

Main trends for the European agricultural markets and the future of the CAP

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Main trends for the European agricultural markets and the future of the CAP

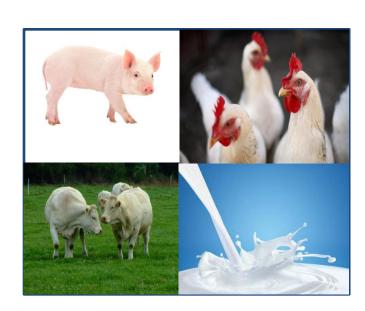
With a focus on animal productions



Vincent CHATELLIER INRA, UMR SMART-LERECO



Tokyo, 16th January 2018



Plan

- 1- EU agriculture and agri-food trade
- 2- Animal productions in the EU
 - 2-1- Pig sector
 - 2-2- Poultry sector
 - 2-3- Beef sector
 - 2-4- Dairy sector
- 3- The Common Agricultural Policy (CAP)
 - 3-1- The previous CAP reforms and subsidies to EU farmers
 - 3-2- The future of EU and CAP





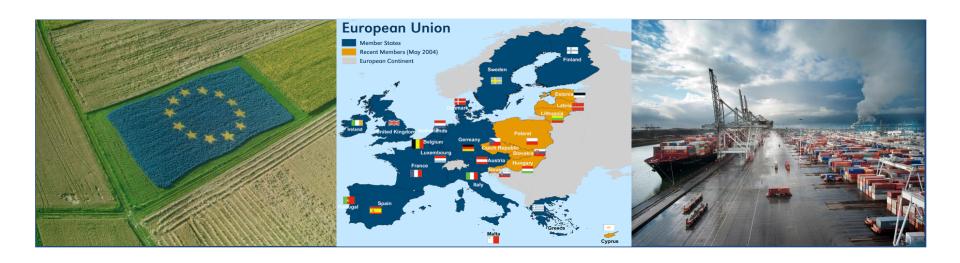
Introduction: EU-Japan Economic Partnership Agreement

- Over time around 85% of EU agri-food products (in tariff lines) will be allowed to enter Japan entirely duty-free (such as Pork).
 Tariffs will be cut from 38% to 9% over 15 years for a significant volume of beef products.
 The tariffs on wine will be scrapped from day one, as will tariffs for other alcoholic drinks.
 As regards cheese exports, high duties on many hard cheeses such as Gouda and Cheddar (which currently are at 29.8%) will be eliminated, and a duty-free quota will be established for fresh cheeses such as Mozzarella.
- The EU-Japan agreement will also scrap today's customs duties (with a transitional period) for processed agricultural products such as pasta, chocolates, cocoa powder, candies, confectionary, biscuits, tomato sauce, etc. There will also be significant quotas for EU exports (duty-free or with reduced duty) of malt, potato starch, SMP, butter and whey.
- ☐ The EU-Japan agreement recognises the special status and offers protection on the Japanese market to more than 200 European agricultural products from a specific European geographical origin, known as Geographical Indications (GIs).





1- EU agriculture and the agri-food trade







EU: population, territory and agricultural specialization

→ EU Population: 510 million (7% of the world population)

- Germany (82); France (66); UK (65); Italy (60); Spain (46); Poland (38)
- People living in rural areas: 20%
- 16% of the EU-28 population is younger than 15 years
- Average population density: 116

→ Territory (land cover): 437 million ha

- 174 million ha of Usable Agriculural Area (UAA = 40% of EU land cover)
- 61% of the UAA is used for arable crops
- 6% of the total UAA is irrigated
- 6% of the total UAA is under organic farming

→ Agricultural output: 358 billion euros

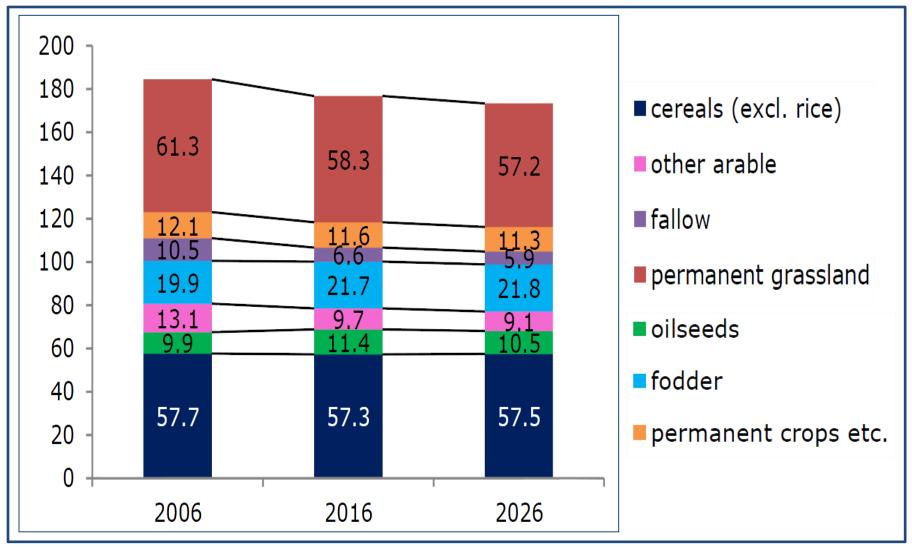
- Crop output (57%)
- Animal output (43%)





Agricultural land-use developments in the EU

(Million hectares)



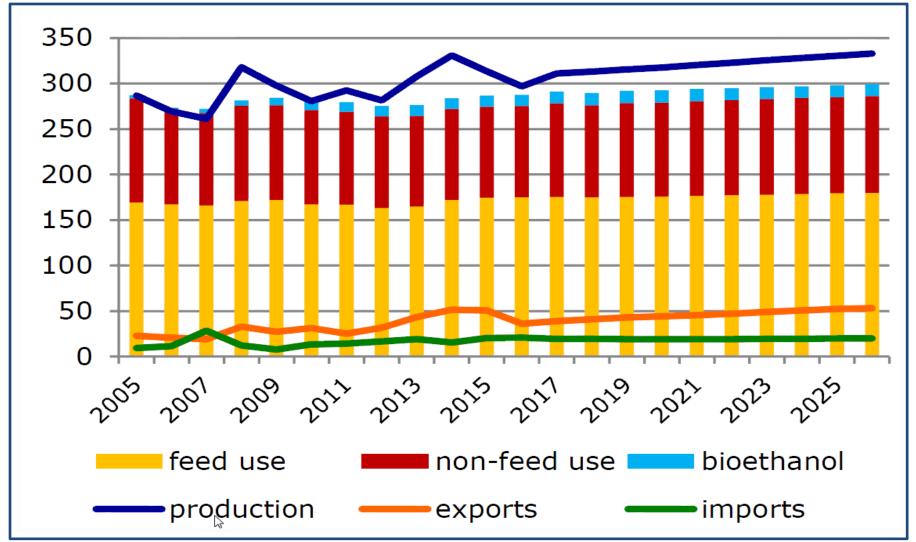
European Commission-DGAGRI





EU cereal market developments

(Million tons)



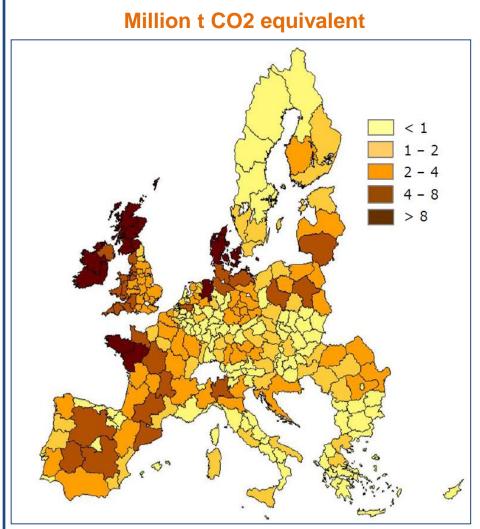
European Commission-DGAGRI





Non-CO2 greenhouse gas (GHG) emissions in 2030 in the EU

(Million t CO2 equivalent)



- → Agriculture accounts for slightly more than 10 % of EU-28 GHG emissions.
- According to the CAPRI projection, total non-CO2 (CH4 and N2O) GHG emissions from agriculture are **expected to decrease by 2030** (-1.5 % to 433 million t CO2 equivalent) compared to 2008.
- Overall, the livestock sector will contribute directly to 72 % of the non-CO2 GHG emissions of agriculture in 2030, if emissions from manure on the field are allocated to the livestock sector.
- ☐ In 2030, livestock will continue to be responsible for 99 % of all methane (CH4) emissions from agriculture, the biggest share (85 %) coming from ruminants digestion.

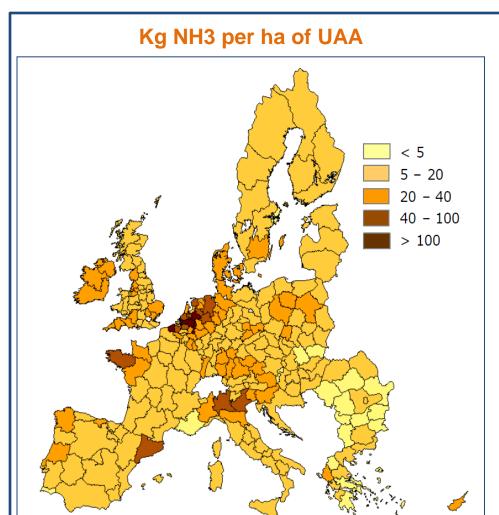
DG JRC, based on the 2016 CAPRI baseline





Ammonia emissions in 2030 in EU

(Million hectares)



- 93 % of the EU-28 NH3 emissions is associated with agriculture, especially with manure management (80 %) and mineral fertiliser use (20 %).
- ☐ In the atmosphere NH3 can combine with other forms of air polluters such as nitrogen oxides released by transport, industrial and household activities, and contribute to the formation of airborne particulate matter (PM2.5), with strong negative impacts on human health.

DG JRC, based on the 2016 CAPRI baseline

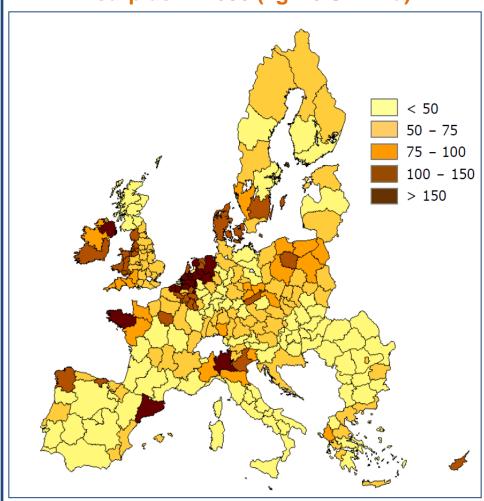




N surplus in 2030

(Kg N per ha of UAA)

N surplus in 2030 (kg N / UAA ha)



- □ High levels of N surplus indicate higher losses of nitrogen to the atmosphere (NH3 and N2O emissions) and nitrate leaching to surface and underground water, leading to eutrophication.
- □ In 2030, the projected average N surplus in the EU- 28 is close to 63 kg N/ha, 2.6 % lower than in 2008. This is due to a general increase in N-use efficiency.
- ☐ The average N surplus per ha increases specially in regions where animal numbers (mainly pigs) increase, together with a decrease in UAA (e.g. Catalonia).

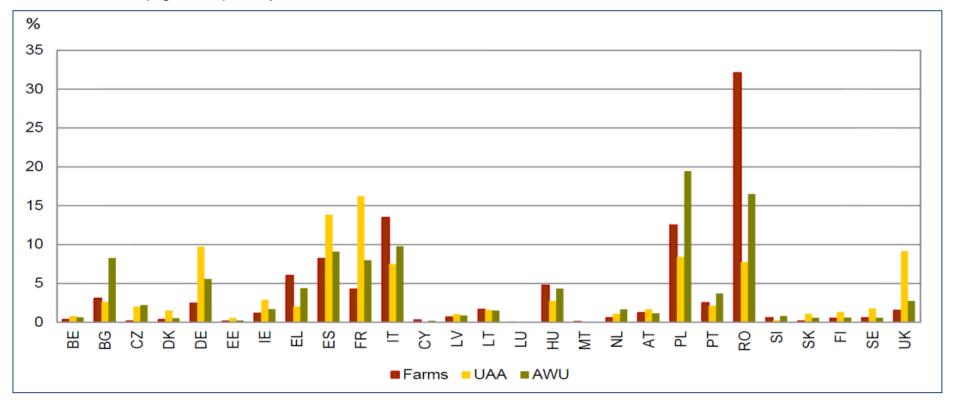
DG JRC, based on the 2016 CAPRI baseline





EU agriculture: keys elements

- → Agricultural Work Unit (AWU): 9,5 million (22 million people)
- → EU farms: 11 million
 - 34% arable crops; 21% grazing livestock; 17% permanents crops; 14% mixed farming;
 10% pigs and poultry; 2% horticulture







A delicate context for too many EU farms

→ A lack of profitability and cash flow difficulties

- Some important productivity gains, but insufficient economic return
- Sales prices of agricultural products are too low compared to production costs
- Strong dependence on direct aids and future directions of the CAP

Uncertainty weighing on generational transitions

- Price volatility weakens investment strategies
- It is difficult (quite impossible) for young farmers to buy a farm
- The requirement on working conditions implies more collective work

→ Agriculture is the subject of much criticism by citizens

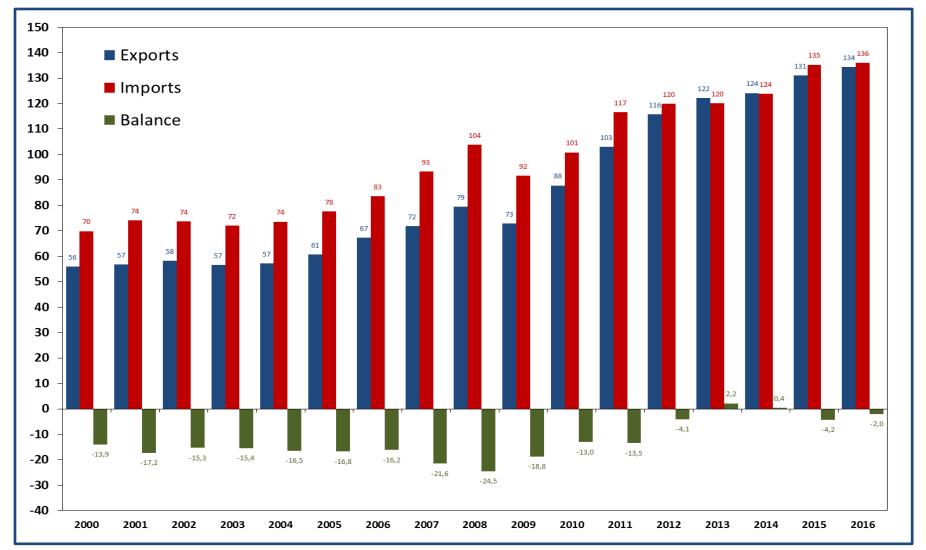
- Debates with citizens are rarely informed by scientific knowledge
- Consumers demand a lot, but without paying the price





