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Report on the state of play of current livestock value chains

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Pathways FOR SUSTAINABLE FOOD

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Executive Summary

EU livestock systems are often studied from a national perspective, analysing in a very accurate manner a specific sector in a country, or from a European Union (EU) standpoint which averages the national characteristics of each animal sector in one big aggregate. In the first case, the main weakness of the analysis is the lack of comparability between member states. In the second, it is the insufficient level of detail. Against these drawbacks, this report provides a comparative, integrative overview of physical flows, current governance, power relationships and logistical constraints of four livestock value chains in different EU countries. Carrying out an analysis from "farm to fork", a specific focus is dedicated to post farm activities and actors (processing industries and retailers) and their relations with farmers and farmers' organisations. A common methodology based on the combination of existing literature, publicly available datasets, qualitative information, and original data is adopted to ensure the maximum of comparability between the case studies.

Main results show that because of a stagnation in consumption, environmental constraints regulating production, and lack of attractivity for animal husbandry, meat production stagnated during the last decades. The situation is less negative for dairy value chains since the removal of dairy quotas favoured a slight increase of national production is various EU countries. A common aspect visible in all countries and sectors is the expansion of farms size related to technological progress and increased spatial concentration. The fact that livestock activities often have a specific geographical localisation shows the important role played by economies of agglomeration and economies of scale in explaining farming productivity. Farmers often have a low bargaining power in determining prices when negotiating with large groups of processors and retailers. Their strategy to survival often lies on gathering in farming organisations or cooperatives to assemble production and have a higher bargaining power. Sometimes, they are forced to threaten to drop production and leave the market to have better selling prices or government aids (in the form of subsidies or more favourable regulations regarding price negotiation). Finally, alternative value chains exist alongside main livestock value chains in most of the countries and sectors analysed despite their importance and production share changes from case study to case study. In the last decades, their presence in the market increased because of a higher segmentation demanded by the consumers. However, in most recent years, the reduced budget of EU consumers for food products following COVID-19 outbreak and increased inflation put their future development at risk.

Introduction

Michele Schiavo, Pierre-Marie Aubert (IDDRI)

This report examines the structure of existing livestock value chains in several EU countries. Its purpose is twofold: first it provides an integrated analysis of economic activities from farm to fork taking place in current EU livestock value chains; second it provides a consistent baseline comprising qualitative and quantitative data useful for future modelling work in the Pathways project. The main livestock systems in the EU are studied using a comparative methodology which underlines the common aspects and differences between countries and between sectors.

At the beginning of the report, three comparative chapters examine the case studies in each value chain analysing their strengths and weaknesses. In the second part of the report, each case study is presented in detail. To ensure comparability, a common structure is used to analyse the case studies. Each chapter starts with a description of the physical flows taking place in the value chain. This section examines the structure of production (total volumes and value produced for the main processed goods of the value chain) giving a specific emphasis on historical trends and regional differences inside a country. Then, trade and trade relations are considered and analysed examining their impact on national production and the country competitiveness on foreign markets. Finally, the section ends examining how consumption patterns evolved during the past years in terms of volumes, but also in terms of the form and the place in which the livestock food products are consumed.

The second section of each case study considers the main actors in the value chain (farm organisations, processing industries, retail companies, etc.). In this section, the number of operators at each “node” of the value chain are identified, as well as the main “key players” (e.g., those producing / processing / selling most of volume and which have a certain control in the value chain). These operators are further characterized based on indicators such as the volumes produced and sold, the region of production, the companies’ turnover, the amount of capital invested, the number of employees and the difference in the product mix.

The third section analyses the governance of the value chain. Three main aspects are considered: the market strategies, and the power relations between actors in the value chain as well as the challenges the sector faces; the role of contracts and of price transmission; and the place that alternative (premium, organic, regional etc.) value chains have in the country, their strategy for survival and their relations with the dominant value chain.

Finally, a conclusion resumes the main findings of the report.

Methods

The information provided in the case studies of this report comes from different sources. To ensure comparability in the quantitative analysis between value chains, when possible, we employed publicly available data coming from Eurostat, Comext and Prodcom databases. However, in many cases these data were not sufficient to provide enough level of detail regarding the physical flows or the description of the main actors in the value chain. For this reason, national data sources were used to fill the gaps. When possible, volumes in tons for meat production were provided in tons of carcass equivalent (tcwe).
Qualitative information was provided by industry partners, the European multi-actor platform, practice hub participants, and national experts. In particular, the description of the governance of the value chain mostly relies on interviews or surveys with experts and stakeholders.

Comparative analysis

The French and Italian beef value chains: a comparative analysis

Michele Schiavo, Louise Picard, Pierre-Marie Aubert (IDDRI)

1. DESCRIPTION OF THE VALUE CHAIN

France and Italy are respectively the first and third largest beef producers in the EU (Figure 1). In the last decades, both countries suffered a decline in production, which was quite smooth for France and more irregular for Italy whose production of beef dropped significantly between 2010 and 2014 during the economic crises. However, in most recent years Italian beef production recovered part of its lost production. Among the reasons explaining the decline in both countries, we can mention, a general reduction of beef consumption, the lack of attractivity by younger generations for a profession which is often perceived as low profit if compared to the amount of work that it requires, and the extensification of production systems to ensure greater forage autonomy, but with a lower level of production. In both countries, beef production is concentrated in specific geographic regions. In France, the production of bovine meat is mostly located in the West, North and North-East part of the country. In these regions, intensive beef production often cohabitates with dairy production. In the central part of France, we can find a higher number of suckler cows, while veal production often driven by slaughterhouses or other integrators is mostly localised in the West and the south-West regions. In Italy, most of the cattle are raised in the Northern part of the country where farms are more productive and where the costs of production are lower than in the Southern regions because of a better logistic position closer to processing factories and to the main axes connecting Italy to the northern European countries.

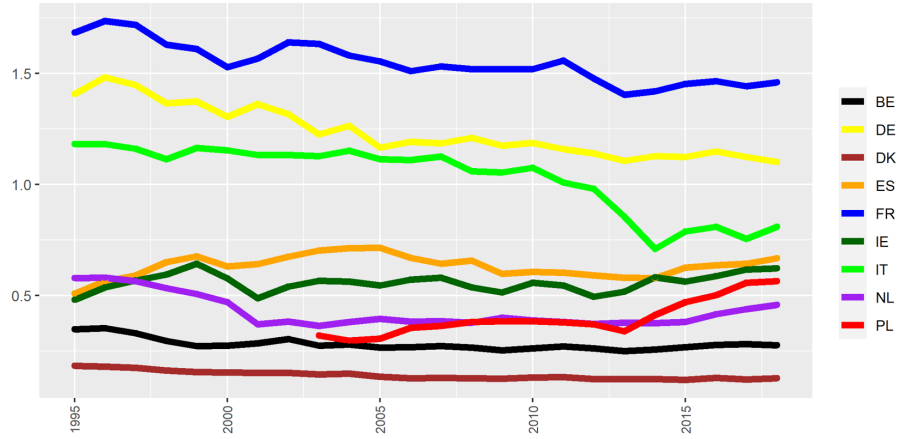


Figure 1: Beef slaughtering in the main EU countries (million tons of cwe). Source: Eurostat

Both Italy and France find themselves in a position of negative trade balance with respect to beef. In France, the trade deficit is relatively low and explained by the preferences of the French consumer for a relatively high amount of veal in bovine meat consumption (often coming from Dutch imports), a higher quality product in terms of image (Irish imports) or regularity of supply (German imports). Imported bovine meat is often valorised in out of home restaurants and in butchers far from livestock areas. In Italy, the situation is different since imported beef meat represents a considerable share of beef consumption. In the most recent years Italy increased the share of imported boneless meat as a consequence of the higher share of discounts and out of home restaurants which usually prefer purchasing pieces of meat easier to cut. The French and Italian beef sectors are very well market integrated. France is the main Italian partner when considering bovine meat imports followed by the Netherlands, Poland, Ireland, and Spain. Most of the imported meat comes from young bulls as it is less appealing for the French consumer, who are more used to eating the more "flavourful" meat from older animals. Italy and France are also very well connected in terms of live animal imports. The French exports of live animals mostly sent in the Northern Italian regions for fattening are a sort of French specificity in Europe. If converted in meat volumes, these exports of live animals represent an amount which is almost the same as the dead carcasses exported. In terms of exports of meat, if France was during the '80s and '90s one of the main beef exporters in the EU, today is less the case, since volumes have significantly dropped (Figure 2). This situation is explained by the already mentioned decline of production and the competition from Poland and more recently Spain. On the other side, Italy has never been a major exporter of beef in Europe and has maintained the level of its exports relatively unchanged during the last 30 years.

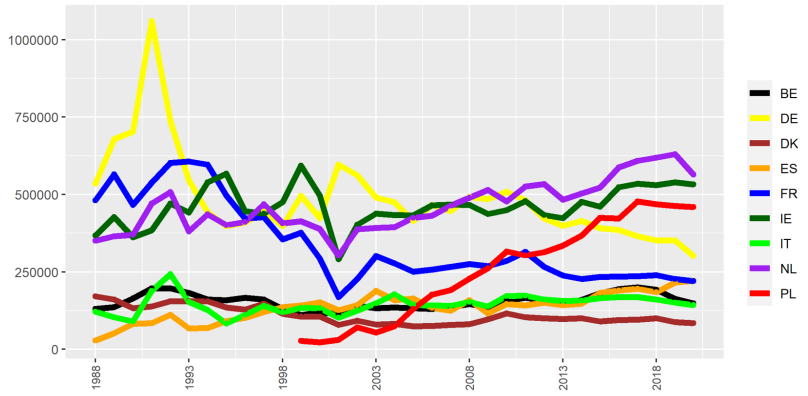


Figure 2: Beef exports of the main EU countries (tons of cwe). Source: Eurostat

During the last two decades, the quantities of beef and veal meat consumed in France and Italy declined. This decline was rather slow for France which also started from a higher level of consumption and more rapid for Italy. Bovine meat suffers the competition from the other meat sectors (especially poultry), the aging of population, the change of consumption habits related to new generations and concerns regarding the environment and human health related to the overconsumption of bovine meat. At the same time, we see an increasing share of bovine meat consumed in the form of burgers and other processed beef products as a sign of a change in consumption habits. A larger share of bovine meat is also consumed in out of home restaurants often purchasing lower value imported beef.

2. ACTORS IN THE VALUE CHAIN

In both countries, the number of farmers having beef cattle is higher than 100,000 with 104,000 farms in Italy and over 157,000 in France. However, only a third of them have more than 20 suckler cows. In Italy, farmers can be open-cycled (fatteners) or close-cycled (breeder-fatteners), the difference lies in the breeding duration. The French sector has more types of farms, mainly because of veal sector: breeders, breeder-fatteners, fatteners, veal producers (for beef breeds) and veal fatteners (dairy breeds). In France, the beef cattle value chain is characterized by a diverse range of farm systems, while in Italy, the farms are mostly divided between open and closed-cycle farms, which are both based on grazing systems for the majority. In Italy, the beef sector and dairy sector share the same geographic areas, while in France this is less the case. In Italy, both sectors are concentrated in northern regions, while in France dairy farms are dominant in western and eastern regions, while suckler farms are present in the central area of the country.

Both countries have producer organisations and breeders' cooperatives to gather the cattle supply and to sell it to slaughterhouses. The Italian Ministry of Agriculture recognizes only 14 professional organisations, which is considerably less the 46 French professional organisations. In addition, France counts 55 cooperatives and around 1,200 private collectors. In France, private collectors trade more than the half of cattle sold and they can be independent, members of producer organisations or integrated by industrial groups.

In terms of slaughtering and processing, both France and Italy have a significant number of processing enterprises and meat producers, but with some differences. France has 183 cattle slaughterhouses of varying sizes mostly concentrated in the West and Central part of the country, with the top five groups treating around 70-75% of the cattle slaughtered. In contrast, Italy has more processing enterprises and meat producers, but with a clear concentration in the northern regions of the country. In France, the Bigard-Socopa-Charal group is the leader, with nearly 40% of the French cattle slaughtered in France being treated in their 29 slaughterhouses. Elivia, SVA-Jean Rozé, Sicarev, and Kermené are other significant players, with different outlets for their products. In Italy, Cremonini dominates the market, by processing and distributing more than 50% of the meat produced in the country leading to high contract power and includes very famous brands appreciated by consumers.

In France, the distribution sector is dominated by a small number of large supermarket chains, with independent butchers and restaurants also playing a significant role. The five largest supermarket chains in France have a combined market share of nearly 80%, with Leclerc, Carrefour, Les Mousquetaires, Système U, and Auchan being the main players. This level of concentration has given these supermarkets significant bargaining power over meat producers and processors, allowing them to negotiate lower prices and more favourable terms of trade. However, independent butchers and restaurants also have a presence in the market, offering consumers a more diverse range of options and promoting competition in the sector. In contrast, the Italian distribution sector is characterized by a more diverse range of players, with a network of supermarkets of various types and various commercial brands dominating the market. The main players in Italy during the decade 2011-2021 were Coop, Conad, Selex, Auchan, Esselunga, Eurospin, and Végé, each with a significant market share. The main differences in distribution between Italy and France is the number of players in this sector and the degree of concentration in the market.

3. THE GOVERNANCE OF THE VALUE CHAIN

In France, the primary sector does not play a crucial role in the beef value chain, and there is a lower level of organization among farmers than in Italy. Producers' organizations have a weak bargaining power over industrial and distribution sectors, even if the aggregation into professional organizations gives farmers more negotiation power than independent farmers. In Italy, the farming sector seems to weigh heavier in the beef value chain, particularly by the existence of producer groups concentrating more farmers than in France. However, for both countries, farmers who are not inside professional organizations have very low market power and are at the mercy of dominant actors such as large industrial groups or large distribution groups. In addition, the geographical concentration of farms and processing industries in some cases can represent a significant disadvantage, making it challenging for farmers to exit the local market or the local sales channels when they do not guarantee the best price.

In France, the processing sector has a relative high level of market power due to the concentration of processing companies. The two main players, Bigard and Socopa, control a massive portion of the market and work on quantity by decreasing the production costs through the concentration of the offer in a single large company. Moreover, Bigard with its brand Charal is the only group which can negotiate on a level playing field with the main distributors. In Italy the dominant player in the industrial sector is the Cremonini Group with important commercial brands, such as Inalca and Montana, very well known to consumers.

In the two countries, the distribution sector has a considerable market power, especially with national major players. In France, the distribution sector has three main players, Carrefour, Auchan, and Leclerc, which account for more than 70% of the market. These players are highly influential in constructing the final price, and they often use their market power to negotiate lower prices with suppliers. In Italy, five brands of large-scale distribution represent more than 50% of the national volume of sales of agri-food products. In this five, we can find as in France: Carrefour and Auchan, but also Coop, Esselunga, and Conad. As mentioned earlier, in France, a small number of large supermarket chains dominate the market, while in Italy there is a more diverse range of players. While the concentration of the market in France has given these retailers significant bargaining power over the meat value chain, the fragmentation of the market in Italy has created a more competitive environment. In addition to retail corporate groups, both countries have independent butchers and restaurants that provide consumers with a diverse range of options.

In both countries, the dynamics of beef value chain are heavily influenced by the dairy sector. In periods of dairy cattle decapitalisation, the meat from the dairy sector can disrupt the price of beef meat from suckler cattle and decrease it.

Contracts are a useful tool to coordinate the activities of different actors in the beef value chain. However, in France, contracts between farmers and processors are not very developed. These contracts typically specify the quantity, quality, and delivery terms for the beef products, and may also include provisions for price adjustments based on market conditions, but also include clauses that require farmers to comply with certain animal welfare, environmental, and food safety standards. In Italy, contracts are also very marginal and linked to local companies with national branches.

In France, price transmission is generally considered to be weaker than in Italy, with farmers often receiving a low share of the final retail price of beef. This is partly due to the dominance of French large processors

and retailers, who have significant bargaining power and can set low prices for beef products. As a result, many farmers in France struggle to make a living from beef production, and some have called for greater regulation of the industry to ensure fairer prices. In contrast, Italian farmers seems to be more able to earn a decent income from beef production.
In terms of production and marketing/sales, both France and Italy have seen an increase in labelled and organic beef production in recent years. In France, there has been a 33% increase in the production of beef labelled under the Label Rouge, PGI, or PDO since 2011, with 28,000 tons produced in 2021. Similarly, the volumes of organic beef in France more than doubled in the past decade, with 33,000 tons produced in 2021. Both countries have also implemented marketing and sales strategies to promote their differentiated beef products, even if they are still not representing a large part of the sales in the market. In France, Interbev developed a "sector plan" to promote the Label Rouge, with communication actions and incentives for butchers and supermarkets. In Italy, the Consortium for the Protection of Piemontese Cattle, which oversees the production of Piemontese beef, has implemented marketing campaigns to promote the quality and authenticity of the product.

The Dutch, French, and Italian dairy value chains: a comparative analysis

Michele Schiavo, Louise Picard, Pierre-Marie Aubert (IDDRI)

1. DESCRIPTION OF THE VALUE CHAIN

The Netherlands, France and Italy place themselves among the five largest dairy producers in the EU (Figure 3). However, while the Netherlands and Italy collect a similar volume of milk, France is (with Germany) a much larger dairy producer with a milk production almost doubling those of the other two countries. All three countries experienced a slight increase in production following the abolition of milk quotas in 2015. The liberalisation of the dairy trade market reinforced the already existing trend of concentration and intensification of milk production. During the last decades, dairy farmers intensified their production with a higher amount of feed concentrates given to dairy cows while reducing the time spent outdoor grazing by the animals. This change in production may limit the positive environmental effects of the dairy cattle such as the maintain of grasslands, carbon sequestration and biodiversity preservation in agroecosystems. The specialisation in the dairy sector produced two other effects which affected all the three countries. First, the increase in milk productivity by cow led to a reduction in the total number of farms and of cows raised. Second, some regions inside the country started to gather a higher amount of dairy production leading to a strong geographical concentration. For this reason, we have regions such as the Friesland province in the Netherlands, Lombardy, and Emilia Romagna in Italy or the "dairy crescent" in France which currently gather most of the national dairy production. In all three countries, but especially in the Netherlands and Italy, where more than the half of the milk collected is transformed into cheese which allows higher earnings for dairies.

In particular, Italy developed a highly profitable cheese value chain where around half of the milk collected from dairies is used to produce PDO cheese. In the most recent years, the production of organic milk substantially increased, notably in France and the Netherlands where it reached a volume representing around 3-5% of the standard milk collected.

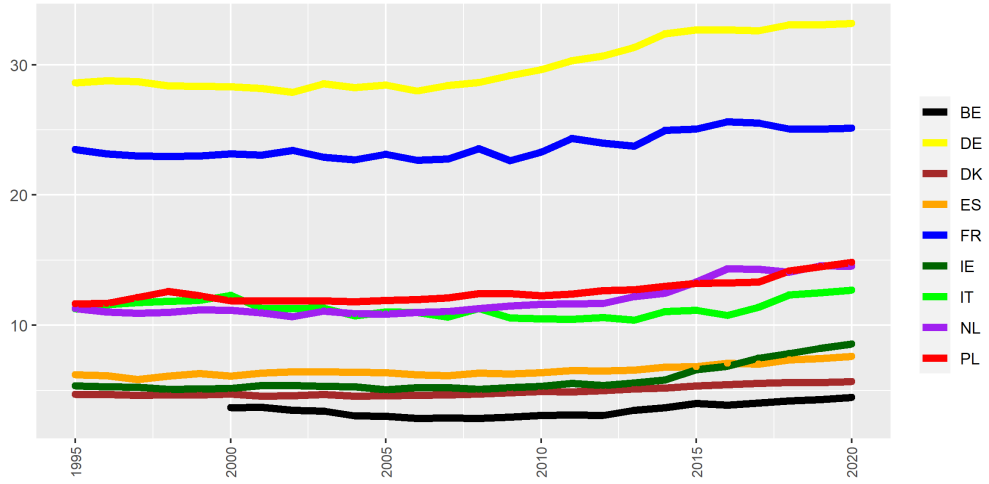


Figure 3: Cow milk production in the main EU countries (millions of tons). Source: FAOSTAT data

The Netherlands, France and Italy are three big exporters in the dairy market (Figure 4). Despite a considerable difference in their level of dairy production, the Netherlands and France share a similar value of exported dairy products showing how export oriented the Dutch dairy sector is, especially for cheese and butter. The strong specialisation in the export of cheese is something similar in all the three countries, with France and Italy also relying on a high share of PDO products. In terms of trading partners, Germany is the main destination for the Dutch and Italian dairy products and absorbs a very large share of total national exports. In contrast, France has a more diversified portfolio of trading partners with China increasing very fast the level of its French imports in the most recent years. France and Italy are very well interconnected in the market of dairy products. Italy is historically one of the main destinations for French products and helped France in absorbing its large surplus of dairy proteins through regular imports of skimmed milk powder. However, this is less true today with Italian imports of French dairy products which are slightly decreasing over time. In contrast, in the last years, Italy has been able to enter massively in the French dairy market pushed by the increased French consumption of Italian PDO cheeses. When we look at imports, while the Netherlands and France experienced an increase in imports of dairy products during the last years, Italy's imports declined primarily because of a reduction in local demand. This situation led the country to almost reach a level of complete self-sufficiency in the market of dairy products despite an historical negative trade balance. Increasing imports of cheese and butter are a similar element common to France and the Netherlands. In particular, butter is the only product for which France has a negative trade balance. Indeed, the country imports butter from the Netherlands and Belgium and, in the export market, suffers from the competition coming from New-Zealand's milk which is richer in fat.

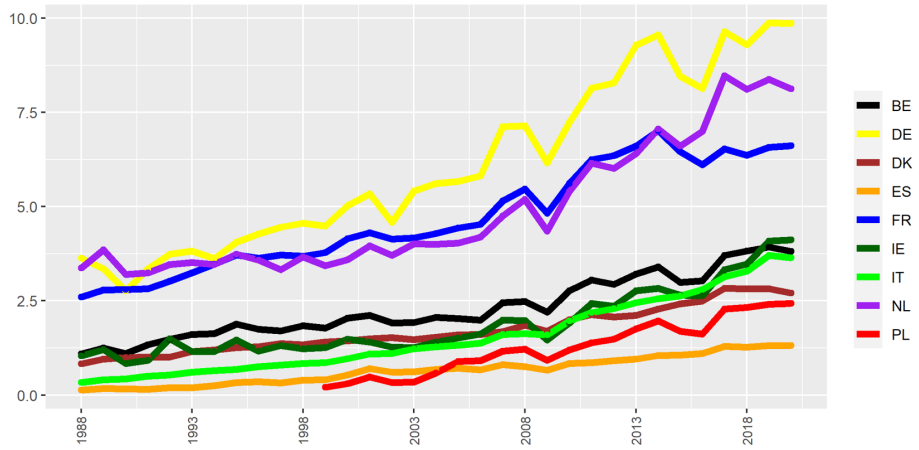


Figure 4: Exports of dairy products in the main EU countries (billions of €). Source: Comext

The form in which the dairy products are consumed varies in the three countries. In the Netherlands, milk accounts for most of the national consumption of dairy products. In Italy, the dominant product consumed is cheese, while in France cheese and butter are the main products consumed when considering dry matter. According to national data provided in the contributions below, a trend of reduction in the consumption of dairy products (liquid milk in particular) in France and Italy could be observed. Cheese makes an exception, and its consumption remains almost stable in Italy and increases in France (with also cream consumption).

2. ACTORS IN THE VALUE CHAIN

While the Netherlands has a lower number of dairy farms than France and Italy, Dutch farmers have a higher average number of animals per farm, around 100 cows per farm, and a higher milk yield with around 9,000 litres per cow per year. France comes in the second place with 72 cows per farm and 7,000 litres per cow, and Italy third with around 50 cows per farm and 5,500 litres per cow. There are, however, regional differences, e.g. the level of animal concentration in the northern regions of Italy is much more important with an average number of 140 cows per farm, and a milk yield reaching peaks of 10,000 litres per cow per year. In the last decades, the number of farms in each country has been decreasing, while the average number of animals per farms increased. In France, production is mostly concentrated in the West, but other areas of dairy production exist in other regions (East and “Massif Central”). The Dutch model is based on grazing systems, with almost 85% farms of this type. Grazing systems are also represented in France and in Italy where it is related to PDO production.

In all three countries, cooperatives often have a role in processing milk. In France, cooperatives collect 55% of the milk and are responsible for 45% of volumes processed. Similarly, in the Netherlands there are 26 milk processing companies and 52 dairy plants. However, the Dutch sector differs from Italian and French ones by having one cooperative (FrieslandCampina) which dominates the sector having around 70% of Dutch dairy farmers as members. In France and in Italy, there are more numerous cooperatives even if the bigger may concentrate a consequent number of farmers. In these two countries, the biggest processor companies have

developed their own brands for distribution. Lactalis, a major international group in dairy products operates in both countries where it has important market shares. Regarding the sales in supermarkets, while in Dutch sector the four largest distribution groups control more than 70% of food retail market, in France the three biggest groups represent around 55% of supermarket shares. In Italy, cooperatives and dairy processing companies are concentrated in the North of the country and these actors are mainly represented by three big companies: Lactalis, Newlat, Granarolo. In a similar way, in France and in the Netherlands, the distribution of dairy products is concentrated in big groups such as FrieslandCampina in the Netherlands or Lactalis and Sodiaal in France. However, for high-value products such as PDO or organic, there is a real difference between these two countries. While in the Netherlands, alternative processors usually produce for the dominant value chain and are represented by large firms, in France alternative processors are often small or medium size companies.

3. THE GOVERNANCE OF THE VALUE CHAIN

All the three countries have a strong dairy sector, with a significant number of farmers and with cooperatives playing a central role. In Italy, there are numerous small-scale dairy farmers who operate independently, making it challenging for them to have a significant bargaining power in the dairy value chains, while other farms, particularly in northern regions, have created organisations of producers or cooperatives, which allow them to have a stronger bargaining power. This kind of group of producers is generalised in the Netherlands and France. On the one hand, in the Netherlands, dairy farmers have come together to form cooperatives, which has given them a strong bargaining position in the dairy value chains. On the other hand, French dairy farmers also developed some cooperative organisations, but they are not as widespread as in the Dutch value chain.

Dairy industries are powerful in all three countries, with large companies dominating the sector. For example, in France, Lactalis is the largest dairy company, with a market share of around 24%. These companies have significant bargaining power in the dairy value chains and can influence prices and production levels. Additionally, they have a strong presence in international markets, giving them even more power and influence.

In all three countries, the power of distribution is concentrated in the hands of a few large retailers and wholesalers. In Italy, the major players are Coop and Conad, while in the Netherlands, Albert Heijn is the largest retailer. In France, Carrefour and Intermarché dominate the market. However, while these companies have significant bargaining power and can dictate prices and product offerings to their suppliers in Italy and France, their power is more limited in the Netherlands. In fact, since most of Dutch dairy production is exported, this decreases the power of national retailers which only buy a limited share of national production.

In the Netherlands, the dairy sector has a highly organized supply chain, with most of farmers joining cooperatives that negotiate with processors and retailers. The use of long-term contracts contributes to the stability of prices for dairy products. On the other hand, in France and Italy, the dairy sector is characterised by a complexity of the supply chain and the involvement of multiple intermediaries. That makes it difficult to ensure an efficient transmission of prices from the retail level to the farm level. The three countries have

different models for contracts in the dairy value chain. In the Netherlands, the use of long-term contracts is common. In France producers and processors also employ also long-term contracts, but contracts between processors and distribution chains can be short or at medium term. In Italy, the use of contracts seems to be less common. To fight against price instability the French and Italian government have implemented several policies (the Egalim law in France for example) in order to promote contracts or to define a minimal price.
France has a mature dairy market, and the segmentation of products has been key to contain the decrease in consumption and meeting consumer expectations. The length of the lines dedicated to ultra-fresh in supermarkets is among the biggest in the world, and dairy processors invest heavily in advertising and product innovation. The country has also promoted organic production and the development of PDO products with enhanced specifications. The Netherlands, on the other hand, is known for its highly efficient dairy industry, with a strong focus on export markets. The country has a high proportion of large-scale dairy farms, with a focus on high-yielding Holstein-Friesian cows. The industry is heavily mechanized, and there is a strong emphasis on technology and innovation. The Dutch dairy industry is also known for its sustainability initiatives, including efforts to reduce greenhouse gas emissions and improve animal welfare. Finally, Italy has a diverse dairy industry, with a wide range of traditional cheeses and dairy products that are regionally specific. The country has many small and medium-sized dairy farms, which often use traditional production methods and focus on quality over quantity. The production of PDO products is a significant part of the Italian dairy industry, with over 40% of total cheese production coming from this label.

The Danish, French, and Spanish pig value chains: a comparative analysis

Michele Schiavo, Louise Picard, Pierre-Marie Aubert (IDDRI)

1. DESCRIPTION OF THE VALUE CHAIN

Denmark, France, and Spain place themselves among the five largest pig producers in the EU (Figure 5). However, while Denmark and France produce a similar volume of pigs, Spain is a much larger pig producer with a production level more than double that of France and Denmark. In the last two decades, the trend regarding the evolution of pig production has been different in three countries. While in Denmark and in France the production stagnated, mainly because of environmental restrictions, limited international competitiveness and social acceptability, Spanish pig production considerably expanded pushed by genetics, better breeding practices and investments in the livestock buildings. Increases in sow prolificacy and in slaughter weight were also involved in Denmark and France and allowed these countries to maintain a constant level of pig meat produced despite a reduction of the number of animals slaughtered and a decrease of the number of sows. If these three countries show different evolutions of their production volumes and number of pigs, they have all increased the number of pigs per farm, which are today larger and more specialised than, in the past. In all three countries, almost all production systems are conventional and

organic production remains a niche market having a very limited share of production sold. In this topic, Spain represents an interesting case study, since in this country there is a specific differentiated value chain, the Iberian pork, whose share in production has remained relatively stable during the last few years. In terms of farms' characteristics, more than half of French pig farms are breeder-fatteners, while in the other two countries the separation of breeders and fatteners is the common standard. The concentration of pig farms is a common characteristic of the three countries raising environmental and social concerns regarding the pollution of water and soils. In Denmark, most pig production takes place in Jutland, in France in Brittany and in Spain in Catalunya and Aragon regions. France and Spain are different regarding the respective share of pig meat which is sold as fresh or frozen and processed. In France around 75% of pig meat produced is transformed into sausages, cured, or cooked hams and other processed meat products. In Spain, the situation is different. Only a half of the pig meat is processed (in particular in the form of sausages and similars), since the share of processed pig meat products consumed domestically is lower and a very large share of production is produced for exports and sold as fresh or frozen meat.

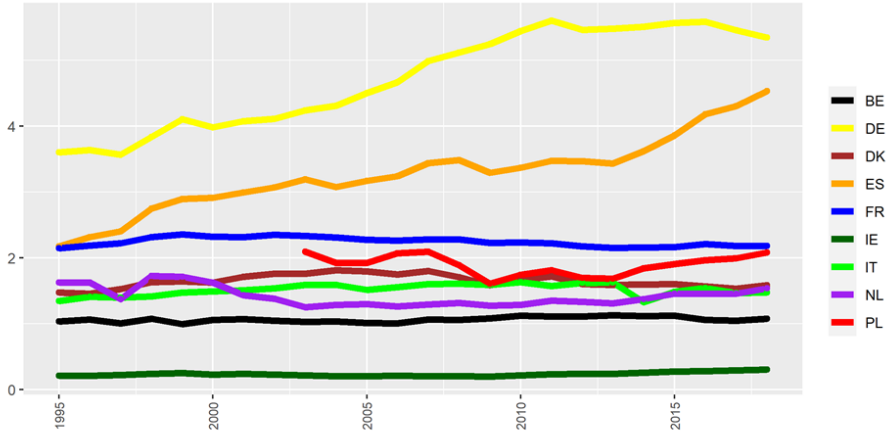


Figure 5: Pork slaughtering in the main EU countries (million tons in carcass equivalent). Source: Eurostat

Spanish and Danish pig production is export-oriented, allowing these two countries to be respectively the first and third pig meat exporter in the EU (Figure 6). In Spain, export is the destination of around a half of Spanish pig meat and has been the main reason behind the great growth of Spanish pig production that occurred during the last decade. In Denmark, due to the small size of internal demand, almost all domestic pig production is exported. In the last few years, Denmark, experienced a different trend regarding the evolution of its exports when compared with France and Spain. Denmark reduced the volumes of its exported pig meat (being replaced by an increasing exports of live pigs), while the other two countries increased their sales in the international markets. As previously mentioned, the increase of Spain was spectacular and pushed by an increase of exports in extra-EU countries. In particular, China massively increased the volume of its imports as a consequence of the increased spending power of its fast-growing middle class and, after 2018, also as a rection to the outbreak of African Swine Fever in the country. Excluding China which became the main trade partner for France and the second for Spain, the main trade partners for France and Spain are mainly European. They are Italy, Spain and Belgium for France and France, Italy, and Portugal for Spain.

Denmark has different export destinations including more North European countries: mostly Germany, but also the Netherlands and Poland. In all the three countries most of the pig meat is exported in the form of fresh or frozen meat, the share of processed products being rather small. When considering imports, the volumes of foreign pig meat coming into the country in Denmark and Spain is very limited. In France, this is less the case since imports increased in the last two decades at a similar pace as exports, and currently represent around 25% of total pig meat consumed in the country. In particular, the share of processed pig meat products, increased at a very fast pace during the most recent years. Spain is the main origin of French pig meat imports and accounts for around a half of total imports. Other import partners are Germany, Belgium, and Italy.

When considering the trade of live pigs, in the last two decades the three countries experienced different evolutions. Despite starting at a very low level, Denmark highly increased its exports, reaching today a volume of live pigs exported which represents around a half of its total pig herd in number of heads. France also knew an increase of live pigs exported during the 2000s, then a slow decrease and a rebound since 2018, while its imports were slightly reduced. Spain, the only of the three countries having a negative trade balance, increased the volumes of its imported live pigs starting from 2012 to keep the pace of its great production growth.

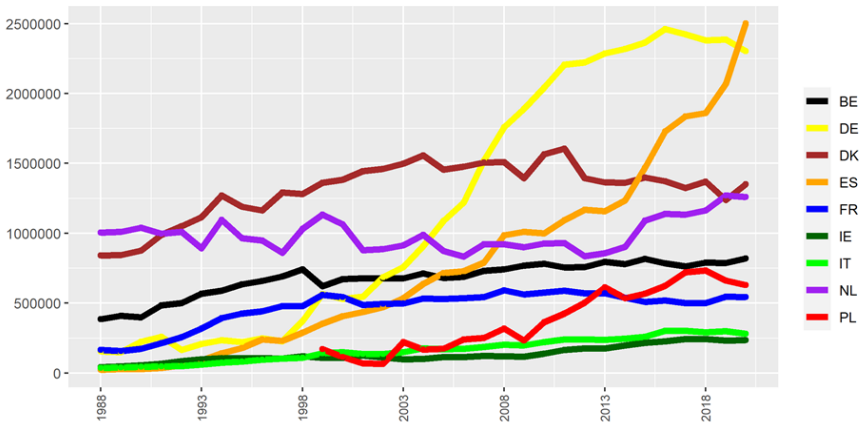


Figure 6: Pig meat exports of the main EU countries (tons in carcass equivalent) Source: Eurostat

The consumption per capita of pig meat products is relatively high in Denmark and Spain with 50-60 kg of meat consumed per person per year and lower in France where it is around 25-30 kg. While Denmark and France experienced a drop of the individual consumption in the last few years, Spanish consumers increased the purchased quantities of pig meat products. Denmark and France also have a different distribution of pig meat products consumed with respect to Spain. In the first case, the share of processed meat products purchased is clearly higher than the fresh and frozen meat; in the second the two categories have a similar value of individual consumption. For French and Spanish consumers, the food chain (mainly hypermarkets, supermarkets, and discounts) is the main location where to buy pig meat. For these two countries, out-of-home consumption represents around 14-15% of total individual consumption.

2. ACTORS IN THE VALUE CHAIN

In Denmark the number of farms is lower than in France (around 2 500 farms in Denmark against more than 8 000 for French sector) and have a higher animal concentration with around 5 000 pigs per farm. Both countries can be taken as example for farm concentration since the number of pig farms decreased in the last decades, while the average number of pigs grew. When we look at the total number of pigs produced, the Danish herd remained quite constant over the years, while the French herd decreased from around 15.5 million heads to 13.2 between 2001 and 2020. Both productions are concentrated in the West areas of their country. Danish farm model is more open cycled than in France. In Denmark, farms currently produce slaughtered pigs or piglets; on the other hand, in France, a considerable number of farmers are breeder-fatteners. In contrast, Spain is the first European pig producer with a herd of 32 million of pigs and over 88 000 farms. The Spanish pig sector continues to grow with intensive livestock in farms. As for France and Denmark, Spain faces the dynamic of farm concentration.
In these three countries, the geographical concentration also corresponds to an "economic" concentration. In France, the pig production is concentrated in 33 producer organisations with the 10 biggest representing around 78% of the total of pigs marketed in France. In France and in Denmark, some of the producer organisations have their own slaughterhouses. In both countries, the biggest national slaughtering company is detained by a cooperative, the Danish Crown in Denmark and Cooperl in France. Despite concentrating a very large share of French pig slaughtering, Cooperl processes a lot less pigs than the Danish Crown, with only around 5 million of pigs slaughtered against over 13 million for the Danish giant. For Spain, it seems that cooperatives and producers' organisations are part of integrated companies as Valls Campanys Group or Jorge Group. France has 165 slaughterhouses, while Denmark has 38 slaughterhouses with only 7 with a capacity of slaughtering superior as 10 000 pigs slaughtered per year. However, France is far from Spain with its 300 slaughterhouses and more than 58 million of pigs slaughtered. Differently from the slaughtering facilities, the second processing is less concentrated in France because of historical tradition of processing pork products of various French regions such as Auvergne-Rhône-Alpes. While in Spain, the processing companies are concentrated according to the pig production of the regions: North-East with white pigs and Southwest with Iberian pigs.

3. THE GOVERNANCE OF THE VALUE CHAIN

As we saw before, in France, producer organisations are key players in the pig value chain. They have an important bargaining power especially when they integrate all the nodes of the value chain. The bargaining power of farmers is clearly linked to the belonging to a producer organisation. Independent farmers either they are big enough to negotiate with a slaughterhouse or they choose a strategy based on selling their products in local markets. In Spain, pig production is vertically integrated into large groups of processing companies. This system can reduce the bargaining power of farmers, while it increases negotiation power of these companies.

In Denmark, to counter the market power of the main producer organisation, Danish Crown, some retailers have started to negotiate directly with farmers contributing to increase the market power of independent farmers. A key characteristic of Danish pork sector is the different selling price for small and large slaughterhouses. Small-scale slaughterhouses can target local markets and have higher prices than large slaughterhouses. In contrast, big slaughterhouses are linked to international companies such as the Danish Crown, which export most of their production and are their selling price is based on global prices. In Denmark, the price is adjusted on a weekly basis depending on global demand and national supply, because of the high ratio of exported pigs. To give the highest return for its shareholders, the Danish Crown applies a high level of control over its members to stabilize its total supply. That is why, if a farmer wants to leave this cooperative, he has to give a one-year notice.

Similarly, in France, farmers usually have a contract with a cooperative or a producer organisation. Then, producer organisations sell pigs according to the price determined twice a week on the "Breton Pig Market" plus added technical value. Using this bid system as reference for most of transactions, producer organisations and cooperatives rarely have a contract with slaughterhouses. Slaughterhouses and processing companies negotiate every week together, and every year with distributors to fix a price for pork meat. In France, the actors who have the strongest bargaining power are distributors. They use their market power to offer relatively stable prices to consumers while processors take the market risk related to the variability of pig price.

In Spain, farmers have contracts with large integrated companies and are submitted to specific requirements dictated from the integrator. This leads to a lower control over pricing and market strategies for individual farmers, but also to a better stability and security of their income. However, some agricultural organizations as JARC (Joves Agricultor I Ramaders de Catalunya) try to improve these contracts to achieve a better repartition of the tasks and issues of production.

When we look at alternative value chains, in recent years Danish consumers started to change their consumption habits by buying more high-quality meat, as labelled or organic. As a result, the number of Danish organic farms has increased to supply the increasing demand of the consumers with a higher volume of sales. In contrast, in France, organic or label productions are not significantly growing, but some differentiation in standard production appeared and need to be mentioned, for example the pork meat "without antibiotics" or the pork meat "without GMOs". As for Denmark, the Spanish value chain faces demand from consumers of more sustainable and local production, that leads to an increase of alternative value chains in Spain.

The beef value chain

The French beef value chain

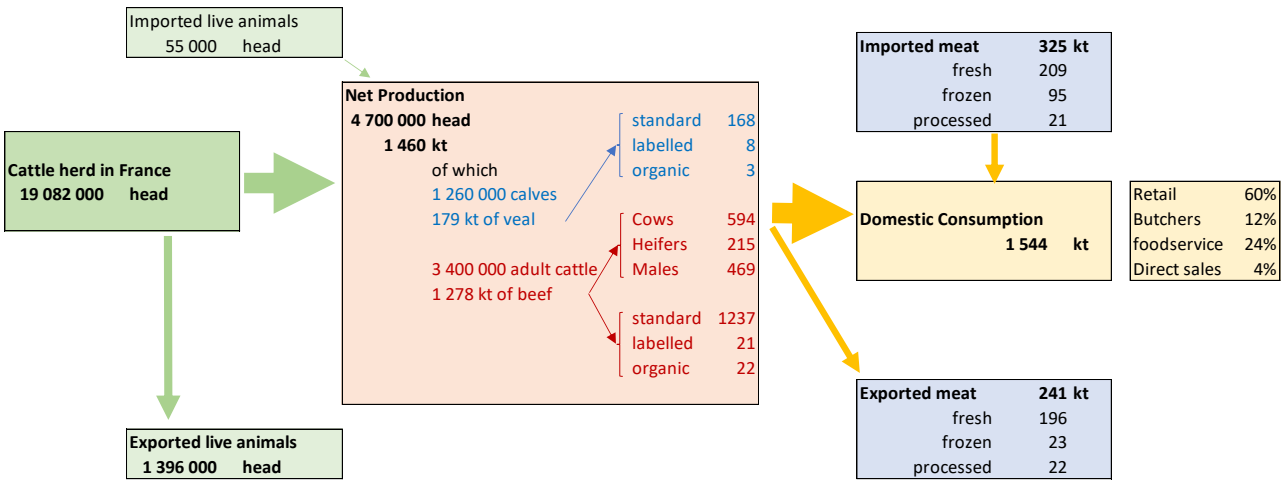
Caroline Monniot, Corentin Puvilland, Marion Cassagnou *(IDELE-ACTA)*

Key findings :

- France has the biggest cattle herd in the EU-27, with 23% of the total European cattle, 37% of EU suckler cows and 17% of EU dairy cows. But the number cows and cattle is declinig, due to the drop in farmers number.
- Despite exporting around 1.4 million live cattle per year (maily to Italy and Spain), France is not self-sufficient for beef and veal. France exports around 240 kt cwe of bovine meat (85% of which is from young bull), and imports around 325 kt cwe (which is composed mainly of cull cow meat and a small amount of veal).
- Farms are relatively small, as they are mainly family farms, so the sector is highly fragmented. The meat industry is more concentrated : the first 5 groups in the beef sector treat approximately 70/75% of cattle slaughtered in France ; the leader Bigard slaughters 37-40% of cattle. Retailers are highly concentrated. The three main retailers represent 58% of the food supermarket share.
- The bargaining power of beef farmers is very weak. Their only market power is the possibility they have of keeping the animals on the farm for a certain time. But this makes the market quite opaque.
- Contractualization has been compulsory since January 2022 [meat type] and 2023 [milk and crossbred type] but it is not effective.
- Organic production is increasing, but accounts only for 2,7% of the beef production in 2021.
- The consumption of burgers and other processed beef is increasing quickly. This is an issue for the supply chain as minced beef does not value the carcass as well as beef cuts. The isue is even more serious for organic products, as their are mainly consumed as minced beef (80% of volumes).

1. DESCRIPTION OF THE PHYSICAL FLOWS IN THE VALUE CHAIN

a. Structure of production



Baseline year 2015-2018 average
kt = 1000 tons carcass weight equivalent

Figure 7 Map of the physical flows in the beef value chain in France. Sources: Agreste and Eurostat

France has the biggest **cattle herd** in the EU-27, with 23% of the total European cattle, 37% of EU suckler cows and 17% of EU dairy cows. However, the French cattle herd in France is decreasing in the long run and the decrease is accelerating in recent years (Figure 8). From 19.082 million head in the baseline year 2015-2018, it fell to 17.3 million head in 2021. The number of dairy cows fell from 3.606 million in the baseline year to 3.322 million in 2021. The number of beef cows fell from 4.184 to 3.882 million. There are many reasons for the decline: e.g. less and less farmers due to their age structure, lack of attractivity, low profitability; stagnant labour productivity; extensification of production systems to ensure greater forage autonomy.

