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International, European and French trade in dairy products: trends and competitive dynamics

Vincent CHATELLIER

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Vincent CHATELLIER

SMART-LERECO, AGROCAMPUS OUEST, INRA, 44000, Nantes, France

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Corresponding author

Vincent Chatellier

UMR SMART-LERECO

Rue de la Géraudière, BP 71627

44316 Nantes cedex 03, France

Email : vincent.chatellier@inra.fr

Téléphone / Phone : +33 (0) 2 40 67 51 72

Fax : +33 (0)2 40 67 50 74

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**International, European and French trade in dairy products:
trends and competitive dynamics**

Abstract

At the international level, the dairy sector is favored by a growing demand, mainly from Asian countries, where dairy consumption per capita remains much lower than that observed in the European Union (EU) and North America. Over the last fifteen years (2000-2015), New Zealand, the country that has most benefited from the growth of international trade in dairy products, especially under the influence of whole milk powdered Chinese imports was far ahead of the USA and the EU. Despite an increase in imports, especially of cheese and butter, France has regularly improved its trade balance which reached €3.75 billion in 2015. This performance was due mainly to the dynamics of trade with the United Kingdom and China. Since 2010, the trade balance of France with non-European countries has been improving while the internal competition with the EU is becoming more difficult. For the European dairy producers, the slight decline in demand for dairy products in the EU and the rapid increase in milk production in several Member States since the abolition of milk quotas in 2015 is a real threat. This should be an additional incentive to, firstly, increase exports abroad and, secondly, better sell the wide variety of dairy products on the domestic market.

Keywords: dairy, milk, trade, European Union, competitiveness

JEL classification: Q13, Q17

Le commerce international, européen et français des produits laitiers : évolutions tendancielle et dynamiques concurrentielles

Résumé

A l'échelle internationale, le secteur laitier bénéficie d'une dynamique soutenue de la demande, en provenance principalement des pays asiatiques où la consommation de produits laitiers par habitant demeure largement inférieure à celle observée dans l'Union européenne (UE) et en Amérique du Nord. Au cours des quinze dernières années (2000-2015), la Nouvelle-Zélande est, loin devant les Etats-Unis et l'UE, le pays qui a le plus bénéficié de la croissance des échanges internationaux de produits laitiers, sous l'influence surtout des importations de la Chine en poudres de laitier entier. En dépit d'une hausse de ses importations, surtout de fromages et de beurre, la France améliore régulièrement sa balance commerciale qui atteint 3,75 milliards d'euros en 2015. Cette performance tient pour une part importante à la dynamique favorable des échanges avec le Royaume-Uni et la Chine. Depuis 2009, le solde commercial de la France avec les pays tiers s'améliore alors que les jeux concurrentiels internes à l'UE deviennent plus difficiles. Pour les producteurs de lait européens, la saturation progressive de la demande européenne de produits laitiers et l'augmentation rapide de la production laitière dans plusieurs Etats membres depuis l'abandon des quotas laitiers en 2015 constitue une réelle menace. Cela doit être une incitation à, d'une part, développer les exportations à l'international et, d'autre part, mieux valoriser la très grande diversité des produits laitiers sur le marché intérieur.

Mots-clés : secteur laitier, produits laitiers, compétitivité, commerce, exportation, importation

Classification JEL : Q13, Q17

International, European and French trade in dairy products: trends and competitive dynamics

1. Introduction

The crisis, which weakened the dairy sector in 2015-2016 and which manifested itself by a severe drop in producer prices, more intense in New Zealand than in the European Union (EU) or the United States (Perrot *et al.*, 2016), calls for a better understanding of the combined factors (FAO 2015, USDA 2015). In addition to the rapid increase in European milk production in a context where milk quotas were abolished in April 2015, the contraction of international trade in dairy products is often referred to explain this difficult period. The decline in Chinese imports of whole milk powder, the Russian embargo on European dairy products and lower purchases in some oil-producing countries weakened by the lower price per barrel of oil are factors that intersect in a context where world milk production continues to increase. In France, where the domestic demand for dairy products is slightly decreasing, at least in milk equivalent, the question of the positioning of national products in European and international markets is all the more serious since it directly affects the domestic productive potential.

The objective here is to present an analysis of the evolution of international, European and French trade in dairy products over the last fifteen years (2000 to 2015) using two statistical databases from Customs Service ("*Comtrade*" for international flows and "*Comext*" for European exchanges). The analysis distinguishes exports, imports and the trade balance in dairy products, with more or less fine levels of disaggregation purposes according to the possibilities offered by customs nomenclatures. Exchanges are expressed in milk equivalent (milk quantity mobilized upstream of marketed finished products), quantity terms (physical quantity of each product) or value terms (in current euros over the period). Three parts can be distinguished:

- *The first part* focuses on international trade in dairy products. In a first cross-section, the goal is to highlight the main actors of the dairy products market in terms of production, export and import. The second section deals with global trade for four flagship dairy products, namely cheese, skimmed milk powder, whole milk powder and butter. The third section presents the specific situation of New Zealand, the USA and Australia, three exporting countries and EU competitors. The fourth section focuses on Russia and China, two major importing countries placed at the heart of many debates.

- *The second part* focuses on the development of EU trade in dairy products and its Member States. After a presentation of extra-Community trade of the EU as a single geographical entity, a variation is proposed for the Member States, while taking care to deal with intra-Community flows. Focusing is then proposed for the main deficit and surplus countries.

- *The third part* deals with France's trade in dairy products. Without going back over the elements already presented upstream, special attention is paid to France's partner countries and to the products that are at the origin of the improvement in the trade balance over the long term.

2. International trade in dairy products and its main actors

This first part discusses the main actors involved in world milk production and international trade in dairy products. It uses, for this, the statistics of the *Comtrade* database and refers to the 2024 forecasts made by the Food and Agriculture Organization of the United Nations (FAO) and the Organization for Economic Co-operation and Development (OECD).

2.1. The location of dairy supply and the main flows between countries

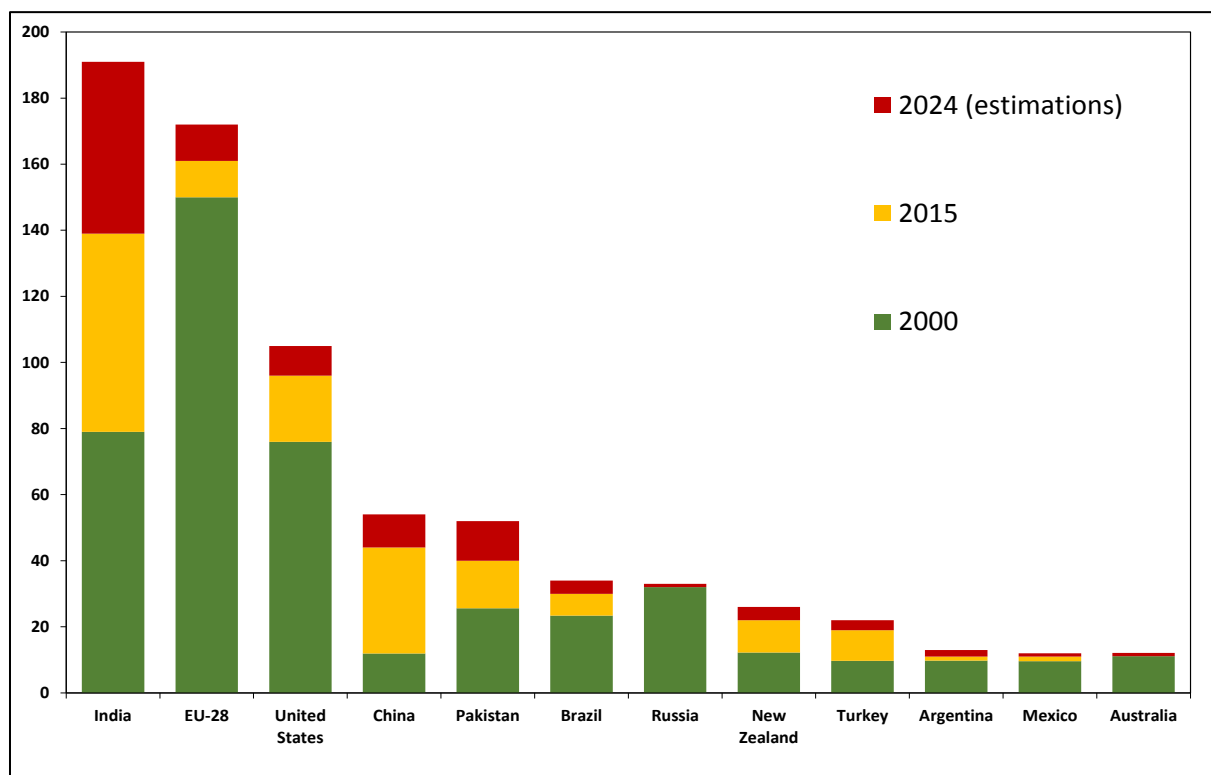
In 2015, world milk production reached 800 million tons. This resulted from various animal species: about 85% of the milk came from cows, 11% from buffaloes, 2% from goats, 1% from sheep and 0.4% from camels. The relative weight of these different species varied greatly by region, resulting in a variety of productive combinations and a complexity of links that the so-called "dairy" sector weaves with the territory. While the proportion of non-bovine milk reached almost 40% in Asia (where buffalos are important), 25% in Africa (where dairy goats are often present), it represented less than 3% in Europe and was marginal in North America and Oceania (Faye and Konuspayega 2012).

In 2015, developed countries accounted for half of world milk production (all species combined). Even though the EU was a major player in the production (20.1% of world quantities), as well as the United States (12.1%), other particularly active countries in international trade were finally modest contributors to global offering, including especially New Zealand (2.7%), Argentina (1.4%) and Australia (1.2%).

World milk production increased by 214 million tons between 2000 and 2015, an increase of 37% or an annual average of about 2.4%. Developing countries played a more important role (+164 million tons) than developed countries (+50 million tons). During this period, the supply's growth rate was significantly higher in Asia (281% in Vietnam, 265% in China, 74% in India, 56% in Pakistan) and Africa (85%) than in Latin America (27% in Brazil, 16% in Argentina), North America (26% in the USA and 7% in Canada) or in the EU (7%). In Oceania, milk production increased significantly in New Zealand (+77%) due to its outstanding performance in international markets, but declined in Australia (-14%) mainly due to climatic reasons.

Despite global population growth between 2000 and 2015 (+1.22 billion, or +16%), the availability of milk per capita per year increased from 95 kg in 2000 to 109 kg in 2015. Over the last fifteen years, half of the increase in global dairy product consumption came from Asian countries. In addition to the demographic effect, three other factors contribute significantly to the consumption' increase in these countries (2013 FAO): improving the population's average income; increasing urbanization that favors a certain westernization of food patterns; technical progress which simplifies dairy product distribution (finished product packaging, improvement of logistic circuits, more widespread observance of the cold chain).

Figure 1: Milk production in the main producing countries (million tons)

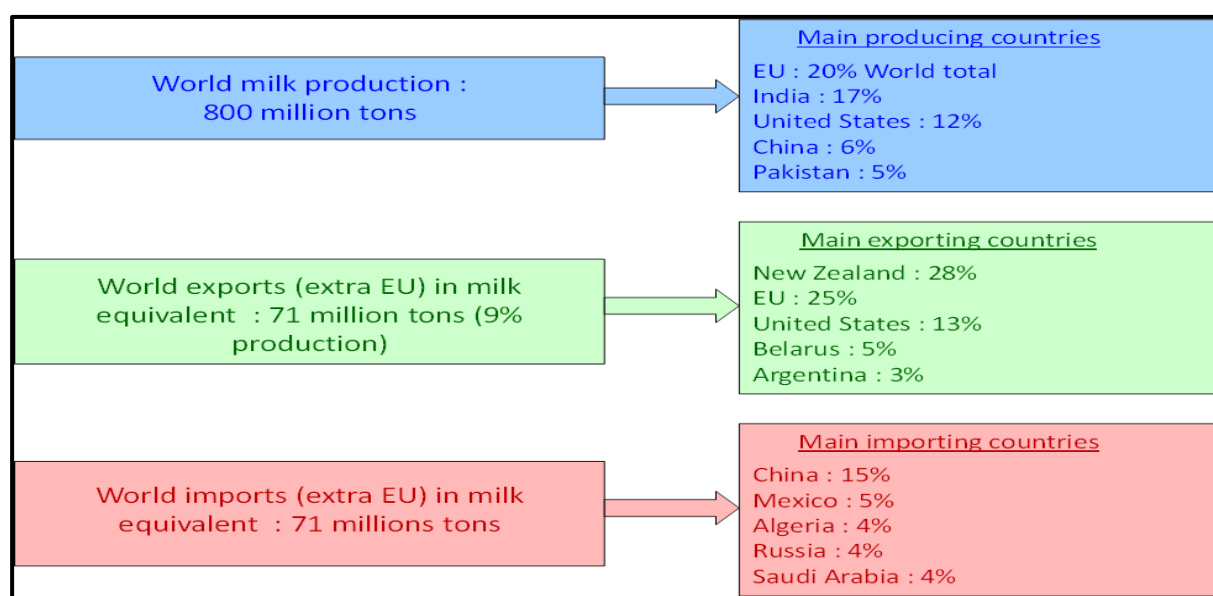


Source: OECD-FAO.