EU agri-food trade

(Billion current euros, 2000 to 2016)

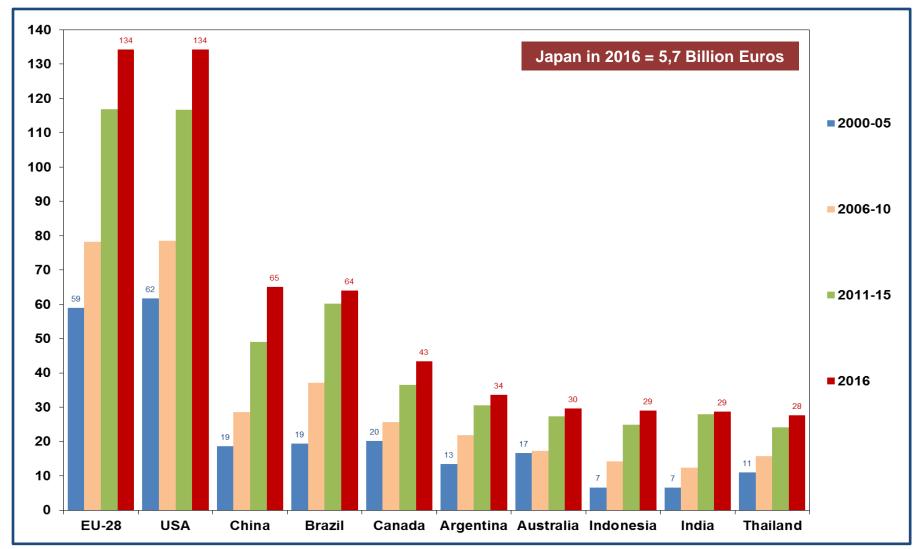






Top 10 global exporters in the agri-food sector

(Billion current euros, 2000 to 2016)



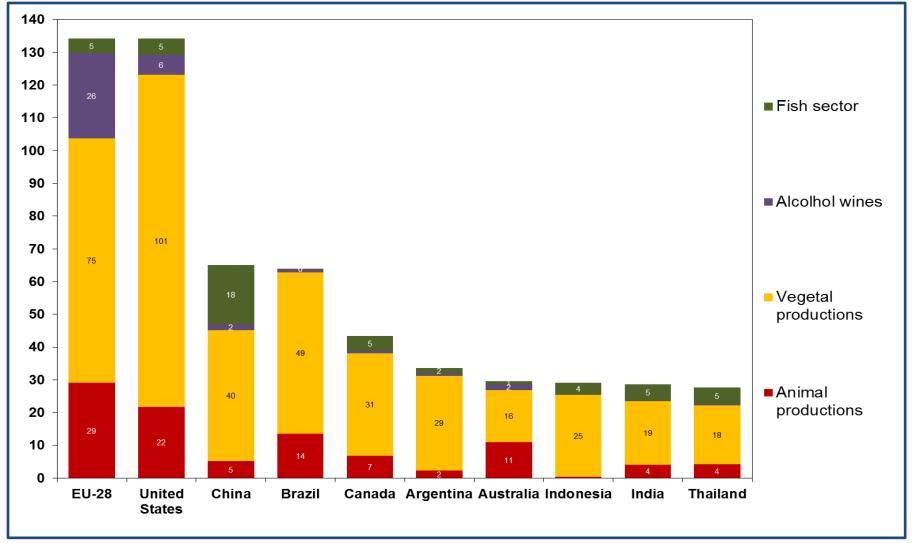
COMTRADE / INRA, SMART-LERECO





Top 10 global exporters in the agri-food sector in 2016

(According to the types of products, billion euros)



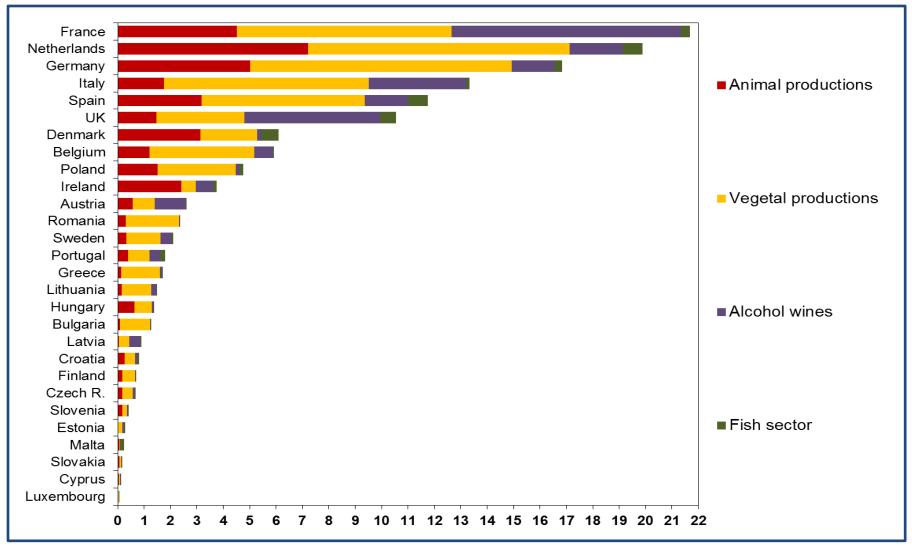
COMTRADE / INRA, SMART-LERECO





EU Member states agri-food exports to non-EU markets in 2016

(According to the types of products, billion euros in 2016)

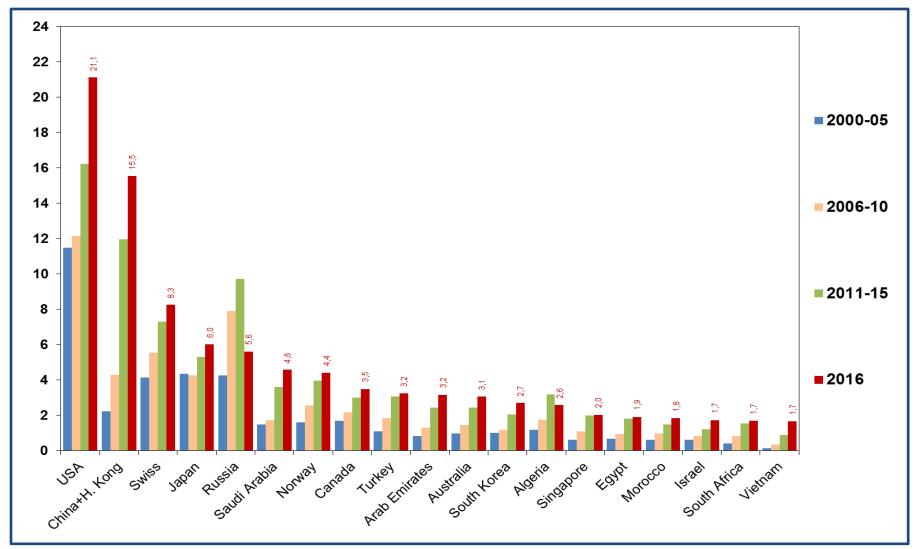






The top 20 EU customers in the agri-food sector

(Billion current euros, 2000 to 2016)

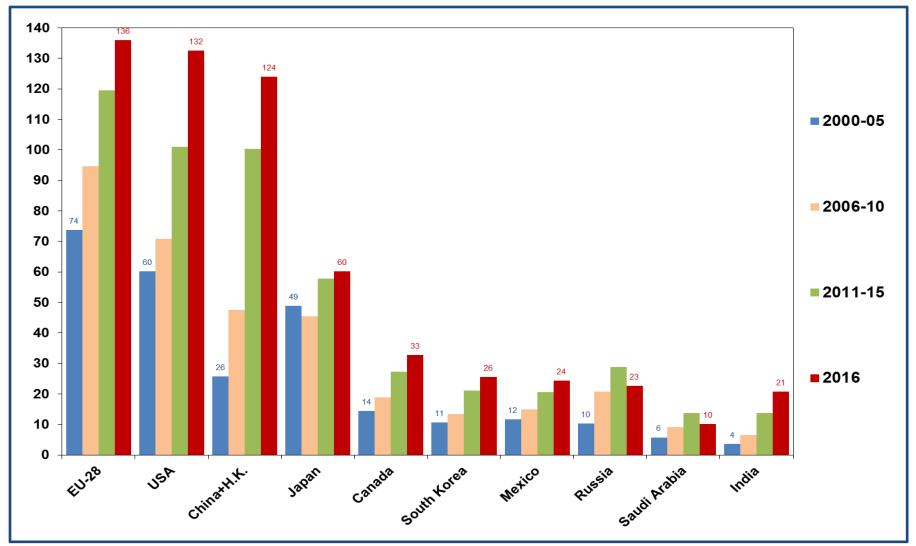






Top 10 global importers in the agri-food sector

(Billion current euros, 2000 to 2016)



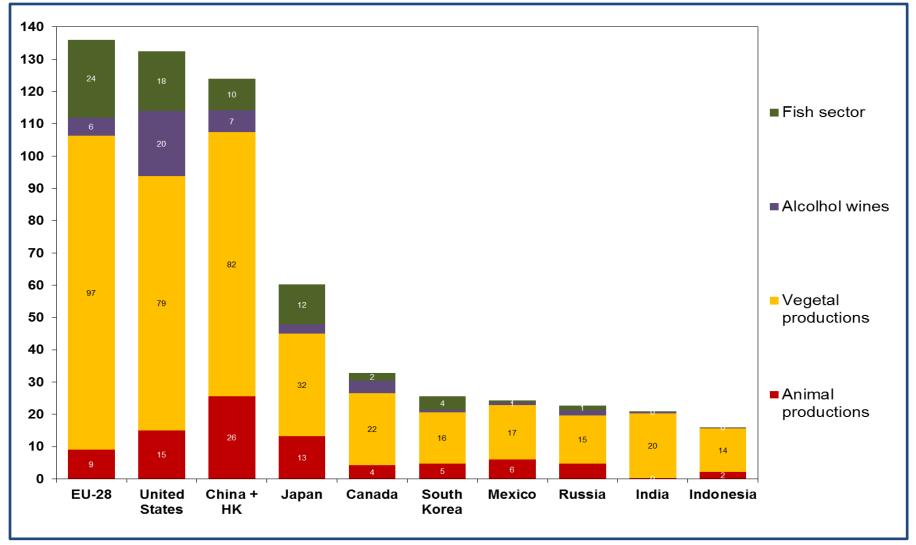
COMTRADE / INRA, SMART-LERECO





Top 10 global importers in the agri-food sector in 2016

(According to the types of products, billion euros)



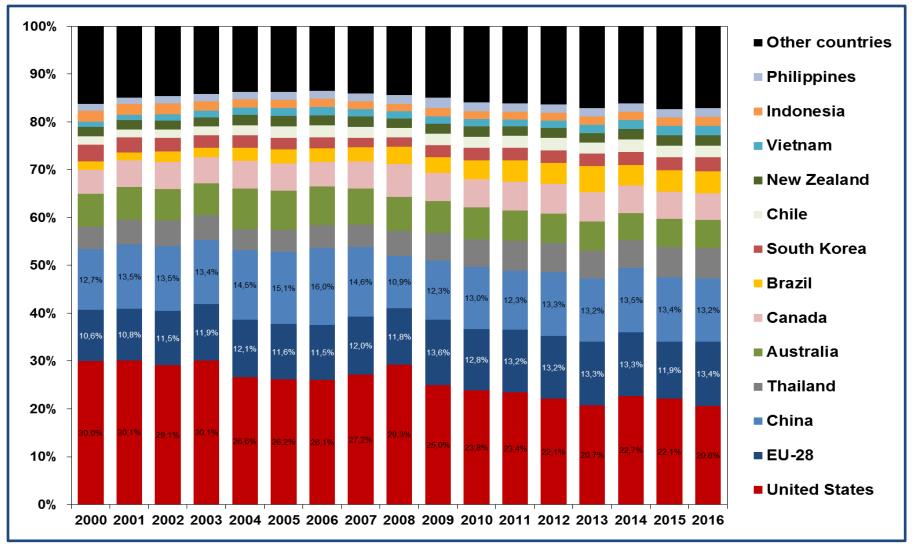
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The EU's place in Japan agri-food imports

(%, 2000 to 2016)

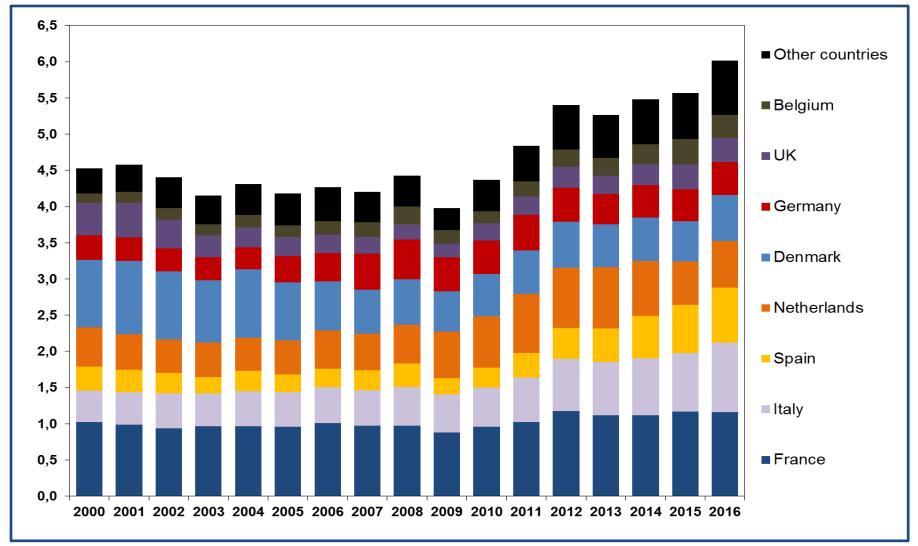






The EU Member states exports of agri-food towards Japan

(Billion current euros, 2000 to 2016)

