

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

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Behind the crisis which weakens the dairy sector in 2015-2016, due to a combination of factors (European overproduction of milk, Russian embargo and decline in Chinese imports), can actors in the dairy sector foresee any reason to hope for a more favorable future for international trade?

The crisis which weakens the dairy sector in 2015-2016 and which manifests 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). Besides 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 lower price per barrel of oil are factors that intersect in a context where world milk production goes on increasing. In France, where domestic demand for dairy products is slightly decreasing, at least in milk equivalent, the question of their European and international markets positioning is all the more serious as it directly affects the domestic productive potential.

Using two statistical databases from Customs Service ("*Comtrade*" for international flows and "*Comext*" for European exchanges), the objective is here to present an analysis of the evolution of the international, European and French trade in dairy products over the last fifteen years (2000 to 2015). 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 euro over the period, after applying

the exchange rate). Three parts are 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 on the current difficulties in the dairy sector.

- *The second part* focuses on the development of the 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 elements already presented upstream, special attention is paid to France's partner countries and to the products which are at the origin of the improvement in the trade balance over the long term.

1 / 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 Cooperation and Development (OECD).

1.1 / The location of dairy supply and the main flows between geographical areas

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

In 2015, developed countries account for half of world milk production (all species combined). If the EU is 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 are 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,

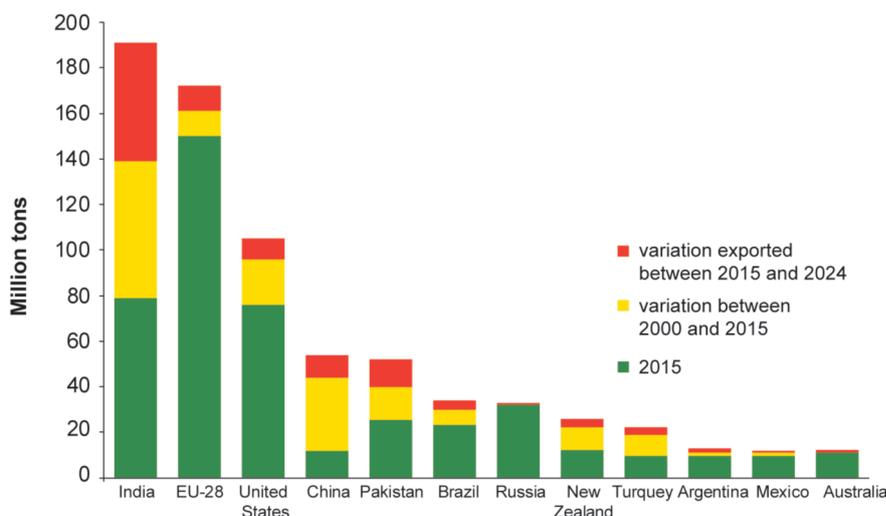
an increase of 37% or an annual average of about 2.4%. Developing countries have played a more important role (+ 164 million tons) than developed countries (+ 50 million tons). During this period, the supply's growth rate was significantly higher in Asia (281% in Vietnam, 265% in China, 74% in India,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

Despite global population growth between 2000 and 2015 (+ 1.22 billion, or + 16%), the availability of milk per capita per year has increased from 95 kg in 2000 to 109 kg in 2015. Over the last fifteen years, half of the increase in global dairy products 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 average income; increasing urbanization that favors a certain westernization of food patterns; technical progress which simplifies the dairy products distribution (finished products packaging, improvement of logistic circuits, more widespread observance of the cold chain ...).

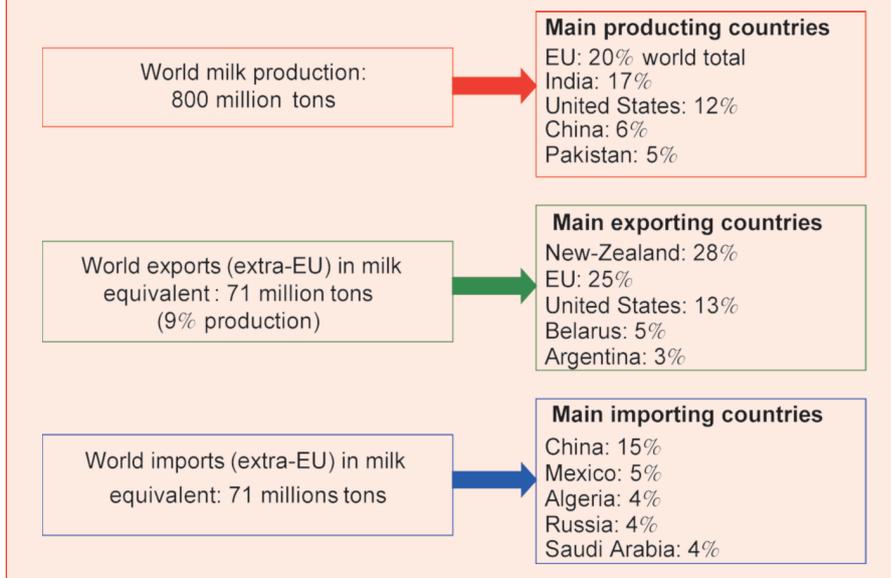
According to FAO and OECD estimates, world milk production could increase by 17% between 2015 and 2024, or 138 million tons (OECD-FAO 2015). This growth should result for 80% of developing countries. India, currently the second largest milk producer behind the EU, should take soon the pole position with 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 expected for China (10 million tons), the country that forward 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 combined species and excluding intra-EU trade, covers 71 million tons in milk equivalent in 2015 (Box 1). These forecasts attribute to the various categories of dairy products identified by the customs nomenclature a coefficient allowing to account for the amount of milk used **upstream**¹.