According to the FAO and OECD estimates, world milk production could increase by 17% between 2015 and 2024, or 138 million tons (OCDE-FAO 2015). Eighty-percent of this growth should result from developing countries. India, currently the second largest milk producer behind the EU, should soon take the first position with an increase of 52 million tons in production between 2015 and 2024, just over a third of global growth. This increase is five times higher than that expected for China (10 million tons), the country that would remain the fourth largest producer, ahead of Pakistan, Brazil and Russia, but behind India, the EU and the United States (Figure 1).

According to FAO estimates, world trade in dairy products, all species combined and excluding intra-EU trade, covered 71 million tons in milk equivalent in 2015 (Box 1). These forecasts attribute a coefficient allowing to account for the amount of milk used upstream¹ to the various categories of dairy products identified by the customs nomenclature. Thus the dairy product exchanges represented about 9% of world milk production (International Dairy Federation 2015). Given the perishable nature of fresh dairy products (trade limiting factor) and the structuring of part of the market around regional basins, the rate was lower than that observed in other agri-food sectors such as cereals, meat, soy, *etc.*

Box 1: The main players in world milk production and dairy trade in 2015



Source: International Dairy Federation

¹ The dairy conversion factors in milk equivalent allow replacing a given amount of dairy products by an equivalent quantity of milk. Their principle means assessing the amount of milk that is necessary for the manufacturing of the products. This conversion, which is subject to methodological debates (Meyer and Duteurtre 1998), allows estimating and comparing quantities of products available or consumed on the scale of a given market (national, European, world). For this, the conversion factors apply not only to liquid milk, but also to various dairy products such as cream, butter, cheese, skimmed milk powder, whole milk powder, whey, *etc.*

In 2015, the global dairy product market was dominated by a limited number of exporting countries, including New Zealand (28% of global export quantities), the EU (25%) and the USA (13%). Between 2000 and 2015, the exports increase was mainly due to New Zealand (+12 million tons in milk equivalent) and, farther behind, the United States (+7 million tons in milk equivalent) and the EU (+5.3 million tons in milk equivalent). In 2015, the main importers of dairy products were China (10.3 million tons in milk equivalent), Mexico (3.2 million tons in milk equivalent), Algeria (3.1 million tons in milk equivalent), Russia (2.9 million tons in milk equivalent) and Saudi Arabia (2.8 million tons in milk equivalent).

Given the types of traded dairy products and their unit value (price per ton), the hierarchy of the above countries varied when calculations favor exchanges in value and not in milk equivalent. In 2015, for example, the EU was the world's largest exporter of dairy products in value (€14.5 billion), ahead of New Zealand (€8.4 billion) and the United States (€4.9 billion). Similarly, countries importing cheese, like the United States or Russia, played a larger role in value and quantity terms compared to the countries importing whole milk powder.

2.2. Main dairy products traded worldwide

An analysis of the evolution of international trade is presented below for the main types of dairy products, namely cheese, skimmed milk powder, whole milk powder and butter.

2.2.1. Cheese

In 2015, developed countries contributed to about 80% of the world cheese production, 75% of exports and 48% of imports. With a production of about 10 million tons, the EU was the largest cheese producing area, ahead of the United States (5.2 million tons). Farther behind, were Brazil (740 000 tons), Egypt (630 000 tons), Argentina (600 000 tons), New Zealand (490 000 tons) and Russia (460 000 tons).

International cheese trades, always excluding intra-EU trade, doubled over the last fifteen years. They covered 2.2 million tons (cheese tonnage) in 2015, or 11% of world production. Products traded consisted mainly of cheese ingredients (including Cheddar) often used in food preparations; high added value cheeses with much higher valorization levels per ton and whose suppliers are mainly European (France, Italy and Switzerland), had a modest role. With 32% of cheeses exported (in terms of quantity) in 2015, the EU was the world leader

ahead of the United States (13%) and New Zealand (12%). In 2015, main cheese importing countries were Japan (249 000 tons), Russia (201 000 tons), the USA (200 000 tons), Saudi Arabia (162 000 tons) and Mexico (116 000 tons). China contributed only to 3% of global imports of cheese (Table 1).

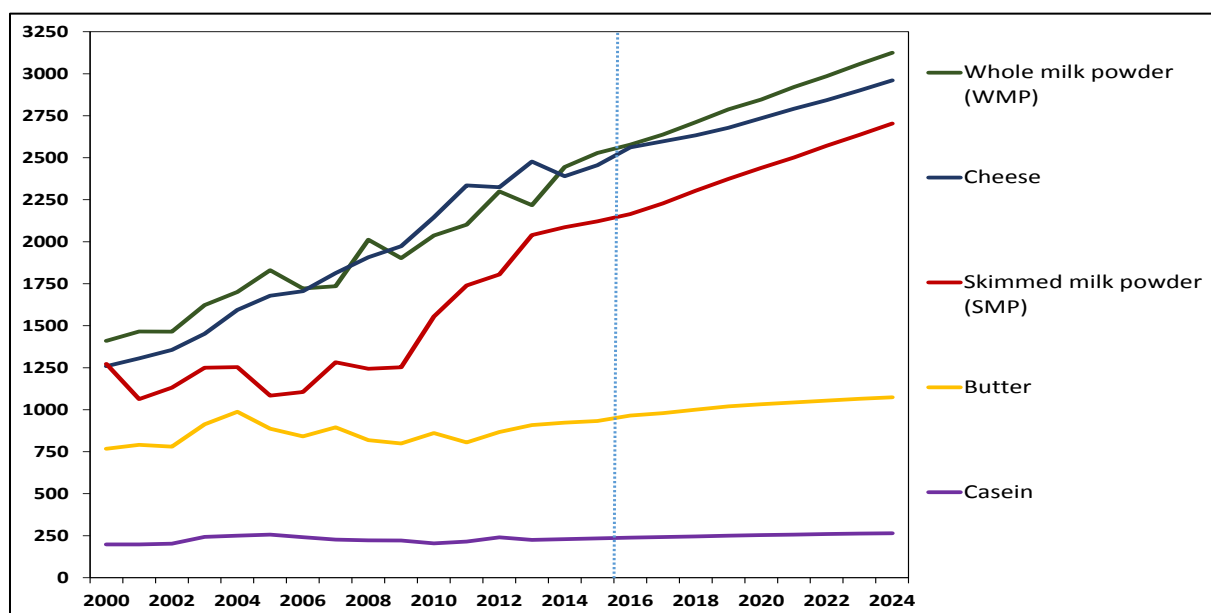
**Table 1: The main world importers of dairy products (thousand tons/year)
- Country ranking in descending order for imports (in value terms) in 2015**

	Cheese				Skimmed milk powder				Whole milk powder				Butter			
	2000-04	2005-09	2010-14	2015	2000-04	2005-09	2010-14	2015	2000-04	2005-09	2010-14	2015	2000-04	2005-09	2010-14	2015
China	4	12	41	76	35	54	175	200	69	83	468	347	7	16	48	71
USA	209	199	150	200	7	1	1	2	6	16	9	8	45	38	18	35
S. Arabia	80	93	102	162	42	56	46	59	45	65	78	133	28	32	42	52
Russia	134	239	348	201	16	11	74	110	6	5	22	33	102	83	113	94
Mexico	99	77	90	116	189	141	197	259	42	37	14	7	51	56	34	35
Japan	205	203	223	249	46	34	33	53	0	0	0	0	5	9	9	16
EU-28	133	94	78	61	56	11	3	3	6	2	2	4	92	77	44	24
Malaysia	6	8	15	21	56	73	106	147	64	53	27	46	10	12	15	19
Singapore	6	8	12	14	46	60	60	70	28	66	83	83	21	26	25	25
Australia	52	70	80	100	3	4	5	9	6	9	11	11	9	16	24	24
Philippines	17	14	17	23	108	94	107	101	49	39	29	17	11	13	20	20
Algeria	18	21	24	na	95	88	125	122	125	172	181	233	12	12	16	na
Venezuela	9	13	24	na	3	4	4	na	53	81	113	189	1	1	2	na
Egypt	10	14	45	na	19	23	63	na	6	14	33	na	44	35	63	58
Hong Kong	10	14	14	16	10	7	9	8	30	26	62	75	13	10	10	11

Sources: Comtrade except for the EU (Comext) / Treatment INRA, SMART-LERECO - na = not available

According to the OECD-FAO outlooks, international trade in cheese should increase by 20% between 2015 and 2024 (Figure 2). While this figure gives an indication of the expected potential developments in the medium-term, it is still difficult to predict the interannual variations that may occur throughout the period since there many economic and political parameters are involved.

Figure 2: The evolution of world trade in dairy products between 2000 and 2015, prospects for 2024 (thousand tons)



Source: OECD-FAO.

2.2.2. Skimmed milk powder

Eighty-eight percent of global skimmed milk powder production (4.1 million tons in 2015, or +25% compared to 2000) came from developed countries. The EU provided 34% of world production, ahead of the USA (24%), New Zealand (12%) and Australia (8%).

International exchanges covered 2.1 million tons in 2015, about half of world production (Lagrange *et al.*, 2015). While this rate is high compared to most other agri-food goods, it is, however, not surprising. Indeed, this product was created to foster the transport of "milk" while limiting as much as possible the transport of water. Skimmed milk powder enables further easier preservation of the product than liquid milk (more perishable) and does not require the (expensive) use of refrigeration. International exports are dominated by the EU (32%), the USA (26%) and New Zealand (19%). Between 2000 and 2015, the USA export increase (+ 400 000 tons, mainly to Mexico) was almost double that of the two countries mentioned above. Ninety-three percent of skimmed milk powder global imports came from developing countries. In 2015, the main importing countries were Mexico (259 000 tons), China (200 000 tons), Indonesia (152 000 tons), Malaysia (147 000 tons) and Algeria (122 000 tons). International trade should increase by 27% between 2015 and 2024, under the influence of Asian country imports (73% of global growth) and Africa (25%).

2.2.3. Whole milk powder

World production (4.8 million tons in 2015 against 2.2 million tons in 2000) is due mainly to New Zealand (1.38 million tons in 2015), China (1.37 million tons) and far behind the EU (680 000 tons), Brazil (617 000 tons) and Argentina (238 000 tons).

New Zealand dominated the market in an exceptional way, realizing 56% of world exports which amounted to 2.3 million tons in 2015. This country captured 83% of the increase of world exports during this period. The entire New Zealand production of whole milk powder was exported, mainly to Asian countries. The EU was far behind, the second largest exporter (383 000 tons in 2015), ahead of Argentina (138 000 tons), Uruguay and Australia (Table 2). The United States occupied a modest place for this product. Developing countries accounted for 97% of whole milk powder imports. Despite an increasing dairy production (Bowman and Conway 2013, Dharmasena *et al.*, 2013), China became the largest importer of whole milk powder. In 2015, its purchases (347 000 tons), however, decreased by almost half compared to the period 2010-14. "The Middle Kingdom" was nevertheless still significantly ahead of Algeria (233 000 tons), Venezuela (189 000 tons), the United Arab Emirates (148 000 tons), Oman (89 000 tons) and Singapore (83 000 tons). Between 2015 and 2024, world exports of whole milk powder could increase by 23%, strengthening New Zealand's position.

**Table 2: The main world exporters of dairy products (thousand tons/year)
- Country ranking in descending order for exports (in value terms) in 2015**

	Cheese				Skimmed milk powder				Whole milk powder				Butter			
	2000-04	2005-09	2010-14	2015	2000-04	2005-09	2010-14	2015	2000-04	2005-09	2010-14	2015	2000-04	2005-09	2010-14	2015
EU-28	542	561	719	706	319	175	494	684	519	444	394	383	246	214	137	185
N. Zealand	286	294	285	340	253	299	379	418	560	680	1225	1403	357	388	469	528
USA	55	95	270	318	124	294	474	560	40	25	38	35	9	38	68	26
Switzerland	51	54	61	64	10	12	13	8	3	2	1	1	1	1	6	3
Australia	237	206	167	179	189	158	147	204	211	148	107	67	101	72	51	36
Belarus	32	93	137	178	30	60	76	111	12	29	35	38	30	60	68	83
S. Arabia	11	139	150	125	9	11	20	11	4	29	21	19	4	7	3	4
Argentina	25	48	55	43	19	15	20	24	119	145	174	138	6	16	19	9
Ukraine	47	76	61	na	55	50	20	na	9	16	2	na	32	10	4	na
Uruguay	18	31	44	na	12	14	24	na	21	40	61	na	11	14	20	na

Sources: Comtrade except for the EU (Comext) / Treatment INRA, SMART-LERECO - na = not available

2.2.4. Butter and dairy fats

World production (10.3 million tons in 2015), which has increased by 39% since 2000, has resulted from 70% of developing countries. India ranks first (41% of the world total in 2015) ahead of the EU (22%), the USA (9%), Pakistan (7%) and New Zealand (5%). Unlike milk powders, butter is a product consumed mainly in the country of production. In India, consumption focuses on the "ghee" which is a clarified butter. The star ingredient of traditional gastronomy and considered to be the purest and noblest fat, ghee comes from a classic butter from which water, lactose and proteins have been removed.

Although a modest contributor to the global supply of butter, New Zealand was the largest exporter (528 000 tons in 2015, half of global flows). It was clearly ahead of the EU (185 000 tons), Belarus (83 000 tons), Australia (26 000 tons) and the USA (26 000 tons). Because of the importance of its domestic market (UN, 2015), the structure of its companies (Rao and Reddy 2014) and the political strategy in the agri-food, India does not export butter (Joshi 2014). The main importers of butter were Russia (94 000 tons in 2015), China (71 000 tons), Egypt (58 000 tons) and Saudi Arabia (52 000 tons). International trade in butter and dairy fat could increase by around 15% by 2024.