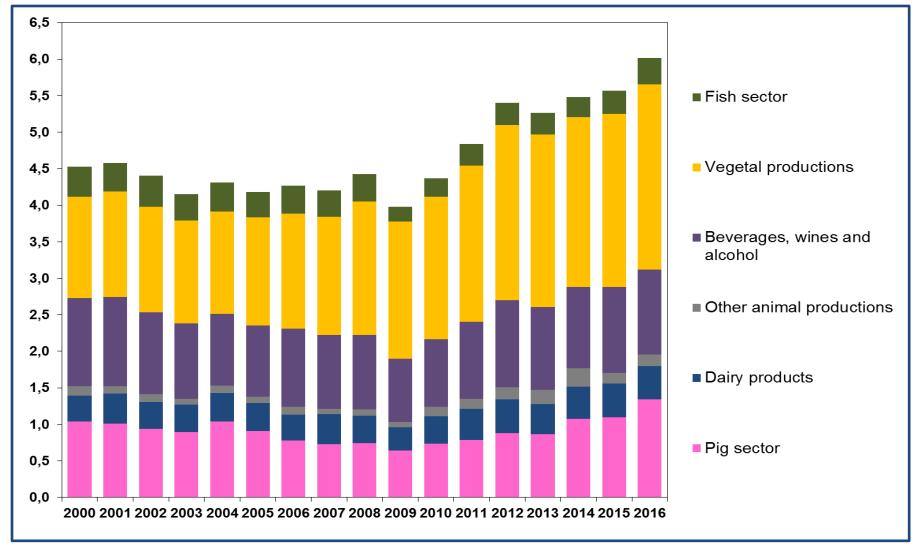






The EU exports of agri-food products towards Japan

(Billion current euros, 2000 to 2016)

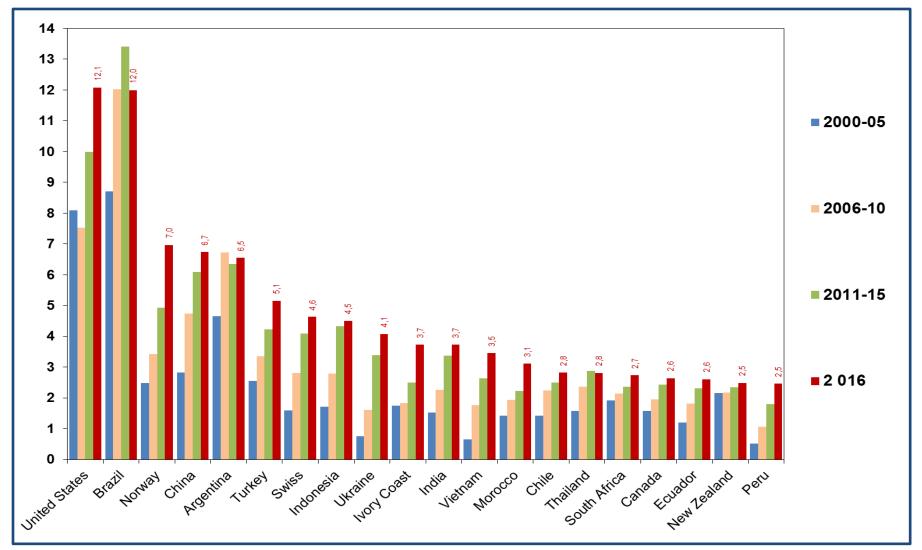






The top 20 EU suppliers in the agri-food sector

(Billion current euros, 2000 to 2016)

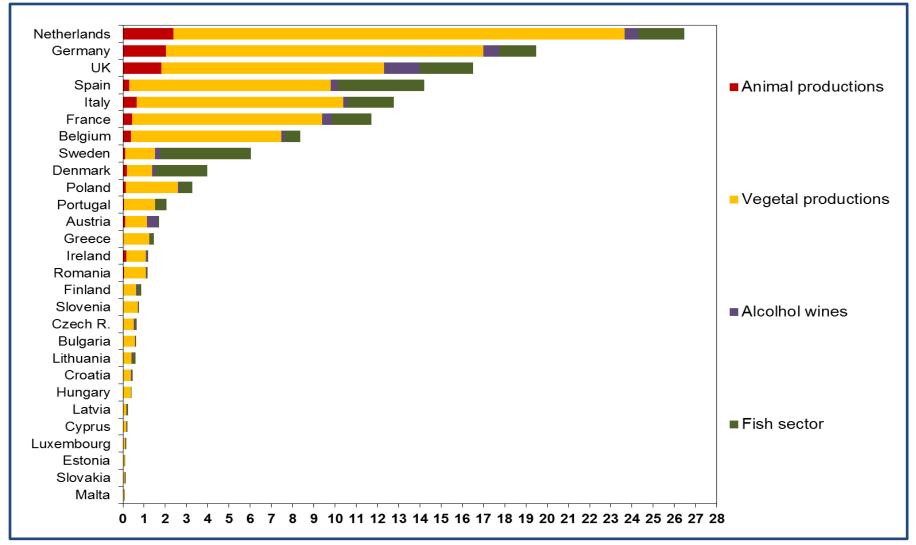






EU Member states agri-food imports from non-EU countries

(According to the types of products, billion euros in 2016)

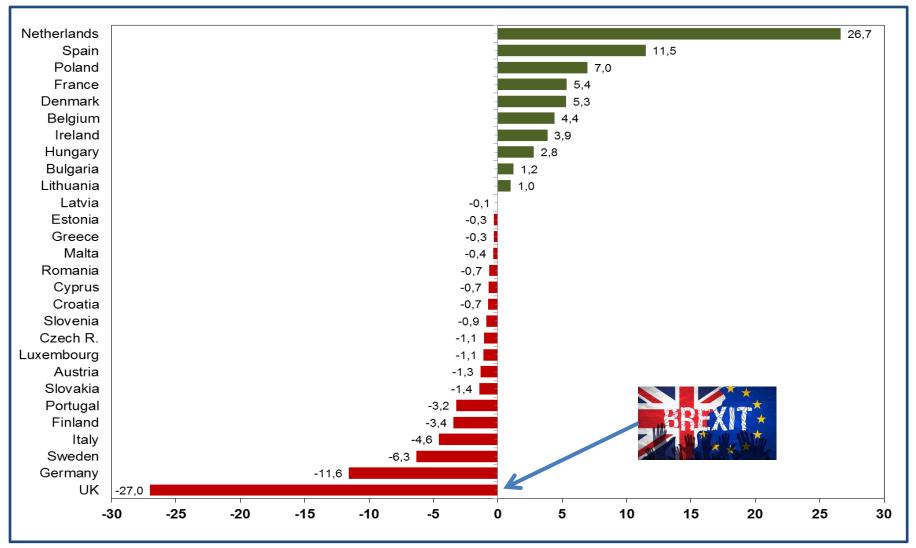






Agri-food balance* of the EU Member States in 2016

(Billion euros, 2016)



(*) Intra-EU and extra-EU

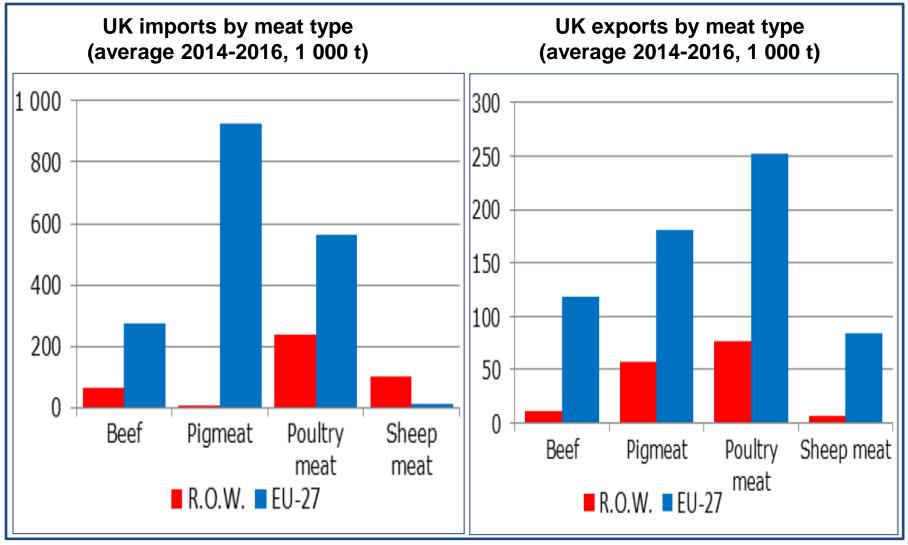
Eurostat - COMEXT / INRA, SMART-LERECO





United Kingdom trade in meat productions

(Thousand tons, average 2014-2016)









A focus on the French agri-food sector: main challenges

→ Increasing intra-Community competition (Northern countries)

- Standards (social, environmental, etc.) less demanding than in France
- Poland increase its production (poultry and milk); Spain (pork and vegetables)
- Germany is geographically located in the heart of Europe

Only external markets are really increasing

- Russia and Ukraine develop their export of cereals
- The rise of food imports is strong especially in the developing countries

→ How to preserve or develop our competitiveness?

- Reduce production costs throughout the agrifood chain
- Make imitation difficult (technology, quality, environmental standards...)
- Use of non-transferable resources (Geographical Indications)
- Innovate and reinvest margins to ensure differentiation





2- Animal productions in the EU







2-1- Pig sector in the EU





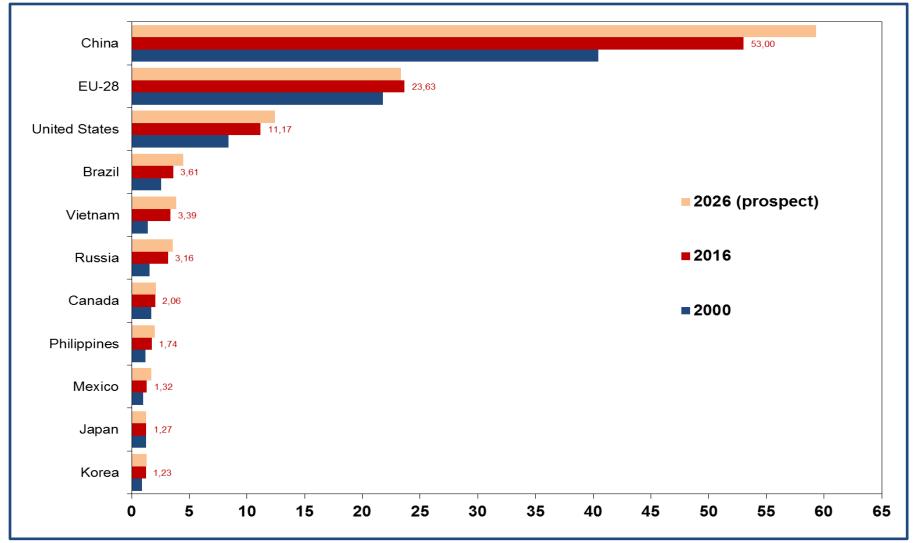






World pig meat production: main countries

(Million tons, 2000, 2016 and prospect 2026)



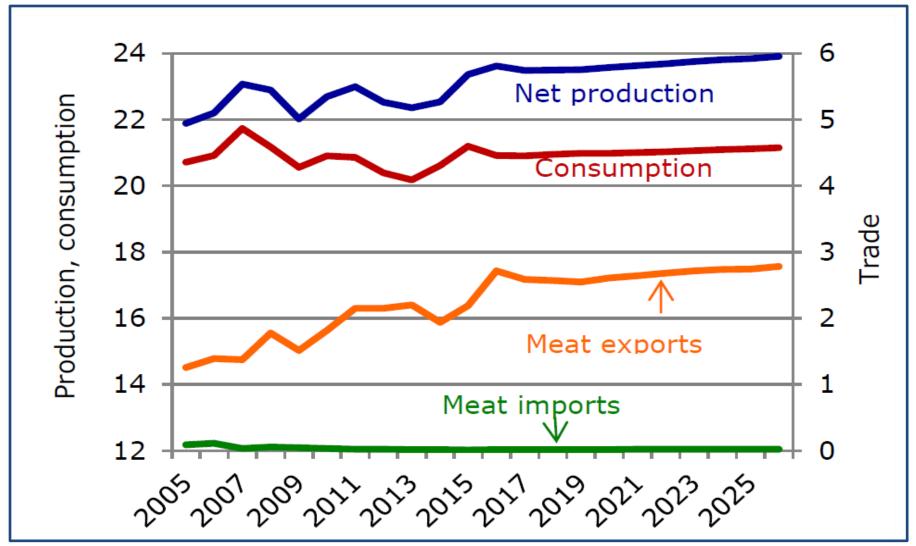
OECD-FAO agricultural outlook 2017-2026





EU pig meat sector

(Million tons, 2005, 2016 and prospect 2026)



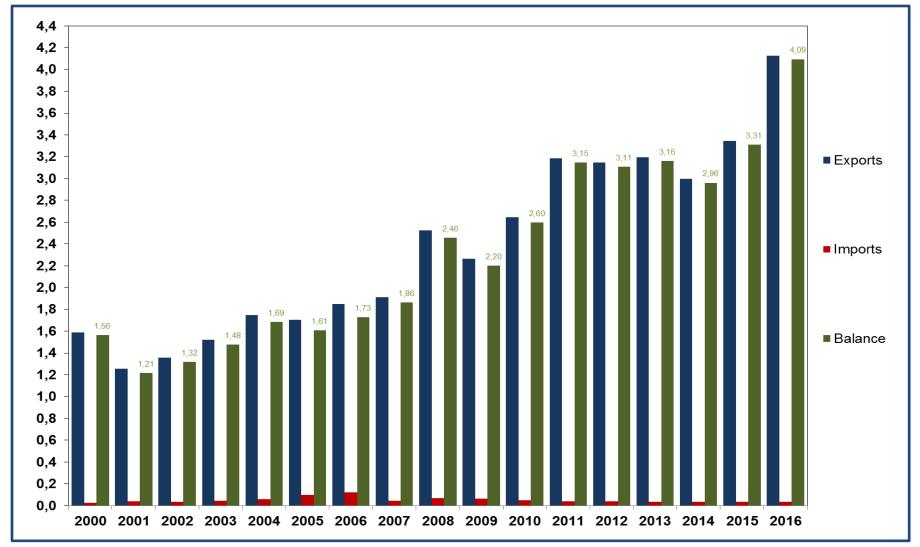
European Commission – Prospects for agricultural markets 2016-2026





EU export, import and trade balance for pig meat

(Million tons of carcass equivalent, 2000 to 2016)

