

EU exports of livestock products to West Africa: An analysis of dairy and poultry trade data

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Photos front page: Ferme avicole moderne Ripaille, route de Thiès, Senegal, 2020 (© Daniela Weible); Cows, Hallelujah Farm, Malejor, Ghana, 2019 (© Johanna Schott)

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Summary

The present report provides the results of the first work package of the IMMPEX project which aims to investigate the impact of German and European livestock product exports on agri-food sectors in selected African countries. Based on various criteria like trade statistics and a literature review, we identified the poultry and dairy sectors in Senegal and Ghana for further analysis in the course of the project. In this report, we provide an overview of the poultry and dairy product trade flows from Germany, the EU, and from the rest of the world to West Africa. We also show how imports, domestic production, and consumption of poultry and dairy products have developed over time. Our analysis reveals an upward trend of dairy and poultry products imports in both countries. Apart from the 28 EU countries, Brazil and the US are the main exporters of poultry to Ghana. However, the share of the EU increased since 2011. Senegal's domestic production has considerably expanded under the import ban on uncooked poultry meat in 2006. Nevertheless, compared with poultry production growth rates in Ghana, Senegal still has lower growth rates. With regard to dairy, intra-African trade plays an important role in this sector, however, there is evidence that intra-African trade flows might be related to re-exports. The EU and New Zealand are the main competitors in the dairy markets of Ghana and Senegal.

Zusammenfassung

Der vorliegende Bericht enthält die Ergebnisse des ersten Arbeitspaketes des IMMPEX-Projektes. In diesem Projekt untersuchen wir die Auswirkungen der deutschen und europäischen Exporte von Nutztierprodukten auf den Agrar- und Ernährungssektor in ausgewählten afrikanischen Ländern. Anhand verschiedener Kriterien, wie Handelsstatistiken und einschlägiger Literatur, haben wir den Geflügel- und Milchsektor im Senegal und in Ghana für weitere Analysen im Rahmen des Projektes identifiziert. In diesem Bericht geben wir einen Überblick über die Handelsströme von Geflügel- und Milchprodukten aus Deutschland, der EU und aus dem Rest der Welt nach Westafrika. Außerdem zeigen wir auf, wie sich die Importe, die einheimische Produktion und der Verbrauch von Geflügel- und Milchprodukten im Laufe der Zeit entwickelt haben. Unsere Analyse zeigt einen Aufwärtstrend bei Importen von Milch- und Geflügelprodukten in beiden Ländern. Abgesehen von den 28 EU-Ländern sind Brasilien und die USA die Hauptexporteure von Geflügelfleisch nach Ghana. Allerdings ist der Anteil der EU seit 2011 gestiegen. Seit dem Importverbot für rohes Geflügelfleisch, das Senegal im Jahr 2006 verhängte, ist die einheimische Produktion erheblich angestiegen. Im Vergleich zu den Wachstumsraten der Geflügelproduktion in Ghana weist der Senegal jedoch immer noch geringere Wachstumsraten auf. Was den Milchsektor betrifft, so spielt der innerafrikanische Handel in diesem Sektor eine wichtige Rolle. Es gibt jedoch Anzeichen dafür, dass die innerafrikanischen Handelsströme mit Re-Exporten aus Drittländern zusammenhängen könnten. Die EU und Neuseeland sind die Hauptkonkurrenten in den Milchsektoren in Ghana und im Senegal.

1. Introduction

Against the background of repeated criticism of German and European exports of animal-based products to African countries - "EU chicken meat floods Africa's markets" and "cheap exports of poultry meat from the EU leave domestic producers with hardly any chance" (Marí, 2017) - the question arises as to how actual exports to Africa are organized and what they do on the ground.

In order to underpin the discussion on this topic with scientifically sound statements, the aim of our research project – acronym IMMPEX - is to analyse the impacts of animal product exports on the agricultural sectors of selected African countries. IMMPEX – the abbreviation stands for “Impact of Meat and Milk Product Exports on Developing Countries” is composed of five work packages: In the first work package, we analyse German and European animal product trade flows to West Africa. In the second work package, we collect data on typical livestock production systems. This includes the physical and economic performance, profitability and competitiveness of these production systems in the international context. In the third work package, we study the local value chains. Work package four deals with the analysis of local consumer preferences for livestock products. In the fifth work package, we compare the different trade policy measures and subject them to an impact analysis. Here, we examine the question of which measures are necessary to avoid or mitigate possible undesired effects of exports. Based on the results of the project, recommendations for the future design of European livestock product export policies concerning important food products that are exported to developing countries will be developed.

The present report provides the results of the first work package of the IMMPEX project. This work package aims at investigating livestock product trade flows to West Africa and at selecting the countries and products to be researched. Three main questions will be addressed in this report: What exactly is exported in which quantities to which African countries and how have exports developed over the years? What is the share of European and German exports compared to exports from other countries? How high is domestic production and consumption in selected West African countries in terms of import quantities? We used various criteria and methods to select the research countries and product groups. The methods included statistical analyses and a literature review. Additionally, our decision for the research countries and product groups was based on public concerns expressed in the media, policy measures currently in place in the African countries in question, feasibility, existing contacts, data availability, and data accuracy. Finally, we selected Ghana and Senegal as countries to be studied within the IMMPEX project. As product groups, we have chosen poultry meat and dairy products.

The present report is structured as follows: The second chapter describes the exports of livestock products from the EU to developing countries. Here, West Africa was identified as the largest trading partner of the EU. The third chapter relates the EU poultry trade to global trade flows to West Africa and chapter four analyses the EU and the global trade flows of dairy products to West Africa.

2. EU-African Trade with Agricultural and Food Products

The European Union (EU) is an important trading partner for many developing countries in the world, but its relative importance varies between these countries. The relative role of the EU is more pronounced when it comes to agricultural products and food trade with African countries. According to the International Trade Consortium (ITC) trade map database, the EU supplied up to 26 percent of the total agricultural products and food exports to Africa in 2017, while it has a less important position in other developing countries such as South Asian and Latin American countries. For some Sub-Saharan African (SSA) countries, the EU supplies up to 50 percent of all food imports (Matthews and Soldi, 2019). In SSA, West Africa is the largest trading partner of the EU. The total value of trade (including exports and imports) between the EU and the Economic Community of West African States (ECOWAS) as well as the West African Economic and Monetary Union (WAEMU) has reached over 60 billion Euros (exports equal 29, imports equal 31 billion Euros) in 2019 (European Commission Report, 2019). The EU is also the main supplier of food and agricultural products in West Africa. As of 2018, agricultural products and food accounted for 14.3% (amounting 4,124 million Euros) of the total EU exports to the West African countries (European Commission, 2020).

In the course of the signing of the EU-SSA trade agreement (e.g. the Economic Partnership Agreements), policy makers expressed their concerns about whether imported products could threaten local markets in Africa (Rudloff and Schmiege, 2016). With regard to this question, those commodities which have the potential to compete with local products should first be identified. Accordingly, EU food exports to developing countries are classified in two groups (Matthews and Soldi, 2019): The first group is called “luxury products”; these are products which are mainly demanded by relatively well-off consumers¹. The second group is named “basic” food products; these products have the potential to compete with local production and markets in the developing countries. Table 1 presents the share of the basic food products group in EU-28 exports to West African countries using the Harmonized System (HS) 4-digit level. It shows that the exports of basic food products to West Africa increased substantially from 1.2 billion USD in 2005 to 2.5 billion USD in 2018 (UN Comtrade, 2018). Moreover, poultry and dairy products together accounted for the largest share of the value of EU agricultural products and food exports to West African countries. While this share was 60% in 2005, we measured a share of 56% in 2018, which means that the importance of EU poultry and milk exports to West African markets has remained relatively stable over the last decade (UN Comtrade, 2018). There are also growing public concerns regarding the negative externalities of EU dairy and poultry exports such as countervailable subsidies, dumping, and market distortion, which may influence the local markets of developing countries (VEN, 2018; ZEIT, 2015; Pfaff and Zick, 2018; Matthews and Soldi, 2019; Choplin, 2019).

¹ Examples include processed foods, spirits, wine, malt, mineral waters, beer, cheese, bread and cakes and chocolate.

Table 1: EU-28 Exports of Basic Food Products to West African Countries²

Products	2005				2018			
	Weight	Share	Value	Share	Weight	Share	Value	Share
0207 Poultry meat	97		86		368		340	
0402 Milk powder and condensed milk	152	16%	376	58%	116	23%	332	54%
1901 Cereal and milk preparations	116		211		329		663	
0203 Pig meat	10		7		34		22	
0206 Meat offal	39		16		110		86	
0703 Onions and similar vegetables	220		37		473		170	
1001 Wheat and meslin	1396		229		1526		345	
1507 Soybean oil	26	84%	20	42%	14	77%	14	46%
1512 Sunflower-seed, safflower or cotton-seed oil	3		3		6		7	
1701 Cane or beet sugar and pure sucrose	218		74		490		193	
2005 Prepared vegetables	20		23		37		62	
2103 Sauces and pastes	14		21		47		80	
2401 Tobacco	6		53		13		170	
Sum	2317	100%	1156	100%	3536	100%	2484	100%

Note: Weight is based on million tons and the unit of value is million USD.

Source: Own calculations based on UN Comtrade (2018).

