3.12** EU milk price (EUR/t) and uncertainty range

EU to strengthen position in global butter trade

After historically high butter prices in 2017-2018, the EU butter price is expected to remain relatively stable by 2030 (around EUR 3 470/t). This stabilisation should be supported by limited EU consumption growth (0.3% per year), mainly thanks to increasing retail sales as in the processing, easier substitution by vegetable fats is limiting butter use, in particular in bakery, viennoiserie and biscuits.

Global demand is also helping EU price to remain stable. EU exports are expected to grow by close to 3% per year. The EU is likely to strengthen its world position (+6pp) as growth in New Zealand, the main export market, might remain constrained. Global demand for butter should mainly be driven by processing and foodservice use in final destinations.

More EU SMP to be traded

The EU demand for SMP processing into high value-added and basic products (1.2% per year) is expected to support an EU SMP price increase by 2030, when it should be around EUR 2830/t (+42% compared with the low average for 2018-2020). Production of baby food, ice cream, FDPs and processed cheese are expected to push up demand in particular.

Despite an increasing price, the EU should remain competitive on the world market and reach more than 1 million t of exports by 2030. In many regions, demand for SMP to be processed into fresh dairy products or baby food (e.g. in China) or sold to consumers as a powder for processing at home (e.g. in Africa) is expected to grow. 63% of import growth is likely to come from Asia and 21% from Africa.

In contrast, EU exports of WMP are expected to continue declining (-2% per year) until 2030 due to lower competitiveness and overall lower global demand as cheaper and customised alternatives exist (e.g. fat-filled powders). The stable domestic WMP food industry demand should become the main outlet (67% of production in 2030).

EU raw milk price to remain competitive

By 2030, global demand for EU high-value added dairy products and commodities is expected to drive an increase in the EU raw milk price (around EUR 38/t in 2030). Despite increasing energy prices and nominal feed prices, the EU could remain competitive on the world market.

EU milk equivalent price is expected to benefit from a stable EU butter price and an increasing SMP price, thus improving protein to fat ratio (0.8 in 2030 compared with 0.5 of 2020). In addition, even more value is likely to come from stronger valorisation of the cheese and whey production stream. Therefore, both milk fat and non-fat solids are expected to be important drivers of EU raw milk price developments.

MEAT PRODUCTS

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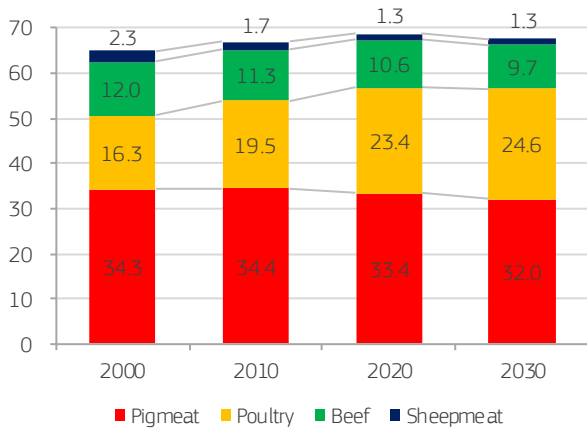
This chapter presents the drivers of EU meat markets and introduces projections for beef and veal, pigmeat, poultry, and sheep and goat meat.

Sustainability and societal concerns should take a more prominent role in shaping EU meat markets. In this context, the most influential trends that could be evident by 2030 include (i) lower consumption per capita, (ii) lower production based on more efficient systems, along with fewer animals, and (iii) reduced exports of live animals. Poultry will be the only sector to clearly expand in terms of production, consumption and exports.

The dependencies vis-à-vis global markets and current events add to uncertainties. EU prices, although generally higher, will continue to follow the world price paths. Although world consumption and demand are expected to expand, opportunities for EU export growth should benefit mostly the poultry sector. The outbreaks of and subsequent recovery from African Swine Fever in Asia, the episodes of ASF in Germany, and the current COVID-19 pandemic bring a lot of uncertainty to the global and EU meat markets.

DEVELOPMENTS IN MEAT MARKETS

GRAPH 4.1 EU meat consumption (kg per capita)



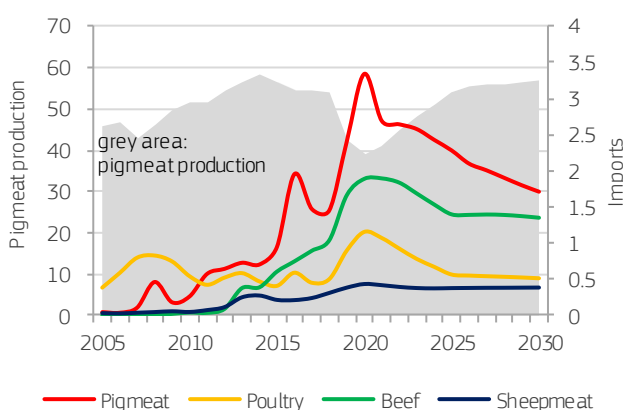
EU meat consumption is set to decline from 68.7 kg to 67.6 kg retail weight per capita by 2030, accompanied by changing consumer preferences, with consumption of beef continuing to decrease and poultry replacing pigmeat. Consumers' concerns over the environment and climate change will mean that they pay more attention to the production process (e.g. local markets, organic and other quality schemes, animal welfare, and environmental footprint). Changes in consumption habits range from dietary adjustments (more flexitarians, vegetarians and vegans) and health considerations (population ageing and lower protein needs) to convenience (with a shift from fresh meat towards more processed meat and preparations).

Availability of meat and short-term events

Nevertheless, EU meat markets are still strongly influenced by the availability of meat on the domestic market (resulting from a combination of production capacity and exports), which may alter the projected (downward) trend. The availability of meat has fluctuated in recent years, from a dip linked to the restructuring of the dairy sector, new regulations affecting the pigmeat sector and generally tight meat supply in 2013, to ample supplies of all types of meat in 2018. This was followed by a decline, particularly in imports, that was accelerated by the COVID-19 pandemic in 2020.

Dependence on the global market has intensified recently, and may continue to affect the availability of meat for EU consumption. The EU redirected a growing proportion of its meat production (pigmeat, specific poultry cuts and offal) to China in 2019-2020, in response to the African Swine Fever (ASF) outbreak in Asia. However, due to the recent ASF-related ban on meat from Germany, the outflow of pigmeat to China and other Asian countries will slow down in 2021.

GRAPH 4.2 China meat imports and pigmeat production (million t)



A bigger role for sustainability in meat production and consumption

Sustainability, with its environmental, economic and societal objectives, will play an increasingly prominent role in EU meat markets, for both producers and consumers. This could lead to a smaller EU livestock herd, particularly of bovines and pigs (-5.5 million and -4.5 million heads, respectively) by 2030²⁴. Linked to production and sustainability, the expected decline in exports will affect live animals (-30%), but an expected increase in poultry exports (+7.6%) will help to valorising cuts that are less popular with EU consumers. Total meat production is set to be lower in 2030 by 2.3%, although modernisation, adaptation and innovative technologies will lead to more efficient production.

World consumption and import demand

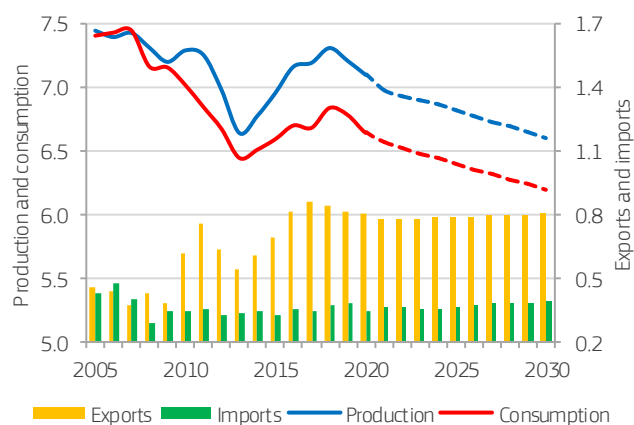
World meat consumption is expected to continue growing (+1.1% per year), thanks to continuing population and economic growth in developing countries. While a large part of world demand will be met through domestic production (+1% per year), an additional 4 million t of imports (especially of poultry and beef) will be needed to cover the gap in many countries. The EU will benefit to a limited extent from the additional demand, mainly for poultry meat, while shipments of EU pigmeat will shrink. China's recovery in terms of livestock and production will be more or less complete by 2025, and its imports of all types of meat, boosted in 2019-2020, will shrink towards 2030.

Global diseases, like the ASF outbreaks and the later recovery in Asia or the current COVID-19 pandemic, create a lot of uncertainty around global demand for meat imports.

²⁴ In this chapter, the main comparison is between 2020 (which represents the 2018-2020 average) and 2030.

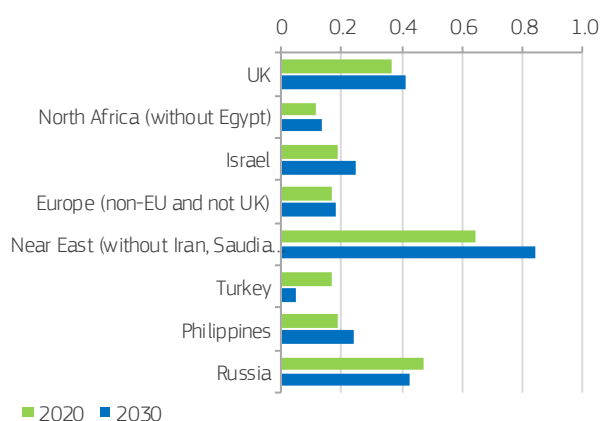
BEEF AND VEAL

GRAPH 4.3 EU beef and veal market (million t)



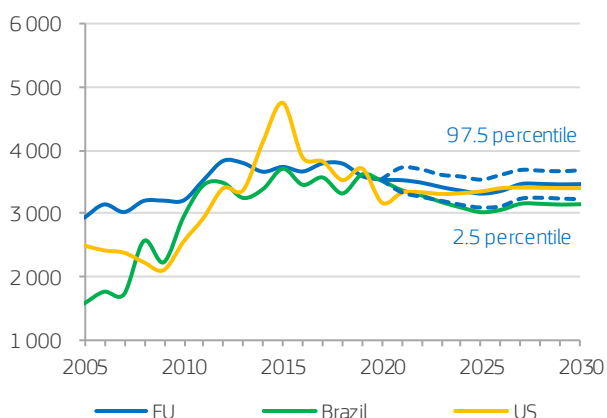
Note: Gross indigenous production; trade includes live animals.

GRAPH 4.4 Beef imports of main EU partners (million t)



Note: Total imports; countries cover 20% of world demand.

GRAPH 4.5 Beef prices (EUR/t) and uncertainty range



EU beef production and consumption falling

Continuing its downward trend from 2019 onwards, the EU gross beef production is expected to fall by 0.6 million t (-8.3%) between 2020²⁵ and 2030. While the average slaughter weight could increase slightly thanks to advanced technologies (e.g. in the management of germinal products), animal numbers will continue to shrink. The total EU cow herd is set to decline by 2.2 million heads (-7%) by 2030, and the dairy herd should decline progressively as the milk yield increases (see chapter on Milk). The suckler cow herd is set to decline to 9.9 million heads by 2030; it has already been declining for years in key producing countries (except Poland and Spain), despite the voluntary coupled support, while overall the decline is driven by loss of profitability in the current price environment. The fall in production will occur despite reasonable export prospects, slightly decreasing feed prices and an expected rebound in beef prices in 2025-2030, when the beef shortage should be more pronounced.

Beef consumption in the EU, sharply down in 2020 due to the effects of the COVID-19 pandemic, will continue its downward trend. By 2030, it could drop from 10.6 kg to 9.7 kg per capita. Overall, lower domestic production and stable imports will be in line with lower beef consumption.

Modest change in EU trade, with exports of meat offsetting exports of live animals

World demand for beef is increasing, but competition is high, both for live animals and for meat. As a result, the EU share in global exports is projected to fall from 7% in 2020 to 6% in 2030. Exports of live animals are expected to decline gradually due to lower demand from Turkey and concerns over animal welfare during transport. Some smaller niche markets for EU beef have expanded in 2020 (the US, Japan, Canada, Norway), while beef exports to the UK have declined for 2 years. Overall, EU meat exports are expected to improve after 2021, mainly thanks to rising demand in the Middle East and the Philippines. EU beef imports, which fell sharply amid the COVID-19 lockdown measures, will slowly normalise, given the gradual increase of tariff-rate quotas (TRQs) under free trade agreements. High-value beef cuts are expected to benefit most from this development.

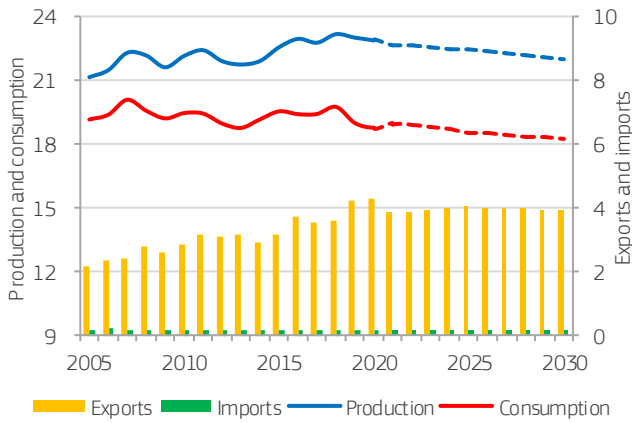
EU beef prices to follow world price developments

Ample supplies from Brazil, the US and Argentina will continue to put downward pressure on world and EU beef prices in the coming years. In 2025-2030, beef prices should rise slightly due to a deceleration in world production.

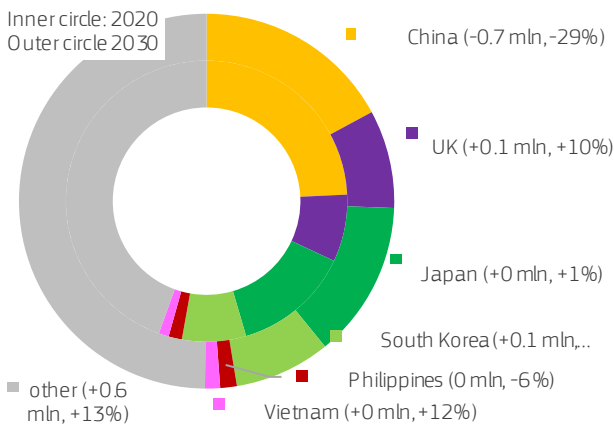
²⁵ 2020 represents the 2018-2020 average.

PIGMEAT

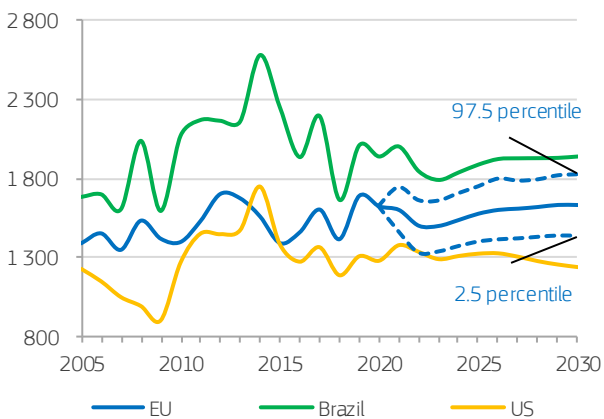
GRAPH 4.1 EU pigmeat market (million t)



GRAPH 4.7 World shares of main EU pigmeat importers (change in volume and %)



GRAPH 4.8 Pigmeat prices (EUR/t) and uncertainty range



EU pigmeat production and consumption falling

Environmental concerns in several EU Member States, coupled with the risk of ASF and changes in consumers' preferences are likely to constrain EU pigmeat production in the medium term. It is expected to fall by 1 million t (-4.6%) between 2020²⁶ and 2030. The global pigmeat market will continue to add uncertainty to production and to the availability of meat for consumption in the EU. For instance, EU production did not rise in 2020 due to the unfavourable investment climate, despite the peak in world demand and favourable prices.

EU per capita pigmeat consumption started to decline in 2019, when the EU redirected a large share of pigmeat production to China while domestic prices were high; this caused consumers to switch to cheaper alternatives. The decline is set to continue after a short recovery in 2021, to 32 kg per capita by 2030 (1.4 kg less than 2020). EU consumers may not return to pigmeat and instead are likely to favour poultry meat.

Impact of ASF on pigmeat market: EU trade stagnation

The global and EU pigmeat market remains uncertain due to the continuous but diminishing impact of ASF in Asia. Firstly, production potential in Asian countries may improve faster than expected. In China, after 2 years of shortages and high prices, which have attracted massive shipments, import demand is set to drop markedly in 2021, and pigmeat production may reach pre-ASF levels by 2025 if the restructuring of its pigmeat industry is successful. Secondly, the ASF-related import bans have intensified in Asian countries after the outbreak in Germany in September 2020 and will bring the large outflow of EU pigmeat to a halt in 2021.

In any case, EU pigmeat exports, which have already peaked in 2019-2020, will not rebound as Chinese demand recedes. By 2030, EU exports may remain slightly higher than in 2018, thanks to demand from other Asian partners who might not manage to recover entirely from ASF. Overall, the EU will remain the global leader in pigmeat exports (38%).

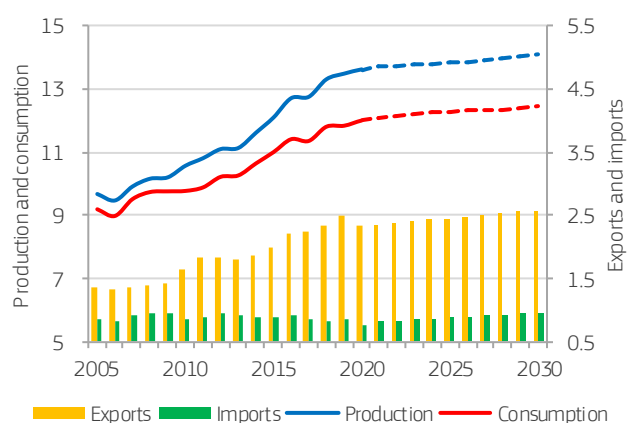
EU pigmeat prices to return slowly to current levels

EU pigmeat prices reached a peak in 2019 due to the massive demand from China, while COVID-19 and the ASF-related import bans on German pigmeat contributed to a decline in 2020. Global competition (from the US, Brazil and Canada) and the ASF-related loss of demand for EU meat will cause further falls in prices. As availability will decrease, EU prices should recover to around EUR 1 600/t by 2030.

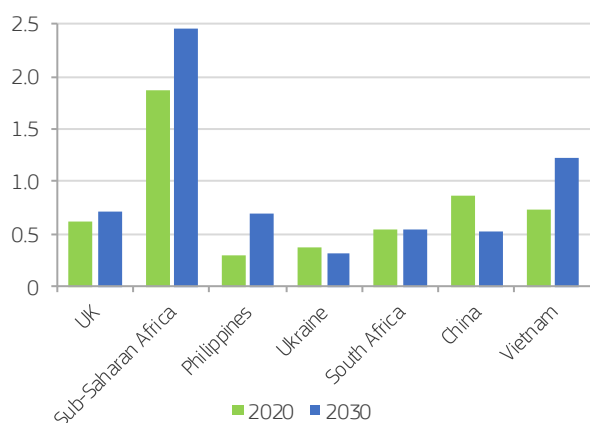
²⁶ 2020 represents the 2018-2020 average.

POULTRY MEAT

GRAPH 4.9 EU poultry meat market (million t)

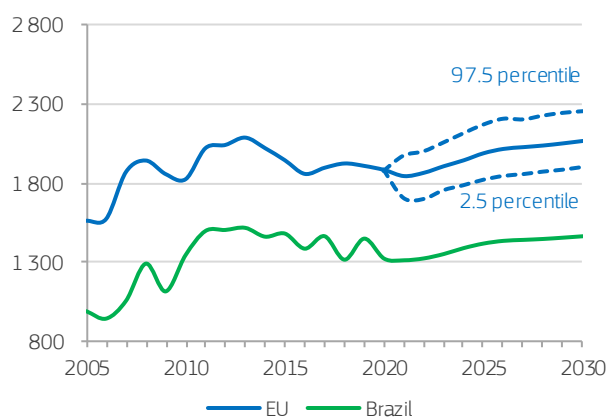


GRAPH 4.10 Poultry imports of main EU partners (million t)



Note: Total imports; countries cover 40% of world demand.

GRAPH 4.11 Poultry meat prices (EUR/t) and uncertainty range



EU poultry production and consumption to grow

EU poultry production is expected to be the only meat category to grow between 2020²⁷ and 2030 (+620 000 t or +4.6%), building on its recent performance while adapting better to consumer demand and becoming more sustainable. It is the only sector to have expanded in 2020 during the COVID-19 pandemic, even without increased exports. In the medium term, production growth should benefit from significant investments, which capitalise on lower costs in eastern European countries, as well as from increasing prices.

EU demand for poultry meat has been rising consistently for many years, as consumers perceive it to be healthy. The COVID-19 lockdown measures strengthened the importance of affordability and convenience of poultry meat for home cooking. The EU per capita consumption of poultry meat, supported by imports of breast meat, is projected to reach 24.6 kg per capita by 2030 (1.2 kg more than 2020). It is likely that EU consumers may not return to pigmeat even if it becomes more available as a result of fewer exports to Asia.

EU poultry trade to remain buoyant

EU poultry exports benefit from valorising specific cuts (e.g. wings to Asia, halves and quarters to Africa), and will increase steadily towards 2030, after the current drop. Demand is projected to grow in key export destinations (including the UK), where poultry meat is expected to replace less abundant and more expensive pigmeat. On the downside, demand will soften in Ukraine and China, while some risks linked to the uncertainty of global recovery from COVID-19 will continue. Given strong competition from Brazil, the EU's share in global exports will decrease slightly from 16.2% in 2020 to 15% in 2030.