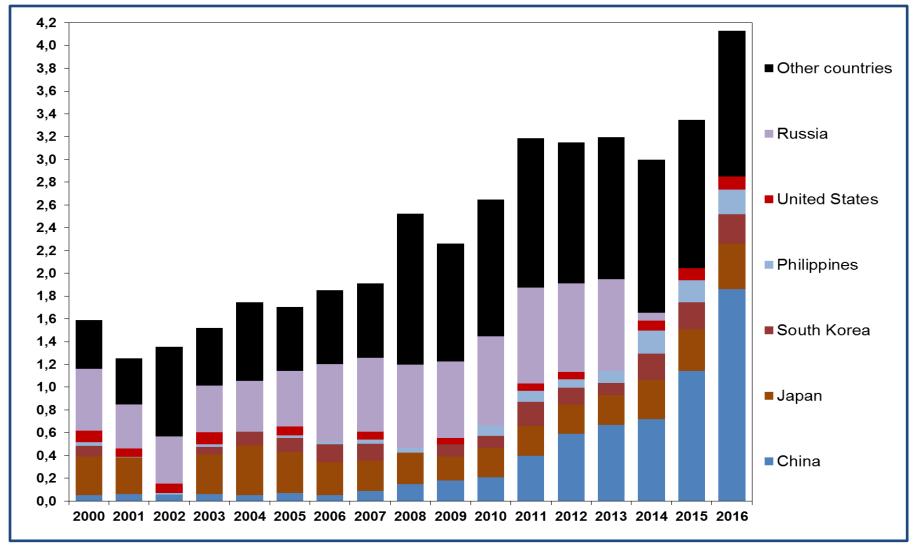






EU export of pig meat: main customers

(Million tons of carcass equivalent, 2000 to 2016)

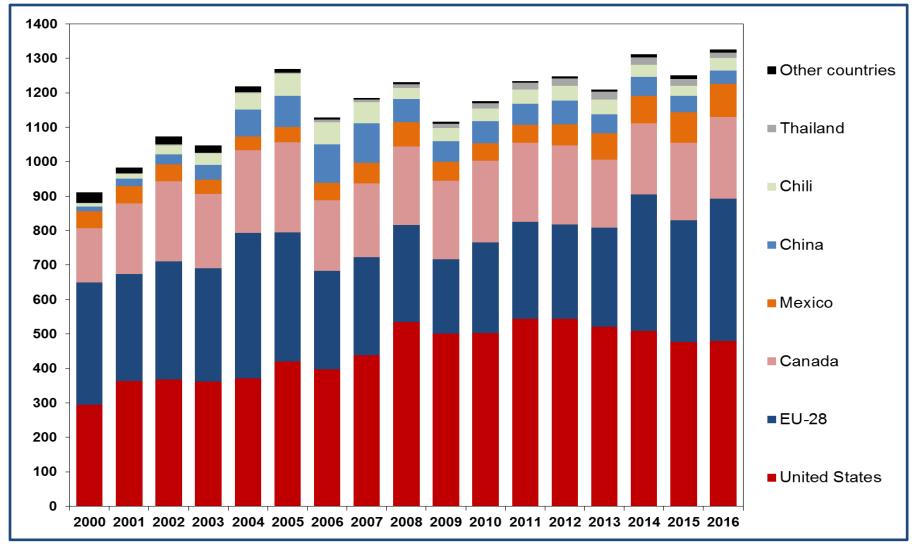






Japan import of pig meat: main suppliers

(Thousand tons of carcass equivalent, 2000 to 2016)

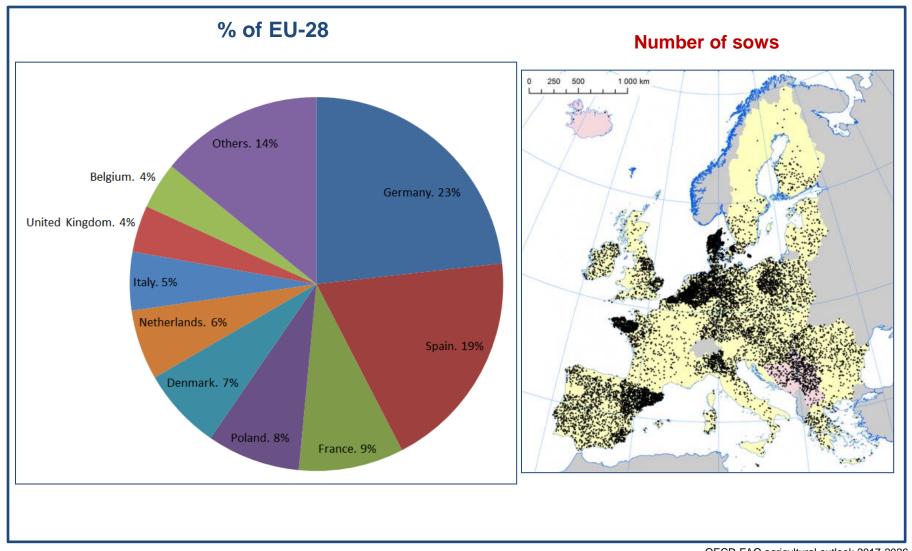


2016 : Denmark (150 300 tce) ; Spain (108 500) ; Netherlands (39 600) ; Germany (27 300) ; Hungary (26 800) ; France (16 000)





EU pig meat production according to Member states



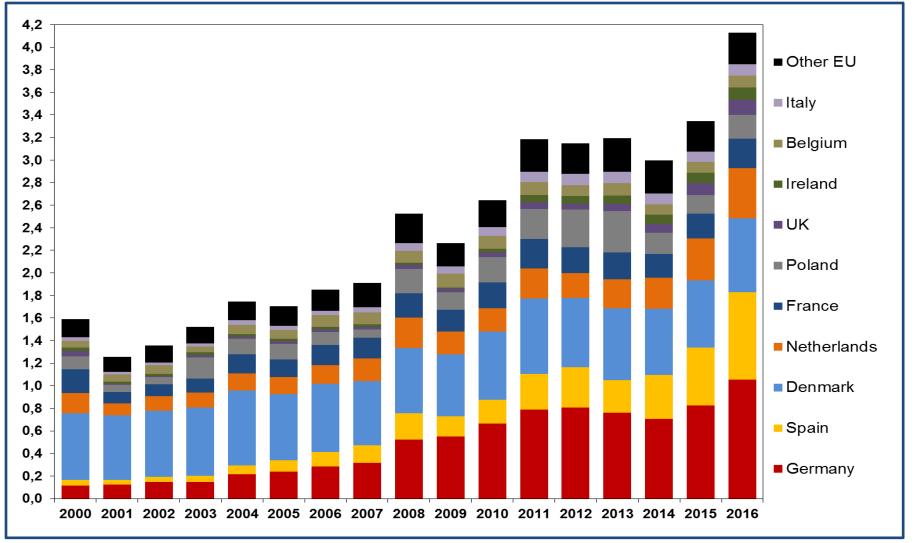
OECD-FAO agricultural outlook 2017-2026





EU Member states export of pig meat towards non EU countries

(Million tons of carcass equivalent, 2000 to 2016)



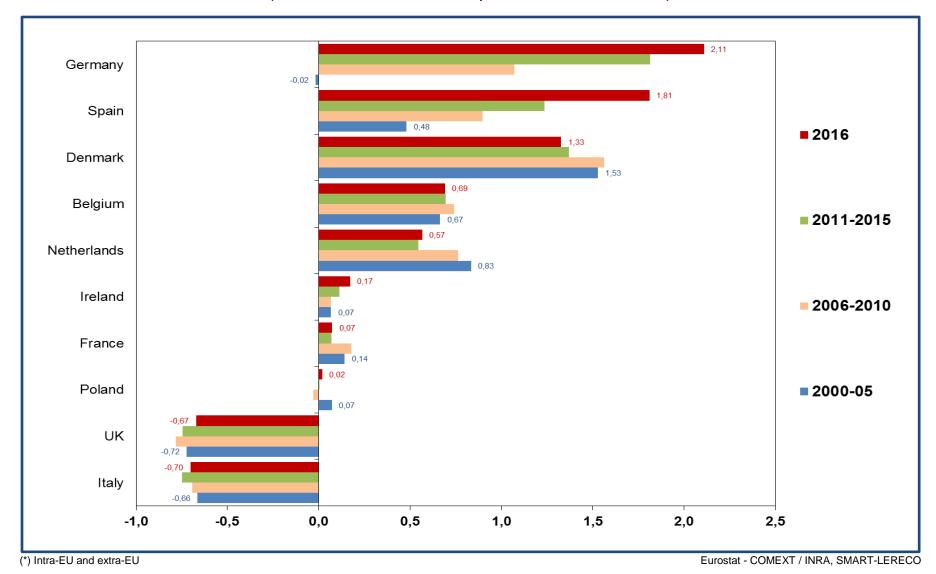






Trade balance* for pig meat in some EU member states

(Million tons of carcass equivalent, 2000 to 2016)







2-2- Poultry sector in the EU

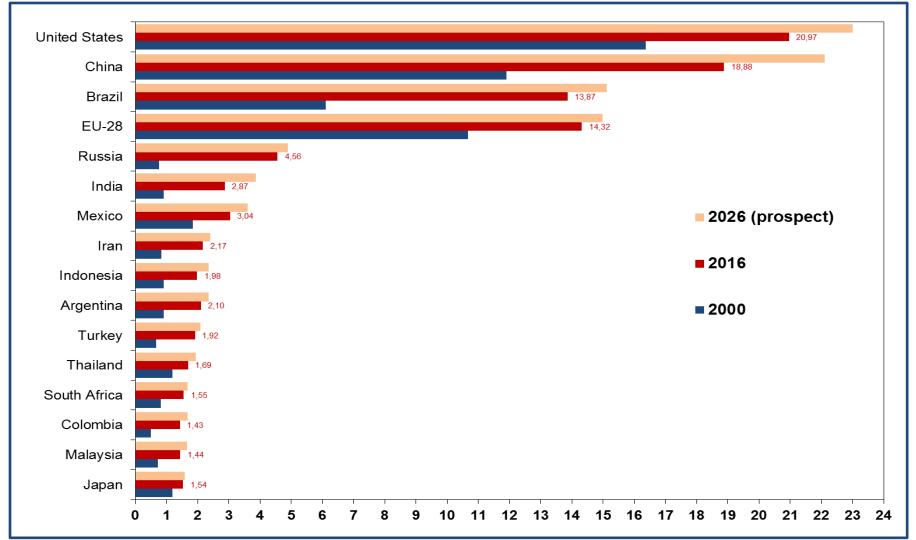






World poultry meat production: main countries

(Million tons, 2000, 2016 and prospect 2026)



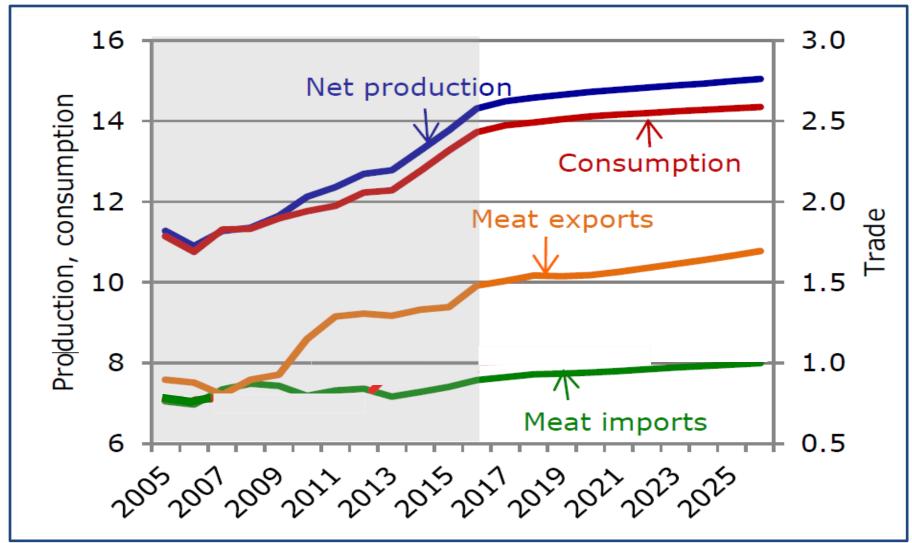
OECD-FAO agricultural outlook 2017-2026





EU poultry meat sector

(Million tons, 2000 to 2016)



A tariff-rate quota (TRQ)

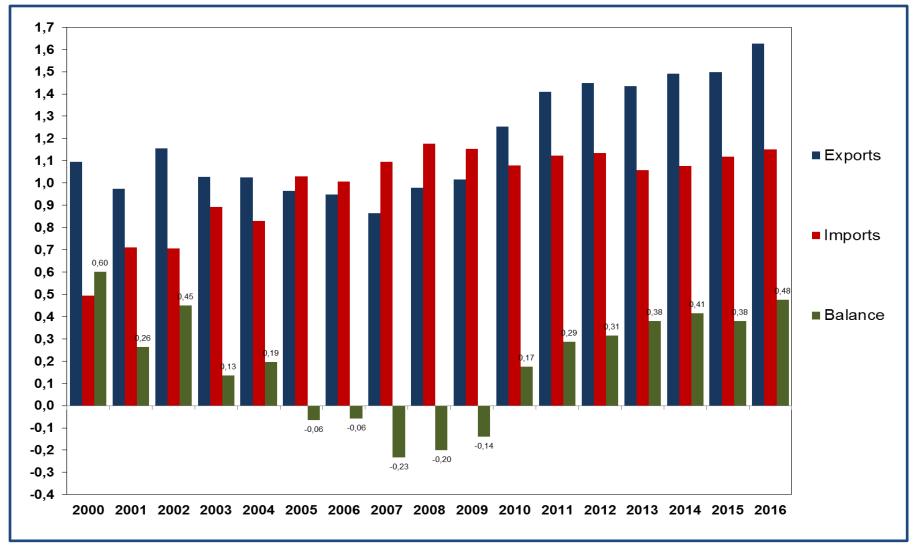
European Commission – Prospects for agricultural markets 2016-2026





EU export, import and trade balance for poultry meat

(Million tons of carcass equivalent, 2000 to 2016)

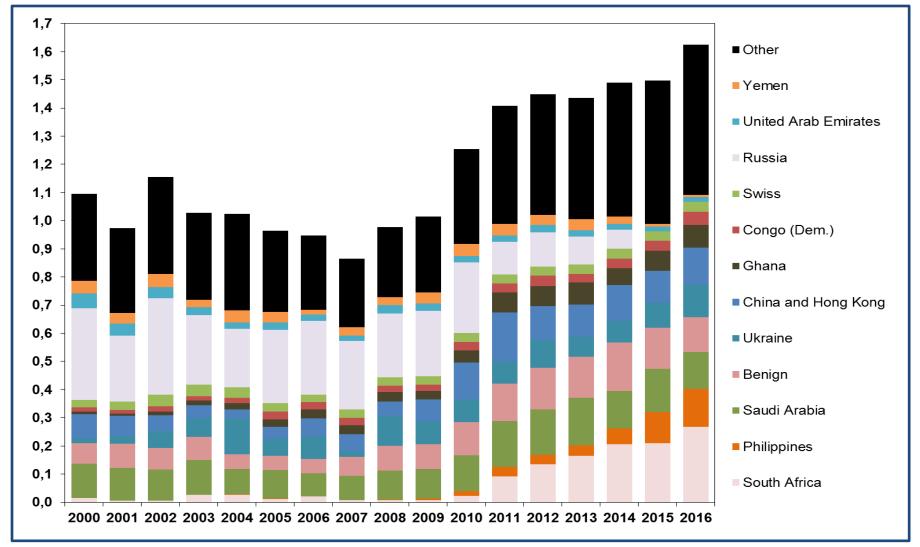






EU export of poultry meat: main customers

(Million tons of carcass equivalent, 2000 to 2016)