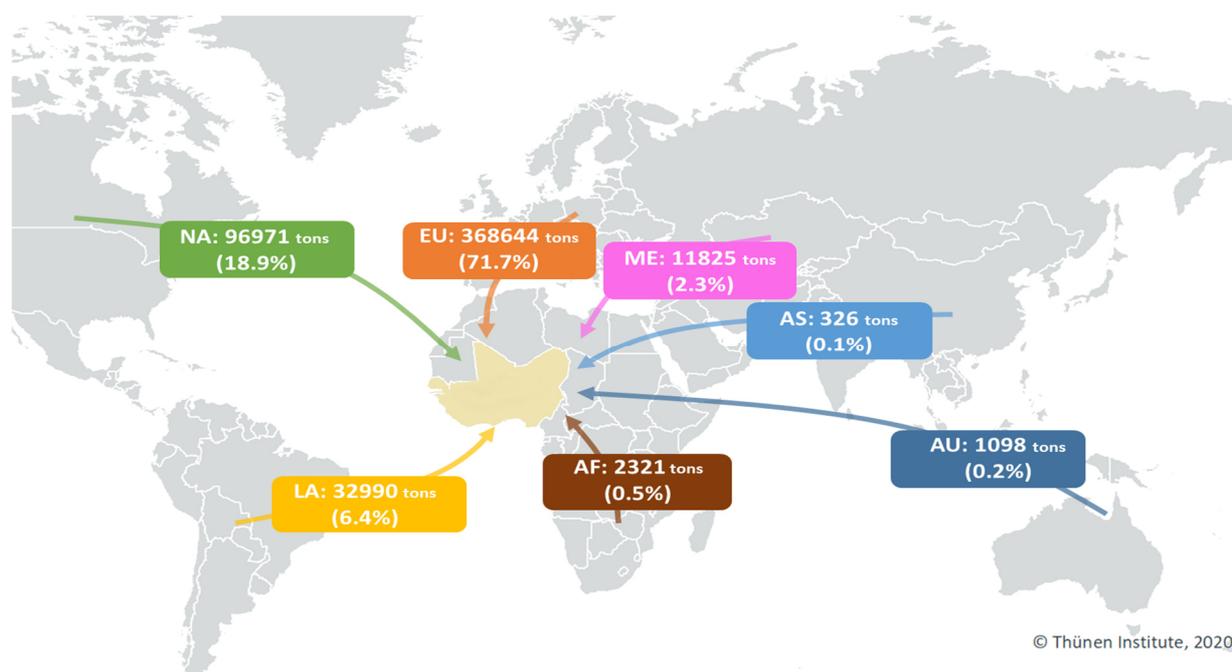
² According to the African Development Bank Group, West Africa includes the same countries as the Economic Community of West African States (ECOWAS) which are Benin, Burkina Faso, Cape Verde, Gambia, Ghana, Guinea, Guinea Bissau, Ivory Coast, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

3. Poultry Trade with West Africa

3.1 Global Trade Flows to West Africa

Poultry meat is a popular source of animal protein in the SSA region. Increasing urbanization and income combined with rapid population growth has led to a growing demand for animal products, including poultry, in many African countries (Schneider et al., 2011). Per capita consumption of poultry meat in SSA has substantially increased from 1.5 to 2.1 kg annually (equivalent to an increase of 40% of per capita consumption) between 2000 and 2017 (Schneider et al., 2011; Asante-Addo and Weible, 2019). According to FAO statistics, imports are rising rapidly, and are higher than the local production (FAO, 2018). The EU is the dominant supplier of poultry meat to West Africa, just ahead of the North American countries (Canada and USA), with Latin American exporters on the third place. Figure 1 highlights that over 70% of West Africa's poultry imports originate from the EU-28. According to the United Nations trade statistics, the Netherlands (31%) and Belgium (17%) make up nearly half of all EU poultry exports to West Africa.

Figure 1: Global Poultry Trade Flows to West Africa in 2017

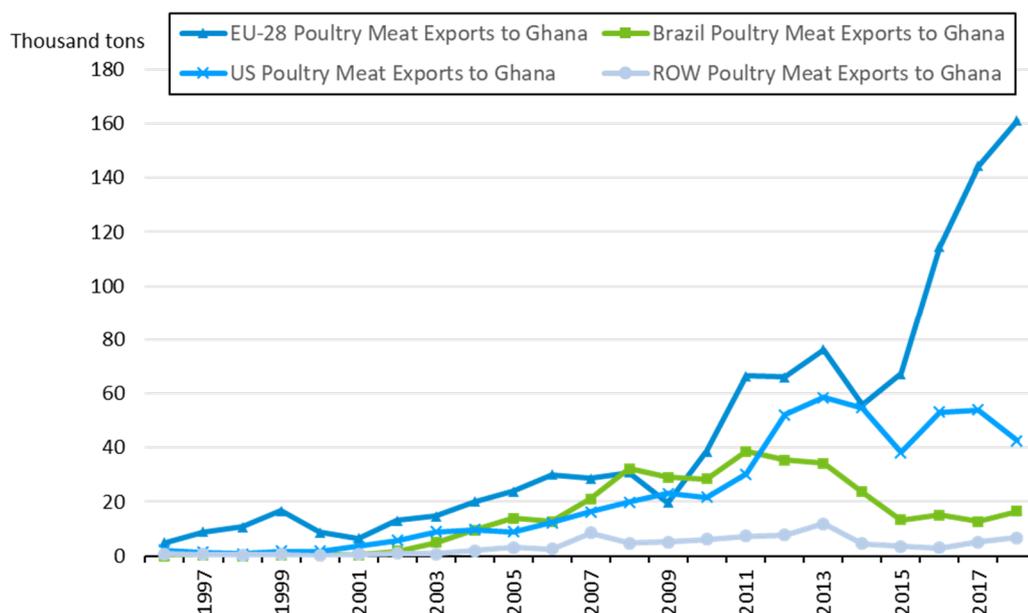


Note: The map is based on thousand tons. NA = North America, LA = Latin America, EU = the EU-28 countries, ME = Middle East, Eurasia and Ukraine, AS = Asia, AU = Australia and New Zealand, AF = Africa.

Source: Own elaboration based on UN Comtrade (2017). HS product codes: 0207, 0105, 160231, 160232, 160239. Map created with ESRI (2020).

Figure 2 displays the change in the value of poultry exports over time and shows the main competitors on the Ghanaian poultry market. From Figure 2, it becomes obvious that Brazil and the US have decreased their poultry exports to Ghana since 2011 and 2013 respectively. Since 2014, the resulting gap has been compensated by the growing poultry exports from the EU. The decline in US poultry exports may be related to the perceived quality of products from other exporters, existing non-tariff barriers and the bureaucratic procedure of obtaining permits for poultry exports (Ashitey, 2017; Asante-Addo and Weible, 2019). Nevertheless, US poultry has continued to enjoy a price advantage over products from Brazil and the EU³.

Figure 2: Main Exporters of Poultry Meat to Ghana from 1996 to 2018 (in 1000 tons)



Source: UN Comtrade (2018). HS code: 0207. ROW stands for “rest of the world”.

3.2 EU Trade Flows to West Africa

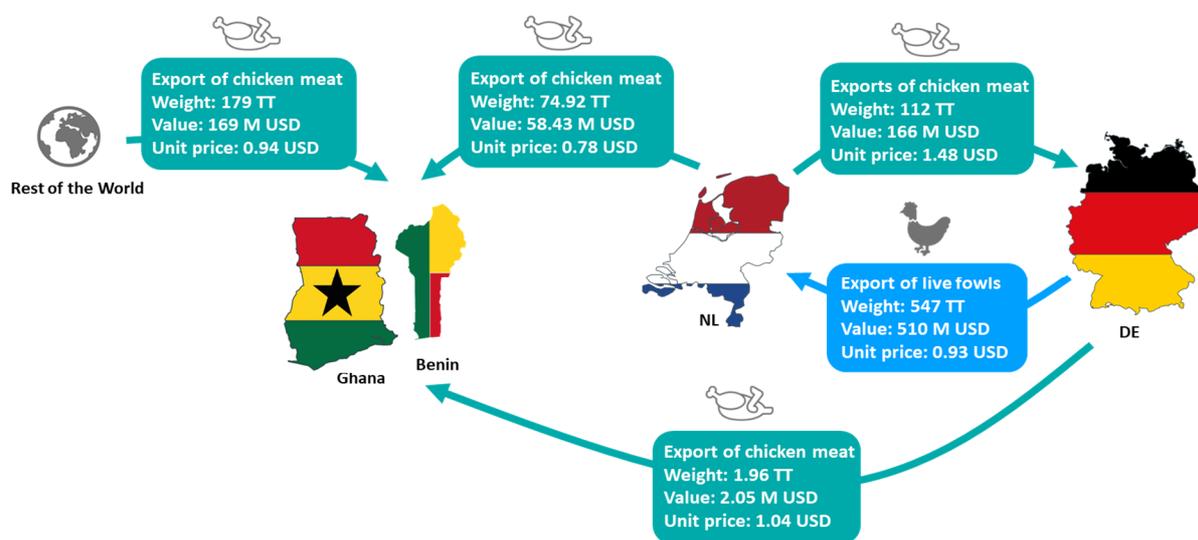
Within the EU, the Netherlands is the main importer of German poultry meat accounting for 30% of its total poultry meat imports (International Trade Center, 2018). Therefore, it can be assumed that a certain quantity of poultry exports from the Netherlands consists of German poultry products that are re-exported which leads to the so-called Rotterdam effect⁴ (Poppy et al., 2019). The Rotterdam effect refers to discrepancies in trade statistics caused by products originating from other countries that are re-exported via the port of Rotterdam.

³ The price of poultry meat per 10 kg box for Brazilian, EU and the US types are \$34, \$32 and \$22 respectively in 2013 (Ashitey, 2013).

⁴ Proximity to the main poultry production sites in Germany (i.e. North Rhine-Westphalia, Lower Saxony) also plays an important role in the Rotterdam port phenomenon.

Figure 3 explains the pattern described above, although the accurate estimation of cross-border trade is difficult to calculate. As shown, Germany exported 547 thousand tons of live fowls to the Netherlands in 2017, which is equal to 36%⁵ of the total production of meat broiler in Germany (EuroStat, 2017). However, the Netherlands only exported 112 thousand tons of chicken meat (HS code 020714) to Germany in the same period. Moreover, the exports from other EU-member states to the Netherlands (specifically Belgium and France) are significant as well⁶. Live fowls from Germany (or other EU-member states) are likely to be processed in the Netherlands and the value-added parts such as whole chicken or boneless parts (with higher unit price) are exported from the Netherlands to Germany. Additionally, the remaining parts, including legs and wings might be re-exported to West Africa as Dutch exports, because the Netherlands became the country of origin. This trading scheme can lead to so-called “bilateral asymmetries” in trade data⁷. Bilateral trade asymmetry is defined as a situation in which the recorded exports from country A to country B do not match the recorded imports of country B from country A (United Nations Statistics Division, 2019). According to the trade databases (e.g. UN Comtrade and ITC trade map), there is a significant bilateral asymmetry under the HS product code 020714 (frozen chicken cuts and offal) between the Netherlands, Germany and West Africa, which is likely due to re-exports. Figure 4 shows how re-exports through the Dutch ports may lead to bilateral asymmetries in trade statistics.

Figure 3: Poultry Trade Flows between Germany and Ghana and Benin with the Netherlands as the Country of Origin in 2017



Note: Data reported by the country of origin. Unit price is calculated as total value divided by total quantity. TT means thousand tons.

Source: Own elaboration based on UN Comtrade (2017). HS codes for live fowls from Germany to the Netherlands: 010594, and for chicken meat: 020714. Maps created with ESRI (2020).