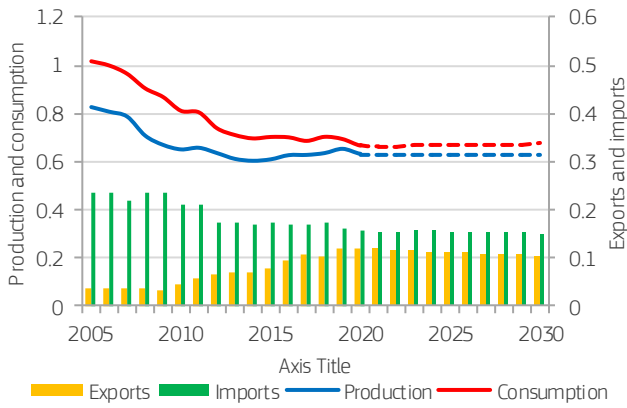
EU poultry imports, often supplying fast foods and other foodservice, should start to recover once shipments from traditional trading partners strengthen after the decline induced by COVID-19 lockdown measures and closures of food services in 2020. Total imports should grow gradually to around the total volume of tariff-rate quotas opened by the EU (around 900 000 t as of 2020).

EU poultry meat prices are expected to rise between 2020 and 2030, as production will meet increased demand.

²⁷ 2020 represents the 2018-2020 average.

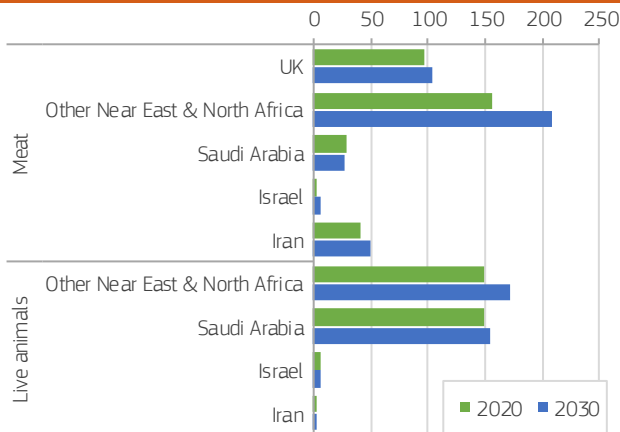
SHEEP AND GOAT MEAT

GRAPH 4.2 EU sheep and goat meat market (million t)



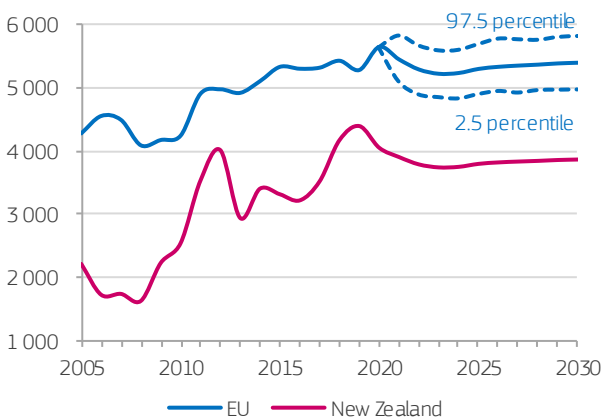
Note: Gross indigenous production; trade includes live animals.

GRAPH 4.13 Sheep imports of main EU partners (1 000 t)



Note: Total imports; countries cover 43% of world demand.

GRAPH 4.3 Sheepmeat prices (EUR/t) and uncertainty range



EU production and consumption to stabilise

After decreasing gradually up to 2013, sheep meat production stabilised and is expected to remain around 630 000 t over the next decade, supported by voluntary coupled payments and the prospect of stable returns for producers. Production will remain concentrated in a few EU Member States, with slaughterings in Spain, Greece, France and Ireland representing more than half of total EU production in 2019.

EU per capita consumption of sheep meat is expected to remain relatively stable by 2030 (1.3 kg, the same level as in 2020)²⁸. In general, sheep meat consumption, which is lower than for other meats, is less sensitive to price changes but more affected by peaks in demand related to religious celebrations.

EU trade limited by global competition

EU exports of live animals are expected to decline slowly to 40 000 t by 2030 (by -32% compared to 2020), mainly due to animal welfare concerns and financial risks linked to certain trade destinations. Exports of meat might face tough international competition since Australia and New Zealand, which represent 80% of international trade, are expected to keep their dominant position on the world market. Even though the EU is still a major export destination, Australia and New Zealand will focus more on the closer Asian markets. While Australia is expected to fill its EU tariff-rate quota (TRQ), New Zealand's production capacity is unlikely to be able to serve both the Asian and European markets. Therefore, EU imports will be stable and stay significantly below the total volume of TRQs opened by the EU.

Prices to fall, followed by a recovery

After the peak in 2020, EU prices are expected to fall, followed by a recovery in 2025-2030, similarly to the world market price. A significant gap between the EU and the world price (New Zealand) will remain, reflecting higher production costs and lower pressure from the world market.

A major uncertainty in the sheep sector is the withdrawal of the UK. The UK was not only the EU's largest producer but also a key importer from Oceania and the EU. This may have a significant impact depending on the exact conditions of the new trade relationship after withdrawal and the possible re-routing of trade flows from the main international partners.

²⁸ 2020 represents the 2018-2020 average.



SPECIALISED CROPS

5

This chapter looks into three specialised crops: olive oil, wine, and fruit and vegetables. In contrast to commodities covered in the other chapters, these sectors are not included in the Aglink-Cosimo model, and projections are largely based on expert judgement and literature reviews, taking into account historical trends in supply and demand. Price developments are not explicitly incorporated into the projections.

The large degree of differentiation and segmentation within these markets does not enable us to fully cover these sectors. For fruit and vegetables in particular, projections are limited to apples, peaches and nectarines, oranges and tomatoes. Other specialised crops, equally fundamental to EU agriculture, such as flowers and ornamental plants, are not covered in the projections.

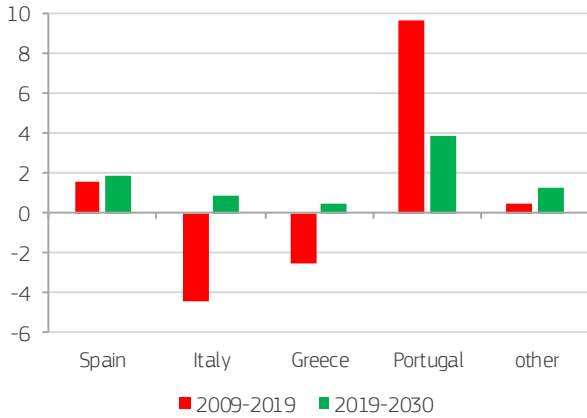
Increasing health awareness and promotional campaigns appear to positively influence the consumption of apples, oranges and tomatoes. Shifts between products will continue their trend, driven by changing consumer preferences and lifestyle. By contrast, the consumption of peaches and nectarines is expected to remain around the current level by 2030, driven by stable supply.

The declining trend in EU wine consumption is expected to slow down by 2030. The wine sector is adapting to changing lifestyle and consumer preferences. Production is due to decline.

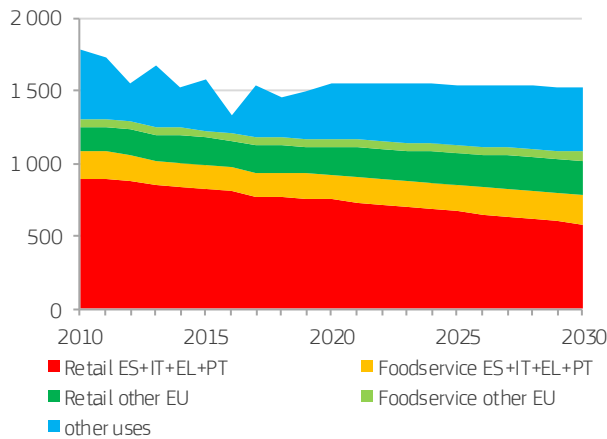
The olive oil market is expected to benefit from an increasing demand worldwide thanks to its positive health image. The growth in production is expected to be driven by growth of intensive and superintensive systems.

OLIVE OIL

GRAPH 5.1 Olive oil production annual growth rates in main EU producing countries (%)

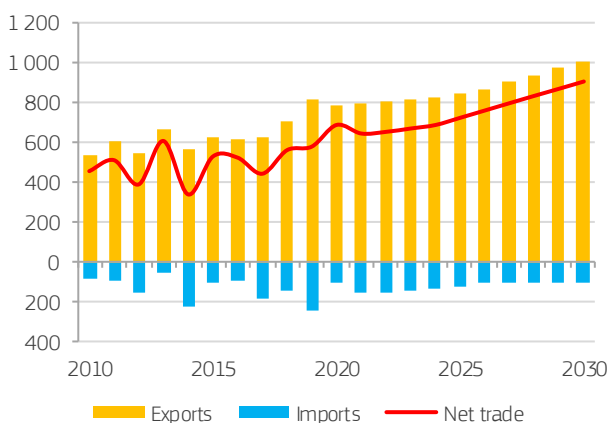


GRAPH 5.2 EU olive oil consumption by channels (1 000 t)



Source: DG Agriculture and Rural Development, based on Euromonitor (until 2020).

GRAPH 5.3 EU olive oil trade (1 000 t)



EU production to grow in a sustainable way

The EU olive oil sector provides economic, environmental and social benefits to communities and has the potential to improve agriculture’s carbon footprint by absorbing CO₂. Thus, it delivers on all sustainability objectives. However, fluctuations in production and prices, damage to olive groves caused by diseases in certain regions and different farm structures create challenges for its expansion.

By 2030, the EU olive oil production is expected to grow by 1.3% per year, driven by increasing yields (+0.5% per year). The area under development is expected to remain stable, although further investment in intensive and superintensive systems is expected. Production in Spain could continue growing, whereas production growth in Portugal could slow down compared to the very strong growth of the recent years. The olive oil sector in Italy should re-start the growth, thanks to new plantations of better disease-resistant cultivars. However, smaller farms and the higher average age of farmers in Italy and Greece could limit growth there compared to Spain and Portugal (characterised by larger farms and a higher capacity to adapt). Cooperation and development of services that enable small farmers to benefit from economies of scale will be crucial.

Differentiation of EU consumption trends to continue

Sustainability and health concerns help to increase EU olive oil consumption, with higher growth rates in the EU non-producing countries. In addition, quality ready meals using olive oil are expected to increase, keeping annual growth in EU consumption stable at +0.2% by 2030 (compared to -2% in 2009-2019²⁹). By 2030, EU non-producing countries could account for 26% of EU consumption (compared to 20% in 2019). In the main producing countries, sustainability and health concerns could slow the declining trend to -0.5% per year between 2019 and 2030 (compared to almost -3% in 2009-2019).

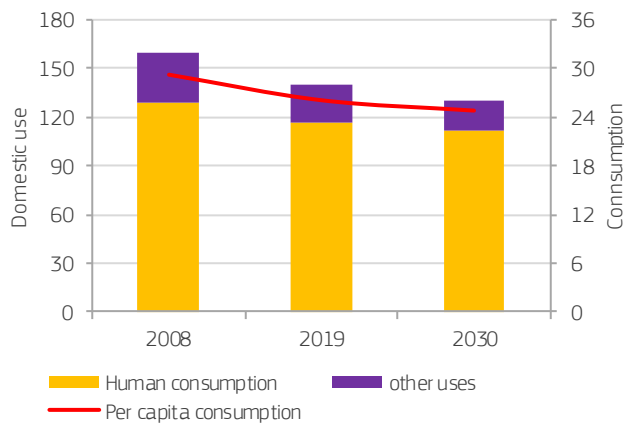
EU exports to gain from an economic recovery

Rising incomes, the popularity of Mediterranean cuisine and prices that are competitive with other vegetable oils support EU olive oil exports, notably to China, South-East Asia and Russia. These regions contributed to 13% of EU export growth in last 10 years. Given the expected pace of economic recovery after COVID-19, growth could slow down in the coming years but accelerate afterwards to reach more than 1 million t in 2030. At the same time, EU imports could decline in the short term and stabilise in the medium term, as EU production grows. As a result, the EU net exports could gain 5% per year by 2030.

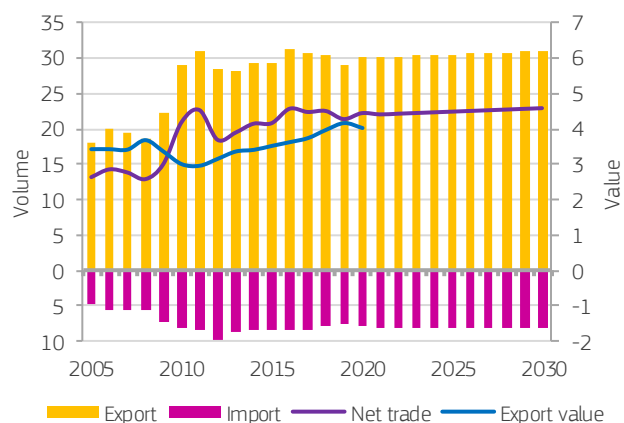
²⁹ 2009 and 2019 represent the 2005-2009 and 2015-2019 trimmed averages.

WINE

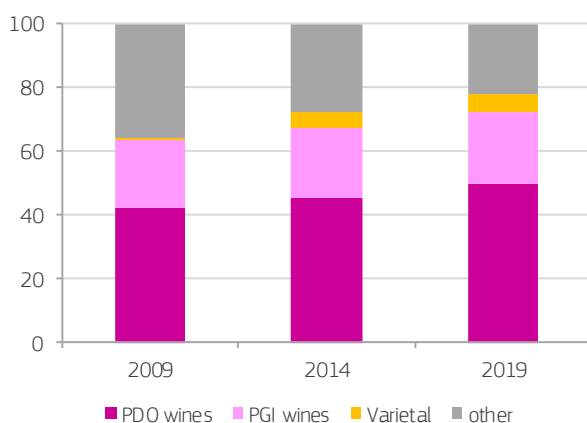
GRAPH 5.4 EU wine domestic use (million hl) and consumption (l per capita)



GRAPH 5.5 EU wine trade in volume (million hl) and unit value (EUR/l)



GRAPH 5.6 EU wine production by categories (%)



Source: DG Agriculture and Rural Development, based on MS notifications.

Changing EU wine consumption and sales trends

The EU wine sector is adapting to changing lifestyles and preferences among new and old generations of consumers. By 2030, these should result in a slower decline of EU per capita wine consumption (-0.3% per year) compared to 2009-2019³⁰ (-1.1%) to around 25 l. However, large differences between EU Member States could remain.

Demand for wines with a lower alcohol content and sparkling wine, which can be consumed on a variety of occasions, is growing. Pushed by the COVID-19 pandemic, new ways to commercialise wine, such as e-commerce, are flourishing and are expected to develop further, also boosting demand. A slight increase in the use of vinified production for 'other uses' (e.g. distillation and the production of 'processed/elaborated products') is expected to compensate for the decline in wine consumption. As a result, total domestic use of vinified production could remain stable.

Slowdown in growth of EU exports

EU wine exports grew strongly from 2009 to 2019 (+5% per year). While volume has stabilised recently, value has continued to grow. EU exports are driven by high demand for EU wine with a geographical indication (GI) and sparkling wines in general. Despite a potentially prolonged impact from COVID-19, stabilising global demand and strong competition from wine producing countries outside of the EU, EU wine exports are expected to grow slightly to 31 million hl in 2030 (+0.3% per year). However, demand for entry-level (low-priced) wines remains strong and the EU could also further develop this market, for example by exporting more bulk wine.

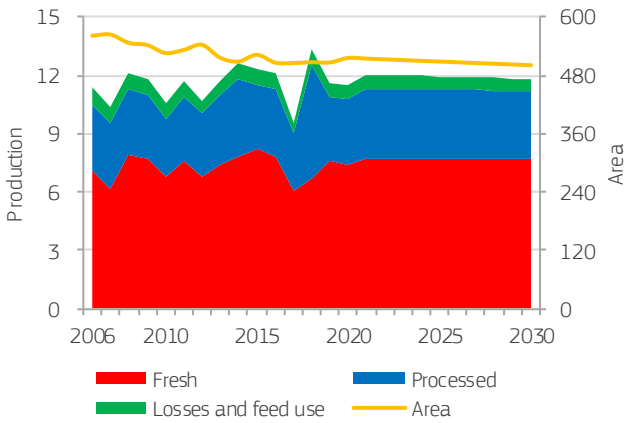
Slightly increasing area along with declining yields

As EU demand is expected to drop and exports to remain almost stable, EU wine production is set to decline to 160 million hl (-0.3% per year) by 2030, although with annual variability due to weather conditions. After a long period of decline, the total area covered by vineyards is expected to grow slightly by 2030 (+0.2% per year), mainly for high quality GI wines with generally lower yields. New and replanted vineyards should outweigh abandonments that arise due to the lack of farm succession and/or difficulties in competing on the market, although increasing production of quality wines and organic wines could result in lower average yields.

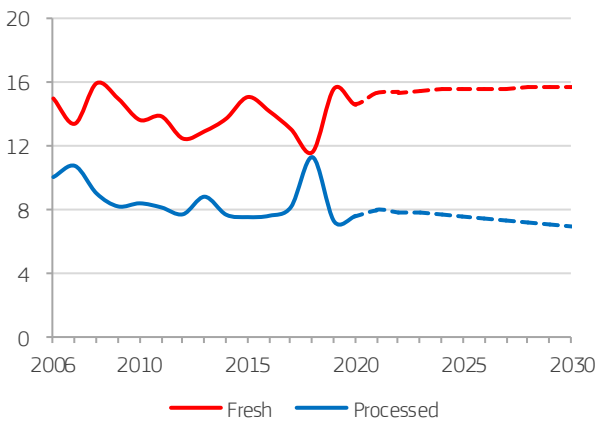
³⁰ 2009 and 2019 represent the 2005-2009 and 2015-2019 trimmed averages.

APPLES

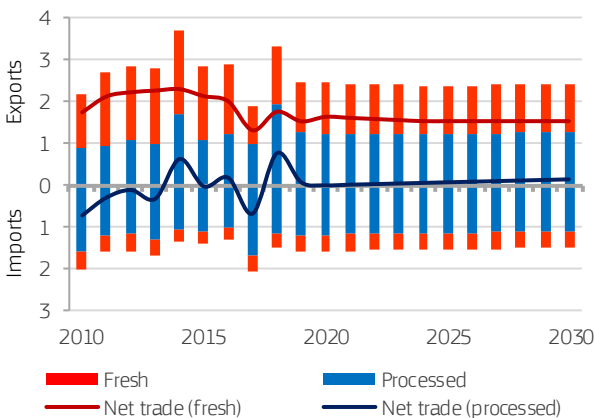
GRAPH 5.7 EU apple production (million t) and area (1000 ha)



GRAPH 5.8 EU apple consumption (kg per capita of fresh equivalent)



GRAPH 5.9 EU apple trade (million t of fresh equivalent)



Stable EU apple production with increasing quality

EU apple production is projected to remain stable between 2019³¹ and 2030 at 11.8 million t, as a result of the decreasing area under cultivation and increasing yields. The modernisation of the Polish apple sector will be a major driver (see section on developments in EU member states).

It is expected that 3.3 million t of apples could be used for processing by 2030 (-2% compared to 2019). The share of apples used for processing in total EU apple production (currently around 30%) should decline towards 2030 due to a decrease in backyard farming and an increase in the overall quality of apples. This could result in lower availability of apples for the processing industry.

EU apple consumption to increase

By 2030, EU per capita apple consumption is expected to increase to 15.7 kg (+1 kg compared to 2019), driven by increasing health awareness among consumers and the increasing number of apple varieties, which better reflect consumers' preferences. In contrast, EU per capita consumption of processed apples is expected to continue falling, to 7 kg by 2030 (-9% compared to 2019), driven by a drop in demand for juices (which account for around 65% of processed apples); consumers tend to seek more fresh juices, often chilled, which are perceived to be of better quality. EU consumption of compote and cider should continue rising up to 2030.

EU exports of fresh apples to stabilise by 2030

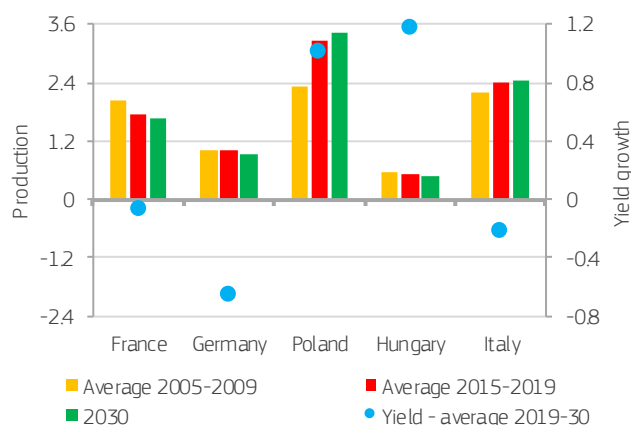
EU exports of fresh apples are expected to continue falling in the short term and to stabilise by 2030 at around 1.2 million t (-19% compared to 2019), despite an increase in quality. Russia, which used to be the largest EU export market, is increasingly self-sufficient, and the potential to export to new markets remains limited because of phytosanitary restrictions. EU imports of fresh apples should also remain stable thanks to their high quality and to EU demand in the summer months (as there is a need to ensure year-round availability).

Global availability and prices of apples as raw materials determine to a large extent the trade in processed apple products, mainly apple juice concentrate. EU exports of processed apple products are expected to remain stable between 2019 and 2030, though there could be strong annual variations related to weather conditions impacting the EU harvest. Still, the EU should remain a net importer of concentrate.

³¹ 2010 and 2019 represent the 2006-2010 and 2015-2019 trimmed averages.