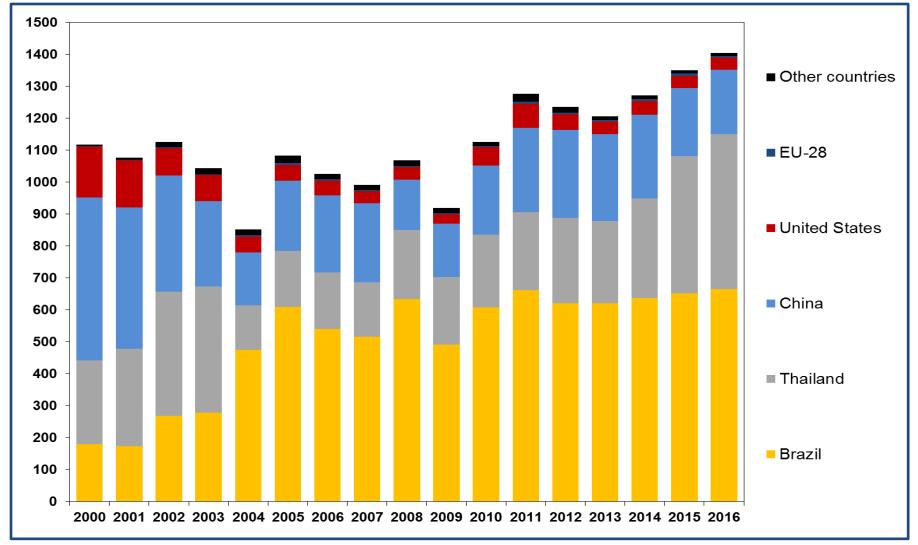






Japan import of poultry meat: main suppliers

(Thousand tons of carcass equivalent, 2000 to 2016)

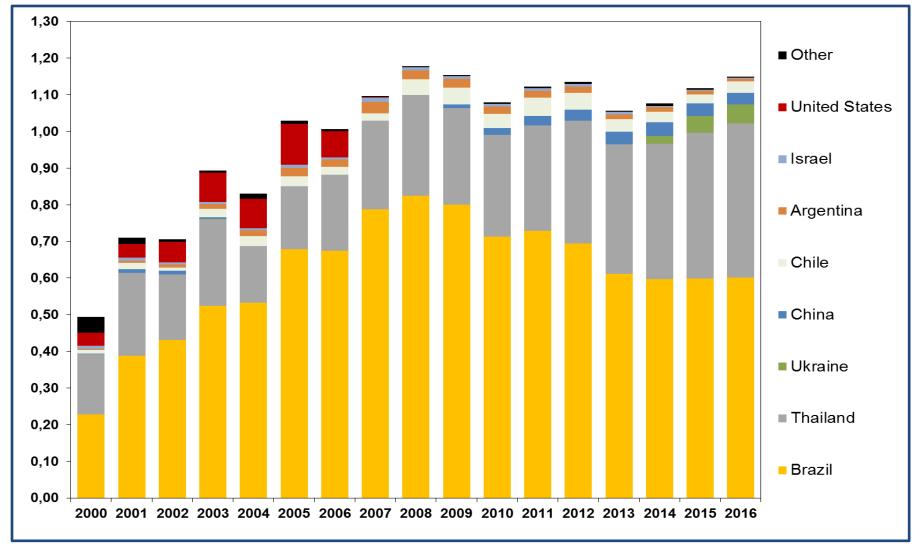






EU import of poultry meat: main suppliers

(Million tons of carcass equivalent, 2000 to 2016)

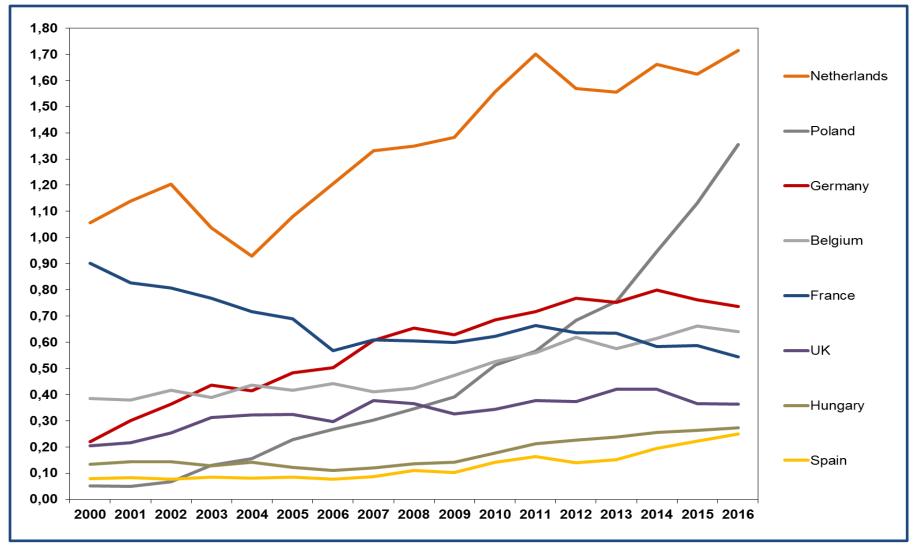






EU member states poultry production

(Million tons of carcass equivalent, 2000 to 2016)



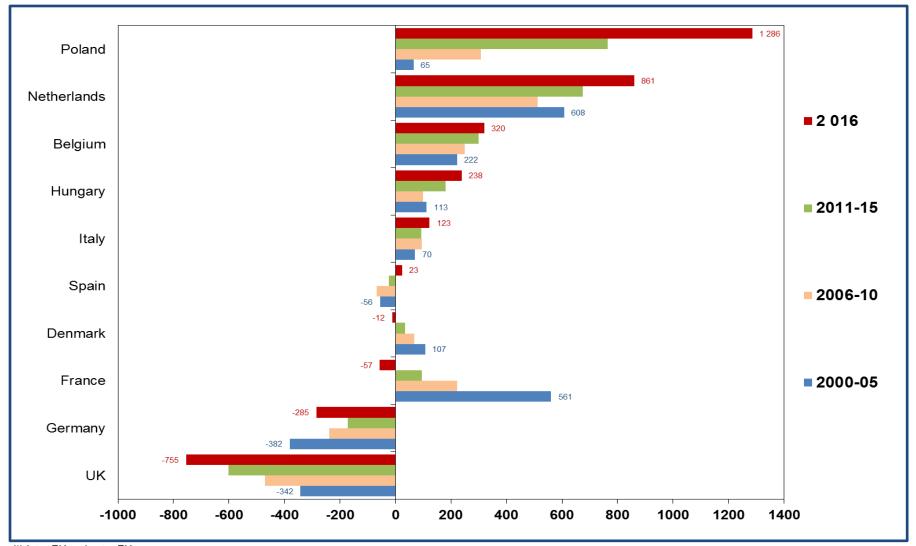
European Commission - Eurostat





Trade balance* for poultry meat in some EU member states

(Thousand tons of carcass equivalent, 2000 to 2016)



(*) Intra-EU and extra-EU European Commission - Eurostat





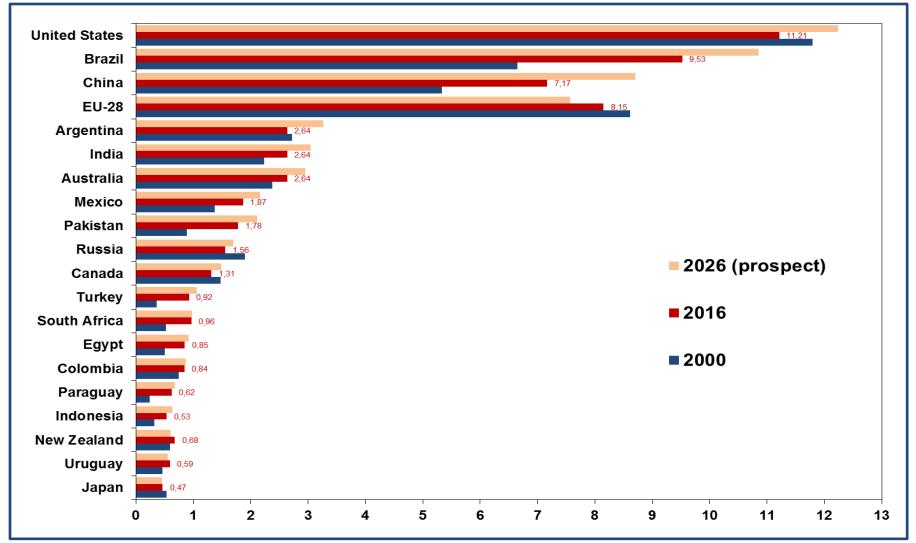
2-3- Beef sector in the EU





World beef meat production: main countries

(Million tons, 2000, 2016 and prospect 2026)



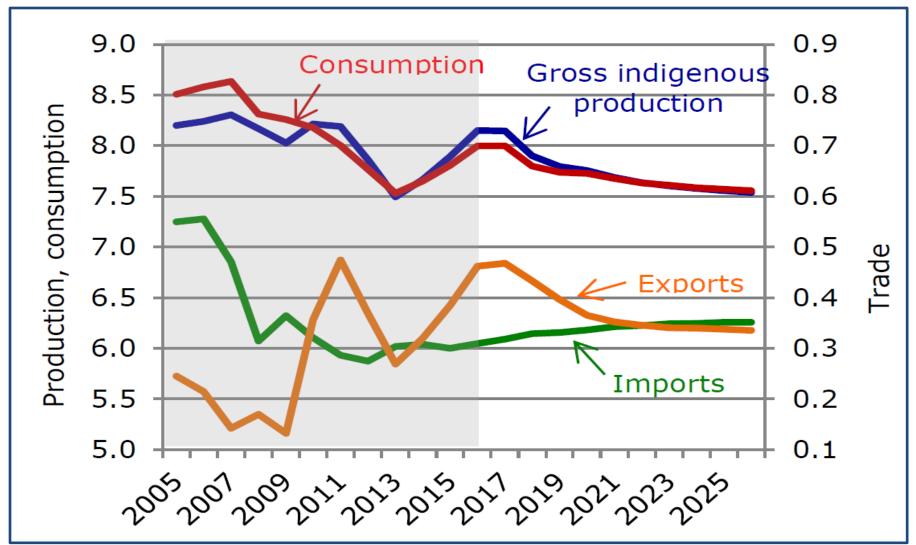
OECD-FAO agricultural outlook 2017-2026





EU beef sector

(Million tons, 2000 to 2016)



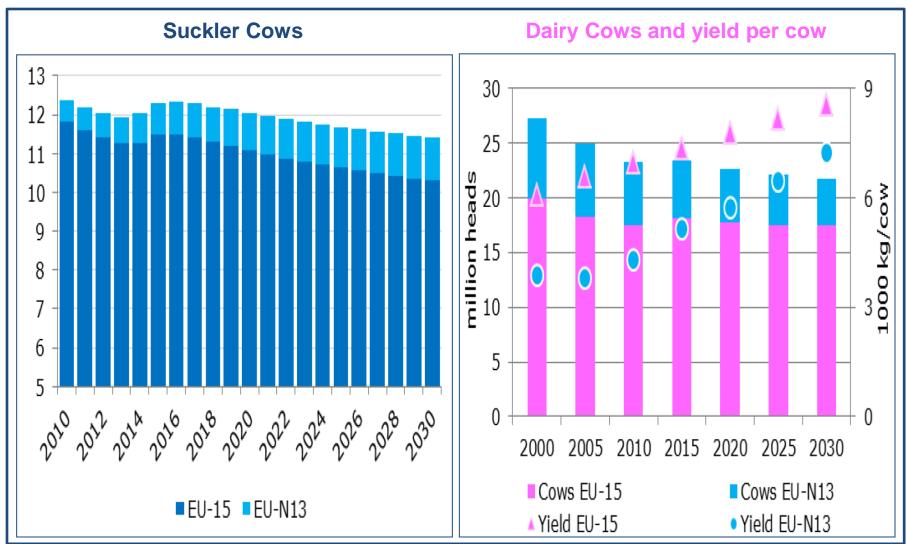
European Commission – Prospects for agricultural markets 2016-2026





EU cows (suckler and dairy) number

(Million heads, 2000 to 2015 - prospect 2030)



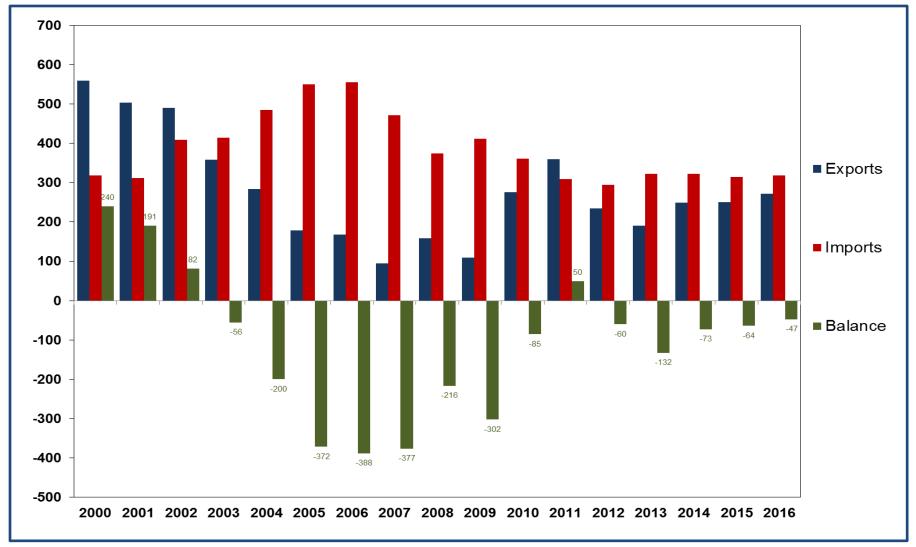
European Commission - DGAGRI





EU export, import and trade balance for poultry meat

(Thousand tons of carcass equivalent, 2000 to 2016)