In addition to the four dairy products mentioned above, others are also subjects of international trade. Whey powder (1.4 million tons traded in 2015), which is a co-product of cheese, is mainly exported by the EU, the USA, and to a lesser extent by Belarus, Switzerland and Argentina (Cappellini, 2011). China is the largest purchaser, with a flow close to 400 000 tons per year, ahead of Russia (110 000 tons), Indonesia (100 000 tons) and Malaysia (70 000 tons). Casein exports are dominated by New Zealand and the EU. International trades in packaged liquid milk and fresh dairy products remain generally modest.

2.3. Three competing exporting countries: New Zealand, USA and Australia

Always from the *Comtrade* database for the period 2000 to 2015, the aim is now to return to the path of three EU competing countries on world dairy product markets, namely New Zealand, the United States and Australia. Data are expressed in quantity terms (tons) and value terms (million current euros). Reasoning in value terms is interesting for at least three reasons:

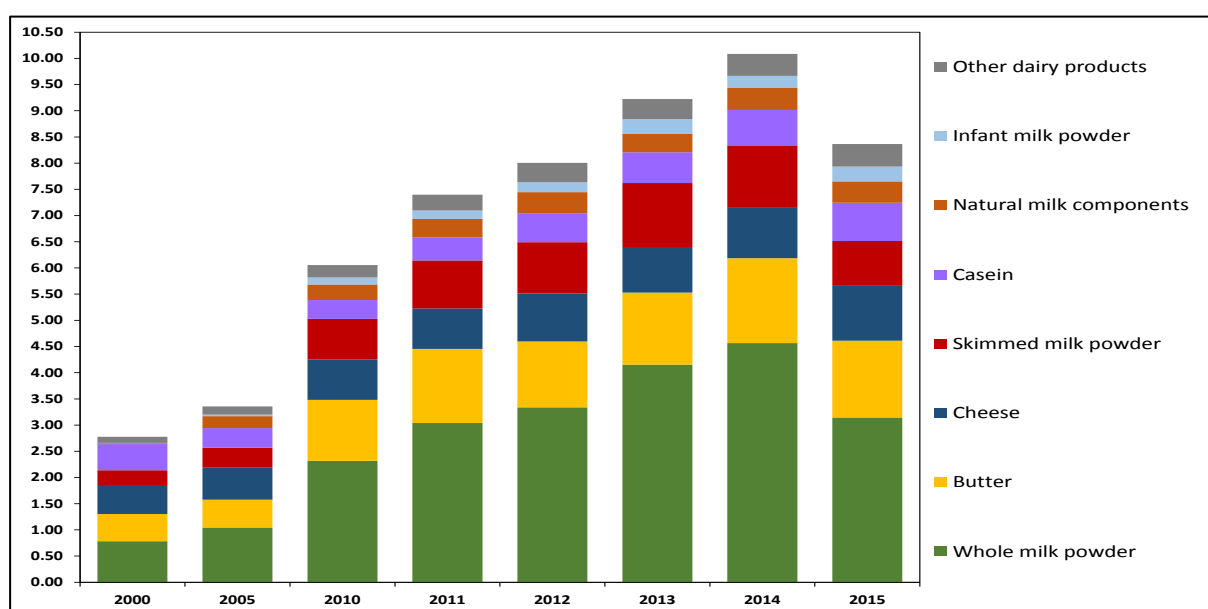
- i) It makes it possible to integrate the question of creating value on a given property (differentiated selling price of the product because of distinct qualities);
- ii) It allows the aggregation of different products to provide a total amount of trade;
- iii) It is sensitive to the effects of price volatility on international markets (for the same quantity exported, the export value may vary from year to year) and changes in currency parities.

2.3.1. New Zealand

This country is not only the most formidable competitor of the EU on international dairy markets, but one whose influence on international prices is the most decisive. Despite the modest size of its territory (11 million hectares of useful agricultural land) compared to the EU (172 million hectares) and to the USA (408 million hectares), the country has already become, for many years, the largest exporter of dairy products, at least in milk equivalent. This is because the consumer market is cramped (New Zealand has 4.5 million inhabitants or less than 1% of the European population) and the natural assets of this country to produce milk are numerous: an abundance of quality grassland; water resources; actors' voluntarism; a high concentration of industrial tools and expertise in dairy technology, *etc.* (Institut de l'Elevage 2010). In 2015, New Zealand milk production was around 22 million tons (slightly less than France) for 5 million dairy cows (DairyNZ 2015). Even though the 12 000 New Zealand dairy farms, with an average herd of 420 heads remain among the most competitive in the world in terms of production costs, the gap is narrowing with European competitors (Perrot *et al.*, 2016). The dramatic increase in land price in the past fifteen years (but with a reversal of it since the 2015-16 crisis) and fodder production intensification due to increased use of fertilizers have contributed to a rise in production costs (Foote *et al.*, 2015). These farms, which are not supported by direct payments as is the case in the EU (Gouin and Kroll 2016), deliver their production mainly to the *Fonterra* cooperative. Founded in 2001 under the auspices of the Government by the merger of two cooperatives and the New Zealand export office, *Fonterra* provides almost 92% of domestic collection. It is the fourth international group for sales revenue behind Nestlé, Danone and Lactalis and it has a major influence on international prices.

In recent years, New Zealand was the country that has most benefited from the growth (in quantity terms) of international dairy products trade. In 2015, dairy products accounted for 18% of the country's total exports, the first rank of the exported goods (New Zealand Ministry of Foreign Affairs and Trade, 2015). The increase in exports (about 12 million tons in milk equivalent since 2000) was made possible by the rapid development of production, especially on South Island where dairy farming has taken over agricultural land at the expense of competing productions (suckler cows and sheep) and where irrigation has promoted the intensification of forage areas. Although still at a low level compared to its competitors, the milk yield per cow (about 4 200 kg in 2015) has also improved helping to strengthen productive effort.

Figure 3: New Zealand exports of dairy products (billion current euros)



Source: Comtrade / Treatment INRA, SMART-LERECO

New Zealand dairy product exports increased in current currency from €2.8 billion in 2000 to €8.4 billion in 2015 (Table 3). Before the sudden and recent decline in Chinese imports, a peak in exports was recorded in 2014 amounting to €10.1 billion (Figure 3). In 2015, exports mainly concerned whole milk powder (38% of export value), butter (18%) and cheese (12%). China was the main recipient of New Zealand's dairy growth. Indeed, only 3% of exports (in value terms) of New Zealand in 2000, the country accounted for 20% in 2015 (with a peak of 33% in 2013). This explains alone, 30% of export growth between 2000 and 2015. Beyond this observation over a long period, China's purchases of dairy products from New Zealand fell sharply between 2013 (€3 billion) and 2015 (€1.7 billion). This decline, which partly explains the drastic decline in international dairy product prices was particularly

strong in whole milk powder (631 000 tons in 2013 to 359 000 tons in 2015). Even though the weighting of the factors that influenced this decline is difficult to establish, there is a consensus around the idea that Chinese stocks were too abundant compared to the dynamics of domestic demand in a period of declining economic growth rate (Institut de l'Élevage 2016). The other main client countries of New Zealand are the United States (7% of total exports in value terms in 2015), Australia (5%) followed by the United Arab Emirates, Malaysia, Japan, Algeria, Philippines, Indonesia and Thailand (+ 3% to 4% for each country).

Table 3: Dairy sector and dairy product trade in the surveyed countries.

	EU-28	New Zealand	United States	Australia	Russia	China
Population (million)	508	4.6	323	24	146	1 374
cow milk production (million tons / year)	159	22	96	10	30	37
Number of dairy cows	23.4	5.0	9.3	1.7	7.7	14.9
Dairy products exports in 2000 (billion €)	6.4	2.8	1.1	1.7	0.2	0.1
Dairy products exports in 2015 (billion €)	14.5	8.4	4.9	1.7	0.3	0.2
variation 2015/2000 (Billion €)	8.1	5.6	3.8	0.0	0.1	0.1
Dairy product imports in 2000 (billion €)	1.2	0.1	1.8	0.2	0.3	0.3
Dairy product imports in 2015 (billion €)	0.8	0.3	3.1	0.8	1.8	5.6
variation 2015/2000 (Billion €)	- 0.4	0.2	1.3	0.6	1.5	5.3
Dairy product balance in 2000 (billion €)	5.0	2.7	- 0.7	1.5	- 0.1	- 0.2
Dairy product balance in 2015 (billion €)	13.2	8.1	1.8	0.9	- 1.5	- 5.4
variation 2015/2000 (Billion €)	8.2	5.4	2.5	- 0.6	- 1.4	- 5.2
Customers #1 in 2015 (in value terms)	China	China	Mexico	Japan	Kazakhstan	Hong Kong
Customers #2 in 2015 (in value terms)	United States	United States	Canada	China	Belarus	United States
Customers # 3 in 2015 (in value terms)	Hong Kong	Australia	China	Singapore	ns	ns
Suppliers #1 in 2015 (in value terms)	Switzerland	Australia	EU-28	New Zealand	Belarus	EU-28
Suppliers #2 in 2015 (in value terms)	New Zealand	ns	New Zealand	EU-28	EU-28	New Zealand
Suppliers #3 in 2015 (in value terms)	Ukraine	ns	Mexico	United States	Switzerland	United States

Source: Treatment INRA, SMART-LERECO after UN FIL Comtrade (Ns = not significant for flows below 80 million €).

In this small country where foreign trade accounts for nearly 58% of the Gross Domestic Product (GDP), the signing of trade agreements is a strategic element to access under better conditions in some growing markets. In this sense, a trade agreement with Australia, Closer Economic Relations (CER), entered into force in 1983 with the elimination of all tariffs and quantitative restrictions. Furthermore, New Zealand is a member of the Forum for Economic Cooperation Asia-Pacific (APEC), whose main objective is to remove barriers to trade and foreign direct investment (FDI) among its members. In April 2008, New Zealand was the first OECD country to sign a free trade agreement with China. In 2010, a free trade agreement between New Zealand, Australia and ten ASEAN countries (Association of Southeast Asian Nations) entered into force. In October 2015, an extension of the Trans Pacific Strategic Economic Partnership Agreement (TPP) was signed by twelve countries representing 40% of global GDP, including Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, Vietnam and the United States.

Despite agreements signed in 1995 in the framework of the World Trade Organization (WTO) to highlight the opening of food markets², the EU contributes only to 3% of New Zealand dairy product exports. In 2015, EU imports from New Zealand included mainly casein (55% of purchases in value terms), butter (30%) and cheese (6%).

2.3.2. The United States

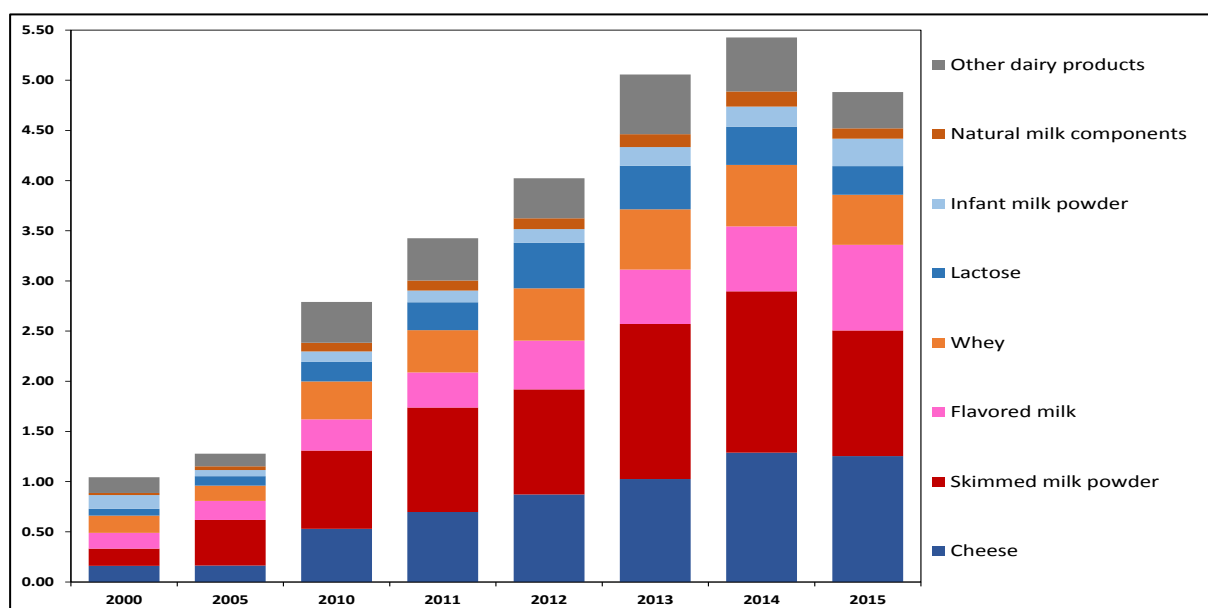
This country, which is the third largest milk producing country behind the EU and India, recorded a significant increase in production over the last fifteen years (+20 million tons, or +26%). According to the USA Department of Agriculture, domestic milk production could increase by about 2% per year by 2025 (USDA 2016). In 2015, USA dairy production (96 million tons) was the result of a herd of 9.3 million highly productive dairy cows (about 10 000 kg of milk per cow per year) distributed on about 60 000 farms. Farms with livestock numbers exceeding 1000 cows accounted for 6% of all farms, but 48% of the USA cow herds

² As part of the pricing procedure agreed during the negotiations at the WTO, member countries were required to maintain current access opportunities for the importation of products priced at levels equivalent to those of the period base (1986-1988). When this "current" access was less than 5% of domestic consumption of the product concerned during the baseline period, a possibility (additional) minimum access should be opened on the basis of the principle of the Most Favored Nation (MFN). In milk, the actual access to the EU market was realized within the framework of preferential import quotas. Imports of butter and cheese from New Zealand have been perpetuated under the current access with low historical duty.