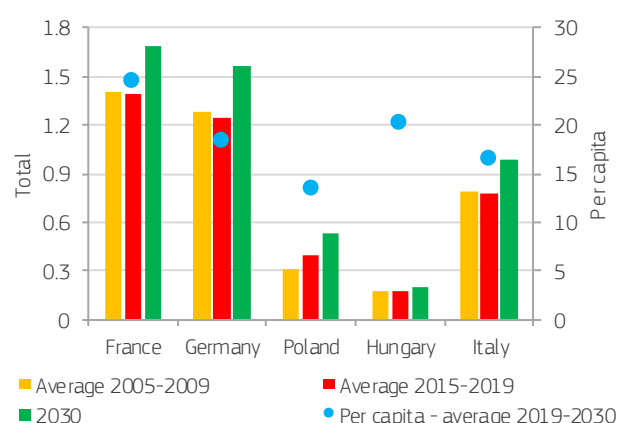
APPLES – DEVELOPMENTS IN EU MEMBER STATES

GRAPH 5.10 Apple production (million t) and annual yield growth (%) in main EU producing countries



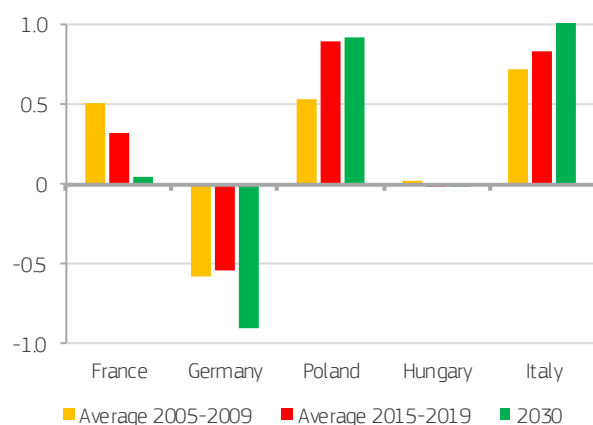
Source: AGMEMOD simulation.

GRAPH 5.11 Apple consumption (million t and kg per capita)



Source: AGMEMOD simulation.

GRAPH 5.12 Apple net trade (million t)



Source: AGMEMOD simulation.

Loss of competitiveness in several EU Member States, but growth in Poland and Italy

The harvested area for apples is expected to decline in most of the main EU producing countries, with Italy being an exception. Yield increases are expected to be strong in Poland, driven by the introduction of new, high-yielding dwarf varieties, improved agronomic management and a shift of production to the most suitable regions. Hungary is also projected to have yield increases, whereas the yield in France is stagnating and yields in Germany and Italy are expected to decline. Measured in terms of production, Poland and Italy are relatively competitive within the EU and on the international market. Poland, which is already by far the largest apple producer in the EU, is projected to increase production irrespective of market forces, which will impose some downward pressure on prices, and also despite the shift in the varietal mix towards higher quality apples. The further growth of EU organic production is expected to limit yield increase and production.

Increase in per capita consumption due to lagging prices

Fresh apple consumption per capita is expected to increase in all main EU producing countries over the 2019-2030 period. Apples are expected to be competitively priced, which improves their relative position within the fruit sector, stimulating greater consumption. Awareness of the potential benefits of adopting a diet rich in fruit and vegetables, as well as public initiatives to promote their consumption, might also contribute to growing consumption of apples. Changing apple varieties to varieties that better correspond to consumer preferences in Poland may add to an increase in fresh apple consumption there.

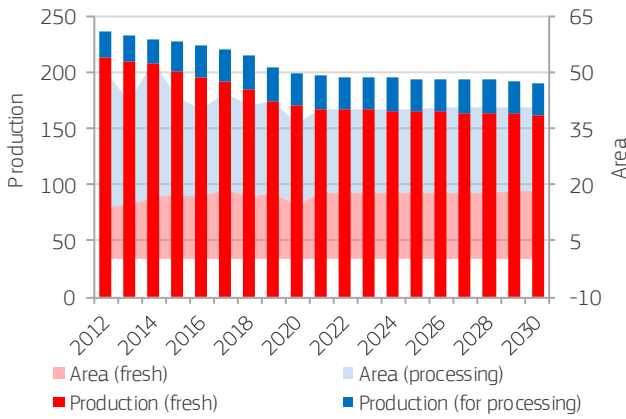
The population of countries analysed here (Germany, France, Hungary, Italy and Poland) will decline by 1.3 million over the next decade, which will have a negative impact on the total consumption of fresh apples, even though its impact is outweighed by the factors stimulating growth in consumption.

Stronger focus on the EU market

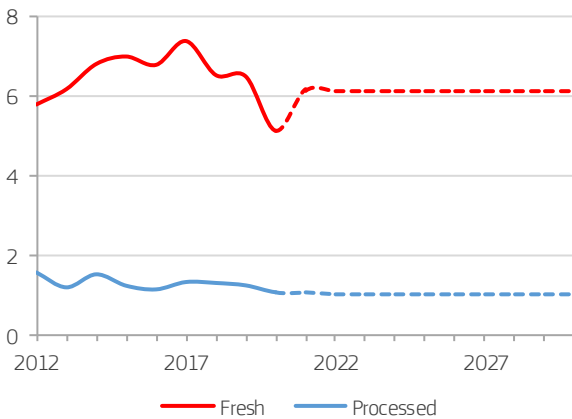
Poland and Italy will remain important apple exporters and increase their net exports. Poland's net export growth is being slowed down by phytosanitary restrictions, which limit the possibility to expand exports, and a projected increase in home demand. In contrast, the net export position of France, which is a significant exporter to the UK, is expected to decline strongly over the next 10 years due to increased domestic consumption. Germany will increasingly become a net importer, as growth in demand is expected to outpace growth in domestic production.

PEACHES AND NECTARINES

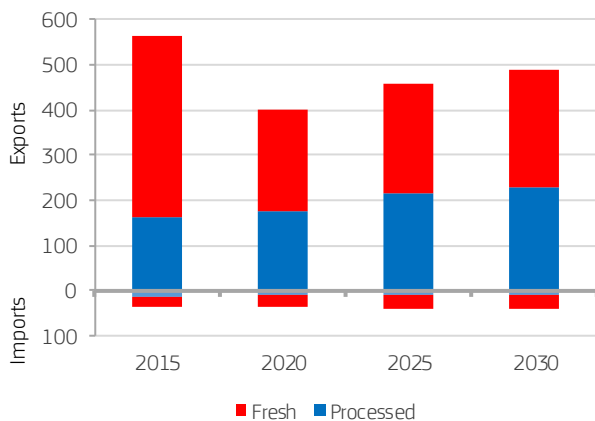
GRAPH 5.13 EU peach and nectarine production (1 000 t) and area (1 000 ha)



GRAPH 5.14 EU peach and nectarine consumption (kg per capita of fresh equivalent)



GRAPH 5.15 EU peach and nectarine trade (1 000 t of fresh equivalent)



Better EU market balance thanks to restructuring

Total EU production of peaches and nectarines is expected to remain stable between 2019³² and 2030 at 3.6 million t, though with high annual variations due to weather conditions. Four Member States (Spain, Italy, Greece and France) accounted for more than 95% of EU production in 2019 and this is expected to remain the case in the future.

EU production of fresh peaches and nectarines is projected to remain stable at 3 million t up to 2030, after several years of decline driven by a restructuring in Spain, which accounted for 42% of total EU production in 2019. New orchards have been planted with new varieties, particularly in Catalonia and Aragon, while orchards in other Spanish regions, northern Italy and France have been declining.

Similarly, EU production of peaches for processing, which represents around 20% of total production, is expected to remain stable. In years of high production, the share of peaches used in processing should increase, particularly in Greece. Greece is the EU's largest producer of canned peaches, with a 60% share of the market, and also has the capacity to process additional supply.

Lower EU consumption of peaches and nectarines

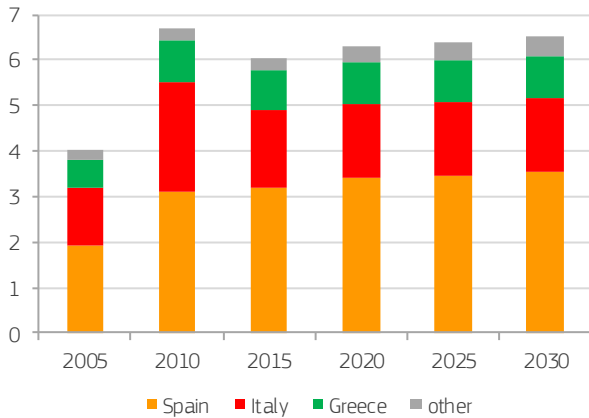
Fresh peaches and nectarines are mainly consumed in the domestic market. It is projected that EU per capita consumption will decline to 6.2 kg by 2030 (9% lower than 2019¹, when availability was high and prices were low). The decline in consumption is driven by lower availability and by competition from other summer or tropical fruits, increasingly available in supermarkets, including in ready-to-eat packages. Consumption of processed peaches is expected to decline by 2.2% per year to 2030, following the historic trend.

EU exports of fresh peaches and nectarines account for less than 10% of EU production. While exports fell by 8% in 2014-2019¹, mainly due to the introduction of the Russian export ban, exports are expected to remain relatively stable up to 2030 (-0.6% per year). Imports, which mainly occur outside the EU production season, are expected to increase in line with the historic trend over the last decade (+2% per year). In contrast to the limited exports of fresh peaches, exports of processed peaches accounted for around 25% of EU production in 2019. By 2030, this share is expected to increase to almost 35% due to declining demand on the EU market and expected growth (+3% per year) driven by growing global demand and the EU competitiveness on the world market. This competitiveness is due to very efficient processing systems, in particular in Greece.

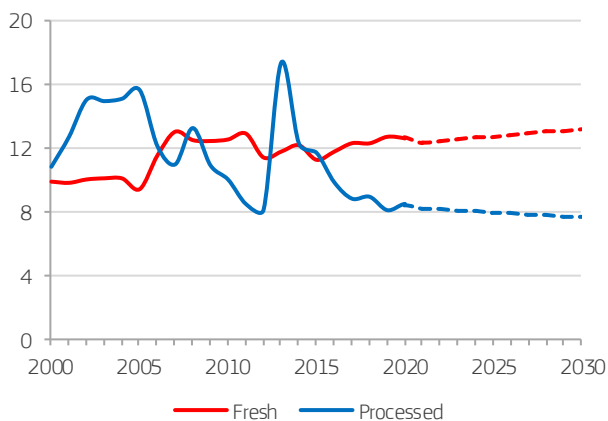
³² 2014 and 2019 represent the 2012-2014 and 2017-2019 averages.

ORANGES

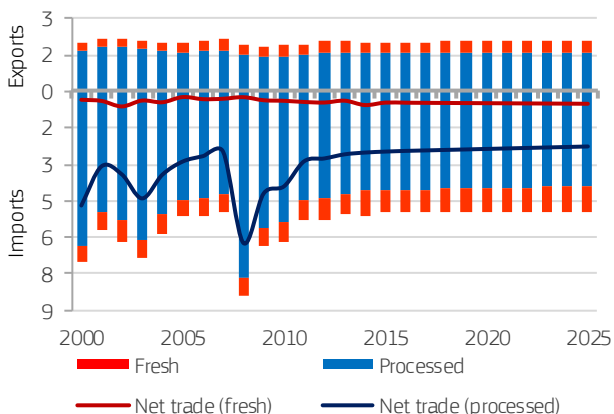
GRAPH 5.16 Orange production by main EU producing countries (million t of fresh equivalent)



GRAPH 5.17 EU orange consumption (kg per capita of fresh equivalent)



GRAPHS 5.18 EU orange trade (million t of fresh equivalent)



EU orange production to grow slightly

By 2030, EU orange production is expected to increase to 6.5 million t (+0.4% per year), driven by a slight yield increase. The area of orange orchards is projected to remain stable after a steady decline in recent years. Spain and Italy, with respective shares of 52% and 28% of the EU orchard area in 2019, are set to remain the two main producing countries.

Around 80% of EU orange production is for fresh consumption. By 2030, production of oranges for fresh consumption is set to increase to 5.4 million t (+0.6% per year). In contrast, the share of production that is directed to the processing sector, mainly to produce juices, is expected to decline. The share of oranges for processing could drop from 20% in 2019³³ to 17% by 2030.

Increasing EU demand for fresh oranges

EU per capita consumption of fresh oranges is expected to grow to 13.2 kg by 2030, driven by increasing health awareness and the positive health image of oranges. Consumption of freshly squeezed orange juice in supermarkets, cafes and restaurants also boosts their consumption. In contrast, EU per capita consumption of processed oranges is expected to continue declining to 7.7 kg by 2030, mainly driven by health concerns (over the high sugar content of juices). This is a slower rate (-1.6% per year) than in 2009-2019 (-2.7%) thanks to expected product innovations such as low sugar juices.

EU imports of fresh oranges to increase

As the EU only produces 70% of the oranges it consumes, it is highly dependent on imports. EU self-sufficiency is particularly low for processed oranges (30%), but the EU also only produces 90% of the fresh oranges it consumes, due to their seasonality and demand for fresh orange juice in summer.

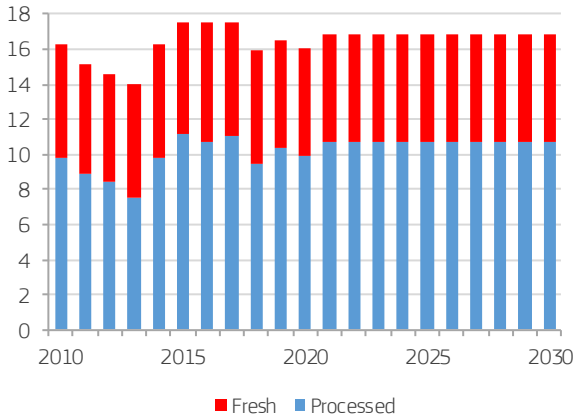
Driven by a strong increase in EU demand, imports of fresh oranges are projected to increase by 1.4% per year up to 2030. Although EU exports of fresh oranges, particularly to neighbouring countries, are projected to increase, the quantities involved will remain low. Therefore, the EU net trade balance for fresh oranges will become more negative.

With the declining EU consumption of processed oranges, imports are projected to continue falling up to 2030 (-1% per year). This will be driven by a sharp fall in imports of orange juice concentrates as consumers increasingly avoid orange juice from concentrate, which is perceived as less healthy than other types of orange juice.

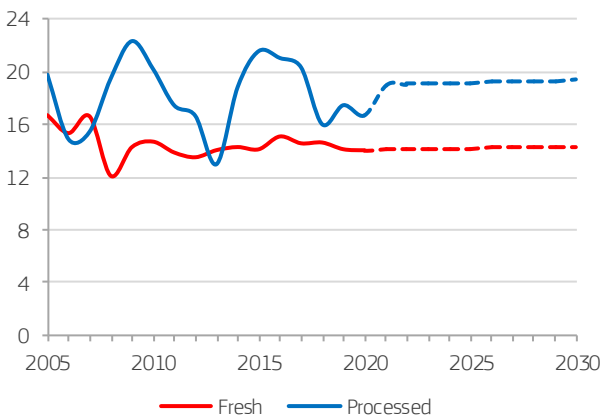
³³ 2009 and 2019 represent the 2005-2009 and 2015-2019 trimmed averages.

TOMATOES

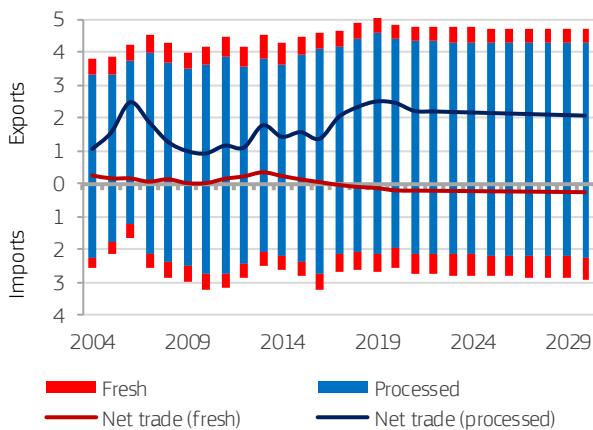
GRAPH 5.19 EU tomato production (million t of fresh equivalent)



GRAPH 5.20 EU tomato consumption (kg per capita of fresh equivalent)



GRAPH 5.21 EU trade of fresh and processed tomatoes, including inward processing (million t of fresh equivalent)



Increasing share of higher value-added tomato products

By 2030, EU fresh tomato production is expected to amount to 6.2 million t, (-4% compared to 2019³⁴). This decline is driven by a strong reduction in winter production in Spain and a shift to small-sized tomatoes. Spanish producers are switching to other, more profitable, crops in winter due to strong competition from Moroccan tomatoes and demand in other glasshouse vegetables. In addition, the production of small-sized tomatoes (e.g. cherry and cocktail tomatoes) is rising in all producing countries at the expense of round tomatoes, thanks to the continuous growing demand and the higher value added to producers. This shift is leading to an increase in the value of EU production but to a decline in its volume.

By 2030, EU production of tomatoes for processing is expected to stabilise at around 10.7 million t. Production is shifting from highly concentrated products, such as tomato paste, to less concentrated and higher value-added products, such as canned tomatoes, passata, tomato sauce, and to organic products.

Stabilisation of EU demand for tomatoes

By 2030, EU per capita consumption of fresh tomatoes is expected to be stable compared to 2019, but with an increasing share of small-sized tomatoes and other varieties. Also the EU per capita consumption of processed tomatoes is projected to be stable by 2030. Despite increasing demand for processed food, consumption (in fresh equivalent) is projected to remain even as the concentration of raw tomatoes in processed food will decline due to more use of other vegetables.

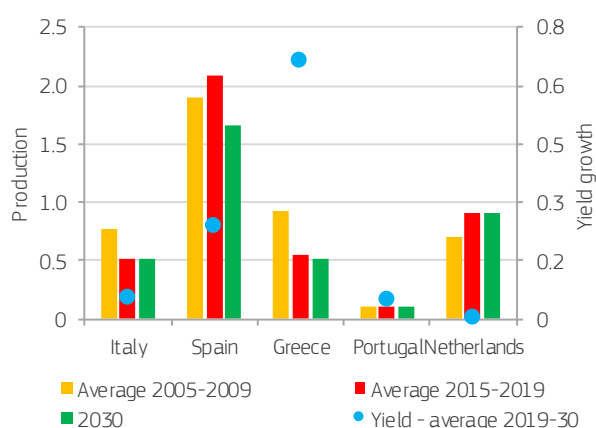
EU imports of fresh tomatoes are due to continue to grow by 2030 (+2% per year). Growth will come in particular from Morocco, which already accounted for almost 80% of total EU imports in 2019, driven by the expected production growth. The significant out-of-quota imports show that Morocco has the potential to strongly compete on the EU market. By contrast, EU exports of fresh tomatoes are projected to be stable towards 2030 due to the increase of self-sufficiency in Russia and the limited alternative markets. As a result, the net import position of the EU is expected to further grow.

Between 2019 and 2030, the EU is projected to remain a net exporter of processed tomatoes, despite the projection of stable exports and increasing imports (+1% per year), mainly from Ukraine. The export value should increase thanks to the growth of high value-added exports.

³⁴ 2009 and 2019 represent the 2005-2009 and 2015-2019 trimmed averages.

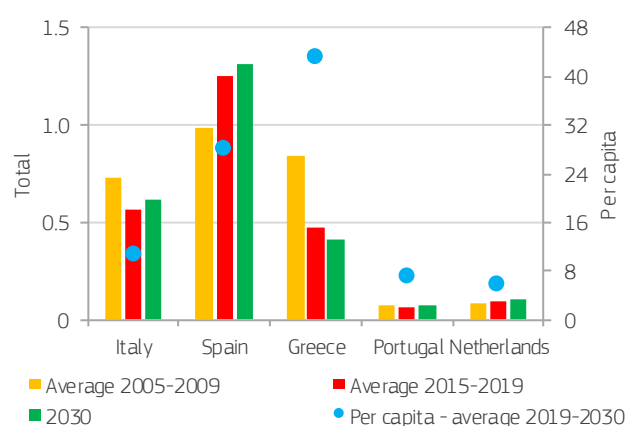
TOMATOES - DEVELOPMENTS IN EU MEMBER STATES

GRAPH 5.22 Tomato production (million t) and annual yield growth (%) in main EU producing countries



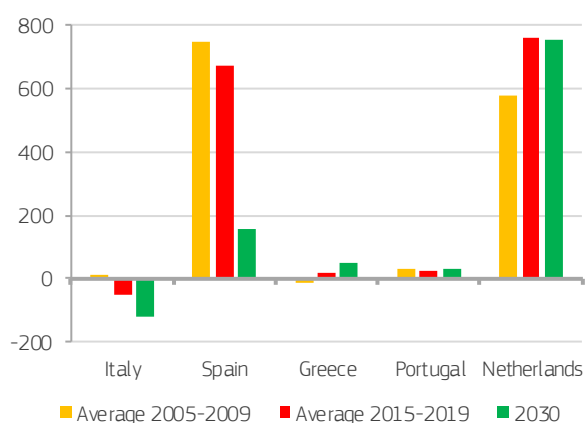
Source: AGMEMOD simulation.

GRAPH 5.23 Tomato consumption (million t and kg per capita)



Source: AGMEMOD simulation.

GRAPH 5.24 Tomato net trade (1000 t)



Source: AGMEMOD simulation.

Declining harvested area and moderate yield growth

The EU tomato sector will face a challenging environment in the coming years, in which the main EU producing countries will need to cope with climate change, pest diseases, fierce competition and changing consumer preferences. By 2030, production in most of the main producing countries is expected to remain around the average levels for 2015-2019. Production in Spain, the biggest EU producer of tomatoes, is however expected to decline by more than 20% by 2030. This reflects a smaller harvested area due to increasing competition from non-EU countries, water shortages and the low profitability of the crop compared to alternative glasshouse vegetables.

Moderate yield growth is expected for most of the main producing countries, with the exception of the Netherlands, in which production already takes place in a highly controlled and optimal environment. In addition, the share of small-sized tomatoes within total Dutch production (and that of other EU Member States) is expected to increase, which negatively impacts yields.

Fresh tomato consumption expected to increase

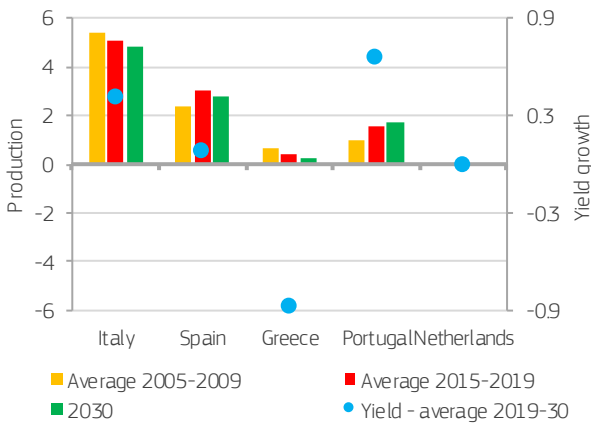
Total tomato consumption is expected to increase by 2030 in the main producing EU Member States, irrespective of differences in current per capita consumption. The lower per capita consumption of a country like the Netherlands reflects differences in preferences, eating patterns (lunches without vegetables) and the consumption of a larger variety of vegetables compared to other EU Member States (e.g. Spain, Greece) where the tomato is still the most consumed vegetable. Overall, increasing health concerns and changes in dietary habits, involving more 'snacking moments', could further increase future consumption.