Figure 1. Milk production in the main producing countries (million tons). (Source: OECD-FAO).



Box 1. The main players in world milk production and dairy trade in 2015. (Source: International Dairy Federation).



Thus the dairy products exchanges represent about 9% of world milk production (International Dairy Federation 2015). Given the perishable nature of fresh dairy products (factor limiting trade) and the structuring of part of the market around regional basins, the rate is lower than that observed in other agri-food sectors such as cereals, meat, soy, etc.

In 2015, the global dairy products market is 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 is 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 are 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 varies when calculations favor exchanges in

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 being necessary to manufacture the products. This conversion, which is subject to methodological debates (Meyer and Duteurtre 1998), to estimate and compare 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.

value and not in milk equivalent. In 2015, for example, while the EU is 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, play a larger role in value and quantity terms compared to the importing countries of whole milk powder.

1.2 / 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.

a) Cheese

In 2015, developed countries contribute 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 is the largest cheese producing area, ahead the United States (5.2 million tons). Farther behind, are Brazil (740 000 tons), Egypt (630 000 tons), Argentina (600 000 tons), New Zealand (490 000 tons) and Russia (460 000 tons).

Cheese international trades, always excluding intra-EU trade, have doubled over the last fifteen years. They cover 2.2 million tons (cheese tonnage) in 2015, or 11% of world production. Products

traded consist mainly of cheese ingredients (including Cheddar) often used in food preparations; high added value cheeses which valorization level per ton is much higher and whose suppliers are mainly European (France, Italy and Switzerland), have a modest role. With 32% of cheese exported (in quantity terms) in 2015, the EU is the world leader ahead of the United States (13%) and New Zealand (12%). In 2015, main cheese importing countries are Japan (249 000 tons), Russia (201 000 tons), the US (200 000 tons), Saudi Arabia (162 000 tons) and Mexico (116 000 tons). China contributes only to 3% of global imports of cheese (table 1).

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 under consideration as many economic and political parameters are involved.

b) Skimmed milk powder

Skimmed milk powder global production (4.1 million tons in 2015, or + 25% compared to 2000) comes from developed countries for 88%. The EU provides 34% of world production, ahead of the US (24%), New Zealand (12%) and Australia (8%).

International exchanges cover 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 not surprising however. 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 that the liquid milk (more perishable) and doesn't require the (expensive) use of refrigeration. International exports are dominated by the EU (32%), the US (26%) and New Zealand (19%). Between 2000 and 2015, the US exports' increase (+ 400 000 tons, mainly to Mexico) was almost double that of the two countries mentioned above. Skimmed milk powder global imports come from developing countries for 93%. In 2015, the main importing countries are 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 imports of Asian countries (73% of global growth) and Africa (25%).

c) Whole milk powder

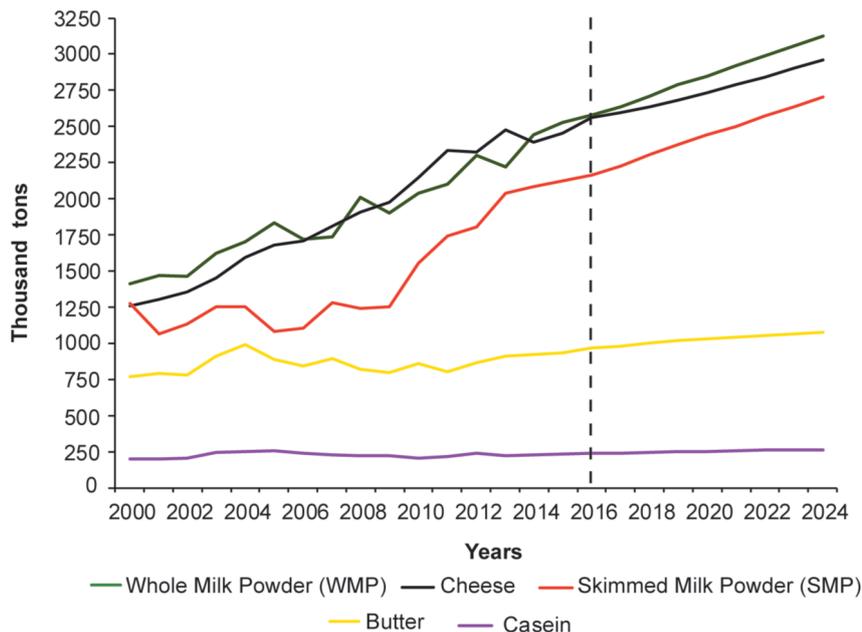
World production (4.8 million tons in 2015 against 2.2 million tons in 2000) is due mainly to New Zealand (1.38 million tons in 2015), China (1.37 million tons) and far behind the EU (680 000 tons), Brazil (617 000 tons) and Argentina (238 000 tons).

Table 1. The world main importers of dairy products (thousand tons/year). Country ranking in descending order for imports (in value terms) in 2015. (Sources: Comtrade except for the EU (Comext)/Treatment INRA, SMART-LERECO).

| | 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 |
| United States | 209 | 199 | 150 | 200 | 7 | 1 | 1 | 2 | 6 | 16 | 9 | 8 | 45 | 38 | 18 | 35 |
| Saudi 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 |

na = not available

Figure 2. The evolution of world trade in dairy products between 2000 and 2015, prospects for 2024 (thousand tons for each product). (Source: OECD-FAO).



New Zealand dominates the market in an exceptional way, realizing 56% of world exports which amount to 2.3 million tons in 2015. This country has captured 83% of the increase of world exports during this period. The entire New Zealand production of whole milk powder is exported, mainly to Asian countries. The EU is 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 occupy a modest place for this product. Developing countries account for 97% of imports of whole

milk powder. 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" 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%, in favor of strengthening New Zealand positions.