(MacDonald *et al.*, 2016); this proportion had considerably increased since it was only 9% in 1992. At the other extreme, farms with less than 100 cows represent three quarters of the farms, but only 17% of the milk supply. The two main USA dairy states are California (19% of the national supply) and Wisconsin (14%), each with productive specificities. California's farms are often characterized by a large herd size, sustained use of wage labor and substantial purchases of food. In Wisconsin, farms are often family-run more modest in size and with feed produced directly on-farm. Other USA states involved in milk production (each for 5% to 7% of the national total) are Idaho, New York state, Texas, Pennsylvania, Michigan and Minnesota.

The new agricultural Bill, enacted at the beginning of 2014 for five years, made some changes in the forms of public intervention. Two new measures were introduced at the dairy policy level: the first is the *Margin Protection Program (MPP)*: This is an insurance margin for dairy farmers that provides compensation when the difference between the milk price and the cost of the food falls below a certain threshold for two consecutive months; the second is the *Dairy Product Donation Program (PDS)*: it provides government purchases of milk to the poorest (domestic food aid) when the margin falls below a certain threshold (Burdine *et al.*, 2014).

While the United States exported few dairy products in 2000 (€1.04 billion), they became a major player in the market in 2015 (€4.9 billion). Exports amounted to 10 million tons in milk equivalent in 2015, nearly 10% of domestic production. The increase in exports alone accounted for half of the production growth observed in the United States since 2000. In 2015, exports from the United States (Figure 4) mainly concerned cheese (25%), skimmed milk powder (25% in value terms), flavored milk (17%) and whey (10%). Exported dairy products were mainly destined to Mexico (24% of the total in value terms) and Canada (16%). These two countries, geographical neighbors and also members of the North American Free Trade Agreement (NAFTA) since 1994, contributed to 43% of the growth of the USA exports between 2000 and 2015. Mexicans purchased mainly skimmed milk powder (45% of total purchases of dairy products in value terms) and cheese (29%) from the USA. Canadian imports were more concentrated on flavored milks (57% of purchases) and infant milk powder (17%). Other major USA customers were China (8%), South Korea (6%), Japan (5%) and Philippines (4%).

Figure 4: USA exports of dairy products (billion current euros)

Source: Comtrade / Treatment INRA, SMART-LERECO

The EU is a marginal customer of the United States, representing 0.9% of total USA dairy exports, or €44 million. Reciprocity is not valid because the USA purchases €1.3 billion of dairy products from the EU (70% cheese and 18% casein). Thus, despite their dynamism in exports, the United States are also major importers of dairy products (€3.1 billion in 2015). Besides the EU, which accounts for 43% of their supplies, other suppliers are New Zealand (21%) and Central America (7%). Among European countries, France is the third largest supplier of the United States behind Italy and Ireland.

2.3.3. Australia

This country, which was the third largest exporter of dairy products in 2000, has since experienced a more difficult period due to the sensitivity of supply to climatic factors (Hanslow *et al.*, 2014). In 2015, Australia had 6 100 dairy farms (against 12 900 in 2000) for a herd of 1.7 million dairy cows (against 2.2 million heads in 2000). Similarly, milk production decreased significantly from 10.8 million tons in 2000 to 9.7 million tons in 2015. Australian dairy farms, which have an average herd of 294 cows with a yield of 5700 kg per year, are fairly concentrated in the coastal areas of southeast Australia, where forage yield of grassland is largely dependent on rainfall and irrigation. The Victoria state thus includes two thirds of dairy farms (Dairy Australia 2015).

The part of milk production exports decreased in Australia from 54% of production in 2000 (€1.76 billion of exports) to 34% in 2015 (or €1.74 billion). Expressed in constant currency, such an evolution translates in fact a substantial drop. Between 2000 and 2015, exports fell in quantity terms by 70% for whole milk powder and butter, 29% for cheese and 9% for skimmed milk powder. The main Australian customers are Japan (19% of the total value of exports in 2015), China (16%) and Singapore (8%). Indonesia, Malaysia, Hong Kong, South Korea, Philippines and Thailand also each accounted for 3% to 7%. Even though cheeses accounted for 90% of Japanese imports from Australia, this rate is only 18% for China.

2.4. The case of two major importing countries: Russia and China

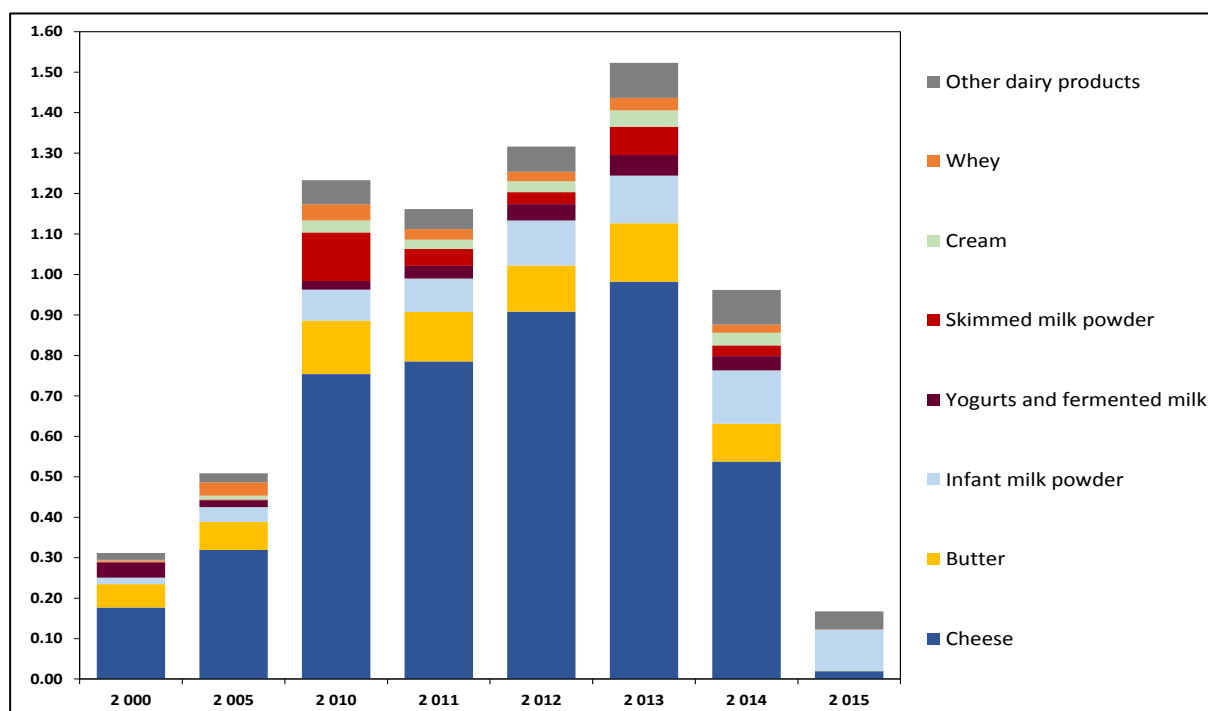
2.4.1. Russia

The role of agriculture in the Russian economy has significantly declined over the last twenty years, from 15% of GDP in 1990 to only 4% in 2015. Despite the political ambition declared in a presidential decree in 2010 to almost achieve food self-sufficiency in 2020 (with a target rate of 90% for milk), Russia still remains a country in deficit for food products (-€9.3 billion in 2015). Agriculture production has been on the rise again since 2005 for some short cycle animal sectors (poultry and swine) after a period of collapse which lasted until the end of the nineteen-nineties and then a period of stabilization between 2000 and 2005. However, the situation remains difficult in the bovine sector, due in particular to the too low return on investment (FranceAgriMer 2013). Milk production fell by around 15 million tons between 1990 and 2000 and then stabilized from 2000 to around 30 million tons for a herd of 7.7 million heads in 2015. In this country, where small-scale family farms using self-consumption are still numerous, milk collection reaches only slightly more than half of the national production.

Faced with this stability of the dairy supply and increase in purchasing power of Russians, imports of dairy products have steadily increased over the last fifteen years. They increased from €300 million in 2000 to €3.5 billion in 2013, the highest peak of the period. At that time (2013), imports mainly concerned cheese (46% of imported dairy products in value terms), butter (15%) and skimmed milk powder (10%). The main suppliers of dairy products of Russia (then the second largest importer behind China) were the EU (43% of purchases), Belarus (35%), and much further behind Ukraine (8%) and New Zealand (3%).

As of August 2014, the ranking of countries providing Russia evolved due to the application by the Russian authorities of an embargo on certain food products (including dairy products) from the EU, the USA, Australia, Canada and Norway (European Commission 2014)³. Compared to 2013, Russian imports of dairy products (in value terms) fell by 14% in 2014 and 47% in 2015. In addition to the reduction in purchased quantities of dairy products, especially cheese, falling international prices contributed to the accentuation of the decline. Although Russia imported more dairy products from Belarus, the embargo led to a lower availability of cheese on the domestic market (European Commission 2015). In 2015, Russian imports amounted to 201 000 tons of cheese (against 438 000 tons in 2013), 94 000 tons of butter (against 144 000 tons in 2013) and 110 000 tons of skimmed milk powder (against 109 000 tons in 2013). European cheese exports to Russia fell by 257 000 tons between 2013 and 2015 (they became almost nil) while those from Belarus increased by 52 000 tons. The drastic and sudden drop in Russian purchases is commercially damaging for the EU (Figure 5).

Figure 5: Russian imports of dairy products from the EU (billion current euros)



Source: Comtrade / Treatment INRA, SMART-LERECO

³ The embargo was imposed following sanctions against Russia for its interference in the Ukrainian crisis of 2013-14 and the attachment (called "annexation" by the European authorities) of the Crimea to the Russian Federation. These measures were decided on 17 March 2014 by the foreign ministers of the twenty-eight EU Member States.

The Russian embargo should last until the end of 2017 according to the decisions announced in June 2016 by Vladimir Putin. Although Russia's recent accession (August 2012) to the WTO could bring more stability to the EU's trade relations with that country, the embargo has changed this trajectory.

In the event of a lifting of the embargo, the question remains as to whether or not the EU will be able or not to resume full market shares acquired in 2013. Not only Belarus has developed its exports and consolidated its trade relations with Russia, but Russia is trying (without really achieving this goal) to develop its domestic dairy production independently of the embargo. The deterioration of the main economic indicators of the country could also penalize a resumption of purchases: the fall in oil and gas prices has weakened financial entries in this great country producing fossil energy; the ruble devaluation penalizes trade; inflation reached 15% in 2015; impoverishment of a part of the population is growing.

2.4.2. China

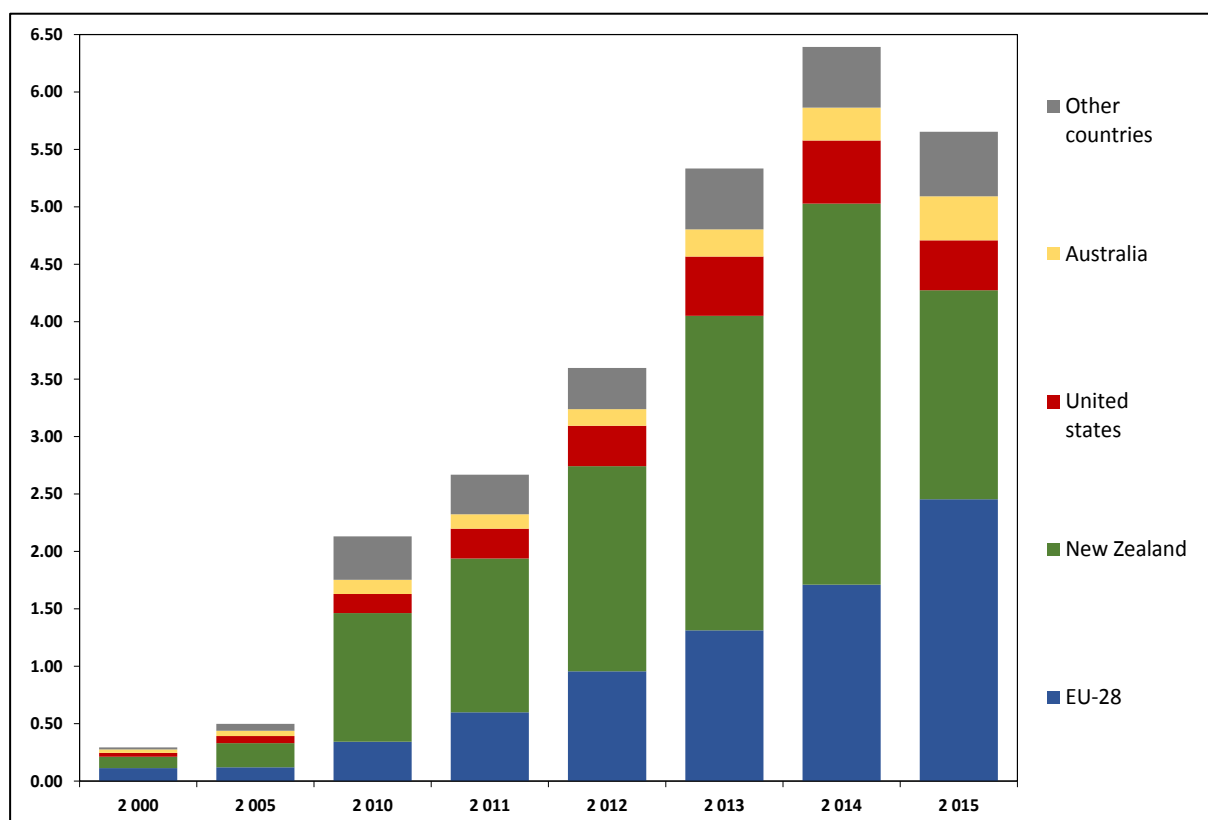
This country is the largest importer of dairy products (Zhang and Roberts 2016). Unlike Indians, whose dairy consumption level is already close to the world average (109 kg per capita per year), the Chinese still consume little milk (about 35 kg). However, for various reasons, the trend is rising: an improvement in disposable income for a part of the population; an increased concern of people for their health; a very positive image of dairy products, primarily in infant milk powder for newborns; more extensive cold chain logistics; increased outlets for dairy products, *etc.* The rural population, given the strength of the traditional food model and the reduced availability of products, is distinguished by consuming still less than 10 kg (International Dairy Federation 2015). In this country, which accounts for 21% of the world population for 9% of arable land, the agri-food trade balance is negative (-€31 billion in 2014) and imports of dairy products account for 20% of consumption.