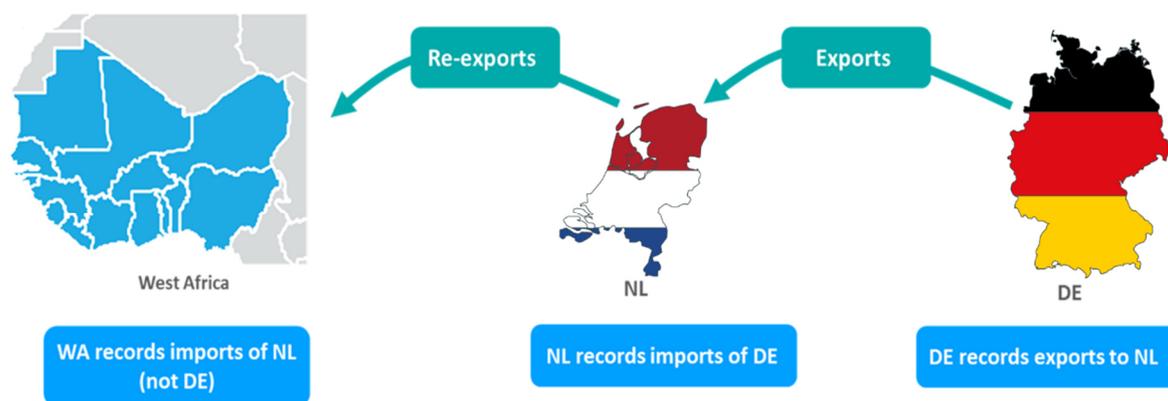
⁵ 17 February correction: This article erroneously stated that 86% of the total German broiler meat is exported to the Netherlands in 2017. The correct proportion is 36%.

⁶ 17 February addition: This sentence was added to avoid a misinterpretation of our argument.

⁷ For more details see: <http://unstats.un.org/unsd/tradekb/Attachment441.aspx?AttachmentType=1>

Another interesting point has to do with the various unit prices of chicken meat according to the country of origin. As presented in Figure 3, poultry meat exported to West Africa by the Netherlands had a lower unit price, i.e. 0.78 USD in 2017, which is less than the unit price of live poultry exported from Germany to the Netherlands (0.93 USD per unit) and also less than the unit price of German poultry exported to West Africa (1.04 USD). Figure 3 reflects the different values of chicken parts exported by the Netherlands to Germany and to West African states. Our inspection of 8-digit HS codes showed that the main share of chicken meat exports from the Netherlands to Germany is boneless parts while the Netherlands' exports to West Africa primarily include frozen halves and quarters of broiler. According to recent trends in German chicken consumption, consumers prefer the chicken breast, while other parts such as legs, are not preferred anymore (Rudloff and Schmiege 2016). Therefore, these parts are not marketable in Germany.

Figure 4: Trade Flow between Germany and West-Africa with the Netherlands as the Country of Origin



Source: Own elaboration 2020. Maps created with ESRI (2020).

As shown in Table 2, frozen chicken cuts (HS code 020714) and frozen whole chicken (HS code 020712) account for over 82% of all poultry exports (quantity share) to West Africa. During the last decade, European exports of frozen chicken (cuts and whole chicken) to West Africa have significantly increased (International Trade Center, 2018). As described above, European consumers are buying more chicken breasts, and the remaining parts are exported to African countries (Rudloff and Schmiege, 2016). Apart from that, frozen chicken cuts have a longer shelf life than fresh chicken which allows for transportation and further re-exportation to neighbouring countries (Shaw et al., 2019).

Table 2: EU-28 Exports of Various Types of Poultry Meat to West Africa in 2017

Rank	Product	Weight	Share%	Value	Share%
1	020714 Frozen chicken cuts and offal	255.57	70%	211.50	62%
2	020727 Frozen cuts and edible offal of turkeys	50.84	14%	57.60	17%
3	020712 Frozen whole chicken	43.60	12%	43.56	13%
4	020713 Fresh and chilled chicken cuts and offal	2.63	1%	2.76	1%
6	0207-- Other types of poultry meat	11.40	3%	10.54	3%
5	0105-- Live poultry	0.74	0.2%	19.29	5.6%
	Sum	364.78	100%	345.25	100%

Note: Weight is based on thousand tons and the unit of value is million USD.

Source: Own elaboration based on UN Comtrade (2017). Live fowls (HS-0105) represent 739970 kg.

3.3 German Trade Flows to West Africa

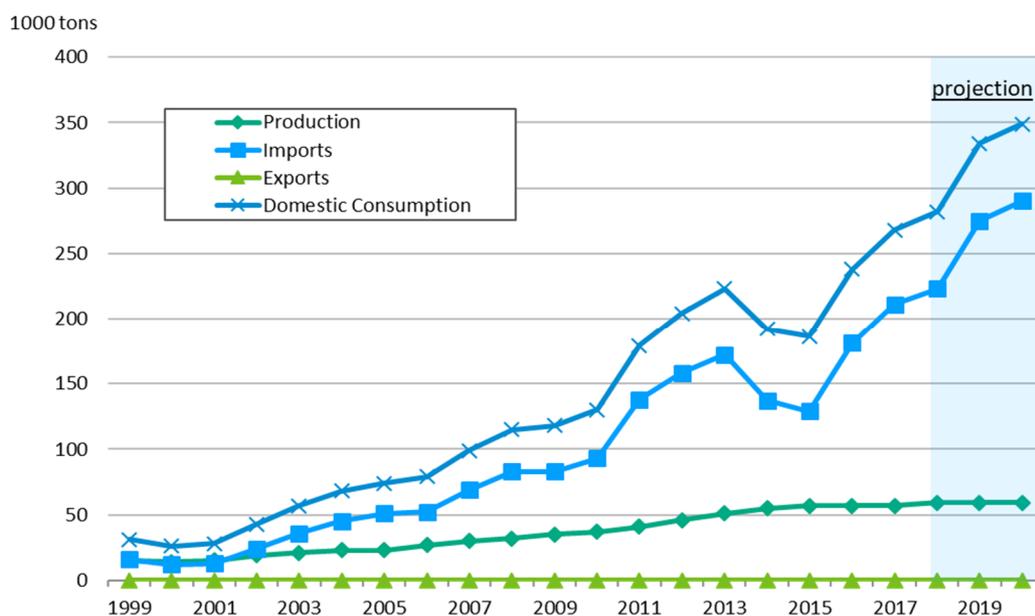
By importing 145 thousand metric tons in 2017, Ghana was the first West African country with regard to the quantity of poultry meat imports from the EU (UN Comtrade, 2017). In the same year, Germany exported 8 thousand metric tons of poultry meat with a value of 9 million Euros to West Africa (UN Comtrade, 2017). A more detailed picture is provided by Figure 5 that ranks West African markets according to their poultry meat imports from Germany. Benin and Ghana are the main importing countries. In 2017, Germany exported 2.74 thousand tons of poultry meat to Benin and 2.20 thousand tons of poultry meat to Ghana, which are equal to 33% and 26% of the total German poultry exports to West Africa respectively (UN Comtrade, 2017). Ghana is also an important country in terms of live poultry imports (see Figure 6). Germany exported 1.2 tons live poultry in form of day-old chicks to that country in 2017 (Figure 6).

While Ghana levy tariffs of 35% on chicken imports, Senegal has imposed an import ban on uncooked poultry meat in 2006 due to the Avian flu. Despite this ban, Senegal still imports prepared and preserved poultry meat (products with HS code 160232) (Figure 5). For instance, Germany exported 17 tons of processed chicken meat to Senegal in 2017. Another case is Benin. The country imports large quantities of chicken meat from Germany. Official statistics show that Benin has supplied over 95% of Nigeria's poultry imports in some years (UN Comtrade, 2017). Thus, it can be assumed that large quantities of German poultry meat are re-directed from Benin to Nigeria. Although there are no statistical data on informal re-exports from Benin to Nigeria, they are expected to be higher (Golub and Mbaye, 2009; Andam et al., 2017). Blum (2014) and Bensassi et al. (2016) state that the trade between Benin and Nigeria mainly takes place in form of smuggling. Based on the findings described above and the difficulties that may arise when researching informal trade flows, we decided to have a close look at Ghana, because poultry imports are consumed in the country.

3.4 Trade and domestic production in Ghana and Senegal

Figure 7 presents the development of total supply (domestic production and imports) and total demand (domestic consumption and export) of poultry meat in Ghana. As shown in Figure 7, the estimated per capita consumption has significantly increased from 1.6 kg in 1999 to 9.6 kg in 2018. The sharp increase in the demand for poultry meat has led to rising Ghanaian poultry imports (Figure 7). The share of imports in domestic consumption of poultry meat in Ghana has increased strongly during the last decades, whereas domestic production shows only a slight increase (Figure 7). The deficiency in domestic production is basically due to the high production costs (including energy price, feed, vaccines), inefficient production technologies, lack of processing facilities, and limited knowledge of modern poultry management (Ashitey, 2013). In this way, the self-sufficiency rate has fallen from 54% in 2000 to 23% in 2011. However, the public sector has continued to support the domestic production by reducing custom duties on production inputs and facilitating access to veterinary services (Ashitey, 2013). After 2010, the self-sufficiency rate remained relatively stable. In 2018, it was still at 21%.

Figure 7: Development of the Poultry Meat Sector in Ghana from 1999 to 2019 (in 1000 metric tons)

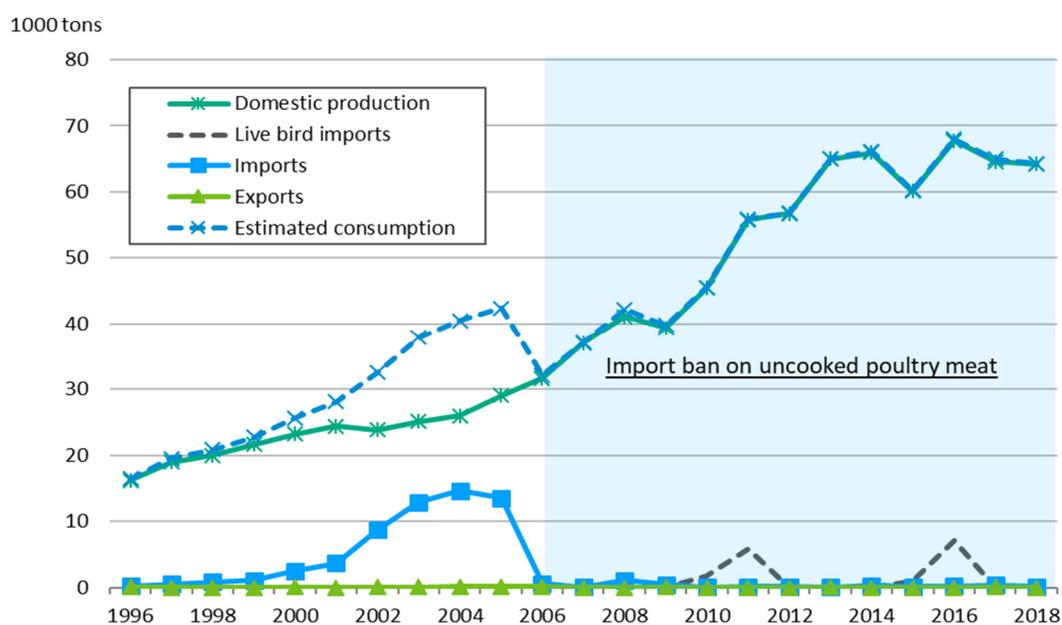


Source: Dataset and projection based on USDA (2019).