Stronger competition from outside the EU

The Netherlands and Spain are and will remain key net exporters of tomatoes in the EU. Net exports by the Netherlands will remain more or less stable, reflecting its stabilising consumption and production of tomatoes. The most significant development in the net trade position of the main producing countries is the expected decline in Spanish net exports by 80% by 2030 (by more than 500 000 t); this is due to a combination of factors, including severe competition from outside the EU and increased domestic consumption. Due to this decline, the net exports of the five main producing countries as a whole will drop by about 40% by 2030. This will be only partially offset by developments in the rest of the EU, where Poland, for example, has the potential to increase acreages and yields, replacing imports from the main EU producing countries with local production.

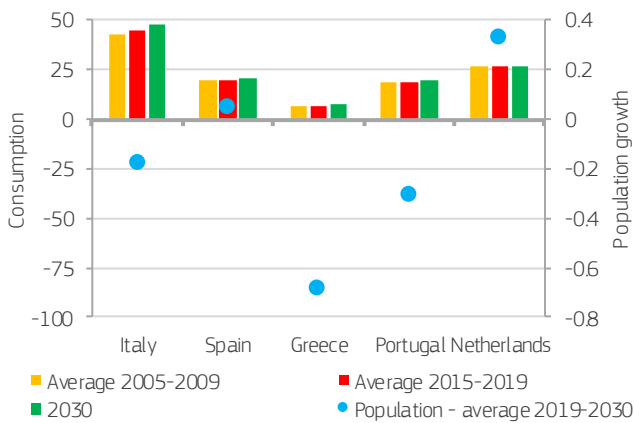
TOMATOES FOR PROCESSING - DEVELOPMENTS IN EU MEMBER STATES

GRAPH 5.25 Production of tomatoes for processing (million t) and annual yield growth (%) in main EU producing countries



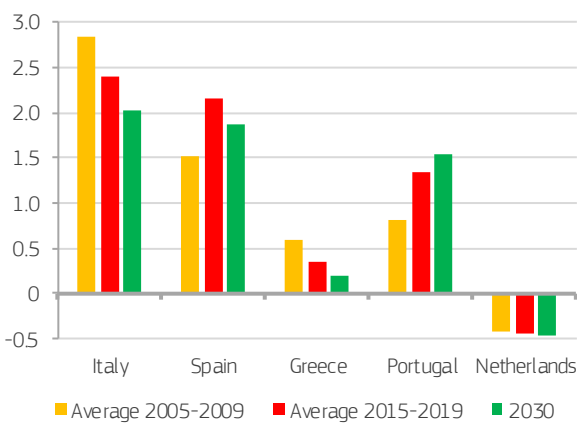
Source: AGMEMOD simulation.

GRAPH 5.26 Processed tomato consumption (kg per capita) and population annual growth (%)



Source: AGMEMOD simulation.

GRAPH 5.27 Processed tomato net trade (1 000 t)



Source: AGMEMOD simulation.

Production differences in EU Member States

The production of tomatoes for the processing sector is expected to differ between EU Member States. For Italy, the largest producer of tomatoes for processing, a reduction in the cultivated area is expected to lead to a decline in production by 2030 (by -5%). Similarly, the combination of a smaller cultivated area and slightly increasing yields is expected to lead to a 7% production decline in Spain. Both acreage and yields are expected to increase in Portugal, leading to a 14% rise in production. For Greece, production is set to decline due to loss of cultivated area.

Tomatoes for processing are produced on relatively large farms that specialise in extensive production of arable crops and vegetables. The Netherlands does not produce these tomato varieties, but is an important processor and trader.

Limited increase in consumption in a mature market

The substantial differences in consumption per capita of processed tomatoes between EU Member States are expected to remain. By 2030, per capita consumption is projected to increase in Italy, Spain, Portugal and Greece, in the range of 4.5-8.5% compared to 2015-2019. Higher consumption of processed tomatoes is mainly driven by factors such as their long shelf-life and usefulness in home cooking, which has become evident during the pandemic. This product also has a positive image from a health perspective, which could improve with new formulations (e.g. no added sugar and salt).

Differing trade developments

It is projected that Portugal will increase its net exports by 2030 (compared to the 2015-2019 average) while Italy, Spain and Greece will remain net exporters but with lower volumes. In addition, the export profiles of EU Member States differ. For example, Italy is a major exporter of canned tomatoes, while Italy, Spain and Portugal are all key exporters of tomato pastes.

The Netherlands is a big net importer, as it has no primary production of its own. Behind this stable number is an increase in the volume of imports and exports of processed tomatoes due to the current expansion of processing capacity in the Netherlands. Within the EU, the Netherlands is a key exporter of tomato ketchup and sauces.

The net exports of the group of main producers as a whole is expected to decline by about 10% over the next decade.



AGRICULTURAL INCOME AND LABOUR

/6

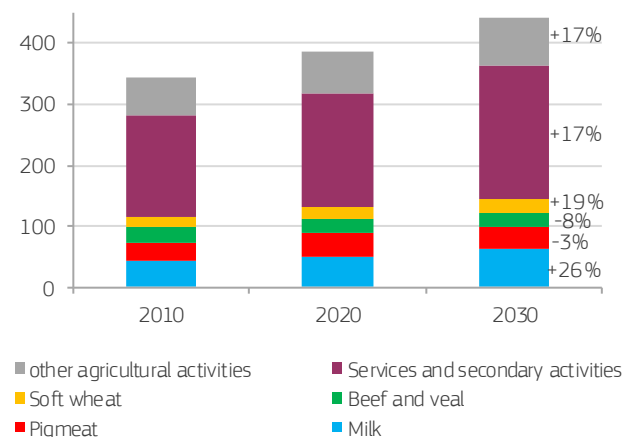
This chapter analyses how changes in agricultural markets over the next decade translate into farmers' income. The analysis is based on current assumptions, including agricultural sectors not explicitly covered by this outlook exercise.

At the EU level, the analysis shows a slight increase of the agricultural income per annual working unit in real terms by 2030, despite higher energy prices that affect feeding expenditures. The current situation regarding public support applies throughout the outlook period.

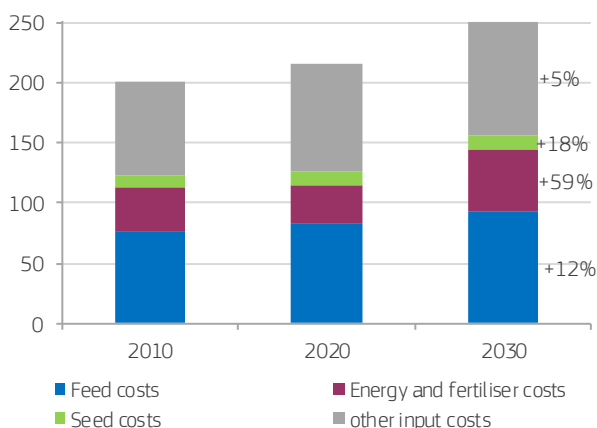
The continued labour outflow from agriculture due to structural changes at EU level is expected to slow down. Increasing profile diversification of both agricultural workers and farm managers is expected, as well as changes in the nature of the work carried out by farm managers, driven by technological progress both in machinery and equipment and in decision-support tools.

FARM INCOME

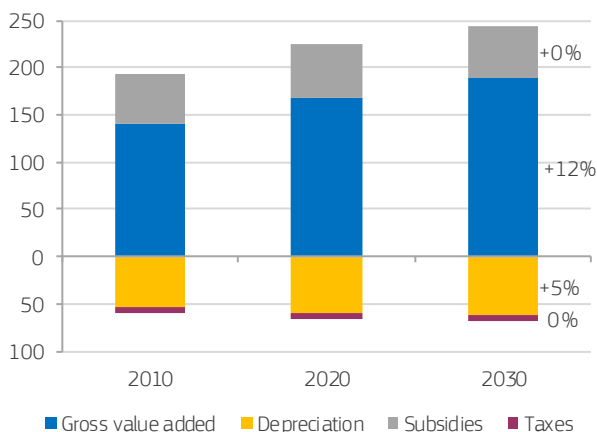
GRAPH 6.1 EU value of farm production (billion EUR) and change 2020-2030 (%)



GRAPH 6.2 EU intermediate costs of farm production (billion EUR) and change 2020-2030 (%)



GRAPH 6.3 EU composition of farm income (billion EUR) and change 2020-2030 (%)



The value of farm production to continue rising

The total value of crop and animal production is expected to increase in 2020-2030 period in nominal terms, by 21% and 9% respectively. In the outlook period, the nominal total agricultural output is due to increase by 14%, reaching EUR 440 billion in 2030. This is driven by both prices and produced quantities. Dairy, wheat and oilseeds markets are projected to continue growing, whereas pigmeat and beef production should decline while also becoming more sustainable (see sections on Meat and Milk). Services and secondary activities are expected to remain a significant driver of the growth in production.

Farm intermediate costs to rise as well

Overall, in the outlook period the nominal farm input costs are projected to increase by 16%, reaching EUR 251 billion in 2030.

Nominal expenses in feedstuffs are expected to rise at both the EU and global level. The efficiency of the feed rations could continue to improve and pasture to gain shares in the feed provision. Energy and fertiliser costs are due to increase in the outlook period. Use of improved plant protection products could continue increasing in the outlook period³⁵ thanks to continuous investments in research and development to meet productivity gains and environmental standards. However, their use is expected to slow down, thanks to better targeting and improved management through digital technologies. Other input costs are also projected to rise following the recovery of GDP in the aftermath of the COVID-19 crisis. These include veterinary expenses, maintenance, as well as the cost of temporary contracted staff and machinery rent.

Nominal farm income to increase slowly

The nominal agricultural income is expected to continue increasing in the outlook period, at a slower pace compared with the past decade: from 19% in 2010-2020 to 11% in 2020-2030.

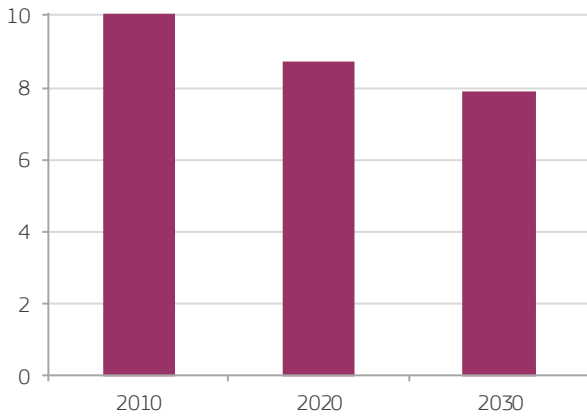
The gross value added is obtained by subtracting the input costs from the value of production. The agricultural income is then calculated by subtracting the depreciation³⁶ and the taxes and by adding the subsidies. The depreciation – e.g. of equipment and buildings – is a result of the evolution of produced quantities, inflation and capital productivity.

³⁵ The Farm to Fork strategy is not taken into account in this outlook (see section on Baseline setting and policy assumptions).

³⁶ Or – as economists call it – the 'consumption of fixed capital'. It accounts for the loss of economic value of capital over time, because of it wearing off or becoming obsolete.

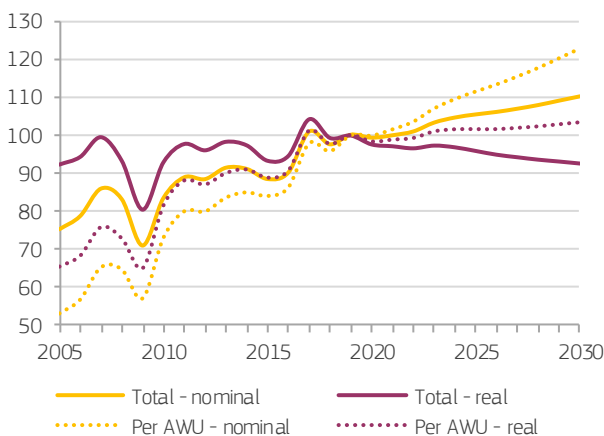
AGRICULTURAL LABOUR

GRAPH 6.4 EU agricultural workforce (million of AWU)



Note: AWU stands for annual worker unit.

GRAPH 6.5 EU farm income change (2019=100)



The agricultural labour force shows similar dynamics across the EU

The decline in the size of the agricultural workforce is expected to slow down at -1% per year, reaching 7.9 million workers in 2030. This could remain a general trend across the EU, the only exceptions being Malta and the Netherlands (+0.7 and +0.1% per year respectively). The most prominently affected EU Member States could be: Bulgaria, Finland (both -4% per year), Estonia, Spain, Slovakia, Sweden (all about -2% per year), Poland and Romania (-1% per year). Over recent years, this trend has spanned farm managers of all age categories and both sexes.

This decline is due to be driven by more mechanisation and equipment, and farms continuing to expand in size. Labour productivity gains supported the increase in farm income with improved management systems and decision-support tools thanks to the use of digital technologies. Furthermore, in the farming sector the number of workers hired could continue rising in relative share, in relation to the trend towards reduced family labour.

Real income per worker to increase slowly

The income per worker is computed by dividing the total agricultural income by the number of annual worker units.

The nominal income per worker is expected to increase by 2.1% per year. Taking into account the expected inflation, the real income per worker could continue increasing in the outlook period (+0.5% per year), slowing down from +1.9% per year over the past decade.





ENVIRONMENTAL ASPECTS

17

This chapter presents an environmental analysis of the medium-term developments of EU agricultural markets based on a set of environmental and climate indicators. This year we focus on the evolution and mitigation potential of GHG emissions and on CO₂ removal from the atmosphere.

Firstly, the revision of the evolution of GHG emissions and reduction targets in the agricultural and land use sectors is recalled. The modelling projections for 2030 are then presented: for GHG emissions from agriculture, and for the soil C budget or C sequestration. Finally, the potential of a few crop-related practices for removing C from the atmosphere is analysed.

The modelling projections use the CAPRI Medium-Term Baseline taking into account the trends of the 2019 EU Agricultural Outlook and reflect the current policy framework.

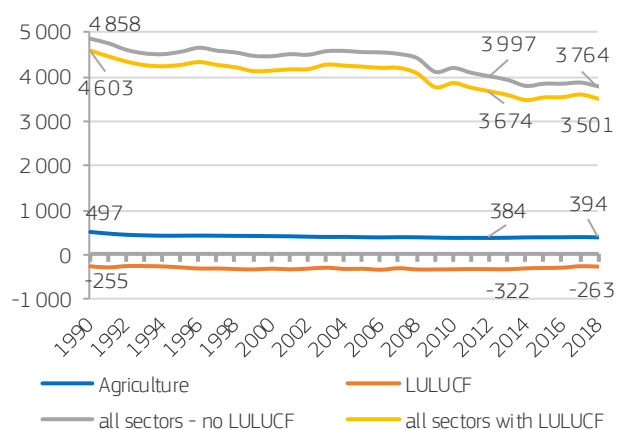
Under these assumptions, GHG emissions are not expected to decrease and the C budget would only slightly compensate the small increase. Further efforts would need to be done to achieve EU's climate targets: using farm practices and technologies to mitigate animal and crop emissions, but also practices that can contribute to C sequestration and to avoiding C losses.

MITIGATION POTENTIAL

GHG emissions and removals in agriculture and LULUCF sectors

According to data from national inventories of greenhouse gas (GHG) emissions and removals submitted to the United Nations Framework convention on Climate Change (UNFCCC), total GHG emissions in the EU decreased by 24% between 1990 and 2018. The largest share, around 77% (in 2018, without LULUCF), comes from the energy sector. GHG emissions related to agriculture are reported in national GHG inventories in different emission sectors. ‘Sector 3-Agriculture’ includes non-CO₂ emissions from animal and crop activities: enteric fermentation, manure management, rice cultivation, fertilisation and other emissions from agricultural soils. This also includes CO₂ from urea and liming. This sector accounts for around 10% of total emissions (in 2018, without LULUCF). ‘Sector 1.A.4.c-Agriculture/Forestry/Fishing’, under the energy sector, includes emissions from fuels and electricity used in agriculture and represents around 2% of total emissions. ‘Sector 4-LULUCF’ (the ‘Land use, land use change and forestry’ sector) includes emissions from cropland and grasslands. It also includes the removals of CO₂, a part of which is carbon sequestration in soils. These removals, to a large extent, are from forest land, and harvested wood products. Given that removals more than offset emissions, values are negative. In the period 2012-2018, LULUCF offset 7-8% of total emissions.

GRAPH 7.1 EU GHG emissions (million t of CO₂ equivalent)



Source: JRC, based on Table UNFCCC_V23 by EEA (2020).

This chapter focuses only on emissions from the agriculture and LULUCF sectors. These two sectors are very much related, given that a large share of the land under LULUCF is agricultural land.

EU-wide economy reduction targets

The 2030 Climate & Energy Framework³⁷, sets a target by which the EU is obligated to cut total emissions by at least 40% below 1990 levels. Large companies in the EU Emissions Trading System (EU-ETS)³⁸, mostly electricity generators, and those in the aviation and industrial sectors, have to meet a 43% target as regards reducing their emissions, compared to 2005. Other sectors (agriculture, building, transport and waste), under the Effort Sharing Regulation³⁹ (ESR), must reduce emissions by 30% as compared to 2005 (with individual binding targets by EU Member States). For the LULUCF sector, after having applied specific accounting rules⁴⁰ that filter the reported estimates in order to better quantify the results of mitigation actions, Member States have to comply with the no-debit rule (Land Use, Land use Change and Forestry Regulation for 2021-2030⁴¹). This rule establishes that each EU Member State has to ensure that, within the LULUCF sector, accounted GHG emissions are offset by at least an equivalent accounted removal of CO₂ from the atmosphere in the 2021-2030 period. If accounted credit is produced, this may partially be used for reaching the ESR climate target up to certain limits. If accounted debit is produced, extra reductions of emissions are needed in other sectors.

Even more ambitious targets have been set in the European Green Deal⁴² proposed by the European Commission in 2020, which aims at climate-neutrality by 2050. The new Commission Proposal for the first European Climate Law (2020)⁴³ intends to make this target binding. In order to reach this, for 2030, we would need to raise the current GHG reduction target from 40% to 55% (2030 Climate Target Plan⁴⁴). According to its impact assessment⁴⁵, in order to achieve the new reduction target and

.....
³⁷ COM(2014)15.
³⁸ For more information see https://ec.europa.eu/clima/policies/ets_en.
³⁹ Regulation (EU) 2018/842.
⁴⁰ While the UNFCCC requests the inclusion of all antropogenic emissions and removals from LULUCF, the Kyoto Protocol restricts the accounting to emissions and removals from specific activities and applies specific accounting rules. The 2018 LULUCF Regulation has revised these accounting rules. They consist of: use of 6 accounting categories - for some categories mitigation efforts are expressed relative to different counterfactual or base values (a base year period for managed cropland, grassland and wetland, a projected reference level for managed forest land); multi-year accounting (2 periods: 2021-2025; 2026-2030);; exclusion of certain emissions resulting from natural disturbances. On top of these, there are various flexibility mechanisms in the way credits and debits can be combined to help Member States comply with the ‘no debit rule’.
⁴¹ Regulation (EU) 2018/841.
⁴² A European Green Deal
⁴³ COM(2020)80.
⁴⁴ COM(2020)562.
⁴⁵ SWD (2020)176.

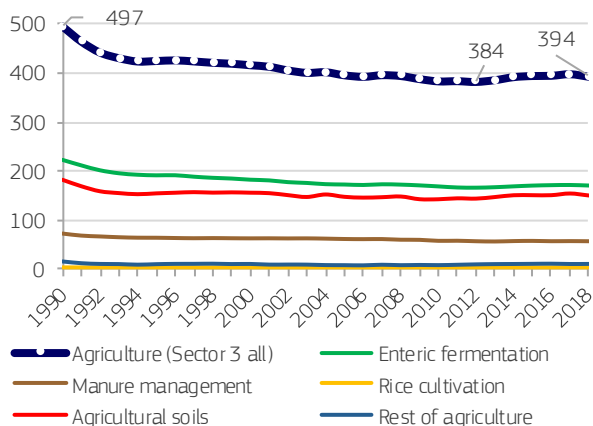
climate neutrality, a significant contribution is expected from the LULUCF sector's sink increase.

Evolution of GHG emissions reduction in agriculture and LULUCF sectors

Emissions from sector 3-Agriculture decreased by 21% between 1990 and 2018. However, the trend has not been constant. There was a significant decrease in the early 1990's, then it slowed down and in recent years there has been a stabilisation at just below 400 million t.

The largest share are methane (CH₄) emissions from ruminants digestion (enteric fermentation). This category of emissions and those originating from manure management have decreased by 23% and 24% respectively and together constitute around 58% of 'Sector 3' emissions. Another main category is called 'agricultural soils'. Emissions from this category have decreased by 17% since 1990. These comprise the following types of N₂O emissions⁴⁶:

GRAPH 7.2 EU GHG emissions, Sector 3 Agriculture (million t CO₂ equivalent)



Source: JRC, based on UNFCCC_v23, Emissions from CRF 3 «Agriculture» (EEA, 2020).

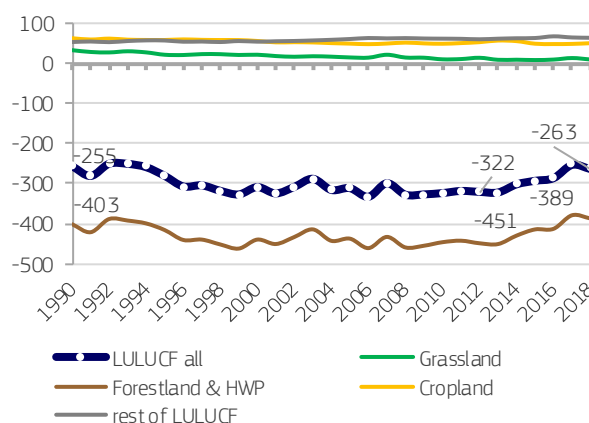
⁴⁶ EEA (2019).