After quadrupling between 2000 and 2008, China's dairy production (37 million tons in 2015 or 4.6% of world supply) has made little progress since 2008, which also corresponds to the public health scandal relating to contamination of milk with melamine (Qian *et al.*, 2011). Indeed, some batches of locally produced milk and infant milk contained melamine (a product considered toxic) in order to make them appear to be richer in protein (Wang and Saghalian 2013). The Chinese authorities incriminated at least twenty-two dairy companies in this scandal, two of them exported products to Burundi, Gabon, Bangladesh and Burma. Chinese

consumers, at least those who can afford it, have since shown a certain distrust of products derived from the domestic dairy industry and prefer an external supply (Wang *et al.*, 2008).

In 2015, China's dairy production was the result of a herd of 6.5 million dairy cows. Even though large farms (more than 1 000 cows) are few, given the multitude of small family units, they hold nearly 15% of the national herd. Many challenges are posed to the Chinese dairy production sector: structures are often fragmented; the productivity of production factors (including land) is limited compared to American or European standards; production costs are rising very quickly due to the high dependency on external purchases (including soybeans, maize, alfalfa and even hay) due to too little forage autonomy. Faced with these challenges and growth in domestic demand, industrialists, world leaders in the sector (including *Fonterra, Danone, Friesland-Campina, etc.*), strengthen their capital links with Chinese players to build new transformation sites. At the same time, Chinese investors are looking to consolidate their supplies through direct investment abroad, as is the case for example in Carhaix in Brittany. The CEO of *Synutra* has indeed announced in 2016 that Chinese investment on the French site could represent €400 million over the period 2014-2020.

Figure 6: China's main suppliers of dairy products (billion current euros)



Source: Comtrade / Treatment INRA, SMART-LERECO

Except for 2015, the past fifteen years have been characterized by an increase in Chinese dairy product imports, with a marked acceleration since 2010 (Figure 6). The growth of Chinese imports has no equivalent in the world (tenfold increase in current currency since 2000). Imports accounted for €5.6 billion in 2015, 43% from the EU, 32% from New Zealand (a country with a better position in 2013), 7% from the USA and 7% from Australia. In 2015, the EU's place in Chinese imports was, in value terms, 3% for whole milk powder (against 91% for New Zealand), 16% for cheese (against 46%), 20% for skimmed milk powder (against 58%), 53% for whey powder (against less than 1%) and 72% for infant milk powder (against 8%). American market share was significant for lactose (67%) and whey powder (36%).

Despite China's increasing openness since it joined the WTO in 2001, the conditions for access to the Chinese market are often complex for companies. This opening remains, however, fragile because it is conditioned to more or less authoritarian / predictable state decisions. Since November 2015, a mutual recognition agreement between China and the EU in terms of certified operators entered into force (Emlinger and Fouré 2016). This agreement gives European companies certified as an Authorized Economic Operator (OEA) the possibility to benefit from simplified and secure customs procedures to access the Chinese market.

Beyond the long-term trend, 2015 saw a decline in Chinese imports of 11% in value terms compared to 2014. This decline in Chinese purchases (-€740 million in total) had a various impact depending on the geographical area. New Zealand is the country that suffered the most economically with a decline in sales of 45% or -€1.5 billion in a single year mainly due to the decline in imports of whole milk powder. The United States recorded, too, a drop in exports (-21% or -€115 million). The EU, for its part, improved its positions in the Chinese market in 2015 (+€743 million) thanks to the increase in purchases of infant milk powder (product representing 67% of all European exports). The origins of the sudden drop in Chinese imports of whole milk powder are multiple: the Chinese economy is facing a slowdown in its gross domestic product (GDP) growth rate; the stocks accumulated at the beginning of 2015 were important; some strategies deployed by industrialists accentuated the phenomenon: not only a part of imported whole milk powder stocks has been rehydrated to make liquid milk cheaper than that produced locally, but significant quantities of Chinese liquid milk surplus have been dehydrated for storage as milk powder (Institut de l'Élevage 2016).

The 2015 crisis has not been neutral domestically (Chaumet 2016). It led to a decline in China's leading dairy group turnovers, with the exception, however, of the leader (Yili); it caused the abandonment in production on small farms weakened by the downturn in milk prices and competition from larger farms integrated with processing; it has slowed investments in the sector. Should we fear other challenges in the coming years? In the first six months of 2016, Chinese imports rebounded for almost all products (+25% for whole milk powder compared to the same period of 2015, +5% for skimmed milk powder; +43% for butter and +16% for whey). This rebound is to be related to the dynamism of the sales of dairy products on the domestic market (+8% in the first quarter 2016 compared to the same period of 2015).

China's exports of dairy products are, in turn, marginal (€191 million in 2015). They mainly concern flavored milk for Hong Kong.

3. Dairy product trade between the EU and member states

The previous analysis made it possible to account for the contribution of the various geographical areas to global milk production and international trade in dairy products. In this second part, the goal is to focus on the EU specificities by valuing the Comext database from Eurostat.

Methodologically, and as in Comtrade, this database is based on the harmonized system (HS) nomenclature administered by the World Customs Organization. By making it possible to provide worldwide a single designation code for the same goods, the HS contributes to the harmonization of customs procedures, trade and customs procedures and facilitates the exchange of trade data. In Comext, external trade statistics cover both extra-EU and intra-EU flows. Following the adoption of the single market on 1st January 1993, customs formalities between Member States were abolished, but a new data collection system by traders was set up for intra-Community trade.

Even though the analysis below covers the vast majority of dairy products (cheese, powder, casein, liquid milk, yogurt, *etc.*), specific categories are excluded, such as milk used for ice cream, milk replacers for animals and certain food preparations. A methodological correspondence (grouping of customs codes) was voluntarily sought with work published annually by the National Interprofessional Centre of the Dairy Economy (CNIEL 2016).

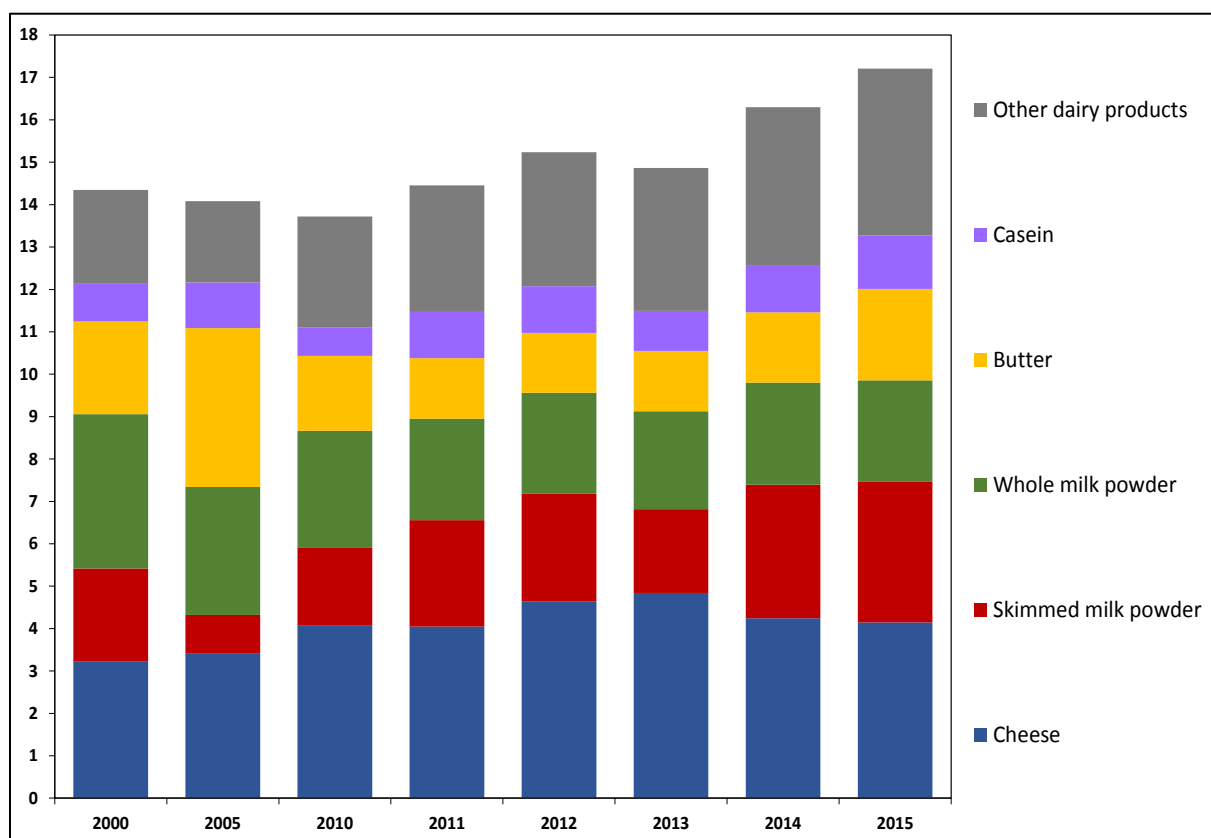
The first section deals with the evolution of the EU's extra-EU dairy products trade during the period 2000-2015. The second section deals with the positioning of the different Member States, distinguishing between extra-EU and intra-EU trade.

3.1. EU's Extra-EU trade

3.1.1. EU exports of dairy products

The EU, the second exporting area in the world in terms of quantity (25% of world trade in milk equivalent) behind New Zealand, exports about 11% of its domestic production (by applying the calculation methodology in milk equivalent developed by the CNIEL to the Comext data). This rate is close to that of the United States, but very far from the record achieved in New Zealand (nearly 95%). Exports increased from 14.2 million tons in milk equivalent in 2000 to 17.2 million tons in milk equivalent in 2015 (+ 20%). In value terms (current currency), they increased from €6.4 billion in 2000 to €14.5 billion in 2015, with a rather sharp acceleration since 2009 (Bojnec Ferto and 2014); the peak of the period studied was reached in 2014 with €15.3 billion.

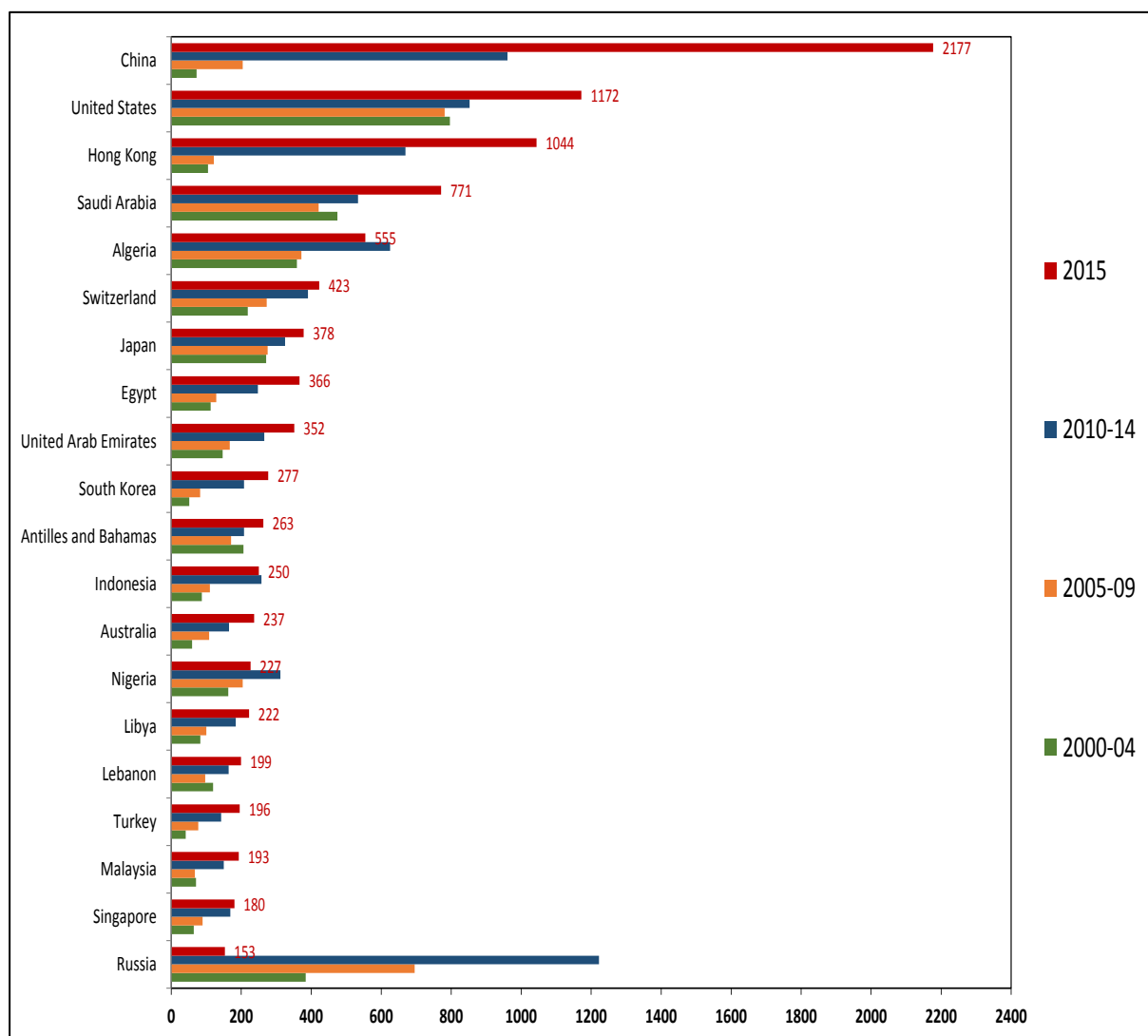
Figure 7: EU exports of dairy products (million milk equivalent tons)