In Senegal, the poultry sector shows a different pattern (Figure 8). Although the domestic production has expanded by 102% since the 2006 ban on imports of uncooked poultry meat, its growth is still lower compared with the poultry sector of Ghana. The Ghanaian poultry production has increased by 119% during the same time.

After 2006, almost no imports of poultry products are visible except for the years 2011 and 2016 (Figure 8). Despite the import ban, Senegal imports live birds in form of day-old chicks for its local poultry production, which are presented in Figure 8 as well. The Senegalese poultry meat market is characterized by autarky from 2006 onwards: domestic consumption is primarily covered by domestic production. This is reflected in a self-sufficiency rate of almost 100% since 2006. Similar to poultry sectors in other West African countries, the domestic consumption of poultry meat in Senegal has experienced an upward trend during the last decades. Based on our estimates, the per capita consumption has more than doubled: It increased from 1.8 kg in 1996 to 4.1 kg in 2018.

Figure 8: Development of the Poultry Meat Sector in Senegal from 1996 to 2018 (in 1000 tons)



Note: The domestic consumption is estimated based on imports + production - exports.

Source: Exports and imports are based on UN Comtrade (2018), HS code: 0207. Production data are retrieved from FAO (2018).

4. Dairy Trade with West Africa

4.1 Global Trade Flows to West Africa

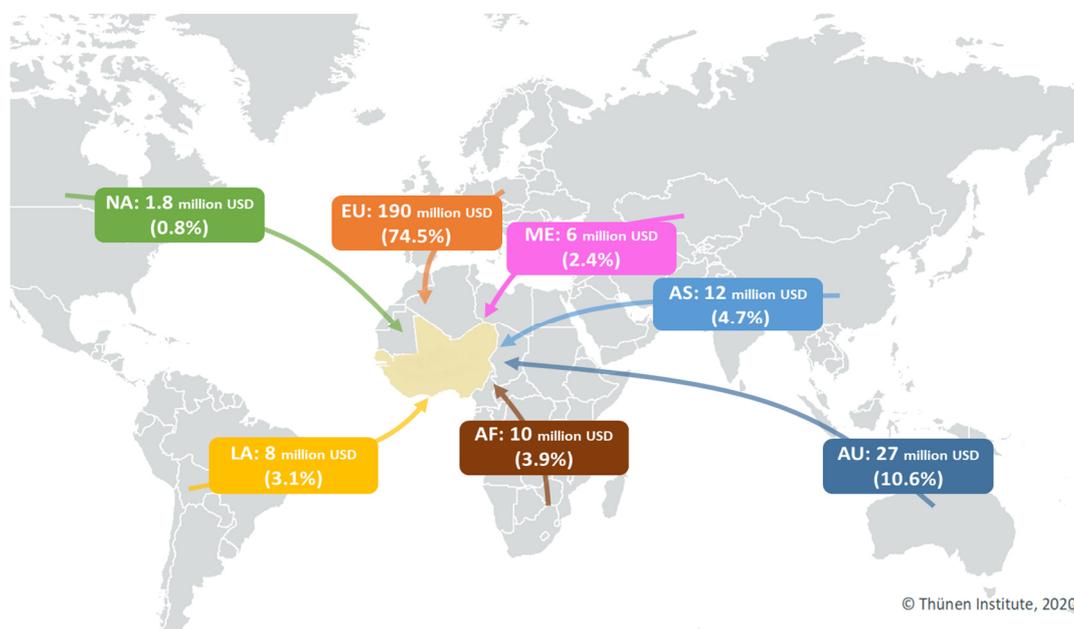
Due to its rising population and consumption, dairy products are becoming increasingly important in West Africa. The dairy markets in Europe and West Africa are complementary. In contrast to the EU's dairy market with its milk surpluses, West Africa has been experiencing a deficit situation in which domestic production can only meet a part of its dairy demand. Dairy exports from the EU to West Africa can be classified into three main categories: 1. Fluid milk and (non-powdered) dairy products, 2. milk powder and 3. full-fat milk. The first group includes liquid milk and its products such as cheese and butter, while the second group only covers milk powder. Full-fat milk is a type of milk powder in which the dairy fat has been removed and replaced by cheaper vegetable fat, usually palm oil. Since there is not a specific tariff code for full-fat milk powder, we apply HS code 190190 which may include other preparations used in the baking industry.

Figure 9⁸ shows that the EU is the main exporter of fluid milk and dairy products (made of liquid milk) to West Africa, just followed by Oceania (including Australia and New Zealand). Among the Oceanian countries, New Zealand has the largest share of exports to West Africa. In 2017, 105 thousand metric tons of fluid milk and (non-powdered) dairy products from the EU, representing 190 million USD, were exported to the West African region. Among the EU countries, the Netherlands (42%), France (19%), Portugal (12%) and Germany (11%) are the main exporters of dairy products to the region (UN Comtrade, 2017). As laid out above, the share of Germany might be underestimated due to the Rotterdam effect and re-exports within the EU.

According to the UN Comtrade database, West Africa imported 525 million USD (equal to 189 thousand tons) of milk powder in 2017; about 296 million USD (equal to 104 thousand tons) out of that were supplied by European countries. Expressed as a percentage it means that West Africa imported 56% of its milk powder from the EU (Figure 10). Here, the EU is a major player in the global trade of milk powder to West Africa. The Netherlands, Ireland, France, UK, and Germany are the main competitors in the market supplying 78% of West Africa's total milk powder imports from the EU. According to Matthews and Soldi (2019), Cape Verde, Ivory Coast, Ghana, and Senegal are more dependent on dairy imports from the EU compared to other West African nations.

⁸Due to heterogeneity of milk products, the trade flows are presented in values.

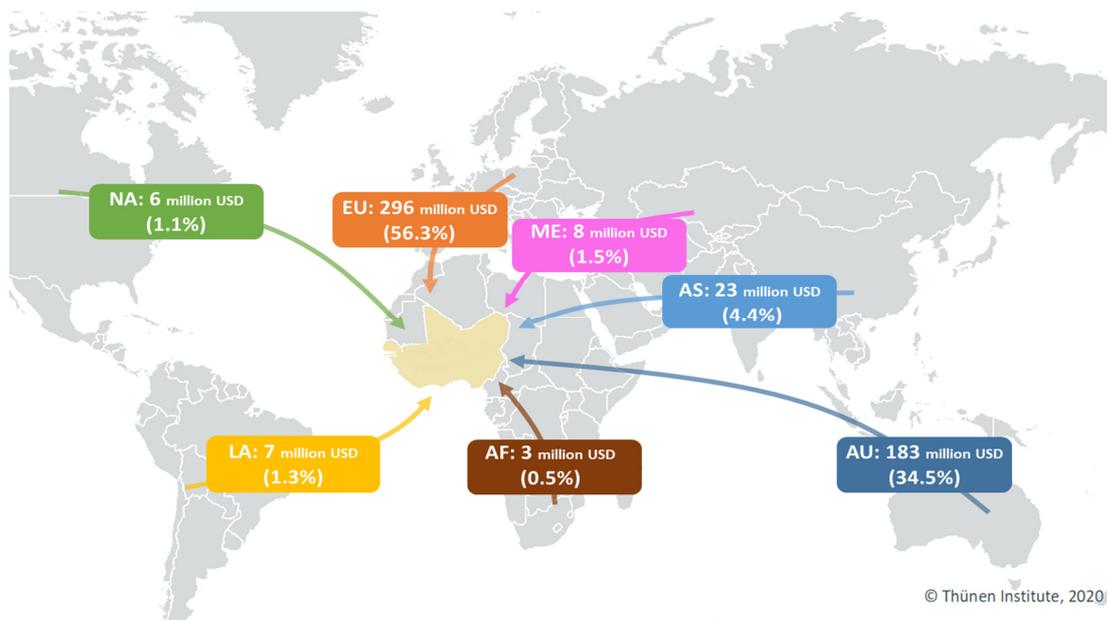
Figure 9: The Value of Global Trade Flows of Fluid Milk and (Non-powdered) Dairy Products to West Africa in 2017



Note: The map is based on exporters as the reporting countries. NA = North America, LA = Latin America, EU = the 28 EU-countries, ME = Middle East, Eurasia and Ukraine, AS = Asia, AU = Australia and New Zealand, AF = Africa.

Source: Own elaboration based on UN Comtrade (2017). HS product codes: 0401--, 040291, 040299, 0403--, 040490, 0405-, 0406--, 170211, 170219, 2105--, 350110. Map created with ESRI (2020).

Figure 10: The Value of Global Milk Powder Trade Flows to West Africa in 2017

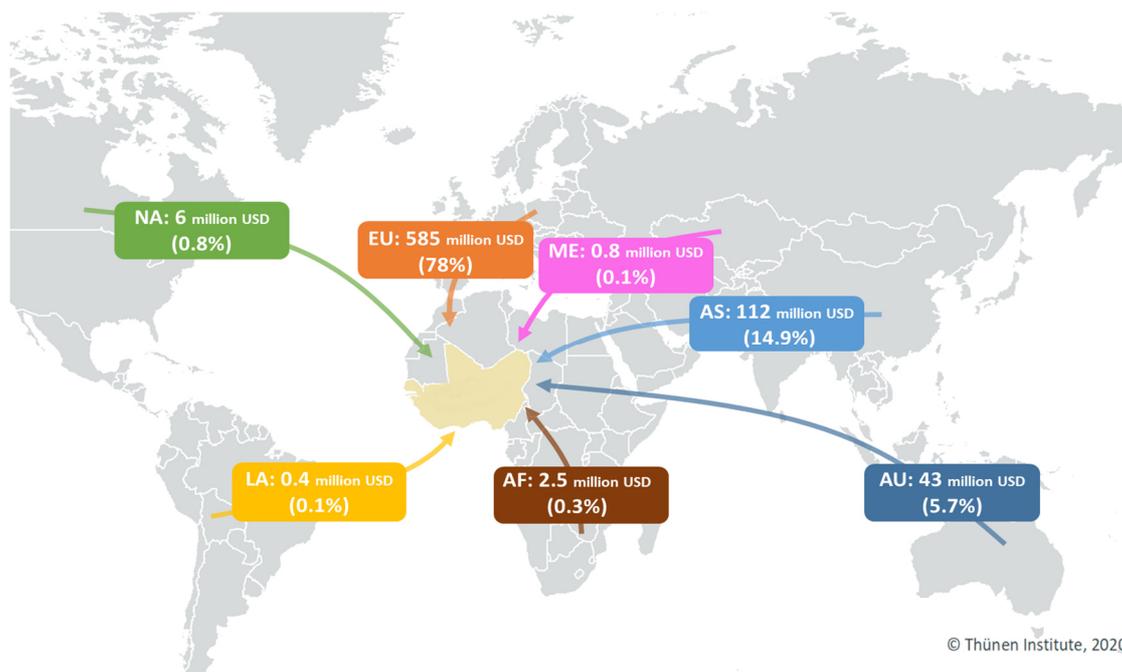


Note: Data are based on exporters as the reporting countries. NA = North America, LA = Latin America, EU = the 28 EU-countries, ME = Middle East, Eurasia and Ukraine, AS = Asia, AU = Australia and New Zealand, AF = Africa.