Direct emissions from managed soils: inorganic nitrogen fertilisers, organic nitrogen fertilisers, urine and dung deposited by grazing animals, crop residues incorporated in the soil, mineralisation/immobilisation associated with loss/gain of soil organic matter, and cultivation of organic soils (histosols).

Indirect emissions from managed soils: atmospheric deposition, nitrogen leaching and run-off.

Net removals from sector 4- LULUCF have only slightly increased by 3% between 1990 and 2018. There was a removal-increasing trend until approximately 2013 but thereafter the trend has changed.

GRAPH 7.3 EU GHG net emissions (+) / removals (-), Sector 4 LULUCF (million t of CO₂ equivalent)



Source: JRC, based on UNFCCC_v23,1 EU27 (2020) submissions 2020 (EEA, 2020).

The trend in net LULUCF emissions follows most closely that of its main component, net removals from forest land. In the graph this is represented together with harvested wood products as they are both net C sinks. Other LULUCF categories are emissions/removals from cropland, grassland, wetlands, settlements and other LULUCF.



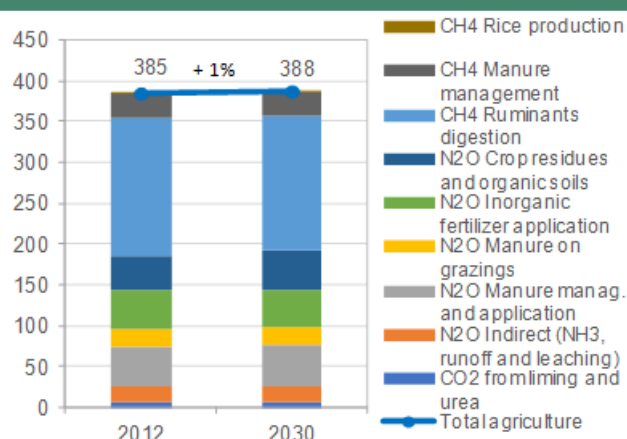
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BASELINE PROJECTION FOR AGRICULTURE

Baseline projection for GHG from agriculture

The modelling projections use the CAPRI Medium-Term Baseline generated under Task 1 of the EcAMPA 4 project (2020 EcAMPA 4 CAPRI MT baseline [2030; MTO 2019]). The CAPRI model provides harmonised projections on the production of the main agricultural commodities, land use and herd sizes, at Member State and regional levels. The 2020 CAPRI baseline consists of a medium-term (MT) outlook of the year 2030, covering both EU and global agricultural commodity markets. It takes into account the 2019 trends for agricultural markets and assumes current (post-2013) CAP policies and Member States' policy options will continue until 2030. The CAPRI baseline projections on regional agricultural output (including livestock herd size) can be directly linked to the development of environmental aspects.

GRAPH 7.4 EU GHG emissions from agriculture (million t of CO₂ equivalent)



Source: JRC, based on preliminary results of the CAPRI Medium-Term Baseline generated under Task 1 of the EcAMPA 4 project (2020 EcAMPA 4 CAPRI MT baseline [2030; MTO 2019]).

GHG emissions from agriculture are projected to slightly increase until 2030 (by less than +1%). Behind this increase there is a trade-off between the driving factors; even though animal numbers are decreasing, animal meat production⁴⁷ and milk deliveries are increasing due to productivity gains over time. Therefore, N-excretion and emissions per animal will increase. The total emissions also increase, but not all gases do. The model estimates that there will be lower CH₄ emissions (-3%, or -1% expressed in relation to non-CO₂ agricultural emissions), but higher N₂O emissions from manure application on the field (+1% of non-CO₂ agricultural emissions) which are

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⁴⁷ Although there is a projected decrease of meat from ruminants and an increase from monogastrics, total production increases compared to 2012. It must be taken into account that in this analysis we are comparing the present situation to 2012 and there have been changes in production since then.

due to the change of animal types (with an increase in manure from poultry and pigs and decrease from ruminants) and to the change in manure management. Furthermore, estimations provide an increase (+1% of non-CO₂ agricultural emissions) in N₂O emissions from crop residues due to higher crop yields. Overall, given the number of uncertainties that are included in the modelling exercise, as 1 pp might not be relevant, emissions will remain more or less stable.

As the CAPRI baseline assumes current CAP policies will continue, no additional policy measures for GHG mitigation technologies have been considered. Although some requirements laid down in the CAP and in environmental legislation are implicitly taken into account (e.g. limitation of the number of animals, change in production), this analysis does not cover the full spectrum of EU and national environmental legislation. The improved farming practices that farmers are currently adopting or will implement in the medium-term (due to environmental constraints, rural development programmes, etc.) are also only partially included in the analysis. Therefore, the related positive environmental impacts are not fully reflected.

The CAPRI model is now able to cover a wide array of mitigation technologies. The potential for these options to meet GHG emissions mitigation targets has been analysed under the EcAMPA 3 project⁴⁸ and tested in simulation exercises. They have been tested (i) individually to assess a measure's theoretical maximum mitigation potential and related costs; and (ii) together, assuming that the introduction of different carbon prices for non-CO₂ emissions can lead farmers to adopt any mitigation option, decrease production and change the production mix. Significant differences between regions were observed. However, overall, results for the EU showed that the potential of the adopted mitigation practices and technologies leads to a decrease in emissions from agriculture of between 15 and 35 million t CO₂ equivalent (for CO₂ prices between EUR 20 and 100 per t CO₂ eq respectively). This would mean that these mitigation practices and technologies could shift the 2030 baseline results from +1% to values of between -3% (with a price of EUR 20) and to -8% (with a price of EUR 100). The effect on LULUCF emissions is between 37 and 45 million t CO₂ eq. The effects from the changes in production intensity and production mix are still greater, specially at high carbon prices (40% higher at EUR 20/t and 180% higher at EUR 100/t). Mitigation from technologies increases considerably under carbon prices below 60 EUR/t CO₂ eq, but with higher carbon prices further technology adoption is very limited, additional mitigation being more efficiently achieved by changes in the production level and production mix.

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⁴⁸ Pérez Dominguez et al. (2020).

SOIL ORGANIC CARBON BUDGET

Factors affecting the SOC balance

The accumulation of organic carbon in the soil constitutes an essential part of carbon farming. Providing a carbon sink through soil organic carbon (SOC) accumulation using appropriate agricultural soil management is one way the agricultural sector can potentially contribute to mitigating GHG, among the key objectives of the new CAP.

There are several factors affecting the SOC balance. First, some climatic and geo-physical factors, like precipitation, temperatures, and soil type, which are most often independent of human intervention. Therefore, climate change and extreme events have an impact on SOC. Then, it also depends to a large extent on the land use/cover; the SOC balance showing better results in general from the presence of permanent grassland rather than temporary grassland or crops and from the presence of perennial crops rather than annual crops.

The SOC budget will also depend on the intensity of management and farm practices which are targeted at increasing organic inputs to the soil and/or decreasing their loss and slowing down mineralisation processes. Some examples of practices that can increase SOC are: (i) the use of manure for fertilisation, (ii) leaving harvest residues on the field, (iii) irrigation or use of crop varieties leading to higher crop yields (provided that more above- or below-ground crop residues remain on the field), (iv) use of cover crops, and (v) rotational grazing. The same principle of avoiding the loss of organic matter and mineralisation applies but with particular relevance to organic soils (histosols or peatland). They form a large stock of SOC and, if drained, they quickly release big amounts of CO₂.

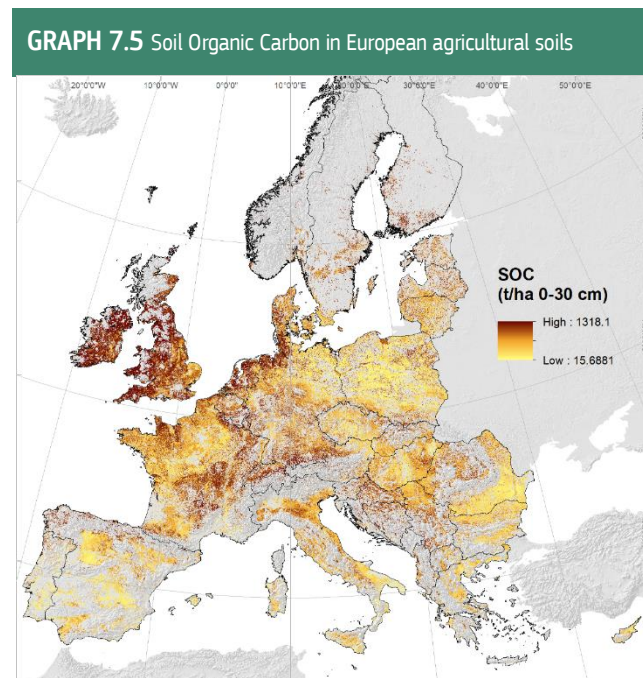
While carbon sequestration measures help to fight against climate change, there are limitations and trade-offs that must be taken into account. Perhaps the main limitation is that the carbon sequestration process for most practices does not last forever. For example, if a new practice is implemented, e.g. conservation tillage, adding organic manure or transforming cropland to grassland, carbon sequestration is generally higher in the first years. Then, carbon sequestration rates decrease over time and, after a certain period, a new equilibrium is reached in which there is no more sequestration. The length of this period depends on different factors (e.g. it takes longer in colder climates) but the 'default' assumption from the Intergovernmental Panel on Climate Change (IPCC) is 20 years. Moreover, the process is reversible and carbon gained can quickly be lost if the practice is stopped.

There are also trade-offs for some practices between carbon sequestered and other emissions. For example, an increase in manure increases SOC but also leads to increased emissions

from grazing animals or from manure management and application. The same thing happens with the use of nitrogen fixing crops. Therefore, an integrated approach needs to be applied, taking into account the nitrogen balances. In the case of nitrogen fixing crops it can be necessary to reduce nitrogen inputs from fertilisers, to alternate nitrogen fixing with grass cover crops, etc.

Modelling the SOC balance

Generally, SOC changes that result from implementing carbon sequestration practices are by order of magnitude lower than SOC stock. Therefore, statistical changes can only be detected after several years and/or with a large number of samples. To analyse the impact of different factors and practices on the carbon stocks and carbon fluxes for all the EU, the JRC is running the DayCent biogeochemical model (Parton et al., 1998). This model simulates the carbon and nitrogen cycles, the crop growth and the water cycle in agricultural soils in the EU. The model also takes into account a broad variety of farming practices (cover crops, irrigation, tillage, fertilisation, removal of residues, etc.) which can affect the carbon budget. It can be used to calculate change in SOC (CO₂ emission or removal) due to change of intensity and type of management.



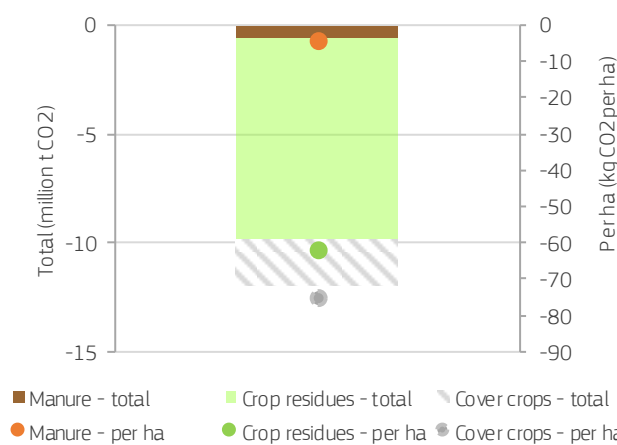
Source: JRC, based on update of Lugato et al. (2014).

The emission and removal factors obtained from the DayCent model have been applied to the CAPRI model⁴⁹. These factors make it possible to estimate the net carbon sequestered or released in the soil - already taking into account the additional losses from soil respiration, etc. - derived from CAPRI results on the changes in organic inputs. These organic inputs consist mainly of crop residues (including root inputs), manure from grazing animals and manure spread over the field. The input increase was calculated from 2012 and it was assumed that it has taken place linearly between 2012 and the simulation year (in this case 2030) over the period. It was also assumed that the carbon sequestration triggered takes place over a period of 20 years (consistent with the 2006 IPCC guidelines).

SOC budget projection results

The results of the projections for 2030 in the EU's utilised agricultural area, driven by the change in inputs from crop residues and manure, are shown by the green and yellow bars in Graph 8.6. It shows a net increase in SOC of almost 60 kg CO₂ per hectare per year, or 10 million t, which is approximately 2% of agricultural emissions. In order to have an idea of the order of magnitude, total SOC stocks in the top 0-30 cm in arable land and grassland are estimated⁵⁰ to be 38,385 million t CO₂ eq for the EU27. Therefore this change would represent 0.026% of these total stocks. The projected SOC change comes mostly from the increase in crop residues, which is derived from the projected increase in crop yields. However, this result is an upper limit of the effect, based on the assumption that all residues (straw) stay on the field.

GRAPH 7.6 EU Soil Organic Carbon projections for 2030



Source: JRC, based on preliminary results of the CAPRI Medium-Term Baseline generated under Task 1 of the EcAMPA 4 project (2020 EcAMPA 4 CAPRI MT baseline [2030; MTO 2019]).

⁴⁹ The environmental indicators reported in the Outlook baseline projection are calculated with CAPRI.

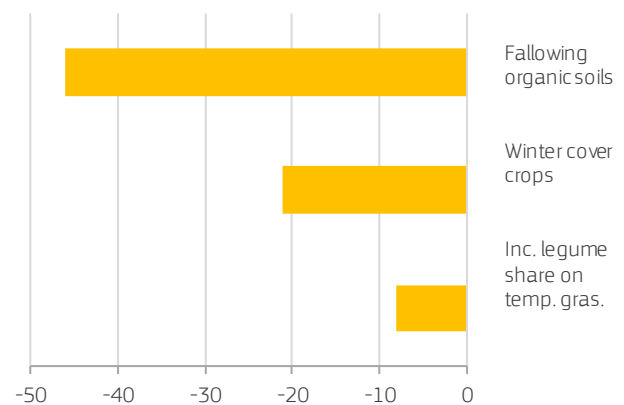
⁵⁰ Updated run of Lugato et al. (2014).

The area on the graph highlighted by the pattern with the grey lines corresponds to the effect of the cover crop practice from Greening, which could potentially remove an additional 2 million t of CO₂. This removal is the result of an additional area of cover crops of 2.3 million hectares (2% of arable land in 2030). This result is also overestimated as, due to the lack of data, it was assumed that the actual area of cover crops in the reference period (2012) was equal to zero.

The potential of different farming practices related to the SOC budget have been analysed in the JRC's EcAMPA 3 study⁵¹. The effect, as compared to a reference scenario for 2030, was calculated assuming that these practices would be implemented to the biggest area possible and includes the indirect effects of the impacts on production.

The greatest effect is observed for the avoided emissions from the practice called 'fallowing organic soils'. This practice assumes that organic soils are not being cultivated and that shallow water on the soil is maintained. However the effect of the carbon sequestration that could take place is not considered; it just includes the avoided CO₂ emissions due to the SOC mineralisation. The potential effect of winter cover crops would be around 21 million t CO₂ eq, while the effect of increasing the proportion of leguminous species on temporary grasslands would be 8 million t.

GRAPH 7.7 EU LULUCF and Agriculture emissions in 2030 - difference relative to reference scenario (million t of CO₂ equivalent per year)



Source: JRC, based on Pérez Domínguez et al. (2020), EcAMPA 3 report.

The sum of the three measures, assuming that there were no interactions between them, would be 75 million t CO₂ eq, so approximately 20% of agricultural emissions.

⁵¹ Pérez Domínguez et al. (2020).



ANNEX /8

This chapter presents figures of macroeconomic and income outlook, balances of key EU agricultural markets, results of COVID-19 recovery scenario and uncertainty analysis. In addition, it includes a list of references used in the report.

UNCERTAINTY ANALYSIS RESULTS

TABLE 8.1 Macroeconomic uncertainty in 2030 (CV, %)

Region	Consumer price index	GDP deflator	GDP	Exchange rate (domestic currency /USD)	Oil price
Australia	0.3	1.5	0.5	6.2	-
Brazil	0.9	0.6	1.5	9.8	-
Canada	0.2	0.6	0.5	2.8	-
China	0.8	1.1	0.7	1.4	-
United Kingdom	0.5	0.3	1	5	-
Indonesia	1.5	1.9	0.4	3.4	-
India	0.7	0.6	1	3.7	-
Japan	0.5	0.4	0.9	5.8	-
New Zealand	0.4	0.5	0.6	3.8	-
Russia	1.7	3	2.2	7.6	-
United States	0.6	0.4	0.6	-	-
EU-27	0.7	0.3	0.9	3.6	-
World	-	-	-	-	199

TABLE 8.2 Yield uncertainty in 2030 (CV, %)

Commodities	Argentina	Australia	Brazil	Canada	China	EU-14	EU-13	Indonesia	India	Kazakhstan	Mexico	Malaysia	New Zealand	Paraguay	Russia	Thailand	Ukraine	United States	Vietnam
Barley	7	2	-	8	-	4	-	-	-	0.8	-	7	-	-	0.5	-	-	1	-
Common wheat	10	12	10	5	2	4	0.6	2	14	7	0.6	11	0.6	9	12	0.6	9	3	0.6
Durum wheat	-	-	-	-	-	5	-	-	-	-	-	6	-	-	-	-	-	-	-
Maize	5	1	8	6	0.8	4	0.2	0.3	0.4	7	0.4	18	0.9	7	0.5	0.4	14	3	0.4
Milk	0.5	14	0.3	0.4	0.1	0	0.3	0.2	0.2	0.1	0.2	0	2	0.2	0.4	0.2	0.2	0.3	0.2
Oats	-	0.5	-	6	-	4	-	-	-	-	-	6	-	-	0.3	-	-	0.1	-
other coarse grains	5	2	2	7	0.8	-	0.4	0.3	0.4	0.7	0.4	-	0.8	9	0.5	0.3	18	2	0.4
other Oilseeds	44	15	0	4	0.9	3	0.8	0.6	11	0	0.9	9	0	14	8	0.8	12	0	0.8
Palm oil	-	-	0	-	0	-	2	0.5	-	0	3	-	-	0.5	-	0.4	-	-	-
Rapeseed	-	15	0	4	1	3	-	-	-	0	-	6	0	-	0.2	-	-	0	-
Rice	0.5	0.1	2	-	13	4	0.1	3	0.2	0.1	0.2	0.6	-	0.2	0.4	2	0.2	5	2
Rye	-	-	-	-	-	7	-	-	-	-	-	10	-	-	0.1	-	-	-	-
Soybean	16	0	4	4	0.5	7	0.9	0.6	7	0	0.9	15	-	12	0.3	0.9	7	6	0.9
Sugarbeet	-	-	-	2	3	9	0.4	0.4	-	-	-	8	-	-	15	-	0.4	5	-
Sugarcane	19	4	12	-	2	-	0.7	4	-	0.7	0.7	-	-	0.5	-	10	-	5	0.6
Sunflower seed	50	-	0	-	2	5	-	-	-	0	-	15	-	-	10	-	-	0	-

TABLE 8.3 Price Uncertainty in 2030 (CV, %)

Commodities	EU domestic producer price	International reference price
Barley	9.2	-
Biodiesel	8.6	7.5
Dried beet pulp	11.2	11.3
Butter	3.8	3.5
Beef and Veal	3.2	3
Casein	1.1	0
Cereal brans	7.3	6.1
Corn Gluten Feed	7.5	6.6
Cheese	2.6	2.6
Cotton	3.9	2.6
Dried Distillers Grains	8.1	7.4
Ethanol	6.8	7.1
High fructose corn syrup	5.3	6.2
Maize	7.2	8.6
Meat and bone meal	0	6.6
Milk	2	-
Molasses	8.7	7
other coarse grains	8.7	8.1
other Oilseeds	17.2	17.9
Pork	6.1	4.7
Total Protein Meal	10.7	10.4
Pulses	6.3	4.8
Poultry	4.5	3.7
Rice	5.4	4.2
Rapeseed	16.8	-
Roots and tubers	3.3	2.7
Soybean	18.7	18.6
Sunflower seed	18.1	-
Sheep	4.1	2.2
Skim milk powder	1.8	1.7
White sugar	12.7	11.8
Vegetable oils	11.2	9.6
Whole milk powder	2.5	2.1
Wheat	11.6	11.1
Whey powder	5.3	6.6

SCENARIO DATA COVID-19

TABLE 8.4 Market impacts: Percentage difference between OECD-FAO Covid baseline and scenario values in 2030

	EU producer prices			EU production		
	Slow recovery scenario	Green investments scenario	OECD-FAO no-Covid baseline	Slow recovery scenario	Green investments scenario	OECD-FAO no-Covid baseline
Meat						
Beef and Veal	-10.4	-11.1	4.3	-2.8	-2.9	1.1
Pork	-14.6	-14.7	4.6	3.0	3.6	0.1
Poultry	-1.4	-5.2	-0.6	-8.3	-5.0	5.4
Sheep	-7.6	-7.7	1.5	-0.7	-0.6	0.0
Dairy						
Butter	-1.3	-2.4	3.4	-6.2	-4.7	1.2
Cheese	-2.0	-0.9	3.0	-3.8	-3.0	0.5
Skim milk powder	-5.3	-3.0	2.1	-12.6	-18.0	-1.9
Whole milk powder	-4.4	-3.6	2.6	-9.4	-12.5	0.6
Grains						
Maize	-6.0	-6.0	4.9	-0.2	0.4	0.7
Other coarse grains	-14.7	-13.0	5.3	-1.2	-0.4	0.2
Wheat	-15.2	-16.9	4.7	-1.7	-1.5	0.5
Rice	-14.5	-15.5	1.2	-3.7	-4.0	0.1
Other cereals	-3.3	-4.2	3.7	0.2	0.6	0.0
Oilseeds						
Rapeseed	-18.0	-26.3	5.2	-3.4	-5.1	1.3
Soybean	-17.7	-17.0	4.8	-3.7	-3.1	1.0
Sunflower seed	-16.4	-19.1	4.0	-3.6	-4.7	1.1
Biofuels						
Biodiesel	-21.9	-59.0	8.2	-1.4	-25.7	2.7
Ethanol	-11.2	-36.1	4.5	-5.8	-16.0	2.5
Other processed products						
Total Protein Meal	-10.8	-5.2	4.5	-0.5	-1.5	0.5
Vegetable oils	-28.0	-45.7	9.0	-1.5	-3.7	0.8
Sugar	-9.0	-11.7	7.3	-0.4	2.5	0.4