Table 2. The world main exporters of dairy products (thousand tons/year). Country ranking in descending order for exports (in value terms) in 2015. (Source: Comtrade / Treatment INRA, SMART-LERECO).

| | 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 |
| New Zealand | 286 | 294 | 285 | 340 | 253 | 299 | 379 | 418 | 560 | 680 | 1 225 | 1 403 | 357 | 388 | 469 | 528 |
| United States | 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 |
| Saudi 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 |

na = not available

d) Butter and dairy fats

World production (10.3 million tons in 2015), which increased by 39% since 2000, results from 70% of developing countries. India ranks first (41% of the world total in 2015) ahead of the EU (22%), the US (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. Star ingredient of the 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 modest contributor to the global supply of butter, New Zealand is the largest exporter (528 000 tons in 2015, half of global flows). It is clearly ahead of the EU (185 000 tons), Belarus (83 000 tons), Australia (26 000 tons) and the US (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 are 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 US, 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.

1.3 / The case of 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 products 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 has interest 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.

a) 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, since 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'Élevage

2010). In 2015, New Zealand milk production is around 22 million tons (slightly less than France) for 5 million dairy cows (DairyNZ 2015). If 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 since fifteen years (but with a reversal of it since the 2015-16 crisis) and fodder production intensification due to increased use of fertilizers contribute to a rise in production costs (Foote *et al* 2015). Not supported by direct payments as it is the case in the EU (Gouin and Kroll 2016), these farms 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. Fourth international group in turnover behind Nestlé, Danone and Lactalis, it has a major influence on international prices.

In recent years, New Zealand is 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 in the South Island where dairy farming took 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) also improved which helped to strengthen productive effort.

New Zealand dairy products 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 amounted to €10.1 billion (figure 3). In 2015, exports mainly concern 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 accounts for 20% in 2015 (with a peak of 33% in 2013). It 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 products prices was particularly strong in whole milk powder (631 000 tons in 2013 to 359 000 tons in 2015). If 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).

In this small country where foreign trade accounts for nearly 58% of 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 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

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.

Table 3. Dairy sector and dairy products trade in the surveyed countries.
(Source: Treatment INRA, SMART-LERECO after UN FIL Comtrade).

| | 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 products imports in 2000 (billion €) | 1.2 | 0.1 | 1.8 | 0.2 | 0.3 | 0.3 |
| Dairy products 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 products balance in 2000 (billion €) | 5.0 | 2.7 | - 0.7 | 1.5 | - 0.1 | - 0.2 |
| Dairy products 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 |

(ns = not significant for flows below 80 million €).

only to 3% of New Zealand dairy products exports. In 2015, EU imports from New Zealand related mainly casein (55% of purchases in value terms), butter (30%) and cheese (6%).

b) 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 US Department of Agriculture, domestic milk production could increase by about 2% per year by 2025 (USDA 2016). In 2015, US dairy production (96 million tons) is the result of a herd of

9.3 million highly productive dairy cows (about 10 000 kg of milk per cow per year) distributed in about 60 000 farms. Farms with livestock numbers exceeding 1000 cows account for 6% of all farms, but 48% of the US cows herd (MacDonald *et al* 2016); this proportion has 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 US dairy states are California (19% of 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 US 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, known as the "Farm 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

Figure 3. New Zealand exports of dairy products (billion current euro).
(Source: Comtrade/Treatment INRA, SMART-LERECO).

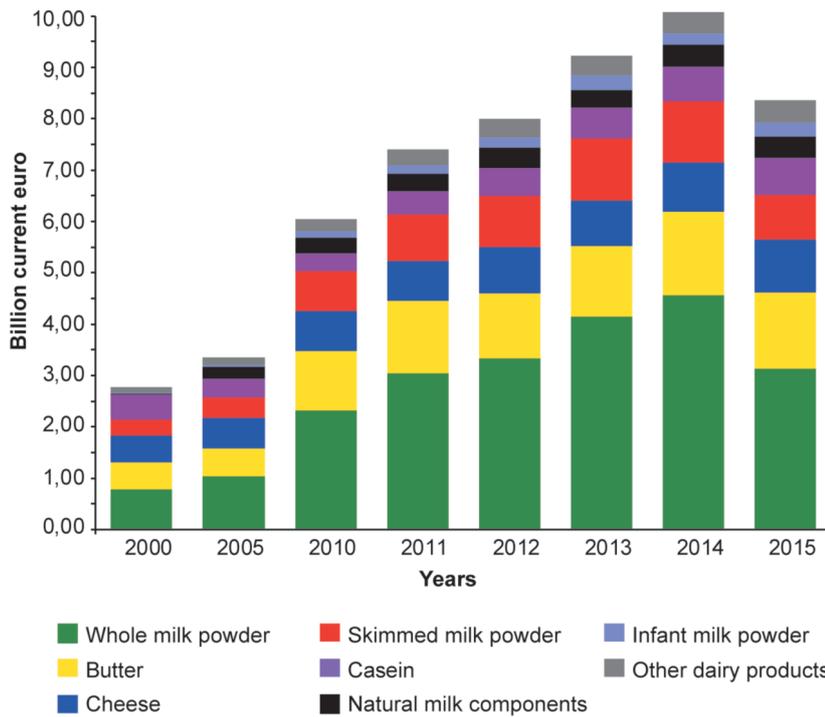
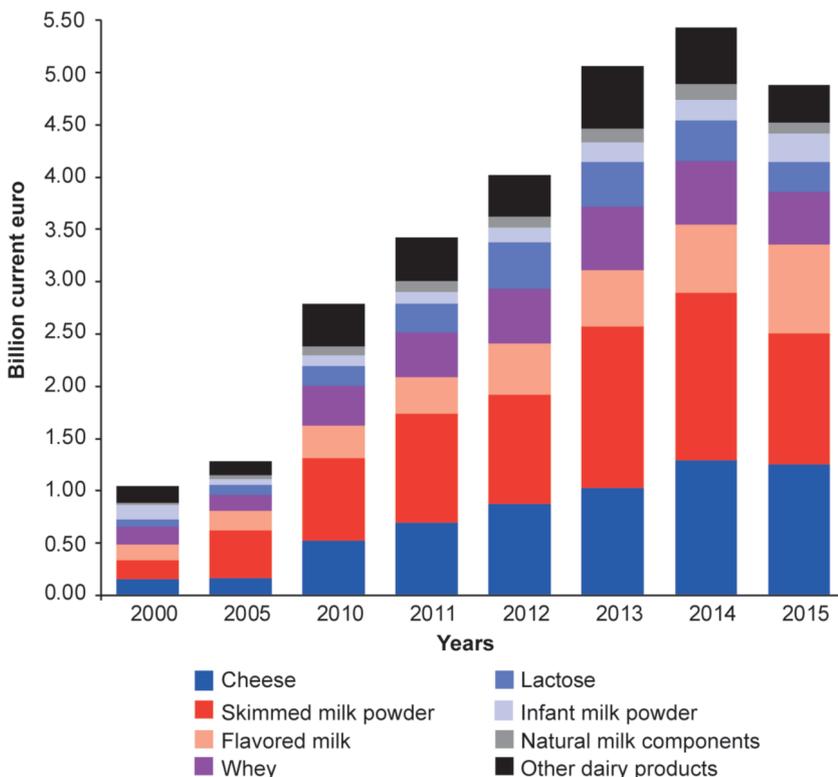