Source: Own elaboration based on UN Comtrade (2017). HS product codes: 040210, 040221, 040229, 040410. Map created with ESRI (2020).

If we were to look at other types of dairy products, the EU supplies the main share of full-fat milk to the West African region (Figure 11). In 2017, West Africa imported full fat milk in the value of 750 million USD of which 78% was supplied by the EU-28. Ireland, the Netherlands, Malaysia, Poland, and Germany are the main exporters by supplying 31%, 14%, 14%, 11% and 8% of the total value of full-fat milk imports respectively.

Figure 11: The Value of Global Full-Fat Milk Trade Flows to West Africa in 2017 (in million USD)

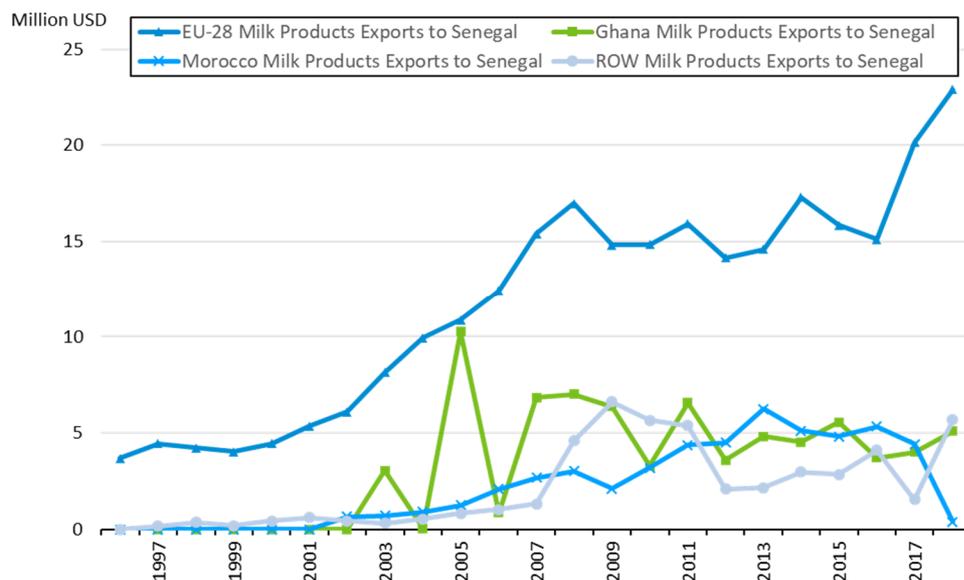


Note: Data are based on exporters as the reporting countries. NA = North America, LA = Latin America, EU = the 28 EU countries, ME = Middle East, Eurasia and Ukraine, AS = Asia, AU = Australia and New Zealand, AF = Africa.

Source: Own elaboration based on UN Comtrade (2017). HS product code: 190190. Map created with ESRI (2020).

A look at the time series shows that there are three major players exporting the lion's share of dairy products to Senegal; these are the 28 EU countries, Ghana and Morocco. Figure 12 presents the trend in exports of dairy products by value from these countries to Senegal. After the EU, some African countries play an important role in the total exports of dairy products to Senegal. There might be different reasons behind this pattern. Morocco, for instance, applies a lower tariff on dairy products (e.g. buttermilk) which makes re-exports profitable. Apart from re-exports, we suppose that there might be inter-company trade flows among partner companies working in both countries.

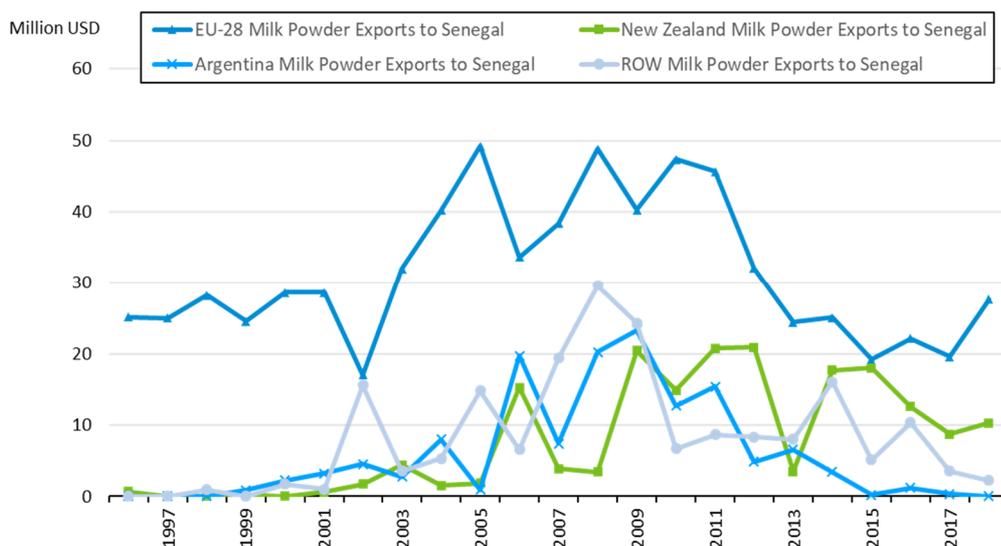
Figure 12: Main Exporters of Fluid Milk and (Non-powdered) Dairy Products to Senegal from 1996 to 2018 (in million USD)



Source: UN Comtrade (2018), HS product codes: 0401--, 040291, 040299, 0403--, 040490, 0405--, 0406--, 170211, 170219, 2105--, 350110. ROW stands for “rest of the world”.

We also collected time series data on the largest exporters of milk powder to Senegal (see Figure 13). The EU, Malaysia, and New Zealand have been the main exporters of dairy products from 1996 to 2018 (Figure 13). The reduction of the total imports of Senegal from 2010 to 2015 might be explained by increasing world prices for milk powder during this period. Since 2011, the EU milk powder exports fell faster than those of the other exporting countries and slowly increased again after 2015.

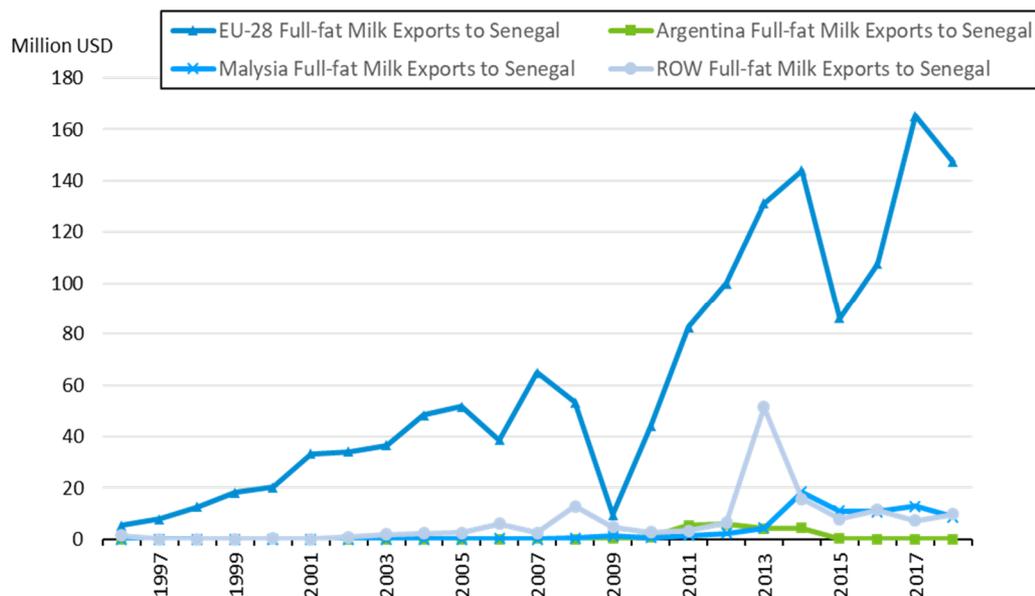
Figure 13: Main Exporters of Milk Powder to Senegal from 1996 to 2018 (in million USD)



Source: UN Comtrade (2018), HS product codes: 040221, 040210, 040410, 040229. ROW stands for “rest of the world”.

Figure 14 displays the export flows of full-fat milk from the 28 EU countries, Argentina and Malaysia to Senegal in 2018. The EU still had the dominant share in the market in that year while the other exporters had only a small share in the market. Despite its low own milk production, Malaysia exports full-fat milk to Senegal. According to the UN Comtrade dataset, there is a considerable trade flow (278 million USD in 2017) of full-fat milk from New Zealand to Malaysia. Thus, we expect that a part of New Zealand's milk powder is re-exported from Malaysia to Senegal.