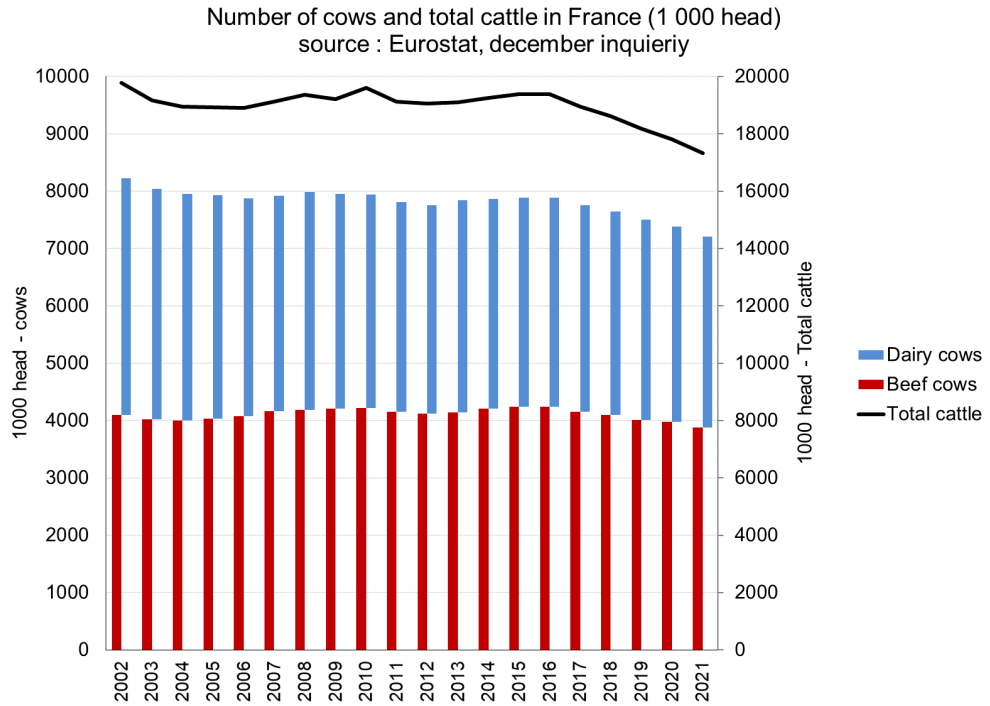


Figure 8: Number of cows and total cattle in France (1,000 head). Sources: Eurostat, december inquiery

France exports each year more than 1 million live animals, mostly store cattle from the beef herd to be fattened in surrounding countries (Italy and Spain, and marginally Belgium and the Netherland). Some of them also go further, in Algeria. A few young bulls ready to be slaughtered are exported (38,000 heads) to Italy, Lebanon and Libya, but exports to these 2 last destinations are decreasing. France exports more and more dairy calves, around 200,000 calves in 2015-2018, and nearly 350,000 calves in 2021. More than 90% is going to Spain and the other ones to Italy. This increase is the result of the decline of veal and dairy young bull productions in France. It led to a big price gap between French dairy calves and Spanish ones which stimulates export flows.

In the baseline year, around **4.66 million head of cattle are slaughtered**, of which 1.26 million calves and 3.40 adult cattle, giving 1,460 kt of meat, of which 179 kt of veal and 1,278 kt of beef.

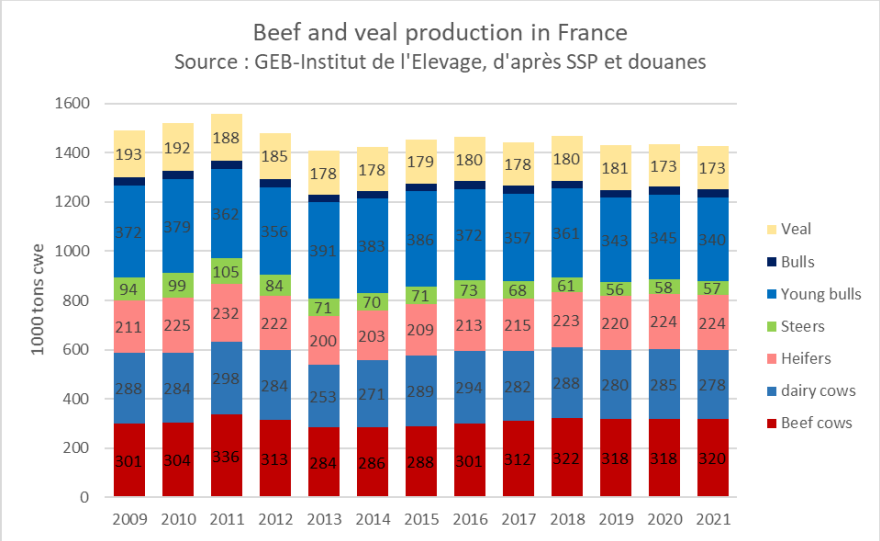


Figure 9: Beef and veal production in France. Source: GEB-Institut de l'Elevage, based on SSP and customs agency data

Veal production is decreasing slowly (Figure 9). The decline in the number of calves slaughtered (-1.7% /year on average during the last 10 years) is partially offset by the increase in carcass weight (+0.8%/year on average). Veal production is integrated by a small number of companies. These operators, who dominate the sector, adjust the volumes produced to the demand which is shrinking from year to year.

Beef production is made up of all the other categories of bovine (Figure 9). During the last five years, female slaughtering rose despite the decline in herd, resulting in an acceleration of decapitalization. This partially offset the decline in male production. In addition, cattle tend to get heavier, except dairy cows.

Most of the beef cows are in the Massif Central and its foothills, but also in Pays-de-la-Loire region and in the foothills of the Pyrenees (Figure 10). Dairy cows are located mainly in the West and the north of the country, but also in mountain areas (Vosges, Jura, Alps and Massif Central) (Figure 11).

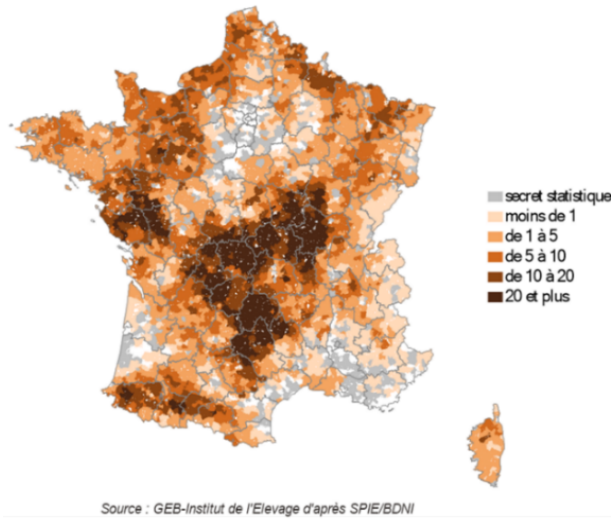


Figure 10: Location of beef cows in 2021. Sources: GEB-Institut de l'Elevage, based on SSP/BDNI data

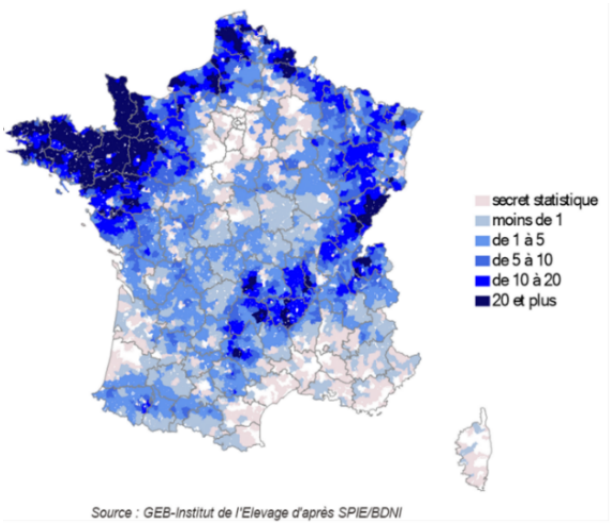


Figure 11: Location of dairy cows in 2021. Sources: GEB-Institut de l'Elevage, based on SSP/BDNI data

Young bull production is located in the West, the North and the North-East, and also in the Limousin region, where males are kept to be fattened when farm conditions allow (more intensive production with enough fodder and feed). Steers are mostly bred in Normandy, North and North-East, on grass. Heifers are produced in all the regions where the beef herd is substantial, as heifers are usually fattened on their birth farm. Veal production is predominant in the West and the Southwest, where there is a dynamic led by slaughterhouses or integrators. In the Southwest, the production of “veau sous la mère” is predominant especially in 3 Departments (Corrèze, Dordogne, Pyrenees-Atlantiques) (Figure 12).

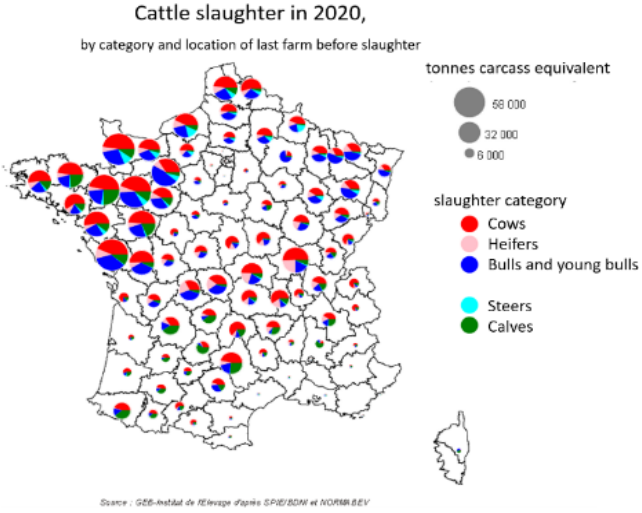


Figure 12: Cattle slaughter in 2020 (tons of cwe) by categories. Sources: GEB-Institut de l'Elevage, based on SSP/BDNI data

Abattoirs are quite well located, near breeding areas (Figure 13). However, business logic sometimes implies that animals are not always slaughtered in the nearest slaughterhouse.

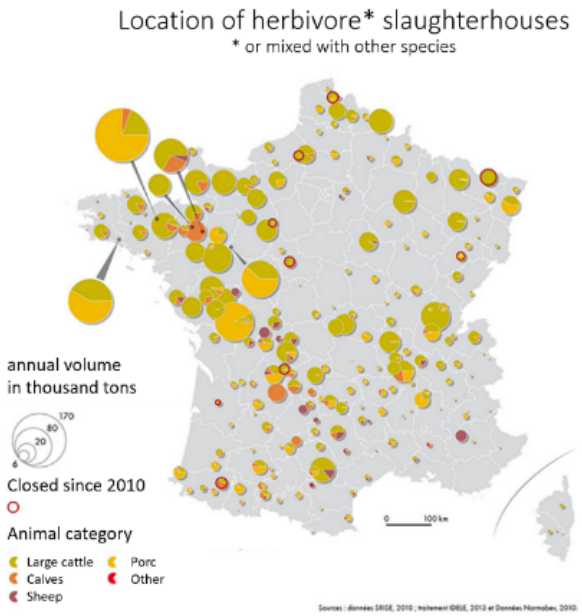


Figure 13: Location of French herbivores (or mixed) slaughterhouses

According to ProdCom and ESANE data, **beef and veal industry turnover is worth 8.8 billion euros** in the baseline year 2015-2018. If we add the balance of foreign trade in live cattle (excluding breeding animals), the turnover of the sector is 10.1 billion euros.

The industry is producing carcasses, quarters, vacuum muscles, and more and more ground beef. Beef is also found in many industrial ready meals (lasagna, shepherd's pie, moussaka, ravioli, Bolognese sauce...) We estimate that industrial ready meals use 12% of the beef available in France, that 45% of the beef is sold as minced beef (or other processed beef products) and only 43% is sold as real cuts.

b. Trade and trade relations with other countries

France exports each year 241 kt of beef and veal, i.e. 16% of the net production, of which 196 kt of fresh meat. According to the (Où va le boeuf), beef exports are 85% meat from young bull, as French people are not used to eat that meat, clearer and less flavourful than cow or steer beef. On the contrary, according to interviews with exporters, the countries in the South of the EU (Italy, Greece…) or in the North-East (Germany, the Netherlands…) appreciate this clear and low-fat meat and are clients for the French beef industry.

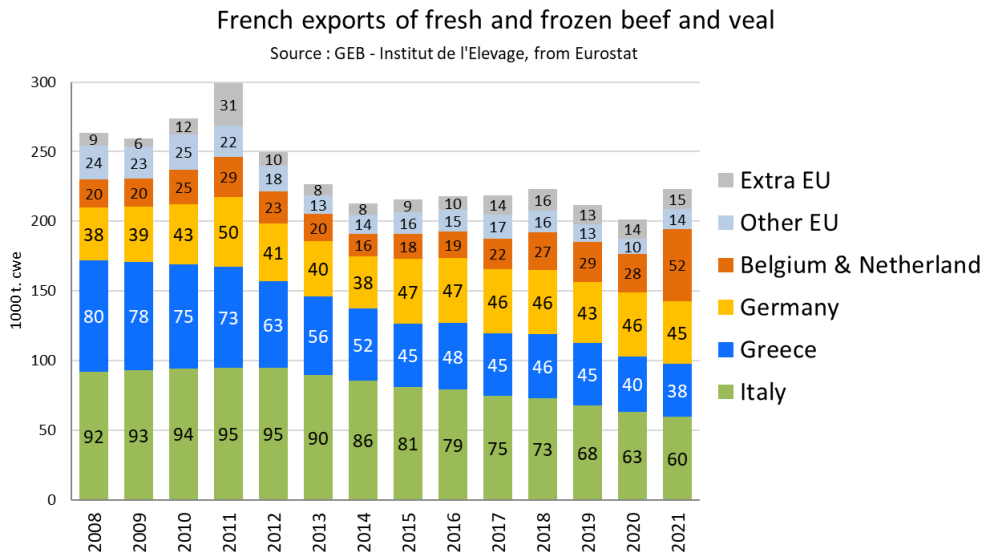


Figure 14: Evolution of French exports of fresh and frozen beef and veal. Source: GEB-Institut de l'Elevage, based on Eurostat data

With 77 kt of fresh and frozen beef in the baseline year 2015-2018, Italy is the first market for French beef. It is followed by Greece (46kt) and Germany (46kt), and by Belgium and the Netherlands (21 kt in total for the two countries)(Figure 14). However, according to the study *Où va le jeune bovin?*, 2021, France has lost market share on Italian and Greek markets with the arrival of Polish beef which is much cheaper, and more recently the competition of Spanish beef (small carcasses of good conformation and competitively priced).
France has developed its sales to Germany and other Northern countries. In Germany the shift of consumption between meats (less pork and more beef) and the decline of young bull production led to more significant import needs. French beef is well established in German supermarkets and wholesalers for butchery, conventional or halal. It is recognized for its quality and good traceability. The German market provides good value for heavy carcasses and round, with relatively constant demand all year round. However, French operators will have to meet the new requirements of German retail sector, regarding animal welfare traceability/labelling and the guarantee of products GMO free.
France imports each year 325 kt of beef and veal (Figure 15**)**, i.e. 21% of French consumption, for the baseline year 2015-2018, of which 209 kt of fresh meat. With 79 kt of fresh and frozen beef and veal, the Netherlands is the first supplier. A large part of this volume (approximately half of it) is made up of veal, as the Netherlands is the first producer of veal in the EU and France the first consumer of this nearly white meat. With 54 kt, Ireland is the second supplier and with 51 kt, Germany is the third. Irish beef (muscles and cuts from cull cows, heifers, and steers) is really appreciated for its quality, its green image, and the highlighting of its breeds (Angus, Hereford). German beef (carcasses and muscles from dairy cows and Simmental cows) is appreciated for its regularity, its good finishing, its price, and its small cuts. Polish beef is price competitive. Imported beef in France is mainly valorised in restaurants and secondary in urban and suburban butchers in regions far from farming areas. Irish, German, NL and Italian beef are also used in burger manufacturing in

France, especially for McDonald's restaurants. McDonald's tries to source 52-55% French but says there is a lack of sufficiently fatty meat in France.
French beef cuts are not competitive in restaurants. They are considered too expansive and not adapted to the size of the plate for the 2 flagship pieces: rib steak and sirloin. However, some big restaurant chains have decided to source 100% French to improve their image. But the foodservice sector in France is dominated by small independent businesses that cannot afford such strict sourcing strategies. Only for fresh burgers, which developed quickly in recent years in at least 25% of traditional restaurants, the sourcing is 100% French, for sanitary reasons mostly but also because they can afford it in terms of price.
It should be noted that in 2021, a part of beef volumes from the UK was reexported to other EU countries. The change in custom procedures following Brexit led to this artefact.

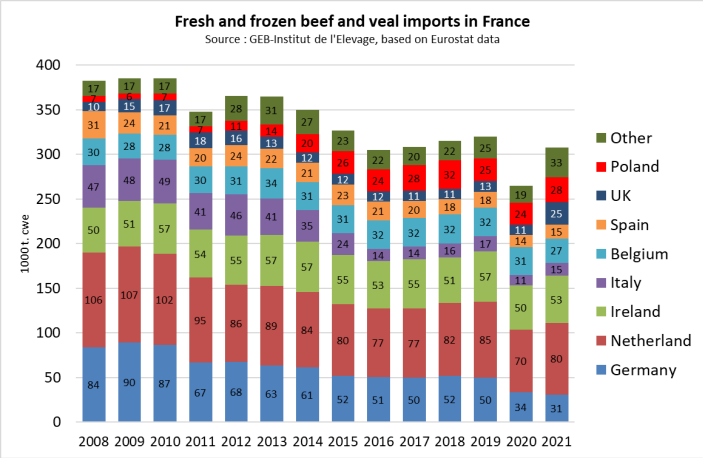
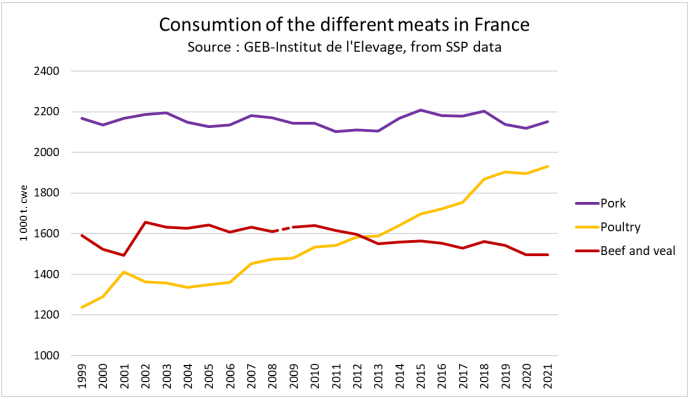


Figure 15: Fresh and frozen beef and veal imports in France. Source: GEB-Institut de l'Elevage, based on Eurostat data

c. Retail sector and consumption

Beef and veal consumption in France is decreasing slowly (Figure 16). It seems that there is a slow transfer between bovine meats consumption and poultry consumption. Indeed, beef and veal are more expensive. But there are also sociologic reasons: renewal of generations and consumption habits, lack of culinary knowledge, population aging (elderly people eat less red meat), less workers and farmers with physical labour leading to a change in nutritional needs… There are also reasons concerning the quality of the product itself, especially tenderness that is not regular enough. And finally, beef is denounced for its effects on the environment because of greenhouse gas emission, and on health.



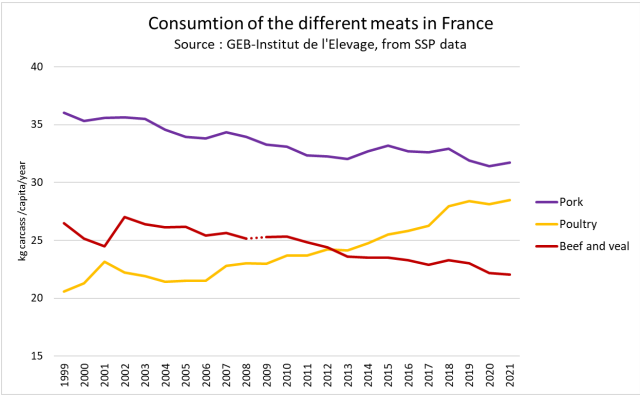


Figure 16: Evolution of the consumption of the different meats in France (Left : Total consumption VS Right: Consumption per capita). Source: GEB-Institut de l'Elevage, from SSP data

Outlets for beef: According to the study "Où va le boeuf" on 2017 figures, supermarkets remain the main outlet for beef available in France with 49% of volumes, and this does not include industrial prepared meals, mainly sold in supermarkets, which represent 12% of the total. With 24% of volumes, foodservice is the second outlet. Traditional butchers use 11% of available volumes. Self-consumption and direct sales use 4%.

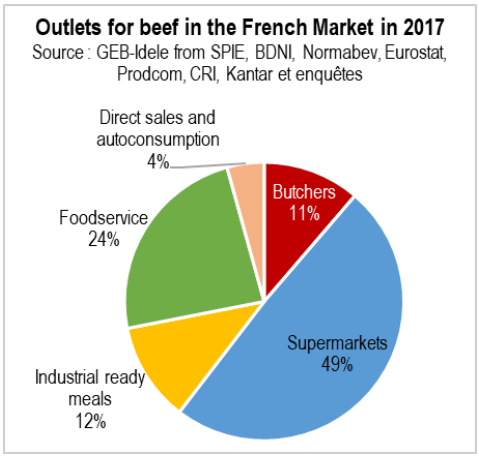


Figure 17: Repartition of outlets for beef in the French market (2017). Source: Geb-Institut de l'Elevage, from SPIE, BDNI, Normabev, Eurostat, Prodcom, CRI and Kantar data

The consumption of burgers and other processed beef is increasing quickly. It is the consequence of the evolution of eating habits and globalization of lifestyles. Burgers became iconic and are even now part of the gastronomic culture: French chefs have made them popular. Minced beef is also part of French daily life at home, as it is practical, quick and easy to prepare, relatively cheap and has no problem of tenderness.
Beef is thus purchased at 57% processed or in prepared dishes. Cuts now represents only 41% of volumes sold in supermarkets and 29% in foodservice.

This is a big issue for the sector, according to the slaughterers interviewed and Interbev. Indeed, the market for cuts is restricted in volume but also in terms of diversity of muscles used. But minced beef does not value the carcass as well as beef cuts. Valorisation of the carcass is therefore based on an increasingly limited number of muscles, mainly sirloin, filet and ribs. Another problem with minced beef is that quality carcasses of suckler cattle are less successful in distinguishing themselves from standard carcasses such as those of dairy cows which are traditionally used for mince. Indeed, the minced meat does not make it possible to differentiate the product, unlike whole muscles which are really different between dairy breeds and meat breeds. This has led to a convergence of prices between beef cattle and dairy cattle despite the segmentation of the minced beef market.
With 52% of imports, the foodservice sector remains the first outlet for imported beef. In butchers, 17% of the beef is imported. For image reasons, the share of imported meat in supermarkets is very low. Most major retailers have almost 100% French supply for beef cuts and minced beef (Figure A1Figure A1.

2. ACTORS IN THE VALUE CHAIN

a. The main actors in the value chain

The actors in the French beef value chain can be divided into 4 categories:
-**Farmers**, producing the cattle to be slaughtered. In 2021, 157,000 famers held at least 8 livestock unit of cattle or 5 cows, of which 51,000 dairy farmers holding more than 10 dairy cows and 54,000 beef farmers holding more than 20 suckler cows. On the suckler side, we had 32,000 breeders (who do not fatten the males and sell them as store cattle, but fatten the heifers and cows), 7,800 breeder-fatteners (who fatten all their cattle, including males into young bulls or steers), 4,000 veal producers (who fatten calves under the cow usually beef bred), 1,200 specialized fatteners of young bulls (who do not have any cow but buy some store cattle), 1,400 specialized veal fatteners (who fatten mostly dairy calves).
- **Cattle collectors**, who gather the supply to sell it to slaughterers (or to export markets). They can be private cattle traders (around 1,200 companies according to FFCB dealing 52% of the cattle sold in France), cooperatives (producer organisations with commercial activity; there are 55 of them; they deal 33% of cattle and 48% of young bull), or non-commercial producer organisations (they put producers in contact with slaughterers/processors and/or distributors; there are 46 of them). Private cattle traders can be totally independent or may be members of non-commercial producer organizations or integrated by industrial groups. Note that there are also livestock markets, where farmers and traders physically meet, and through which 5% of cattle transit.
- **Abattoirs and meat industry**, which slaughter the cattle and process the meat. In total there are 183 cattle slaughterhouses of varying size in France. The first 5 groups in the beef sector (Bigard-Socopa-Charal, Elivia, SVA, Sicarev, Kermené) treat approximately 70/75% of cattle slaughtered in France.

- The leader, Bigard-Socopa-Charal (BSC), holds 29 slaughterhouses throughout France and treats nearly 40% of the cattle slaughtered in France. the BSC group, which processes both cattle and pigs, does not rank among the world's top 10 meat processors. Its level of turnover is nearly 10 times lower than the world

number one, the Brazilian group JBS. The BSC group fluctuates between third and fourth place among European meat processors in all meats but is nevertheless the first European processor in beef.

-The second one, Elivia, treats around 14% of cattle, in 5 slaughterhouses: 3 in the west of France (Le lion-d'Angers, Villers-Bocage and Bressuire), 1 in the North in Noeux-les-mines and 1 in the East of France in Mirecourt. Elivia is a subsidiary of the Terrena cooperative, in which the Irish beef processor Dawn Meats has acquired a stake.

-The third one, SVA-Jean Rozé, treats around 10% of cattle, in 2 slaughterhouses in the West of France (Vitré and Trémorel, both in Britany). SVA is part of the Agromousquetaire group which supplies Intermarché supermarkets which represent the bulk of its outlets, except for the young bull beef which is mainly exported or secondarily sold to halal butchers in France.

- Sicarev, mainly based in the middle of France, holds 4 slaughterhouses (Migennes, Roanne, Sury-Le-Comtal, La Talaudière) and slaughter also a few cattle in the public abattoir in Limoges. Sicarev treats around 7% of the cattle slaughtered in France. The Sicarev processor belongs to the eponymous cooperative.

- Kermené belongs to the Leclerc supermarket group. It holds one big slaughterhouse in Britany (in Le Mené). Leclerc supermarkets represent the bulk of the outlets for Kermené, except for the young bull beef which is mainly exported (or secondarily sold to halal butchers).

In addition to private processors, there is also a network of small public slaughterhouses or service providers slaughterhouses. These facilities can be used by butchers or wholesalers who buy their cattle on the hoof, or by farmers who sell directly to consumers.

-**Distribution**, which sell the meat to final consumers. There are independent butchers, supermarket chains, or restaurants (commercial or social).

- There are around 15,800 independent companies active in the butcher's sector, bringing together 18,200 establishments (shops).

- There are 9 supermarket groups in France, the 5 biggest having nearly 80% of the market share: Leclerc 22.1%, Carrefour 20.1%, Les Mousquetaire 15.8%, Système U 11.9%, Auchan 9.2%.

- The foodservice sector is highly fragmented and heterogeneous. We have 2 sub-sectors: institutional catering (whether self-managed or delegated to specialized companies like Sodexo, Compass, Elior…) and commercial foodservice (within which we find fast food and traditional restaurants). Within this commercial sector, there is a multitude of small businesses, but also some large restaurant chains (Buffalo grill, Hippopotamus, McDonalds, Burger King…).

- Between processors and the foodservice sector, we usually find some wholesalers. They can take care of the logistics and deliver products directly to restaurants (Pomona, Davigel…) or have cash and carry stores (Metro, Promocash…). There are also some wholesalers specializing in meat, who act as intermediaries between slaughterhouses and traditional butchers.

b. Typology of actors in the value chain

54,000 professional suckler farmers (owing more than 20 suckler cows): Between 2011 and 2021, the number of owners of more than 20 suckler cows fell by 9,000 units (-10%) to 54,000. In 2021, these farms with more than 20 suckler cows had an average herd of 62 suckler cows. 7,800 farms hold more than 100 suckler cows and together hold 30% of the national suckler herd. At the opposite, 22,300 suckler farms had less than 20 cows, which represents 7% of the national suckler herd. Including these small farms, the average suckler cow herd size was less than 48 cows in 2021 (Figure 18).

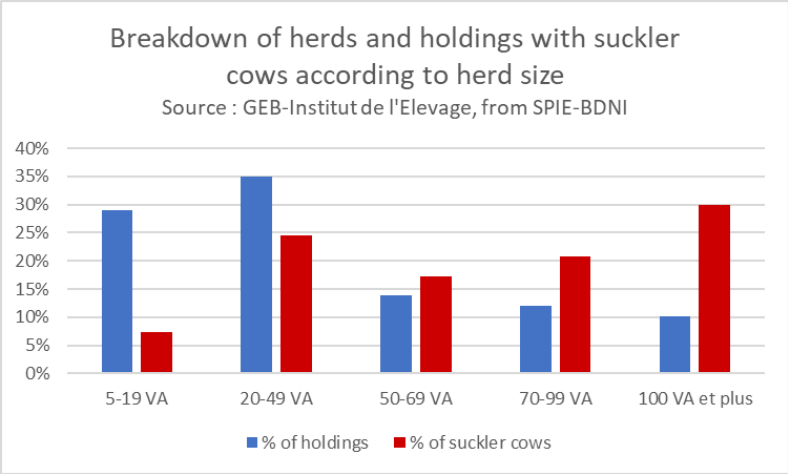


Figure 18: Breakdown of herds and holdings with suckler cows according to herd size (2021). Source: GEB-Institut de l'Elevage, from SPIE-BDNI data

Around 10,000 of these suckler farmers fatten all their cattle, including males into young bulls. And we can add 1,200 specialized fatteners. The production of young bulls is a little bit more concentrated than the suckler herd, but the units remain relatively small. The breeders-fatteners produce an average of 35 young bull each year and the specialized fatteners 141 young bulls.

The different types of cattle farms are unequally distributed across the territory (Figure 19). Whereas dairy farms are mostly concentrated in the west of France where grass is green thanks to oceanic weather and in the mountains (Jura, the Alpes and secondary the Massif Central) where some famous PDO cheeses bring added value, suckler farms are predominant in less favoured areas of the Massif Central and its foothills (Auvergne, Bourgogne, Limousin, Occitanie), in the South-West and in Pays-de-la Loire. Most of specialized fatteners are in the West and the East, where growing cereals is easier than in less favoured areas.

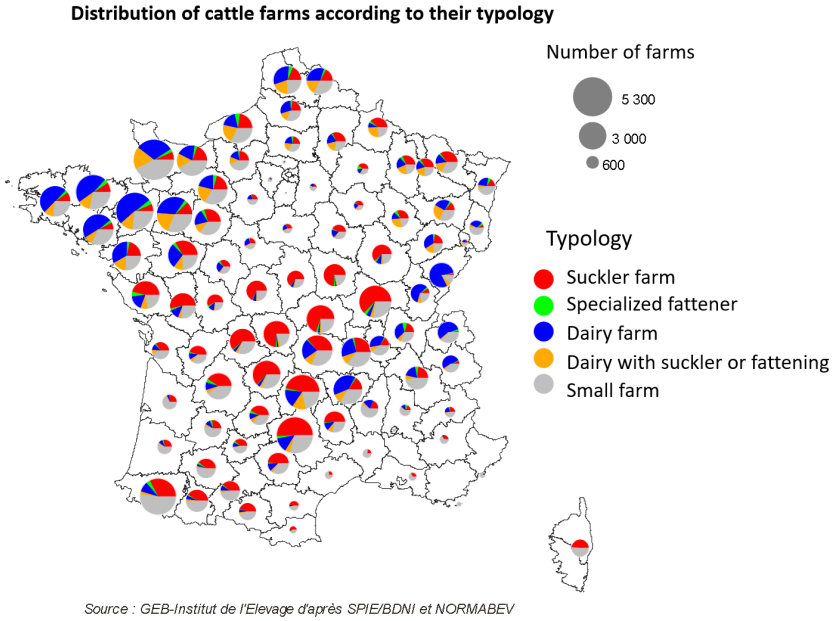


Figure 19: Distribution of cattle farms according to their typology. Souce: Geb-Institut de l'Elevage, from SPIE/BDNI and Normabev data

There were 189 slaughterhouses (including 6 in the French overseas departments and territories), slaughtering bovines in France in 2020, versus 228 in 2010 (Figure A2) . In 2021, 183 facilities slaughtered adult cattle. Among them, 106 slaughtered each one less than 2,000 tons of beef, making together only 6% of French beef production, 39 slaughtered each one between 2,000 and 12,000 tons, making together 17% of beef production, 19 slaughtered each one between 12,000 and 22,000 tons, making together 26% of beef production. The 19 biggest abattoirs made 51% of beef production (Figure 20).

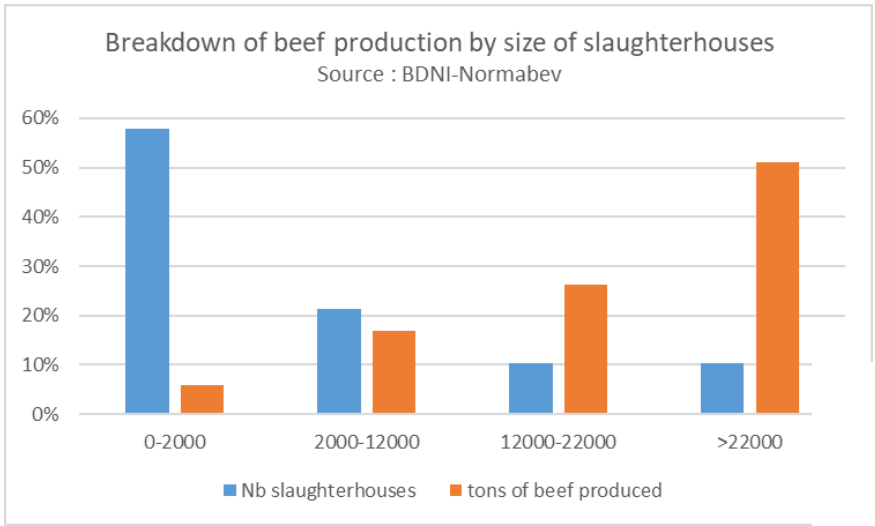


Figure 20: Number and production of slaughterhouses by their size. Source : BDNI/Normabev data

Big slaughterhouses are concentrated in the West of France. In other parts of the country, slaughterhouses are medium or small (Figure 13). Some territories do not have easy access to a slaughterhouse and some French department, such as the *Creuse* which is nevertheless a large livestock department, do not have even one abattoir.

A mobile slaughterhouse has been set up in Burgundy. It started operating in August 2021. But the business model was not economically efficient enough: it had to stop its activity in December 2022 and was placed in receivership.

Retailers are highly concentrated. 60% of the beef consumed in France is bought in supermarkets. If we consider only French beef, this market share rises to 68%, as foodservice uses mainly imported beef. The three main retailers, Leclerc, Carrefour, Les Mousquetaires, have together 58% of the food supermarket share. And 2 of them are closely related to beef processors: Leclerc has its own abattoir (Kermené), as well as Les Mousquetaires (with SVA). We estimate that 70 to 80% of the beef sold in these supermarkets comes from their own abattoirs. This allows them to better understand the upstream issues. Moreover, this gives them relative independence from their suppliers, and therefore a strong market power.

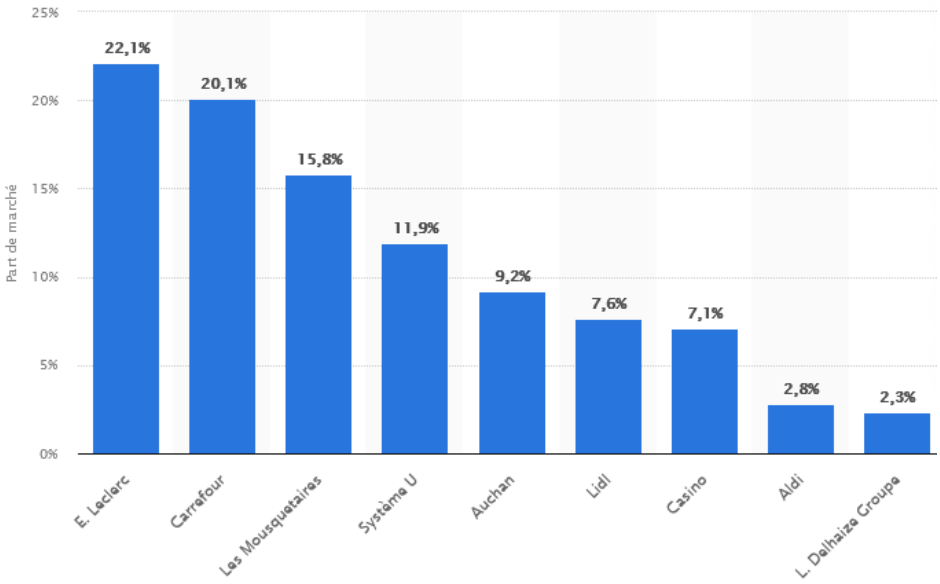


Figure 21: Market share of the main retailers in France (March-April 2022). Source: Statistica

3. THE GOVERNANCE OF THE VALUE CHAIN

a. Power relations in the value chain

The **asymmetry** between the upstream sector and the downstream sector is very strong. Indeed, the upstream of the sector is very dispersed while the buyers downstream (industry and especially distribution) are very concentrated.

The bargaining power of beef farmers remains very weak, even if the number of breeders is decreasing. The weak organization that persists in the sector still weighs heavily. Farmers do not have a wide choice of buyers and the nearest slaughterhouse is not always the one that pays the best. Between farmers and processors, the cattle dealer has a social role which he can take advantage of to negotiate his price. Indeed, the farmer can be relatively isolated and likes to welcome the cattle dealer to their farm and offer them a coffee or a snack. The farmer doesn't like disappointing the dealer and the market power is often unbalanced.

Direct sales from farmers to consumers is developing but remains marginal (around 3% of beef sold in France). This involves a slaughterhouse service provider which provides a local service to farmers for the slaughter and cutting of the carcass.

Moreover, **the large number of dairy culled** cows in France, as in the rest of the EU, managed as a by-product of dairy production and therefore highly sensitive to the dairy situation, is disrupting the finished cattle market. They regularly put pressure on prices. In France, competition from dairy cows is particularly strong because French people like this cow beef in steaks or roasts. For minced meat, which is increasingly consumed, meat from suckler cows has even more difficulty in distinguishing itself from dairy cows.

The **distribution sector is highly concentrated** and has an enormous market power. Only the Bigard group, with its brand Charal, can have a balanced relationship with the main distributors. Charal is a very strong brand, well known by consumers. It was the first brand to offer vacuum cuts in the early 2000s, the packaging enabling powerful communication. It is positioned at the top of the range, although it is made from dairy cows for the most part.

In this unbalanced market power between breeders, slaughterers and retailers, the lack of French beef and the willingness of retailers to offer French beef to maintain a good image act as safeguards. Indeed, French beef supplies are declining whereas the French origin is highly important for most consumers.

Interbev is the inter-branch organization for beef, veal, sheep meat and horse meats. It is a place of dialogue between the various categories of actors in the supply chain, where each federation can express itself during monthly meetings. Interbev promotes farming that respects animal welfare and the environment (through its "societal pact"). Interbev finances research on the quality of products and the economics of the sector. It has a budget for positive communication to promote French farming and French beef on the French market as well as the export markets (especially Italy, Germany and Greece). The regional committees of Interbev are also the arbiters between farmers and slaughterers when they disagree on the classification of carcasses. As a forum for dialogue, Interbev has drawn up a "sector plan" in 2017 with objectives for the supply chain, like increase the part of Label Rouge to 40% of the beef production to limit the competition of dairy cows or increase the part of commercial contracts in the supply chain. Recently, Interbev took some decisions to curb

the downward trend in production. One of them is that all lines of its budget must have a direct impact on the income of beef farmers.

b. The role of contracts and price transmission

Historically, production costs are not transmitted at all in the supply chain. Price rises and falls are usually the result of a supply shock or a market shock, a market opening or closing. For instance, the second BSE crisis in December 2000 led to a sharp drop in cattle prices. In 2008-2009 a dairy crisis led to a drop in prices for all the cattle, due to a huge number of dairy cows slaughtered and despite a sharp rise in costs of production. In 2011, the opening of the Turkish market allowed a rise in young bull prices, and then the retention of dairy cows in the perspective of the end of dairy quotas led to an increase in prices in 2012-2013, but the over-production of milk in the EU in 2014 has caused prices to fall again. Cattle prices did not rise in 2018-2019, whereas costs were increasing. They had to wait until late 2021 and the beginning of the production shortage to initiate a real rise (Figure 22).

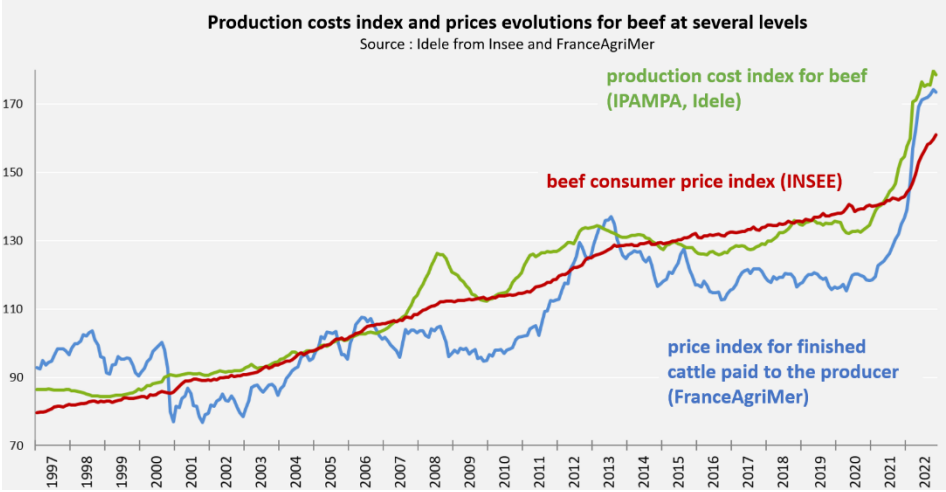


Figure 22: Production costs index and prices evolutions for beef at several levels. Source: Idele, from Insee and FranceAgriMer data

Pushed flow, very few price signals from downstream

Cattle production is a “long cycle” production. Despite the presence of producer’s organizations, farmers remain fragmented and produce "storable" animals. Unlike milk, they have the possibility of keeping the animals on the farm for a certain time (depending on the market situation, fodder stocks, cash, etc.). They use this possibility because it is finally their only power in this market dominated by processors and retailers, but this makes the market relatively opaque.

Despite successive sector plans, the adjustment between supply and demand remains complex. The sector remains based on picking flows (collecting available cattle regardless of quality) pushed from production downstream. The inertia is historical and few signals are sent from retailers and processors to producers. The coordination between actors is weak.

French prices depending on the European context and dairy situation

The French market is open to the EU market. Depending on the year, France imports 22 to 26% of its beef consumption (essentially cow beef) and exports 16 to 19% of its beef production (mainly young bull beef). In certain market segments, EU prices can be decisive. Thus, the foodservice and further processing sectors are markets where import rates and price competition are high. Otherwise, young bull beef is also subject to strong competition on export markets and young bull prices in France depend on Italian and German prices. Finally, the dairy situation is usually disrupting the domestic market, with sometimes retention and sometimes massive arrivals of culled cows in slaughterhouses.

Contracts: the 2017 Interbev sector plan has set a target of 30% contracted cattle

In 2017, Interbev noted that less than 2% of finished cattle were covered by contracts that considered an indicator indexed to production costs. The objective was then set for this figure to rise to 30% in 2022. In late 2021, the goal was far from being achieved. According to our investigations, commercial contracts only concerned 5 to 10% of finished cattle sold by farmers.

The "spot" market still represents more than 90% of sales of finished cattle, including cooperative contracts which rarely contain the commitments usually expected in a contract: numbers, weight range, price of sale, delivery date, etc.

Table 1: Repartition of different types of contracts in the French beef sector

	"Spot" market	Cooperative "contract"	Commercial contract
Share of cattle transactions between farmer and his first buyer	Around 65% of finished cattle	Around 30% of finished cattle	5-10% of finished cattle
contract length	-	Permanent	6 to 18 months for young bulls

The goal of 30% was not achieved for several reasons. Several actors were reluctant to enter this type of commercialization. Some cattle dealers for instance and even some farmers were afraid to lose their freedom. Processors were afraid of not being able to pass on the contracted prices to their various outlets. Indeed, for one animal, there is often more than one client (muscle of the hindquarter for a retailer and forequarter for a further processor). Moreover, for young bulls, clients are mainly out of France, in countries spot markets prevail. However, the situation has since changed a bit as production is declining, so some slaughtering groups have been thinking of making more contracts.

The law Egalim 2 imposes contracts

The objective of the "Egalim 2" law is to reverse the constitution of agricultural commodity prices to ensure a fair return to producers.

For beef, the Egalim 2 law requires that a written contract be drawn up for any sale of cattle. This mandatory rule starts:

- on January 1, 2022, in beef breeds for young bulls, heifers, cows and all cattle under official quality sign,
- on July 1, 2022, weanlings and store cattle,
- no later than January 1, 2023 for all other categories of cattle (dairy young bulls, steers, dairy cows, dairy calves...)

The sales of cattle on livestock markets are not concerned.
The contract proposal must be made by the farmer and not the buyer. The farmer can contract with any type of buyer: cattle dealer, slaughterer, butcher, distributor, foodservice, and fattener. He can sign contracts with several buyers.
The contract must mention a volume of animals, a duration, a sales schedule, and a price.
The price can be set in 2 ways:

- It can be a fixed price with price revision every month, quarter, semester: The parties agree on a firm price per animal or per kg. The price is automatically revisable according to freely determined indicators (eg: IPAMPA evolution)

- It can be a price determined with indicators such as production cost, quotations, and quality indicators for specific specifications (eg: Label rouge). The price can then be x% of the production cost + y% of the quotation + additional valuation if label. (Production cost indicators are available on the Idele website: https://idele.fr/detail-dossier/indicateurs-de-reference-pour-la-contractualisation)

In addition to this, the parties can add a price tunnel: the price cannot be less than X€ nor exceed X€.

Review of compulsory contractualisation, one year after its implementation

Despite the legal obligation, the share of cattle sold under a commercial contract remains low, for the same reasons explained previously. Moreover, in recent months, the production decline caused a sharp rise in prices, which did not encourage farmers to contract.
Due to this lack of interest in contracts, Interbev decided to set up an observatory of the number of commercial contracts established in France which will not be public. Before mid-year 2023, Interbev will have the first data. This observatory will be fed by the anonymized feedback from the slaughterers. It will make it possible to follow the rate of production under contract according to the racial type (beef, dairy, mixed) and the category of animals (young cattle, heifer or cow). The goal is to provide individual and collective visibility to give elements of confidence.

c. The place of differentiation in the value chains

Increase of labelled and organic production (Figure 23**)**

In 2021, 28,000 tons cwe of beef were labeled under the ***Label Rouge***, **PGI** (Protected Geographical Indication) or **PDO** (Protected Designation of Origin), representing an increase of 33% since 2011. The *Label Rouge* provides guarantees in terms of product quality, animal welfare and respect of the environment.