Figure 4. New Zealand exports of dairy products (billion current euro).
(Source: Comtrade/Treatment INRA, SMART-LERECO).



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 have become 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 concern cheese (25%), skimmed milk powder (25% in value terms), flavored milk (17%) and whey (10%). Exported dairy products are mainly destined to Mexico (24% of the total in value terms) and Canada (16%). These two countries, geographically neighbors and also members of the North American Free Trade Agreement (NAFTA) since 1994, contributed to 43% of the growth of the US exports between 2000 and 2015. Mexicans purchase mainly skimmed milk powder (45% of total purchases of dairy products in value terms) and cheese (29%) to the US. Canadian imports are more concentrated on flavored milks (57% of purchases) and infant milk powder (17%). Other major US customers are China (8%), South Korea (6%), Japan (5%), Philippines (4%) and Vietnam (4%).

Representing 0.9% of total US dairy exports, or €44 million, the EU is a marginal customer of the United States. Reciprocity is not valid because the US purchases €1.3 billion of dairy products to 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.

c) 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 has 6 100 dairy farms (against 12 900 in 2000) for a herd of 1.7 million dairy cows (against 2.2 million head 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).

Unlike other major suppliers of the world market, the part of milk production exported has 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 account for 3% to 7%. If cheeses account for 90% of Japanese imports from Australia, this rate is only 18% in the case of China.

1.4 / The case of two major importing countries: Russia and China

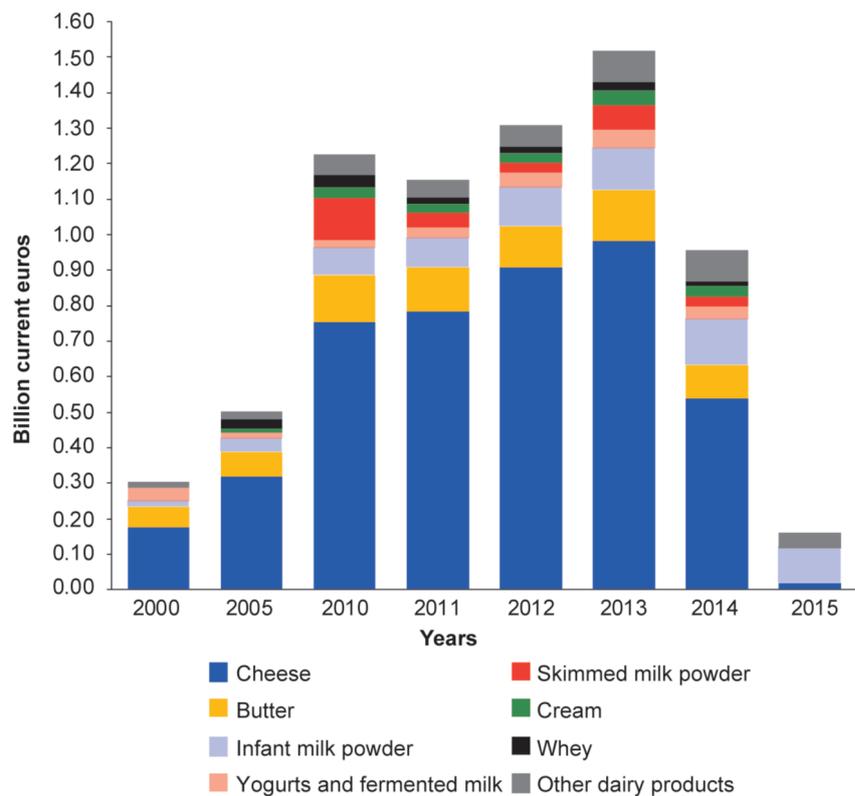
a) Russia

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% in the case of milk), Russia still remains a deficit country in food products (- €9.3 billion in 2015). After a period of collapse of agricultural production until the end of ninety years, then stabilizing between 2000 and 2005, production is raising again for some short cycle animal sectors (poultry and swine). However, the situation remains difficult in the bovine sector, due in particular to the too low return on investment (France-AgriMer 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 head 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 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 has evolved

Figure 5. Russian imports of dairy products from the EU (billion current euros). (Source: Comtrade/Treatment INRA, SMART-LERECO).



due to the application by the Russian authorities of an embargo on certain food products (including dairy products) from the EU, the US, 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 will amount 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 have become 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).