Figure 14: Main Exporters of Full-fat Milk to Senegal from 1996 to 2018 (in million USD)

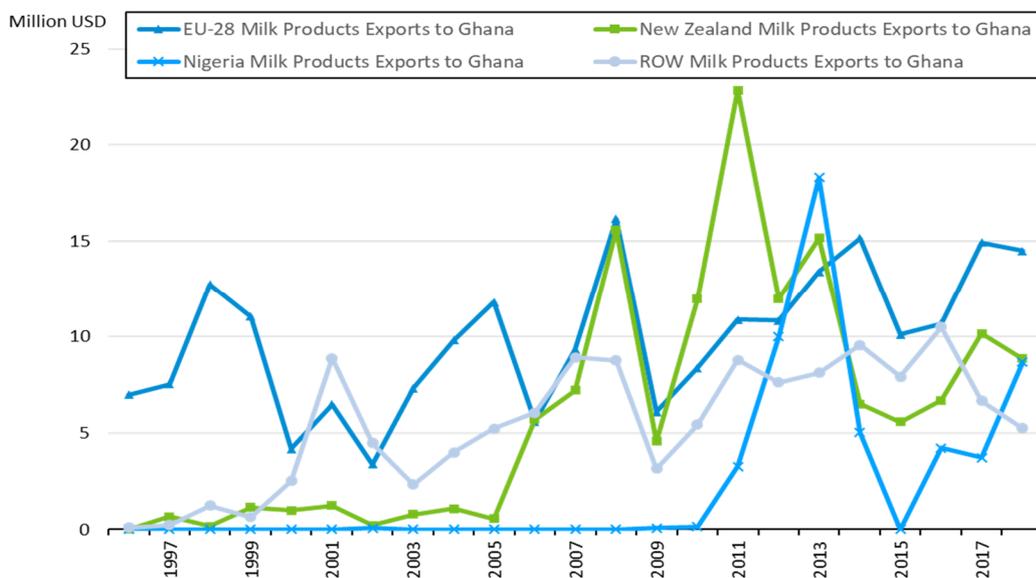


Source: UN Comtrade (2018), HS product code: 190190. ROW stands for "rest of the world".

Figure 15 shows that the 28 EU countries, New Zealand, and Nigeria are the main exporters of fluid milk and non-powdered dairy products to Ghana. Although the statistics demonstrate a considerable share of Nigerian exports, the country itself imports high volumes of milk powder from other countries to cover its domestic demand. For instance, Nigeria imported dairy products (made of liquid milk) in the value of 118 million USD from the Netherlands in 2017. We suppose that maybe other countries re-export dairy products through Nigeria. In Figure 15, it is noticeable that Nigeria reached an export high in 2013. This might be explained by an increase in the world price for dairy products⁹. Apart from that, inter-company sales also may play a role: In 2013, Danone took over Fan Milk International in Nigeria, which is the largest milk product distributor in Ghana and Nigeria with market shares of 89% and 85% respectively (Vidalon, 2013).

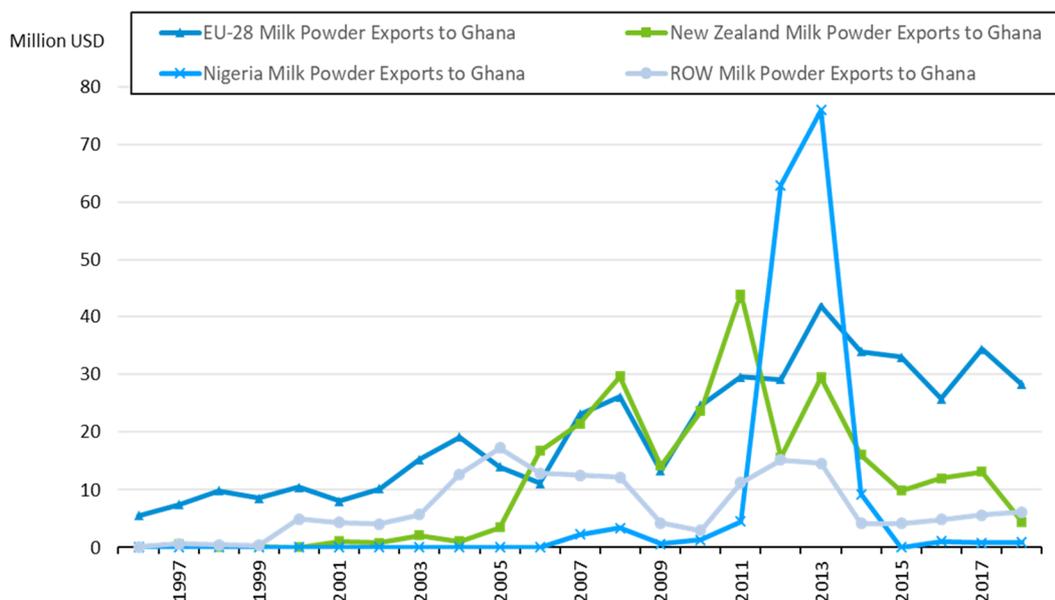
⁹ For the world price of dairy products, please check Figure 22 in the following sections.

Figure 15: Main Exporters of Fluid Milk and (Non-powdered) Dairy Products to Ghana from 1996 to 2018 (in million USD)



Source: UN Comtrade (2018), HS product codes: 0401--, 040291, 040299, 0403--, 040490, 0405--, 0406--, 170211, 170219, 2105--, 350110. ROW stands for "rest of the world".

Figure 16: Main Exporters of Milk Powder to Ghana from 1996 to 2018 (in million USD)



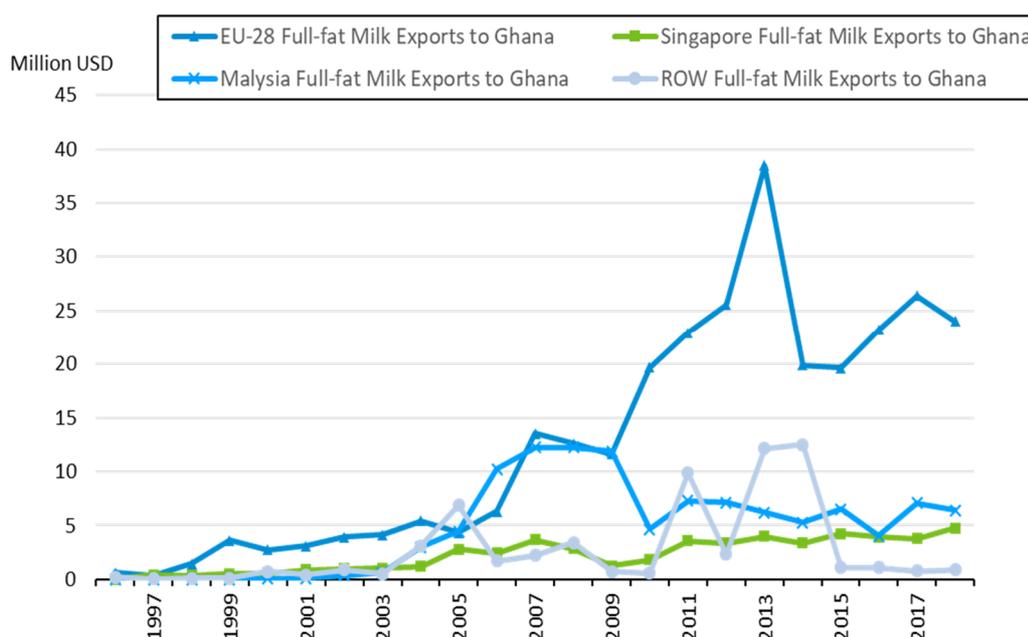
Source: UN Comtrade (2018), HS product code: 040221, 040210, 040410, 040229. ROW stands for "rest of the world".

Similar to the market of dairy products that are not made out of milk powder, the 28 EU countries, Nigeria and New Zealand are the main exporters of milk powder products to the Ghanaian market (see Figure 16). Again, the considerable share of Nigeria in 2013 might be due to international price

peaks and inter-company trade explained in the previous section. With regard to the large shares of Fan Milk International in Nigeria and Ghana, the reason may also lie in inter-company trade between the regional headquarters (Vidalon, 2013). In 2017, Nigeria imported milk powder (equal to 104 thousand tons) in the value of 289 million USD. Overall, the share of the 28 EU countries has been higher compared with other competitors.

As shown in Figure 17, there are three prominent exporters of full-fat milk to the Ghanaian market. These are the 28 EU countries, Singapore and Malaysia. As mentioned earlier, due to the low domestic production of dairy products, the exports of Malaysia and Singapore might consist of imports from other countries (e.g. from New Zealand), that are re-exported to West Africa. The peak of the EU's exports in 2013 might be explained by a high in international prices for dairy products in that year.

Figure 17: Main Exporters of Full-fat Milk to Ghana from 1996 to 2018 (in million USD)



Source: UN Comtrade (2018), HS product code: 190190. ROW stands for "rest of the world".

4.2 EU Trade Flows to West Africa

Table 3 displays the exports of EU dairy products under various HS codes on a 6-digit level. The bold printed rows show the share of each category in total, and the other rows present the share of each individual product within each category, i.e. sub-category shares. As presented in Table 3, full-fat milk, on its own, accounts for 56% of the total dairy exports from the EU to West Africa, just followed by milk powder and milk with the same contribution by value (22% in each category). Readers should be aware that HS code 190190 covers more than full-fat milk. In the milk category, milk and cream (concentrated and non-concentrated with HS codes 040291 and 0401--) account

for 79% (40% + 39%) of the total milk exports from the EU to West Africa. In the milk powder category in Table 3, there are two major sub-categories including whole milk powder (fat content<1.5%) and skimmed milk powder (fat content>1.5%) which together account for 89% (40% + 49%) of the total milk powder exports from the EU to West Africa.

Table 3: Types of Dairy Product Exports from the EU-28 to West Africa in 2017

Products	Weight	Share%	Value	Share%
Group 1 Fluid Milk and Non-powdered Dairy Products	104.2	22%	189.2	18%
040291 Milk and cream, concentrated but unsweetened (excl. in solid forms)	42.1	40%	73.4	39%
0401-- Milk and cream, not concentrated nor containing added sugar	40.2	39%	33.3	18%
0406-- Cheese and curd	7.0	7%	36.4	19%
0403-- Buttermilk, curdled milk, and cream, yogurt, etc.	6.4	6%	12.3	7%
0405-- Butter, incl. dehydrated butter and ghee	4.1	4%	24.1	13%
----* Other types of fluid milk products	4.4	4%	9.7	5%
Group 2 Milk Powder	104.6	22%	296.1	28%
040221 Whole milk powder, not containing sugar	51.3	49%	185.9	63%
040210 Skimmed milk powder	42.1	40%	97.1	33%
040410 Whey and modified whey -in powder-	11.0	10%	12.5	4%
040229 Whole milk powder, sweetened	0.2	0.2%	0.6	0.2%
Group 3 Full-Fat Milk	266.4	56%	585	55%
190190 Milk powder preparations, including full-fat milk powders	266.4	100%	585	100%

*Other types of fluid milk products include HS codes 040299, 170211, 170219, 2105--, 350110.

Note: Weight is based on thousand tons and the unit of value is million USD.

Source: Own calculation based on UN Comtrade (2017).