Carcasses must be well shaped. The animals are raised in accordance with the seasonal cycles: they are in the meadows as soon as the weather allows it (generally from April to November) and sheltered in buildings adapted to their needs when the weather is bad. They mainly eat grass, hay and cereals produced at 80% on the farm. Farmers are with their cattle daily to check that they are well and take care of providing them with what they need. Interbev has shown the desire to develop the *Label Rouge* in its "sector plan" established in 2017, with communication actions and incentives for butchers and supermarkets. The aim was to segment the market and allow all beef from suckler herds to be differentiated from dairy beef. However, with only 2.2% of the total beef production, the objective of 40% is far to be achieved.

The volumes of **organic beef** have increased by 153% in 10 years to 33,000 tons cwe in 2021, representing 2.7% of the total cattle slaughtering. The development of organic production is explained by the dynamics of conversion to organic farming of many farms and livestock whether dairy or beef. It seems quite easy for extensive grassland farms to convert into organic production, without any additional investment. With 20,000 tons cwe, beef cattle comprising the majority of organic beef production (61% of volumes).

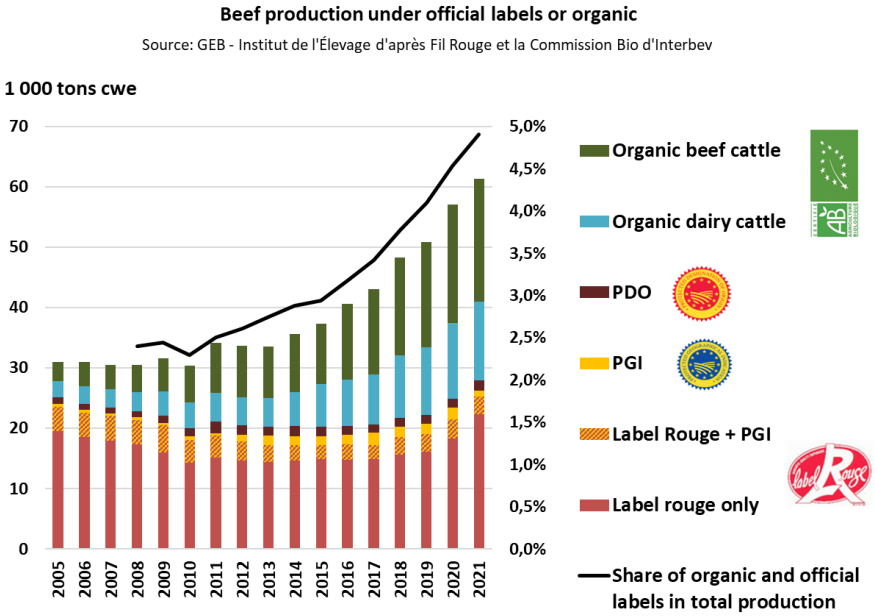


Figure 23: Evolution of French beef production under official labels or organic. Souce: Geb-Institut de l'Elevage, from Fil Rouge and Interbev data

Organic beef consumption: mainly minced beef

In organic beef, minced beef is over-represented. Organic has not found its market for the muscle cuts. Indeed, organic beef is mainly bought by families with young children who buy organic burgers for children and a piece of meat (non-organic) for adults, it is a bit caricatural but close to reality. So if in conventional beef, 42% of the carcass goes into ground beef, in organic it is 55% of the carcass. Moreover, of the remaining 15% of muscles, half is downgraded to conventional (the remaining 30% are bones, fat, waste).

Organic minced meat is therefore much more expensive than standard minced meat. Not only are kg of meat more expensive to produce due to less intensive production, but the unbalanced product mix makes minced beef more expensive (indeed, the valuation of the carcass relies much more on it due to the low consumption of noble muscles).

In 2022, as for all food products, the consumption of organic beef did not resist the drop in purchasing power. The consumption fell by 20% compared to 2021 according to the organic commission of Interbev. In addition to the problem of purchasing power, organic suffers from competition from other labels which have recently developed, with promises close to those of organic products (on the environment, health, animal welfare, Fair Trade…) or from local products. Finally, the delisting of some organic products in supermarkets also contributed to the drop in consumption.

It is difficult to predict whether this organic crisis will be long-lasting or temporary. Convinced organic consumers are still present, but it will be necessary to win back the opportunistic consumers who came to organic thanks to the development of the offer in supermarkets. In 2022, France had 2.88 million hectares under organic farming or under conversion, i.e. 11% of agricultural area. We are still far from the EU objective of 25% organic agricultural land, and yet the market seems more than saturated. The economic, social and fiscal context will have to change if we want organic products to become attractive to consumers. **The law imposes a proportion of organic and superior quality products in collective catering**

The “Egalim 2” law stipulates that from 1/1/2022, 50% of the products served in institutional catering (school cafeterias, company restaurants, social catering, etc.) must be high-quality products (Label Rouge, PGI, PDO, fair-trade, HVE…), of which 20% must be organic.

The « Climat et resilience” law stipulates that from 1/1/2024, 60% of meat and fish in institutional catering must be high-quality products, and this must be 100% in public-owned restaurants.

These laws will lead to less, but better beef consumed by the guests. For organic beef, this law will accentuate the problem of carcass balance. Indeed, collective catering uses very few noble pieces to grill, for price reasons but also for service constraints. So the forequarter of the carcass will be much more in demand than hindquarter for which it will be necessary to find a complementary outlet.

In 2022, it has been very difficult for institutional restaurants to comply with the law, due to the high inflation rate on all goods.

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Annexes:

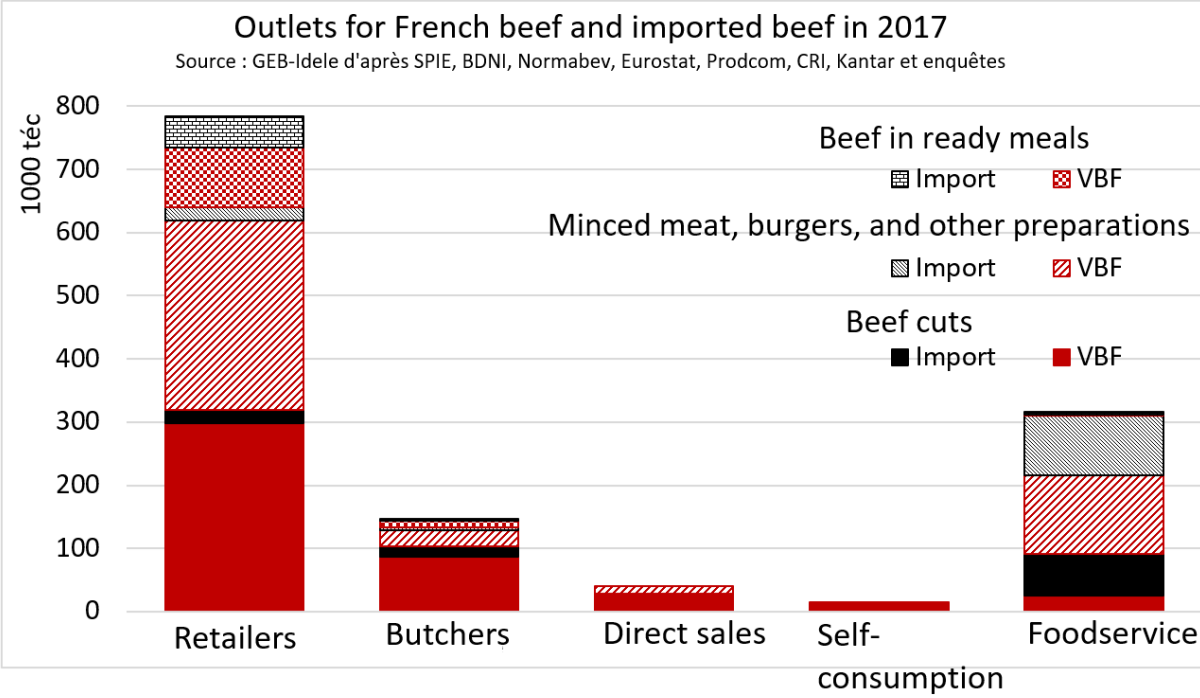

Figure A1: Outlets for French beef and and imported beef (2017). Source: Geb-Institut de l'Elevage, from SPIE, BDNI, Normabev, Eurostat, Prodcom, CRI and Kantar data

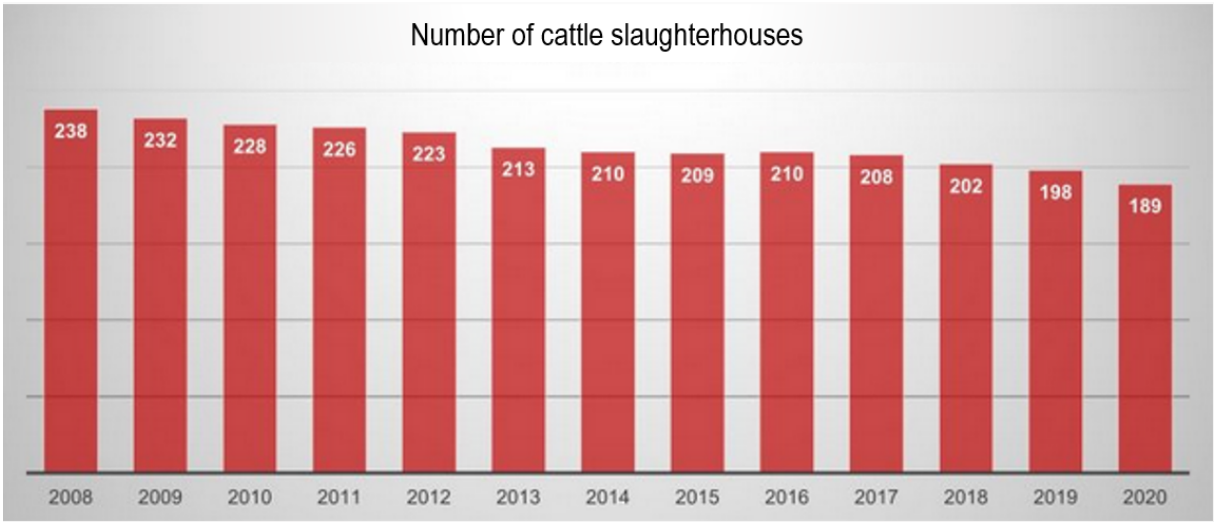

Figure A2: Evolution of the number of French slaughterhouses. Source: Normabev data

The Italian beef value chain

Matteo Finocchi, Chinedu Obi, Michele Moretti (UNIPI)

Key findings :

- The analysis of physical flows showed a rather constant trend of the animals reared after an initial decrease starting from 2012. This has led to a decrease in the total value of beef produced but also to a decrease in imports. These trends are reflected in the decrease in per capita meat consumption that has occurred over the years.
- The main actors within the value chain are farmers, processors, and distributors. The number of breeders has decreased over time, keeping the number of animals reared constant through a capitalization of the farms and therefore an increase in the average number of animals reared for each farm.
- The processing sector is characterized by over 2300 companies but that only 16 of them represent more than 50% of slaughtering and that follow the distribution of the animals from a geographical point of view, located in the north of the country. In the retail sector, over 50% of the total value is held by 7 large supermarket chains.
- Breeders are not united in an association, cooperative, and have a low bargaining power towards the processing industries and towards distribution. On the contrary, processors and distributors are responsible for price formation and above all hold a bargaining power such as to define the price during the purchase of the raw material.
- However, breeders can associate and therefore exploit all the benefits of the guidelines of guaranteed policy instruments that act on quantity and collective marketing that reduces costs and increases the possibility of managing the supply of raw materials in the market.

1. DESCRIPTION OF THE PHYSICAL FLOWS IN THE VALUE CHAIN

a. Structure of production

Italy is currently the third-largest beef producer in the EU. Beef production is a major driving force for the Italian agricultural sector, prevalent in the northern part of the country, where 70% of the country's cattle are raised. Italy is not self-sufficient in meat production, and imports of beef and live animals are two of the major causes of its fiscal deficit. Recent statistics indicate that Italy consumes almost 13% of the beef available in the EU despite producing only 6% of the cows in the EU-28. Therefore, the country's beef needs cannot be met solely by Italian cattle production. To meet its domestic needs, Italy has relied on the import of live cattle and beef. This report provides a brief overview of the beef value chain in Italy from 2015 to 2018, examining the trends in beef production, meat slaughtering, imports, and exports, as well as the domestic market and consumption of beef and veal. Whenever possible, the average data from 2015 to 2018 was used as a single indicator of the typology of the variable. Because of the impact of the Covid-19 pandemic on beef production, data from 2019 to 2021 have been purposefully excluded from this report.

Italy has a sizeable bovine population: only German, France, Spain and Ireland have more bovines than Italy in EU in 2020. The number of bovine animals was 6.28 million in December of 2021, according to EUROSTAT. Historically, the number of bovine animals in Italy reached a record high of 6.4 million in December of 2020 and a record low of 5.83 million in December of 2010. Looking in more detail at developments in the last decade, the population of cattle in Italy increased by 7.7 % between 2010 and 2021. There was a rapid decline in 2014 (down 2 % against previous year). Between 2015 and 2018 before the pandemic, bovine population were increasing steadily, while there was a 1.9 % fall in the number of bovine animals between 2020 and 2021. A majority of the Italian bovine population are bovine animals, 2 years and above. Between 2015 and 2018, as well as at 2021, the population of bovine animals, 2 years and above has remain a little above 3.0 million heads (almost 50% of total bovine). Italy also has a sizeable number of bovine animals between 1 and 2 years (approximately 1.5 million heads), and bovine less than 1 years (approximately 1.7 million heads). Around 58% of the bovine animals less than 1 year are reared for slaughter. It is also worth to note that 10% of cows reared in Italy are specialized in meat production, while 90% are specialized in dairy or mixed.

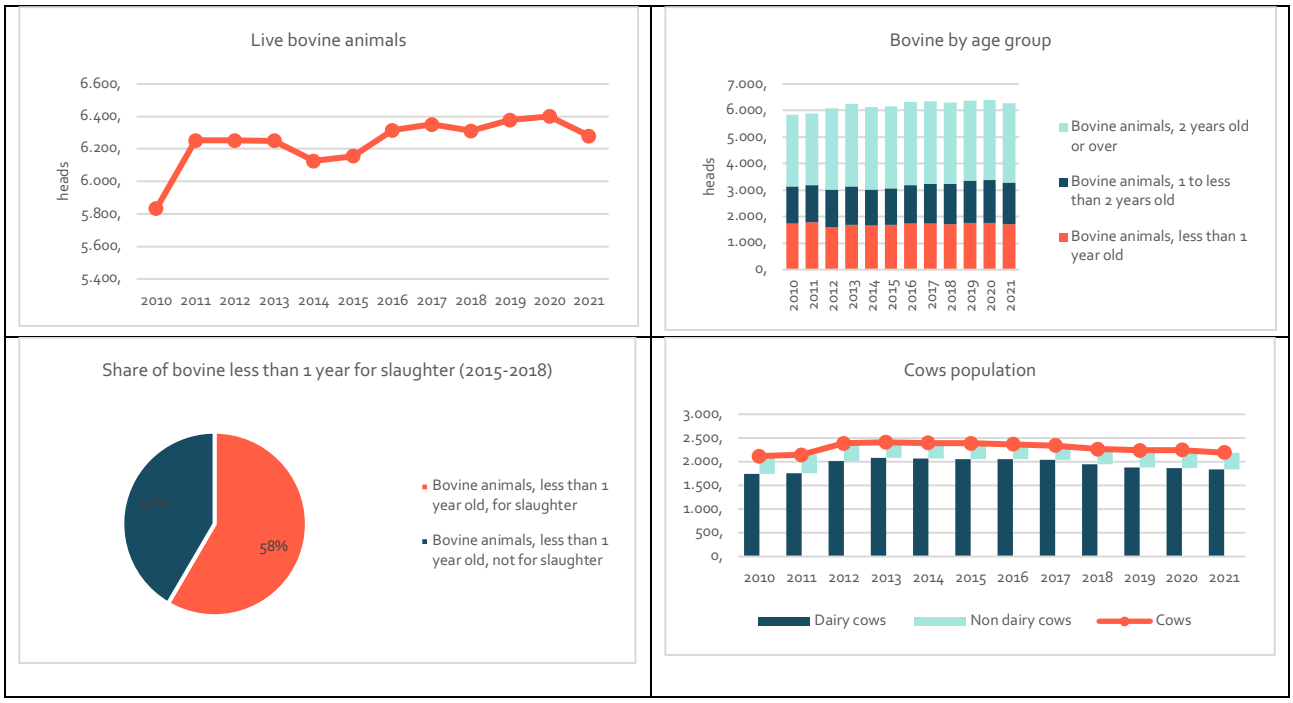

Figure 24: Evolution of bovine population in Italy. Source: Eurostat data

Meat from bovine animals of at least one year of age is referred to as beef. Veal is defined in this article as meat from bovine animals younger than one year of age (usually calves and young cattle). In the EU, Italy is among the top three leading producer of beef producing around 11.1 % of EU's beef in 2020. The number of bovine animals slaughtered for beef and veal production in Italy has decreased significantly between 2012 and 2021 (Figure 254). Around 748 thousand tonnes of bovine beef and veal were produced in December of 2021, according to EUROSTAT. Within the years reviewed, the production of bovine meat in Italy reached a

record high of 981 thousand tonnes in December of 2012 and a record low of 709 thousand tonnes in December of 2014. Adult cattle (beef) contribute the highest share of bovine meat, contributing almost 90% of bovine meat in Italy. The number of adult cattle slaughtered annually in Italy from 2012 to 2021 was affected by some fluctuations. In 2020, approximately 652 thousand tonnes were slaughtered in Italy for the production of marketable meat for human consumption. During the following year, the number of cattle slaughtered increased, reaching approximately 661 thousand tonnes. The number of young cattle and calves slaughtered annually in Italy decreased significantly between 2012 and 2021. As of 2021 approximately 87 thousand tonnes of young cattle and calve were slaughtered in Italy for the production of marketable meat for human consumption. By contrast, the number of young cattle and calves slaughtered in 2012 amounted to 127 thousand tonnes.

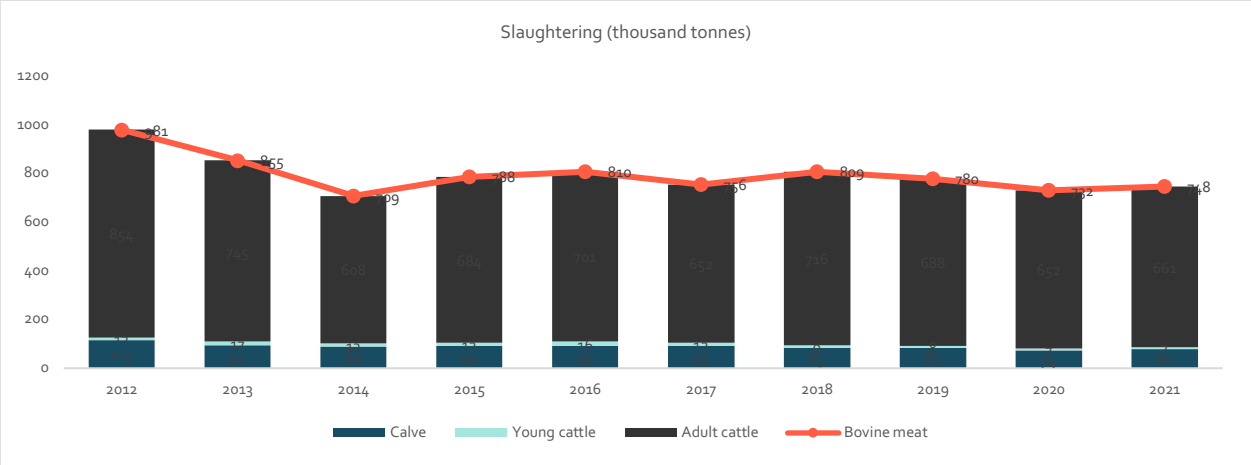

Figure 25: Evolution of beef and veal slaughtering in Italy. Source: Eurostat data

b. Trade and trade relations with other countries

According to the Observatory of Economic Complexity (OEC) report, Italy exported €312 million of bovine meat in 2020, making it the 17th largest producer of bovine meat in the world. During the same period, bovine meat ranked 261st in terms of Italy's exports. Bovine meat is primarily exported from Italy to the following countries: Germany (€68.2M), Netherlands (€54.9M3M), Greece (€40.4M), France (€39.9M), and Spain (€26.6M). Between 2019 and 2020, the Netherlands (€6.5M) and), Croatia (€1.7M) 94M),were the fastest growing export markets for Italian bovine meat. The figure below shows the quantity in tonnes of beef and veal products and leading trade partners for the export meat from Italy. Generally, the export quantity of meat and veal from Italy has been on a gradual decline since 2015 (Figure 26). In terms of tonnes, fresh meat was the leading meat product by export quantity across the years reviewed, with an export value of between 88 and 77 thousand tonnes, followed by frozen meat which had an export value of around half of fresh meat. The least exported products in terms of quantity are live animals and offals. Between 2015 to 2018, the Netherland was the leading destination of Italian fresh meat, purchasing around 20.3 thousand tonnes per year, followed by Germany which purchased 13.4 thousand tonnes per year. Germany leads in

the purchase of Italian frozen meat, purchasing around 6.9 thousand tonnes per year between 2015 to 2018, followed by France which purchased 5.4 thousand tonnes per year.

Figure 26: Beef export from Italy to other countries. Source: Comext

According to European Commission, during the year 2020, Italy imported €1.52 billion worth of bovine meat, making it the fourth-largest importer of bovine meat globally. Bovine meat ranked 50th in imports to Italy in the same year. Bovine meat is imported to Italy primarily from France (€289.2M328M), the Netherlands (€283.9M), Poland (€270.7M), Ireland (€143.7M163M), and Spain (€140.2M159M). The fastest growing import markets in Bovine Meat for Italy between 2019 and 2020 were Spain (€25.829M), Canada (€3.39M), and Slovenia (€649.9k737k). The figure below shows the quantity in tonnes of beef and veal products and leading trade partners for the import meat to Italy. Generally, the import quantity of meat and veal from Italy witness a significant decline in 2019 mainly due to the global pandemic, and decreasing decline of meat in the country (Figure 27). In terms of tonnes, live animals was the leading meat products by import quantity across the years reviewed, with an import value between 343 and 458 thousand tonnes, followed by fresh meat which had an import value of around 322 to 354 thousand tonnes over the years reviewed. The least

imported products in terms of quantity are processed meats including salted, prepared and offal. Between 2015 to 2018, France was the leading supplier of fresh meat and live animals to Italy supplying around 75 thousand tonnes of fresh meat and 351 thousand tonnes of live animals per year between 2015 to 2018. Germany ranked highest, with meat and edible offal imports valuing approximately 0.11 thousand tonnes per year.

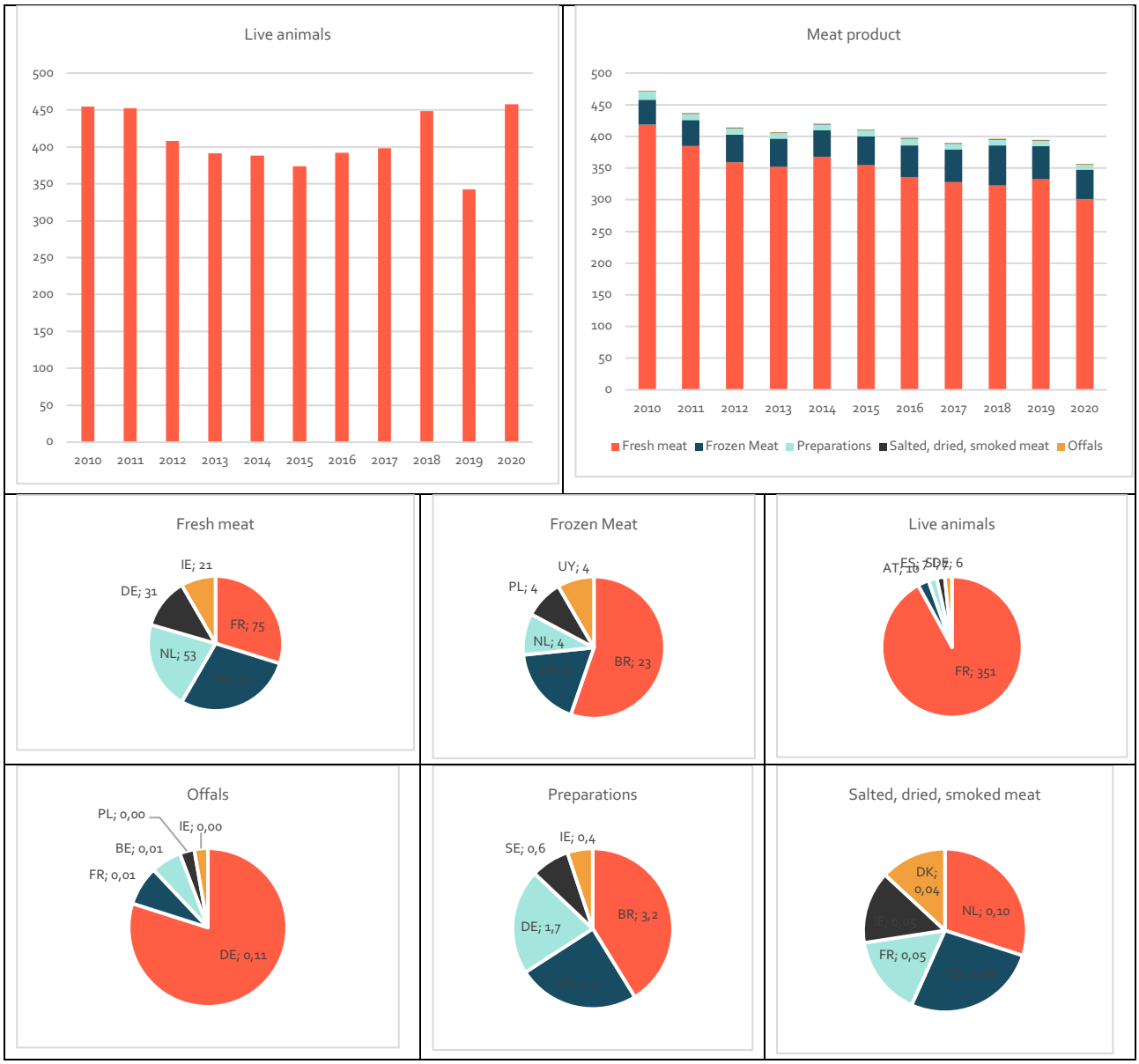

Figure 27: Beef import from other countries to Italy. Source: Comext

c. Retail sector and consumption

In terms of consumption, the data indicates that the average expenditure on beef and veal meat has increased from 30.25 euros in 2014 to 31.08 euros in 2018, before decreasing to 30.39 euros in 2019. The second statistic shows the volume of beef and veal meat consumed per capita in Italy between 2005 and 2017. During the period under consideration, the consumption of beef and veal meat has fluctuated within a negative trend. Specifically, in 2017, the per capita consumption of beef and veal meat reached 17.1 kilograms after peaking at 25 kilograms in 2007.

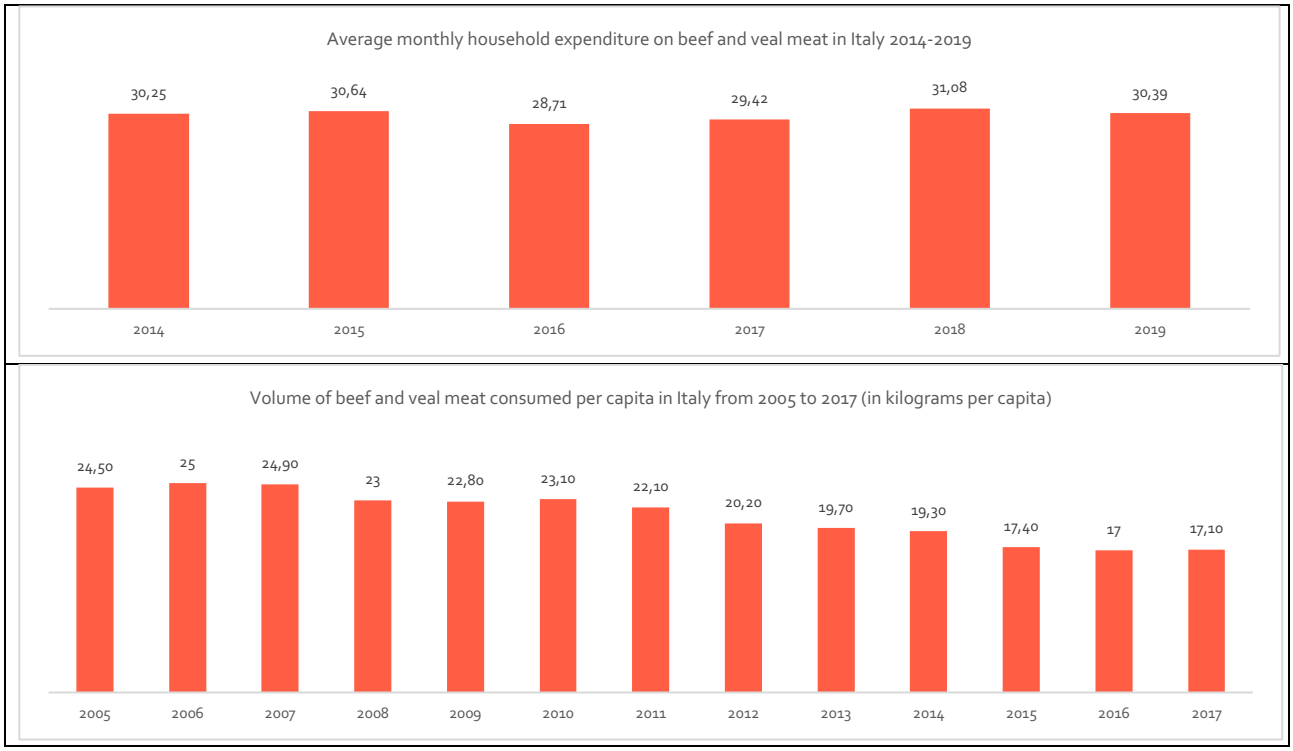

Figure 28: Consumption of beef and veal meat in Italy. Sources: Istat and ISMEA data

2. ACTORS IN THE VALUE CHAIN

a. The main actors in the value chain

The main actors in the value chain are divided into farmers, professional organizations, trade associations and agricultural unions, meat industries, wholesalers, and distribution.

- **Farmers**: in Italy there are more than 104 thousand farms with beef cattle in 2019. Of these farms it's difficult to divide those open-cycle and those closed-cycle. The difference concerns the length of the breeding phase which, in the case of open-cycle ones, begins with weaning calves at 6 months

and ends with slaughter. In the case of closed one, animals are brought for slaughter starting from the birth of calves; very often it is a very extensive breeding system based on the grazing of heifers and the birth of grazing calves. In summary, the location of farms is prevalent in the north of the country. Referring to a period of 4 years (2015 - 2018) we have an average number of animals that exceeds 2.3 million. Of these animals over 1.3 million are in the northern regions (Lombardy, Piedmont, Emilia Romagna, Veneto) for a percentage value that exceeds 54% (data from National Zootechnical Register). For farms, in the same reference period, we have more than 110 thousand of which over 58 thousand in the same regions as before (53%). The main breeds bred are: Piemontese, Limousine, Charolaise, Friesian. Of these breeds we slightly exceed 300 thousand heads each, compared to over 900 thousand for Half-breed / Crossbreeding (Data from National Zootechnical Register: BDN). These latter data are able to underline the relationship between beef and dairy sector.

- **Professional organizations and breeders' cooperatives**: they are a set of farmers who have a series of very important tasks for the market and for income sustenance. They are present throughout Italy but mostly located in areas where there is the greatest presence of cattle breeding and where the feed production (maize and soybean) is concentrated. The professional organizations recognized by the Italian Ministry of Agricultural Policies are only 14 of which 8 in Emilia - Romagna and Veneto. The main role of these professional organizations is linked to the power conferred by the European Union as indirect instruments of the Common Agricultural Policy.

- **Agricultural unions**: They are organizations representing and protecting agricultural workers, born to bring political battles in the agricultural field, for the guarantee of farmers' rights. In Italy we have three main ones: Confagricoltura, Coldiretti, Confederazione Italiana Agricoltori (CIA), born in different historical periods and with different political representatives.

- **Abattoirs and meat Industry**: In Italy there are more than 3000 processing enterprises and meat producers of different size. Our analysis starts from Eurostat data about the number of employed people per enterprise as a metric for measuring industries' size. The other very important aspect is the geographical distribution of meat industries that are typically located in northern Italy. The number of slaughter and processing industries has decreased dramatically in recent years to the benefit of large industries and groups operating in the sector. The main group is Cremonini which processes and distributes more than 50% of the meat produced in the country. This group includes very famous brands appreciated by the consumer and leads to high contract power. The group has an average selling volume of over 4 billion euros if we consider the production, processing, and distribution sectors. More than 18,000 people worldwide are employed in this node of the chain.

- **Wholesalers**: In our country there is a subsequent node of the chain that is represented by wholesalers who have the task of aggregating agri-food products and relating with large retailers who have the task of making the products available to the final consumer.

- **Distribution**: it is the final node of the supply chain; it is a retail system that makes use of a network of supermarkets of various types and various commercial brands; the main ones, during the decade 2011 - 2021 for quantity of sales volume in Italy, represent more than 50% of the market and are: Coop, Conad, Selex, Auchan, Esselunga, Eurospin, Végé.

The main goods produced and processed by the beef cattle value chain are mainly fresh or processed meat products as well as weaning calves (sent to the market at 6th month old).

The **geographical location** of farms and processing industries is northern Italy due to several technical and economic advantages. The proximity and connection of primary production with the processing industry, and secondly the possibility of cooperation between actors in the supply chain and the existence of intermediate institutions (professional organizations or cooperatives) aimed at aggregating breeders. A rather narrow geographical location certainly entails the disadvantage linked to the low bargaining power of individual farms in comparison to the large processing industries established in the area. An important aspect to consider is the problem caused by the narrow geographical location and the specific environmental impact caused by the farming and production of products for animal feed. The existence of producers' association leads to a better market placement for animal products and stabilizes markets by ensuring high bargaining power. Farmers have the choice of joining in or directing themselves to the sales channels of large retailers or multinational holding companies. The regions of northern Italy are very productive areas from an agricultural point of view, especially for corn and soybeans that are the basis for animal feed. In these areas, cattle breeding is concentrated, and it overlaps with the feed productions, creating an environmental impact in terms of nitrogen leaching and in terms of emissions into the atmosphere of methane and ammonia.

3. THE GOVERNANCE OF THE VALUE CHAIN

a. Power relations in the value chain.

The first important aspect, in the study of governance and power relations within the value chain, is certainly related to the primary sector, in the analysis of what the market strategies adopted by the actors are. The existence of producer organizations in the beef sector has important repercussions on the contracting power of farmers towards industrial and large-scale retailers. Through producers' organizations, it is possible to promote the concentration of supply, creating a bargaining power with respect to the meat industry and influencing, in part, the final selling price. The producer organizations are also able to concentrate the demand of calves that need to fatten in the finishing farms. They are also very important for delivering technical assistance to their members to improve the profitability of their farms and to favour the adoptions of innovations. It should not be forgotten that the grouping entails also the possibility of carrying out investments in marketing and advertising for commercial brands, that brings the consumer to know the product and it becomes essential for distribution on the shelves of the supermarket. There are certainly other reasons why aggregation into associations is important and are purely of an economic and technical nature: facilitations for credit access, investments in research and development activities. Storage of the product is however a task that in Italy can only be performed by the meat industry.
Therefore, considering market power, we have normally defined this economic characteristic as the ability of a company to sell its product at a higher price than the most competitive one.

The primary sector has the capacity to influence the selling price only if it is organized in associations, cooperatives, and professional organizations. Under this condition, there are market dynamics that allow to a) activate economies of scale (increasing the quantity while reducing production costs), and b) develop marketing policies. All farmers who are not inside professional organizations have very low market power. These breeders are dispersed and at the mercy of prices governed by the dominant actor such as large industrial groups (e.g., Cremonini) or other meat companies. A critical factor affecting market power dynamics is the geographical location of farms and processing industries. Proximity between the two actors favor a better price negotiation. Exiting from a local market or local sales channels does not always enable to meet the buyers who can guarantee the best price on the market. It is to solve this issue of localization that producers' aggregation into intermediary institutions is promoted as a solution to govern the price dynamics within the market, reduce competition within the same production sector and increase bargaining power.

The industrial meat industry, on the other hand, has is a central market power for the construction of the price of live animals, but it is subject to the very high market power ofthe large-scale retailers. Large groups in the value chain, such as the Cremonini Group, that hold important commercial brands that are well known to the consumer (e.g., Inalca and Montana) are better equipped against the power of large retailers. Market power is mainly linked to the size of the meat industry: work on quantity by decreasing production costs, through the concentration of the offer in a single large company, through the digital heritage of advertising and marketing. The reasons for the success of these two important commercial and meat processing brands, belonging to the Cremonini group, are related to economic and marketing reasons. The first reason is related to a broad economic base of the group that is able to develop wide-ranging marketing policies throughout the Italian territory and especially on many media channels. Another important reason is linked to the ability of the Cremonini group to have built over time an integrated supply chain that starts from production and arrives at distribution / catering – restaurant. To mention the brands of the group we have this type of business organization: Production of beef and processed meat (cold cuts, snacks, hamburgers, canned meat, etc.), distribution under the MARR brand, Chef Express catering and Roadhouse restaurant. To better understand how the group's integrated supply chain is established, the website of the same states that the total financial data exceed 4 billion euros for 2021, divided into 2.3 billion for the production - processing sector, 1.4 billion for the distribution sector and over 400 million for catering.

The distribution sector has enormous market power especially in the construction of the final price. In Italy we have 5 brands of large-scale distribution which represent more than 50% of the national volume of sales of agri-food products. Still talking about the Cremonini group, there is the presence of investments in slaughter and beef production. From the ASSOCARNI website (National Association of Industry and Trade Meat and Livestock), in the shareholders' list there is several processing companies that have dedicated themselves to distribution through a series of economic investments as Bioalleva in Veneto, Botteri in Trentino etc…

b. The role of contracts and price transmission

Beef consumption is decreasing very slowly; this nature of consumption cannot be held responsible for changes in the price of meat over a very limited period.
Considering the most representative category of animals in our country, defined as half-breed / crossbreeding, the average price for calves expressed as live weight, has evolved over the years as represented by Figure 29

Since 2010, the starting point of our survey, there has been a decrease in the import of beef, which has led to an unchanged number of animals slaughtered in Italy, with a consequent increase in the average price of calves at origin. This price trend is also justified by the overall decreasing trend in imports of live animals from other countries. The decrease in beef imports has not led to an increase in domestic demand in the country, due to a generalized decrease in meat consumption per capita.

The price of beef is a very different question, it is an economic value that derives from a production process that goes beyond primary production and involves a series of actors that we talked about earlier. First, meat is composed of a series of cuts that have very different economic values due to the nature of the anatomical region in which they are located.
Retail sales bring with it an economic value that is the result of the intermediate phases to which the animals and carcasses are subjected. Typically, we talk about slaughter and subsequent processing. For the agricultural part only, we have breeders who very often have a low bargaining power compared to the meat processing industries and even lower compared to the distribution and sale of the final product. As we mentioned in the previous paragraph, breeders very often find themselves isolated in a free market that decides the final selling price thanks to the high bargaining power of the meat processing industries and large-scale retailers. Overall, farmers have very low bargaining power with respect to industrial and distribution actors even if grouped into producer organizations. Industrial and distribution players have the possibility to intervene in the market and modify meat supplies and consumers' prices. In this condition, the breeders remain attached to the industrial productions that drive the quantities and decide the transmission of the price in the chain.
To oppose this phenomenon, a growing number of cattle farms are flexible and may modify the supply in the market by anticipating of or delaying the sale of animals around 18 months This possibility is feasible within certain limits since the sale price may decreases beyond a certain category of live weight at slaughter.

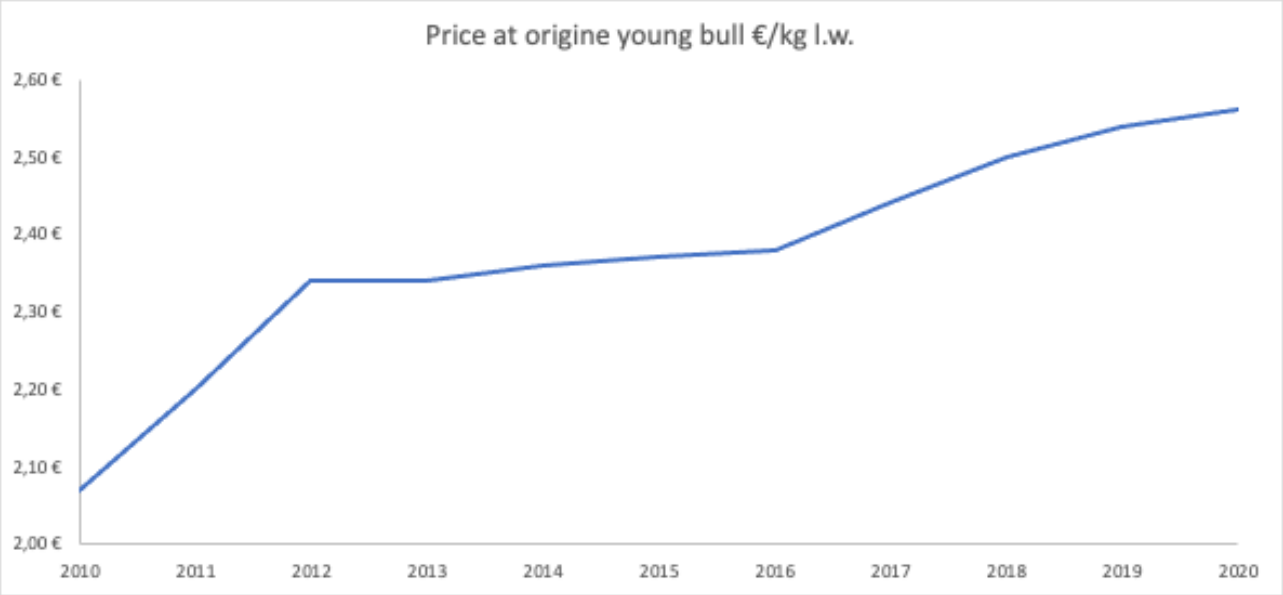

Figure 29: Young bull price evolution at origin (€/kg of live weight). Source: ISMEA

The transmission of the price is mainly linked to the quotations of representative cattle market of Modena. In addition to this characteristic of the distribution, we also have the modulation of supply governed by producer associations that act as an indirect instrument of agricultural policy with a specific price modulation function. Additionally, the role of contracts in the beef value chain has become very important. A very significant share of cattle farmers work under contract with a fixed price and quality premia, negotiated either with the feed industry or the meat industry. Sometimes even colleague cattle farmers act as contract counterparts. In these contract prices is fixed before the finishing period of the cattle

The **policy framework** related to the sector has been analyzed through structured interviews. Certainly, past policies and trade agreements have influenced power dynamics within the value chain. To detail this aspect, it is appropriate to quote the answers we have received to this fundamental question:

- *In the case of beef livestock support policies have managed to maintain the national supply.*
- *(Agricultural Policies) have a limited ability to influence power dynamics.*
- *Given the condition in which the livestock sector is concerned, being very fragmented and with little power of aggregation of supply, all sector policies cannot ignore this condition by modifying the trend of the market.*
- *Civil society has always influenced the livestock sector due to products that are below cost and available every day.*
- *Politics has increasingly neglected production and the value of the supply chain, focusing on environmental issues.*
- *The European policy with the Common Agricultural Policy (CAP) has influenced the world of primary production, while the value chain of the product has been managed above all by the large-scale distribution.*

- *The policies have allowed an important development of the sector both from the production point of view and in environmental issues.*
- *It is always the market and the consumer who change the agenda, politics and distribution sectors can only indicate on which tracks they should move.*
- *Beef cattle farmers have been able to count on the premiums of the CAP and rural development program that are fundamental to maintain an acceptable level of income while there has been no strong policy of valorization of the product on quality markets, including international ones.*

These are the main responses received and show a diversified view of the policy issue within the sector. The common opinions are certainly to increase the quality of products, maintain prices and increase the environmental sustainability of the sector. The main policies that influence the beef sector are certainly health policies and both national and European sector policies also linked to traceability and branded products. The final consumer is certainly the most important driver of production choices, and it focuses more and more often on animal welfare, the tendency to graze and certainly the reduction of veterinary drugs.

Changes in policies have been driven mainly by the legislator, counting little on issues raised by consumers and production actors. The interview showed that farmers are the least of all actors who have driven the changes. Slightly more weight is attributable to the final consumer and an important weight to the processing industries and trade associations.

In the policy section of the interview, there is an important contradiction in the context of processing industries and traders. In the previous sections, industries were defined as the main actor as bargaining power and as a series of subjects capable of changing the market in the final price of the product. In this case, however, we note how the weight is reduced or at least the sector is not very important compared to the legislator and trade associations.

c. The place of differentiation in the value chains

The main tools of differentiation of the product are the Community PDO (Protected Designation of Origin) / PGI (Protected Geographical Indication) trademarks, specific labels of the individual supermarket chains, organic products and quality assurance schemes set up by the producer organizations to which we will dedicate a separate paragraph. What we are also focusing on is the emergence of alternative value chains.

Community-branded beef products with PGI lables are very limited, especially within the national market. Two PGIs need to be mentioned here: "Vitellone Piemontesi della coscia IGP" and "Vitellone Bianco dell'Appennino centrale" . This last PGI which can be translated as Young bull of the Central Apennines. Within the total supply of beef on the national market this PGI labels represent a very limited market share. The Vitellone Piemontese is produced in the region of Piedmont exclusively with the Piemontese cattle breed. The cattle breeds that are part of the PGI Vitellone Bianco dell'Appennino Centrale are those typical

of the central regions of the Italian territory: Chianina, Marchigiana, Romagnola. The only processed product that has a PGI label is “Breasola della Valtellina”, a cold cut derived from anatomical regions of the hindquarter, typical of Sondrio province in Lombardy, but primarily based on imports of beef, particularly from Brazil.