The Russian embargo should last until the end of 2017 according to the decisions announced in June 2016 by Vladimir

Putin. If 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 tries (without really achievement) to develop domestic dairy production away from 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 weakens financial entries in this great country producing fossil energy; the ruble devaluation penalizes trade; inflation reached 15% in 2015; impoverishment of part of the population is growing.

b) 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

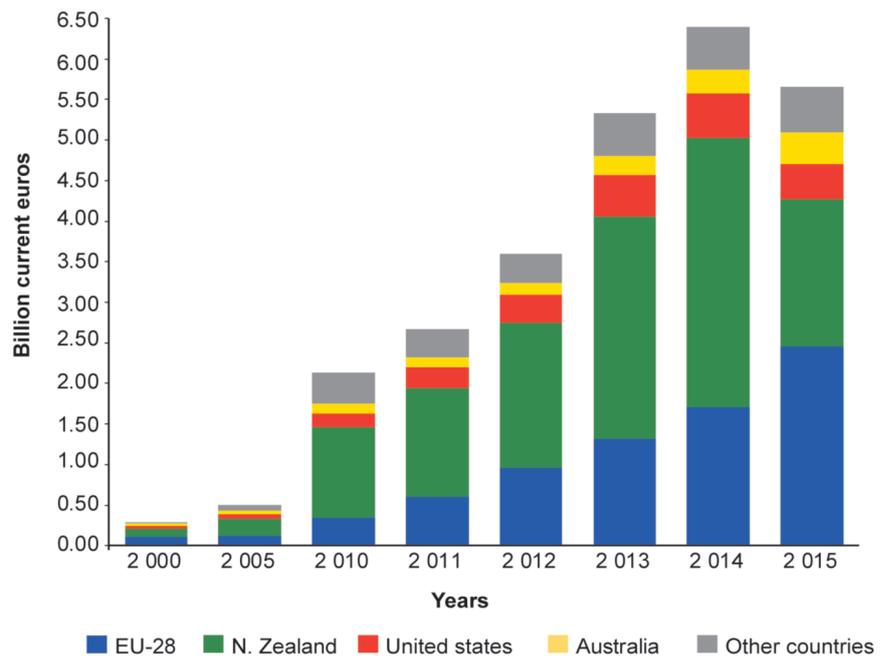
³ The embargo was imposed following sanctions against Russia for its interference in the Ukrainian crisis of 2013-14 and the attachment (called "annexation" by the European authorities) of the Crimea to the Russian Federation. These measures were decided on 17 March 2014 by the foreign ministers of the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

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 consumption 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 (Wand 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, since show a certain distrust of products derived from the domestic dairy industry and preferred an external supply (Wang *et al.* 2008).

In 2015, China's dairy production is the result of a herd of 6.5 million dairy cows. If 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 factors of production (including land) is limited compared to American or European standards; production costs rise very quickly due to the high dependence 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 it is the case for example in Carhaix in Brittany. The CEO of *Synutra* has indeed announced in 2016 that Chinese investment on the

Figure 6. China's main suppliers of dairy products (billion current euro). (Source: Comtrade/Treatment INRA, SMART-LERECO).



French site could represent €400 million over the period 2014-2020.

Except for 2015, all years spent over the past fifteen years have been characterized by an increase in Chinese dairy products 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 account for €5.6 billion in 2015, 43% from the EU, 32% from New Zealand (country with a better position in 2013), 7% from the US and 7% from Australia. In 2015, the EU's place in Chinese imports is, 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 is 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 moreover 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 to 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 growth rate of the gross domestic product (GDP); the stocks accumulated at the beginning of 2015 were important; some strategies deployed by industrialists accentuate 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 stored as milk powder (Institut de l'Élevage 2016).

The 2015 crisis hasn't been neutral domestically (Chaumet 2016). It led to a decline in China's leading dairy groups turnover, with the exception however of the leader (Yili); it caused the abandonment in production in 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 as 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.

2 / Trade between the EU and member states in dairy products

The previous analysis made it possible to account for the contribution of the various geographical areas to the 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 the case of 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 to intra-Community trade.

If 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.

2.1 / EU's Extra-EU trade

a) EU exports of dairy products

Second exporting area in the world in quantity terms (25% of world trade in milk equivalent) behind New Zealand, the EU exports about 11% of its domestic production (by applying to the Comext data the calculation methodology in milk equivalent developed by CNIEL). 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 (Bojnc Fertó and 2014); the highlight of the period studied was reached in 2014 with €15.3 billion.

In 2015, European dairy products exports expressed in value terms, result to 25% of infant milk powder, 23% of cheese, 10% of skimmed milk powder, 8% of whole milk powder, 6% of flavored milk, 5% whey, 5% butter, 4% of condensed milk, 4% 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 farms level.