4.3 German Trade Flows to West Africa

With regard to their dependence on milk product imports from Germany, there are significant differences between the West African states. Figure 18 shows that Nigeria, Senegal and Ghana are the largest importers of German dairy products with 3.4, 2.6 and 1.2 million metric tons representing 3.9, 2.2 and 2.2 million USD respectively (UN Comtrade, 2017). However, Germany's market share in Senegal's and Ghana's total imports of milk and dairy products made of liquid milk is 6.3% and 6.1% respectively and, thus, slightly higher than Nigeria's imports which account for 4.5%. Beyond this, Nigeria, on its own, supplied 11% of Ghana's total imports of dairy products, which might be re-exports of German products. This point was discussed in the previous sections.

Figure 18: The Value of Exports of Fluid Milk and (Non-powdered) Dairy Products from Germany to West African Countries in 2017 (in 1000 USD).

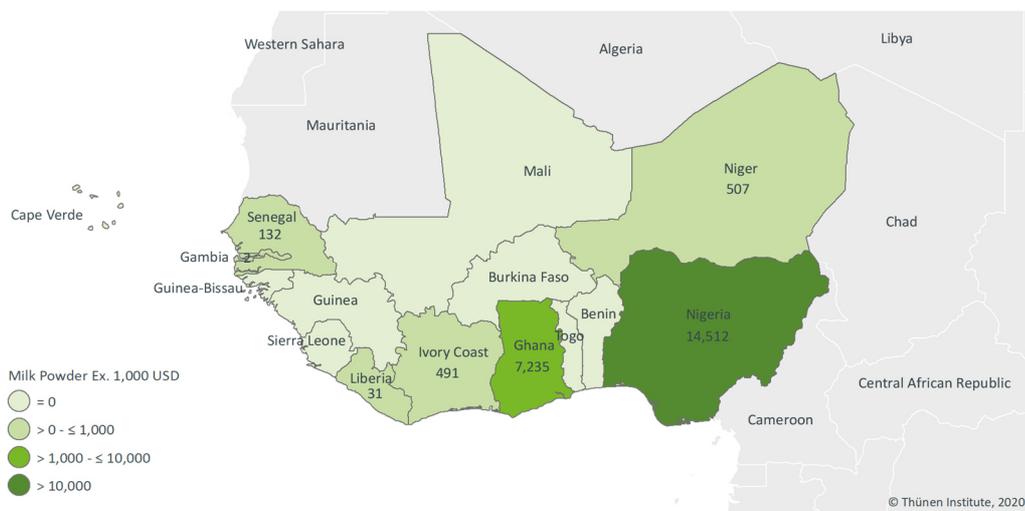


Note: Data are based on Germany as the reporting country.

Source: Data are based on UN Comtrade (2017). HS product codes: 0401--, 040291, 040299, 0403--, 040490, 0405--, 0406--, 170211, 170219, 2105--, 350110. Map created with ESRI (2020).

Direct exports of German milk powder to West Africa accounted for 10.4 million tons (equal to 23 million USD) in 2017 (UN Comtrade, 2017). As shown in Figure 19, West Africa, Nigeria and Ghana are the main destinations of German milk powder. Both countries imported 6.3 and 3.3 million metric tons in the value of 14.5 and 7.2 million USD respectively. Germany has with 14% of the total imports of milk powder (by weight) a larger share in the Ghanaian milk powder market.

Figure 19: The Value of Milk Powder Exports from Germany to West African Countries in 2017 (in 1000 USD)

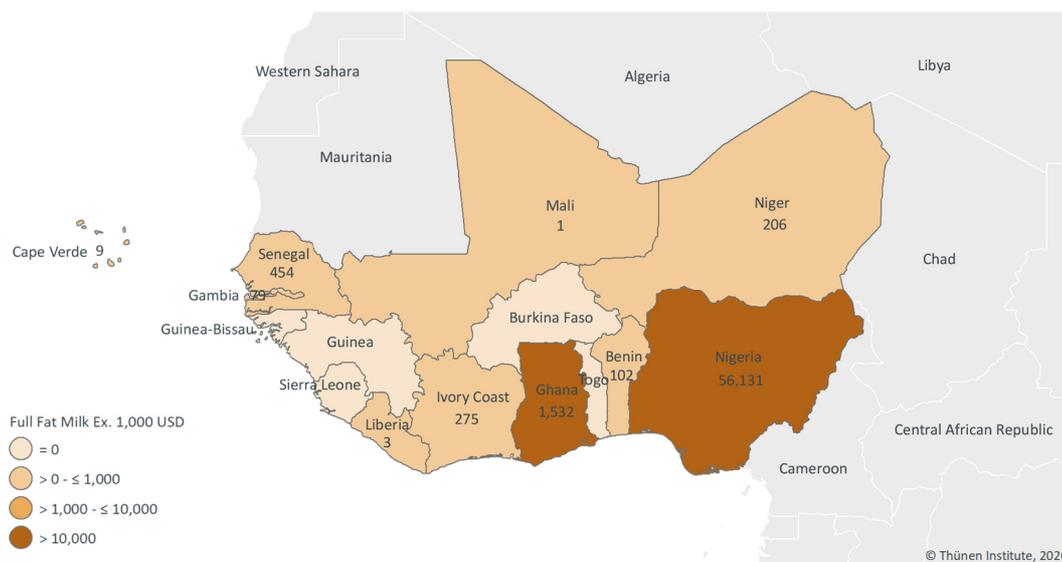


Note: Data are based on Germany as the reporting country.

Source: Data are based on UN Comtrade (2017). HS product codes: 040221, 040210, 040410, 040229. Map created with ESRI (2020).

If we look at the third product group, Germany exported 26 million tons of full-fat milk which was equal to 58 million USD in 2017 (UN Comtrade, 2017). As presented by Figure 20, Nigeria, Ghana and Senegal are the main destinations for German full-fat milk in West Africa by importing this product in the value of 56, 1.5 and 0.45 million USD respectively.

Figure 20: The Value of Full-Fat Milk Exports from Germany to West African Countries in 2017 (in 1000 USD).

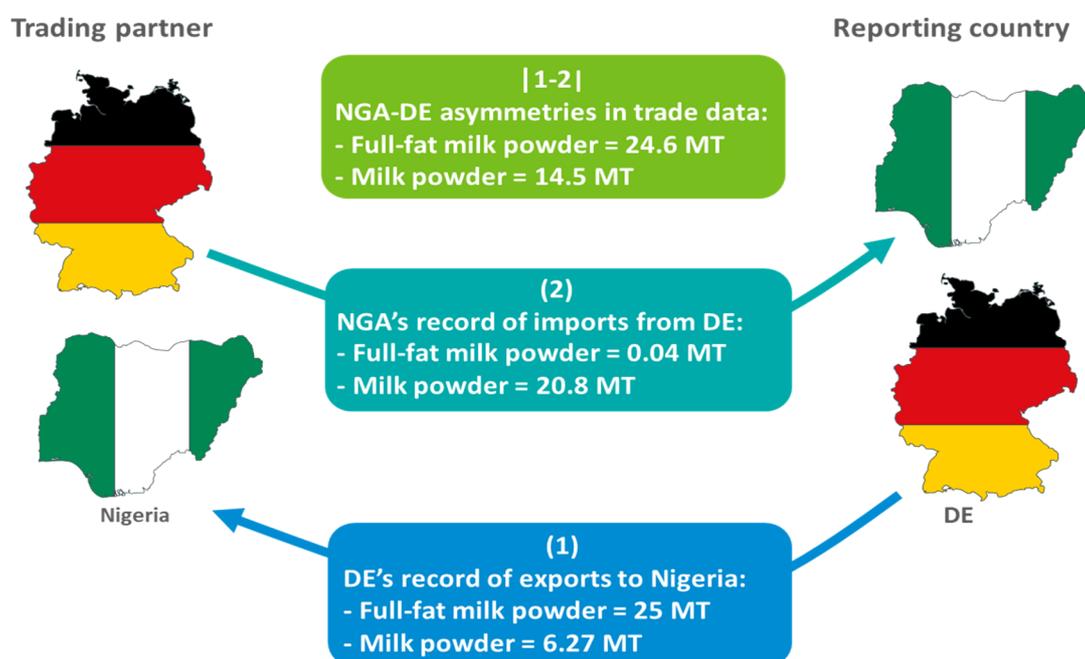


Note: Data are based on Germany as the reporting country.

Source: Data are based on UN Comtrade (2017). HS product code: 190190. Map created with ESRI (2020).

The official trade statistics show the substantial asymmetries in both, trade flows of milk powder and full-fat milk from Germany to Nigeria. Figure 21 shows that the export data reported by Germany differ significantly from the data that Nigeria states on imports from Germany. This might be related to re-exports, as Nigeria plays an important role in the imports of other West African states. However, it would go beyond the scope of our analysis to undertake a closer investigation of this discrepancy in trade statistics. Nevertheless, the aforementioned error may significantly influence our analysis in the end. Therefore, Ghana and Senegal are more suitable for further analysis, because both countries provide more accurate trade statistics.

Figure 21: Bilateral Asymmetries in the Full-Fat Milk Trade Flow between Nigeria and Germany in 2017 (in million tons).



Source: Own elaboration based on UN Comtrade (2017). HS product code: 190190. Maps created with ESRI (2020).

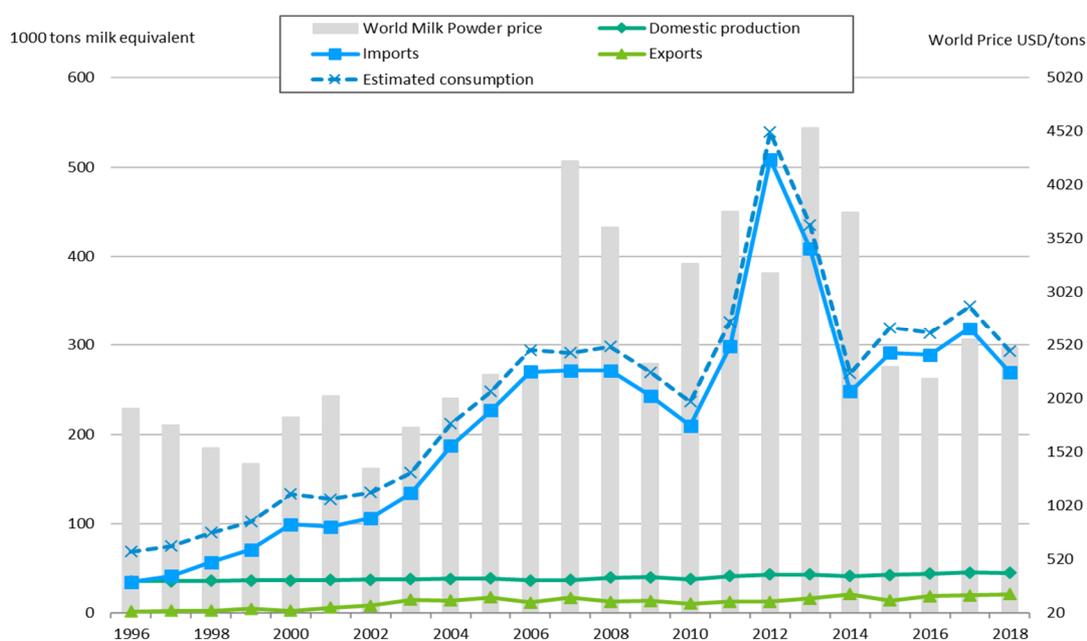
4.4 Trade and Domestic Production in Ghana and Senegal

As illustrated in Figure 22, Ghana's total imports of dairy products have risen substantially, especially since the year 2000. This upward trend is mainly driven by population growth, higher per capita income and increased domestic demand for dairy products in West Africa in general, and Ghana in particular. According to our estimates, the per capita consumption went considerably up from 3.9 kg in 1996 to 9.9 kg milk equivalent in 2018 (UN Comtrade, 2018). However, the statistics present a stable trend with respect to domestic dairy production. The gap between the increasing dairy imports and the stable domestic production suggests that the self-sufficiency rate has fallen steadily from 52% in 1996 to 15% in 2018. As presented by Figure 22, total imports have as well been affected by the world market price, specifically from 2008 to 2015. However, the correlation is not obvious in some years as there might be other drivers behind the growth in imports. Out of all dairy imports, milk powder, including full-fat milk powder, makes up the biggest part of total dairy supply and also of domestic consumption.