With the available data we are unable to separate the market share of Vitellone Bianco PGI from the rest. The only information we have available is the selling price of meat. In the case of PGI breeds: Marchigiana, Romagnola, Chianina we have an average production value of 51 million euros for the year 2021 (ISMEA 2022 data) which represents value of production (143 million euros is the consumer value). It is difficult to compare these values with the aggregated value which is expressed as a value at basic prices and is around EUR 2.98 billion.

In fact, these are very small market shares. In contrast, the brands of the individual supermarkets have a greater weight in value and in retail sales quality.

The main purpose of branded products is certainly the differentiation of products and their diffusion with marketing operations. The reality is that the majority of the bovine meat market is undifferentiated and linked only to the brands of meat processing companies with a minimum very limited share (few percentage points) of PGI products.

An interesting aspect concerns the birth of alternative value chains created to contrast the main agro-industrial groups and provide greater choice to the consumer. The main problem of these value chains is related to their survival in the market.

The actors in this value chains focused on two main objectives: a) market price competition and therefore consumer accessibility, and b) differentiation of the product from mainstream market, through guarantees of quality and environmental sustainability of the products. The key point of sustainability is to show how animals and farms not only provide basic goods but also provide ecosystem, landscape, and multifunctional services.

The role of **organic farming** within the beef sector is closely linked to the various instruments to support the sector: CAP resources, supply chain contracts and the national action plan. If organic breeding is done for ethical and ideological beliefs as well as for economic reasons linked to public support, it certainly provides a series of side actions such as direct sales and the integrated supply chain. According to ISMEA, investments in the organic beef production sector have intensified, especially to manage vertical integration of the supply chain.

The main issue concerns the low-price difference between organic and conventional products which does not cover the additional production costs in the organic regime. The point is that beef is already the most expensive type of meat for the consumer and therefore the price difference of organic beef with conventional beef cannot be too high. The higher price for organic beef explains the low demand for this product In 2019, the share of animals slaughtered from organic farms does not exceed 3.5% (ISMEA, 2019).

In time there is however a positive trend in the demand for organic beef cattle.

Finally, we found a contraction in the beef demand, combined with an increasing demand for organic products, especially due to the current trend in consumption patterns. Consumers are very careful to invest

in food and purchase mainly high-quality products. Such evolution in the consumption patterns directly affect the upstream stages of the value chain. Indeed, to fully adhere to organic livestock production specification, there is an impulse to develop short supply chains with products distributed in proximity of the production sites.
Finally, for the hamburger sector, which is a very important segment of the beef market, it is difficult to quantify the share of the market held by this product of the meat industry. The work we have done is a search on the net of interesting articles that talk about the topic. In the first instance it is a product that limits the production (they are also prepared with excellent meats, with less valuable cuts and dairy cattle at the end of their career) of waste from beef processing but above all it is rich in technology, easy to prepare, tasty, tender and savory. The market needs innovation and above all bringing services to the consumer's table. In recent years we are also witnessing the preparation of foods with high quality meat and certain breeds such as Chianina which sees most of the meat sold as burgers and not as steak unlike in previous years. An advantage of burgers is the valorization of the fore quarters of the beef cattle, that otherwise would have been sold with difficulties. We do not have qualitative data that support the market of different types of meat, but the consumer orientation is clear and the production satisfies the requests. Evidence of the increased demand for minced meat (burgers) is the rise of the number of burger restaurants in Italy (Burger King, McDonalds, Old Wild West etc.)

In the last fifteen years producers' organisations have been working hard to define product specifications for high quality beef. Examples are the regional initiatives of the producer organization Unicarve in Veneto of beef produced under the umbrella of Qualità Verificata (Verified Quality) and the national quality system "Sigillo Italiano". Both initiatives have been backed by an official recognition first by the regional administration of Veneto and subsequently by the national Ministry of Agricultural Policies. Adhering to the labels is voluntary but allows the beef cattle farmers to obtain a better price on the market.

References:

- The Observatory of Economic Complexity
- INTERCARNEITALIA – Interprofessional organization of bovine meat produced in Italy
- ASSOCARNI - National Association of Industry and Trade Meat and Livestock
- ISMEA – Istitute of Services for the Agricultural Food Market
- EUROSTAT – Statistical office of European Union
- ISTAT – National Institution of Statistical analysis
- BDN – National Zootechnical Register
- MASAF - Ministry of Agriculture, Food Sovereignty and Forestry
- Ministry of Health of the Italian Republic
- Eurostat 2020 – Agriculture, forestry and fishery statistics – edition 2020

The dairy value chain

The French dairy value chain

Corentin Puvilland, Marion Cassagnou (IDELE-ACTA)

Key findings :

- Since the end of the quotas in 2015, the number of dairy farmers declined as well as the national herd. The dairy herd is distributed in the so-called "dairy crescent" which goes from the Pays de la Loire to the Massif Central, passing through Brittany, Normandy, the Hauts de France, the Grand Est, and the Jura.
- Farmers, dairy industries and retailers are the main actors of the value chain. More than 55% of farms deliver their milk to a cooperative and 45% to “private” processors. Among the dairy industries, four are multinationals placed in the top 20 companies. Some are specialized in the production of cheese whereas others are multiproduct.
- Retailers are highly concentrated, and it leads to asymmetry in the governance of the value chain. As milk is perishable, farmers don’t have lot of market power individually. To balance the power of some few actors on milk prices, the government decided to implement a law named Egalim.

1. DESCRIPTION OF THE PHYSICAL FLOWS IN THE VALUE CHAIN

a. Structure of production

Features and evolution of the French cow dairy herd

France has the second largest dairy herd after Germany, with 3.32 million heads in 2021. The dairy herd is distributed in the so-called "dairy crescent" which goes from the Pays de la Loire to the Massif Central, passing through Brittany, Normandy, the Hauts de France, the Grand Est, and the Jura.
Dairy cows are mostly bred in the north-West of France; Normandy, Pays de La Loire, and Britany comprise half of the national cattle.

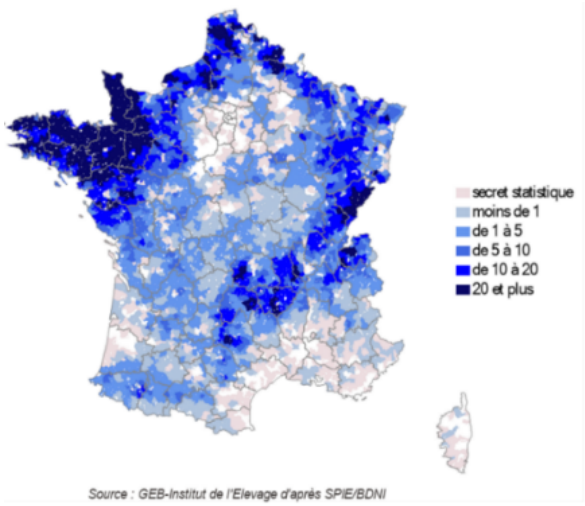

Figure 30: Spatial distribution of the French cow dairy herd. Source: GEB-Institut de l'Elevage, from SPIE/BDNI data

The dairy herd suffered a decrease by 9 percent since 2015, mainly because of the strong decline of the number of dairy farmers over the last two decades (-4% per year in average since 10 years). For the past 2 years, the rate of decline of farmers has remained steady (-4% per year) but the growth in the size herd per farm has slowed down. Therefore, the decrease of the national cattle has accelerated. The decline in livestock is particularly strong in the southwest of the country; the Occitanie region has lost 25% of its dairy cattle since 2015.

Evolution and structure of French cow milk deliveries

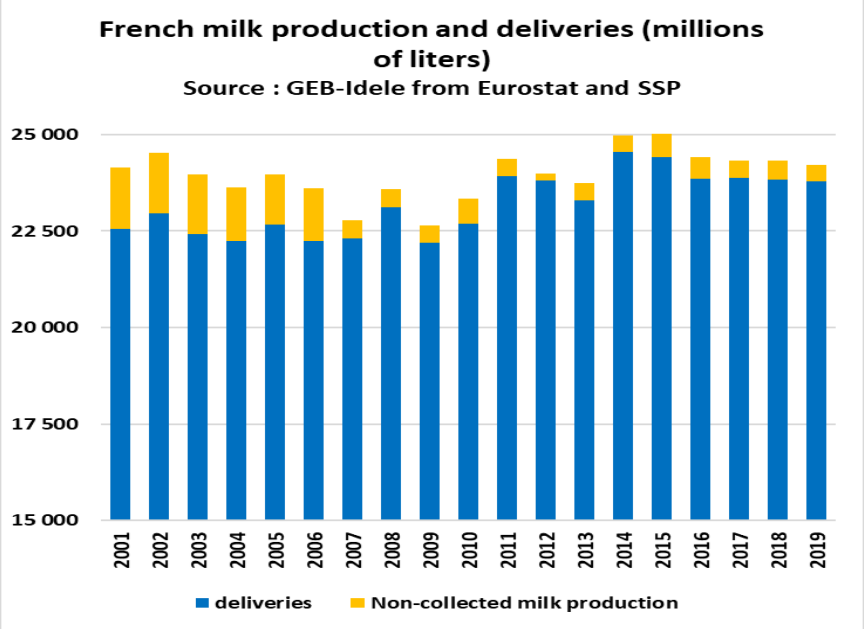

Figure 31: Repartition of production and French milk deliveries. Source: GEB-Idele from Eurostat and SSP data

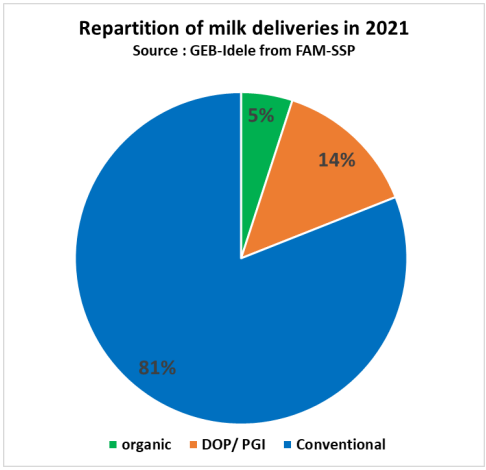

Figure 32: Repartition of milk deliveries in 2021. Source: GEB-Idele from FAM-SSP data

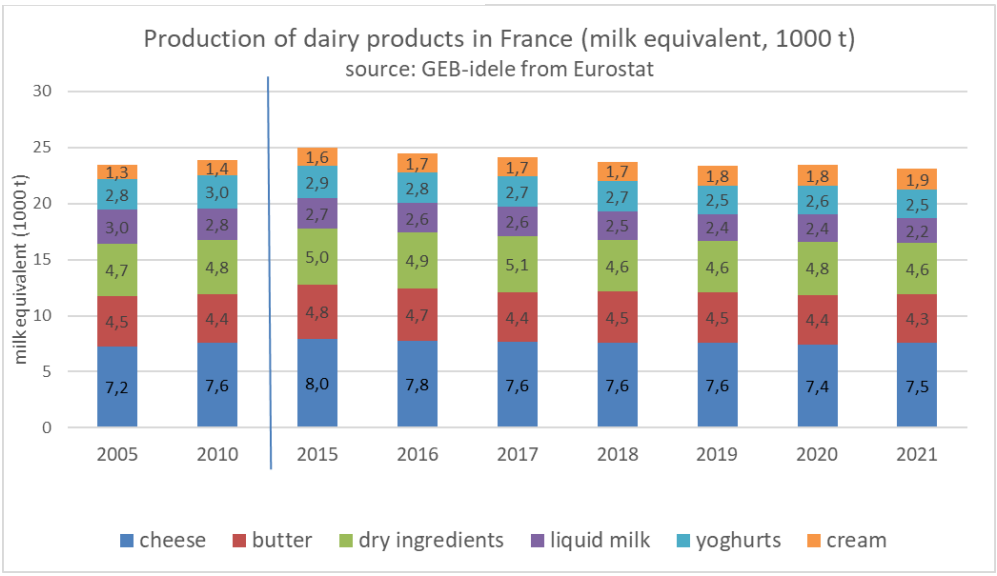

Figure 33: Production of dairy products in France (1,000t of milk equivalent). Source GEB-Idele from Eurostat data

Milk production reached a peak in 2014 at the end of the European milk quotas and has been decreasing during the 5 last years. 23,195 billion of litter have been collected in 2021, 4% less than in 2015. The proportion of milk collected has been up in the last 2 decades. It represented 98% in 2019, against 92% in 2001.The production of organic milk has been going up sharply during the last decade. Deliveries of organic milk have more than doubled between 2015 and 2021, reaching 1,24 billion litres in 2021. About 14% of the cow milk collected in France is used for the manufacturing of designated origin products (DOP) (13%) and protected geographical indication (1%), overwhelmingly to produce cheese; this share has remained quite steady in the 2 last decades. Most of the milk collected in the Jura and Alps is valorised as AOP cheese. In contrast, in central massif only 25% of the milk is valorised as AOP.

Production of dairy products

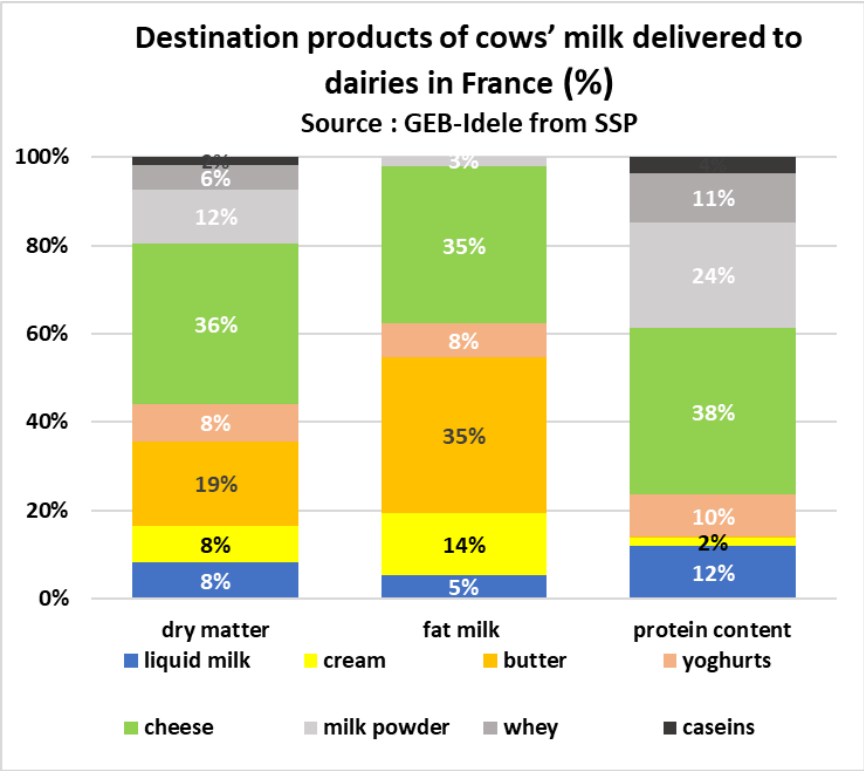

Figure 34: Evolution of the production of dairy products in milk equivalent. Source: GEB-Idele from SSP data

Cheese remains the first product processed in France: 7.5 million tons (out of 23.5) of milk are utilized for this production.

The repartition of production between different products has been quite steady since 2005. Nevertheless, the part of liquid milk has decreased by 4 points (from 14% to 10%) since 2015, mainly because of the reduction in consumption of this product. Similarly, the share of milk used to manufacture milk powder has decreased since 2015 (from 14% to 12%), as it is a low value-added product, often used as an adjustment variable.

As milk deliveries have decreased in recent years (-4% since 2015), dairy processors have preferred to maintain the production of high-value-added products (finished products), at the expense of powder manufacturing. For this reason, the proportion of milk used for the production of cheese and cream has increased (from 30 to 32%, and from 6 to 8% respectively). Those evolutions are mainly related to the trends on the French retail market.

More than one-third of raw milk in France is used for cheese production (35%). The production of butter uses almost 20% of the dry matter/milk solid collected in France, but 35% of the fat milk (as much as cheese). The production of milk powder consumes one quarter of the protein content. The two main outlets for dairy products in France are sales of finished products to French households (42%) and exports (40%).

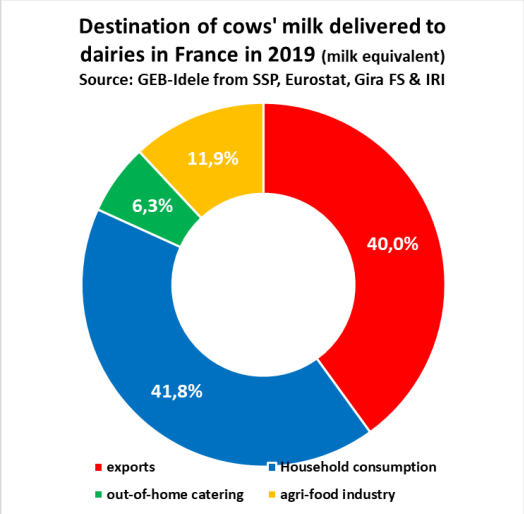

Figure 35: Destination products of cow's milk delivered to dairies in France (%). Source: GEB-Idele from SSp, Eurostat, Gira FS and IRI data

b. Trade and trade relations with other countries

Germany, Belgium, and China are the 3 most important clients of France. The exports of French dairy products have been increasing in the last 20 years, going from 4 billion euros in 2001 to more than 7 billion in 2020. The proportion of exports to extra-EU countries has increased from 34% to 48%, notably because of the fast growth of exports to China (8% in 2020). The exports to the U.S. more than doubled and represented 2.8 billion euros in 2020 (4% of French exports). The importance of exports to Italy and Spain has decreased in the last 10 years, because milk production has been up in both countries since the end of the European quotas.

Between 2001 and 2020, the exports of dairy products in milk equivalents have increased by +27% (from 8 Mt to 10.25 Mt). French dairy exports peaked in 2015, the year milk quotas ended, but have been declining since then by 8%.

In 2020, 10.25 Mt of milk equivalent were exported, against 11.32 Mt in 2015. Firstly, this is due to a slight decrease of milk deliveries in this period, which have been down by -3%. Then, the part of the milk exported (in the total milk deliveries) has lightly diminished (from 44% in 2015 to 42% in 2020 (it was only 35% in 2001).

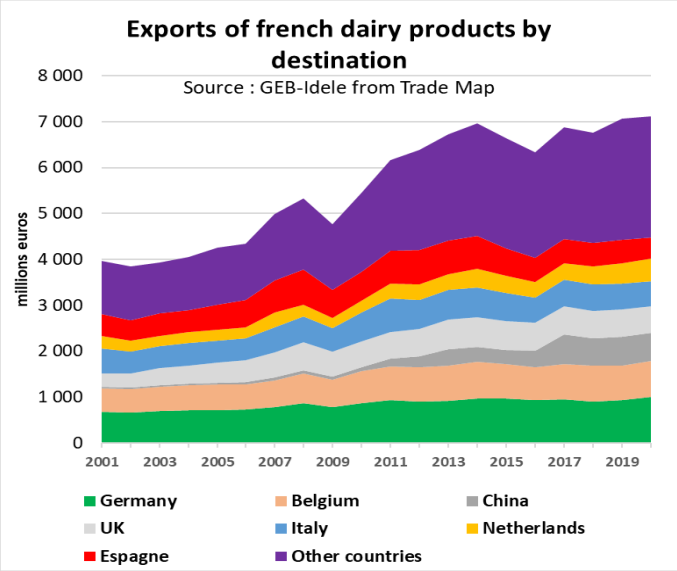

Figure 36: Evolution of exports of French dairy products by destination. Source: GEB-Idele from Trade Map

More protein exported

Between 2015 and 2021, only the exports of dry ingredients (casein, whey…), cheese, and milk powder have remained almost stable, but the exports of cream (-12%) and butter (-14%) have decreased sharply. The French butter is less price-competitive, for example compared to the new-Zealander products, because the fat proportion is lower in France. On the contrary, French cheeses benefit from their quality competitive advantage, and their exports keep increasing in value despite their slight decrease in volume.

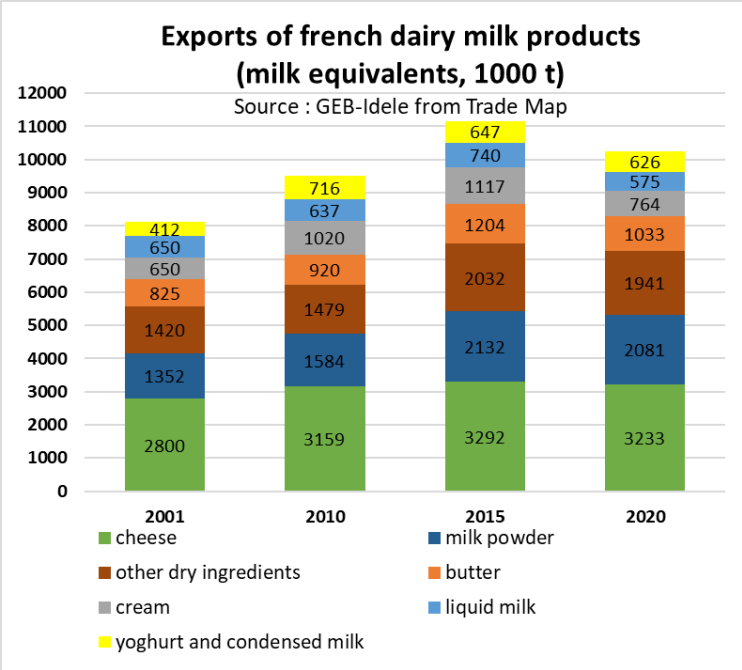

Figure 37: Exports of French dairy milk products (1,000 tons of milk equivalent). Source: GEB-Idele from Trade Map data

Because of the large surplus of proteins in the French dairy market, large amounts of skimmed milk powder are exported, notably to the Netherlands, China, Italy, and Algeria. As a result, exports of proteins (12 billion of milk equivalent) are way higher than exports of fat (7 billion) (Figure 38).

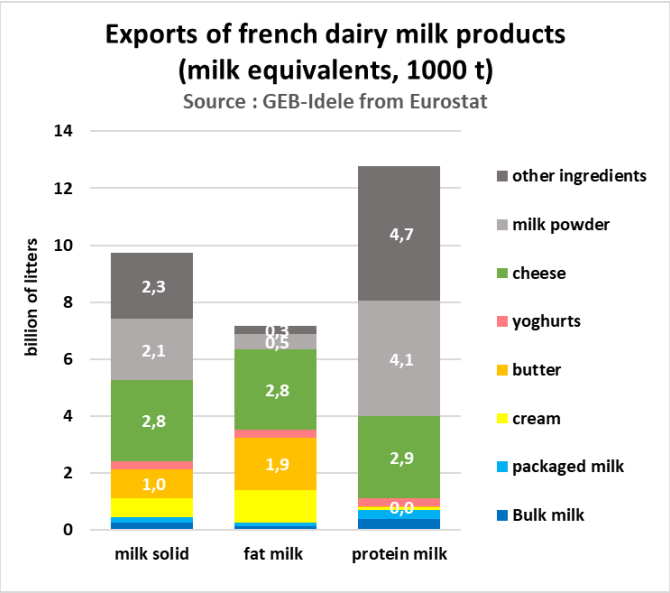

Figure 38: Exports of some French dairy milk products (billions of litters in milk equivalent). Source: GEB-Idele from Eurostat data

Like exports, the imports of French dairy products have nearly doubled in 20 years, going from about 2,2 billion in 2001 to 3,9 billion in 2020. Unlike the exports, the rise of imports is related to an increase of imports from European countries, especially from the 4 first exporters in 2020: Netherlands, Italy, Germany and Belgium. 98% of the imports come from the European Union in 2020 (Figure 39).

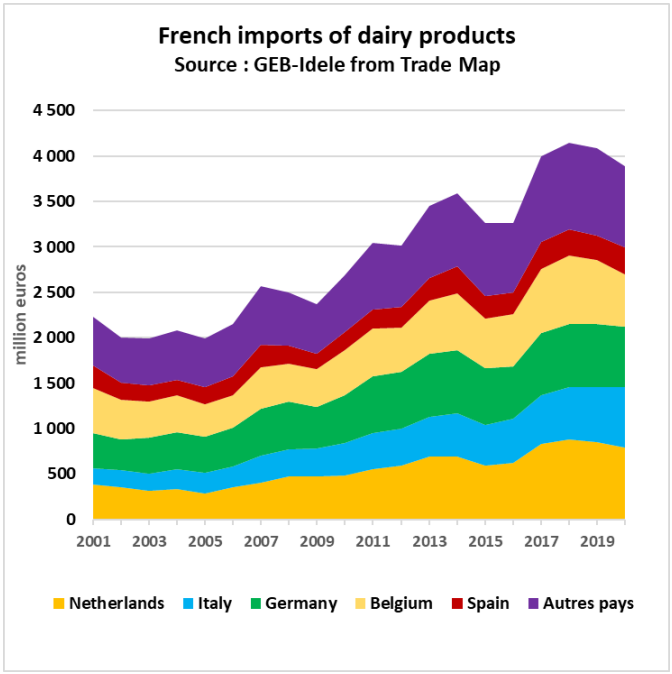

Figure 39: Evolution of the origin of French imports of dairy products. Source: GEB-Idele from Trade Map data

Imports of dairy products from Italy have been multiplying by 4 since 2001, mainly due to the increase of French consumption of Italian PDO cheeses. The growth of imports from Netherland (+109% /2001 in euros) and Germany (+69% /2021) is related to the increase of imports of cheese and butter bought by the French agri-food industries. The increase of imports from Ireland (+117% /2001) and Belgium (+17%) are mainly due to the development of purchases of butter in the French agri-food industries.

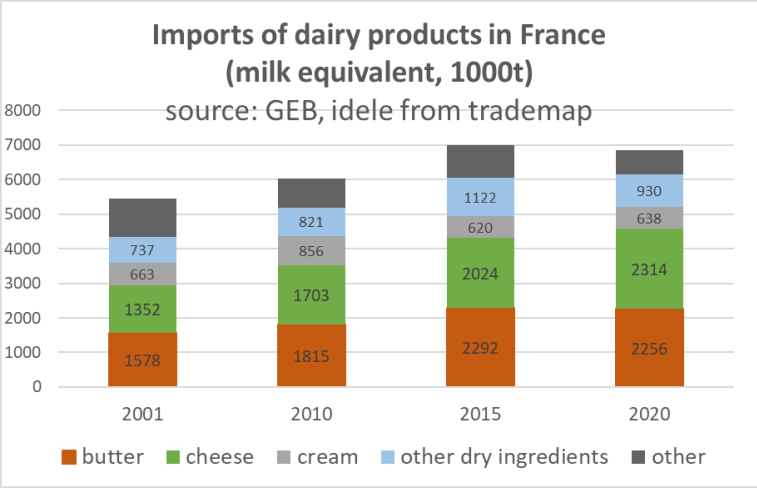

Figure 40: Evolution of the repartition of different dairy products imported in France. Source: GEB-Idele from Trade Map data

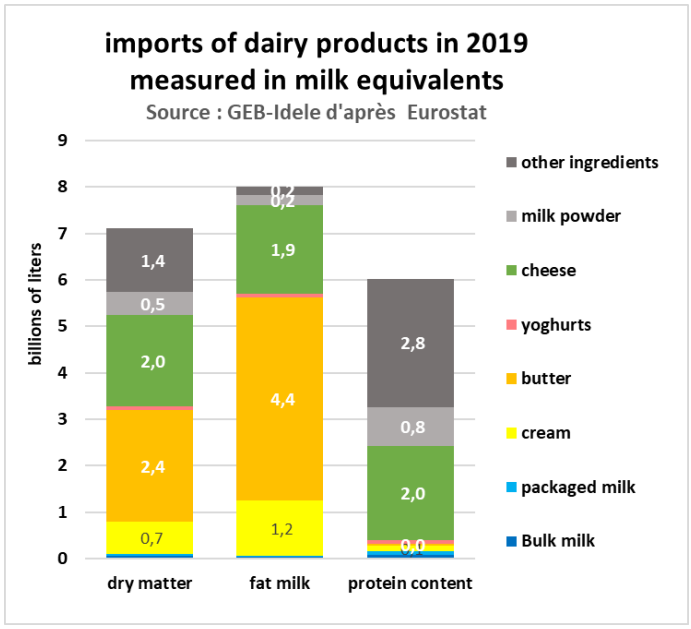

Figure 41: French imports of dry matter, fat milk and protein content (2019)(in billions of litters in milk equivalents). Source: GEB-Idele from Eurostat data

Between 2001 and 2020, the imports of dairy products in milk equivalents have increased by +26% (from 5,4 Mt to 6,9Mt). French dairy imports peaked in 2018 (7,7Mt). The growth of imports is related to the increasing imports of butter and cheese, which represented each one third of the milk equivalent imported in 2020 and have both strongly increased in the two last decades. Imported dairy products are mainly ingredients (cubed butter, cheese, bulk milk and cream) for the food industry. Because of the heavy imports of butter, the imports of fat milk are way more important than the imports of protein (Figure 40,Figure 41).

Logically, butter is the only dairy product with a negative trade balance. On the contrary, the trade balance is strongly positive for products with high protein content (cheese, milk powder, and other ingredients) (Figure 42).

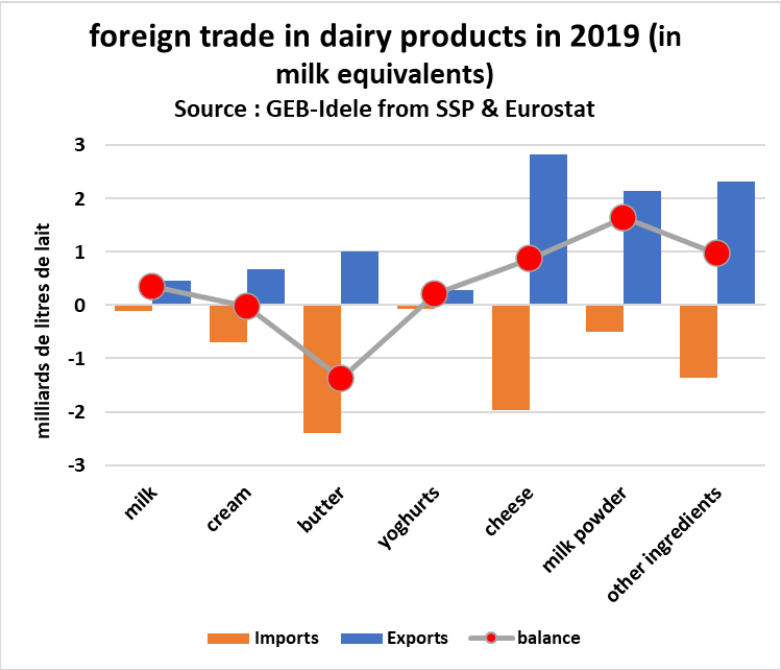

Figure 42: French foreign trade in dairy products (2019). Source: GEB-Idele from SSP and Eurostat data

c. Retail sector and consumption

According to the Figure here below, in supermarkets, since 2013, liquid milk consumption has decreased by 23%. Yogurt consumption went also down sharply (-14% /2021). On the contrary, cheese and cream purchases have increased (+8%). These trends are very stable over time. French products represent more than 95% of retail consumption for every products, except for cheese (86%). Imports have a larger share in the industry's purchases.

In terms of apparent milk consumption (production - exports + imports), 21,5 billion liters of milk were consumed in France in 2019, out of milk production of 25 billions liters. The percentage of self-sufficiency in dairy production was therefore about 115%. As a result, the French dairy market is balanced in fat milk (consumption equivalent to 25 billion liters, which is the production of milk), but a surplus in protein.

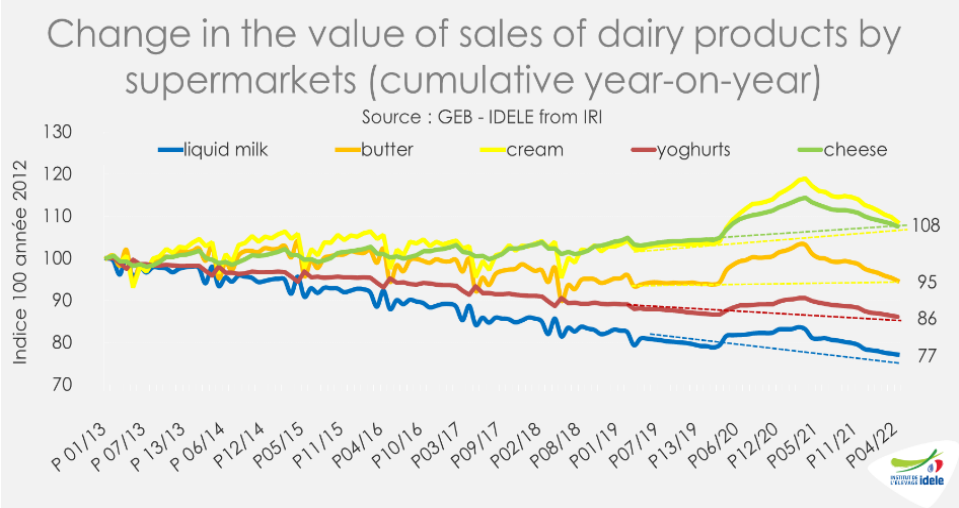

Figure 43: Change in the value of sales of dairy products by supermarkets (cumulative year-on-year). Source: GEB-Idele from IRI data

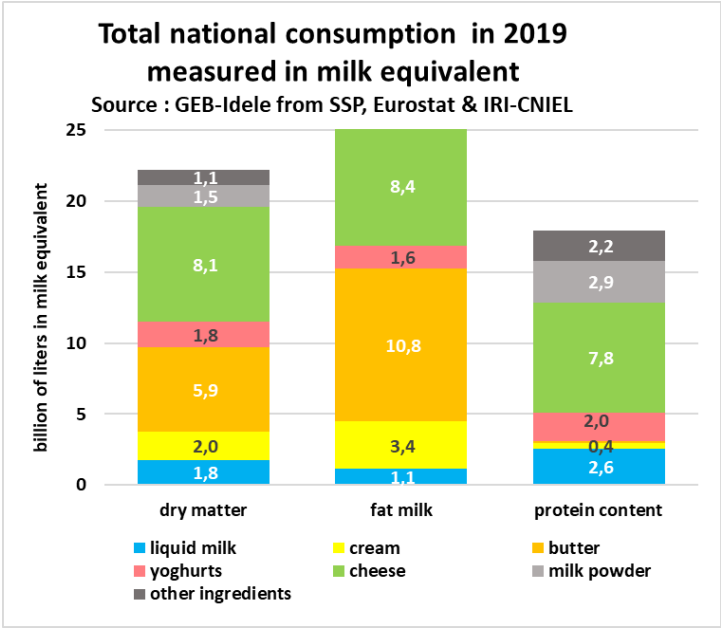

Figure 44: Total French consumption in 2019 (in milk equivalent). Source: GEB-Idele from SSP, Eurostat and IRI-CNIEL data

2. ACTORS IN THE VALUE CHAIN

a. The main actors in the value chain

The actors in the value chain can be divided into 3 categories:
- **Farmers**, producing milk. In 2022, we could count around 47 500 dairy farmers holding more than 10 dairy cows. The national dairy herd consists in 3,4 million cows. Less than 2,000 have on-farm dairy processing and the others deliver their raw milk production, mostly to a single collector. More than 55% of farms deliver their milk to a cooperative, whose managers are generally members, and 45% to uncooperative ("private" collectors/processors) (BDNI , FranceAgriMer and CNIEL).
- **Dairy industries** employ 56,500 employees in 762 processing sites owned by more than 500 companies and with a turnover of €39 billion in 2020 (CNIEL, 2020). Usually, they are responsible for collecting raw milk from producers in addition to processing. Only a handful of operators, usually delivery cooperatives, do not process into finished products and resell all or part of the milk. They can also pre-process it into intermediate products (casein, cream, skimmed milk, serum protein after pre-treatment) marketed to other processors to increase their own supply.
- **Retailers** handle 85% of French households' purchases of food products. Household consumption represents 52% of the national dairy utilization. Dairy products are still very popular and consumed at all meals. They are used as ingredients in many recipes. People buy finished products, massively pre-packaged with a fixed weight like cheese (44%), fresh products (27%), packaged milk (13%), butter (9%), fresh cream (5%) in 2019, according to Kantar. It is largely provided by supermarkets.

The food service sector represents 10% of the dairy consumption. The sector is highly fragmented and heterogeneous between small and individual restaurant and some large chains. It also includes school and company canteens and military, hospital, and penitentiary food service. Generally, some wholesalers can be found between processors and the foodservice sector. Dairy products used in the food service are mainly ingredients (milk, cream, butter, cheese) but also, in a second part, some final products (yoghurt, aged cheese, portion of butter, milk-based desserts).

Food industry utilizes 38% of the dairy demand. They are buying fresh products (liquid milk, cream, butter, cottage and fresh cheeses), dry ingredients (casein, lactose, milk powders, whey), and processed cheese (mozzarella, grated or powdered). Fresh products are similar to those sold for food service and to retailers. But ingredients are specifically manufactured for the food industry who incorporate them into their recipes. They are used in a wide variety of agri-food products (infant food, sauces, bakeries, chocolate, charcuterie).

About two-thirds of dairy products used by the food service are imported (65% in 2019 according to our estimates). 71% of the cream used and 61% of the butter are imported. The share is less important for the cheeses (39%). Despite the French high milk surplus in milk proteins, the share of dry ingredients (milk powders, whey, casein, serum proteins) imported is relatively substantial (30% for powdered milk and 35% for other ingredients).

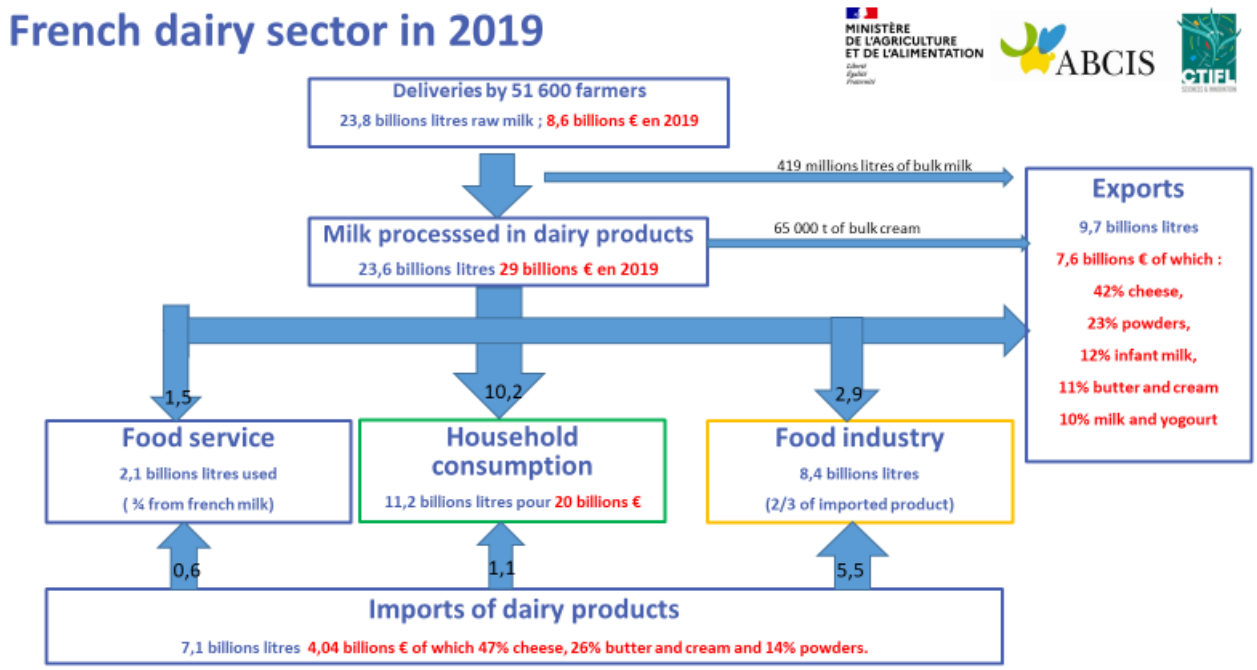

Figure 45: Representation of French dairy sector (2019). Source: GEB-Idele

b. Typology of actors in the value chain

47,500 professional dairy farmers (owning more than 10 cows): Nearly 9,500 dairy farms operate a dairy farm with over 100 cows and hold more than a third of the national dairy herd. Conversely, another 16,000 dairy farms have herds of less than 50 cows and together hold 15% of the national dairy herd.
The national deliveries reached 24 Mt in 2022. Dairy farms delivered an average of 505,000 litres in 2022 with an average herd of 72 dairy cows.

Collectors and processors are concentrated: the ten main dairy groups now provide 78% of the deliveries and 80% of the dairy production. Five of them have become multinationals with a strong international presence. It includes a cooperative (Sodiaal) and four private companies (Lactalis, Danone, Savencia and Bel):

The other group of dairy industry have different sizes and market positions: cooperatives of regional to inter-regional size, cooperatives and smaller enterprises in high value-added markets, delivery cooperatives, private specialized companies and finally small processors positioned on PDO products.
Some examples of them:

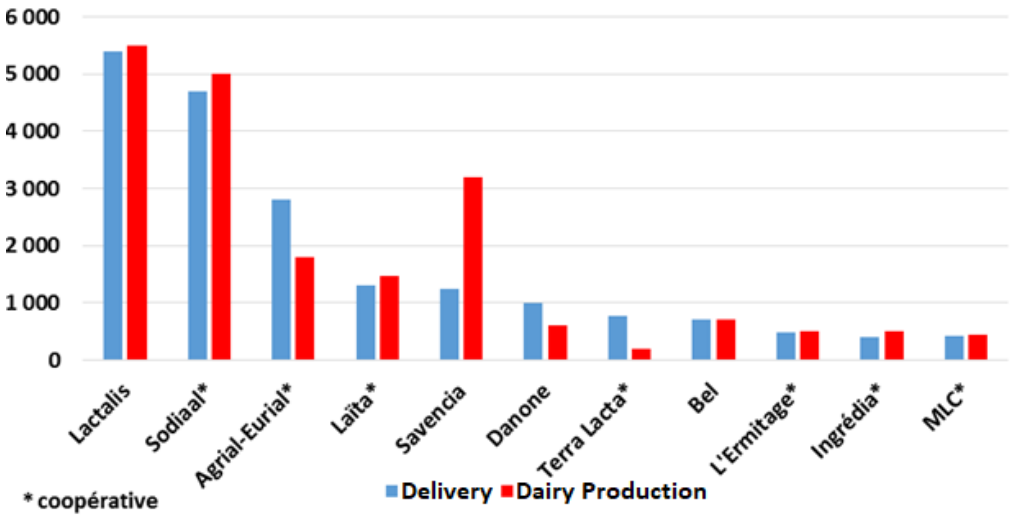

Figure 46: Main collectors and processors in 2017 (million litres)
Source: GEB-Idele from company data

French **dairy cooperatives** account for 55% of the national deliveries, but only 45% is processed. The rest is sold to private processors with long term contracts (5 to 10 years). Within them, it includes a wide variety of situations:

- Some cooperatives are only collectors (Altitude in Cantal, Laitna in Hauts de France, UPLV, ULM in Meuse, Terra Lacta in Nouvelle-Aquitaine, Agrial for a part) and resell the milk or pre-process it.
- Some are collectors and processors without subsidiary (fruitière in Franche Comté, regional cooperatives such as Ermitage in the East, Maître laitiers du Cotentin or Isigny in Normandy).
- A national cooperative group specialized in dairy. Each type of product is sold in a subsidiary organization (Sodiaal).
- Some cooperatives involved dairy production, but also having other processing activities (Eurial/Agrial, Eureden, Terrena and Even codetent of the SAS Laïta).

Retailers are highly concentrated with only 6 main purchasing groups (Carrefour, E. Leclerc, Intermarché, U and Auchan system, Casino). The three main retailers, Leclerc, Carrefour and Intermarché have together 56% of food supermarket share.

Table 2: Characteristics of French main retailers. Source: GEB-Idele

Retailers highly concentrated

Main retailer in France	Market share in France	Turnover FR (Billions €)	Turnover Monde (Billion €)	Part of french market
Groupement E.Leclerc	22%	48	50	97%
Groupe Carrefour Envergure*)	20%	38	80	48%
Intermarché (Auxo)*	16%	34	46	25%
Groupement U (Envergure)*	11%	26	26	100%
Auchan Retail	10%	17	46	36%
Groupe Casino (Auxo)*	8%	17	31	55%
Lidl	6,3%	11,5	81	15%
Cora	2,8%	6	8	75%
Aldi	2,4%	4	82	5%
Amazon	faible	?	500	?

*Purchasing group common to different retailers

3. THE GOVERNANCE OF THE VALUE CHAIN

a. Power relations in the value chain

As many other sectors, there is an important **asymmetry** between farmers which are numerous, and the industry combined with retailers which are more and more concentrated.

There is a strong relationship that could lead to dependency between **farmers and their collector**, usually their only buyer, due to the specificities of the product delivered. Milk is a perishable product (storage time limited to 3 days) and heavy (88% of water). The farmer produces a commodity that he cannot store, as grain farmers do, or adjust sharply from one day to the next, except to compromise productive animal capital. The production cycle is very long: on average 29 to 30 months between the birth of a female calf and its entry into production (beginning of its first lactation). As the number of collectors is decreasing (buying or restructuring program) and despite the high rate of reduction of dairy farms, farmers still have insignificant market power individually. In some region, farmers don't have choice for the collector as there is only one in the area. Moreover, as collecting milk is costly in transport, collectors agree to maximize collection rounds. Farmers remain relatively captive to its collector and depend on the price the collector will give them. Nevertheless, in return, they secured a market outlet.

Farmers who deliver to a cooperative usually owe it to their ascendants who had joined the cooperative, or even created it. But time has passed and the cooperative spirit of many farmers has often faded. Lot of cooperatives have merged and farmers have lost the notion of belonging.