In value terms, for the year 2015, the first three EU customers in dairy products are China (€2.17 billion), the US (€1.17 billion) and Hong Kong (€1.04 billion). 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 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* reach 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 were the EU's largest customer of cheese before 2004 then the second's largest customer behind Russia between 2005 and 2013, again occupy the pole position with 140 000 tons bought in 2015, or 20% of total exports the EU. 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 cheeses European trade, they unfortunately are not placed at the heart of world population growth to come. 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* amount 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 are 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 come after in the customers hierarchy 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* reach 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 the European industrialists in the face of the strong competition of New Zealand. In 2015, the two major EU customers are 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) amount to 185 000 tons in both 2015 and 2000 (peaking at 325 000 tons in 2004). In 2015, the three main customers are 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 produ-

Figure 7. EU exports of dairy products (million milk equivalent tons).
(Source: Comext/Methodology CNIEL / Treatment INRA, SMART-LERECO)

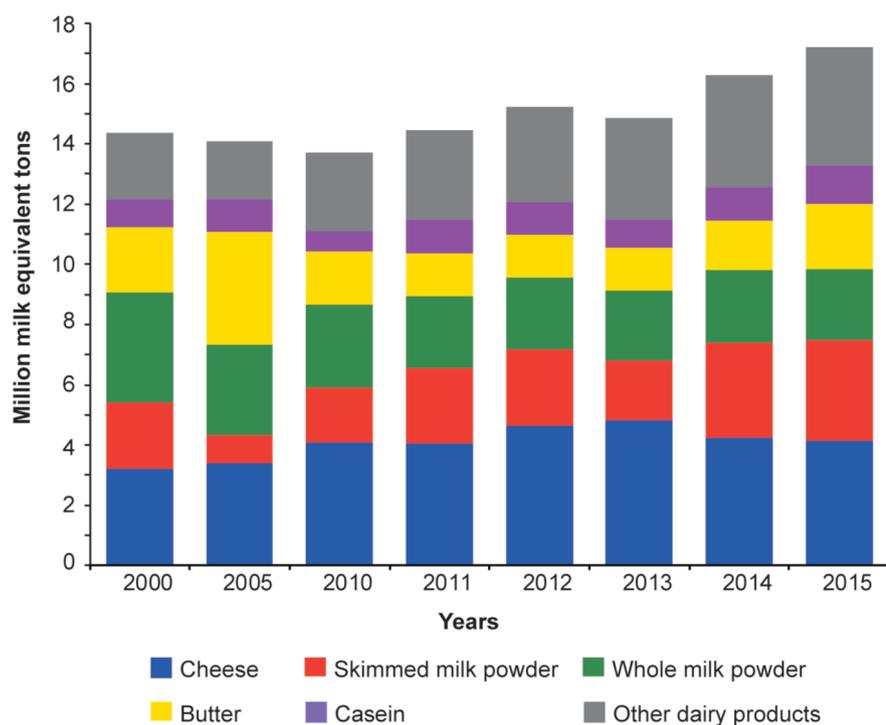
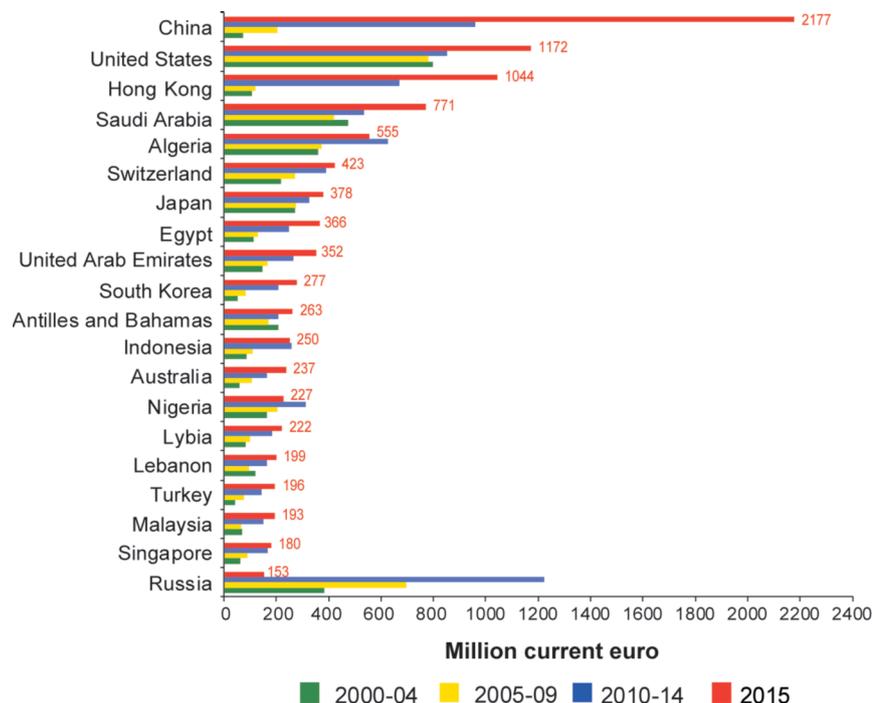


Figure 8. The EU's main customers in dairy products (million current euro).
(Source: Comext/Treatment INRA, SMART-LERECO).



ced have increased from 155 000 tons in 2000 to 432 000 tons in 2015. The EU's main customers for these products are China (123 000 tons), Hong Kong (41 000 tons) and Saudi Arabia (37 000 tons) followed by Algeria, Russia and Turkey.

b) EU imports of dairy products

They are very weak. In 2015, they amount 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 concern 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 remains New Zealand, with 23% of total imports in value terms.

c) The EU trade balance in dairy products

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

2.2 / Deficit and surplus member states in dairy products

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%.