TABLE 8.5 Trade impacts: Percentage difference between OECD-FAO Covid baseline and scenario values in 2030

	EU exports			EU imports		
	Slow recovery scenario	Green investments scenario	OECD-FAO no-Covid baseline	Slow recovery scenario	Green investments scenario	OECD-FAO no-Covid baseline
Meat						
Beef and Veal	-4.3	-5.7	2.3	31.9	44.4	-10.3
Pork	21.6	23.6	0.0	-4.1	-5.0	1.4
Poultry	-47.1	-35.3	26.4	0.9	0.7	-3.3
Sheep	0.0	-0.1	0.5	-0.3	1.1	1.5
Dairy						
Butter	-36.0	-30.9	6.2	43.9	33.9	-2.6
Cheese	-19.0	-18.6	-0.3	14.0	14.5	2.0
Skim milk powder	-20.7	-29.5	-3.7	0.0	0.0	0.0
Whole milk powder	-17.7	-24.1	0.9	0.0	0.0	0.0
Grains						
Maize	-33.6	-41.0	2.7	-26.0	-26.7	1.2
Other coarse grains	-29.0	-20.7	0.9	-0.2	0.1	-0.1
Wheat	-13.0	-16.4	0.0	6.3	7.8	-3.3
Rice	-0.3	-0.3	0.9	4.6	4.7	0.5
Other cereals	0.0	0.0	0.0	35.2	34.8	-11.6
Oilseeds						
Rapeseed	-9.3	21.3	3.8	4.0	-7.4	0.5
Soybean	0.0	0.0	0.0	4.8	6.5	-0.7
Sunflower seed	-18.1	-23.9	9.9	22.0	31.4	-4.3
Biofuels						
Biodiesel	10.1	9.1	0.7	-21.4	-19.6	3.4
Ethanol	-16.4	3.0	10.5	33.2	-4.6	-7.6
Other processed products						
Total Protein Meal	-2.9	-11.8	2.7	1.7	1.0	1.2
Vegetable oils	0.0	52.3	-0.2	0.9	-11.3	3.0
Sugar	-8.8	3.3	4.0	-2.9	-7.0	3.3

TABLE 8.6 EU producer prices: Percentage difference between pre-Covid baseline and scenario values in 2030

	Slow recovery scenario			Green Investment scenario			
	Total	Macro	Oil	Total	Macro	Oil	Fuel
Meat							
Beef and Veal	-10.4	-10.2	-0.3	-11.1	-9.3	-1.4	-0.8
Pork	-14.6	-14.0	-0.8	-14.7	-11.2	-3.2	-1.2
Poultry	-1.4	-0.3	-1.3	-5.2	-1.3	-3.9	-0.6
Sheep	-7.6	-7.2	-0.4	-7.7	-5.8	-1.8	-0.3
Dairy							
Butter	-1.3	-0.4	-1.0	-2.4	1.6	-3.2	-1.1
Cheese	-2.0	-1.4	-0.6	-0.9	1.3	-2.0	-0.6
Skim milk powder	-5.3	-5.1	-0.2	-3.0	-2.7	-0.6	0.1
Whole milk powder	-4.4	-3.9	-0.6	-3.6	-1.9	-1.8	-0.3
Grains							
Maize	-6.0	-5.9	-0.4	-6.0	-4.6	-2.7	-3.2
Other coarse grains	-14.7	-14.5	-0.2	-13.0	-9.7	-2.0	-2.9
Wheat	-15.2	-14.8	-0.4	-16.9	-13.4	-2.7	-2.3
Rice	-14.5	-14.3	-0.3	-15.5	-13.8	-1.3	-0.5
Other cereals	-3.3	-3.3	-0.1	-4.2	-2.8	-1.1	-2.3
Oilseeds							
Rapeseed	-18.0	-17.5	-0.7	-26.3	-12.8	-3.4	-12.6
Soybean	-17.7	-17.3	-0.5	-17.0	-12.5	-2.8	-2.6
Sunflower seed	-16.4	-15.8	-0.7	-19.1	-12.8	-3.3	-4.0
Biofuels							
Biodiesel	-21.9	-19.7	-2.2	-59.0	-8.4	-9.0	-51.9
Ethanol	-11.2	-9.5	-1.9	-36.1	-5.8	-6.4	-27.1
Other processed products							
Total Protein Meal	-10.8	-10.5	-0.2	-5.2	-7.0	-1.8	3.6
Vegetable oils	-28.0	-27.5	-0.7	-45.7	-19.2	-4.1	-27.5
Sugar	-9.0	-9.2	0.0	-11.7	-7.3	-0.8	-3.8

MARKET OUTLOOK DATA

TABLE 8.7 Baseline assumptions on key macroeconomic variables

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Population growth (EU-27)	0.2%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%
World	1.1%	1.1%	1.1%	1.1%	1.0%	1.0%	1.0%	1.0%	0.9%	0.9%	0.9%	0.9%	0.9%	0.8%	0.8%
Real GDP growth (EU-27)	1.9%	2.6%	1.8%	1.3%	-7.6%	4.2%	2.9%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.2%
World	2.8%	3.5%	3.2%	2.6%	-4.5%	4.4%	3.7%	3.2%	3.2%	3.1%	3.0%	2.9%	2.9%	2.8%	2.8%
Inflation (Consumer Price Index)	0.2%	1.5%	1.8%	1.3%	0.5%	1.2%	1.4%	1.5%	1.7%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%
Exchange rate (USD/EUR)	1.1	1.1	1.2	1.1	1.1	1.12	1.12	1.13	1.13	1.14	1.14	1.15	1.15	1.15	1.16
Oil price (USD per barrel Brent)	44	55	71	64	41	49	58	58	59	63	68	73	77	80	82

Sources: DG AGRI estimates based on the European Commission macroeconomic forecasts and IHS Markit

TABLE 8.8 EU area under arable crops (million ha)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Cereals	53.7	52.0	51.9	53.2	52.4	52.4	52.2	52.0	51.9	51.8	51.6	51.5	51.3	51.2	51.0
Common wheat	22.4	21.6	21.3	22.0	20.8	21.5	21.5	21.4	21.4	21.3	21.2	21.2	21.1	21.1	21.0
Durum wheat	2.8	2.5	2.5	2.2	2.2	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.0
Barley	11.2	10.9	11.1	11.1	11.3	10.9	10.8	10.7	10.7	10.6	10.6	10.5	10.5	10.4	10.4
Maize	8.6	8.3	8.3	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.8	8.8	8.8
Rye	1.9	1.9	1.9	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1
other cereals	6.8	6.8	6.9	6.8	7.0	6.7	6.6	6.6	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Rice	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Oilseeds	10.9	11.5	11.3	10.4	10.6	10.9	11.0	11.0	11.0	10.9	10.8	10.8	10.8	10.7	10.7
Rapeseed	6.0	6.2	6.3	5.2	5.2	5.6	5.6	5.6	5.6	5.5	5.5	5.4	5.4	5.4	5.3
Sunseed	4.1	4.3	4.0	4.3	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.3	4.3	4.3
Soyabeans	0.8	1.0	1.0	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Sugar beet	1.4	1.6	1.6	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Roots and tubers	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5
Pulses	2.1	2.4	2.2	2.0	2.1	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.7	2.8	2.9
other arable crops	4.4	4.4	4.7	4.4	4.8	4.2	4.3	4.4	4.5	4.6	4.7	4.7	4.8	4.9	5.0
Fodder (green maize, temp. grassland etc.)	19.4	19.5	19.7	19.9	20.1	20.1	20.1	20.1	20.1	20.1	20.2	20.2	20.2	20.2	20.2
Utilised arable area	94.0	93.5	93.4	93.5	93.5	93.4	93.4	93.4	93.4	93.3	93.3	93.2	93.2	93.1	93.1
set-aside and fallow land	6.1	6.1	5.9	5.8	5.7	5.6	5.5	5.4	5.4	5.3	5.2	5.1	5.0	4.9	4.8
Share of fallow land	6.5%	6.6%	6.3%	6.2%	6.1%	6.0%	5.9%	5.8%	5.7%	5.6%	5.5%	5.4%	5.3%	5.3%	5.2%
Total arable area	100.3	99.8	99.5	99.5	99.4	99.3	99.2	99.1	99.0	98.9	98.8	98.6	98.5	98.4	98.3
Permanent grassland	49.2	49.6	50.1	50.2	50.2	50.2	50.2	50.3	50.3	50.3	50.4	50.4	50.4	50.4	50.5
Share of permanent grassland in UAA	30.5%	30.7%	31.0%	31.0%	31.0%	31.1%	31.1%	31.1%	31.1%	31.2%	31.2%	31.2%	31.3%	31.3%	31.3%
Orchards and others	11.9	12.0	12.1	12.1	12.1	12.1	12.2	12.2	12.2	12.2	12.3	12.3	12.4	12.4	12.4
Total utilised agricultural area	161.4	161.4	161.8	161.7	161.7	161.6	161.6	161.5	161.5	161.4	161.4	161.3	161.3	161.2	161.2

TABLE 8.9 EU cereals market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	275.0	282.4	268.9	294.2	274.3	273.5	273.4	274.0	274.7	275.4	276.0	276.5	277.1	277.6	278.1
Imports	20.4	24.9	30.0	25.7	26.2	27.3	27.5	27.6	27.4	27.6	27.9	28.4	28.8	29.0	29.3
Exports	39.4	35.6	35.9	55.1	39.2	43.3	43.1	43.2	43.5	44.0	44.8	45.5	46.1	46.5	47.0
Consumption	260.8	263.0	263.2	261.7	260.9	258.2	258.1	258.6	258.8	258.9	259.2	259.5	259.8	260.0	260.4
of which food and industrial	89.4	90.1	89.8	87.7	88.3	87.8	87.7	87.8	87.6	87.6	87.6	87.6	87.7	87.7	87.7
of which feed	160.5	161.6	162.5	163.0	161.9	159.6	159.9	160.2	160.5	160.7	161.0	161.3	161.6	161.9	162.2
of which bioenergy	11.0	11.3	10.9	10.9	10.6	10.7	10.5	10.5	10.7	10.7	10.6	10.6	10.5	10.4	10.4
Beginning stocks	37.4	32.5	41.2	41.1	44.2	44.7	44.0	43.7	43.4	43.3	43.2	43.2	43.2	43.2	43.2
Ending stocks	32.5	41.2	41.1	44.2	44.7	44.0	43.7	43.4	43.3	43.2	43.2	43.2	43.2	43.2	43.2
of which intervention	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stock-to-use ratio	12.5%	15.7%	15.6%	16.9%	17.1%	17.0%	16.9%	16.8%	16.7%	16.7%	16.7%	16.6%	16.6%	16.6%	16.6%

Note: cereals marketing year is July/June

TABLE 8.10 EU wheat market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	145.7	146.4	145.4	155.8	151.5	145.5	145.6	146.1	146.8	147.4	148.0	148.5	149.0	149.5	150.0
Imports	14.4	19.2	24.6	20.5	20.2	21.9	22.0	21.9	21.8	21.8	22.2	22.6	22.9	23.1	23.3
Exports	12.2	12.0	12.5	16.9	13.9	13.7	13.7	13.9	14.0	14.3	14.8	15.2	15.6	15.9	16.2
Consumption	149.9	151.3	151.5	156.1	155.9	154.5	154.3	154.6	154.7	155.1	155.6	156.0	156.5	156.8	157.3
of which food and industrial	27.9	28.2	27.2	26.4	26.4	26.8	26.5	26.6	26.4	26.3	26.3	26.3	26.4	26.4	26.4
of which feed	114.9	115.7	116.9	122.1	122.0	120.3	120.4	120.7	120.9	121.3	121.8	122.3	122.7	123.1	123.5
of which bioenergy	7.2	7.3	7.5	7.6	7.5	7.4	7.3	7.3	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Beginning stocks	23.1	21.2	23.5	29.5	32.9	34.9	34.1	33.6	33.2	32.9	32.8	32.6	32.5	32.3	32.2
Ending stocks	21.2	23.5	29.5	32.9	34.9	34.1	33.6	33.2	32.9	32.8	32.6	32.5	32.3	32.2	32.1
of which intervention	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: the wheat marketing year is July/June

TABLE 8.11 EU common coarse grains market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	145.7	146.4	145.4	155.8	151.5	145.5	145.6	146.1	146.8	147.4	148.0	148.5	149.0	149.5	150.0
Imports	14.4	19.2	24.6	20.5	20.2	21.9	22.0	21.9	21.8	21.8	22.2	22.6	22.9	23.1	23.3
Exports	12.2	12.0	12.5	16.9	13.9	13.7	13.7	13.9	14.0	14.3	14.8	15.2	15.6	15.9	16.2
Consumption	149.9	151.3	151.5	156.1	155.9	154.5	154.3	154.6	154.7	155.1	155.6	156.0	156.5	156.8	157.3
of which food and industrial	27.9	28.2	27.2	26.4	26.4	26.8	26.5	26.6	26.4	26.3	26.3	26.3	26.4	26.4	26.4
of which feed	114.9	115.7	116.9	122.1	122.0	120.3	120.4	120.7	120.9	121.3	121.8	122.3	122.7	123.1	123.5
of which bioenergy	7.2	7.3	7.5	7.6	7.5	7.4	7.3	7.3	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Beginning stocks	23.1	21.2	23.5	29.5	32.9	34.9	34.1	33.6	33.2	32.9	32.8	32.6	32.5	32.3	32.2
Ending stocks	21.2	23.5	29.5	32.9	34.9	34.1	33.6	33.2	32.9	32.8	32.6	32.5	32.3	32.2	32.1
of which intervention	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: the coarse grains marketing year is July/June

TABLE 8.12 EU common wheat market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	119.6	127.3	114.8	130.9	115.5	119.8	119.8	119.9	120.1	120.2	120.3	120.5	120.7	120.8	120.9
Yield	5.3	5.9	5.4	5.9	5.5	5.6	5.6	5.6	5.6	5.6	5.7	5.7	5.7	5.7	5.8
Imports	4.1	4.1	4.0	2.7	3.5	3.5	3.4	3.4	3.4	3.4	3.3	3.3	3.3	3.2	3.2
Exports	25.7	22.4	22.4	36.8	24.0	28.4	28.2	28.2	28.3	28.6	28.9	29.2	29.5	29.7	29.9
Consumption	101.6	102.3	102.3	96.6	96.0	94.7	94.8	95.0	95.0	94.8	94.6	94.4	94.3	94.2	94.1
of which food and industrial	52.4	52.7	53.4	52.5	53.1	52.2	52.3	52.4	52.4	52.4	52.4	52.4	52.5	52.5	52.5
of which feed	45.3	45.7	45.4	40.7	39.7	39.2	39.3	39.4	39.4	39.2	39.0	38.8	38.7	38.6	38.5
of which bioenergy	3.8	3.9	3.4	3.4	3.1	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.0	3.0
Beginning stocks	12.0	8.5	15.2	9.4	9.5	8.5	8.6	8.8	9.0	9.1	9.2	9.4	9.5	9.7	9.8
Ending stocks	8.5	15.2	9.4	9.5	8.5	8.6	8.8	9.0	9.1	9.2	9.4	9.5	9.7	9.8	10.0
of which intervention	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EU price in EUR/t	166	162	196	183	163	154	150	158	166	175	179	179	180	181	182
World price in EUR/t	176	202	198	191	181	172	167	171	180	191	197	200	200	201	203
World price in USD/t	194	228	234	214	205	192	188	193	204	217	225	229	230	232	235
EU intervention price in EUR/t	101	101	101	101	101	101	101	101	101	101	101	101	101	101	101

Note: the common wheat marketing year is July/June

TABLE 8.13 EU durum wheat market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	9.6	8.7	8.7	7.5	7.3	8.2	8.1	8.0	7.9	7.8	7.6	7.5	7.4	7.2	7.1
Yield	3.5	3.4	3.5	3.4	3.3	3.4	3.4	3.4	3.4	3.4	3.5	3.5	3.5	3.5	3.6
Imports	1.8	1.6	1.4	2.4	2.5	2.0	2.1	2.2	2.3	2.4	2.4	2.5	2.6	2.7	2.8
Exports	1.5	1.3	1.0	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0
Consumption	9.3	9.4	9.4	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
of which food and industrial	9.1	9.2	9.2	8.8	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.8	8.8	8.8	8.8
of which feed	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
of which bioenergy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beginning stocks	2.4	2.9	2.5	2.3	1.9	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.1	1.1
Ending stocks	2.9	2.5	2.3	1.9	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.1	1.1	1.1

Note: the durum wheat marketing year is July/June

TABLE 8.14 EU barley market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	52.9	51.2	49.5	55.1	55.0	51.9	51.5	51.5	51.5	51.6	51.6	51.7	51.7	51.7	51.7
Yield	4.7	4.7	4.4	5.0	4.9	4.8	4.8	4.8	4.8	4.9	4.9	4.9	4.9	5.0	5.0
Imports	1.3	1.4	0.9	1.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.5
Exports	8.6	8.9	7.9	10.5	10.5	10.0	9.9	10.0	10.2	10.5	10.8	11.0	11.2	11.3	11.5
Consumption	47.7	45.7	40.9	44.0	44.4	43.0	42.9	42.8	42.7	42.5	42.4	42.2	42.1	42.0	41.9
of which food and industrial	9.8	9.7	9.3	9.1	9.2	9.6	9.5	9.4	9.3	9.2	9.1	9.0	8.9	8.8	8.7
of which feed	37.5	35.6	31.3	34.5	34.8	33.0	33.0	33.0	32.9	32.9	32.8	32.7	32.7	32.7	32.7
of which bioenergy	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Beginning stocks	5.6	3.4	1.5	3.2	5.7	6.7	6.6	6.4	6.2	6.0	5.9	5.7	5.5	5.3	5.2
Ending stocks	3.4	1.5	3.2	5.7	6.7	6.6	6.4	6.2	6.0	5.9	5.7	5.5	5.3	5.2	5.0
of which intervention	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EU price in EUR/t	140	156	188	162	148	140	140	148	155	164	168	172	172	173	174
World price in EUR/t	143	168	187	161	150	141	140	149	156	165	170	173	174	175	176
World price in USD/t	158	190	220	180	170	157	158	168	177	188	194	198	200	202	204

Note: the barley marketing year is July/June

TABLE 8.15 EU maize market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	62.8	64.8	69.0	70.0	63.1	65.4	65.6	65.9	66.3	66.7	66.9	67.2	67.4	67.7	68.0
Yield	7.3	7.8	8.4	7.9	7.1	7.3	7.4	7.4	7.5	7.5	7.5	7.6	7.6	7.7	7.7
Imports	12.9	17.2	22.6	18.4	19.0	20.6	20.7	20.5	20.3	20.3	20.6	21.0	21.2	21.3	21.5
Exports	3.3	2.8	4.2	5.9	3.0	3.3	3.4	3.4	3.3	3.3	3.5	3.6	3.8	3.9	4.0
Consumption	69.4	74.0	82.4	84.7	83.1	82.5	82.6	82.9	83.1	83.5	83.9	84.3	84.7	84.9	85.3
of which food and industrial	10.8	10.9	10.8	10.5	10.4	10.4	10.6	10.7	10.8	10.9	11.0	11.0	11.1	11.2	11.3
of which feed	52.8	57.1	65.2	68.1	66.5	66.1	66.1	66.2	66.3	66.6	67.0	67.3	67.5	67.7	68.0
of which bioenergy	5.8	6.0	6.4	6.2	6.2	6.0	5.9	5.9	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Beginning stocks	11.0	14.0	19.2	24.2	22.0	18.1	18.3	18.5	18.7	18.9	19.0	19.2	19.4	19.6	19.8
Ending stocks	14.0	19.2	24.2	22.0	18.1	18.3	18.5	18.7	18.9	19.0	19.2	19.4	19.6	19.8	20.0
of which intervention	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EU price in EUR/t	166	154	177	167	145	140	141	150	159	166	166	166	166	168	169
World price in EUR/t	140	142	143	149	132	130	132	139	145	150	151	152	153	155	157
World price in USD/t	156	160	169	167	149	145	148	157	164	170	172	174	176	179	182

Note: the maize marketing year is July/June

TABLE 8.16 EU other cereals* market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	30.1	30.4	26.9	30.8	33.4	28.3	28.5	28.7	28.9	29.2	29.4	29.7	29.9	30.1	30.4
Yield	3.4	3.5	3.1	3.4	3.6	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.4	3.4
Imports	0.2	0.5	1.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Exports	0.3	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
Consumption	32.8	31.6	28.3	27.3	28.4	29.0	28.7	28.9	29.0	29.1	29.3	29.5	29.7	30.0	30.2
of which food and industrial	7.2	7.6	7.1	6.8	6.7	6.8	6.4	6.4	6.3	6.2	6.2	6.3	6.3	6.3	6.4
of which feed	24.6	23.0	20.4	19.5	20.7	21.2	21.3	21.5	21.7	21.9	22.1	22.3	22.5	22.7	22.8
of which bioenergy	1.0	1.0	0.8	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Beginning stocks	6.5	3.7	2.8	2.1	5.2	10.1	9.2	8.7	8.3	8.0	7.9	7.7	7.6	7.4	7.3
Ending stocks	3.7	2.8	2.1	5.2	10.1	9.2	8.7	8.3	8.0	7.9	7.7	7.6	7.4	7.3	7.1