To prepare farmers for the end of milk quotas in 2015, the Ministry of Agriculture played a major regulatory role to strengthen the market power (structurally weak) of dairy farmers giving them the right of collectively negotiate their contract through recognised producer organisations (decree of 19 April 2012). This led to the creation of "**Organisation de producteurs**" (OP - farmer organisation). Their main mission is to inform and represent their members to negotiate contract with private collectors.

In 2021, there were 68 farmer organizations in the milk sector, 54 in conventional and 14 in milk under QOIS (Quality and origin identification sign). 62 of them are without transfer of ownership on milk deliveries.

Cooperatives are de facto farmer organisations. Very few of them asked to be recognized as OP probably because there are little additional benefits to cooperative status.

As it is highly concentrated, retailers have an enormous market power. Only the biggest dairy group can sometimes have a balanced negotiation power with the main retailers. In general, the cooperatives negotiation power is less favourable than for private dairy groups. They have fewer emblematic and well-known brands and sell them under private label. Moreover, because of regional location, they export less.

Examples of brands:

Cooperatives	Private companies
   	    

Created in 1974, the National Interprofessional Center for Dairy Economics (**CNIEL**) is the association representing milk farmers, private dairy companies, dairy cooperatives, retailers, and food service. The main missions are:

- Organize economic relations between producers and processors (including providing information, economic data and indicators, decide strategic orientation)
- Coordinate collective research programs for a better understanding from production to the consumer, and collectively manage dairy product safety
- Promote dairy products to French consumers through advertising.

b. The role of contracts and price transmission

Historically, milk price varies from month to month based on seasonality indices, usually defined in a regional inter-professional framework (CRIEL) and according to indicators of market (dairy product prices on internal and world market). There is no raw milk spot market for farmers (obligation to deliver milk to a collector) but it exists between collectors and processors to adjust their availabilities (surplus or deficit depending on the period and their process capacity).

Until 1997, the milk price was nearly administered: the **CNIEL, the inter-branch organization** determined a basic price. Processors used it and add a quality bonuses/malus depending on milk quality (% of fat and protein). Then, from 1997 to 2009, the CNIEL moved to a recommendation of a basic price based on three market indicators: butter and skimmed milk powder prices (30%), Gouda, Emmental and Edam prices in Germany (20%) and the price of products sold in supermarket in France (50%). In 2004, a new additional indicator allowed companies to take into account changes in butter and powder prices depending on their share in the company's product mix.

Over time, collectors have gradually detached themselves from the CNIEL indicators, which at the same time proposed a very wide range of market indicators that were validated by the European Commission in 2019.

Table 3: Some milk price indicators used

Indicator	Publisher	Update	Description
IPAMPA	Idele	Monthly	Indicator of purchase prices for agricultural production
Butter-Powder indicator	Calculated by CNIEL with prices from the FAM survey	Monthly	Valorization of milk processed into butter and powder
French milk price	FranceAgriMer	Monthly	Survey of FranceAgriMer (FAM) for standard milk price expressed in 38g of fat and 32g of protein
German milk price	ZMB	Monthly	Standard milk price converted in 38g of fat and 32g of protein
Italian milk price	CLAL	Weekly	SPOT price for pasteurized whole milk from France in Italy
Cost price of milk	Idele, CNIEL	Yearly	Calculated according to Idele method for dairy farms (without any other animal or plant production)
Production costs of milk	CER, Inosys, Farmer organisation	Yearly	Production costs calculated regionally or for the farmer organisation
MILC	Idele	Monthly	Margin indicator calculated from milk price and purchased prices
German cheese prices	ZMB	Monthly	Kempten prices
PVI Indicator	INSEE	Monthly	Industrial selling price
Consumer price	IRI-Cniel	Monthly	Selling prices to households in hypermarkets, supermarkets

Contracts have been implemented few years before the end of milk quotas in Europe. The relationship between farmers and their collector is now defined in a contract for those who are milk suppliers (non-cooperative collector) or in a “contribution or cooperative contract” for those who join a dairy cooperative. Farmers deliver milk to cooperatives without being members. In that particular case, they are suppliers and have a contract.

Since the **EGAlim 1 law** nº2018-938 of 30 October 2018, “upstream” indicators such as production costs and their evolution should enter the negotiations on the methods of fixing and developing the milk price. Because the law now imposes an agreement at the end of the negotiation (obligation of result), farmer organizations have a real power to negotiate milk contracts with the collector. It also strengthens and clarifies the possibility for OPs to bill deliveries on behalf of their members. Downstream, contracts between processors and distributors fall under the commercial code.

In October 2021, EGAlim2 law inscribes the non-negotiability of the value of the agricultural raw material in the final product in order to safeguard the portion of the final price corresponding to the price of milk payed to farmers. Prices negotiation downstream between processors and retailers concern only the other cost such as energy, transport, packaging, marketing… The objective of this law is to reverse the constitution of agricultural commodity prices to ensure fair return to farmers but only concern the milk sold to retailers (42% in 2019).
The price of the milk used for exported products (40%), or sold to food industry (12%) or to food service (6%) is not concerned yet by this new law.
In conclusion, the milk price depends on the collector and the mix-product processed. Dairy products for sale on the French market for retailers should take into account indicators on production cost (Production cost indicators are available on the Idele website : https://idele.fr/detail-dossier/indicateurs-de-reference-pour-la-contractualisation). Product for export will follow prices on German market and product for the food industry will take into account butter and skimmed milk powder prices.

c. The place of differentiation in the value chains

In France, the market is mature for dairy products. The segmentation on packaged milk depends on its fat content (whole milk, skim milk or semi-skim milk), absence of lactose, or added vitamins, but also the size (litre, half-litre) and type of packaging (brick, bottle). The length of the lines dedicated to ultra-fresh in supermarkets is among the biggest in the world. Dairy processors demonstrate product innovation (new recipes, new products), invest heavily on advertising. But, in spite of such efforts, the domestic market for ultra-fresh products declines in volume in 2022 (24,9 kg/hab. in 2022, -2%/2021).
The cheese industries have also diversified the cheese supply to adapt it to multiple uses and moments of consumption: snacking, aperitif, cooking… Thus, this expansion of the supply and forms of consumption has made it possible to compensate for the reduction in consumption of cheeses known as “plateau” at the end of meals.
So, segmentation has been an answer for the dairy sector to contain the decrease of the consumption for one part and to meet consumer new expectations (welfare, environment, …) on the other part.
The segmentation has been promoted by the CNIEL in a program called “France Terre de Lait”. The main objective was the development of organic products with the prospect of doubling production, the consolidation of the PDO with enhanced specifications (integration of societal expectations), the sustainability of mountain milk production with local distribution channels. The CNIEL also wanted to develop the segmentation approaches depending on production methods (grazing, non-GMO…) to create added value.
CNIEL also promotes the reduction of the carbon footprint of French dairy farming with “Low Carbon Dairy Farm” initiative to reduce greenhouse gas emissions.

Increase of labelled and organic production
French milk production is diversifying:

- Organic milk production is increasing fast (5,4% of collection in 2022 in comparison with 2,7% in 2017).
- Production of cow's milk valued in products sold under protected designation of origin (PDO) and PGI (Protected geographical indication) is relatively stable in time around 13% national collection of cow's milk. Most of this milk is processed into cheese.
- Production of unmarked milk outside QOIS (Quality and Origin Sign of identification) are developing (around 8% in 2022). The most well-known brands are « C'est qui le patron ? » (Who is the boss?), « Mont Lait », « Cantavélot », Les laitiers responsables, l'Appel des Prés, Lait de Montagne…

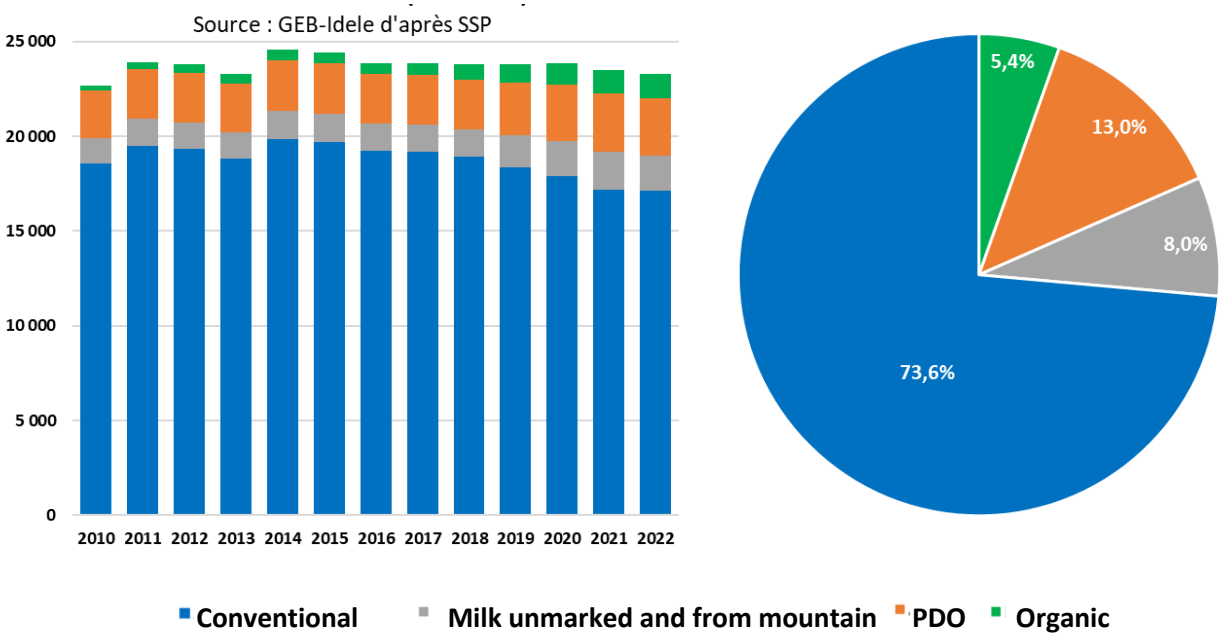

Figure 47: Evolution of French milk deliveries depending on the differentiation (in million litres) and distribution of it (2022). Source: GEB-Idele from SSP

Organic production shows its limits in a context of reduced consumption

The organic milk production has seen an important increase since 2010: it has quadrupled in ten years and continue to rise each year to 1.26 billion litres in 2022 (+2,7%/2021). As the national production is decreasing, the share of organic grow (5.4% of the national collection in 2022). Organic producers (4,200 in 2022 or 9% of total cow milk deliverers) have smaller and less productive farms than conventional producers.

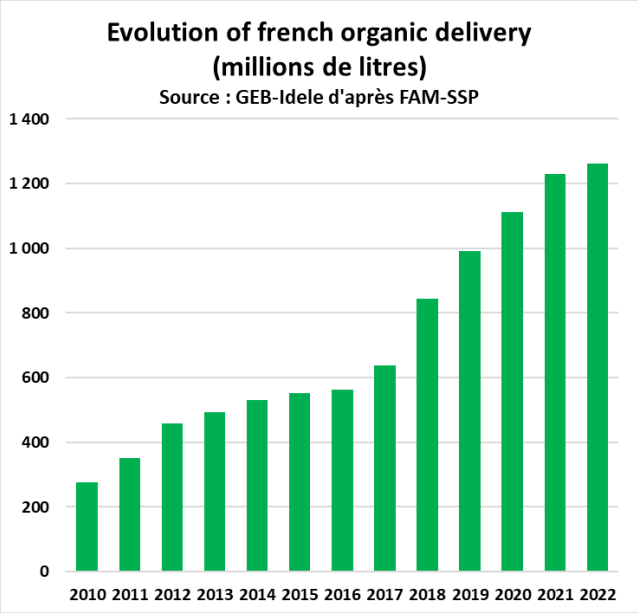

Figure 48: Evolution of French organic delivery (millions of litres). Source GEB-Idele from FAM-SSP data

This development of organic milk production took place in successive cycling waves. Firstly, in the cycle, thanks to an important demand, a growth phase took place and generated a surplus of supply that is followed by a crisis phase of overproduction causing stops of conversion or even de-conversions. The last wave, launched in 2017, was led by the main French dairy processors, including Eurial, Lactalis and Sodiaal, which together with Biolait collect around 75% of organic cow milk in France. Brittany and Pays de la Loire is by far the first organic dairy area representing 44% of the national delivery. Then, Auvergne-Rhone-Alpes (14%), Normandy (11%) and the Great East (11%) belong to secondary areas. After allowing many conversions and helping with technical advice, in 2021 the main processors stopped conversions. Currently, the sector faces a brutal stop in the demand for organic dairy products. There are more expensive in a context of inflation but also because there is a competition with other segmented products (local, better price for farmers, grazing…). An important part of organic milk has been processed in the conventional sector in 2022.

Between 2015 and 2020, household purchases of organic products more than doubled (from €6.0 billion to €12.8 billion), and then began to decline in 2021. This decline accelerated in 2022 (-8% to -16% in volume, depending on the product families from one year to the next). This decrease is more important than conventional products. In times of crisis and inflation, organic dairy products suffer the double penalty of being considered expensive and not “local” enough, a strong and growing criterion in consumer choices.

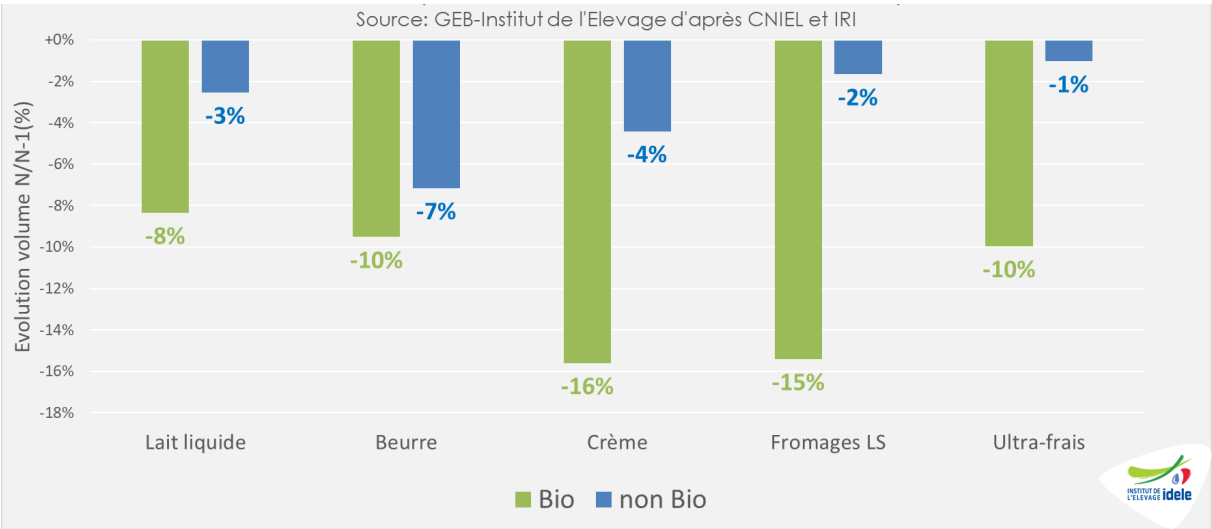

Figure 49: Volume sales of organic and conventional dairy products in 2022 vs 2021. Source: GEB-Institut de l'Elevage from CNIEL and IRI data

The segmentation is highly impacted by inflation

The return of inflation and the perspective of a new economic slowdown could momentarily, or more persistently stop the logic of segmentation and demarcation of products. Even before the inflation increase, organic milk production suffered from the slowdown in household purchases. Now that the food inflation in France reach 12% in 2023 and continue to rise, the consumption of dairy products is expected to decrease again. The low-income households are logically the most sensitive to rising prices, but inflation does not leave the wealthiest indifferent. According to a survey conducted by Harris Interactive in July 2022, nearly ¾ of consumers reported changing their eating habits as early as spring 2022. Among the major changes: more private labels or first price products (40%), brand change (29%) and change of distribution channel (19%). At the same time, local authorities are facing as households the increase of energy and commodities costs and have to contain their budget allocated to school catering.

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The Italian dairy value chain

Matteo Finocchi, Chinedu Obi, Michele Moretti (UNIPI)

Key findings :

- The number of animals increased close to the end of the era of milk quotas, with a consequent increase in total production, and a progressive decrease in the following years. At the same time, we have seen an increase in exports and a decrease in imports.
- The actors in the value chain are the central node for the formation of value, the farmers have a rather important weigh in the milk sector because they have been able to take full advantage of the indirect agricultural policy instruments that the European Union has made available.
- In this value chain, associations in consortia and cooperative are very present with their products, for example the Parmigiano Reggiano PDO and Grana Padano PDO which together bring together over 5000 breeders. This has led farmers to increase their bargaining power over time. Another group of key players is the milk processing sector, which is also very often brought together in cooperatives and associations.
- The bargaining power of dairy cattle farmers is much more important than in meat supply chain, both for the size of the farms but above all for the strong spirit of association that has expended this sector over the years. Cooperatives and associations are able to concentrate the offer and above all to build an image, a brand and distribute it in society.
- The notoriety of the brands of Italian dairy products pushes distributors and supermarkets to purchase these products since they are famous and requested by consumers thanks to the marketing activity of the consortium cooperative. In this situation the breeders are not alone in front of a free market but are able to negotiate the final selling price thanks to group work.

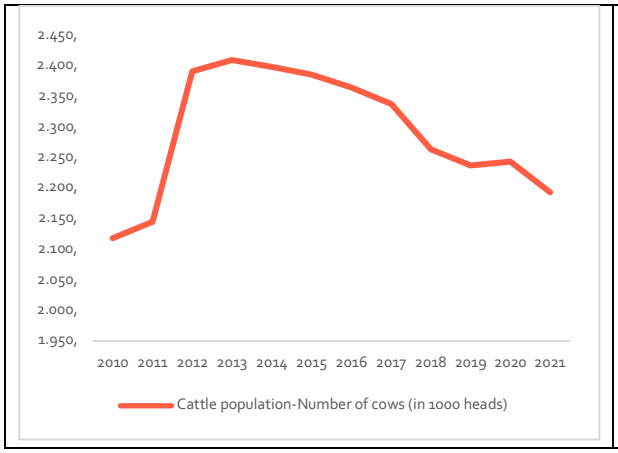
1. DESCRIPTION OF THE PHYSICAL FLOWS IN THE VALUE CHAIN

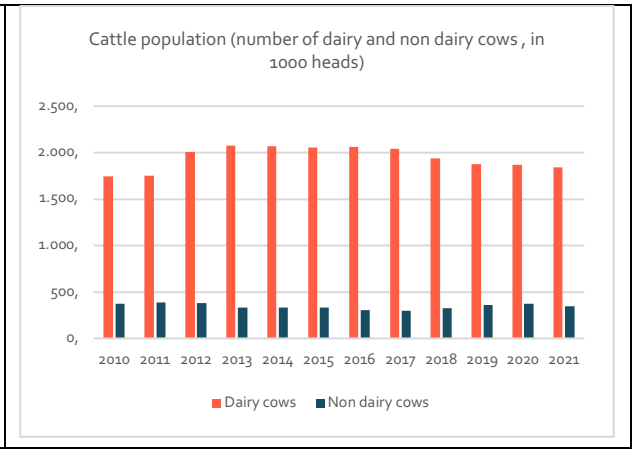
a. Structure of production

Italy is one of the top players in the EU dairy industry, with national production combining quality, volume, and tradition. It accounts for 9,4% of EU milk deliveries and 5,7% of EU dairy exports in 2020 and 2021, respectively. The country has a variety of milk and cheeses that meet the diverse needs of domestic and foreign consumers, and it is the biggest producer of PDO cheeses. In Italy, cheese and ice cream are popular food items, but liquid drinking milk dominates the dairy market. Italy is getting closer to self-sufficiency in milk with declining domestic demand and more domestic raw materials readily available. Using quantitative data collected from various sources, this paper described the physical flows of the dairy value chain in Italy, focusing especially on post-farm activities. As a result of the Covid-19 pandemic, which impacted the dairy industry, the report pays attention to average values from 2015 to 2018 but for some data it will be essential to refer also to the following period. It's also worth noting that dairy products in Italy come from various

animals, including cows, buffaloes, goats, and sheep. However, products from cows make up more than 90% of the Italian dairy market. This report, therefore, focuses on dairy products from cows.

Italy had an average of 2.3 million cows per year from 2010 to 2021, of which 90 percent are dairy cows. After a period of sharp increase in 2011 to 2013, there has been a steady decline in the number of cows and dairy cows in Italy since 2015. In 2021, there were roughly 2.2 million cows in Italy, compared to 2.4 million in 2015, which represents a decrease of 9%. The number of dairy cows decreased from 2.05 million heads in 2015 to 1.8 million heads in 2021. In the period under review, the number of dairy cows reached a peak in 2016, recording about 2.06 million heads. In the years following this peak, there was a gradual decline with 2021 showing the lowest number of dairy cows. Non-dairy cow numbers have remained relatively stable over the last 7 years reviewed, ranging from 329 thousand in 2015 to 349 thousand in 2021. Although the number of cows in Italy is declining, the number of heifers seems to be on the rise. There were 886 thousand heifers younger than two years old in 2015, 679 thousand (77%) of which were not for slaughter. In 2021, however, the number of heifers younger than two years has risen to 1.02 million heads, of which 759 thousand heads (74%) are not for slaughter. The number of heifers younger than two years peaked in 2020 with 1.04 million heads, of which 779 thousand were not for slaughter. A similar increase occurred in the number of heifers of two years and older, from 620 thousand heads in 2015, of which 552 thousand are not meant for slaughter, to 693 thousand heads in 2021, of which 591 thousand are not meant for slaughter. During the same period, the number of heifers of two years and above peaked in 2018 at 696 thousand heads, 603 thousand of which were not for slaughter *(Eurostat, ISTAT, National Zootechnical Register, 2010-2021).*





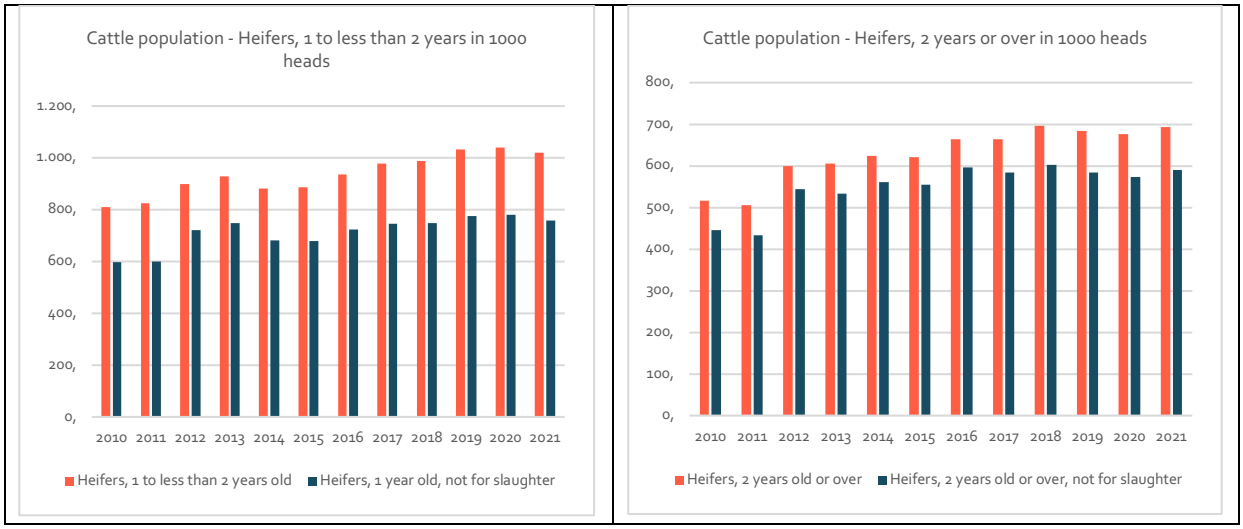


Figure 50: Charts showing the evolution of the numbers of animals. Source: Eurostat/Istat data

Between 2015 and 2018, Italy delivered approximately 11.3 million tonnes of raw cows milk Approximately 12.5 million tonnes of raw cow's milk were delivered in Italy in the year 2021, of which around 246 thousand tonnes is organic milk. Notably, the volume of raw cow's milk, drinking milk, fermented milk, cream butter, and cheese decreased substantially in 2019. However, some of these products began to recover in 2021. **Cows milk** – Italy delivered approximately 10.6 million tonnes of cow's milk in 2015. Cows milk deliveries increased by 10% between 2016 and 2017, going from 10.8 million tonnes to 11.9 million tonnes. From 2017 to 2020, cow's milk deliveries remained stable but increased by 5% in 2021 compared to 2020. Similarly, in milk equivalent, the value of raw cream delivered to dairies decreased during the study period. The value of raw–milk equivalents delivery peaked in 2018 with a value of 1.2 million tonnes of milk equivalent. However, since 2019, there has been a downward trend in raw milk deliveries. **Drinking milk–-** Over the same period, the volume of drinking milk produced in Italy amounted to just over 2.3 million tonnes by the end of 2020, showing a slight increase over previous years. Around 2.5 million tonnes of liquid milk were produced in Italy in 2021. The amount of **cream produced for direct consumption** went down also. In 2015, 164 thousand tonnes of creams for direct consumption were produced. By 2021, the amount of creams for direct consumption decreases to 149 thousand tonnes.

It is estimated *(data from EUROSTAT and ISMEA)* **that the volume of fermented milk (acidified milk, yogurt, etc.) produced in Italy totalled 284 thousand tonnes in 2021, indicating a decline during the reported period.** Fermented milk production reached a peak of 366 thousand tonnes in 2012. In the period under review, **butter** production (including dehydrated butter and ghee and other fats and oils produced from milk; dairy spreads) remained relatively unchanged. The total butter production in 2015 was 94 thousand tonnes, and in 2021, around 98 thousand tonnes of butter was produced. On the other hand, the value of **cheese produced from cows milk** has increased substantially during the period examined. From 1 million tonnes produced in 2010, cheese produced from co''s milk increased to 1.2 million tonnes by 2021. The rate of growth in 2017 was the fastest, with an increase of 12% over the previous year. Over the period, the **regional share of deliveries of cow milk** in Italy has remained relatively constant, with Lombardy ranking as the

leading region in terms of deliveries of cow milk in 2021 with a share of 45%. Lombardy is followed by Emilia-Romagna, which produces almost one-third of the amount of milk that Lombardy produces. In contrast, Friuli-Venezia Giulia and Lazio accounted for only two percent of the total share.

Figure 51: Evolution of national production by product in the last 10 years. Source: Eurostat/ AGEA- Agency for the disbursement in agriculture

b. Trade and trade relations with other countries

Various milk products are exported by Italy to the European Union and third countries, with Italy contributing for around the 5,7% of EU dairy export in terms of milk equivalent in 2021. Cheese, whey and fresh products are the three most important dairy products exported from Italy both in terms of volume and value, with cheese accounting for up to the 85% of the export value. The export and import data shown below represent the average values between 2015 and 2018. Over the period reviewed, the export of dairy products from Italy peaked in 2017 but declined in 2018 before the COVID pandemic began. The volume of cheese exported

from Italy increased steadily between 2013 and 2021. The total volume of cheese exported in 2015 was 358 thousand tonnes, and as of 2020, the amount reached approximately 463 thousand tonnes, showing a significant increase over previous years. Exports of whey not in powder fell significantly from 295 thousand tonnes in 2015 to 178 thousand tonnes in 2020, a decrease of approximately 40%. In contrast, the amount of whey-powder exported increased by 28% from 103 thousand tonnes in 2015 to 133 tonnes in 2020. Within the period under review, Skim Milk Powder (SMP) export decreased from 11.7 thousand tonnes in 2015 to 6.7 thousand tonnes in 2020, however Whole Milk Powder (WMP) exports increased from 1.3 tonnes in 2015 to 3 thousand tonnes in 2020. Over the period under review, butter, casein, daily spread, and fermented milk lactose also experienced modest increases in exports. Nevertheless, condensed milk exports experienced a significant decline from 7.8 thousand tonnes exported in 2015 to 1.2 thousand tonnes exported in 2020, an 85% decrease.

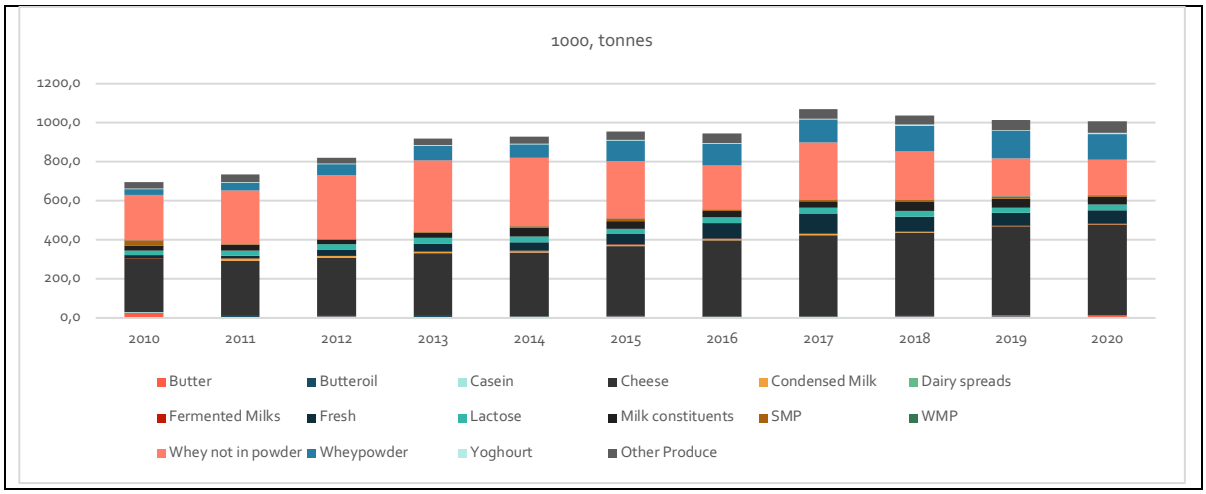


Figure 52: Evolution of exports by product (in 1000, tonnes). Source: Comext

The main destination country for Italy's dairy exports between 2017 and 2019 were France, Germany and the United States (Figure A3). According to the data provided by Prometeia in 2019, dairy products exported from Italy into France reached a value of 656 million euros, a significant increase in comparison with 2017. Germany and the United States were Ital''s second and third major destinations for exports of dairy products, respectively. In terms of volume, Germany was the leading importer of butter, butteroil, and milk constituents from Italy. The export of butter from Italy to Germany averaged 3 thousand tonnes per year between 2015 and 2018. From 2015 to 2018, the Netherlands ranked as the second largest importer of butter from Italy, importing around 1 thousand tonnes per year. Germany imports approximately 1.2 thousand tonnes of butteroil and 23,4 thousand tonnes of milk constituents every year. Between 2015 and 2018, France was the largest importer of cheese, lactose, and whey not in powder from Italy, importing an average of 83 thousand tonnes of cheese, 9.2 thousand tonnes of lactose, and 169 thousand tonnes of whey not in powder. Libya imported the highest share of fresh milk products from Italy during this period, importing around 33 thousand tonnes per year on average during this period.

Italy has reported a decline in milk imports in recent years, primarily due to a decrease in local demand. Fresh milk products and cheese are among the most imported dairy products into Italy. Fresh milk products imported to Italy in 2015 amounted to 2,106 thousand tonnes but dropped to 1,685 thousand tonnes in 2020. During the same period, semi-skimmed milk imports to Italy were 78 thousand tonnes but fell to only 13 thousand tonnes in 2018. Furthermore, other types of milk, such as whole milk and skimmed milk, also experienced this downward trend. Interestingly, fermented milk imports and condensed milk imports to Italy increased during the period under consideration. The volume of cheese imported in Italy peaked in 2020, reaching 533 thousand tonnes, compared to the 510 thousand tonnes of cheese imported in 2015.

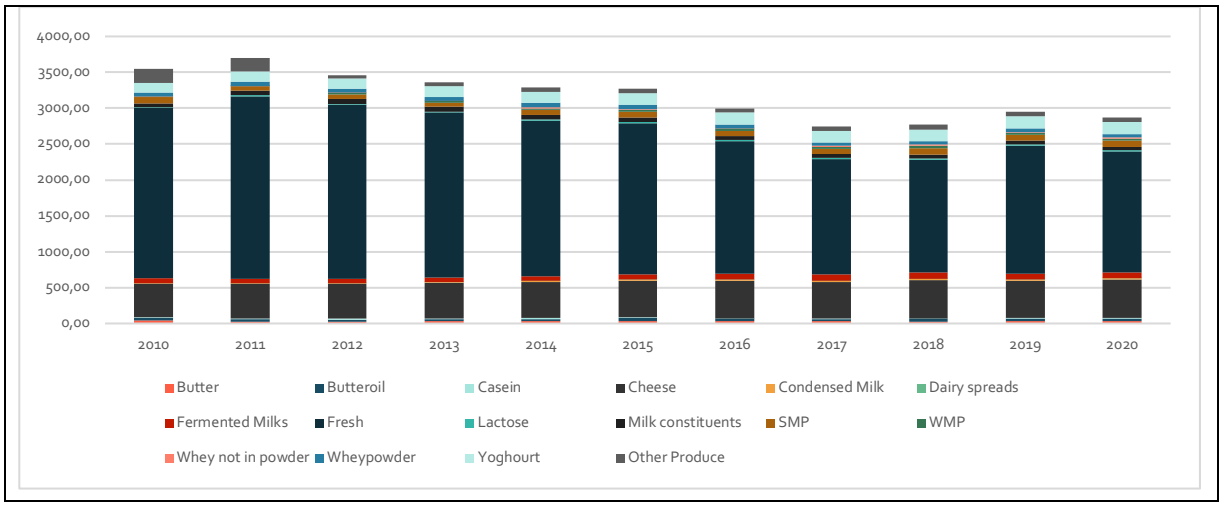


Figure 53: Evolution of imports by product in the last 7 years (in volume). Source: Comext

Germany and France are the leading suppliers of dairy products to Italy. During 2015 to 2018, Germany was the major supplier of cheese, yogurt, SMP, WMP, condensed milk and fresh milk products to Italy, while France supplied mostly butteroil, fermented milks, whey powder, and milk constituents (Figure A4). During the period from 2015 to 2018, Germany supplied over 254 thousand tonnes of cheese, 82 thousand tonnes of yoghurt, 30 thousand tonnes of SMP, and 604 thousand tonnes of fresh milk to Italy. In contrast, France supplies more than 26 thousand tonnes of fermented milk, 18 thousand tonnes of whey powder, and 55 thousand tonnes of milk constituents to Italy. Italy imports butter primarily from Belgium, and whey that is not in powder form from Austria.

c. Retail sector and consumption

Cheese and yoghurt comprise the majority of dairy product purchases in the country, together, these two items account for more than three quarters of the total domestic expenditure on dairy products. The apparent consumption of these and other dairy product are in decline. A possible explanation is that special diets (such as veganism) are becoming more popular in Italy. In 2019, Italy saw its consumption of fermented

milk products reach a five-year low. According to the data, the volume of fermented milk consumed in Italy was the same between 2018 and 2020, with a slight decline between the two years. Cheese consumption also declined from 1,414 thousand tonnes in 2018 to 1368 thousand tonnes in 2020. Similarly, butter consumption declined from 151 thousand tonnes in 2018 to 137 thousand tonnes in 2020. Despite a general decline in apparent domestic consumption, household consumption has remained relatively unchanged from year to year. Therefore, it is probable that the decline in dairy consumption is not the result of a reduction in consumption sizes, but rather a shift in consumer preference towards other products. Due to the decline in demand as well as the relative availability of raw materials, Italy has become increasingly self-sufficient in dairy production. There has been an increase in the percentage of self-sufficiency from 84% in 2018 to 94 % in 2021.

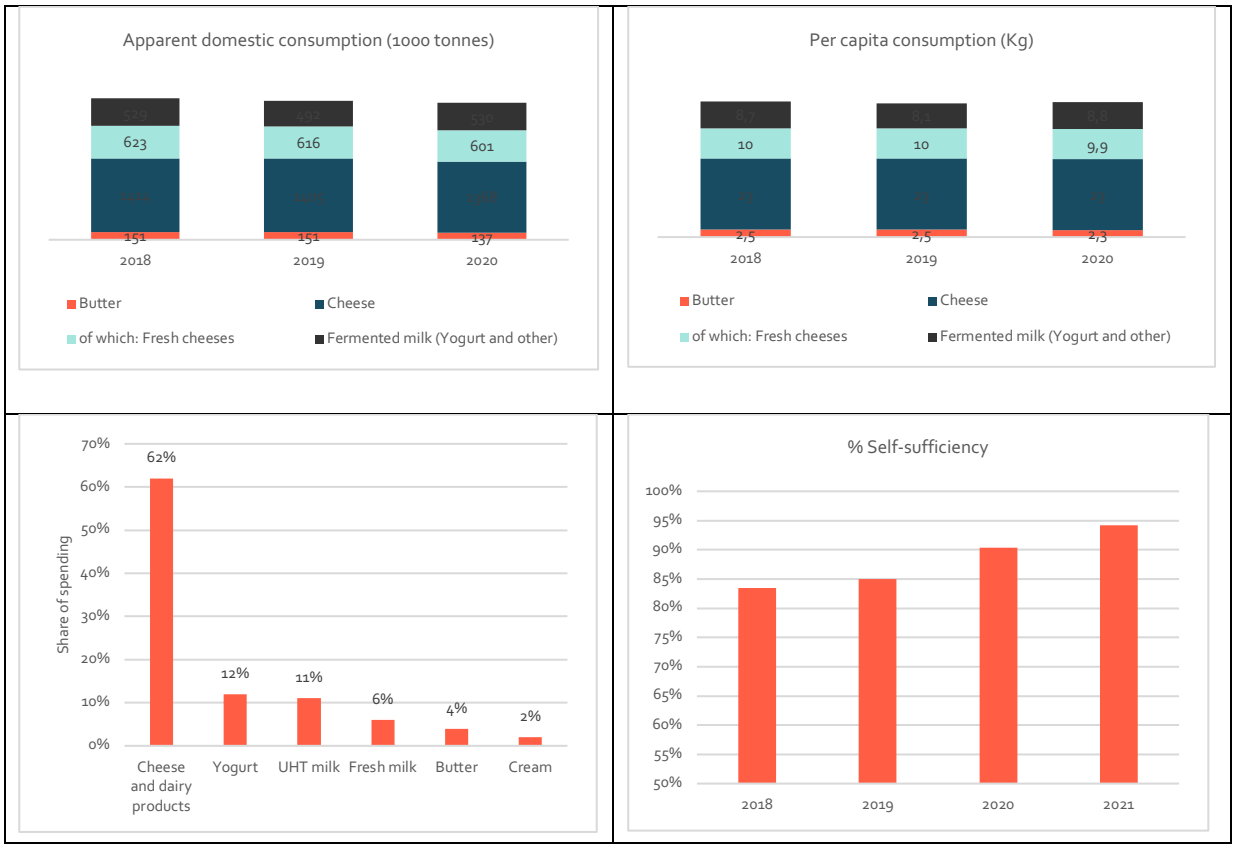


Figure 54: Evolution of national consumption by product. Sources: ISMEA(Italy) data and Nielsen

2. ACTORS IN THE VALUE CHAIN

a. The main actors in the value chain

In the milk sector, we have a very complex chain structure mainly for the huge number of products from the processing industries. In this first paragraph, we need to expand on what we described in the previous document. New details emerged as a result of the structured interview we carried out. The survey allowed

us to understand how the dairy value chain is structured in our country and the dynamics and main actors involved in producing drinking milk and processed products: farmers, industries, wholesalers, and distributors.

- **Farmers**: the situation of dairy breeding is very complex to describe; there was a transformation over the years in terms of animal numbers, breeds and technology which had repercussions in the market and production. According to the data we have collected for the previous work, Italy counts over 2.3 million dairy animals on average in the period 2011 – 2021 in more than 28 thousand farms. Regarding the regional distribution of heads and farms, we can see how Lombardy has the highest number of farms (20% of the total) and at the same time the highest number of heads (39% of the total). Lombardy is followed by Emilia Romagna (13% of farms and 13% of heads) and Veneto (13%, 10%). Very significant data is the high average number of animals for each farm, clearly demonstrating the high technological l financial assets intensity in every single farm. The northern regions register an average higher than 140 heads per farm with this classification: Lombardy more than 170, Piemonte 150, and Emilia Romagna 122. To make a brief representation of the dairy cattle sector we can say that it is a highly specialized sector, very rich in capital and business investments, and where the Friesian is the most representative maintained breed. At the level of specialized farms, we find a production of milk per head of over 40kg per day for a total of over 12 tons of milk produced in the average lactation (about 300 days) (data from National Association of Friesian, Brown and Italian Jersey Breeders). Another important aspect is the close link between dairy animals and meat production. In the production systems of dairy products, we have the reproduction of animals that leads to the birth of calves for fattening or heifers for replacement. The meat also comes from cows at the end of their career, very often with an age not exceeding 4 years or 2 lactations. The regions in Northern Italy have the highest number of farms and average heads of each farm; the reason for this geographical location of the farms is to be found in several factors of both economic and practical nature. The first aspect concerns the conditions of cultivation of fodder and concentrates in these places that enjoy high availability of production factors. From an economic perspective, it is necessary to mention the presence of two important PDO products that Italy boasts: *Parmigiano Reggiano PDO* and *Grana Padano PDO.* The disciplinary of these products provides for the production in a wide territory of the regions of northern Italy that have the greatest number of farms at the Italian level. Later we will deepen the allocation of milk produced to produce cheese but there are no doubts that it is an important resource for the Italian agriculture as a whole and especially for the dairy sector of cattle breeding.

To increase the level of detail of dairy cattle breeding systems that we described in the previous document, we analyze the regional distribution in the Italian territory.

- **Professional organization and breeders cooperative**: as for the beef sector, there are a lot of cooperatives and consortiums related to dairy transformation as Parmigiano Reggiano, Grana Padano, etc. They are groups of farmers who have a series of very important tasks for the market and for income sustenance. The main role of these agricultural organizations is linked to the power conferred by the European Union as indirect instruments of agricultural policy. Unlike the beef sector, in this case, the organizations are more organized, with a strong market and bargaining

power. In absolute terms, the sector counts 46 professional organizations dedicated to the dairy sector, of which 26 (60%) located in the regions of northern Italy: Lombardy, Veneto, Emilia Romagna and Piedmont (data from Italian Agricultural Minister–- 2023); this aspect will be developed later in a separate paragraph. In addition to these organizations, it is important to list the two main consortia for the enhancement of bovine cheese: *Grana Padano PDO* and *Parmigiano Reggiano PDO*. The areas of Grana Padano are quite extensive and include all the regions of Northern Italy. The range of Parmigiano Reggiano is rather restricted and includes only 5 provinces of Emilia Romagna.

Trade associations, and agricultural unions: They are organizations representing and protecting agricultural workers, born to bring political battles in the agricultural field, for the guarantee of farmer'' rights. In Italy, three main ones are representative: Confagricoltura, Coldiretti, CIA – Confederazione Italiana Agricoltori, born in different historical periods and with different political representatives. We must mention Confindustria, an association that represents industries of each size, and in total it represents more than 150 thousand farms and more than 5 million people. The importance in our country is related to lobbing for safeguarding the economic interests of farms.

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Industries: the last aspect described within the previous paragraph allows us to enter in the world of co''s milk processing in Italy. Their role is fundamental for the market and for trade relations with other countries. The whole market sales for processed milk products are represented by no more than 3 big companies: Lactalis, Newlat, Granarolo. Within this companies, we have a multinational group (Lactalis) and the other two large national companies. These large industries have several commercial brands that belong to agro-food holding companies. Considering the total sales, these three groups cover around the 60%s of market share. The number of workers in these industries is very high and differs in the various groups by a considerable percentage: Granarolo: 2700, Lactalis Italy: 5000, Newlat 2000. The main commercial brands contained in these groups are Granarolo (Granarolo, Yomo, Accadi, Centrale del latte Milano, etc); Lactalis (Galbani, Vallelata, Invernizzi, Locatelli, etc..); Newlat (Mukki, Giglio, Polenghi, Ala, etc). If we consider all the plants that manage milk: milk plants and dairies, in Italy we have over 1200 units, with characteristics of different products and located throughout the territory with a prevalence in the northern regions (ISTAT – 2021).

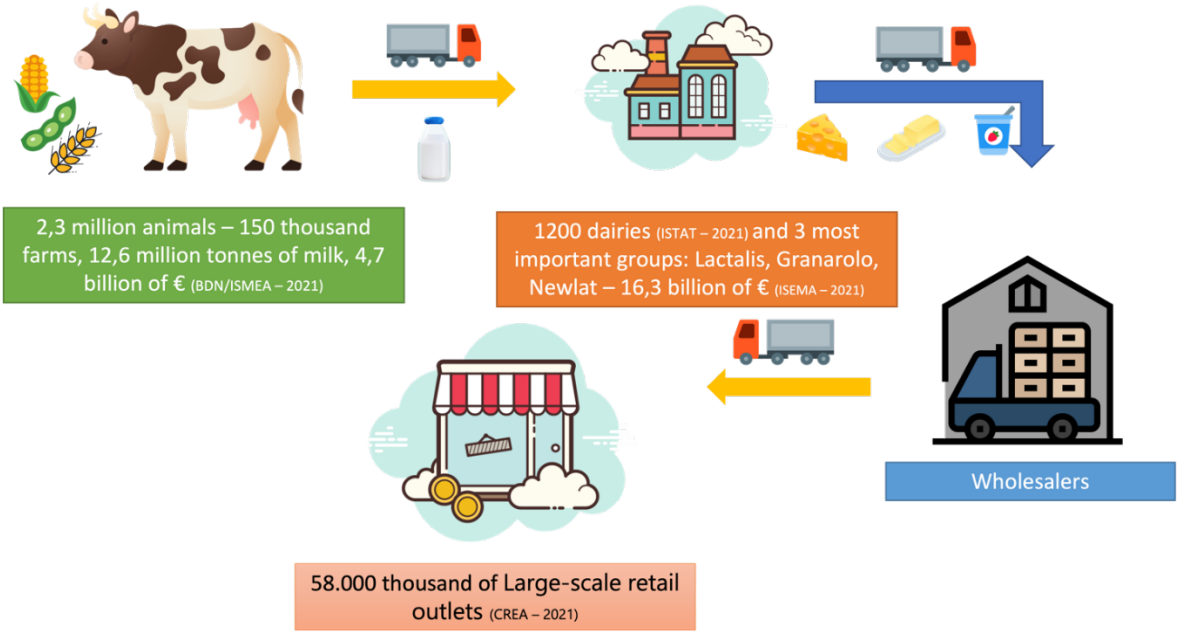


Figure 55: Actors in the value chain (Personal processing, data from ISMEA, ISTAT, CREA 2021)

The **geographical location** of farms and processing industries is northern Italy and exists technical and other economic advantages related to this effect. Certainly, in the foreground, there is the proximity and connection of primary production with the processing industry, and secondly is the possibility of cooperation between actors in the supply chain and belonging to districts or cooperatives of breeders. The localization in the dairy cattle sector is very strong and it represents a sector that entirely moved to the northern regions of the country. This type of breeding means an intensive type linked to high production and not necessarily to the high quality of milk in terms of percentage of fat and proteins.
The presence of the two consortia (*Grana Padano PDO* and *Parmigiano Reggiano PDO*) and their regulations requires a very localized production for the PDO brand that characterizes them. A very important problem is related to the environment in a limited territory in terms of direct emissions and nitrate leaching. The advantages are certainly those of high agricultural productions that are able to meet the needs of animals with corn and soy which are the two most important products for cattle feed.