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 are historically 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 in a distant country because of their perishability and induced transportation costs.

a) The three main EU deficit countries in dairy products

These are, 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 has always been negative throughout the last fifteen years. The deficit widened over time, from €951 million in 2000 to €2.22 billion in 2015. The main deficit products are cheeses (- €1.13 billion in 2015), the infant milk powder (- €452 million), yogurt (- €393 million) and flavored milks (- €249 million). The UK however is in surplus

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. (Source: Comext/Treatment INRA, SMART-LERECO).

| | % of production | Exports | | | Imports | | | Balance | | |
|----------------|-----------------|---------|---------------|-------|---------|---------------|-------|---------|---------------|-------|
| | EU milk | EU-28 | Third country | Total | EU-28 | Third country | Total | EU-28 | Third country | Total |
| 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 |

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) is, for at least fifteen years insufficient to cover all domestic needs, especially since Italians are exporters of dairy products (€ 2,54 billion), mainly cheese (89% of exports in value terms). The main customers of Italy are France (18% of exports), Germany (13%) and the US (11%). Italy's trade deficit in dairy products is €990 million in 2015. While Italy enjoys a positive trade balance in cheese (+€659 million), thanks to the development of quality specialties, Italy is deficit in liquid milk (-€632 million), in 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 reaches €586 million in 2015. With the exception of cream, infant milk powder and condensed milk. Spain is in deficit for all dairy products, but mainly for cheese (-434 million). Spain's imports of dairy products (€1.77 billion) come mainly from France (33%), Germany (19%) and the Netherlands (12%). Spain exports €1.19 billion of dairy products in 2015, including 34% of cheese, 15% of infant milk powder and 12% of yogurt. Its main customers are France (20%), Portugal (20%), Italy (10%), and the US (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 countries.

b) 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 countries.

- *The Netherlands*, where milk production reaches 12.6 million tons, have 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 is mainly due to improved trade with third 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 US (€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 countries play a central role in infant milk powder (86% of export quantities), exports of cheese (763 000 tons in 2015 against 485 000 tons in 2000) are destined for 83% 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'Élevage 2012), ranks third in 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 accounts 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 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).

- *Ireland*, a small milk-producing country (about 6 million tons, or 3.8% of the European total) ranks fourth European place in dairy products trade balance and best place in 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'Élevage 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 King-

dom (€463 million balance at Ireland's profit in 2015), China (€380 million) and the US (€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 is 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 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 has most affected the Netherlands (- €259 million), Finland (- €253 million), Germany (- €167 million), Lithuania (- €155 million), Poland (- €142 million) and France (- €91 million).

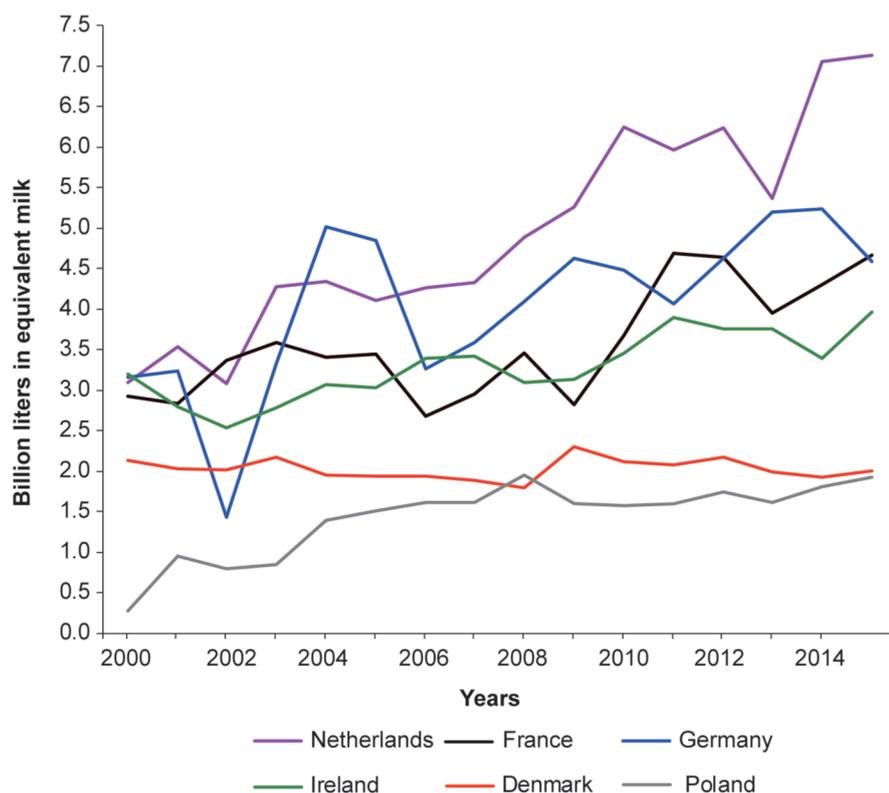
3 / France's trade in dairy products

With just over 25 million tons of cow milk collected in 2015, France accounts for 3.2% of the world collection and 16.1% of the European collection (CNIEL 2016, Chatellier et al 2013). The French dairy production comes from a herd of 3.6 million dairy cows distributed in 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 France's regions (Roguet et al 2015), the diversity of production systems remains very high in the country, but with although 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 countries. After a presentation of France dairy products exports evolution and its customers, this third part deals with French imports and suppliers and then with the trade balance.

3.1 / France's exports and its main customers

In 2015, France ranks 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

Figure 9. The trade balance (in milk equivalent) of the leading exporters European countries.
(Source: Comext/Treatment INRA, SMART-LERECO).



in 2000 to €6.91 billion in 2015. In milk equivalent, they have also increased from 7.96 to 10.75 million tons, an increase of 35%. In 2015, exports therefore represent 42% of domestic milk production and are oriented 72% towards the EU.