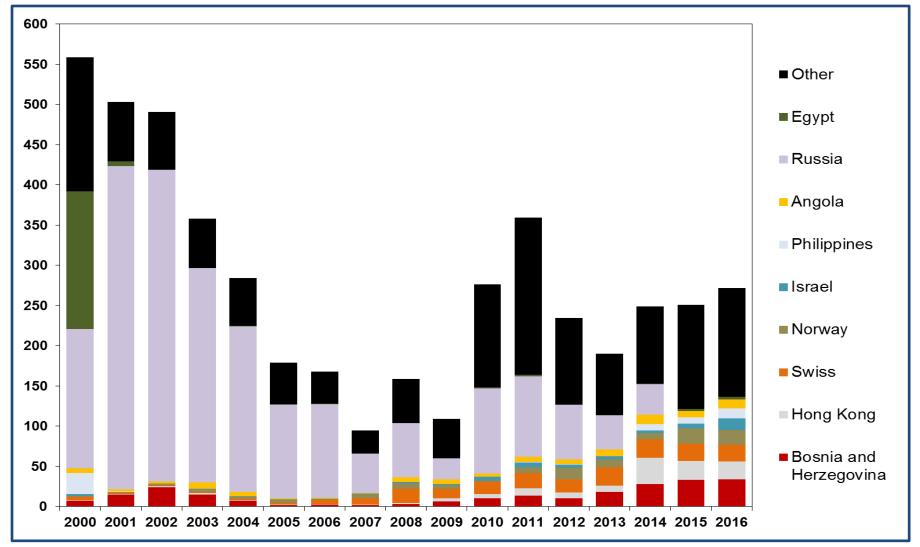






EU export of beef meat: main customers

(Thousand tons of carcass equivalent, 2000 to 2016)

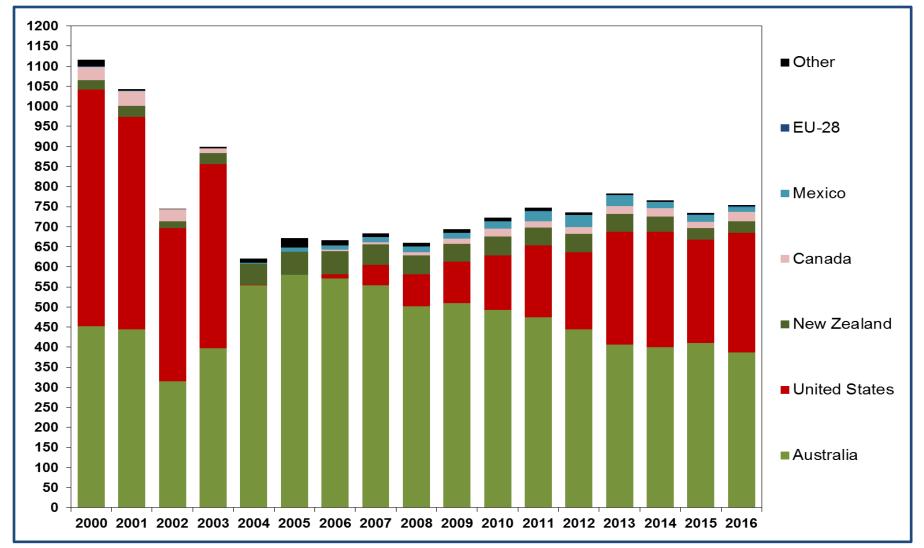






Japan import of beef meat: main suppliers

(Thousand tons of carcass equivalent, 2000 to 2016)

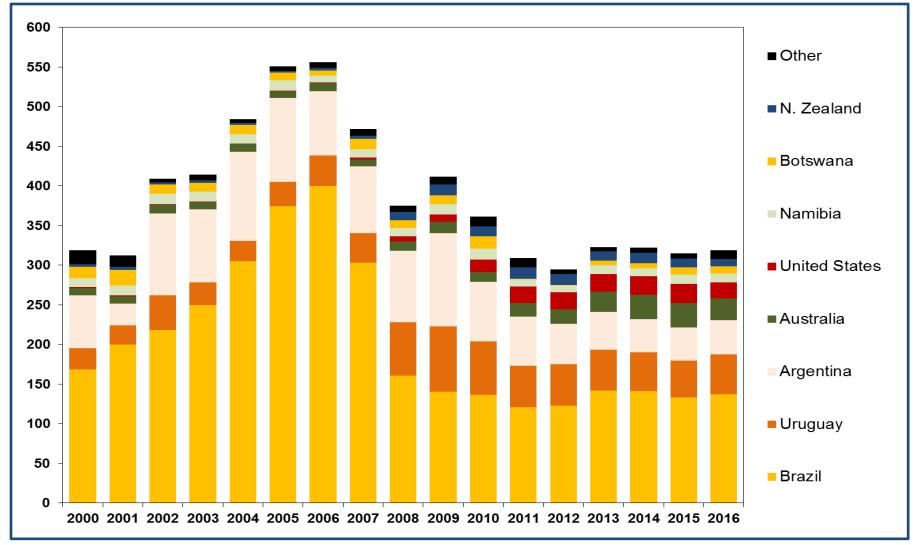






EU import of beef meat: main suppliers

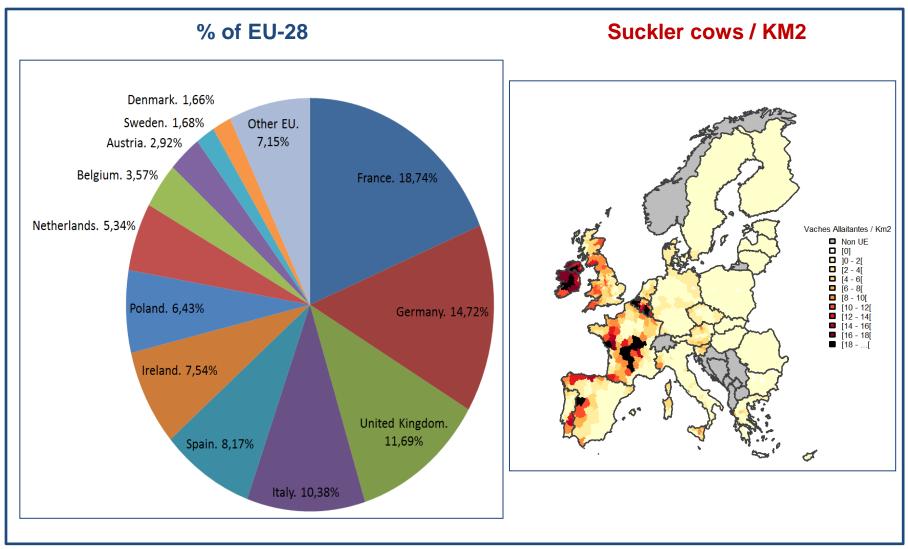
(Thousand tons of carcass equivalent, 2000 to 2016)







EU beef meat production according to member states



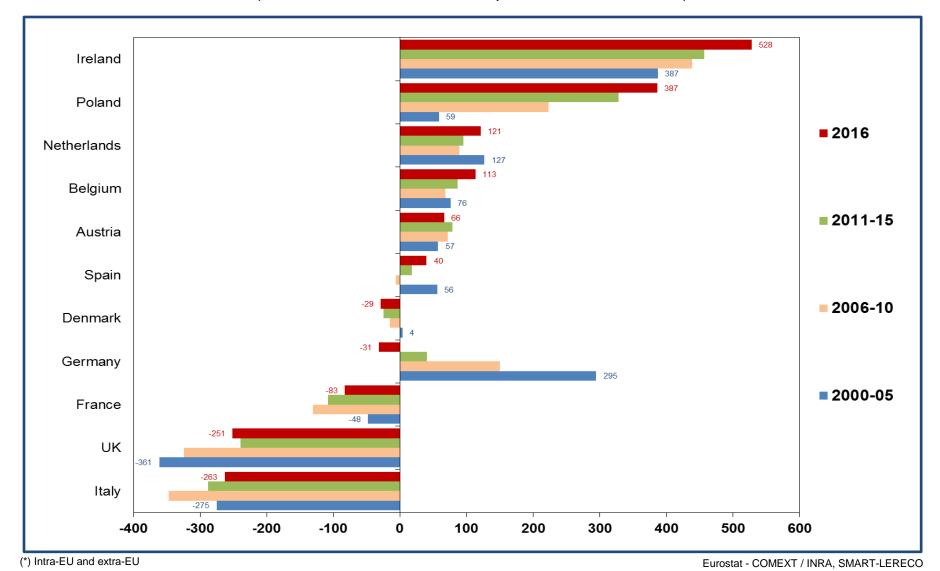






Trade balance* for beef meat in some EU member states

(Thousand tons of carcass equivalent, 2000 to 2016)







2-4- Dairy sector in the EU

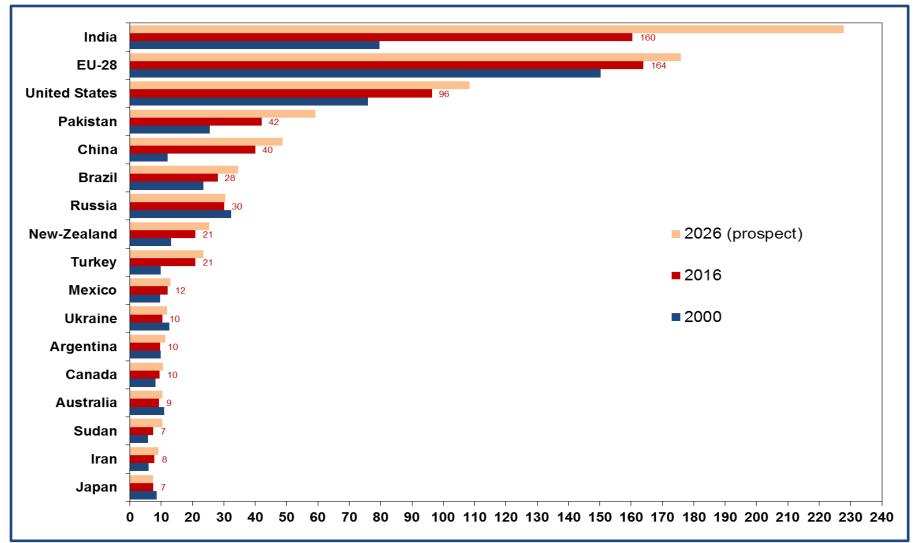






World dairy production: main countries

(Million tons, 2000, 2016 and prospect 2026)



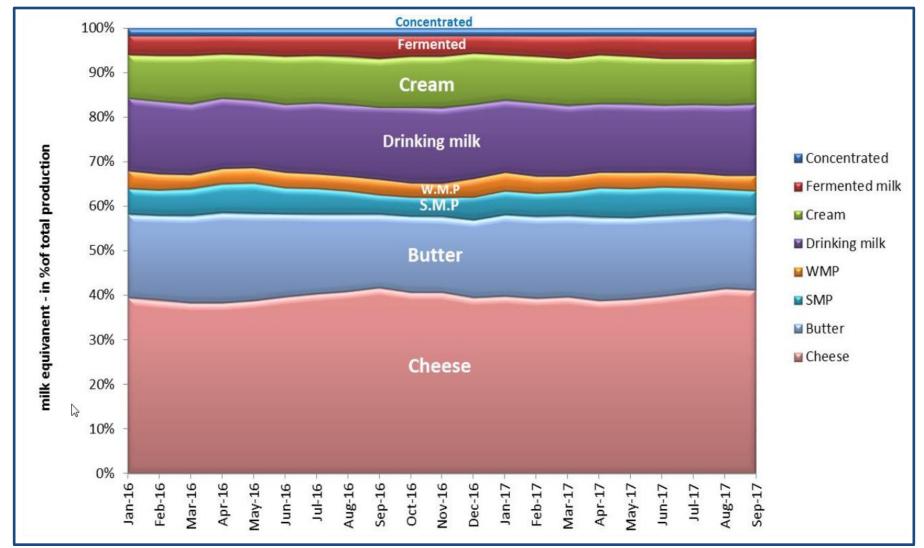
OECD-FAO agricultural outlook 2017-2026





Production of dairy products in the EU

(% du total milk equivalent)



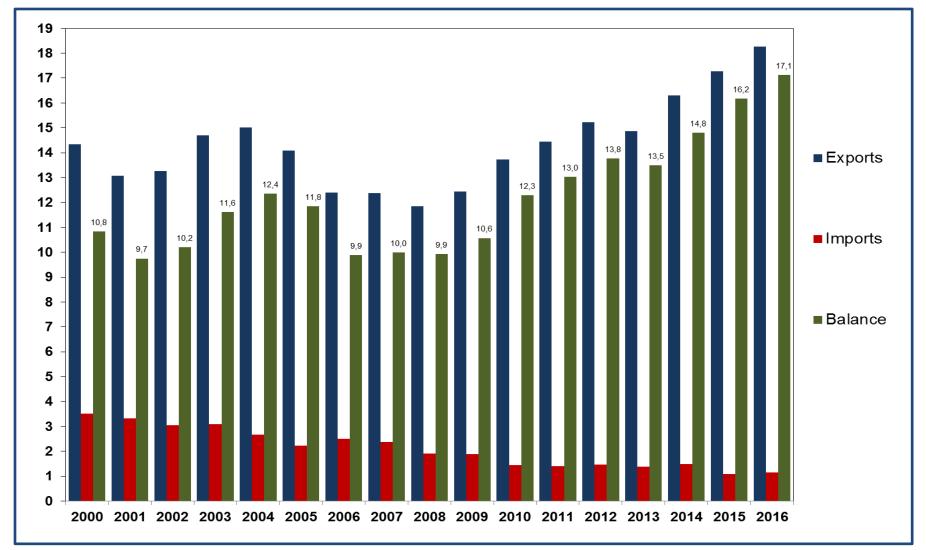
DGAGRI





EU trade in dairy products

(Million tons of milk equivalent, 2000 to 2016)

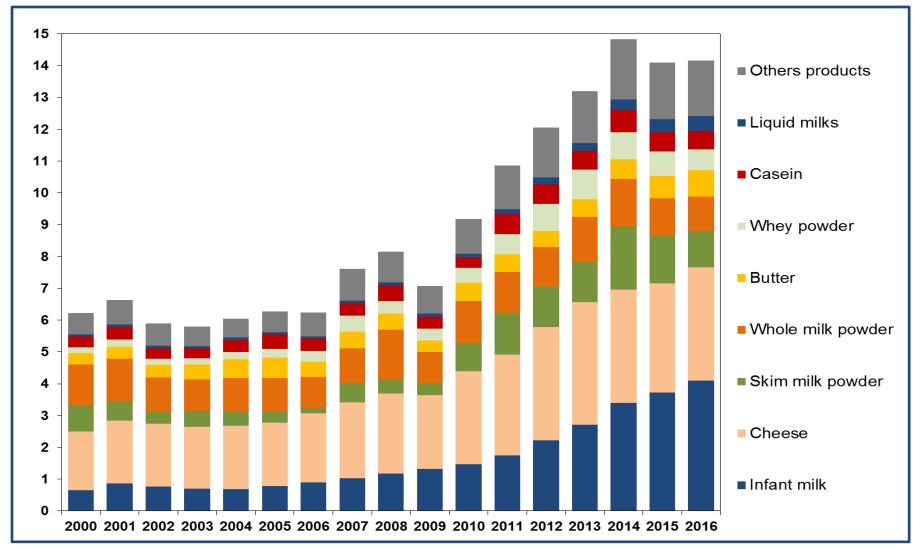






EU exports of dairy products

(Billion current euros, 2000 to 2016)