To summarize, the number of dairy animals bred from 2011 to 2021 has not changed a lot (less than -0,1%) like milk production (around 20%) and value of production referred to raw milk (around 15% or 700 million of euros). If we consider the distribution, the importance of the export of agri-food products related to the bovine milk sector is significant. Given the competitiveness between countries such as France and Germany, the enhancement of the Italian products plays a fundamental role in increasing added value. Some cheeses known as the result of the association of breeders and processors, Parmigiano Reggiano for example, is certainly the strong point in the export of the entire supply chain.

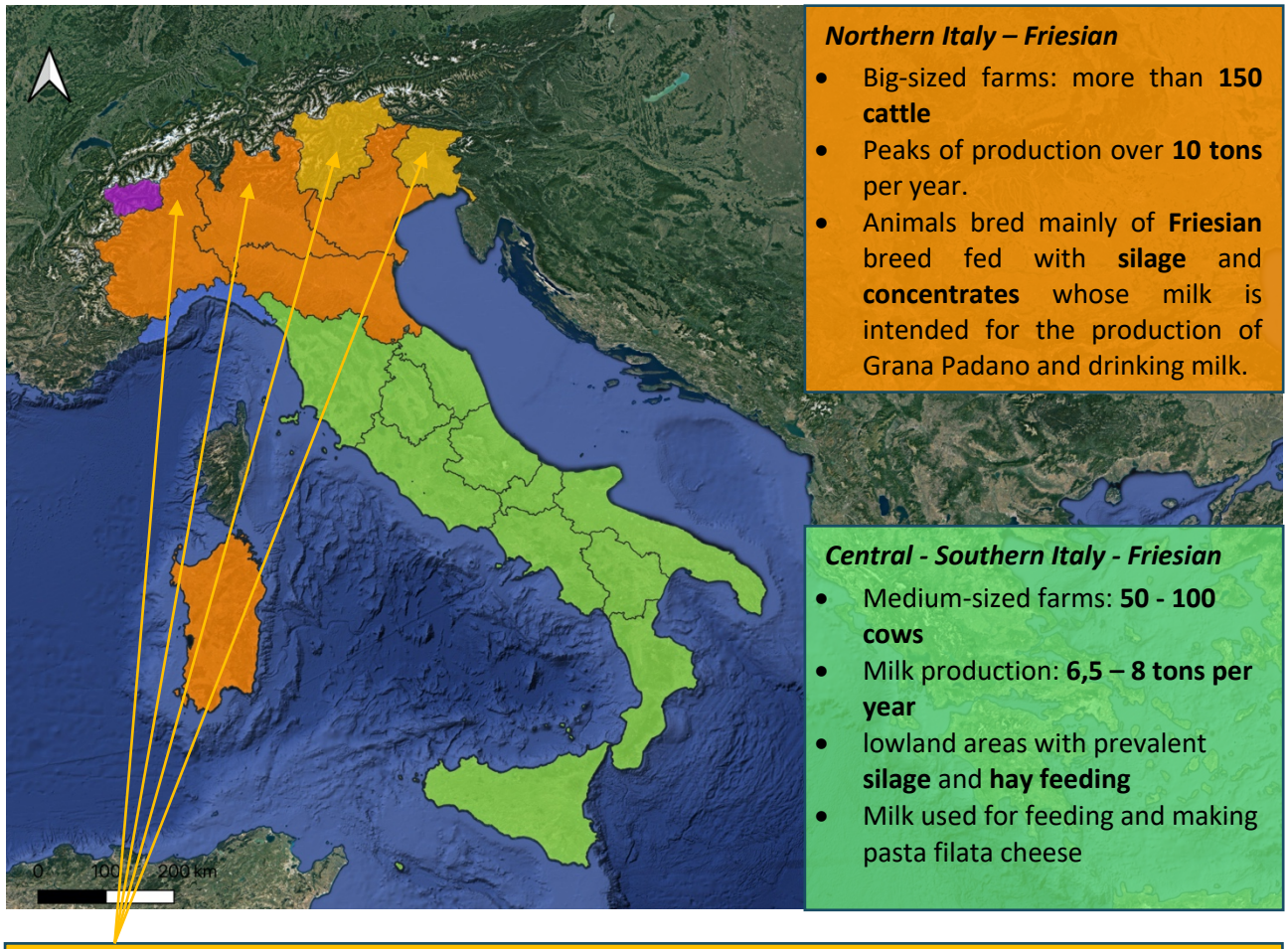


Figure 56: Italian farms and geographical distribution. Adapted from ISEMA 2021. Personal processing

For this sector, it is important to provide a summary of the consequences of the ending of the **milk quota** system in 2015. In recent years, the sector has gone through a period of crisis due to the measure that protected milk prices with a direct instrument of agricultural policy for the containment of production (the milk quota). This protection system was born in 1984 after years of considerable overproduction of milk as well as dairy products. This measure has led to a reduction in production and, above all, to a stabilization of prices. These quotas have also affected the meat sector. With the end of milk quotas, the country has seen a slight increase in production, but above all an increase in the export of dairy products. Since 2015, there has also been a decrease in imports from European and non-European countries as well as an increase in the country's internal self-sufficiency. This discussion is supported by the data we reported in"The Italian dairy value chai" we have submitted, and they come from Eurostat and Comext.

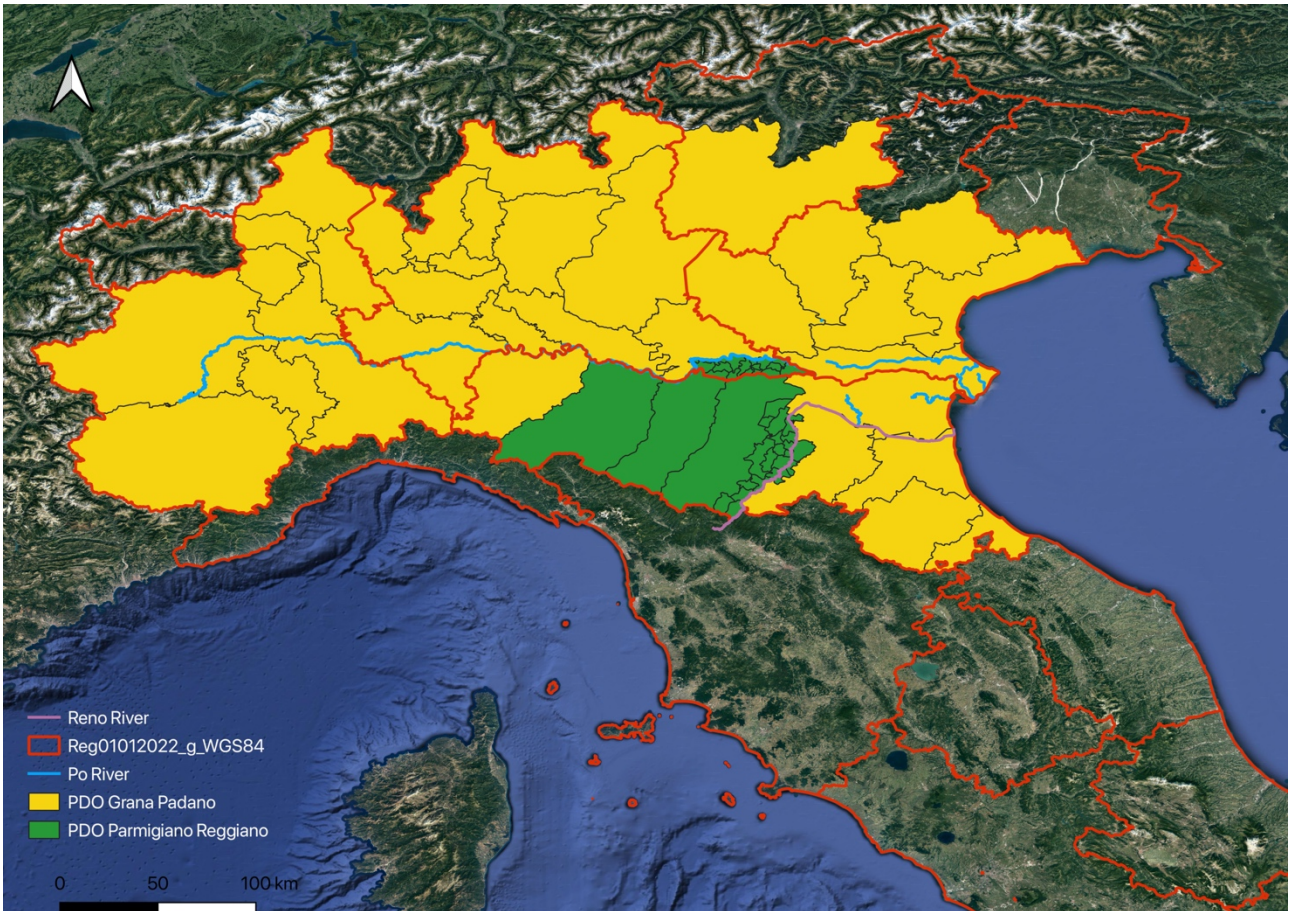


Figure 57: Production area of Parmigiano Reggiano PDO and Grana Padano PDO. Adapted from ISMEA – 2021. Personal processing.

The Emilia Romagna region deserves a closer look. It is a region very suited to the production of milk and above all for the simultaneous presence of the two most important PDO products of the Italian territory. The farms have a rather large size (over 100 animals) with annual yields of more than 7 tons. The prevailing breed is the Friesian and for the type of diet we find hay, silage, fresh fodder according to the type of processed cheese.

In this table we can see a grouping of Italian provinces that differ in filling colors. The yellow areas are Grana Padano PDO territory: Piedmont, Lombardy, Veneto, Trentino and Emilia Romagna excluding the provinces of Modena, Parma, Reggio Emilia and Mantova to the right of the river Po representing the territory of Parmigiano Reggiano. For the province of Bologna we have territory of the Reggiano in the municipalities to the left of the river Reno.

3. THE GOVERNANCE OF THE VALUE CHAIN

a. Power relations in the value chain

In this section, we are interested in analyzing the bargaining power of the different actors in dairy supply chain. Bargaining power is considered as the defense of one's own economic interests or as the power possessed by one of the parties seeking to reach an agreement to influence or prevail over the decisions of the other.

Farms bargaining

The first aspect we can highlight in comparison with the beef value chain is related to farmer'' bargaining power. In this case, we have large farms with many animals in northern Italy and very high investments, compared to most beef farms. This characteristic is responsible for higher bargaining power than beef breeders. Another important aspect is the cooperation and farmer association which in the milk sector is widely practiced and which is entrusted with an important organization and economic task. As for the beef market, despite the fact that the milk sector enjoys farms with an economic weight, the farmer remains isolated in a market where the price is decided on the side of consumption, a little bit, and above all on the side of processors, distributors with a huge bargaining weight. This condition of isolation occurs when farms do not aggregate into associations or cooperatives.

Through the associations of producers, it is possible to implement different management and marketing such as: a) policies of promotion, marketing, and management of advertising at the international level for consortia/associations that are better structured and that bring together many producers; b) storage of the product and concentration of supply; c) joint management of processing without the purchase of the primary product by processors.

The presence of professional organizations in the milk sector is very important for fully understanding the balance of power in price dynamics. The organizations recognized by the ministry, for the dairy sector, are 46 distributed in 13 Italian regions with a greater concentration in northern Italy where the dairy sector is more developed. In percentage terms, we have Lombardy with over 19%, followed by Veneto and Emilia Romagna with 17%. In addition to this aspect, it is important to analyze the data provided by the Ministry of Agriculture about the values of marketed production (VPC) by organizations for the year 2021. The VPC parameter is very important for several aspects of an economic and structural nature. First of all, it is the basis for determining the contribution calculation received by the organization themselves, and a verification criterion for compliance with the organization's minimum requirements for recognition by the ministry. To give some examples, let's take the Emilia Romagna region where the average product values marketed are about 46 million euros if we consider all the organizations, but we have a main one in the province of Modena with over 180 million euros (Granterre Cooperative). The same for the Veneto region where the average values are over € 46 million with peaks of 110 million for the Belluno Lattebusche coop. In the regions of central and southern Italy, we have a limited number of cooperatives with much lower production values, mainly due to the lack of PDO products as important as those of the north. Taking for example the Tuscany

region, we have only 2 pOs with an average sale of around 16 million euros. The single case of Maremma milk in the province of Grosseto exceeds 26 million euros and represents most of the processed milk in the region.

To conclude, the most powerful tool of market regulation is certainly the association of producers who are able to manage large quantities of products by offering them on the market in limited quantities while keeping the price high. For a couple of important associations, a huge promotional work has also been done that forces distributors to purchase the trademark.

Regarding the foreign market and so the Italian trade relations with other countries, Italy has had a variation in terms of export and specifically we can see an increase in export quantity and a decrease in imports. This is also coupled with increased self-sufficiency and market stabilization. In this economic context, the two main consortia have managed to promote their product outside the national borders, increasing product exports and enhancing the entire Italian territory.

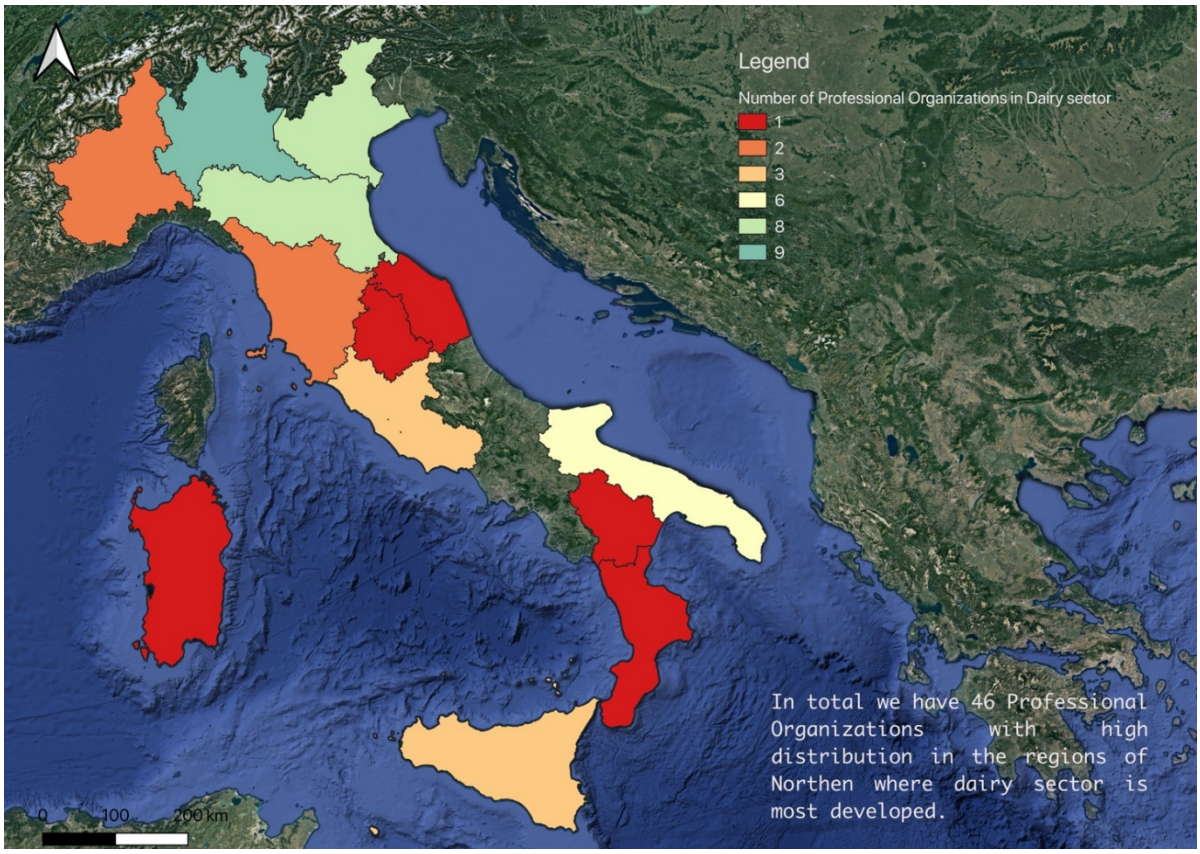


Figure 58: Number of agricultural and cooperative organizations: data from Ministry of Agriculture – 2022. Personal processing.

Direct sale

Direct sale of dairy products, from farmers to consumers is a mean of sustenance to the income of farmers that allows the sale on the farm with a consequent increase in the price. Direct sales are not the only tool, we can think of shortening the supply chain and creating agreements with local distributors. The percentage share of direct sales is difficult to estimate even through interviews that have given qualitative judgments on this aspect, which can be translated into a few points or percentages.

Bargaining power of processing industries

Let's start by saying that the processing industries have enormous bargaining power. These are huge groups with very important turnovers that have over the years incorporated many brands of equally famous products in our country.

Bargaining power of large-scale retail trade

Large-scale retail is an actor in the supply chain that plays a very important role in price definition. The enormous bargaining power derives from the fact that even in this case we have a few large supermarket groups that have branches both throughout Italy and in other European countries. These are the places where the most important brands of the dairy industry are sold to consumers. Large-scale retailers have an enormous market power especially in the construction of the final price and in Italy we have 5 brands of large-scale distribution which represent more than 50% of the national volume of sales of agri-food products.

As we have seen for the meat sector, in this case the direct sale represents a negligible small percentage of sales volumes compared to the total. ISMEA 2019/2020 data suggest that Italian families prefer to buy in supermarkets and hypermarkets with a share in value that is close to the 70%.

The interviews show that consumption patterns have also changed in the milk sector and above all that the consumer is very attentive to environmental sustainability and animal welfare. The main answers refer to the purchase of products made in Italy at kilometer 0, preference towards an organic farming system, and attention to the environment in all its forms even in the case of packaging and food containers

b. The role of contracts and price transmission

Studying the price formation mechanism in the food chain is not easy, mainly due to the lack of exhaustive and reliable data on prices, refills, as well as costs at each stage. It is a complex phenomenon that depends on several factors: the intrinsic specificities of the products (e.g., shelf life, perishability, seasonality) that affect their supply, the market structure (e.g., the degree of competitiveness present at each stage of the chain and the number of intermediaries) as well as the impact of the public policies in place. The construction of the price for agricultural products is dictated by four main components: the value of agricultural production (generally not exceeding 10%), processing, distribution, transport. This feature of prices is a

dynamic and constantly evolving theme and above all in line with the structural economic dynamics in the development of agriculture but not in absolute value.
This economic condition of development of the demand for agricultural goods is responsible for the decline in values intended for agriculture.
In this situation, we must not forget the sector behind primary production, which is that of the industries producing the main factors of production in agriculture: seeds, fertilizers, and pesticides, which play a fundamental role in crop production.

Milk price evolution

There are many processed products in the dairy cattle sector, so it is impossible to analyze prices as a whole. We, therefore, rely on the price of milk in an analysis that also includes the quota period as we explained earlier. The final period of application of the protectionist policy of the milk market took place in steps from the CAP of 2008 (Health Check) with quota increases until 2014.
From the graph (Data: ISMEA – personal processing) we see that before the end of the milk quota, we have an average price of € 38.8 / hl, which plummeted in the 2014/2015 period and then rose again in the 2016/2017 period. Following this first economic destabilization of the market, the average price increased and settled at values slightly lower than those of the previous protectionist policy (pre-post milk quota difference of 2.5%, around 0.95€). The prices processed are derived from the ISMEA database and refer to the hectoliter as the average price at origin for the regions that most represent the milk sector in Italy.
The consumer is involved in the formation of the price of dairy products with his percentage of income invested in the purchase and willingness to pay for milk products. Recent data, referring to the year 2019, show that cheese and dairy products represent a source of expenditure equal to 12.5% of the total allocated to the purchase of food, with over 50€ of average expenditure per family per month.
Price formation for these agri-food products pass through many phases and actors: suppliers of technical means for primary productions, farmers–- breeders, processors, wholesalers, and distributors. Each phase is crossed by logistics and transport that have a huge impact on the construction of the final price. The processing of ISMEA data on the value chain of agricultural products shows that as much as 41% of a certain basket of goods of Italian products is destined to remunerate transport and distribution costs. It is a very high share, which underlines the need to change the distribution of food, which is unnecessarily transported over long distances to end up in the various large centers of distribution. A sustainable food system requires a shorter supply chain: promoting a direct link between producer and consumer (think also of the pollution caused during the transportation of food by road).
Italian market prices depend on the European context and most of all from dairy products import – export.

Figure 59: Chart of the evolution of the price of milk at origin. Data from ISMEA 2010 – 2021. Personal processing.

c. The place of differentiation in the value chains

In the bovine breeding sector, PDO products are the most important in the market. As we can see for the meat sector where the supply chains of the individual commercial brands connected to distribution, Coop, Esselunga, etc are very important, in this sector, PDO products are a very large part of the sales share of the markets.

The value chain of dairy products from organic farming has an important weight in the market. The agricultural phase counts more than 770 dairy cattle farms on average in the period 2017–- 2020. If we consider it as a percentage of the total dairy cattle, it does not exceed 3%.

Regarding organic milk production, farm'' contribution in 2020 is estimated at around 260 thousand tons. The percentage of the total does not exceed 2%.

The regions that offer the greatest contribution to production are in descending order: Lombardy, Emilia-Romagna, Veneto, and Piedmont which alone account for around 85% of the national total.

The issue of the price of organic milk is the central theme of breeding which, unlike conventional milk, has a price of around 0.50€ per liter in 2021, more than 37% greater than conventional milk. The organic co''s milk

value chain fully shares the main processing industries; there are some groups that are more interested in the organic market: Granarolo, Parmalat, etc.
In the Italian scenario, PDO cheeses represent over 40% of the total for over 500 thousand tons. The number of PDO/PGI is 38 made from co''s milk and mixed milk. The production values of Grana Padano, Parmigiano Reggiano, and Gorgonzola exceed on average 3.5 billion euros in the years 2016-2020. Confirming what we have seen before with the geographical distribution, at the territorial level, in Emilia Romagna and Lombardy more than two-thirds of the total value of PGI cheeses are concentrated, respectively with 1.6 and 1.5 billion euros of production turnover. (ISMEA 2021).

References:

- ISMEA – Istitute of Services for the Agricultural Food Market
- EUROSTAT – Statistical office of European Union
- ISTAT – National Institution of Statistical analysis
- BDN – National Zootechnical Register
- MASAF - Ministry of Agriculture, Food Sovereignty and Forestry
- Ministry of Health of the Italian Republic
- Eurostat 2020 – Agriculture, forestry and fishery statistics – edition 2020
- AGEA – Agency for the disbursement in agriculture
- ANAFIBJ – National Association of Italian Friesian breeders, Bruna and Jersey

Annexes:

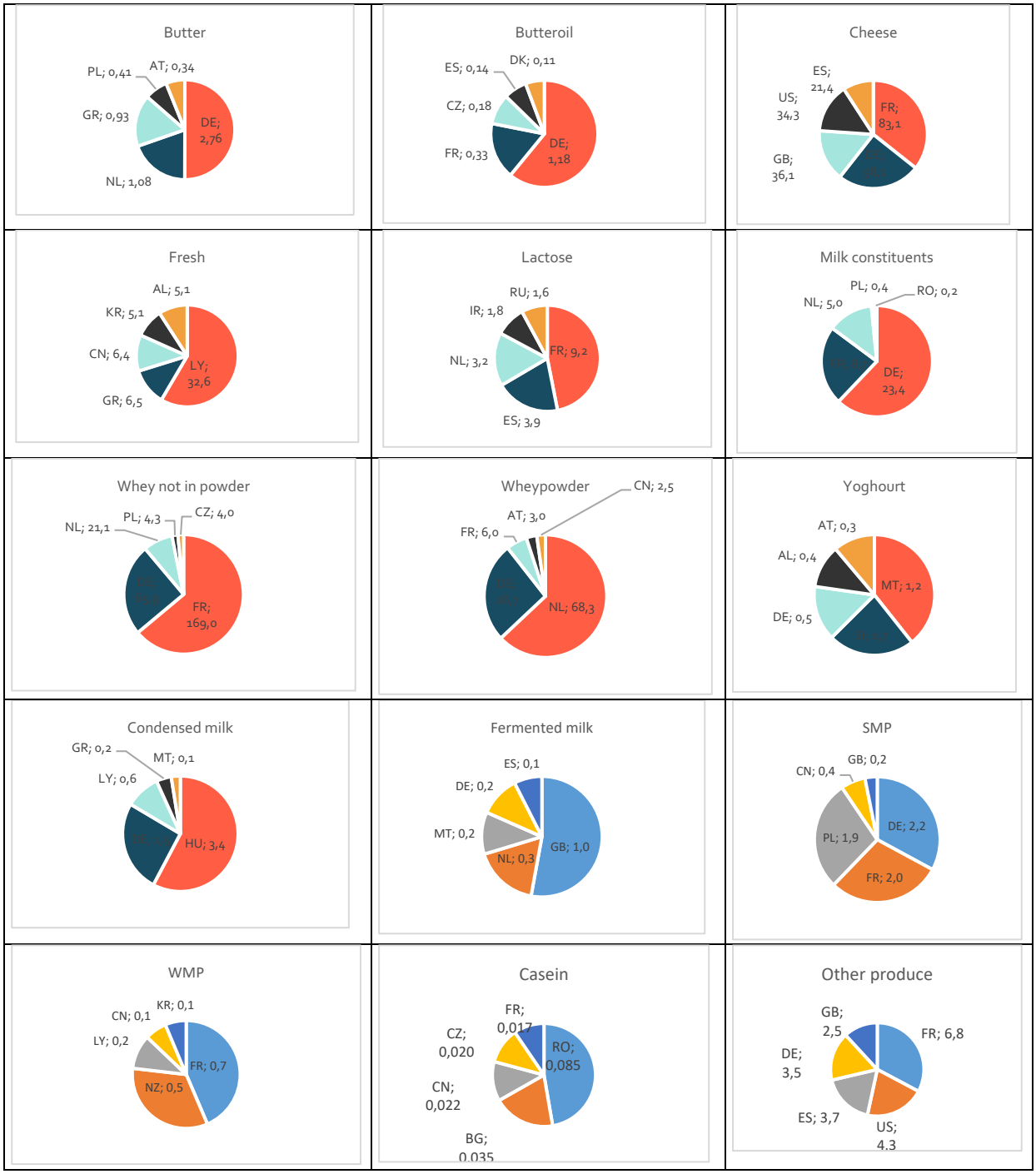


Figure A3: Charts showing the main partners for exports (1,000 tons). Source: Comext (based on average from 2015 to 2018)

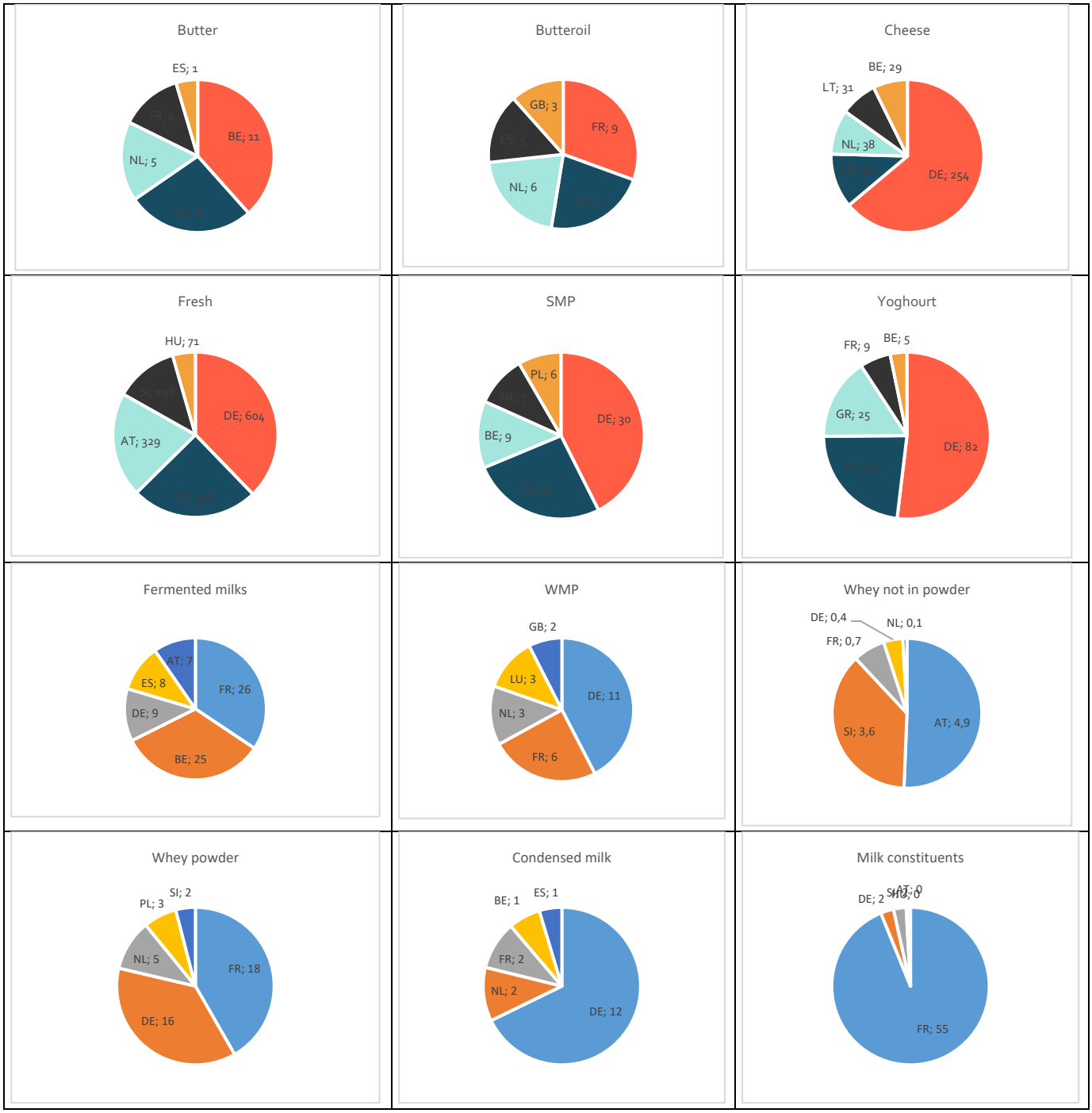


Figure A4: Chart showing the main partners for imports (1,000 tons). Source: Comext (based on average from 2015 to 2018). Alpha 2, code abbreviation

The Dutch dairy value chain

Behrang Manouchehrabadi, Coen van Wagenberg (WR)

Key findings :

- The Dutch dairy sector contributes 7% to total income of the agri-food industry and 1% to GDP. It is focused on producing high value added products, given the relatively high costs for producing milk on farm level. It mainly produces cheese (55%), milk powder (14%) and drinking milk (7%).
- It is a major exporter and importer, with an annual export value of €7.8 billion and import value of €3.7 billion. Cheese accounted for approximately half the export value and a third of the import value. In volume, cheese and milk and cream each accounted for 28% of exports, and other products and milk and cream each accounted for one third of imports.
- The Netherlands had 16,000 dairy farms in 2020, mostly family based. In the last decades, this number consistently decreased due to a lack of successors and low margins. Processing is dominated by a handful of cooperatives, with FrieslandCampina being the largest with approximately 70% of Dutch dairy farmers as a member. Supermarkets are the major players in the retail of dairy products, with the four largest controlling over 70% of the market.
- More than 90% of Dutch dairy farms are member of a dairy processing cooperative. Most farmers have a long-term contract that obliges the farmer to deliver milk to the dairy processor and the dairy processor to buy the milk from the farmer.
- Differentiation plays a significant role in the Dutch consumer dairy market, but hardly on export markets. Labels on products are used to communicate the sustainability program to consumers. All dairy processors in the Netherlands have an own sustainability program based on the national program "Sustainable dairy chain." Each program is adapted to the demand of the processor's customers, with farmers needing to comply with multiple requirements, such as environment, biodiversity, climate, animal welfare, and antibiotics use.

1. DESCRIPTION OF THE PHYSICAL FLOWS IN THE VALUE CHAIN

a. Structure of production

The dairy sector in the Netherlands is a large and important sector in its agri-food industry. In 2019, it contributed 7% to the total income of the agri-food industry and around 1% to the gross domestic product (GDP). The dairy sector is export oriented with 65% of dairy production being exported. The value of exported

dairy products was €7.6 billion in 2019 which made it the third in category of agri-food products after horticulture and meat. In 2019, around 47,500 people were employed in the dairy sector, of which 12,500 in dairy processing firms and the rest in dairy farms. The figure here below gives an overview of the sector.

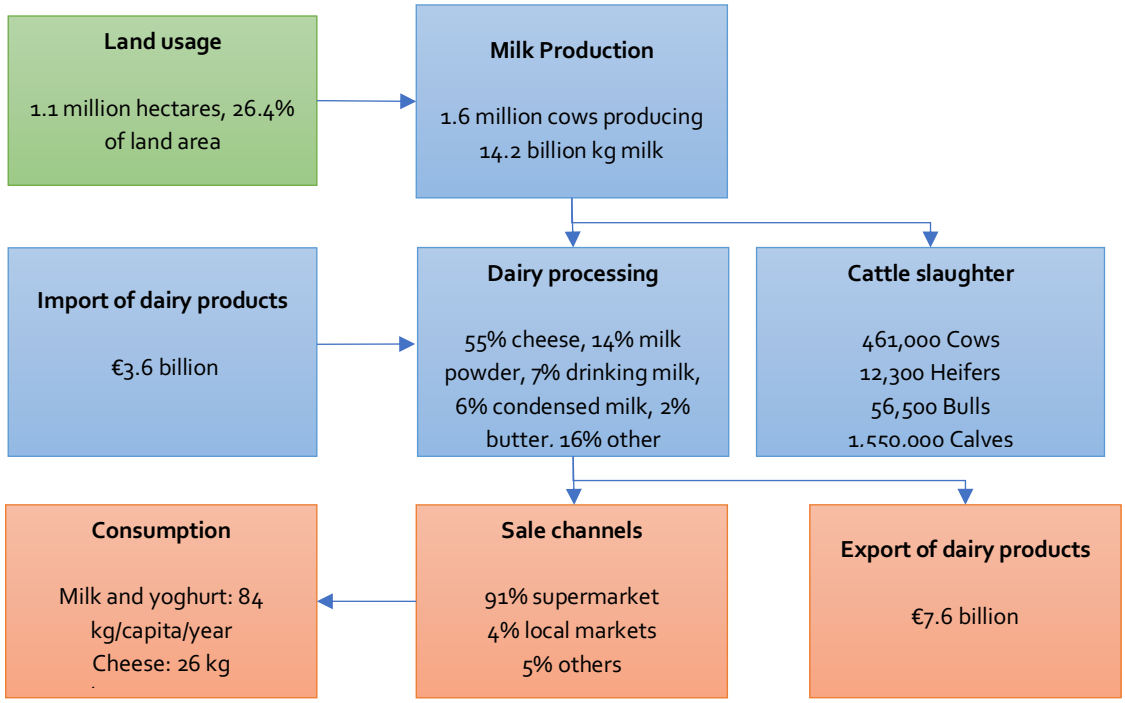


Figure 60: Overview of Dutch dairy sector in 2019. Source: Authors

Raw milk production

From 2017 to 2020, annual raw milk production at Dutch dairy farms was between 14.0 and 14.5 million kg Figure 61). Not all raw milk produced on farms was delivered to the dairy processing industry. Approximately 1.5% of the raw milk was used on farms as milk for calves and for dairy production and consumption on the farm. Van der Peet et al. (2018) estimated that 374 dairy farms processed (part) of their own raw milk in 2018.

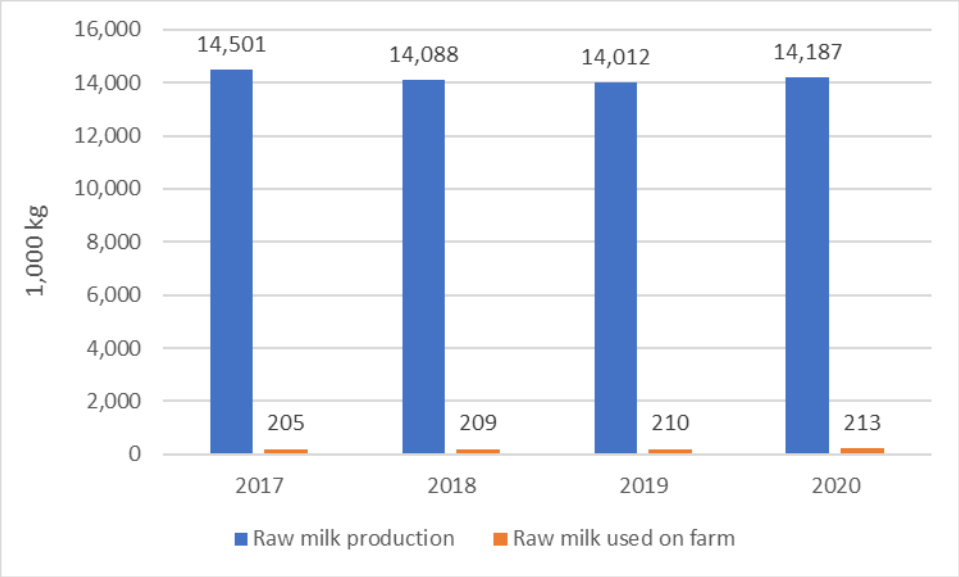


Figure 61 Raw milk production and use on dairy farms in the Netherlands from 2017 to 2020 (source: ZuivelNL, 2019; ZuivelNL, 2020; ZuivelNL, 2021)

Production of Dairy Products

From 2017 to 2020, annual Dutch production of drinking milk and cream increased from 980 to 1,070 million kg and that of cheese from 870 to 960 million kg. Together, these products accounted for approximately 70% of total annual production volume of dairy products.

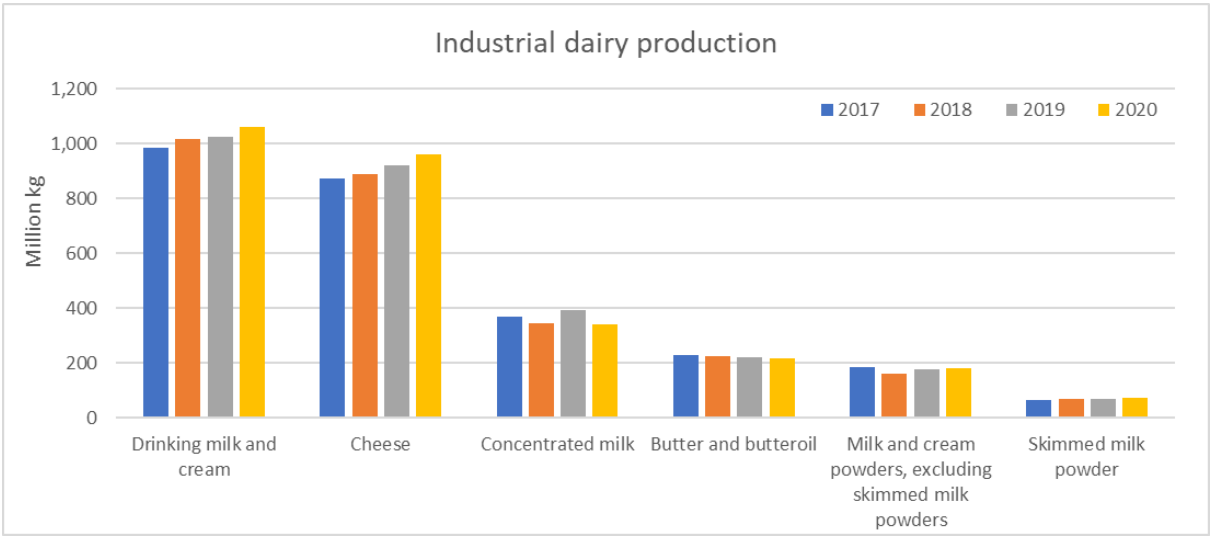


Figure 62: Industrial dairy production in the Netherlands from 2017 to 2020 (source: ZuivelNL, 2019; ZuivelNL, 2020; ZuivelNL, 2021)

The figure here below shows the fraction of Dutch raw cow's milk that went to each of these dairy products from 2018 to 2020. More than half of the raw milk in the Netherlands was used for cheese production, and approximately 15% for other derivatives and milk powder each. Only about 7% was consumed as drinking milk.

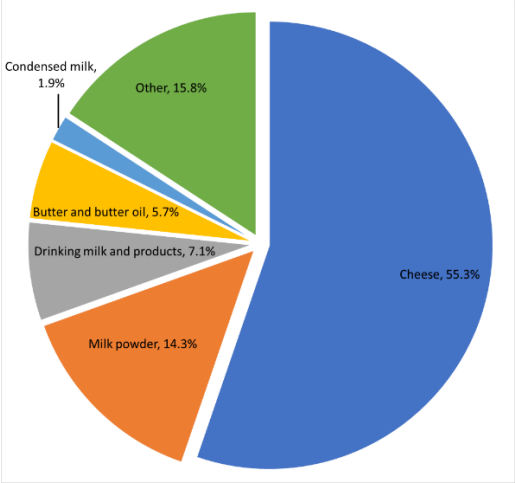


Figure 63: Destination products of cows' milk delivered to dairies in the Netherlands (average 2018-2020).

As cheese is one the most important dairy products, we take a detailed look into production and trade statistics. Figure 64 shows production, domestic use and export of cheese since 2010 and projected into 2025. Cheese production increased from 2011 to 2016, slightly decreased in 2017, and modestly increased since then until 2020. It is projected to keep increasing until 2025. In 2020, the volume of cheese production exceeded 540 kilotons and almost 60% of the total production was exported. Production, net exports, and domestic use of cheese are expected to continue to increase until 2025.

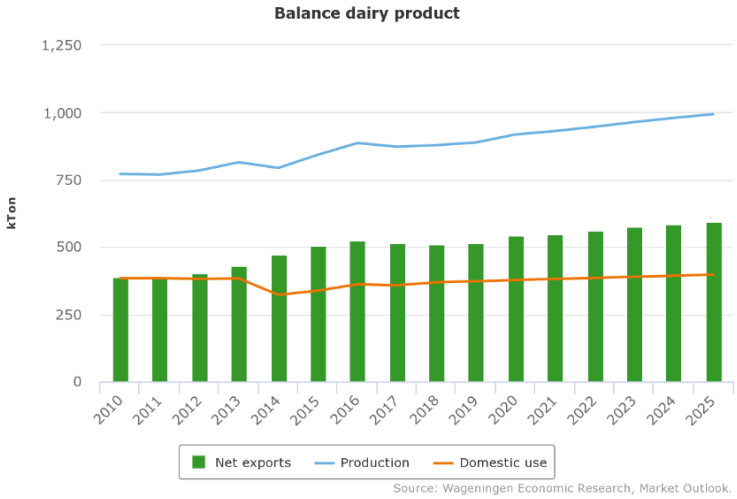


Figure 64: Production, import and export of cheese in the Netherlands from 2010 to 2020 and forecast to 2025. Source: Agrimatie.nl

We also take a closer look at whole milk powder, because the Netherlands is a major exporter of product. Figure 65 shows that production peaked in 2016 and decreased afterwards until 2020 and this decrease is expected to continue until 2025. Almost 75% of produced whole milk powder is exported annually. A similar story applies to the production and exportation of butter (Agrimatie, 2019). While the domestic consumption of butter has been stable in the last decade, the production has been increasing. As a result, the share of the exportation has been increasing. Finally, consider drinking milk. The Netherlands has been a net importer of drinking milk. In 2020, of the total domestic consumption of 1,335 kilotons, more than 50% was imported.