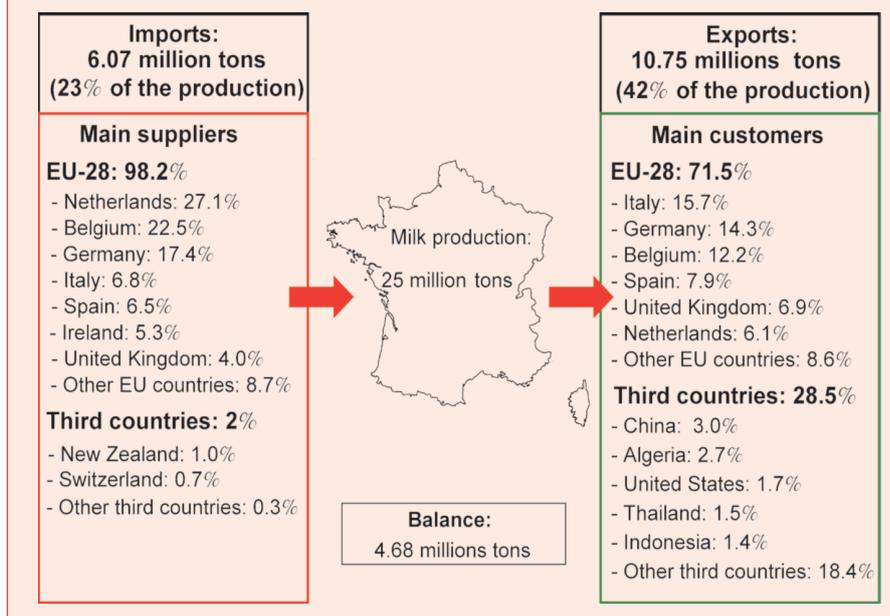
At the Community level, France's top five dairy products customers are, in value terms, Germany (€952 million), Belgium (€740 million), the United Kingdom (€624 million), Italy (€608 million) and Spain (€589 million). If these five countries remain at the forefront when the calculation is performed in milk equivalent, Italy then goes back to 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 countries, exports are almost doubled in current currency in fifteen years. They are 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 most to the increase in exports were the United Kingdom, China, Belgium and Germany (table 5).

In 2015, France contributes 6% to Chinese dairy products 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 products exports relate mainly (table 6) 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 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 is significantly lower for cheese (22%), liquid milk (14%), and yogurt (2%).

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

Box 2. France's major suppliers and customers in milk equivalent in 2015. (Source: Comext/Treatment INRA, SMART-LERECO).



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 amount 681 000 tons or close to €3 billion. The main buyers of French cheeses are Germany (20% of exported tonnages), the UK (16%), Belgium (12%) and Spain (10%). Types of products exported are 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, by example Comté, Roquefort, Camembert or Saint-Nectaire represent limited tonnages for export (table 7).

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 (- 4000 tons). Despite an increase in exports of 12% since 2000, third countries account for only 15% of the quantities of exported cheese in 2015 (or 103 300 tons). The main customers are the United States (22 500 tons), Switzerland (13 800 tons), Japan (9300 tons), Saudi Arabia (9 100 tons) and South Korea (6800 tons).

3.2 / 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). 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 to the French market, in addition to 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 amount 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

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. (Source: Comext / Treatment INRA, SMART-LERECO)

| | 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 |
| - United 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 |
| Third countries | 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 |

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 value terms) in 2015. (Source: Comext / Treatment INRA, SMART-LERECO).

| | 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 | - | - | - | - | - | - |

Table 7. EU exports of dairy products (million milk equivalent tons).
(Source: Comext/Methodology CNIEL / Treatment INRA, SMART-LERECO)

| | Exports | | | Imports | | | Balance | | |
|--|------------|------------|------------|------------|------------|------------|------------|------------|-----------|
| | 2000 | 2015 | Variation | 2000 | 2015 | Variation | 2000 | 2015 | Variation |
| 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 cheese | 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 cheese | 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 |

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%).

3.3 / 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 the wines and spirits (€11.4 billion), cereals and grain mill products (€6.8 billion). The trade balance reaches 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 is positive for all categories of dairy products except butter (€ - 218 million), condensed milk (- €59 million) and flavored milks (- €30 million). It amounts 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 is mainly due to the skimmed milk powder (+ €486 million), the infant milk powder (+ €444 million) and cheeses (+ €435

million). On the other hand, a deterioration of the trade balance is 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). On the other hand, a negative trade balance is observed with the Netherlands (- €369 million) and Ireland (- €94 million). The trade balance is positive both with the partner countries of the EU (+ €1.45 billion) and with third countries (+ €2.30 billion). However, since 2009, the French trade balance falls down with European countries and increases with third countries. This development highlights the gradual saturation of the Community market and the recent strengthening of several Northern European countries in competitive games.

Conclusion

In 2015 and 2016, the dairy sector is facing a serious crisis that manifests

itself in an intense drop in producer prices both within EU Member States and in most other parts of the world. This crisis is 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 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 (Found *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 cover 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 the ambitions of

domestic demand. Within the EU, the global consumption of milk products expressed in milk equivalent increases slightly. It is now saturated in many Member States. 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 then willing to pay) 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 the 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 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 how certain societal concerns (animal welfare, food patterns, environmental quality, etc.) will become more or not key elements in purchasing behavior of importing countries.

Several European countries, including France, have undeniable assets to remain a main actor in 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 value added 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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Abstract

At international level, the dairy sector is favored by a growing demand, mainly from Asian countries, where dairy consumption per capita remains much lower than observed in the European Union (EU) and North America. Over the last fifteen years (2000-2015), New Zealand is, far ahead of the USA and the EU, 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. Despite an increase in imports, especially of cheese and butter, France regularly improves its trade balance which reached €3.75 billion in 2015. This performance is due mainly to the dynamics of trade with the United Kingdom and China. Since 2010, the trade balance of France with non-European countries is improving while the internal competition with EU is becoming more difficult. For the European dairy producers, the slight decline in demand for dairy products in 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 for, firstly, increase exports abroad and, secondly, better sell the wide variety of dairy products on the domestic market.

Résumé

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

À 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 États-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 États 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.

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