* Rye, Oats and other cereals

Note: the other cereals marketing year is July/June

TABLE 8.17 EU rice balance (million t milled equivalent)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6
Yield	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Imports	1.4	1.5	1.4	1.5	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.8
Exports	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7
Consumption	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.8	2.8	2.8
Beginning stocks	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Ending stocks	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
EU price in EUR/t	561	555	575	551	521	512	512	521	538	551	560	567	572	576	582
World price in EUR/t	367	367	377	381	355	355	352	357	368	375	380	383	385	386	389
World price in USD/t	407	415	445	426	403	397	396	403	416	427	434	439	443	446	450

Note: the rice marketing year is September/August

TABLE 8.18 EU oilseed* (grains and beans) market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	29.5	32.9	30.8	28.1	28.4	29.6	29.9	30.0	30.0	30.0	30.0	30.0	30.1	30.1	30.2
Rapeseed	18.3	19.9	18.0	15.4	15.8	16.5	16.6	16.6	16.5	16.4	16.3	16.2	16.2	16.1	16.0
Sunflower seed	8.7	10.4	10.0	10.1	9.8	10.1	10.3	10.3	10.4	10.4	10.4	10.5	10.5	10.6	10.6
Soya beans	2.5	2.7	2.8	2.7	2.8	3.0	3.0	3.1	3.2	3.2	3.3	3.3	3.4	3.5	3.5
Yield (t/ha)	2.7	2.9	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8
Rapeseed	3.1	3.2	2.8	3.0	3.0	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sunflower seeds	2.1	2.4	2.5	2.3	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.5
Soya beans	3.0	2.8	3.0	3.0	3.0	3.1	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.3	3.3
Imports	18.9	18.8	19.8	22.5	21.6	21.6	21.6	21.7	21.7	21.8	21.8	21.9	21.9	22.0	22.0
Exports	1.2	1.4	1.1	1.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Consumption	46.5	48.8	50.4	50.5	49.2	50.0	50.4	50.5	50.6	50.7	50.7	50.8	50.9	51.0	51.0
of which crushing	42.4	44.5	46.0	45.9	44.7	45.3	45.6	45.7	45.7	45.7	45.8	45.8	45.9	46.0	46.0
Beginning stocks	2.9	3.7	5.1	4.3	3.2	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6
Ending stocks	3.7	5.1	4.3	3.2	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6
EU price in EUR/t (rapeseed)	393	355	370	385	358	392	398	403	425	425	437	440	450	449	453
World price in EUR/t (soya bean)	365	357	313	339	335	299	303	317	363	351	359	361	375	374	379
World price in USD/t (soya bean)	404	403	370	380	380	334	341	358	411	399	410	414	431	432	439

*Rapeseed, soya bean, sunflower seed and groundnuts

Note: the oilseed marketing year is July/June

TABLE 8.19 EU oilseed meal* market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	26.8	27.9	29.2	29.1	28.4	28.7	28.8	28.9	28.9	29.0	29.0	29.1	29.1	29.2	29.3
Imports	20.4	21.2	20.4	20.3	20.5	20.8	20.7	20.6	20.4	20.2	20.1	19.9	19.6	19.5	19.3
Exports	1.7	1.8	1.7	2.0	1.8	1.8	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1
Consumption	45.5	47.4	47.8	47.3	47.1	47.6	47.6	47.6	47.4	47.2	47.1	46.9	46.7	46.5	46.4
Beginning stocks	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Ending stocks	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
EU price in EUR/t (soya bean meal)	338	404	331	277	341	307	306	318	345	354	361	364	373	377	382
World price in EUR/t	282	316	265	269	264	237	236	245	266	273	278	281	288	291	295
World price in USD/t	312	357	313	301	299	265	265	276	302	310	318	322	331	336	342

** Tables include rapeseed, soya beans, sunflower and groundnuts; in Table vegetable oil palm oil, cottonseed oil, palmkernel oil and coconut oil are added

Note: the oilseed meal marketing year is July/June

TABLE 8.20 EU oilseed oil* market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	14.6	15.5	15.8	15.9	15.2	15.6	15.7	15.7	15.8	15.7	15.7	15.7	15.7	15.8	15.8
Imports	2.2	2.2	2.7	3.3	2.5	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Exports	2.1	2.1	2.0	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2
Consumption	14.5	15.7	16.6	17.0	15.6	16.4	16.3	16.2	16.3	16.4	16.5	16.5	16.6	16.6	16.7
Beginning stocks	1.0	1.1	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7
Ending stocks	1.1	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7
EU price in EUR/t (rapeseed oil)	786	713	731	783	632	709	744	760	813	820	827	834	849	854	858
World price in EUR/t (vegetable oil)	720	662	559	683	556	617	647	659	703	708	717	725	739	745	753
World price in USD/t (vegetable oil)	797	748	660	765	630	690	728	744	796	806	819	831	850	861	873

*Rapeseed-, soya bean-, sunflower seed- and groundnut-based oils.

Note: the oilseed oil marketing year is July/June

TABLE 8.21 EU vegetable oil* market balance (million t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	14.7	15.6	15.8	16.0	15.3	15.7	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8
Imports	10.1	10.6	11.1	11.9	10.8	11.0	10.8	10.6	10.5	10.2	10.0	9.7	9.5	9.2	9.0
Exports	2.4	2.4	2.3	2.3	2.4	2.5	2.5	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Consumption	22.2	24.1	24.8	25.4	23.6	24.2	24.0	23.7	23.5	23.3	23.1	22.9	22.7	22.5	22.3
of which food and other use	12.4	12.9	13.1	14.0	13.3	13.1	13.1	12.9	12.8	12.8	12.8	12.9	12.9	12.9	13.1
of which bioenergy	9.8	11.2	11.7	11.4	10.3	11.1	10.9	10.7	10.7	10.5	10.3	10.0	9.8	9.6	9.2
Beginning stocks	1.5	1.5	1.3	1.2	1.3	1.3	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0	0.9
Ending stocks	1.5	1.3	1.2	1.3	1.3	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9

*Rapeseed-, soya bean-, sunflower seed- and groundnut-based oils plus cottonseed oil, palm oil, palm kernel oil and coconut oil.

Note: the vegetable oil marketing year is July/June

TABLE 8.22 EU sugar market balance (million t white sugar equivalent)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Sugar beet production (million tonnes)	106.7	134.2	111.9	111.7	108.6	107.5	107.0	106.7	106.3	106.7	107.0	107.2	107.4	107.7	108.0
of which for ethanol	10.8	10.6	10.2	9.9	11.6	12.4	12.4	12.7	12.9	12.9	12.9	12.8	12.6	12.5	12.5
of which processed for sugar	95.9	123.6	101.8	101.7	96.9	95.2	94.6	94.0	93.4	93.8	94.1	94.4	94.8	95.1	95.5
Sugar production*	15.9	20.0	16.5	16.2	15.9	15.8	15.7	15.6	15.6	15.7	15.7	15.8	16.0	16.1	16.2
Sugar quota	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imports	2.3	1.2	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.5	1.5	1.4
Exports	1.8	3.8	2.1	1.1	1.2	1.2	1.2	1.2	1.2	1.3	1.5	1.6	1.7	1.8	1.9
Consumption	16.1	17.2	16.9	16.5	16.8	16.6	16.4	16.2	16.2	16.1	16.0	16.0	16.0	16.0	15.9
Beginning stocks**	1.5	2.0	2.2	1.6	2.1	1.9	1.8	1.7	1.7	1.8	1.8	1.8	1.7	1.6	1.5
Ending stocks**	2.0	2.2	1.6	2.1	1.9	1.8	1.7	1.7	1.8	1.8	1.8	1.7	1.6	1.5	1.4
EU white sugar price in EUR/t	488	386	320	358	358	343	341	348	363	381	396	407	409	410	412
World white sugar price in EUR/t	429	310	284	320	301	303	300	308	323	341	356	367	369	370	372
World white sugar price in USD/t	475	351	336	358	342	339	338	347	366	388	406	421	424	427	431

* Sugar production is adjusted for carry forward quantities and does not include ethanol feedstock quantities.

** Stocks include carry forward quantities.

TABLE 8.23 EU biofuels market balance sheet (million t oil equivalent)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	13.4	14.9	15.4	15.3	14.0	15.1	14.9	14.9	14.9	14.9	14.8	14.6	14.4	14.2	13.9
Ethanol	2.9	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.2	3.2	3.2	3.2	3.1	3.1	3.1
...based on wheat	0.7	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
...based on maize	1.0	1.2	1.3	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
...based on other cereals	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
...based on sugar beet and molasses	0.8	0.8	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
...advanced	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Biodiesel	10.5	11.8	12.4	12.3	11.0	12.0	11.9	11.8	11.8	11.7	11.6	11.4	11.3	11.1	10.8
...based on rape oils	5.1	5.9	6.2	6.1	5.5	6.0	6.0	5.9	5.9	5.9	5.9	5.8	5.8	5.8	5.7
...based on palm oils	2.5	2.8	3.0	2.8	2.5	2.7	2.5	2.4	2.3	2.1	1.9	1.7	1.6	1.4	1.1
...based on other vegetable oils	0.7	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0
...based on waste oils	1.9	2.0	2.1	2.2	1.9	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3
...other advanced	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7
Net trade	- 0.3	- 0.8	- 2.3	- 2.1	- 2.3	- 2.3	- 2.2	- 2.1	- 2.0	- 1.9	- 1.8	- 1.7	- 1.7	- 1.5	- 1.3
<i>Ethanol imports</i>	<i>0.4</i>	<i>0.4</i>	<i>0.3</i>	<i>0.5</i>	<i>0.6</i>	<i>0.6</i>	<i>0.6</i>	<i>0.6</i>	<i>0.6</i>	<i>0.5</i>	<i>0.5</i>	<i>0.5</i>	<i>0.5</i>	<i>0.5</i>	<i>0.5</i>
<i>Ethanol exports</i>	<i>0.3</i>	<i>0.4</i>	<i>0.4</i>	<i>0.4</i>	<i>0.3</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>
<i>Biodiesel imports</i>	<i>0.9</i>	<i>1.5</i>	<i>3.5</i>	<i>3.7</i>	<i>3.3</i>	<i>3.1</i>	<i>3.0</i>	<i>2.9</i>	<i>2.7</i>	<i>2.6</i>	<i>2.4</i>	<i>2.3</i>	<i>2.2</i>	<i>2.0</i>	<i>1.8</i>
<i>Biodiesel exports</i>	<i>0.7</i>	<i>0.7</i>	<i>1.1</i>	<i>1.7</i>	<i>1.3</i>	<i>1.2</i>	<i>1.2</i>	<i>1.1</i>	<i>1.0</i>	<i>0.9</i>	<i>0.9</i>	<i>0.8</i>	<i>0.7</i>	<i>0.7</i>	<i>0.7</i>
Consumption	13.8	15.4	16.8	17.7	16.6	17.2	17.4	17.3	17.2	17.0	16.7	16.5	16.1	15.8	15.5
Ethanol for fuel	2.0	2.2	2.4	2.4	2.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3
non fuel use of ethanol	0.9	0.8	0.9	0.9	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Biodiesel	10.8	12.3	13.5	14.3	13.4	13.7	13.9	13.8	13.7	13.5	13.3	13.0	12.7	12.4	12.1
Gasoline consumption	66.1	69.9	69.9	69.9	62.6	65.6	67.4	66.6	65.5	63.8	61.6	59.0	56.2	53.4	50.5
Diesel consumption	167.7	175.0	175.0	175.1	157.0	165.7	170.5	167.9	164.6	160.2	154.9	148.7	142.1	135.1	127.9
Biofuels energy share (% RED counting)	6.5	7.0	7.5	8.0	8.2	8.2	8.1	8.2	8.4	8.6	8.8	9.0	9.3	9.7	10.0
Energy share: 1st-generation	4.5	5.0	5.5	5.8	6.0	5.8	5.7	5.7	5.7	5.8	5.8	5.9	6.0	6.1	6.3
Energy share: based on waste oils	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.2	1.3	1.3	1.4	1.5	1.6	1.7	1.8
Energy share: other advanced	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Energy share: Ethanol in Gasoline	3.1	3.2	3.4	3.5	3.5	3.8	3.7	3.7	3.8	3.9	4.0	4.2	4.3	4.5	4.7
Energy share: Biodiesel in Diesel	6.4	7.0	7.6	8.1	8.4	8.2	8.1	8.2	8.2	8.4	8.5	8.7	8.9	9.1	9.4
Ethanol producer price in EUR/hl	50	55	48	60	61	53	55	56	56	56	58	59	60	60	59
Biodiesel producer price in EUR/hl	72	74	74	77	73	74	76	77	75	76	76	79	81	79	76

TABLE 8.24 EU isoglucose market balance (million t white sugar equivalent)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Isoglucose production	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8
Isoglucose quota	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Isoglucose consumption</i>	0.7	0.6	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8
<i>share in Sweetener use (%)</i>	4.0	3.1	3.0	3.3	2.9	3.2	3.4	3.5	3.7	3.8	4.0	4.1	4.3	4.4	4.5
Imports	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exports	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

Note: the isoglucose marketing year is October/September

TABLE 8.25 EU milk market balance

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Dairy cows (million heads)	21.4	21.2	20.8	20.5	20.4	20.3	20.1	20.0	19.9	19.8	19.7	19.6	19.4	19.3	19.2
Milk yield (kg/cow)	6 834	6 977	7 162	7 294	7 411	7 529	7 617	7 704	7 790	7 876	7 962	8 047	8 133	8 218	8 302
Dairy cow milk production (million t)	146.2	147.6	148.9	149.7	151.5	152.7	153.3	154.1	154.9	155.8	156.6	157.3	158.1	158.8	159.6
Total cow milk production (million t)	148.6	149.9	151.3	152.0	154.0	155.2	155.9	156.7	157.6	158.4	159.3	160.1	160.9	161.7	162.5
Fat content of milk (%)	4.1	4.1	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.2
Non-fat solid content of milk (%)	9.5	9.6	9.6	9.6	9.6	9.6	9.6	9.7	9.7	9.7	9.8	9.8	9.8	9.8	9.9
Delivered to dairies (million t)	138.8	140.9	142.2	142.9	144.9	146.1	147.1	148.1	149.3	150.4	151.5	152.6	153.6	154.7	155.7
<i>Delivery ratio (%)</i>	93.5	93.9	94.0	94.0	94.1	94.1	94.3	94.5	94.7	94.9	95.1	95.3	95.5	95.7	95.8
On-farm use and direct sales (million t)	9.7	9.1	9.1	9.1	9.1	9.1	8.8	8.6	8.3	8.1	7.8	7.5	7.3	7.0	6.7
EU Milk producer price in EUR/t	280.7	348.1	321.1	343.7	321.1	319.5	336.3	342.3	347.3	352.8	358.4	364.6	370.5	376.7	382.1

TABLE 8.26 EU fresh dairy products market balance (1 000 t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	38692	38366	38055	37747	38089	38019	38017	37983	37970	37940	37944	37913	37866	37829	37825
of which fresh milk	24131	23789	23349	23124	23567	23186	23417	23292	23164	23036	22909	22782	22655	22528	22400
of which cream	2 446	2 478	2 421	2 469	2 462	2 479	2 496	2 509	2 522	2 535	2 547	2 560	2 572	2 584	2 596
of which yogurt	7 880	7 873	7 913	7 731	7 801	7 819	7 839	7 845	7 850	7 854	7 858	7 862	7 865	7 867	7 869
Net trade	1 035	839	725	875	1 052	1 124	1 188	1 257	1 343	1 430	1 530	1 592	1 640	1 700	1 780
Consumption	37657	37527	37329	36872	37037	36895	36829	36726	36627	36509	36415	36321	36225	36129	36045
of which fresh milk	23691	23551	23192	22820	23151	22849	22730	22568	22403	22239	22075	21911	21748	21584	21420
of which cream	2 277	2 304	2 255	2 309	2 296	2 311	2 323	2 331	2 339	2 347	2 354	2 362	2 369	2 376	2 383
of which yogurt	7 699	7 690	7 737	7 537	7 599	7 616	7 633	7 637	7 638	7 640	7 641	7 641	7 641	7 641	7 639
per capita consumption (kg)	84.6	84.2	83.6	82.4	82.7	82.4	82.1	81.9	81.8	81.6	81.4	81.3	81.2	81.0	80.9
of which fresh milk	53.2	52.8	51.9	51.0	51.7	51.0	50.7	50.3	50.0	49.7	49.4	49.0	48.7	48.4	48.1
of which cream	5.1	5.2	5.1	5.2	5.1	5.2	5.2	5.2	5.2	5.2	5.3	5.3	5.3	5.3	5.4
of which yogurt	17.3	17.3	17.3	16.9	17.0	17.0	17.0	17.0	17.1	17.1	17.1	17.1	17.1	17.1	17.2
of which other FDP	9.0	8.9	9.3	9.4	8.9	9.2	9.2	9.3	9.5	9.6	9.7	9.9	10.0	10.2	10.3

TABLE 8.27 EU cheese market balance (1 000 t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	10 024	10 165	10 267	10 469	10 543	10 607	10 641	10 710	10 771	10 824	10 895	10 985	11 079	11 169	11 253
Imports	195	191	197	212	216	208	211	214	217	222	224	226	226	227	228
Exports	1 231	1 275	1 279	1 347	1 414	1 463	1 492	1 523	1 543	1 557	1 586	1 633	1 684	1 730	1 772
Consumption	9 014	9 081	9 185	9 335	9 315	9 352	9 380	9 410	9 445	9 489	9 534	9 578	9 622	9 665	9 709
<i>per capita consumption (kg)</i>	20.2	20.4	20.6	20.9	20.8	20.9	20.9	21.0	21.1	21.2	21.3	21.4	21.6	21.7	21.8
Variation in stocks	- 26	0	0	0	30	0	-20	-10	0	0	0	0	0	0	0
EU market price in EUR/t	2 532	3 257	3 095	3 133	3 093	3 023	3 121	3 186	3 242	3 301	3 367	3 439	3 511	3 581	3 647
World market price in EUR/t	2 791	3 406	3 093	3 497	3 085	3 089	3 166	3 212	3 248	3 292	3 339	3 385	3 431	3 475	3 513
World market price in USD/t	3 090	3 848	3 652	3 915	3 500	3 456	3 561	3 625	3 680	3 744	3 812	3 880	3 947	4 013	4 073

TABLE 8.28 EU butter market balance (1 000 t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	2 250	2 253	2 283	2 319	2 377	2 393	2 405	2 414	2 425	2 438	2 449	2 456	2 463	2 469	2 476
Imports	51	48	59	59	50	53	53	53	53	53	53	53	54	54	55
Exports	288	243	234	292	321	335	346	349	354	361	366	368	370	371	372
Consumption	2 030	2 067	2 093	2 102	2 107	2 111	2 112	2 118	2 124	2 130	2 135	2 141	2 147	2 152	2 158
<i>per capita consumption (kg)</i>	4.6	4.6	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.8	4.8	4.8	4.8	4.8	4.8
Ending Stocks	121	112	127	112	112	112	112	112	112	112	112	112	112	112	112
of which private	121	112	127	112	112	112	112	112	112	112	112	112	112	112	112
of which intervention	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EU market price in EUR/t	3 243	5 085	5 022	3 921	3 324	3 114	3 260	3 287	3 301	3 326	3 358	3 392	3 425	3 454	3 477
World market price in EUR/t	2 937	4 748	4 147	4 037	3 306	3 087	3 164	3 179	3 177	3 184	3 205	3 230	3 254	3 273	3 283
World market price in USD/t	3 251	5 364	4 898	4 520	3 750	3 454	3 558	3 589	3 599	3 621	3 659	3 702	3 743	3 780	3 805
EU intervention price in EUR/t	2 218	2 218	2 218	2 218	2 218	2 218	2 218	2 218	2 218	2 218	2 218	2 218	2 218	2 218	2 218

TABLE 8.29 EU SMP market balance (1 000 t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	1 491	1 448	1 465	1 478	1 551	1 600	1 638	1 666	1 696	1 728	1 759	1 788	1 817	1 846	1 872
Imports	44	55	46	56	54	54	50	50	50	50	50	50	50	50	50
Exports	597	794	826	946	852	893	916	928	943	959	974	988	1 001	1 014	1 027
Consumption	720	755	822	809	753	760	773	788	803	819	835	851	866	882	895
Ending Stocks	488	442	305	84	84	84	84	84	84	84	84	84	84	84	84
of which private	143	74	214	84	84	84	84	84	84	84	84	84	84	84	84
of which intervention	345	368	91	0	0	0	0	0	0	0	0	0	0	0	0
EU market price in EUR/t	1 794	1 772	1 492	2 100	2 164	2 224	2 383	2 439	2 493	2 547	2 602	2 659	2 717	2 775	2 832
World market price in EUR/t	1 802	1 813	1 685	2 341	2 405	2 529	2 579	2 652	2 716	2 767	2 814	2 856	2 900	2 942	2 983
World market price in USD/t	1 994	2 048	1 990	2 621	2 728	2 829	2 900	2 993	3 077	3 147	3 212	3 273	3 336	3 398	3 459

TABLE 8.30 EU WMP market balance (1 000 t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	704	747	703	714	719	713	708	707	705	704	703	701	700	698	697
Imports	41	34	43	43	39	39	38	38	37	37	37	36	36	35	35
Exports	381	404	346	315	315	306	300	297	292	288	284	280	275	271	267
Consumption	364	377	400	442	443	445	446	448	450	453	455	458	460	463	465
EU market price in EUR/t	2 349	2 922	2 700	2 913	2 763	2 764	2 832	2 889	2 939	2 992	3 049	3 108	3 167	3 225	3 281
World market price in EUR/t	2 190	2 739	2 545	2 798	2 512	2 614	2 680	2 751	2 808	2 867	2 934	3 004	3 074	3 143	3 207
World market price in USD/t	2 424	3 095	3 005	3 133	2 850	2 924	3 014	3 105	3 181	3 261	3 350	3 443	3 537	3 630	3 718

TABLE 8.31 EU whey market balance (1 000 t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	1 816	1 909	1 995	2 078	2 141	2 196	2 223	2 249	2 273	2 295	2 321	2 351	2 383	2 413	2 443
Imports	62	70	65	69	52	51	51	51	51	52	52	52	51	51	51
Exports	594	603	635	637	669	713	721	725	727	729	733	740	749	756	767
Consumption	1 284	1 377	1 425	1 510	1 523	1 534	1 553	1 575	1 597	1 618	1 640	1 663	1 685	1 708	1 727
EU market price in EUR/t	706	867	717	756	756	707	760	825	895	972	1 048	1 113	1 177	1 244	1 292
World market price in EUR/t	681	902	792	820	994	926	969	1 033	1 105	1 184	1 260	1 320	1 379	1 442	1 478
World market price in USD/t	754	1 019	936	918	1 127	1 036	1 089	1 166	1 252	1 347	1 438	1 513	1 587	1 665	1 713

TABLE 8.32 EU beef and veal meat market balance (1 000 t c.w.e.)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total number of cows (million heads)	32.2	31.9	31.5	31.3	31.1	30.9	30.7	30.4	30.2	30.1	29.9	29.7	29.5	29.3	29.1
of which dairy cows	21.4	21.2	20.8	20.5	20.4	20.3	20.1	20.0	19.9	19.8	19.7	19.6	19.4	19.3	19.2
of which sukler cows	10.8	10.8	10.7	10.7	10.7	10.6	10.5	10.4	10.4	10.3	10.2	10.1	10.0	10.0	9.9
Gross Indigenous Production	7 166	7 196	7 310	7 211	7 102	6 986	6 939	6 907	6 874	6 826	6 779	6 738	6 694	6 652	6 612
Imports of live animals	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Exports of live animals	228	246	246	235	223	219	211	204	197	190	184	178	172	166	160
Net Production	6 939	6 951	7 067	6 978	6 881	6 770	6 730	6 705	6 679	6 637	6 598	6 562	6 525	6 489	6 454
Imports (meat)	351	348	371	386	348	359	360	355	357	366	371	377	382	386	390
Exports (meat)	585	613	595	577	582	555	566	579	589	598	608	617	626	635	646
Consumption	6 705	6 686	6 843	6 788	6 646	6 572	6 525	6 480	6 446	6 405	6 362	6 323	6 281	6 240	6 198
<i>per capita consumption (kg r.w.e.)*</i>	10.5	10.5	10.7	10.6	10.4	10.3	10.2	10.1	10.1	10.0	10.0	9.9	9.9	9.8	9.7
EU market price in EUR/t	3 661	3 788	3 784	3 586	3 532	3 523	3 483	3 412	3 357	3 312	3 356	3 463	3 464	3 457	3 461
World market price in EUR/t (Brazil)	3 466	3 582	3 329	3 632	3 526	3 378	3 295	3 190	3 103	3 030	3 070	3 167	3 163	3 152	3 158
World market price in USD/t (Brazil)	3 836	4 047	3 931	4 066	4 000	3 779	3 705	3 600	3 516	3 447	3 505	3 629	3 639	3 640	3 661

* r.w.e. = retail weight equivalent; Coefficient to transform carcass weight into retail weight is 0.7 for beef and veal.