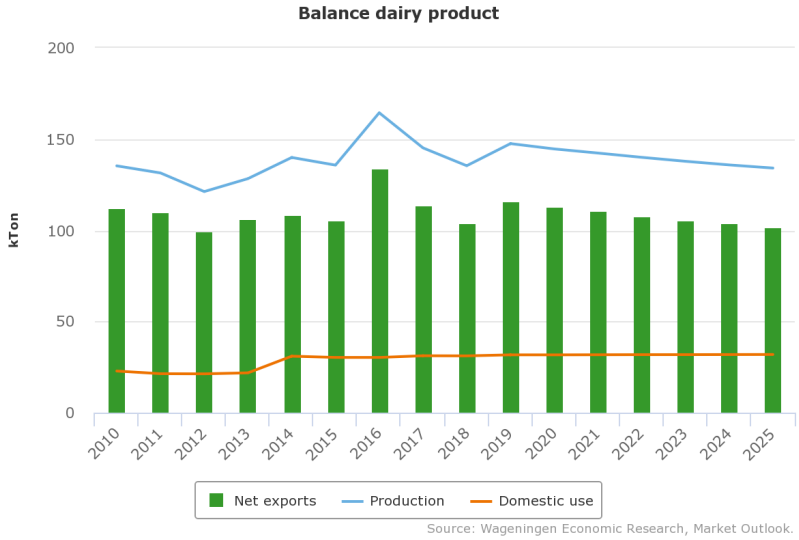
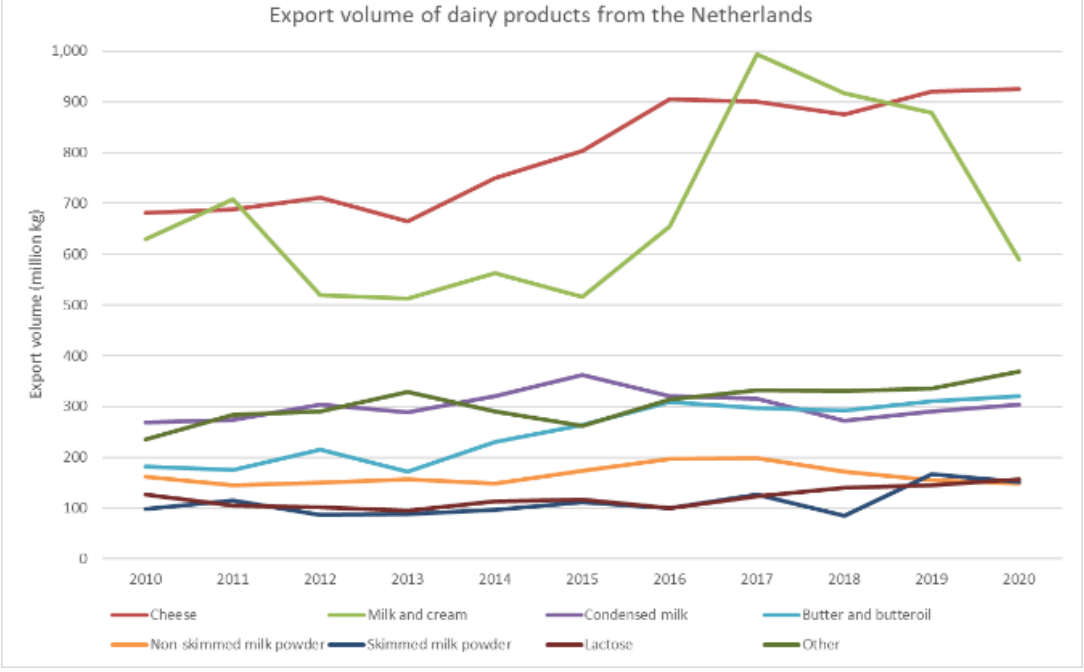
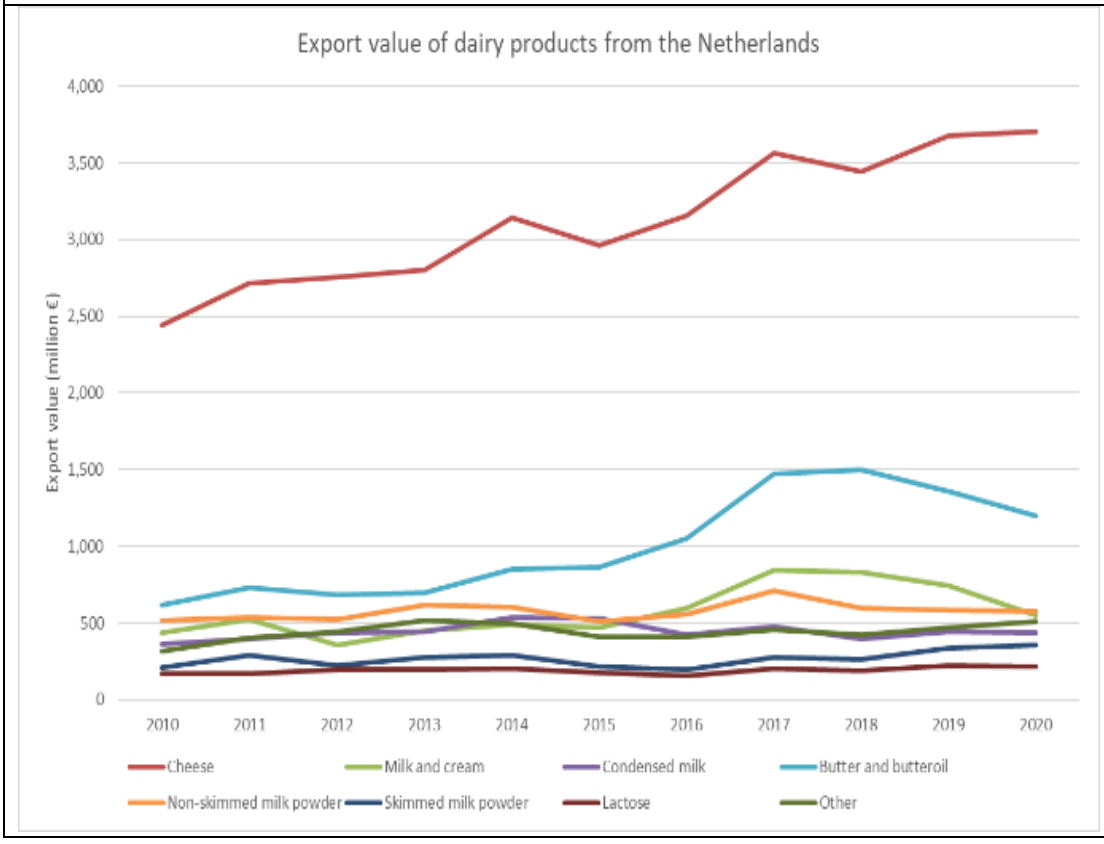


Figure 65: Production, import and export of milk powder in the Netherlands from 2010 to 2020 and forecast to 2025. Source: Agrimatie.nl

b. Trade and trade relations with other countries

Netherlands is a global player and a major exporter and importer of dairy products (Figure 66). The annual value of dairy products exported from the Netherlands increased from between €5.0 and €5.8 billion in 2010-2012 to between €7.5 and €8.0 billion in 2018-2020. The annual value of dairy products imported increased from between €2.2 and €2.5 billion in 2010-2012 to between €3.6 and €3.8 billion in 2018-2020. Annual import value was approximately 45% of annual export value. Cheese accounted for approximately half the export value and a third of the import value. In volume, cheese and milk and cream were exported most, each accounting for approximately 28% of exported volume. Other products and milk and cream were imported most, with each approximately one third of imported volume.


Export volume of dairy products from the Netherlands
Export volume (million kg)
1,000
900
800
700
600
500
400
300
200
100
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Cheese
Milk and cream
Condensed milk
Butter and butteroil
Non skimmed milk powder
Skimmed milk powder
Lactose
Other


Export value of dairy products from the Netherlands
Export value (million €)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2010
2011
2012
2013
2014
2015
2016
2017
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2019
2020
Cheese
Milk and cream
Condensed milk
Butter and butteroil
Non-skimmed milk powder
Skimmed milk powder
Lactose
Other

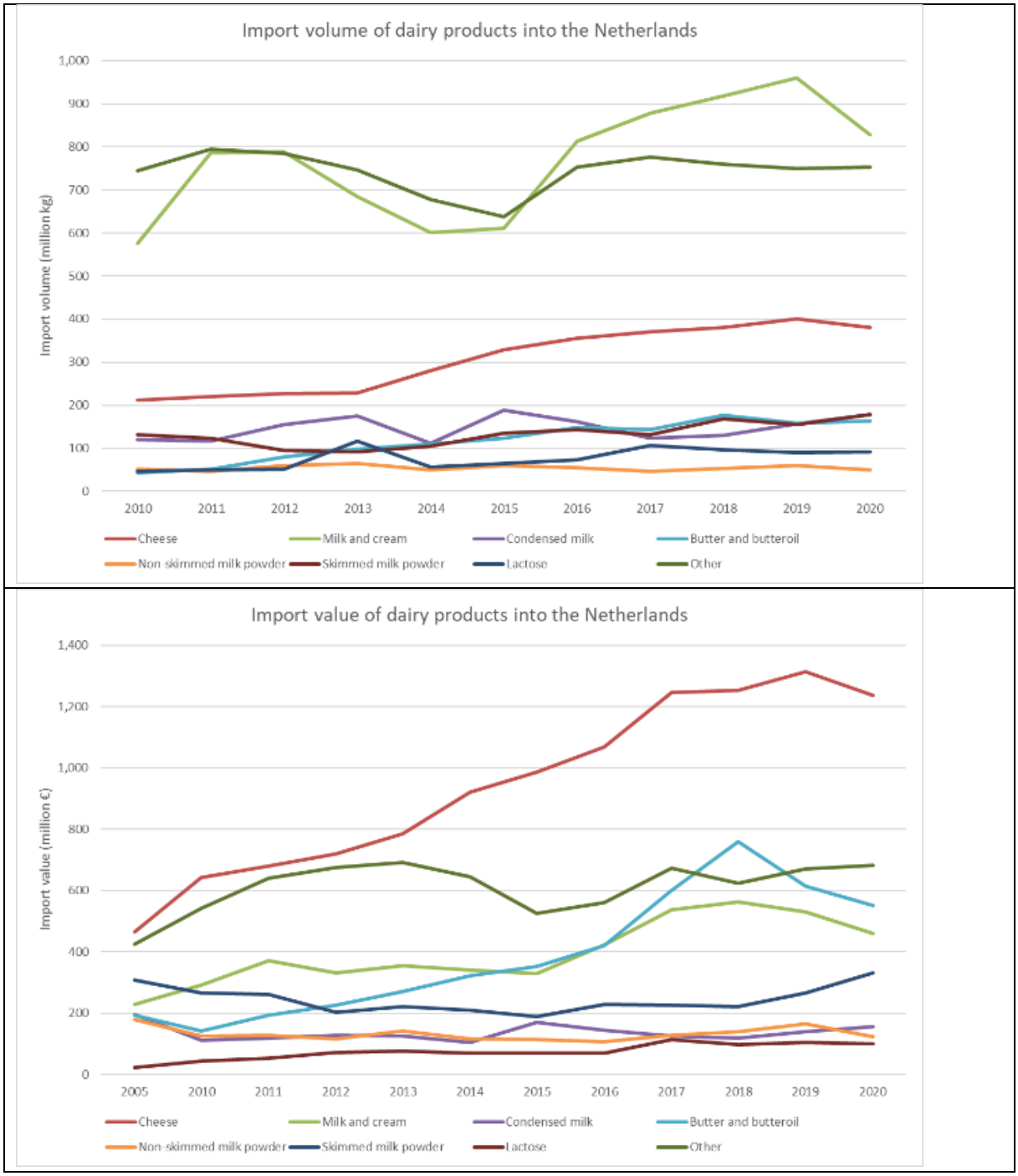


Figure 66: Development of dairy product export from and import into the Netherlands from 2010 to 2020. Source: Eurostat, Comext database

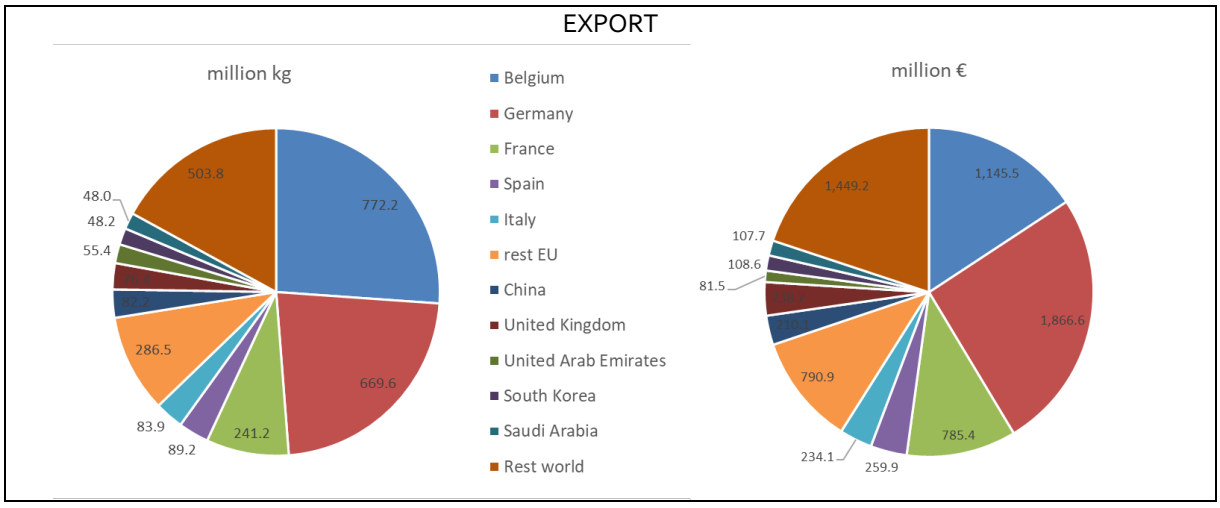
Table 4 shows that in 2018 cheese and butter (butter oil) were the two dairy products with the largest Trade surplus in the Netherlands. On the import side, whey was the product with the largest import value. The Annexes provides detailed information regarding import and export of cheese and drinking milk. Overall, Dutch dairy processors have a focus on products with higher margins and rely on importation for low margin products such as drinking milk.

Table 4: Import and Export value of Dairy Products in the Netherlands in 2018. Source: Eurostat, Comext database

Product	Import value (million €)	Export value (million €)
Cheese	1,139	3,282
Butter and butteroil	533	1,222
Milk and Cream	463	700
Non-skimmed milk powder	122	594
Condensed milk	140	440
Skimmed milk powder	216	236
Whey	371	206
Natural milk constituents	19	117
Yoghurt, buttermilk, fermented products	206	101
Total	3,210	6,899

Trade Partners

shows the relative size of trading partners in terms of the value of trade. Germany and Belgium, France and Ireland were main trading partners of dairy products, both imports and exports, with more than 60% of the total trade value of the Netherlands. Outside the EU, the UK was the largest trade partner concerning both imports and exports.



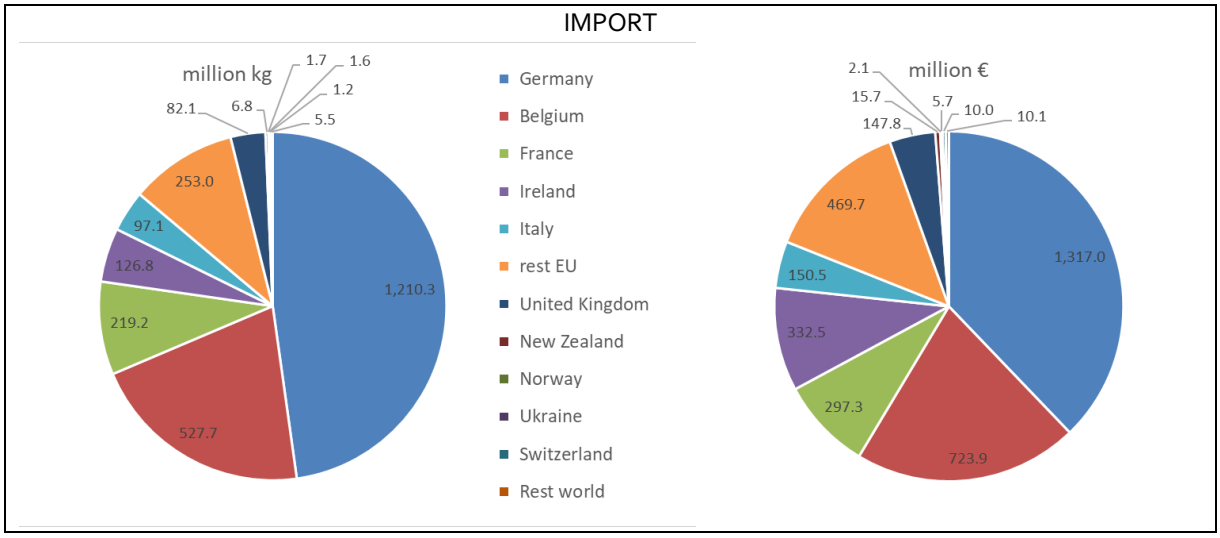


Figure 67: Annual average (2016 to 2020) dairy product export and import volume (million kg) and value (million €) for the Netherlands. Source: Eurostat, Comext database

c. Retail sector and consumption

Consumption of Dairy Products

The most recent Dutch food consumption survey shows that in 2016 an average Dutch person consumed 73.2 kg fermented and non-fermented milk and milk beverages (57% of total dairy consumption in weight), 19.6 kg yoghurt (15%) and 11.9 kg cheese (9%) (Figure 68). No more recent food consumption survey is available.

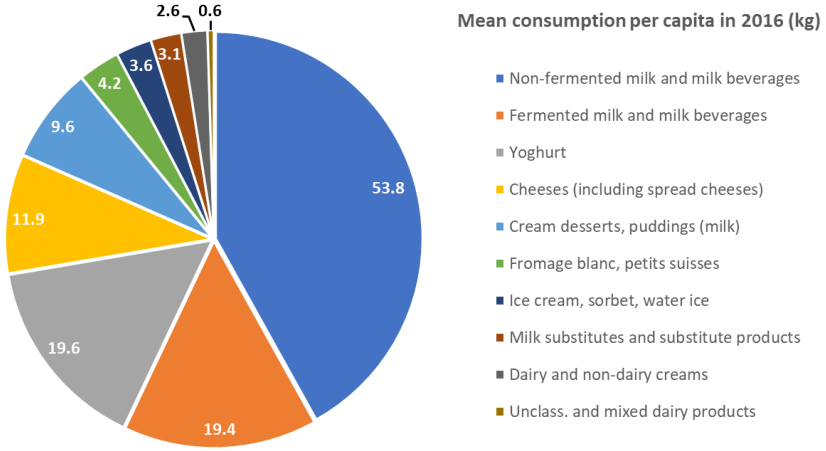


Figure 68: Dairy consumption in the Netherlands in 2016 in kg product/capita. Source: RIVM, Voedselconsumptiepeiling 2012-2016(https://www.wateetnederland.nl/)

In 2020, the average expenditure of Dutch households on dairy products was €624, 20% higher than that of €519 in 2015 (Table 5). Expenditure increased from 2015 to 2020 for all product categories except full-fat milk and ice cream. In both years, approximately 45% of the total expenditure on dairy products was spent on cheese, 21% on other dairy products, and 13% on fresh demi- and low- fat drinking milk and yoghurt each.

Table 5: Household expenditure on dairy products in 2015 and 2020. Source: CBS Bestedingen van huishoudens; bestedingscategorieën

	Average expenditure (€)		Share in total expenditure (%)	
	2015	2020	2015	2020
Fresh full fat drinking milk	2	1	0.0	0.0
Fresh demi- and low-fat drinking milk	65	84	0.2	0.2
Yoghurt	64	84	0.2	0.2
Cheese	231	285	0.7	0.8
Other dairy products	108	136	0.3	0.4
Butter	19	30	0.1	0.1
Consumption ice cream	30	4	0.1	0.1
Total	519	624	1.6	1.8

2. ACTORS IN THE VALUE CHAIN

a. The main actors in the value chain

In 2020, the Netherlands had just under 16,000 dairy farms (Figure 69). The number of dairy farms has consistently decreased since 2000. This is mainly caused by a lack of successors in combination with low margins (margins are shown in Figure 70). Dairy farms in the Netherlands are mostly family based. This means that for most their continuation depends on children taking over from the parents. Especially smaller farms have lower income. So, children on smaller farms are less willing to take over the farm than children on larger farms. Outsiders buying a dairy farm is rare, because of the large investment needed to buy an existing farm (land, buildings, equipment). So, the number of smaller farms that quit is larger than the number of larger farms. The fact that farms that remained in business bought the production rights of farms that stopped, contributed to the increase in average size of dairy farms. A dairy farm is only allowed to produce the amount of phosphate in manure as it has phosphate production rights. Furthermore, entrepreneurs in agricultural, horticultural and livestock sectors have to register their land use each year with the Netherlands Enterprise Agency. For animal farms, like dairy farms, there are also regulations that require the farmers to register and identify the animals. This has to be done immediately after buying, selling, or moving the animals.

Dairy farming in the Netherlands is capital intensive (land, buildings, equipment) and the return on investments (ROI) is often low. Furthermore, the Dutch dairy sector is export oriented, operating on the

world market. Higher costs (e.g., for land, environmental issues) than in other countries, also put downward pressure on ROI. However, dairy farmers don't really look at ROI in deciding to farm since the majority took over from their parents and did not have to invest the real value of the farm. Instead they look at cash flow and whether this can provide sufficient income. In the last five years, dairy farmers could extract a decent net income from their farm of between 30 and 60k€ per labour unit. So, as long as the farm generates sufficient cash to pay for the expenses and the farmer has a decent income, they stay in business. It should be noted that land prices in the Netherlands are the highest in the EU (Figure 71), so with their land many dairy farmers have a pot of gold.
Overall, raw milk production is decentralized in the Netherlands with no farms dominating the industry. There is a trend of raw milk production taking place on larger farms, because smaller farms stop, and larger farms take over their production rights.

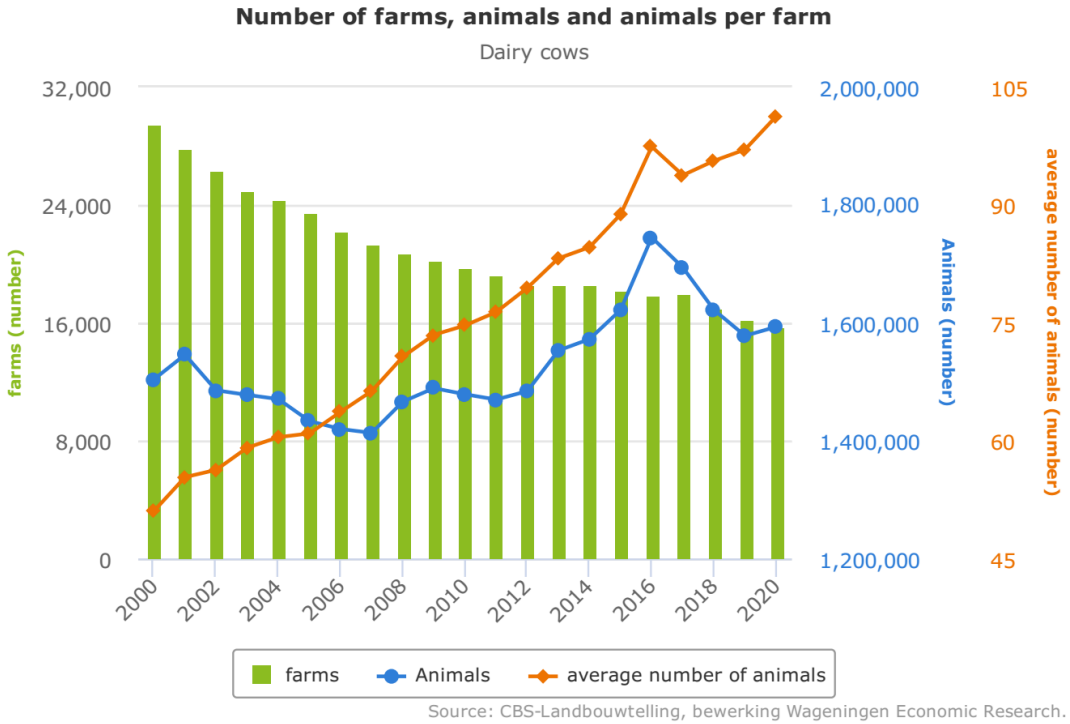


Figure 69: Number of dairy farms, dairy animals, and animals per farm in the Netherlands from 2000 to 2020. Source: Agrimatie.nl

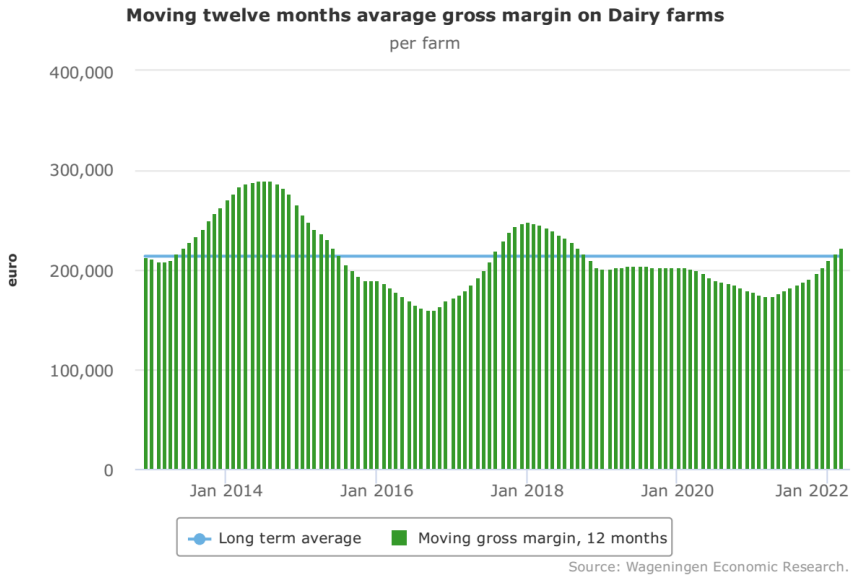


Figure 70: Average gross margin of Dutch dairy farms from 2013 to 2022. Source: Agrimatie.nl

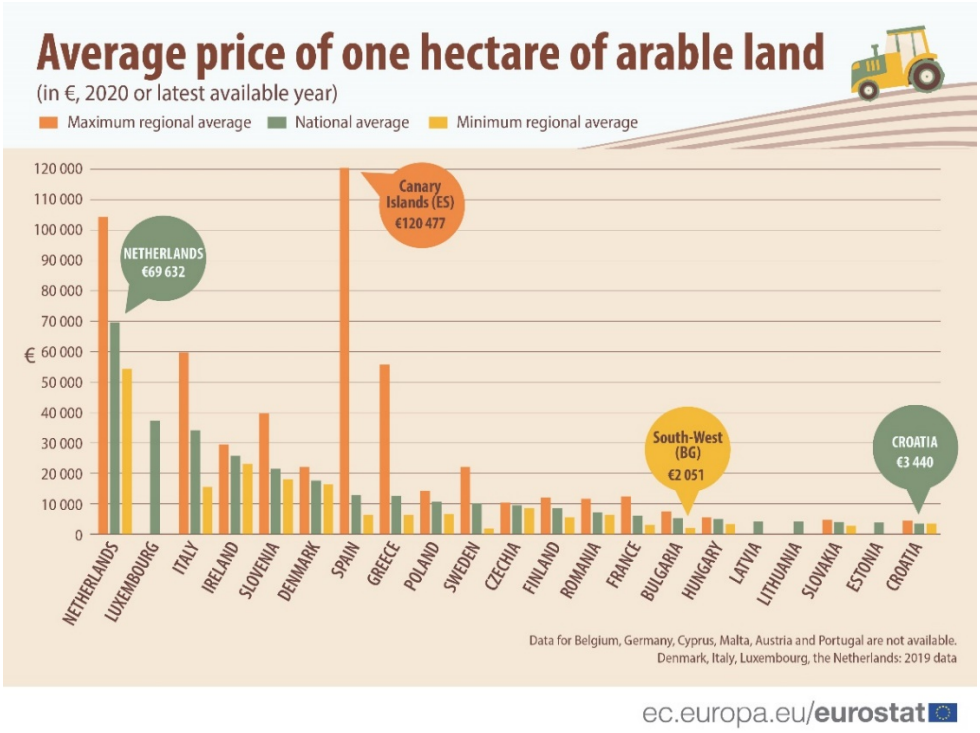


Figure 71: Arable land prices in Europe (Eurostat)

Figure 69 also shows that the number of cows was relatively stable from 2000 to 2012, showed a steep increase from 2013 to 2016, after which it steeply decreased to 2020. The main reason for the steep increase was the lifting of the milk quota in 2015. Before 2015, Dutch milk production was close to the milk quota, so the quota was a limiting factor for the number of dairy cows. Already before 2015, the number of dairy cows increased, because 1) the milk quota was loosened in the years prior to 2015, and 2) farmers already built new barns and started producing because they knew that the quota would be removed. The steep decrease from 2017 was mainly caused by government measures to decrease the national phosphate excretion in dairy manure. In 2015/2016 the amount of phosphate in the manure of cows exceeded the phosphate ceiling from the EU Nitrogen Directive (for the Dutch dairy sector this was 84.9 million kg). Thus, the Dutch government introduced a (temporary) phosphate reduction plan in 2017, with which they bought a number of cows and farms to reduce the national phosphate production. On 1 January 2018, this was replaced by a system with phosphate production rights (rights to produce phosphate in manure up to a certain ceiling, phosphate quota system) and farmers could now only produce so much phosphate in the manure as they had rights and the number of cows Increased again. The system has a flat-rate phosphate production per cow, which does depend on milk yield, but not an actual phosphate excretion.

Figure 72 shows the geographic distribution of dairy cows in the Netherlands. The northern province of Friesland has the highest number of farms followed by the eastern provinces Overijssel en Gelderland. The western part of the province Zuid Holland also has a large concentration of dairy farms. The southwestern province of Zeeland has the lowest number of farms. The white spot in the middle is the Veluwe region including national park 'De Hoge Veluwe' and military areas.

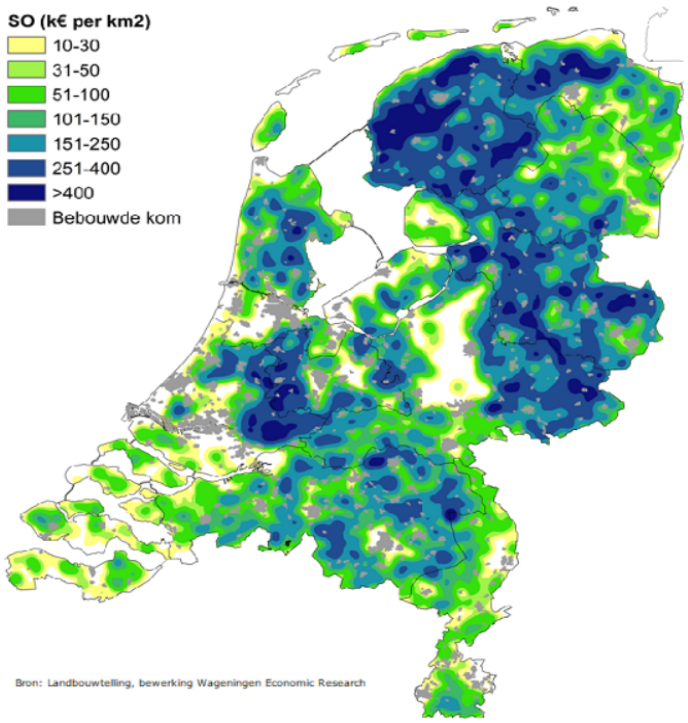


Figure 72: Geographical distribution of dairy cows in the Netherlands. Source: Agrimatie.nl

Although organic dairy farms comprise a small share of the total dairy farms in the Netherlands, the share of organic farming has been steadily increasing from 1.9% in 2015 to 3.3% in 2021 (Table 6). The number of organic dairy cows showed a similar pattern, although the share in cows is somewhat lower with 2.6% than the share in farms with 3.3% in 2021, reflecting that organic dairy farms are smaller than other dairy farms in the Netherlands.

Table 6 Organic dairy farms and cows in the Netherlands. Source: agrimatie.nl

	2015	2016	2017	2018	2019	2020	2021
Organic dairy farms	351	356	391	461	466	484	500
% of total	1.9%	2.0%	2.2%	2.7%	2.9%	3.1%	3.3%
Organic dairy cows	25,480	28,368	31,883	37,180	37,902	40,041	41,631
% of total	1.6%	1.6%	1.9%	2.3%	2.4%	2.5%	2.6%
Dairy farms in transition to organic	14	68	100	46	42	32	44
% of total	0.1%	0.4%	0.6%	0.3%	0.3%	0.2%	0.3%
Dairy cows in transition to organic	1,063	5,277	7,408	2,535	2,079	1,644	3,706
% of total	0.1%	0.3%	0.4%	0.2%	0.1%	0.1%	0.2%

Outdoor grazing is considered a favourable way of keeping dairy cattle, is advocated by the proponents of animal welfare, and gives the dairy sector a good public image. Yet, it is less efficient compared to keeping cows indoors. The percentage of farms with outdoor grazing decreased from 82% in 2010 to 77% in 2016, after which it increased again to 81% in 2019. The percentage of cows with outdoor grazing decreased from 74% in 2010 to 65% in 2016, after which it increased again to 72% in 2019. The percentage of cows with grazing decreased, because keeping cows inside gave farmers more control over production and it was easier to give an optimal feed. Already before 2010, the Dutch dairy sector (i.e., farmer organizations plus processors together) feared that the trend of keeping cows inside without grazing would increase due to the abolishment of quota in 2015, potentially causing the sector to develop a bad public image. Therefore, in 2010, the Dutch dairy sector developed a national program called “Sustainable Dairy Chain”, placed under the Dutch Interbranch organization ZuivelNL, to steer the sector development towards getting a better public image and to prevent the sector to go over environmental ceilings. This program focused on multiple topics, such as environment, biodiversity, climate, animal welfare, antibiotics use. Furthermore, the sector feared that if they did not develop themselves, legislation would be developed that would force them to take actions. One of the topics addressed is stimulating outdoor grazing. In 2012, the Dutch treaty on Grazing was concluded and by 2023 it was signed by 83 organisations from the Dutch dairy chain (Duurzame Zuivelketen, 2023). Since 2017, the percentage of cows with outdoor grazing increased due to this treaty.

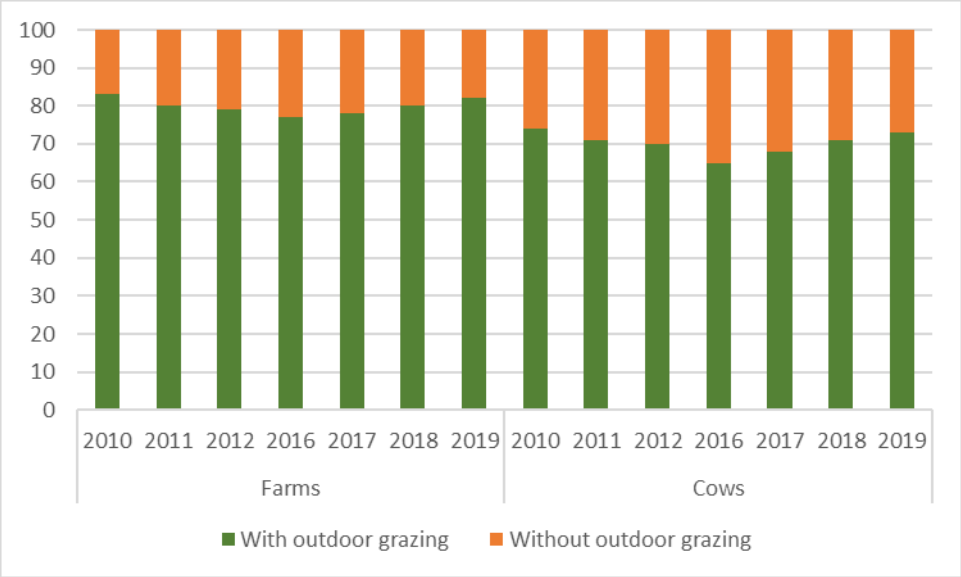
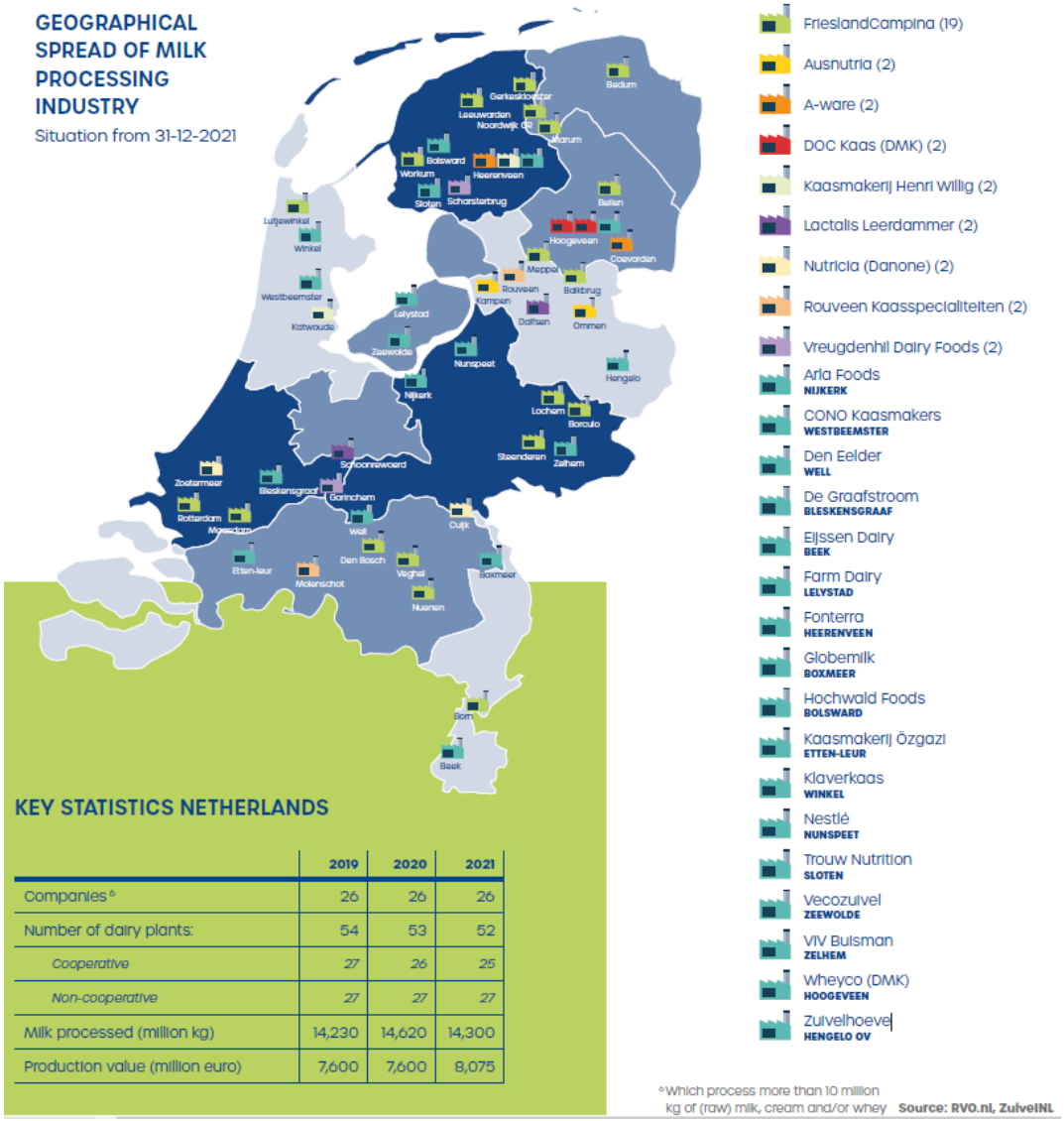


Figure 73: Percentage of indoor and outdoor grazing of dairy farms and dairy cows in the Netherlands from 2010 to 2019. Source: Agrimatie.nl

Dairy processing companies

In 2020, dairy companies processed 14.6 billion kg of raw milk. There were more than 26 dairy processors with 52 locations in the Netherlands, of which 25 were locations of cooperatives and 27 locations of non-cooperatives which annually process more than 10 million kg of raw milk. Figure 74 shows the spatial distribution of milk processing locations at the end of 2021 of these processors. The colours indicate the dairy processor. Dairy processing is concentrated in regions with dairy farms. Of the milk processors, five are farmer cooperatives: FrieslandCampina, CONO Kaasmakers, DOC Kaas U.A., Arla, and DeltaMilk. FrieslandCampina is the largest dairy processor in the Netherlands with approximately 11,000 members (approximately 70% of dairy farmers in the Netherlands) and one of the largest dairy firms in the world (van Galen et al., 2021). CONO Kaasmakers, DOC Kaas U.A., Arla, and DeltaMilk are also significant dairy cooperatives with a large number of farmer members. The largest four companies that supply supermarkets with dairy products, have a market share of over 95% (van Galen, 2021). Market shares of individual companies are not publicly available.



	2019	2020	2021
Companies*	26	26	26
Number of dairy plants:	54	53	52
Cooperative	*27*	*26*	*25*
Non-cooperative	*27*	*27*	*27*
Milk processed (million kg)	14,230	14,620	14,300
Production value (million euro)	7,600	7,600	8,075

Figure 74: Geographical distribution of dairy processing facilities of processors in the Netherlands at the end of 2021. Source: ZuivelNL (2022)

There is a national program "Sustainable dairy chain" developed by the association of dairy processors and farmer organizations together. This program is placed under the interbranch organisation ZuivelNL and sets standards and monitoring for all dairy farmers and processors but does not provide incentives for individual dairy farmers. Incentives for farmers to become more sustainable come from sustainability programs that individual dairy processors have implemented. All dairy processors in the Netherlands have an own sustainability program, adapted to their specific needs, mainly related to the demand of their customers. Dairy farmers need to comply with multiple requirements, such as environment, biodiversity, climate, animal welfare, antibiotics use. Many programs give dairy farmers points for how they perform on each issue and

require dairy farmers to have a minimum number of points on each issue and a minimum amount in total. The points can be received for activities (participation in a workshop) or for a specific performance (e.g. longevity of cows). For specific issues, dairy farmers receive financial compensation. For example, farmers receive a bonus of €0.01 to €0.02 per kg of milk for grazing.
The demand uncertainty and long waiting list for certification are viewed as the main hinderance toward sustainable practices by the dairy supply chains (van Galen, 2021). The final consumers are supposed to pay a premium for products produced in sustainable products. However, the dairy companies are not sure if the premium is realized, and the expected volume of the demand will be placed. For the dairy farmers, the fear that requirements become stricter in the future also results in hesitation in joining the programs.

Traders

Several dairy processing companies are also traders, for example FrieslandCampina. There are also traders without processing capacity, which buy dairy products from processing companies. For example, Hoogwegt is the world's largest independent supplier of dairy products and ingredients. Another trader, OFI (Olam Food Ingredients), recently started processing to be able to more easily comply with sustainability demands from their customers.

Supermarkets

Supermarkets are the dominant retailers of dairy products in the Netherlands. Almost all fresh milk and approximately 90% of all other dairy products are sold via supermarkets (van Galen et al., 2021). In 2021, supermarkets in the Netherlands were dominated by Albert Heijn with a market share of 35.9% in food, followed by Superunie (26.4%), Jumbo (21.8%) and LIDL (10.7%) (FMCG Opleidingen, 2022). The four largest supermarkets together controlled more than 70% of the Dutch food retail market (van Galen et al., 2021).

b. Typology of actors in the value chain

Usually, processors in alternative value chains also produce for the 'dominant' value chain. For example, Rouveen Kaasspecialiteiten and FrieslandCampina produce both organic and conventional cheese. Producing for small alternative value chains could be a bit complicated for large processing companies such as FrieslandCampina, because their processing location capacities might be larger than the demand for those speciality products. However, large companies can produce for multiple markets. For example, FrieslandCampina has 7 or 8 different milk streams.
All Dutch dairy processors that buy milk from Dutch dairy farmers have sustainability programs in place based on the national program "Sustainable dairy chain." Some dairy processors communicate their sustainability program to consumers/customers, others do not. This depends mainly on their customer market. For example, Cono Kaasmakers and FrieslandCampina communicate their system, because they sell to consumers. Vreugdenhil Dairy Foods does not communicate the program to consumers, because they mainly produce milk powder for the world market. Often, communication to consumers also includes sustainability

labelling. Specific sustainability systems with labelling include On-the-way-to-PlanetProof (independent quality label that proves that food, including dairy, and floriculture products are produced more sustainably), Beter leven ("Better life", a sustainability label of the Dutch animal welfare organisation with a focus on animal welfare, environment and biodiversity), Beter voor Koe, Natuur & Boer ("Better for cow, nature & farmer", a specific program of the processor Royal A-ware in cooperation with the retailer Albert Heijn). In these programs together approximately 1000 farmers participate. Farmers get a price premium for participating in such a system, but the premiums are not publicly available.

Foreign dairy processors have access to the Dutch market, especially those from within other EU member states. They might sell dairy products made from milk from cows in other countries. For example, Arla is also selling organic dairy products in the Dutch market which might come from Denmark or Germany if supply from Dutch farmers is insufficient to meet demand.

3. THE GOVERNANCE OF THE VALUE CHAIN

a. Power relations in the value chain

Most dairy farmers are member of a dairy cooperative. Farmers have a say in the strategy of their cooperative. In smaller cooperatives, such as Cono Kaasmakers with approximately 500 members, this is more visible than in a large cooperative, such as FrieslandCampina with approximately 11,000 members, where individual farmers have less influence.

Dutch retailers constituted only a small part of the dairy value chain in the Netherlands, because most dairy products made in the Netherlands are exported. Thus, the added value for the Dutch dairy chain was not so much in the Dutch retail but more in the export of high value products (e.g., infant milk formula powder). So, the Dutch retailers had relatively little bargaining power in the Dutch dairy chain. However, this changed in the last years, because of development of programs by the retail in cooperation with dairy processors, for example the Beter voor Koe, Natuur & Boer program ("Better for cow, nature & farmer") of the retailer Albert Heijn in cooperation with the processor Royal A-ware. In 2022, total dairy production in Europe went down making it more difficult for European retail to get sufficient dairy products. This resulted in an extremely high raw milk price (€0.65 per kg).