Source: Comext / Methodology CNIEL / Treatment INRA, SMART-LERECO

In 2015, European dairy product exports expressed in value terms, resulted in 25% of infant milk powder, 23% of cheese, 10% of skimmed milk powder, 8% of whole milk powder, 6% of flavored milk, 5% of whey, 5% of butter, 4% of condensed milk, 4% of casein and only 3% of liquid milk. The types of exported products have evolved over time as the infant milk powder accounted for only 10% of exports in 2000 against 20% for whole milk powders. In milk equivalent, the hierarchy of the main products exported differs from that expressed in value terms (Figure 7): cheeses first (24% of total), ahead of skimmed milk powder (19%), whole milk powder (14%), butter (12%). Infant milk powder (2.7%) has little influence when considering the amount of milk mobilized upstream. These few figures suggest that increasing exports of high added value products (but low milk) products does not necessarily imply much extra milk production at the farm level.

Figure 8: The EU's main customers in dairy products (million current euros)



Source: Comext / Treatment INRA, SMART-LERECO

In value terms, for the year 2015, the first three EU customers in dairy products are China (€2.17 billion), the USA (€1.17 billion) and Hong Kong (€1.04 billion). The next countries are Saudi Arabia, Algeria, Switzerland, Japan, Egypt, the United Arab Emirates and South Korea (Figure 8). Asian countries, especially China and Hong Kong, are clearly the two destinations that have contributed the most to the increase in European exports.

An analysis of the evolution of exports (in tons) for different dairy products further clarifies the diagnosis for EU customers.

- *European cheese exports* reached 706 000 tons in 2015 against 519 000 tons in 2000. Despite the significant decline in sales on the Russian market since 2013 (-257 000 tons), the EU has lost only 89 000 tons in export since that date thanks to increased exports to other countries, including the United States, Japan and South Korea (about 25 000 tons each). The United States, which was the EU's largest customer for cheese before 2004 then the second's largest customer behind Russia between 2005 and 2013, again occupies the pole position with 140 000 tons bought in 2015, or 20% of total EU exports . Japan (68 000 tons) comes in second place ahead of Switzerland (55 000 tons), Saudi Arabia (38 000 tons) and South Korea (35 000 tons). While developed countries are an important part in European cheese trade, they unfortunately are not placed at the heart of the world's upcoming population growth. The challenge is certainly to develop cheeses that can be sold in countries with lower purchasing power in the light of what is being done in North Africa.

- *EU exports of skimmed milk powder* amounted to 684 000 tons in 2015 (best result of the last fifteen years) against 450 000 tons in 2000, an increase of 50%. In 2015, the main EU customers were Algeria (107 000 tons), Egypt (58 000 tons), China (54 000 tons) and Indonesia (46 000 tons). The Philippines, Thailand, Saudi Arabia, Vietnam and Malaysia then follow with purchases between 20 000 and 30 000 tons. These buyers, mainly African and Asian, have a different economic profile than the leading cheese buyers. On this market, the EU is often in competition with the United States whose exports have increased more sharply in recent years.

- *EU exports of whole milk powder* reached 383 000 tons in 2015 against 586 000 tons in 2000 (a record year). This significant decline is explained by the choice of specialization of European industrialists in the face of strong competition with New Zealand. In 2015, the two major EU customers were Oman (57 000 tons) and Nigeria (28 000 tons), far ahead of China, Angola, Kuwait, Hong Kong and Guinea.

- *EU exports of butter* (including butter oil) amounted to 185 000 tons in both 2015 and 2000 (peaking at 325 000 tons in 2004). In 2015, the three main customers were China (25 000 tons), the USA (18 000 tons) and Saudi Arabia (18 000 tons).

- *EU exports of infant milk powders* which use little milk in quantity but generate a high turnover per ton produced increased from 155 000 tons in 2000 to 432 000 tons in 2015. The EU's main customers for these products were China (123 000 tons), Hong Kong (41 000 tons) and Saudi Arabia (37 000 tons) followed by Algeria, Russia and Turkey.

3.1.2. EU imports of dairy products

They are very weak. In 2015, they amounted to only €843 million for a milk production equivalent to 1.08 million tons, or 0.7% of domestic consumption. Imports fell too during the period under review, reaching 3.5 million tons in 2000. This decline is mainly due to lower butter purchases, mainly from New Zealand and Ukraine. In 2015, imports mainly concerned cheeses (51% in value terms), casein (16%), flavored milks (10%) and butter (8%). Switzerland is by far the EU's largest supplier with 62% of imported dairy products (expressed in value terms). These flows account for 75% of the cheeses. EU purchases of Swiss cheeses (51 000 tons in 2015) are almost equivalent to European exports of cheeses to Switzerland. The second largest EU supplier of dairy products remained New Zealand, with 23% of total imports in value terms.

3.1.3. The EU trade balance in dairy products

This has clearly increased over the period under review. It went from €5 billion in 2000 (or 10.8 million tons in milk equivalents) to €13.2 billion in 2015 (or 16.1 million tons in milk equivalents). This positive dynamic is not found in most other animal sectors.

3.2. Dairy product deficits and surpluses for member states

Cow's milk production in the EU (159 million tons in 2015) is fairly geographically concentrated (Roguet *et al.*, 2015). The top five milk producing countries are Germany, France, the UK, Poland and The Netherlands (table 4). While these five countries account for 61% of the European milk supply, the fifteen smallest producing countries account for only 11%.

Table 4: Milk production and trade of EU countries in dairy products in 2015 (billion euros)
- Country ranking in descending order for the trade balance in 2015

	% of product -ion	Exports			Imports			Balance		
	EU milk	EU-28	Non EU-28	Total	EU-28	Non EU-28	Total	EU-28	Non EU-28	Total
The Netherlands	7.9	3.99	4.03	8.02	2.66	0.09	2.76	1.33	3.94	5.27
France	16.1	4.52	2.39	6.91	3.06	0.09	3.15	1.46	2.30	3.76
Germany	20.3	6.96	1.76	8.72	5.62	0.38	6.00	1.34	1.38	2.73
Ireland	3.6	1.85	1.37	3.23	0.77	0.00	0.77	1.09	1.37	2.46
Denmark	3.2	1.36	0.89	2.25	0.51	0.02	0.54	0.85	0.86	1.71
Poland	8.1	1.22	0.55	1.77	0.80	0.04	0.84	0.42	0.51	0.94
Austria	2.2	1.04	0.17	1.20	0.74	0.02	0.77	0.29	0.14	0.44
Lithuania	1.1	0.30	0.11	0.40	0.18	0.00	0.18	0.11	0.11	0.22
Czech Rep.	1.8	0.59	0.08	0.67	0.55	0.00	0.55	0.03	0.08	0.12
Luxembourg	0.2	0.47	0.00	0.47	0.37	0.00	0.37	0.10	0.00	0.10
Estonia	0.5	0.12	0.01	0.13	0.05	0.00	0.05	0.07	0.01	0.08
Latvia	0.6	0.14	0.03	0.17	0.11	0.00	0.12	0.02	0.03	0.05
Cyprus	0.1	0.08	0.02	0.11	0.08	0.01	0.09	0.00	0.02	0.02
Finland	1.5	0.24	0.13	0.38	0.38	0.00	0.38	- 0.14	0.13	0.00
Slovenia	0.4	0.11	0.04	0.15	0.16	0.00	0.16	- 0.05	0.04	- 0.01
Belgium	2.3	2.32	0.52	2.85	2.83	0.04	2.87	- 0.51	0.49	- 0.02
Malta	0.0	0.00	0.00	0.00	0.04	0.00	0.05	- 0.04	0.00	- 0.04
Hungary	1.2	0.20	0.06	0.26	0.32	0.00	0.32	- 0.12	0.06	- 0.06
Slovakia	0.6	0.25	0.00	0.26	0.32	0.00	0.32	- 0.07	0.00	- 0.06
Bulgaria	0.7	0.09	0.03	0.12	0.19	0.00	0.19	- 0.10	0.03	- 0.07
Croatia	0.3	0.05	0.03	0.09	0.17	0.00	0.17	- 0.12	0.03	- 0.09
Portugal	1.3	0.20	0.12	0.32	0.50	0.00	0.50	- 0.30	0.12	- 0.18
Romania	2.6	0.08	0.01	0.09	0.31	0.00	0.32	- 0.23	0.01	- 0.23
Greece	0.5	0.47	0.07	0.54	0.77	0.00	0.77	- 0.30	0.07	- 0.23
Sweden	1.8	0.18	0.16	0.34	0.88	0.01	0.89	- 0.70	0.15	- 0.55
Spain	4.2	0.85	0.33	1.19	1.76	0.01	1.77	- 0.91	0.33	- 0.59
Italy	7.2	1.82	0.72	2.54	3.46	0.07	3.53	- 1.64	0.65	- 0.99
United Kingdom	9.5	1.12	0.44	1.56	3.74	0.05	3.78	- 2.62	0.39	- 2.22

Source: Comext / Treatment INRA, SMART-LERECO

Intra-Community trade in dairy products (€30.6 billion in 2015) is significantly higher than extra-EU exports of Member States (€14.5 billion). Several factors explain this situation : some EU countries have a historical deficit in dairy products; consumers of a country often express a taste for diversity of their food (example : the French buy Dutch gouda while the variety of French cheeses on the market is, however, already extraordinary); goods move freely within the EU without the application of customs duties; some ultra-fresh dairy products can be shipped easily to a neighboring country but with more difficulty to a distant country because of their perishability and induced transportation costs.

3.2.1. The three main EU countries with deficits in dairy products

These were, in decreasing order in 2015, the United Kingdom, Italy and Spain.

- *In the UK*, the EU's third largest milk producing country (15.1 million tons in 2015), the trade balance in dairy products was always negative over the last fifteen years. The deficit increased over time, from €951 million in 2000 to €2.22 billion in 2015. The main deficits were for the following products: cheeses (-€1.13 billion in 2015), infant milk powder (-€452 million), yogurt (-€393 million) and flavored milks (-€249 million). The UK, however, had a surplus for some low added value dairy products, such as bulk liquid milk (€138 million) and whole milk powder (€83 million). The major UK suppliers are Ireland (32% of imports in value terms), France (18%) and Germany (12%).

- *In Italy*, domestic milk production (11.5 million tons in 2015) has been for at least fifteen years, insufficient to cover all domestic needs, especially since Italians are exporters of dairy products (€ 2,54 billion), mainly cheeses (89% of exports in value terms). The main customers of Italy are France (18% of exports), Germany (13%) and the USA (11%). Italy's trade deficit in dairy products was €990 million in 2015. While Italy enjoyed a positive trade balance in cheese (+€659 million), thanks to the development of quality specialties, Italy had a deficit in liquid milk (-€632 million), yogurt (-€230 million) and butter (-€201 million). Italy's main suppliers of dairy products (€3.53 billion in imports in 2015) are Germany (37%), France (19%), Belgium (7%), and Austria (7%). Given the types of products purchased, exports to Italy are large in terms of milk equivalent for its suppliers but generate little turnover compared to other destinations where exports involve products with higher unit cost (cheese or infant milk powder).

- *In Spain*, where milk production is rather low (6.7 million tons) compared to the population, the deficit in dairy products reached €586 million in 2015, with the exception of cream, infant milk powder and condensed milk. Spain had a deficit for all dairy products, but mainly for cheese (- 434 million). Spain imports dairy products (€1.77 billion) mainly from France (33%), Germany (19%) and The Netherlands (12%). Spain exported €1.19 billion of dairy products in 2015, including 34% cheese, 15% infant milk powder and 12% yogurt. Its main customers were France (20%), Portugal (20%), Italy (10%), and the USA (7%).

Alongside these three deficit countries, some fifteen EU Member States, including several new entrants from Central Europe, have a trade balance that is not far from equilibrium (table 4). No EU member state has a negative trade balance with third world countries.