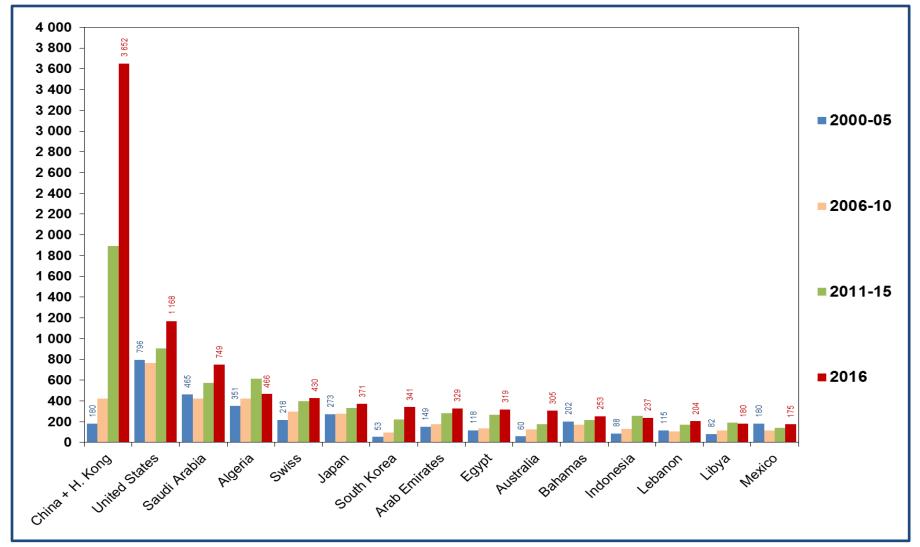






EU exports in dairy products: 15 main customers

(Billion current million euros, 2000 to 2016)

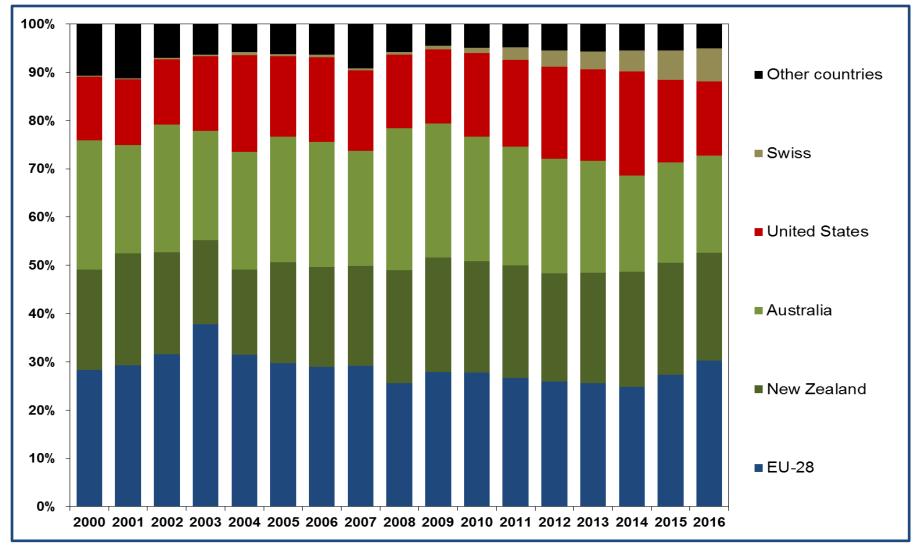






Japan imports of dairy products: main suppliers

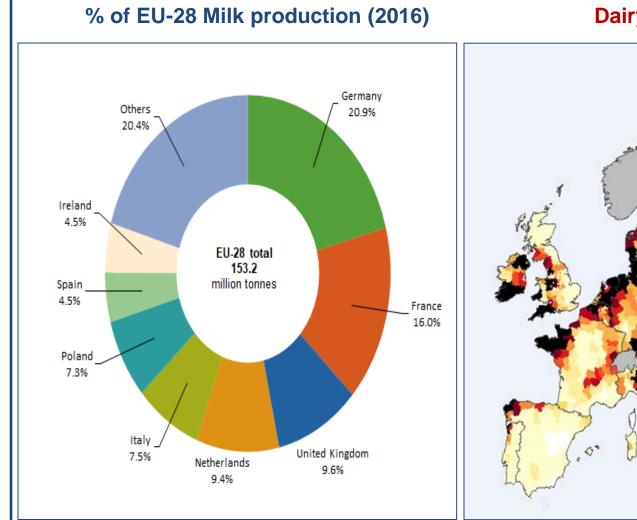
(% of the total import, 2000 to 2016)



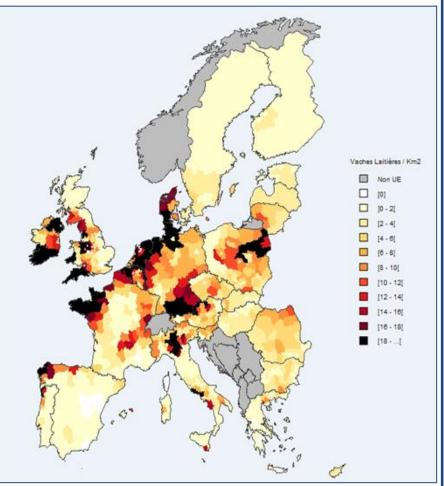




EU dairy production according to Member states



Dairy cows / KM2



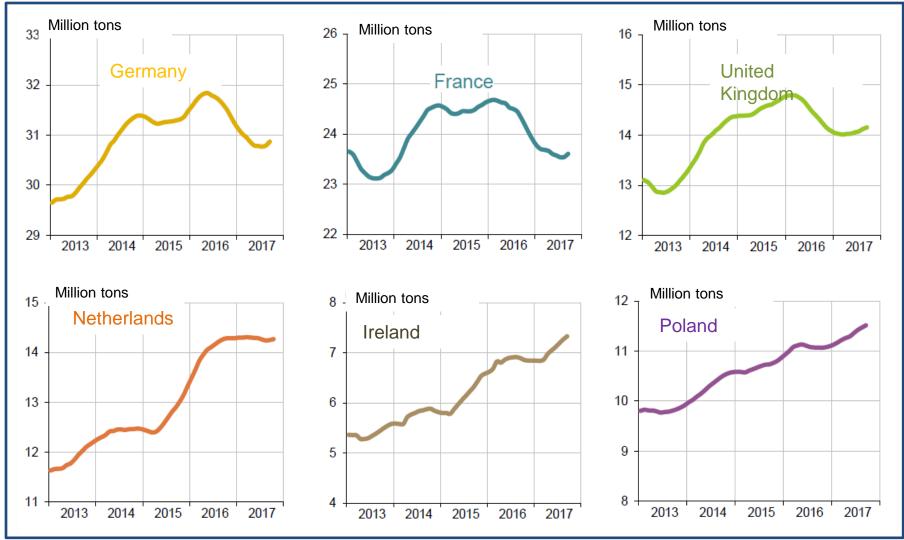
Eurostat





Milk collection in several EU countries

(Millions of tons, 2013 to 2017)



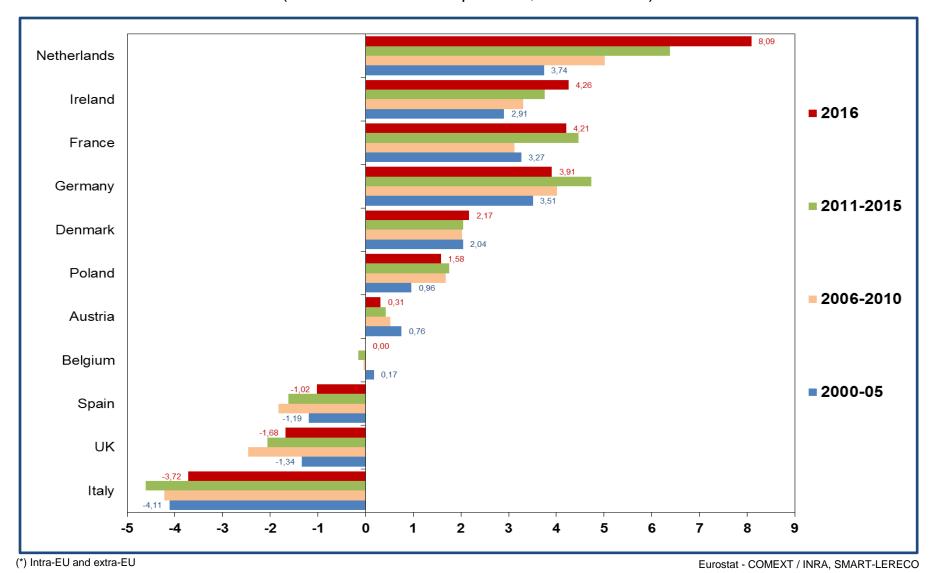
CNIEL from ZMB, FAM, DairyCo, CLAL, Eurostat





Trade balance* for milk in some EU member states

(Million tons of milk equivalent, 2000 to 2016)







3- The Common Agricultural Policy (CAP)







3-1- The previous CAP reforms and subsidies to EU farmers

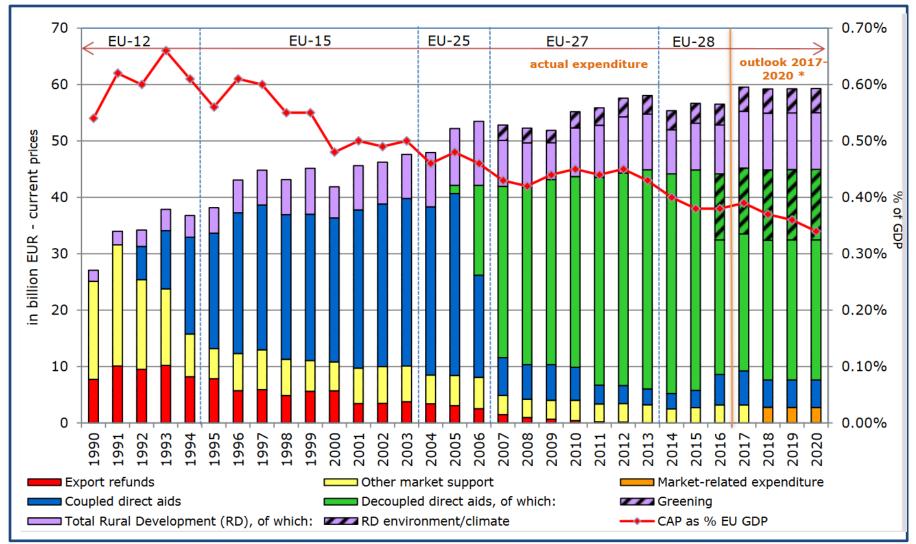






The structure of CAP expenditure

(Billion current euros, 1990-2020)



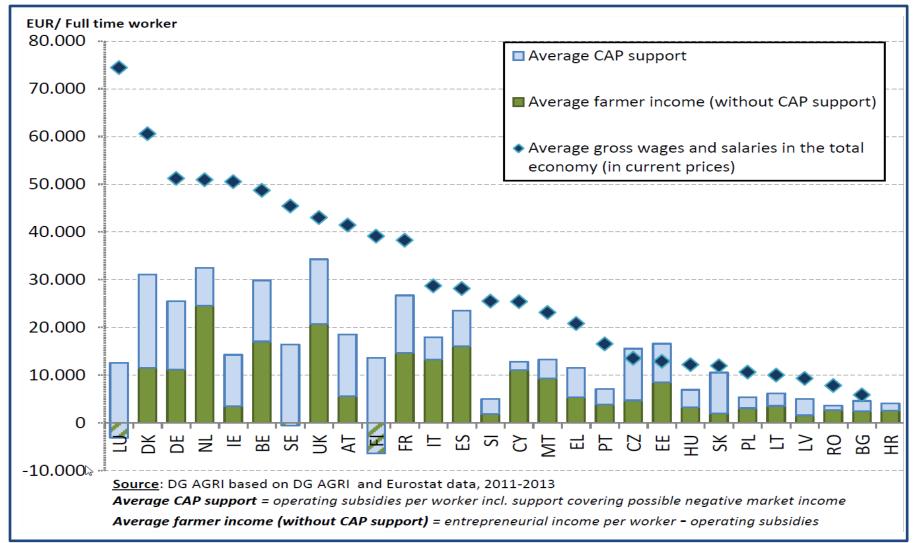
European Commission





Subsidies and farmers' income in the EU Member states

(Euros per full time worker)



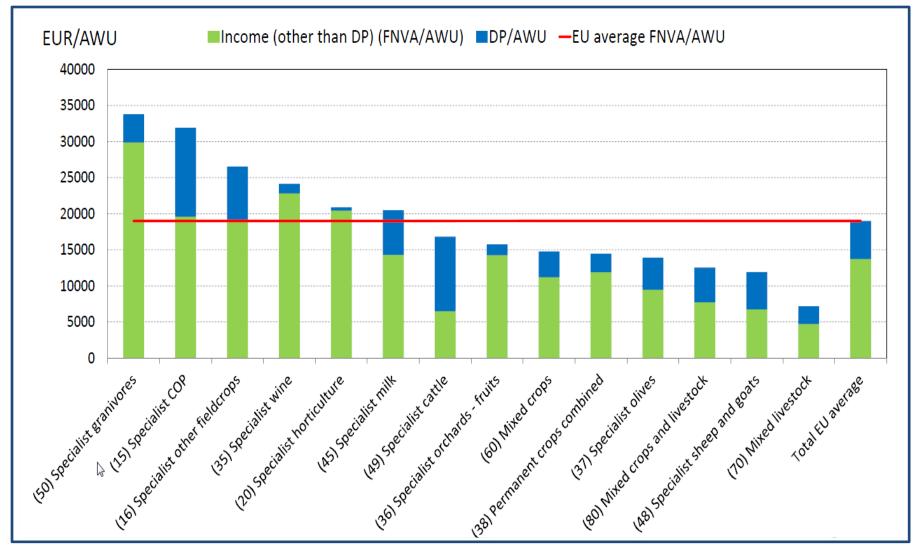
DG AGRI based on DG AGRI and Eurostat data, 2011-2013