In Senegal, milk and other dairy products are highly important in terms of economic, cultural and nutritional aspects (Seck et al., 2016; Magnani et al., 2019). The total whole milk production in Senegal reached roughly 150 thousand tons in 2018 (FAO, 2018). Milk is in Senegal mainly produced by extensive farming systems which have been affected by various public dairy programs throughout the country. For instance, the decline in production from 2012 to 2014 may be

explained by the poor outcomes of the Special Artificial Insemination Program (PSIA) (Diouf et al., 2016).

Figure 22: Development of the Dairy Sector in Ghana from 1996 to 2018 (in 1000 tons, milk equivalent)

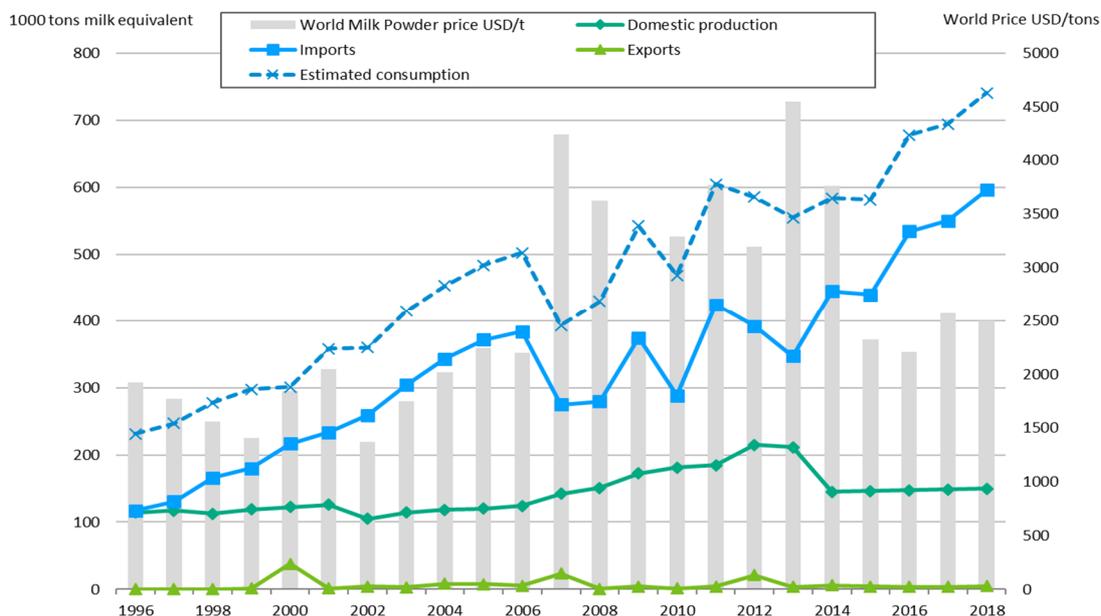


Note: The domestic consumption is estimated based on imports + production - exports. Storage was not considered.

Source: Exports and imports are based on UN Comtrade (2018), HS codes: 0401--, 040291, 040299, 0403--, 040490, 0405--, 0406--, 170211, 170219, 2105--, 350110, 040221, 040210, 040410, 040229, 190190. The production data is retrieved from FAO (2018). World market prices are given by OECD (2018).

Although local milk production has increased constantly during the last decades, domestic supply is principally insufficient to cover domestic demand. The milk equivalent consumption per capita has almost doubled from 25.9 kg in 1996 to 47.7 kg milk equivalent in 2018. The dairy sector in Senegal is characterized by low productivity of local breeds and a strong presence of imported milk powder. In order to increase production, intensification through improving animal genetic resources has been a central objective of policy makers since long time (Seck et al., 2016). However, as presented by Figure 23, Senegal imports high quantities of dairy products to meet domestic demand. Figure 23 shows fluctuating imports which may be linked to the volatility of world market prices. Total dairy imports of Senegal, including dairy products and milk powder (see Table 3), amounted up to 595 million tons of milk equivalent in 2018, out of which 85% is milk powder and full-fat milk by value (i.e. 87% by weight) (UN Comtrade, 2017). According to our analysis, the self-sufficiency rate of the Senegalese dairy sector has steadily decreased from 41% in 2000 to 20% in 2018.

Figure 23: Development of the Dairy Sector in Senegal from 1996 to 2018 (in 1000 tons, milk equivalent)



Note: The domestic consumption is estimated based on imports + production - exports. Storage was not taken into account.

Source: Exports and imports are based on UN Comtrade (2018), HS codes: 0401--, 040291, 040299, 0403--, 040490, 0405--, 0406--, 170211, 170219, 2105--, 350110, 040221, 040210, 040410, 040229, 190190. The production data is retrieved from FAO (2018). World market prices are given by OECD (2018).

5. Conclusion

This report presents the findings of the first work package of the IMMPEX project which aims to investigate the impact of German and European livestock product exports on agri-food sectors in selected African countries. To choose the research countries, we consider various dimensions and criteria. Given the fact that West Africa is the largest trade partner of the EU in SSA, we focus on this region for a detailed analysis. Using the 4 and 6-digit HS codes, the first part of the report sets the scene by describing the most important livestock products exported to West Africa. Based on a literature review, statistical analysis, food security reasons and public concerns, we select two product types: poultry meat and dairy products. We assume that these two product groups can lead to the choice of the research countries. To better understand the role of Germany in the global food trade with West Africa, we identify the main importing countries on the basis of the following indicators:

- 1) Total value and weight of their imports from Germany,
- 2) Share of German exports in their total imports,
- 3) Trade data accuracy and reliability.

Apart from these indicators, other criteria such as social and public concerns, previous studies or re-exports are considered. Among the West African states, Ghana and Benin are the main importers of German poultry meat. However, the lion's share of Benin's poultry imports is formally and informally re-exported to neighbouring countries such as Nigeria. As official statistics show, over 95% of Nigeria's total imports of poultry meat are supplied by Benin. Cross border trade is not only important between West African states, but also between EU exporters. Due to the substantial re-export of German poultry products by the Netherlands (i.e. Rotterdam effect), we estimate that the share of Germany in the poultry market of West Africa might be larger than what formal data present. Accordingly, we select Ghana as a country to study with regard to German poultry exports. Moreover, Senegal's poultry sector can be considered as a benchmark of comparison with Ghana's poultry sector because Senegal has banned all imports of uncooked poultry meat in 2006.

With respect to the dairy sector, we identify three sub-categories including milk powder, full-fat milk and fluid milk (including non-powdered dairy products). According to official statistics, Nigeria, Ghana and Senegal are the main importers of German dairy products. There is, however, a striking bilateral asymmetry in Nigeria's dairy data. There might be different reasons for this inconsistency in the trade statistics but it would go beyond the scope of this study to investigate them. Compared with Nigeria, the two other major importers, Ghana and Senegal, provide more accurate trade statistics. In addition to that, the share of Germany in Nigeria's dairy imports is comparatively lower than its share in Ghana's and Senegal's dairy imports. For these reasons, we finally selected Ghana and Senegal as countries for the analysis of the impact of German and European dairy and poultry exports on developing countries.

Following the ban on imports of uncooked poultry meat in 2006, domestic production increased significantly by 102% in Senegal, however, it is still lower than the growth of the Ghanaian poultry production by 119% during the same time. From the demand perspective, the domestic consumption of poultry meat in Senegal and Ghana increased strongly during the last decades, especially in Ghana. Due to the ban on imports of uncooked poultry meat and lower per capita consumption, the self-sufficiency rate in Senegal amounted up to 100%, while it was 21% in Ghana in the year 2018. On the import side, the US, EU and Brazil are the main competitors in the poultry market of Ghana. But in contrast to the market share of the EU, the market shares of Brazil and the US have been decreasing since 2011. In the importing countries, the quality of poultry meat of US origin is perceived to be lower than that of poultry meat of other competitors, specifically in comparison to products from Brazil. Nevertheless, US poultry products have a price advantage.

Due to population growth and increased demand, dairy products are becoming increasingly important in Senegal and Ghana. Both countries are similar with respect to their reliance on dairy imports, but they are different in their degree of self-sufficiency: Ghana's self-sufficiency level is with 15% lower than Senegal's self-sufficiency level of 20%. The exports of EU countries play an important role in the dairy markets in both countries. However, their share is much higher in the dairy market of Senegal. Apart from the 28 EU countries, which are the main exporters of dairy products to West Africa, New Zealand, Argentina and Malaysia are the main exporters to Ghana, while New Zealand, Singapore and Malaysia are the main exporters to Senegal. In addition, inter-African trade plays an important role in the milk powder market of Ghana and the dairy product (made of liquid milk) market of Senegal. According to the high value of dairy imports in both countries, we believe that a major part of inter-African trade is related to re-exports. Thus, the major competitors in the dairy sectors of the two research countries are the 28 EU countries and New Zealand. Based on our estimation, milk equivalent consumption per capita was with 47.7 kg of milk equivalent in 2018 significantly higher in Senegal than in Ghana with a consumption of 9.9 kg of milk equivalent in the same year. In contrast to poultry imports by Ghana and Senegal, dairy imports are characterized by high volatilities which can partly be explained by fluctuating world milk and milk (powder) prices.

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