3.2.2. The four major surplus EU dairy countries

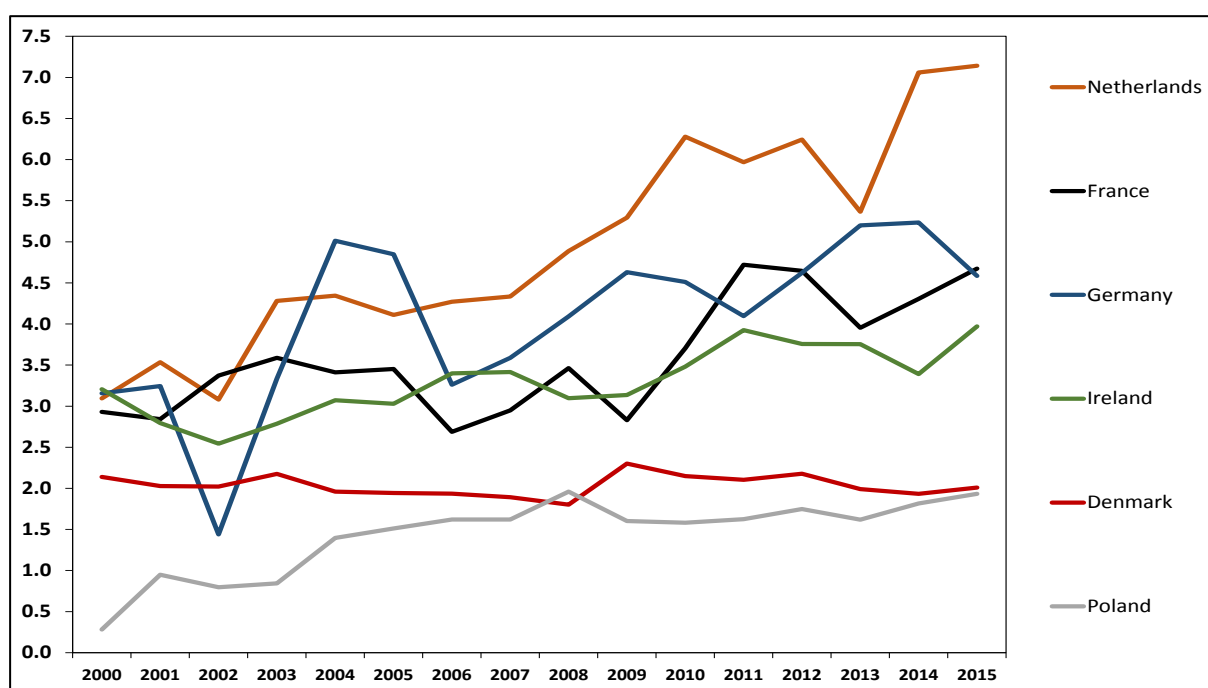
These are, in descending order in 2015, The Netherlands, France, Germany, and Ireland. These four countries, accounting for 48% of the EU's milk collection, account for two thirds of European exports to third world countries.

- *The Netherlands*, where milk production reaches 12.6 million tons, had the best trade balance in dairy products of the 28 Member States, with 7.14 million tons in milk equivalent and €5.27 billion in 2015 (against €1.58 billion in 2000). This was mainly due to improved trade with third world countries, especially those located in Asia. The most important extra-EU partners are Hong Kong (€818 million balance in 2015), China (€787 million), Saudi Arabia (€140 million), Nigeria (€116 million) and the USA (€114 million). The Netherlands have a positive trade balance with Germany, Belgium and France. They have, however, a negative balance with Ireland, Denmark and Poland. The Netherlands' performance is mainly due to cheese (1.93 billion balance in 2015) and infant milk powder (€1.58 billion). While third world countries play a central role in infant milk powder (86% of export quantities), 83% of cheese exports (763 000 tons in 2015 against 485 000 tons in 2000) are destined to European countries. The logistics efficiency of the port of Rotterdam, the concentration of economic operators (with the key role of Friesland-Campina) and the strength of the trading organization (trading activities) promote the connection of The Netherlands to European and international markets. This country is a crossing point for dairy products not directly manufactured internally but yet generating surplus value in the trade balance.

- Germany, the European country leader in dairy production with 20% of the EU total (Institut de l'Elevage 2012), ranks third for trade balance behind The Netherlands and France. It increased from €1.56 billion in 2000 to €2.73 billion in 2015 (with a peak at €3.67 billion in 2013), or a lower increase compared to its first two competitors (Figure 9). The trade surplus accounted for about 15% of domestic production (or 4.6 million tons in milk equivalent in 2015). Germany is Europe's leading exporter of dairy products (€8.72 billion in 2015). Its sales are 80% towards EU Member States, mainly to Italy (15% of German exports), The Netherlands (14%), France (7%) and Belgium (6%). Germany is the largest European

exporter of cheese (1.16 million tons in 2015 against 540,000 tons in 2000), 91% towards the EU. Given the importance of its home market, Germany is also the largest importer of dairy products (€6 billion in 2015) and cheese (753 000 tons in 2015), ahead of Italy (511 000 tons), the UK (482 000 tons) and France (335 000 tons). Its purchases of dairy products come mainly from The Netherlands (€1.57 billion), France (€950 million), Austria (€533 million), Denmark (€432 million) and Poland (€330 million). Products contributing the most to the positive trade balance are skimmed milk powder (€628 million in 2015), yogurt (€603 million) and liquid milk (€365 million).

Figure 9: The trade balance (in milk equivalent) of the leading exporters EU countries



Source: Comext / Treatment INRA, SMART-LERECO

- *Ireland*, a small milk-producing country (about 6 million tons, or 3.8% of the European total) ranks fourth in Europe for dairy product trade balance and the first position for self-supply (Donnellan *et al.*, 2015). This outstanding performance is due to the small domestic market (4.6 million inhabitants), its international openness, the voluntarism of its various actors and natural conditions (climate, grassland) particularly favorable milk production (Institut de l'Elevage 2013, Pflimlin 2010). Irish trade balance for dairy products increased from €1.09 billion in 2000 to €2.46 billion in 2015, a level close to Germany, where milk production is, however, five times higher in quantity terms. This balance is due largely to the United Kingdom (€463 million balance at Ireland's profit in 2015), China (€380 million) and the USA (€177 million). In 2015, dairy products contributing the most to the positive trade

balance are infant milk powder (€1.14 billion), butter (€597 million), and cheese (€504 million). Ireland has a deficit in bulk liquid milk (-€120 million). Imports are almost exclusively from Northern Ireland and this milk is then processed into ingredients for export. Given the structure of its trade relations, Ireland will be particularly sensitive to the negotiations that will be engaged after the favorable vote of the British to the exit of their country from the EU.

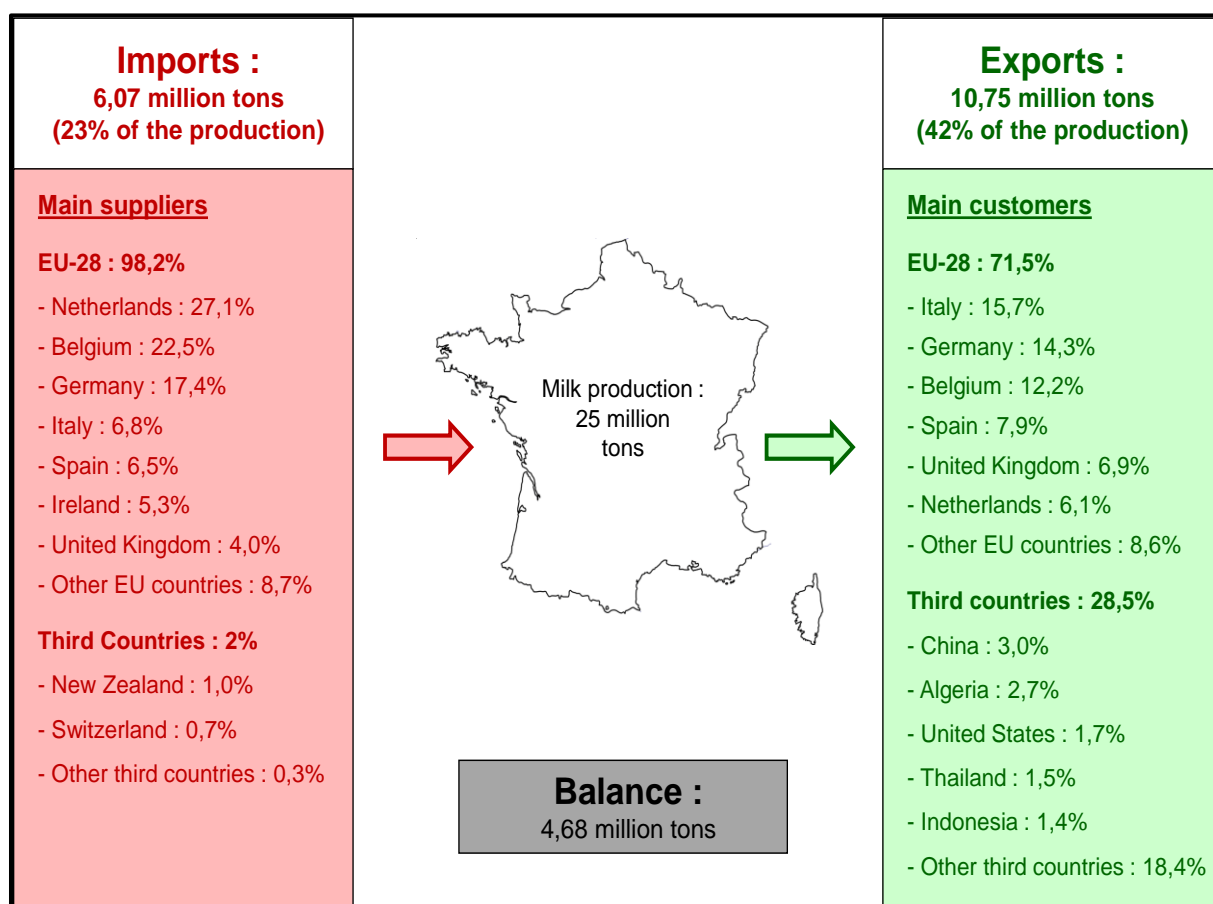
The other EU member states which subsequently enter the dairy products trade balance's hierarchy are Denmark (from €1.26 to €1.71 billion trade balance between 2000 and 2015), Poland (€144 to €938 million), and Austria (€153 to €437 million). Between 2013 and 2015, the decline in exports of dairy products to Russia affected the most the following countries: The Netherlands (-€259 million), Finland (-€253 million), Germany (-€167 million), Lithuania (-€155 million), Poland (-€142 million) and France (-€91 million).

4. Dairy product trading in France

With just over 25 million tons of cow milk collected in 2015, France accounted for 3.2% of world collection and 16.1% of European collection (CNIEL 2016, Chatellier *et al.*, 2013). French dairy production comes from a herd of 3.6 million dairy cows distributed on 63 000 dairy farms (against 384 000 in 1983, the year before milk quotas were implemented). Although dairy production is highly concentrated in the western and northern French regions (Roguet *et al.*, 2015), the diversity of the production systems remains high in the country, but with a decrease in production in mixed farming areas of low density (Southwest and Poitou-Charentes). In recent years, the improvement in its trade balance is mainly due to the dynamics of exports to third world countries. After a presentation of French dairy product export evolution and its customers, this third part deals with French imports and suppliers and then with the trade balance.

4.1. France's exports and its main customers

In 2015, France ranked third among European dairy exporters (all destinations and in value terms) behind only Germany and The Netherlands. Its exports increased (in current currency) from €4.15 billion in 2000 to €6.91 billion in 2015. In milk equivalent, they also had an increase of 35% from 7.96 to 10.75 million tons. In 2015, exports therefore represented 42% of domestic milk production and 72% were oriented towards the EU.

Box 2: Major suppliers and customers in milk equivalent in France in 2015

Source: Comext / Treatment INRA, SMART-LERECO

At the Community level, France's top five dairy product customers are, in value terms, Germany (€952 million), Belgium (€740 million), the United Kingdom (€624 million), Italy (€608 million) and Spain (€589 million). Even though these five countries remain at the forefront when the calculation is performed using milk equivalent, Italy occupies the first position (Box 2). The thirteen new EU member states purchase very few dairy products from France (2% of its exports). In terms of third world countries, exports were almost doubled in current currency in fifteen years. They were mainly destined for China (€300 million in 2015), Algeria (€233 million), the USA (€180 million), Saudi Arabia (€136 million), Switzerland (€124 million), Indonesia (€85 million) and Egypt (€82 million). The countries that contributed the most to the increase in exports were the United Kingdom, China and Belgium (Table 5).

Table 5: France's exchanges in dairy products with its main partners in 2000 and 2015 (million euros) - Country ranking by balance (in value terms) in 2015

	Exports			Imports			Trade Balance		
	2000	2015	2015/2000	2000	2015	2015/2000	2000	2015	2015/2000
EU-28	2 905	4 518	1 613	2 067	3 062	995	838	1 456	618
- U. Kingdom	283	624	342	167	118	- 50	115	507	391
- Germany	729	952	223	383	609	226	346	343	- 3
- Spain	397	589	192	206	252	46	190	337	147
- Italy	495	608	113	160	415	254	334	193	- 141
- Belgium	468	740	272	487	550	63	- 19	190	209
- Denmark	29	52	22	45	52	7	- 16	0	15
- Ireland	26	65	39	128	160	31	- 102	- 94	8
- Netherlands	274	318	44	389	688	299	- 115	- 369	- 255
Non EU-28	1 247	2 391	1 144	83	88	6	1 165	2 303	1 138
- China	27	300	273	1	0	- 1	26	300	274
- Algeria	192	233	41	0	1	1	192	232	40
- United States	127	180	53	1	1	0	126	179	53
- Saudi Arabia	105	136	32	0	0	0	105	136	32
- Indonesia	6	85	78	0	0	0	6	85	78
- Egypt	17	82	64	0	0	0	17	82	64
- Japan	54	65	11	0	0	0	54	64	11
- South Korea	11	64	52	0	0	0	11	64	52
- Switzerland	85	124	38	45	67	22	40	57	16
World	4 153	6 910	2 757	2 150	3 150	1 000	2 003	3 759	1 756

Source: Comext / Treatment INRA, SMART-LERECO

In 2015, France contributed 6% to Chinese dairy product imports (in value terms). It thus ranks seventh among supplier countries, though far behind New Zealand (32%) and The Netherlands (15%). Likewise, France accounts for one quarter of Swiss imports of dairy products. The geographical proximity of markets is obviously not neutral, especially in the case of fresh dairy products. This rate is, for example, 32% in Spain, 19% in Italy, 18% in the UK, 16% in Germany, 7% in Poland and 6% in Greece. It is still modest for other more distant countries such as Japan (5%), Hong Kong (2%), Russia (1%) or Mexico (1%).