TABLE 8.33 EU sheep and goat meat market balance (1 000 t c.w.e.)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gross Indigenous Production	623	624	632	649	629	628	627	627	627	627	627	627	628	628	629
Imports of live animals	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1
Exports of live animals	52	53	51	62	59	58	56	54	51	49	47	45	43	42	40
Net Production	572	572	581	587	570	570	571	574	576	578	580	582	585	587	590
Imports (meat)	170	169	172	163	156	152	154	156	155	154	153	152	151	150	149
Exports (meat)	41	55	51	56	60	60	60	61	61	62	63	63	64	64	65
Consumption	701	686	703	694	668	662	665	669	669	670	671	672	672	673	674
<i>per capita consumption (kg r.w.e.)*</i>	<i>1.4</i>	<i>1.4</i>	<i>1.4</i>	<i>1.4</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>
EU market price in EUR/t	5 300	5 317	5 428	5 280	5 650	5 449	5 288	5 220	5 232	5 298	5 331	5 351	5 366	5 385	5 396
World market price in EUR/t	3 220	3 522	4 176	4 399	4 055	3 907	3 791	3 744	3 752	3 799	3 823	3 836	3 847	3 861	3 869
World market price in USD/t	3 564	3 979	4 932	4 925	4 600	4 371	4 263	4 226	4 252	4 321	4 364	4 396	4 426	4 459	4 485

* r.w.e. = retail weight equivalent; Coefficient to transform carcass weight into retail weight is 0.88 for sheep and goat meat

TABLE 8.34 EU pigmeat market balance (1 000 t c.w.e.)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gross Indigenous Production	22984	22802	23205	23038	22906	22696	22642	22611	22524	22446	22364	22268	22178	22082	21995
Imports of live animals	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Exports of live animals	38	45	51	43	26	23	24	23	24	25	25	26	27	28	30
Net Production	22947	22758	23156	22996	22881	22674	22619	22589	22501	22423	22339	22243	22152	22055	21966
Imports (meat)	152	154	167	161	148	150	158	157	159	162	164	166	167	169	171
Exports (meat)	3 695	3 498	3 580	4 175	4 259	3 860	3 814	3 893	3 967	4 005	3 987	3 964	3 936	3 908	3 890
Consumption	19404	19414	19743	18982	18771	18964	18959	18854	18694	18579	18516	18434	18387	18321	18242
<i>per capita consumption (kg r.w.e.)*</i>	<i>34.0</i>	<i>34.0</i>	<i>34.5</i>	<i>33.1</i>	<i>32.7</i>	<i>33.0</i>	<i>33.0</i>	<i>32.8</i>	<i>32.5</i>	<i>32.4</i>	<i>32.3</i>	<i>32.2</i>	<i>32.1</i>	<i>32.0</i>	<i>31.9</i>
EU market price in EUR/t	1 458	1 603	1 414	1 691	1 623	1 600	1 499	1 498	1 536	1 577	1 601	1 608	1 619	1 632	1 632
World 'Atlantic' market price in EUR/t (Brazil)	1 936	2 197	1 664	2 012	1 940	2 003	1 845	1 791	1 839	1 889	1 924	1 928	1 929	1 931	1 940
World 'Atlantic' market price in USD/t	2 143	2 482	1 965	2 252	2 201	2 241	2 075	2 021	2 083	2 148	2 197	2 210	2 219	2 230	2 249
World 'Pacific' market price in EUR/t (US)	1 277	1 368	1 191	1 312	1 283	1 382	1 338	1 293	1 313	1 328	1 330	1 308	1 280	1 259	1 242
World 'Pacific' market price in USD/t	1 413	1 546	1 406	1 468	1 456	1 546	1 505	1 459	1 487	1 510	1 518	1 499	1 472	1 454	1 440

* r.w.e. = retail weight equivalent; Coefficient to transform carcass weight into retail weight is 0.78 for pigmeat

TABLE 8.35 EU poultry meat market balance (1 000 t c.w.e.)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gross Indigenous Production	12703	12746	13295	13471	13605	13696	13726	13766	13806	13846	13883	13925	13972	14022	14076
Imports (meat)	914	849	836	850	748	810	829	843	861	880	897	914	928	944	960
Exports (meat)	2 208	2 241	2 326	2 487	2 337	2 349	2 381	2 417	2 431	2 445	2 472	2 503	2 533	2 553	2 566
Consumption	11409	11354	11804	11834	12000	12103	12167	12201	12249	12294	12332	12352	12365	12416	12454
<i>per capita consumption (kg r.w.e.)*</i>	22.6	22.4	23.3	23.3	23.6	23.8	23.9	23.9	24.1	24.2	24.3	24.3	24.4	24.5	24.6
EU market price in EUR/t	1 857	1 895	1 922	1 907	1 881	1 843	1 864	1 905	1 942	1 986	2 013	2 024	2 034	2 048	2 063
World market price in EUR/t	1 384	1 463	1 314	1 448	1 321	1 310	1 322	1 350	1 388	1 417	1 434	1 440	1 446	1 454	1 463
World market price in USD/t	1 532	1 653	1 552	1 621	1 498	1 466	1 487	1 524	1 572	1 611	1 637	1 650	1 663	1 679	1 696

* r.w.e. = retail weight equivalent; Coefficient to transform carcass weight into retail weight is 0.88 for poultry meat.

TABLE 8.36 Aggregate EU meat market balance (1 000 t c.w.e.)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gross Indigenous Production	43476	43367	44442	44369	44242	44006	43933	43910	43831	43745	43653	43558	43472	43384	43311
Imports of live animals	4	4	4	4	3	3	3	3	3	4	4	4	4	4	4
Exports of live animals	319	344	347	340	308	300	291	281	272	264	257	249	242	235	230
Net Production	43161	43027	44099	44033	43937	43709	43646	43633	43562	43484	43400	43313	43234	43153	43085
Imports (meat)	1 587	1 520	1 546	1 561	1 400	1 472	1 500	1 510	1 532	1 561	1 585	1 609	1 629	1 649	1 670
Exports (meat)	6 529	6 406	6 551	7 295	7 238	6 823	6 821	6 949	7 048	7 109	7 130	7 148	7 159	7 160	7 166
Consumption	38218	38140	39093	38298	38086	38302	38315	38204	38058	37949	37880	37781	37706	37650	37568
<i>per capita consumption (kg r.w.e.)*</i>	68.5	68.2	69.9	68.4	68.0	68.4	68.3	68.2	68.0	67.9	67.8	67.7	67.7	67.7	67.6
of which Beef and Veal meat	11	10	11	11	10	10	10	10	10	10	10	10	10	10	10
of which Sheep and Goat meat	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
of which Pig meat	34	34	34	33	33	33	33	33	33	32	32	32	32	32	32
of which Poultry meat	23	22	23	23	24	24	24	24	24	24	24	24	24	25	25

* r.w.e. = retail weight equivalent; Coefficients to transform carcass weight into retail weight are 0.7 for beef and veal, 0.78 for pigmeat and 0.88 for both poultry meat and sheep and goat meat

TABLE 8.37 EU egg market balance (1 000 t)*

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	6 085	6 128	6 304	6 306	6 313	6 472	6 512	6 542	6 574	6 606	6 639	6 673	6 706	6 740	6 774
Imports	584	488	731	935	914	932	951	970	988	1 007	1 025	1 044	1 063	1 081	1 100
Exports	1 208	998	982	991	1 040	1 056	1 072	1 088	1 104	1 120	1 136	1 152	1 168	1 184	1 200
Total use	5 462	5 618	6 053	6 251	6 187	6 348	6 391	6 423	6 458	6 493	6 529	6 565	6 601	6 637	6 674
<i>per capita consumption (kg)</i>	12.3	12.6	13.6	14.0	13.8	14.2	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	15.0

* eggs for consumption

TABLE 8.38 EU olive oil market balance (1 000 t)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production	1 742	2 188	2 264	1 917	2 233	2 133	2 168	2 202	2 236	2 269	2 303	2 336	2 369	2 402	2 434
of which ES+PT	1352	1397	1890	1261	1696	1 562	1 587	1 612	1 637	1 662	1 686	1 710	1 734	1 758	1 782
of which IT+EL	377	775	359	640	520	555	564	572	581	590	599	608	616	625	634
Imports	92	182	147	252	100	143	150	141	136	119	107	104	102	101	99
Exports	616	624	709	821	790	800	805	813	826	845	871	905	940	975	1 010
Consumption	1 329	1 538	1 449	1 495	1 547	1 554	1 553	1 550	1 546	1 543	1 539	1 535	1 531	1 528	1 523
of which ES-IT-EL-PT	1040	1259	1123	1190	1232	1 218	1 212	1 202	1 192	1 182	1 172	1 161	1 151	1 141	1 131
of which other EU	289	279	326	305	316	336	341	348	354	361	367	373	379	386	392
<i>per capita ES-IT-EL-PT (kg)</i>	8.1	9.8	8.8	9.3	9.6	9.5	9.4	9.3	9.3	9.2	9.2	9.1	9.0	9.0	8.9
<i>per capita other EU (kg)</i>	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2
Ending stocks	322	531	783	638	638	560	520	500	500	500	500	500	500	500	500

Note: the olive oil marketing year is October/September

TABLE 8.39 EU wine market balance (million hectolitres)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Area (million ha)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.3	3.3
Yield (hl/ha)	53.4	41.6	57.	49.4	49.6	50.5	50.4	50.2	50.	49.8	49.6	49.4	49.2	49.	49.
Vinified production	171	133	183	157	159	163	163	162	162	162	161	161	161	160	160
of which 5 main producer MS	156	118	166	142	145	148	149	149	148	148	148	148	148	147	147
other EU MS	14	16	18	16	14	14	14	14	14	13	13	13	13	13	13
Imports	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Exports	31	31	30	29	30	30	30	30	30	31	31	31	31	31	31
Domestic use	143	128	139	138	142	146	141	140	140	139	139	138	138	137	137
Human consumption	119	113	118	110	111	117	116	116	116	115	115	114	114	113	113
<i>per capita consumption (l)</i>	26.8	25.3	26.3	24.6	24.8	26.1	26.0	25.9	25.8	25.8	25.7	25.6	25.5	25.4	25.4
Other uses	23	15	21	28	31	29	24	24	24	24	24	24	24	24	24
Ending stocks	170	153	175	173	168	163	163	163	163	163	163	163	163	163	163

Note: the wine marketing year is August/July

TABLE 8.40 EU apples market balance (1 000 t fresh equivalent)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Area (million ha)	507	506	507	507	516	515	513	511	510	508	507	505	504	502	500
Yield (t/ha)	23.9	19.	26.3	22.9	22.3	23.4	23.4	23.4	23.5	23.5	23.5	23.5	23.6	23.6	23.6
Gross production	12112	9 595	13333	11594	11527	12040	12016	11991	11966	11941	11916	11891	11866	11841	11815
of which losses and feed use	770	604	830	711	695	719	710	700	689	679	668	658	647	637	627
of which usable production	11 342	8 991	12 504	10 883	10 831	11 321	11 306	11 291	11 277	11 262	11 248	11 233	11 219	11 203	11 188
Production (fresh)	7 785	6 038	6 674	7 582	7 431	7 715	7 731	7 748	7 766	7 785	7 803	7 822	7 842	7 860	7 880
Imports (fresh)	308	412	361	377	390	390	390	390	390	390	390	390	390	390	390
Exports (fresh)	1 690	916	1 397	1 158	1 250	1 225	1 200	1 175	1 150	1 150	1 150	1 150	1 150	1 150	1 150
Consumption (fresh)	6 340	5 851	5 230	7 022	6 571	6 880	6 921	6 963	7 006	7 025	7 043	7 062	7 082	7 100	7 120
per capita (kg)	14.3	13.1	11.7	15.7	14.7	15.3	15.4	15.5	15.6	15.6	15.6	15.6	15.7	15.7	15.7
Ending stocks (fresh)	469	153	561	340	0	0	0	0	0	0	0	0	0	0	0
Production (for processing)	3 557	2 953	5 830	3 301	3 400	3 606	3 575	3 543	3 510	3 478	3 444	3 411	3 377	3 343	3 309
Imports (processed)	1 971	1 971	1 971	1 971	1 971	1 971	1 971	1 971	1 971	1 971	1 971	1 971	1 971	1 971	1 971
Exports (processed)	1 203	995	1 927	1 291	1 200	1 206	1 212	1 218	1 224	1 230	1 236	1 243	1 249	1 255	1 261
Apparent consumption (processed)	3 377	3 632	5 061	3 231	3 400	3 592	3 546	3 500	3 453	3 406	3 358	3 311	3 263	3 214	3 166
per capita (kg)	7.6	8.1	11.3	7.2	7.6	8.0	7.9	7.8	7.7	7.6	7.4	7.3	7.2	7.1	7.0

Note: the apples marketing year is August/July

** Consumption and trade figures of processed apples are expressed in fresh apple equivalent. For further info please see the STO methodology:

https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/short-term_en

TABLE 8.41 EU tomatoes market balance (1 000 t fresh equivalent)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production (total)	17491	17565	15935	16523	16030	16831	16837	16842	16846	16850	16853	16856	16858	16860	16861
Production (fresh)	6 751	6 460	6 443	6 196	6 097	6 107	6 115	6 123	6 130	6 137	6 143	6 148	6 153	6 157	6 161
Imports (fresh)	481	528	576	583	621	626	631	636	641	646	651	655	660	665	670
Exports (fresh)	522	492	482	459	430	430	430	430	430	430	430	430	430	430	430
Apparent consumption (fresh)	6 710	6 496	6 536	6 320	6 288	6 303	6 316	6 329	6 341	6 352	6 363	6 374	6 383	6 393	6 401
per capita (kg)	15.1	14.5	14.6	14.1	14.0	14.1	14.1	14.1	14.1	14.2	14.2	14.2	14.3	14.3	14.3
Production (for processing)	10740	11105	9 492	10326	9 933	10724	10721	10719	10716	10713	10711	10708	10705	10703	10700
Imports (processed)	2 739	2 166	2 082	2 131	1 961	2 126	2 140	2 154	2 168	2 181	2 195	2 209	2 223	2 236	2 250
Exports (processed)	4 085	4 169	4 392	4 612	4 397	4 319	4 317	4 315	4 313	4 311	4 309	4 306	4 304	4 302	4 300
Apparent consumption (processed)	9 395	9 102	7 182	7 845	7 497	8 531	8 544	8 558	8 571	8 584	8 597	8 610	8 624	8 637	8 650
per capita (kg)	21.1	20.4	16.1	17.5	16.7	19.0	19.1	19.1	19.2	19.2	19.3	19.3	19.3	19.4	19.4

** Consumption and trade figures of processed tomatoes are expressed in fresh tomatoe equivalent. For further info please see the STO methodology:

https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/short-term_en

TABLE 8.42 EU peaches and nectarines market balance (1 000 t fresh equivalent)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production (total)	3 986	4 362	3 838	4 046	3 120	3 631	3 632	3 632	3 632	3 632	3 632	3 632	3 632	3 632	3 631
Area (1000 ha) (fresh)	196	193	186	175	170	168	167	167	166	166	165	165	164	164	162
Yield (t/ha) (fresh)	16.9	18.8	16.8	17.9	14.4	17.6	17.7	17.8	17.8	17.9	17.9	18.	18.	18.1	18.3
Production (fresh)	3 312	3 622	3 115	3 140	2 463	2 963	2 963	2 963	2 963	2 963	2 963	2 963	2 963	2 963	2 963
Imports (fresh)	24	19	27	24	29	29	29	29	29	29	29	30	30	30	30
Exports (fresh)	312	344	226	258	200	230	233	236	239	242	245	248	251	254	257
Apparent consumption (fresh)	3 024	3 298	2 917	2 906	2 292	2 762	2 759	2 757	2 754	2 751	2 748	2 745	2 742	2 739	2 736
per capita (kg)	6.8	7.4	6.5	6.5	5.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Area (1000 ha) (for processing)	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
Yield (t/ha) (for processing)	23.5	25.8	24.5	24.3	22.3	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
Production (for processing)	675	740	722	718	657	668	668	668	668	668	668	668	668	668	668
Imports (processed)	14	16	15	10	11	11	11	11	11	12	12	12	12	12	12
Exports (processed)	183	167	158	174	192	205	208	211	213	216	219	222	224	227	230
Apparent consumption (processed)	506	589	580	553	476	474	472	469	466	464	461	458	456	453	450
per capita (kg)	1.1	1.3	1.3	1.2	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

** Consumption and trade figures of processed tomatoes are expressed in fresh tomatoe equivalent. For further info please see the STO methodology:

https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/short-term_en

TABLE 8.43 EU oranges market balance (1 000 t fresh equivalent)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production (total)	6 325	6 206	6 515	6 220	6 505	6 302	6 316	6 359	6 375	6 399	6 413	6 442	6 464	6 486	6 506
Area (million ha)	279	272	274	273	273	272	272	271	271	271	271	271	272	272	272
Yield (t/ha)	22.7	22.8	23.8	22.8	23.8	23.2	23.2	23.4	23.5	23.6	23.6	23.7	23.8	23.9	23.9
Production (fresh)	4 834	5 052	5 136	5 140	5 205	5 072	5 096	5 149	5 175	5 209	5 233	5 272	5 304	5 336	5 366
Imports (fresh)	861	909	881	995	930	940	950	960	970	980	990	1 000	1 010	1 020	1 030
Exports (fresh)	419	443	494	420	460	465	470	475	480	485	490	495	500	505	510
Apparent consumption (fresh)	5 276	5 518	5 524	5 716	5 675	5 547	5 576	5 634	5 665	5 704	5 733	5 777	5 814	5 851	5 886
per capita (kg)	11.9	12.4	12.4	12.8	12.7	12.4	12.4	12.6	12.7	12.8	12.8	12.9	13.0	13.1	13.2
Production (for processing)	1 491	1 154	1 379	1 080	1 300	1 230	1 220	1 210	1 200	1 190	1 180	1 170	1 160	1 150	1 140
Imports (processed)	4 432	4 390	4 189	4 101	4 051	4 035	4 020	4 005	3 990	3 975	3 960	3 945	3 930	3 915	3 900
Exports (processed)	1 543	1 614	1 580	1 563	1 553	1 565	1 570	1 575	1 580	1 585	1 590	1 595	1 600	1 605	1 610
Apparent consumption (processed)	4 380	3 929	3 988	3 618	3 798	3 700	3 670	3 640	3 610	3 580	3 550	3 520	3 490	3 460	3 430
per capita (kg)	9.8	8.8	8.9	8.1	8.5	8.3	8.2	8.1	8.1	8.0	7.9	7.9	7.8	7.8	7.7

Note: the oranges marketing year is October/September

** Consumption and trade figures of processed tomatoes are expressed in fresh tomatoe equivalent. For further info please see the STO methodology:

https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/short-term_en

TABLE 8.44 EU agricultural income (2018-2020=100)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Factor income in nominal terms	90.6	101.4	98.0	100.6	99.8	100.4	101.4	103.8	105.1	105.9	106.6	107.4	108.4	109.5	110.7
Factor income in real terms	93.5	103.0	98.2	98.8	96.5	96.0	95.5	96.2	95.8	94.8	93.8	93.2	92.5	92.1	91.6
Labour input	102.8	101.4	100.2	98.4	97.8	96.8	95.9	94.9	93.9	93.0	92.0	91.1	90.1	89.2	88.2
Factor income in real terms per labour unit	91.0	101.6	98.0	100.4	98.7	99.2	99.6	101.4	101.9	102.0	102.0	102.3	102.7	103.3	103.8

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