Income and subsidies in the EU agriculture

(According to type of farming, Euros per full time worker)



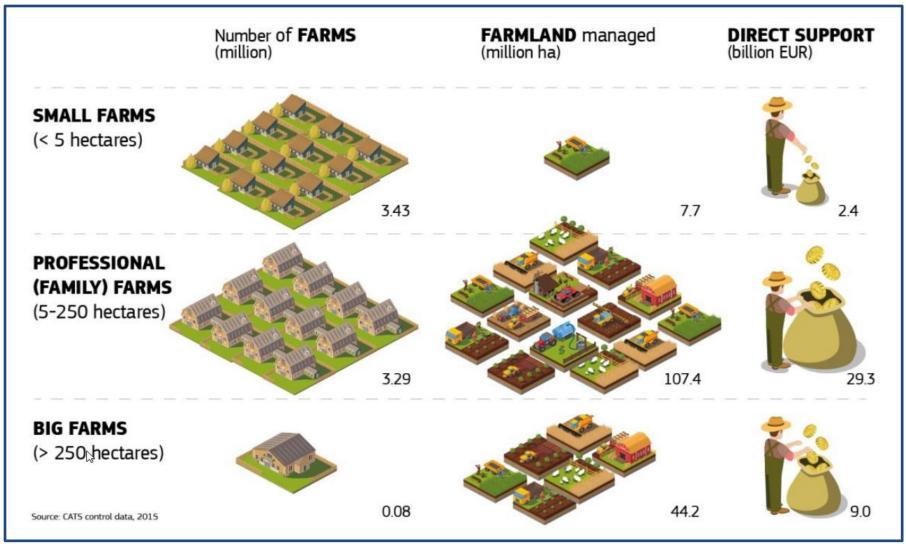
DG Agriculture and Rural Development, based on FADN. Income per AWU and DP per ha estimated at 2019 DP levels





Distribution of EU direct support to farms

(according to the size of farms)



CATS control data





The new design of direct payments in the EU

(since 2014)

Cross compliance Streamlined – Climate change

Coupled support

- Wide range of sectors
- Up to 5% or 10% of DP envelope, to be decided by MS

Natural constraint support

- For areas with natural constraints
- Up to 5% of the DP envelope

Young Farmer Scheme

- Up to 2% of DP envelope
- < 40 years

- For 5 years
- Commencing activity

'Green' Payment

- Crop diversification
- Permanent grassland
- Ecological focus area
- 30% of the DP envelope

Basic Payment Scheme

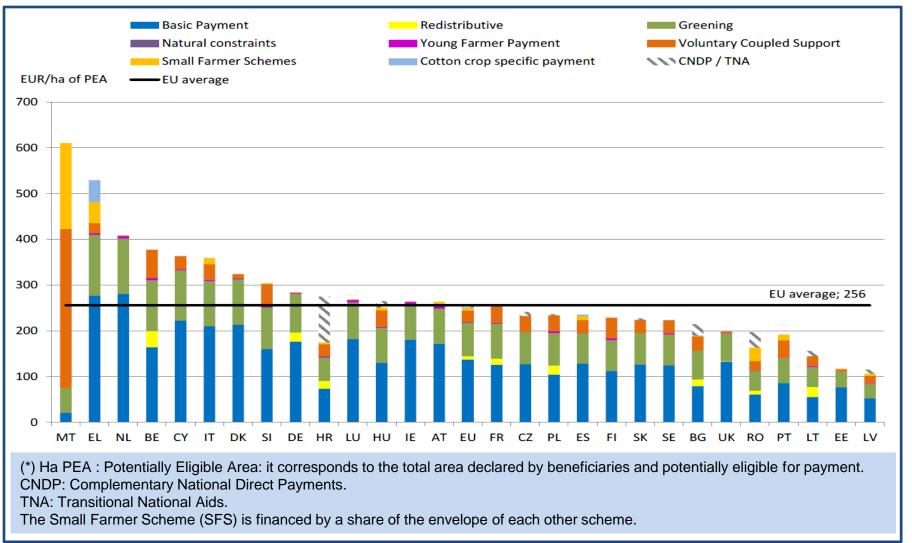
- National or regional flat rate per eligible hectare
- Regions and criteria to be chosen by MS
- New entitlements in 2014
- rate per eligible hectare Definition of agricultural activity
 - Definition of active farmer





Direct Payments expenditure per ha* by Member State

(Euros per ha of PEA)



•AGREX EU for DP expenditure, MS notifications in ISAMM for CNDP/TNA and MS reports to CATS for PEA





3-2- The future of EU and CAP







A White paper on the future of EU (with 5 scenarios) with five reflection documents (may 2017)



The social dimension of Europe

The reflection paper opens up the debate by offering different ideas, proposals and options for a social dimension of Europe by 2025.



Future of European defence

REFLECTION PAPER ON THE

FUTURE OF EUROPEAN DEFENCE

The reflection paper outlines future scenarios of Europe's defence, contributing to the debate on strengthening the protection of European citizens.



Harnessing globalisation

The reflection paper opens up a vital debate on how the EU can best harness globalisation and respond to its opportunities and challenges.



Future of EU finances

The paper presents possibilities and reform options, mapping out opportunities, risks and trade-offs for the future of EU budget.



Deepening of the economic and monetary union

The reflection paper is intended to stimulate the debate on the economic and monetary union and to help reach a shared vision of its future design.



Webpage: Click here





Three background reports on challenges facing EU agriculture and rural areas (2016)

Climate & environmental

Economic

Socio-economic







PDF - Click Here

PDF - Click Here

PDF – Click Here

European Commission - DGAGRI





The Future of food and farming in the EU

(Communication of the Commission - 29 November 2017)



Brussels, 29.11.2017 COM(2017) 713 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

The Future of Food and Farming

PDF – Click Here

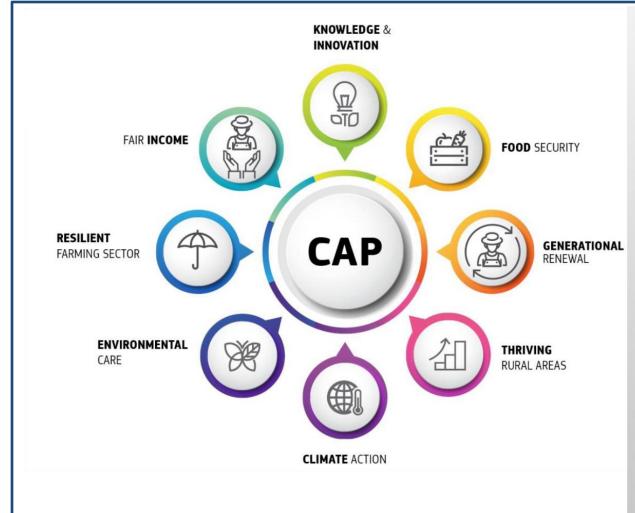
1.	A NEW CONTEXT	
2.	TOWARDS A NEW DELIVERY MODEL AND A SIMPLER CAP9	
3.	A SMARTER, MODERN AND SUSTAINABLE CAP11	
	3.1.	Using research and innovation to better link what we know to what we grow
	3.2.	Fostering a smart and resilient agricultural sector
		3.2.1. A fair income support to help farmers to make a living14
		3.2.2. Investing to improve farmers' market reward
		3.2.3. Risk Management
	3.3.	Bolstering environmental care and climate action and contributing to the achievement of EU environmental and climate objectives
	3.4.	Strengthening the socio-economic fabric of rural areas
		3.4.1. Growth and jobs in rural areas
		3.4.2. Attracting new farmers
	3.5.	Addressing citizens' concerns regarding sustainable agricultural production, including health, nutrition, food waste and animal welfare23
4.	THE GLOBAL DIMENSION OF THE CAP	
	4.1.	Trade
	4.2.	Migration





The Future of food and farming in the EU

(Communication of the Commission - 29 November 2017)



Economic challenges

- Food security
- Price variability
- Economic crisis

Environmental challenges

- GHG emissions
- Soil depletion
- Water/air quality
- Habitats and biodiversity

Territorial challenges

- Vitality of rural areas
- Diversity of EU agriculture





Are the principles of the CAP old fashioned?

■ Market unity

- Its means that agricultural products move throughout the EU under conditions similar to those in an internal market, thanks to the abolition of quantitative restrictions to trade (quotas, import monopolies...) and the removal of duties, taxes and measures having equivalent effect.
- > With different social, environmental and fiscals standards from one country to another.

□ Community (European) preference

- Its signifies that products of European origin are bought in preference to imported products, in order to protect the common market against low-price imports and fluctuations in world prices.
- ➤ With lower intervention prices, lower tariffs, trade agreements...and, now, BREXIT.

☐ Financial solidarity

- Its signifies that the Member States are jointly liable as regards the financial consequences of the common agricultural markets policy.
- With a low level of budgetary support in the 13 new (2004) Member states





The post 2020 CAP: six questions^(1/2)

→ What will be the future overall budget of the EU?

- 2014-2020 budget: about 1% of the EU GDP
- The key role of economic growth in the coming years
- The Brexit and the rising power of nationalism in some Member states

→ What will be the share of the EU budget allocated to the CAP?

- Agriculture and natural resources: 36% of the budget of the EU in 2020
- Towards new priorities for the EU budget: immigration, army, research, etc.
- How to justify the weight of funds allocated to the CAP?

→ What will be the external/internal pressures on the CAP?

- The potential influence of WTO rules on the orientations of the CAP
- Bilateral agreements and their influence on European trade in agri-food sector
- Political balances between the European Commission, the Parliament and the Council





The post 2020 CAP: six questions^(2/2)

→ How will the CAP funds be distributed among the EU countries?

- France: 19% of the CAP budget in 2017 (for 19% of final agricultural output)
- A difficult debate between Member States: EU-15 versus NEM-13
- Towards a further rise of subsidiarity

→ How many pillars to structure the next CAP?

- An already old structuring choice (Agenda 2000)
- Rural development measures are co-financed by the Member States
- Towards a third pillar on risk management (through a transfer of funds)

→ How to target direct aids?

- More direct payments for small farms / organic farms (link with employment)?
- Share of coupled direct payments versus decoupled payments?
- More direct payments for environmental services and disadvantaged areas?





Conclusion









Conclusion

Good reason to believe in the future of EU agriculture

- Global demand for food is growing
- The contributions of agriculture diversify (energy, environment, biomaterials, ..)
- Standards, traceability and segmentation will play a more determining role
- Contractualization is getting stronger and companies are concentrating
- UE is able to boost its exports (quality, notoriety, technologies)

→ Main challenges for the future

- Prepare, already, the terms of the future CAP (2020)
- Continue to consider that technology is one of the levers of competitiveness
- Reconcile productivity and environmental performance
- Better distribute the added value between farmers, processors and distributors
- Encourage young people to settle successfully in agriculture
- Better communicate about agriculture and its useful role for our society







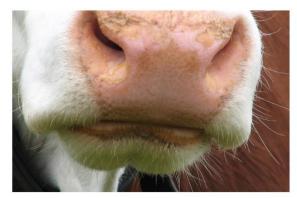
Thank you for your attention!





















Selection of my publications on EU and French agriculture(1/2)

DELABY L., CHATELLIER V., DUMONT B., HORAN B. (2017).

L'Irlande, un territoire porté par l'élevage laitier dans des conditions de milieu favorable et de marchés incertains.

INRA Productions Animales, 30 (4), 321-332.

https://tinyurl.com/y93pofah

HERCULE J., CHATELLIER V., PIET L., DUMONT B., BENOIT M., DELABY L., DONNARS C., SAVINI I., DUPRAZ P. (2017).

Une typologie pour représenter la diversité des territoires d'élevage en Europe.

INRA Productions Animales, 30 (4), 285-302.

https://tinyurl.com/y8nxbkds

PERROT C., CHATELLIER V., GOUIN D.M., RICHARD M., YOU G. (2017).

Le secteur laitier français est-il compétitif face à la concurrence européenne et mondiale ?

A paraître dans Economie Rurale.

http://tinyurl.com/j5rve5u

CHATELLIER V. (2017).

Les échanges de bovins vivants et de viande bovine dans le monde et dans l'UE.

Working Paper SMART-LERECO n°17-06, 53 p.

https://tinyurl.com/y7n6nsrt

CHATELLIER V. (2017).

International, European and French trade in dairy products.

Working Paper SMART-LERECO n°17-05, 48 p.

https://tinyurl.com/ybybdyjn

CHATELLIER V. (2016).

Le commerce international, européen et français de produits laitiers.

INRA Productions Animales, 29 (3), 143-162.

http://tinyurl.com/jbwx8yc

INRA (2016).

Rôles, impacts et services issus des élevages en Europe.

Rapport pour les Ministères en charge de l'agriculture et de l'environnement.

Rapport : http://tinyurl.com/juog5be ; Synthèse : <a href="ht





Selection of my publications on EU and French agriculture(2/2)

CHATELLIER V., MAGDELAINE P. (2015).

La compétitivité de la filière volaille et chair française : entre doutes et espoirs.

INRA Productions Animales, vol 28 (5), pp 411-428.

http://tinyurl.com/z6zkrcg

ROGUET C., GAIGNE C., CHATELLIER V., CARIOU S., CARLIER S., CHENUT R, DANIEL K., PERROT C. (2015).

Spécialisation territoriale et concentration des productions animales européennes : état des lieux et facteurs explicatifs.

INRA Productions Animales, vol 28 (1), pp 5-22.

http://tinyurl.com/zzlrkja

LECUYER B., CHATELLIER V., DANIEL K. (2014).

Analysis of price volatility of mineral fertilisers: possible issues for European farmers.

International Journal of Agricultural Resources, Governance and Ecology, vol. 10 (4), pp 344-361.

http://tinyurl.com/pz7mhuf

CHATELLIER V. (2013).

Les effets redistributifs des décisions françaises relatives à la PAC post 2015.

Académie d'Agriculture de France. Communication lors de la séance plénière du 6 novembre, Paris, 8 p.

http://tinyurl.com/kwegfgl

HOCQUETTE J.F., CHATELLIER V. (2011).

Prospects for the European beef sector over the next 30 years.

Animal Frontiers (American Society of Animal Science)

http://tinyurl.com/pmlcedf

CHATELLIER V. (2011).

Price volatility, market regulation and risk management: challenges for the future of the CAP.

International Agricultural Policy, vol. 1, pp 33-50.

http://tinyurl.com/c6pergh

PISANI E., CHATELLIER V. (2010).

La faim dans le monde, le commerce et les politiques agricoles.

Revue Française d'Economie, vol 25 (1), pp 4-75.

http://tinyurl.com/oggzxua

Page WEB: http://tinyurl.com/q8csmqq





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