In 2015, the French dairy product exports relate mainly (Table 6) to cheeses (43% of exports in value terms). Then come infant milk powder (10%), skimmed milk powder (8%), yogurts and fermented milk (7%), butter (6%), liquid milk (5%) and cream (4%). The share of third world countries in total French exports is high in value terms for infant milk powder (76% in 2015), whey powder (63%), skimmed milk powder (59%) and whole milk powder (40%); it was significantly lower for cheese (22%), liquid milk (14%), and yogurt (2%).

Table 6: France's exchanges according to the types of dairy products in 2000 and 2015 (in million current euro and thousand tons) - Products ranking by trade balance in 2015

	Million current euro						Thousand tons					
	Exports		Imports		Balance		Exports		Imports		Balance	
	2000	2015	2000	2015	2000	2015	2000	2015	2000	2015	2000	2015
Cheese	¹ 940	3 001	707	1 333	1 232	1 667	515	681	213	335	302	346
Infant milk powder	114	701	29	172	85	529	38	139	10	53	28	86
Skimmed milk powder	191	550	190	63	1	487	90	280	84	29	6	251
Yogurts and fermented milk	236	505	79	92	157	413	250	399	78	78	171	321
Whey powder	213	387	45	87	168	299	366	322	54	66	311	256
Whole milk powder	490	248	20	55	470	193	212	83	8	22	204	60
Casein and caseinates	183	210	53	32	130	178	40	43	14	5	26	38
Bulk liquid milk	127	202	135	84	- 8	118	390	624	342	167	49	457
Natural milk components	56	108	13	16	44	92	31	83	14	26	17	57
Packaged liquid milk	152	180	130	109	22	71	367	339	346	228	22	111
Buttermilk powder	14	36	11	4	3	32	7	23	8	3	- 1	20
Cream	152	257	186	255	- 35	2	159	257	172	143	- 13	114
Lactose and lactose syrup	10	20	12	36	- 2	- 16	17	31	19	27	- 3	4
Flavored milk	16	37	33	67	- 16	- 30	17	18	43	32	- 26	- 14
Condensed milk	65	64	80	123	- 16	- 59	60	83	66	82	- 7	1
Butter and butteroil	194	404	427	622	- 233	- 218	73	105	149	198	- 77	- 94
Dairy products (total)	4 153	6 910	2 150	3 150	2 003	3 759	-	-	-	-	-	-

Source: Comext / Treatment INRA, SMART-LERECO

Between 2000 and 2015, French exports of dairy products increased in all product categories except for whole milk powder. Cheeses played a leading role in the growth of exports (+€1.06 billion), alongside with infant milk powders (+€587 million), skimmed milk powders (+€359 million), yogurts and other fermented milk products (+€269 million), butter (+€210 million) and whey powder (+€174 million). For infant milk powders, exports were multiplied by 8.1 in value terms between 2000 and 2015 and by 3.6 in quantity terms. For cheese, they were multiplied by 1.5 in value terms and by 1.3 in quantity terms. For whole milk powders, they were divided by 2 in value terms and by 2.5 in quantity terms.

In 2015, French exports of cheese amounted to 681 000 tons or close to €3 billion. The main buyers of French cheeses were Germany (20% of exported tonnages), the UK (16%), Belgium (12%) and Spain (10%). Types of products exported were mainly fresh and white cheeses (37% of quantities, but 21% of value) processed cheese (10% of quantities) and Brie (9%). Cheeses with a strong reputation among French consumers, for example Comté, Roquefort, Camembert or Saint-Nectaire represented limited tonnages for export (Table 7).

Table 7: France's exchanges in the cheese sector in 2015 (thousand tons)

	Exports			Imports			Balance		
	2000	2015	Var.	2000	2015	Var.	2000	2015	Var.
Fresh and white cheese	132	253	121	46	92	46	86	161	75
Grated cheese	21	21	0	10	37	27	11	- 16	- 27
Processed cheese	81	64	- 17	18	36	18	62	28	- 34
Roquefort	3	4	1	0	0	0	3	4	1
Other blue veined cheese	7	9	2	5	6	1	2	3	1
Camembert	18	23	5	0	0	0	18	23	5
Brie	63	71	8	0	1	1	63	70	7
Other soft cheeses	69	78	9	9	3	- 6	60	75	15
Processed cheese	11	9	- 3	4	7	3	8	2	- 5
Saint-Paulin and Saint-Nectaire	22	27	6	2	2	0	20	26	6
Edam, Gouda and Fontal	4	2	- 2	27	28	1	- 23	- 26	- 3
Cheddar and similar cheese	1	11	10	7	14	7	- 6	- 4	2
Mimolette, Tomme and Maasdam	25	22	- 3	35	28	- 6	- 9	- 6	3
Emmental and similar cheese	19	37	17	34	45	11	- 14	- 8	6
Other pressed cheeses	18	5	- 12	7	18	11	11	- 12	- 23
Other cheeses	19	44	25	6	18	12	13	25	13
Total	515	681	166	213	335	122	302	346	44

Source: Comext / Treatment INRA, SMART-LERECO

Cheese exports increased by 166 000 tons since 2000 mainly due to the United Kingdom (+ 50 000 tons), Luxembourg (+ 33 500 tons) and Spain (+ 29 300 tons). A slight decline was recorded with Italy (- 10 000 tons) and Germany (- 4 000 tons). Despite an increase in exports of 12% since 2000, third world countries accounted for only 15% of the quantities of exported cheese in 2015 (or 103 300 tons). The main customers were the United States (22 500 tons), Switzerland (13 800 tons), Japan (9 300 tons), Saudi Arabia (9 100 tons) and South Korea (6 800 tons).

4.2. France's imports and its main suppliers

Despite the very wide range of hexagonal products offered to consumers, France imports a significant quantity of dairy products. It ranks fourth in European importing countries, behind Germany, the United Kingdom and Italy. French imports increased from €2.15 billion in 2000 (or 5.32 million tons in milk equivalent) to €3.15 billion in 2015 (or 6.07 million tons in milk equivalent). These imports come almost exclusively from EU countries (97%), especially those located nearby, namely The Netherlands (€688 million in 2015), Germany (€609 million), Belgium (€550 million), Italy (€415 million) and Spain (€252 million). The absence of customs duties between European countries, sales price differentials for finished goods, improvement of logistics networks, proximity to consumer areas (Lille and Paris are closer to Belgium than to Brittany) and the power of French purchasing centrals in search of a low cost supply, are all factors that interfere with the dynamics of intra-Community flows. Outside the EU Member States, Switzerland (68 million) and New Zealand (€17 million) are virtually the only suppliers of the French market, with very low quantities. Thus, despite lower tariffs and the opening of import quotas following previous multilateral agreements of the World Trade Organization (WTO), the key major exporting powers are not present on the French market.

French imports of cheese in 2015 amounted to €1.3 billion, or 42% of the total imported dairy products. Since 2000, they have increased both in quantity terms (+ 122 000 tons) and in value terms (+€626 million). These imports, which reach 335 000 tons in 2015, consist of 92 000 tons of fresh and white cheeses, 45 000 tons of Emmental, 37 000 tons of grated cheese, 36 000 tons of processed cheese, 28 000 tons of Mimolette, Tomme and Maasdam and 28 000 tons of Edam and Gouda. Cheeses are purchased mainly in Germany (24% of the tonnages), The Netherlands (23%) and Italy (23%). French people, who are among the largest consumers of cheese in the world, are therefore not fully satisfied with the abundance of the domestic supply. These purchases, which are justified to satisfy a taste for the diversity, also result from the channels of mass retailing, with the establishment of foreign brands on the domestic market. In a deficit domestic market, butter imports (198 000 tons in 2015) are, in turn, 20% of the total imported dairy products. They come mainly from The Netherlands (37%), Belgium (22%) and Germany (11%). Not only the French are major consumers of butter, but the cheese manufacturing incorporates a lot of milk cream. Other dairy products that count in imports are cream (8%), liquid milk (7%), infant milk powders (5%), condensed milks (4%) and yoghurts (3%).

4.3. The trade balance

France ranks second in the European trade balance for dairy products, behind The Netherlands but ahead of Germany, Ireland, Denmark and Poland. With €3.75 billion in 2015 against €2 billion in 2000, the dairy sector actively contributes to the French agro-food trade balance, however, far behind wines and spirits (€11.4 billion), cereals and grain mill products (€6.8 billion). The trade balance reached 4.67 million tons in milk equivalent in 2015 (18% of domestic milk production) against 2.92 million tons in milk equivalent in 2000, or an increase of 1.75 million tons in milk equivalent. In 2015, the French trade balance was positive for all categories of dairy products except butter (€ -218 million), condensed milk (-€59 million) and flavored milks (-€30 million). It amounted to €1.66 billion for cheese, €529 million for infant milk powders, €487 million for skimmed milk powder and €413 million for yogurts. Since 2000, the improvement in the trade balance was mainly due to skimmed milk powder (+€486 million), infant milk powder (+€444 million) and cheeses (+€435 million). On the contrary, a deterioration of the trade balance was observed for whole milk powder (-€277 million), condensed milk (-€43 million) and flavored milk (-€14 million).

In 2015, countries with which France has the best trade balance are the United Kingdom (+€507 million), Germany (€343 million), Spain (€337 million) and China (€300 million). A negative trade balance was, however, observed for The Netherlands (-€369 million) and Ireland (-€94 million). The trade balance was positive both with partner countries of the EU (+€1.45 billion) and with third world countries (+€2.30 billion). However, since 2009, the French trade balance fell with European countries and increased with third world countries. This development highlights the gradual saturation of the Community market and the recent strengthening of several Northern European countries in competitive games.

5. Conclusion

In 2015 and 2016, the dairy sector was facing a serious crisis that manifested itself in an intense drop in producer prices both within EU Member States and in most other parts of the world. This crisis was due mainly to the combination of four factors: a sustained increase in milk production in several EU Member States since the milk quotas were abolished in April 2015; the implementation by Russia of an embargo which has heavily penalized European exports of dairy products (mainly cheese); the decline in Chinese imports of whole milk powders mainly from New Zealand; the decline in imports in some oil producing countries, weakened by the lower price per barrel of oil. Without going back to the previous quota

system, the Community authorities should in this context which has also not really been anticipated think about the best instruments that can be used to solve the current difficulties. Indeed, the search for improved competitiveness on world markets does not necessarily mean that all forms of supply regulation must be forbidden (Trouvé *et al.*, 2016).

The dairy sector enjoys a sustained increase in aggregate demand (about 2% per year), especially in Asian countries where population growth combines with a gradual change in diets associated with an overall increase in purchasing power. International trade in dairy products, which covers an even limited fraction of the global dairy supply (about 9%) and concerns a wide range of finished products, is developing in the long-term due to the inability of some countries (including China) to boost their milk production to match domestic demand. Within the EU, the global consumption of milk products expressed in milk equivalents has increased slightly. In many Member States, it is now saturated. It is declining even in some of them, including France where the individual dairy consumption is still equivalent to three times the global average. In this context, the strategy of the European and French dairy sector must be, on the one hand, to maximize the valorization of milk in domestic and European markets (added value creation strategy, in particular on new, original products or associated to specifications valued by consumers who are willing to pay for them) and, on the other hand, to export more dairy products to the international market. Without the conquest of new export markets, it will become more and more difficult to see an increase in French and European milk production.

Over the next few decades, several EU Member States, including France, but also Germany, The Netherlands, Denmark, Ireland and Poland, could benefit from increased global demand for dairy products. However, nothing is known about the level of prices and milk quantities potentially affected. In addition to the uncertainties affecting some economic parameters (monetary parity, cost of energy and transport, *etc.*) and geopolitics (durability of embargoes, bilateral agreements ...), it remains difficult to see what will become of the annual rate of growth of dairy supply in several competing EU countries, including New Zealand and the United States, where environmental and / or climate issues arise. Similarly, it is also difficult to imagine whether certain societal concerns (animal welfare, food patterns, environmental quality, *etc.*) will become more or not key elements in the purchasing behavior of importing countries.

Several European countries, including France, have undeniable advantages helping them to remain main actors of the dairy markets: climate and agronomic potential favorable to forage production; expertise both at the farm level as processing industries; a reputation enhanced by the quality and diversity of marketed products. The control of production costs throughout the value chain, the equitable sharing of the added value generated by the sector between its various links, innovation, adapting products to a heterogeneous demand and the conquest of markets yet insufficiently explored are essential factors for long-term success.

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35011 Rennes cedex, France

Email : smart-lereco-wp@inra.fr

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