Interbranch organization ZuivelNL

ZuivelNL is the inter-branch organisation of the Dutch dairy sector incorporating both farmer organisations and processor organisations. It was established in 2014 by the Dutch Federation of Agriculture and Horticulture and the Dutch Dairy Organization. Its main mission is fostering collaboration between the members of the dairy supply chain. In addition, the organization serves as an intermediary between the government and the dairy sector. ZuivelNL is active in areas where cooperation between the links in the dairy chain leads to added value. Activities include financing and initiating research & innovation in dairy farming and the dairy chain, financing and facilitating development and program management in the field of sustainability and animal health & welfare. Examples of this are the Sustainable Dairy Chain, the

KringloopWijzer and KoeMonitor. In the context of food safety, ZuivelNL finances the Joint Research Dairy research programme. ZuivelNL publishes market information about the international dairy market and Dutch dairy farming and facilitates the export of dairy products.
ZuivelNL finances its activities from a contribution based on kilos of milk supplied by dairy farmers to dairy companies and kilos of milk processed by dairy companies. Dairy farmers pay €0.05 per 100 kg of milk and dairy companies €0.02 per 100 kg of milk.

b. The role of contracts and price transmission

More than 90% of the conventional Dutch dairy farms and more than 95% of the organic Dutch dairy farmers deliver to deliver milk to a dairy cooperative. The remaining farmers mostly deliver to a non-cooperative dairy processor, and only a few dairy farmers sell their raw milk on the spot market. FrieslandCampina is the biggest cooperative, with approximately 11,000 members. Farmers select the cooperative for membership mainly based on geographical distance of farm from the processing facility and also the demand for the type of milk that is produced by the farm. Most farmers have long-term contracts with the cooperatives which obliges them to deliver milk to the cooperatives, with the exception of the raw milk they use themselves for processing on the farm. Cooperatives are also obliged to take the raw milk from their member farmers. Contracts between dairy farmers and non-cooperative processors are mostly similar in nature, with an indefinite term and the option to cancel once a year. A dairy processor must allow dairy farmers sufficient time to adapt to any changes to the contract (fair trading practices). This type of long-term contracts has the benefits that they provide the farmers with security and insures their income. In addition, it helps the cooperative to have stable inputs. On the other hand, these long terms contracts limit flexibility of the farmers in choosing the best buyer. Van Galen et al. (2021) stated that with conventional milk, slightly more than 80% of dairy farmer sales are generated through long-term contracts and the rest via direct sales, daily and weekly trading, or other sales systems. With organic milk, the percentage of sales via contracts is slightly higher with more than 90%.
Dairy companies in the Netherlands are highly export oriented and also face competition from international suppliers. Farmers can leave a cooperative, but the exact conditions differ. Leaving a cooperative is possible but not always a straightforward process. The exact procedures for leaving dairy cooperatives differs between cooperatives. It is stated in the articles of association and the membership rules of cooperatives. Farmer members are usually allowed to leave and receive some sort of severance payment in case they notify the cooperative sufficiently in advance. Some cooperatives require leaving farmers to pay an exit fee. The aim of the exit fee is discouraging the members from leaving and thus disintegrating the cooperative. The exit fee is also used to recoup the investment that cooperative made for the farmers. FrieslandCampina is an exception because it was formed as a merger of FrieslandFoods and Campina and has the legal obligation to return the capital if a member leaves.
All Dutch dairy farmers receive approximately the same price per kg of milk of the same quality or with the same specific label. Guaranteed prices of cooperatives are published by the cooperatives themselves. They can differ between cooperatives, because they are set depending on the expected future revenue of the specific products the cooperative is producing. Guaranteed prices function as a reference for the price of

non-affiliated dairy farmers and retail. Guaranteed prices are adjusted monthly. The milk price is a result of the national and international market conditions for various (by)products of raw milk. International prices are more influential on the reference price for conventional milk than for organic milk, due to the stronger international competition in conventional dairy products (butter, cheese, powder).

In 2010, the Dutch family businesses Bouter Kaas and Anker Kaas merged into Royal A-ware. After the merger, they implemented a growth strategy in the Netherlands (and abroad) and, thus actively started searching for more Dutch dairy farmers as suppliers. At that time, many Dutch dairy farmers were used to delivering milk to a specific dairy processor without considering that they could move to another. The option of delivering milk to Royal A-ware made Dutch dairy farmers think better about to whom they are delivering their milk and whether this processor fits their own farm strategy.

Van Galen et al. (2020) found no price transmission between processor and retailer with both conventional and organic milk. Price transmission in this case is a term to indicate that prices in one stage of the supply chain are changing in response to a change in another part of the supply chain. The response is defined in statistical terms. Price transmission has several attributes: speed and completeness define the extent of price transmission. And asymmetry explains whether there is a different response to price increases and price decreases. In food chains with a variety of contracts ranging from spot-markets to annual contracts or even full integration between actors, price transmission is usually not immediate; it takes a few weeks or even months before the transmission process is finished. Also, price transmission is often not fully complete. This means that although prices react, not all the of the price change in one stage will be finally observable in the other stage. For milk, van Galen et al. (2020) found incomplete price transmission from farm to processor, but only 3.6 cents permanently after 10 cent shock at primary stage. They did not find price transmission from processor to retail, meaning that in this period retail prices moved independently from processor prices.

c. The place of differentiation in the value chains

Usually, larger processors in alternative value chains also produce for the regular value chain. For example, Rouveen Kaasspecialiteiten, FrieslandCampina, Arla Foods, and Vecozuivel produce both organic and conventional dairy products, such as drinking milk and cheese. Producing for small alternative value chains could be a bit complicated for large processing companies such as FrieslandCampina, because their processing location capacities might be larger than the demand for those speciality products. However, large companies can produce for multiple markets. For example, FrieslandCampina has seven or eight different milk streams.

For the Dutch dairy sector high added value is critical given the relatively high costs for producing milk on farm level. Although cheese often is seen as high added value, some sorts of cheese can also be lower added value. In contrast, milk powder is often considered as low added value commodity, but specific milk powders such as infant formula are high added value products. Food Ingredients such as specific proteins are high value-added products.

Within conventional milk, several labels are used in the Netherlands with farmers being certified to produce milk for these labels. The most important initiatives are Weidemelk (Meadow milk, milk from cows with outdoor grazing), VLOG-melk (Verband Lebensmittel Ohne Gentechnik, German label on feed without

genetic modification), On the way to PlanetProof, Beter Leven, and Beter voor Koe, Natuur & Boer (van Galen et al., 2021). Weidemelk was introduced in 2007 by Campina and Friesland Foods. This is an open initiative; all dairy farmers and processors can participate. Dairy cows should graze for at least six hours per day and at least 120 days per year on a pasture with sufficient grass supply. The total turnover of dairy products with outdoor grazing is estimated at €1 billion (van Galen et al., 2021).

For dairy products, On the way to PlanetProof labelling was introduced in retail at the end of 2018 by FrieslandCampina on a number of dairy products, such as brand name fresh milk and yogurt. A number of other dairy processors and their supplying dairy farmers are currently also certified. At many supermarkets, private label milk products can be found certified with this label. This is also an open initiative. An estimated 700 dairy farmers have a certificate from On the way to PlanetProof. It has basic requirements for biodiversity, climate, and animal welfare, such as permanent grassland, prevention of eutrophication, feed partly from own land, greenhouse gas emissions per kg of milk, space in the barn, and grazing. Certification is done on the basis of 'Chain management', in which the chain director, i.e. the dairy processing company, carries the responsibility that the participants, i.e. dairy farmers, meet the requirements. Dairy farmers are thus not a certificate holder.

The Beter Leven quality mark for dairy was introduced in April 2019 in the retail, and in particular at Jumbo. This is an open initiative. The quality mark indicates that extra efforts are being made performed with regard to animal welfare. It is still limited, with only a few dozens of dairy farms with Better Life certification.

The Beter voor Koe, Natuur & Boer label was introduced in Albert Heijn in 2018 as a minimum requirement for their private label milk. The program sets requirements with regard to grassland soil specificity and grazing, biodiversity, energy, and feed. In 2020, 40% of the Albert Heijn private label dairy products carried the label Beter voor Koe, Natuur & Boer, including milk and buttermilk. Approximately 300 dairy farmers participate.

d. Most recent trends and future development of the value chain

The dairy farming sector in the Netherlands has a problem with the production of phosphate and nitrogen (ammonia emission). During 2015 to 2018, the production of phosphate in the dairy sector exceeded the European standard set by the European Commission. As a result, the government introduced a phosphate rights system in 2018 that curbed phosphate production and resulted in complying with the standard in 2020. Production of nitrogen is still an issue, and the dairy sector exceeded the production ceiling in 2020. Excess emission of ammonia, especially close to nature areas, is a large problem in the Netherlands. Dairy farmers will need to reduce the ammonia emission or even to stop farming at that location. Other issues the dairy farming and the dairy sector are facing, are the consequences of climate change through hotter and dryer summers and excessive rain in shorter periods, measures to mitigate biodiversity loss (for example using less or no pesticides or herbicides, having herbal-rich field borders and flower strips, harvesting grass after bird breeding season has ended), and the upcoming societal discussion about consumption of animal products.

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Annexe

Table A1: Trade of cheese and drinking milk in kg/year in the Netherlands (average 2015-2018) (source: Eurostat, comext database)

Cheese				Drinking milk			
export		import		export		import	
DE	1,100,212,000	DE	424,021,694	BE	381,336,559	DE	424,021,694
BE	402,087,478	BE	237,860,852	DE	182,836,388	BE	237,860,852
FR	301,030,295	FR	61,147,992	FR	45,869,132	FR	82,909,681
ES	187,317,896	DK	78,783,223	ES	1,717,670	DK	85,359,955
IT	130,049,784	IE	62,886,396	IT	9,571,993	ES	15,252,345
EU	2,596,286,689	EU	1,046,216,892	EU	635,137,936	EU	460,816,983
JP	74,364,746	GB	67,493,227	CN	6,154,540	GB	6,340,493
GB	126,300,769	CH	12,069,272	SA	20,633,920	NV	1,269,522
US	78,777,768	NZ	11,885,452	GB	6,268,781	CH	43,893
KR	27,038,673	QV	€366,911	QA	182,037	QV	0
MA	17,758,280	US	€241,103	KR	405,601	ID	0
Rest world	685,898,412	Rest world	92,433,712	Rest world	49,988,890	Rest world	2,638,948
Total	3,282,185,101	Total	1,138,650,605	Total	685,126,826	Total	463,455,931

The pig value chain

The Danish pig value chain

Heidi Mai-Lis Andersen (Innovation Centre for Organic Farming), Peter Rasmussen (Organic Denmark)

Key findings :

- Danish pig value chain moved towards fewer but larger units (both farms and slaughterhouses) and passed from mainly producing to slaughter to also being a large exporter of weaners
- The destination of exported products changed, the Denmark passed from mainly exporting to EU countries to a situation in which approximately half of the pork is exported within the EU and rest outside the EU
- Large slaughterhouses have a production that imply a large export business, whereas the smaller Danish slaughterhouse mainly focus on the domestic market
- In the last years, Danish consumer preferences shifted from red meat to poultry meat
- Organic production is still a niche, but is increasing
- Danish retail chains have started to develop direct partnerships with specific farmers to organize production and gain more control in the value chain

1. DESCRIPTION OF THE PHYSICAL FLOWS IN THE VALUE CHAIN

a. Structure of the Danish pig production

The pig population in Denmark was per January 1, 2020, approx. 12.7 million pigs (Danmarks Statistik), approx. 1.1 pct. of them were organic.

The Danish pig population has been relatively stable during the last 20 years, with a population between 12 and 13 million pigs, with some small ups and downs during the years, see Figure 75. (Danmarks Statistik). The main production is conventional pig production, but the organic production is increasing (Danmarks Statistik). In addition, there are other small niche productions such as free-range pig, raised without antibiotics and a state-controlled welfare brand. The proportion of these niche productions is still very low, just as there is very little data on these niche productions.

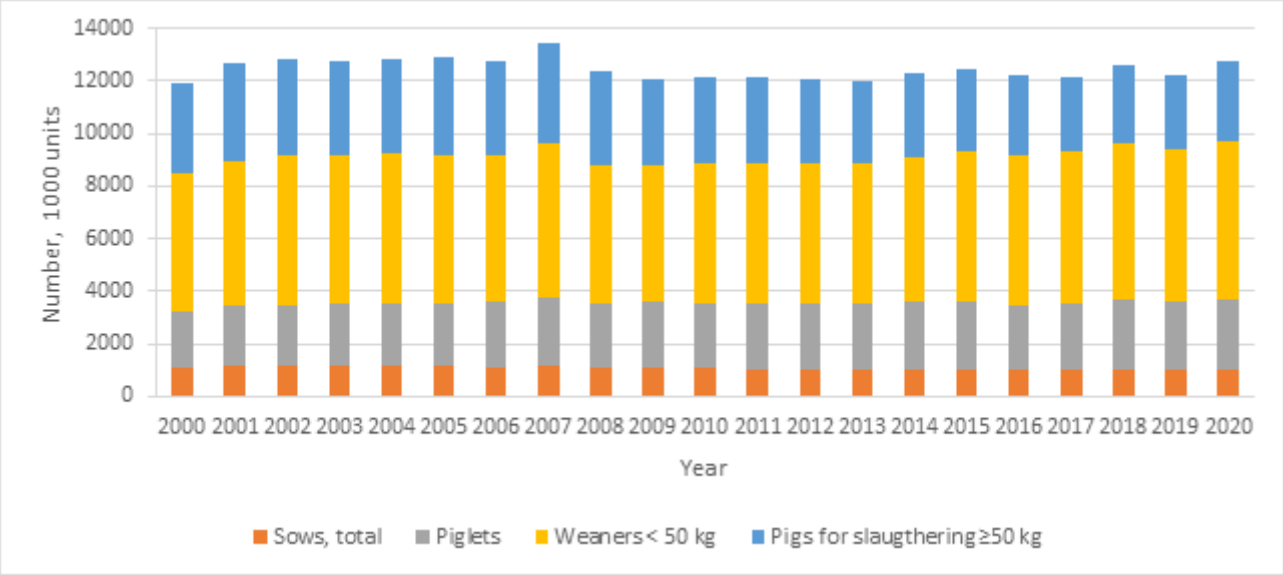

Figure 75: The pig population in the period 2000 to 2020, divided into different subgroups of animals (Danmarks Statistik).

The geographical distribution of the Danish pig herds is heterogeneous and is mainly concentrated in the western part of the country, where the main part of pig farms and slaughterhouses are situated. Approx. 78% of the pig population are in Jutland, 10% on Zealand, 9% on Funen and 2% on Bornholm. The distribution between the region has been relatively stable in the period 2010-2020 (Danmarks Statistik).
The Danish pig production, moving towards fewer but larger units and towards increased specialization. The number of farms with conventional pigs as the main form of operation has decreased from 3,500 in 2010 to 2,066 in 2020 (Danmarks statistik), while the average number of animal unit per farm increased from 268 to 417. For the organic pig production, the number of farms with organic pigs as the main form of operation has increased from 26 in 2011 to 48 in 2020, simultaneously the average number of animal unit per organic pig farm increased from 164 to 171 (Danmarks statistik). The farms more often concentrate on either piglet production or slaughter pigs instead of having an integrated production, but usually with a long-term supplier agreement between the piglet- and the fattening pig producer.
Danish pig production has increasingly concentrated on the most knowledge-intensive and artisanal part of the process – producing piglets and making optimal use of breeding material. Thus, there has been a large structural development, from mainly producing to slaughter to also being a large exporter of weaners. The changes starting around year 2004, were largely driven by a high demand for piglets in Germany (Bruun L.K. and Christiansen M.C, 2009). As it appears from Figure 76, the number pigs slaughtered in Denmark has decreased by approx. 3.7 million in the period from 2000 to 2020. While the number of live pigs exported in the same period has increased with 13.3 million of which approx. 95% were weaners in 2011 and approx. 98% in 2020 (Danmarks statistik). In the same period, the sow population has been stable, thus the reason for that the changes in between slaughter and export are not reflected in the number of pigs in the period, may therefore reflect the increased efficiency in the pig production, where especially the number of weaned piglets per. year sow has increased (Udesen, F.K., 2011; Schlægelberger, S.V. 2021).

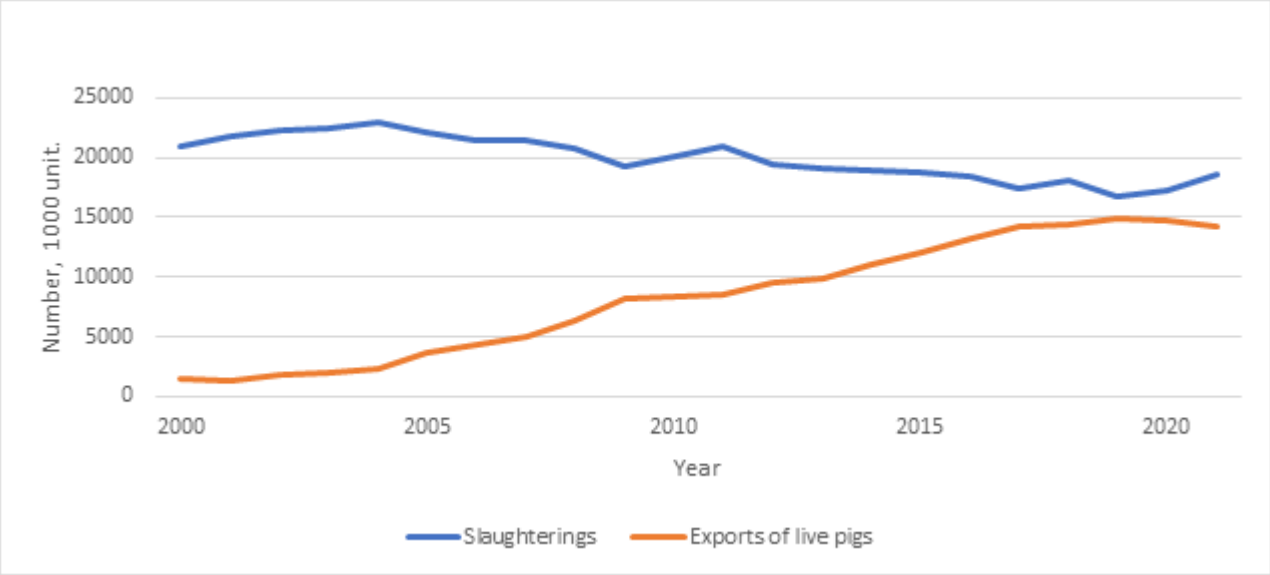

Figure 76: Number of pig slaughters in Denmark and exports of pigs excl. breeding animals (Danemarks Statistik)

The structural development towards fewer but larger units has also taken place in the slaughterhouse sector, where the number of slaughterhouses has fallen from 60 in 2010 to 38 in 2020 (Danmarks Statistik). However, the majority of slaughterhouses are small. In 2010, there were only 10 slaughterhouses (2 cooperative slaughterhouses and 8 private slaughterhouses) that slaughtered more than 10,000 slaughter pigs per year and in 2020 only seven (1 cooperative slaughterhouses and 6 private slaughterhouses). During the same period, the number of employments at the slaughterhouses fell from 8680 to 6505 full-time employees (Danmarks Statistik).

The total amount of pig products was 1,961,500 tonnes in 2020 and the total export value of live pigs and pork in 2020 amounted to 700,428 million DKK (Danish Agriculture & Food Council, 2010-2021). A general map over the physical flows in the Danish pork meat sector are shown in Figure 77 (baseline is 2015-2018).

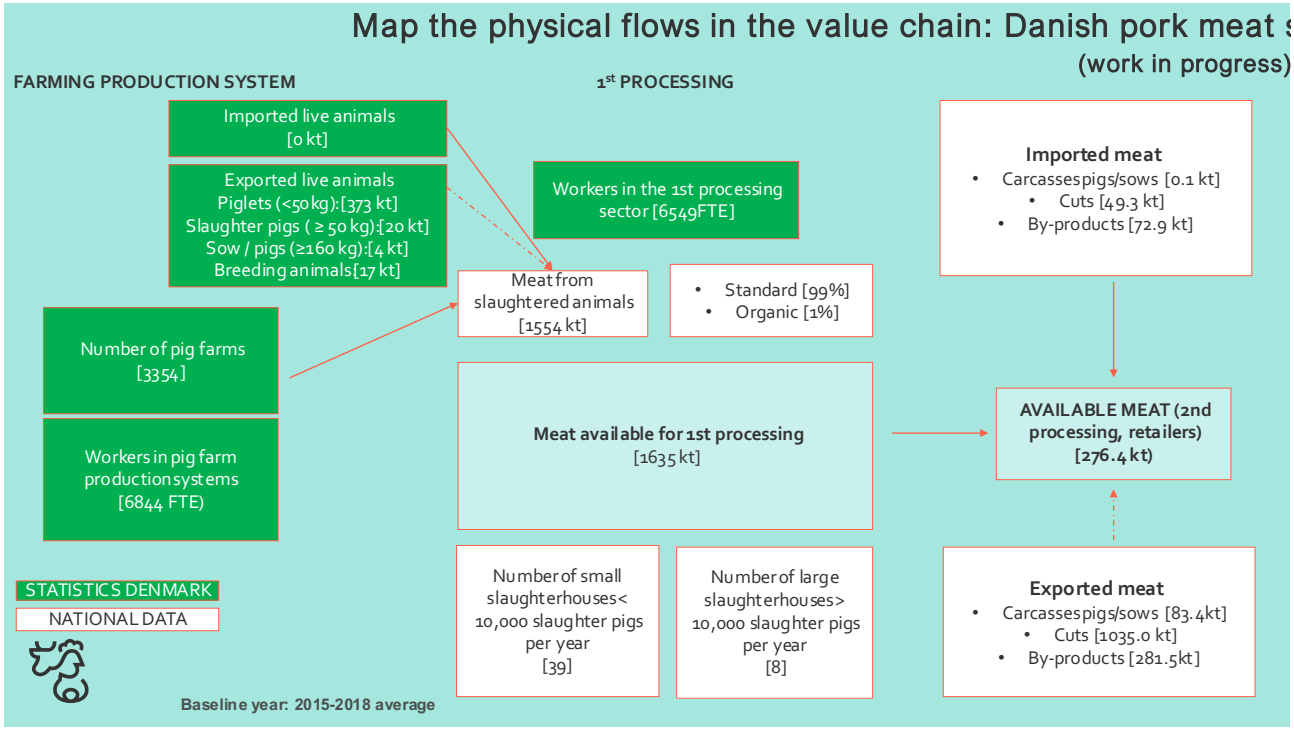

Figure 77: The physical flows in the Danish pork meat sector

b. Trade and trade relations with other countries

The majority of pork products produced in Denmark is exported. The total volume of exported pork and live pigs was 1,915,088 tons in 2020, of which 22% were live animals, primarily piglets. Over the last 10 years the total amount of exported pork products and live pigs has fallen by 4%. This is mainly related to the increase in the number of piglets exported and thus fewer being fattened for slaughter in Denmark.

The export market for Danish pork products has changed. In 2010, 71% of the pork was exported to countries within the EU, while 29% was exported to other countries. This has changed, so that in 2020 approximately half of the pork was exported within the EU, while the rest was exported outside the EU. Denmark exported to 124 countries, the main export markets for Danish pork are shown in Figure 78. For live pigs, the situation is different, as they are generally exported to countries within the EU (99%-100%), which has not changed in the last 10 years.

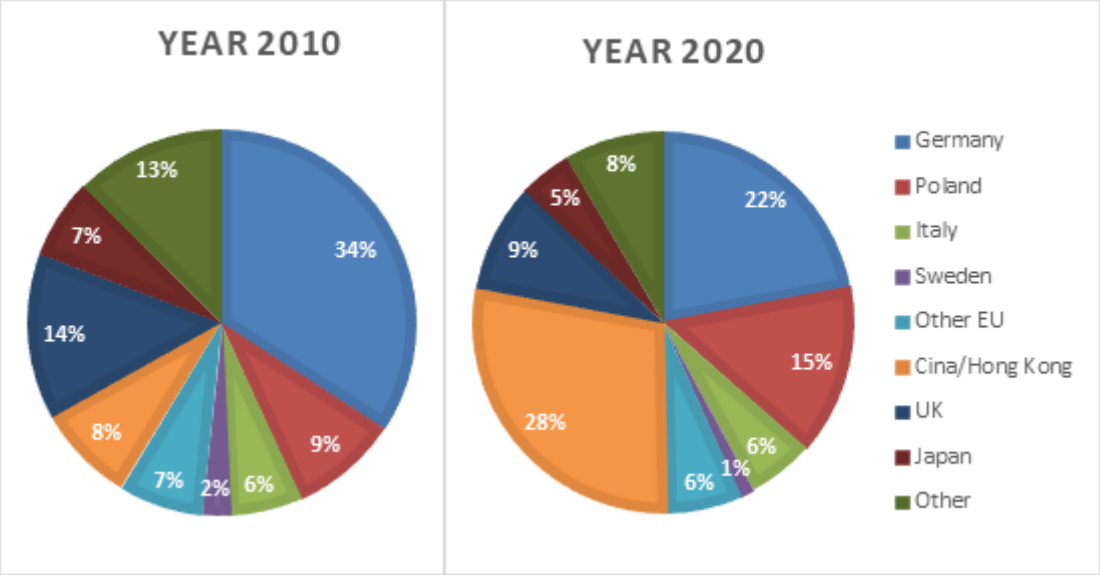

Figure 78: Exported countries for Danish meat products in 2010 and 2020. Source: Danish Agriculture & Food Council, 2010-2021

The Danish export of pork products consists primarily of fresh and frozen cuts / parts, followed by live animals (mainly weaners), then by-products (Figure 79). The volume of further processed product is relatively low and has been declining over the last 10 years (Figure 79).

The countries import different products. Carcasses are primarily exported to Germany. While cuts are primarily exported to China, followed by the UK and Germany. Prepared or preserved are primarily exported to the UK, followed by Germany. Bacon and sausages are primarily exported to England, while China primarily buys the by-products.

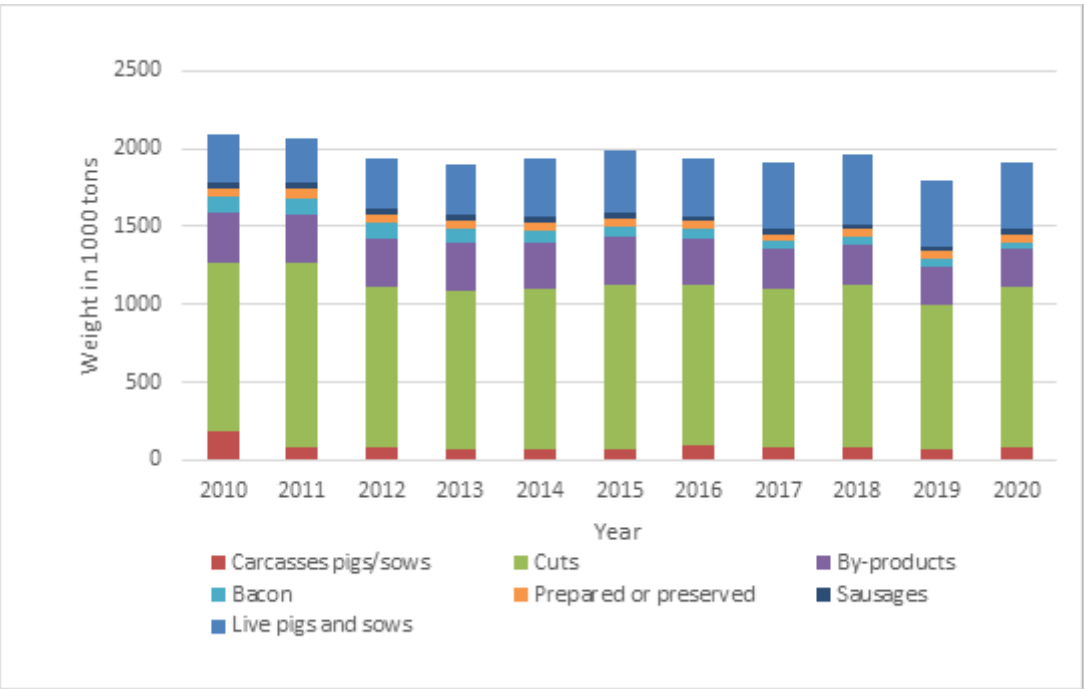

Figure 79: The evolution of exported pig products (1000 tons) in the last 10 years. Source: Danish Agriculture & Food Council, 2010-2021

The piglets are primarily exported to Germany and Poland which each imported 43% of the piglets Denmark exported in 2020. There have been an increased in the piglets exported to Poland from 8% in 2010, to 34% in 2015 up to 43% in 2020. Whereas there have been a decreased in the percent of piglets exported to Germany from 81% in 2010, to 56 % in 2015 and 43% in 2020 (Danmarks Statistik).

The Danish import of pork products increased overall from 2010 to 2020 (+6%) but has varied during the period and was particularly high in 2011, 2013 and 2014 compared to 2010. The import comes primarily from the EU (96%), which have not changed between 2010 and 2020. The countries within the EU from were Denmark imports have, however, changed. Germany is generally the largest supplier (>50%), although the share has fallen from 2010 to 2020. But where Sweden was the second largest supplier in 2010, it is today the Netherlands and Poland that account for a large part (Figure 80).

It is mainly by-products and cuts that are imported. However, the share of by-products has decreased in the last 10 years, while the share of cuts has increased, so that today they make up 31%, while by-products make up 27% of the total imports. In addition, there has been a slight increase in the proportion of imported bacon and sausages (Figure 81).

Denmark generally does not import live pigs, which may be due, among other things, to strict requirements for importers to protect the Danish pig herds against disease.

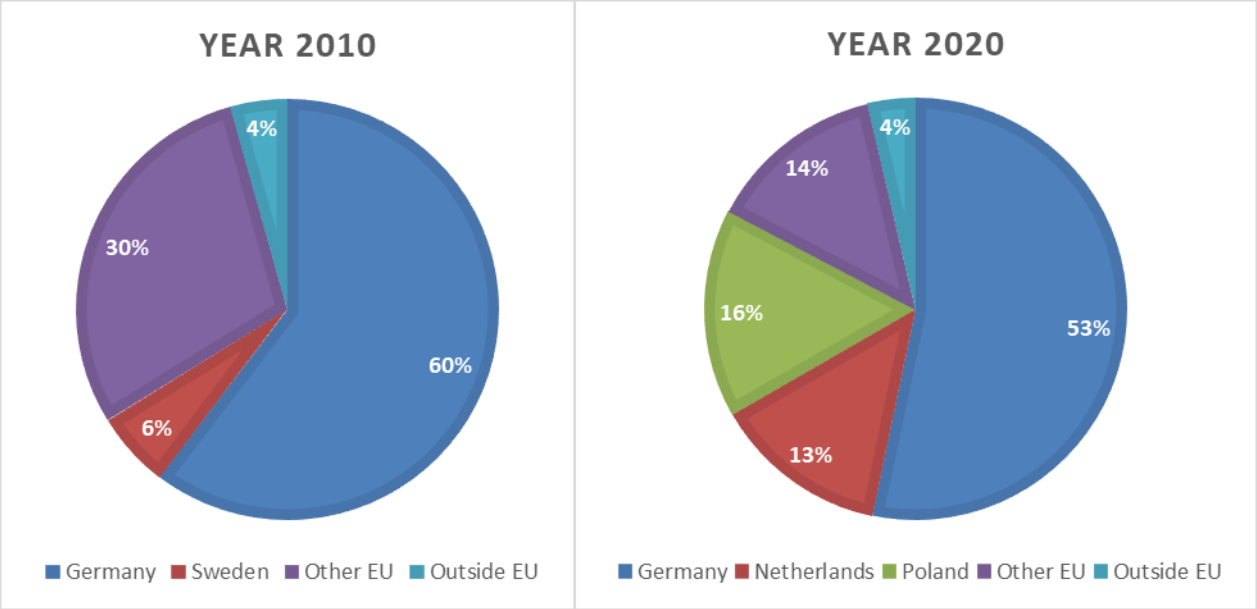

Figure 80: Origins of Danish pork products imported in year 2010 and 2020. Source: Danish Agriculture & Food Council, 2010-2021

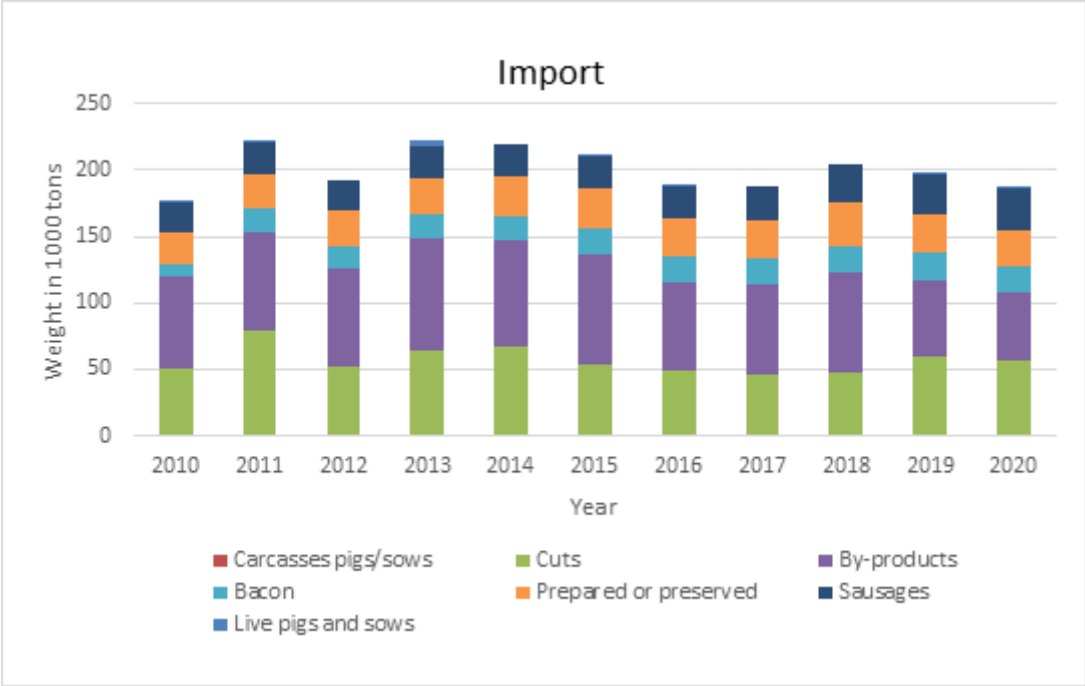

Figure 81: The evolution of imported pig products (1000 tons) in the last 10 years. Source: Danish Agriculture & Food Council, 2010-2021

c. Retail sector and consumption

The official figures for meat available for consumption per capita were in 2000 64.4 kg, 2010 50.8 kg, 2015 56.0 kg and in 2017 54.6 kg. The number expresses the statistically calculated and thus principal amount available in the market. The real consumption, however, varies significantly from here. In Denmark, official diet surveys as well as ongoing consumer panel surveys have consistently shown a consumption per person of just under half of the supply statistics (Landbrug & Fødevarer, 2014)

Figures from the DTU Food Institute (2016) showed that in 2016 the Danes ate an average of 142 grams of meat per day distributed over the day's meals, of which 42 grams per day were prepared meat products (Anonym, 2022).

An analysis made by Madkulturen in 2022 showed that 76% of Danes ate meat for their evening meal (Anonym, 2022). Pork is included in 31% of the evening meals (Anonym, 2022). In general, the proportion of Danes who made homemade dinners has fallen, whereas the proportion of processed food has increased. A comparison of the year 2015 versus 2018 shows that the proportion of home-cooked food (evening meal) has fallen from 55% in 2015 to 48% in 2018. On the other hand, it is predominantly home-cooked food (where some things are ready-made), and the predominantly ready-made food (where some things are homemade), increased from 27% to 31%. This indicates that the Danes are making less home-cooked food, and in increasing degree leaves processed foods included in the evening meal. Simultaneously are there more people who eat ready meals (5% vs. 8%) and more, who eats take-away (4% vs 7%) or out of home (8% vs. 5%) (Hoff, H., Westergaard, K. and Jakobsen, G.S., 2018).

As a mean to understanding the development within the meat category, we look at household spendings, and see a clear tendency. From Figure 82, it is obvious that traditional red meats (beef, veal, lamb, goat and pork) have faced a significant drop from 2018 and onwards. The only category to exhibit growth is poultry, which have grown considerably since 2016, indicating a change from red meats to poultry. Looking at processed meat (dried, salted, smoked), we see the same tendency as described above, but a drop that began a couple of years earlier than the other red meat categories. However, this development, will not exclude meat as a part of daily meals in Denmark, as meat for a lot of Danish consumers is an important part of food culture and adds taste, texture and satiety (L&F report, September 2021).

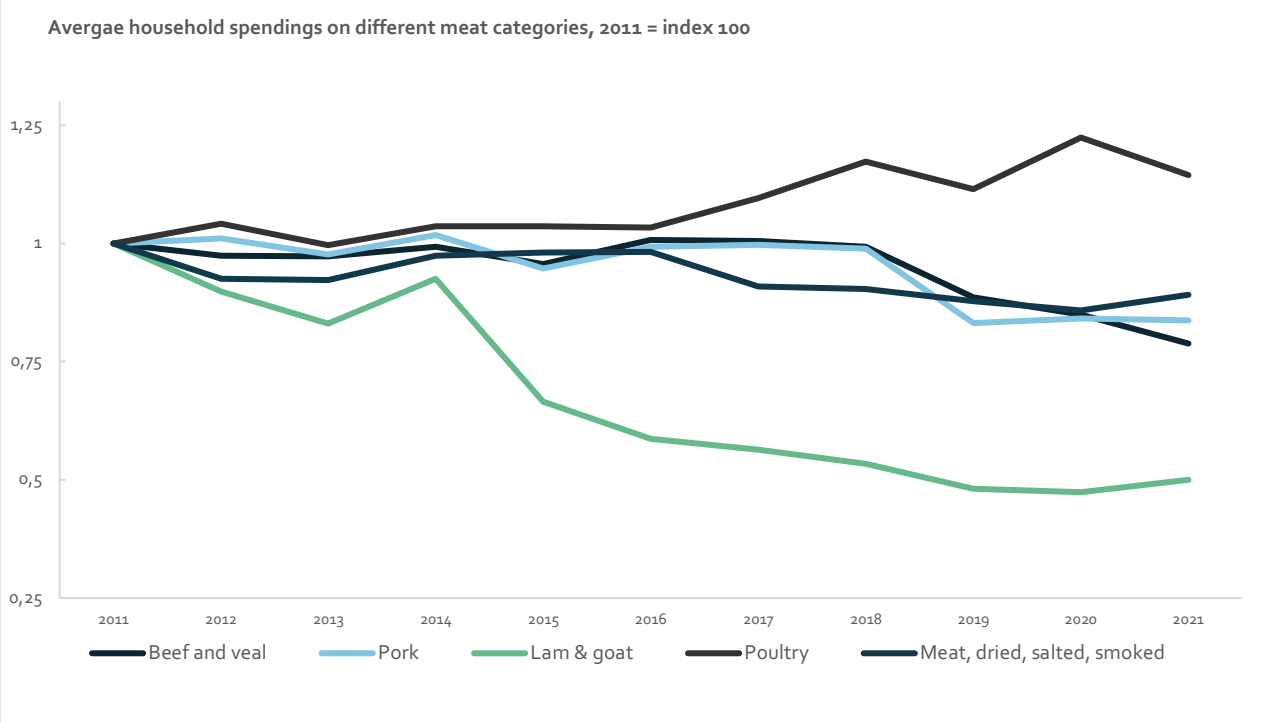

Figure 82: Average household spending on different meat categories in the period 2001 to 2021. Source: Danmarks Statistik, Average household spending

Looking specifically at the consumption of pork meat, the average consumption per person has dropped from 2.5 kg per quarterly in 2011 to under 2 kg per quarterly in 2017 (Figure 84, Danish Agriculture & Food Council, 2018). Data shows that especially within the young generation (from 18 to 34 years old), people have a lower preference for pork meat compared to older generations. However, data only considers the amount of pork consumed at home and does not take the out-of-home (foodservice) consumption into account. Estimates on meat consumption in the future in Denmark is however clear, and states that by 2030, consumers will be eating less meat, especially within the red meat category (L&F report, September 2021).

A high number of traditional Danish dishes are based on minced meat, and thus this product owns a high share of total sales within the pork meat category. Minced pork meat accounts for 23% of the market, tenderloin 11 % and pork chops 9%. The three largest meat cuts stand for 43% of total sales (Figure 83; Landbrug & Fødevarer, 2014).

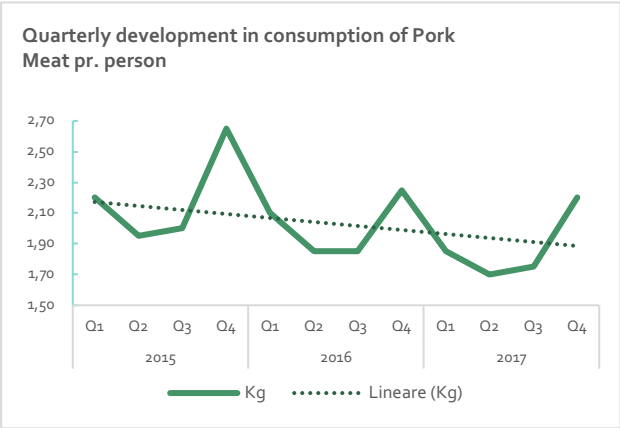

Figure 85: The trend in development in consumption of pork meat per quarterly. Source: Danish Agriculture & Food Council, 2017

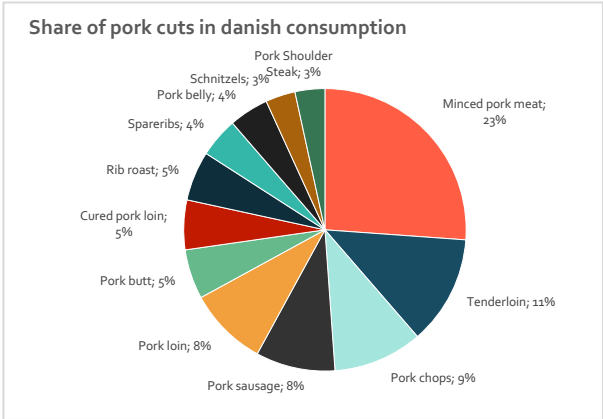

Figure 83: Share of pork cuts in Danish consumption. Source: Danish Agriculture & Food Council, 2017

Data indicates that Danish consumers are changing their consumption to eat less meat and choose meat they associated with higher quality. Price is still important to Danish consumers, but (perceived) quality factors such as Danish origin and specialty productions as organic, free range and so on, becomes more and more important to the consumers. Danish pork meat is regarded as quality meat, and thus is one of the main factors when consumers buy it in the retail stores. This tendency has increased as Danish producers of pork, have made navigation easier in retail stores, by incorporating the national flag and messages like Produced by Danish farmers as a mean of branding on labels etc.

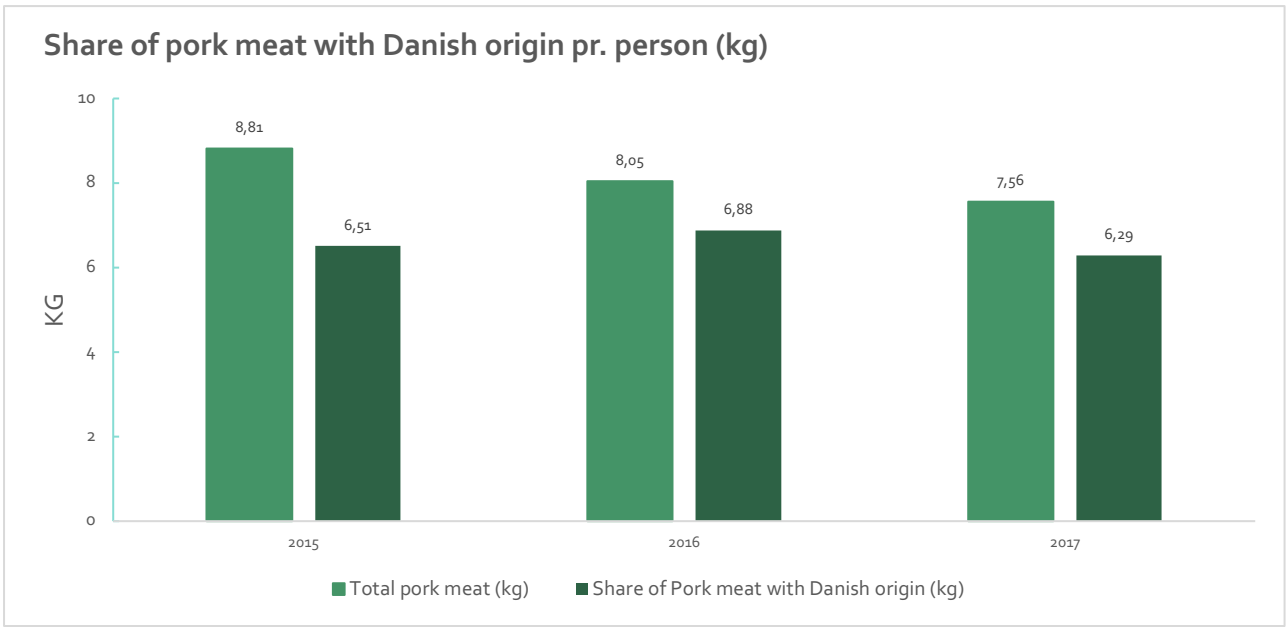

Figure 84: Share of pork meat with Danish origin per person. Source: Danish Agriculture & Food Council, 2017

The shift in consumption to quality pork meat, is furthermore emphasized by the development in organic meat in the Danish retail sector. Organic pork sales, both turnover and volumes, has been showing a pronounced growth within the last 10 years, and has increased from 50 mil. DKK I 2011, to 210 mil (Figure 86). in 2021. This represents a noticeable preference for pork meat that comes from specialty productions, where animal welfare plays a significant role: "*We see a general trend for some consumers to reduce their meat intake a bit, and maybe even have days where they completely avoid meat. This tendency is particularly strong among young people. In addition, we see a tendency that when young people buy meat, they instead choose to spend their money on more expensive and better cuts of meat - and, for example, on meat products where that has particular focus on animal welfare"* (Frandsen, A.H., 2019). Thus, focusing initiatives on developing organic pork meat could be one way of dealing with the falling consumption within the pork business.

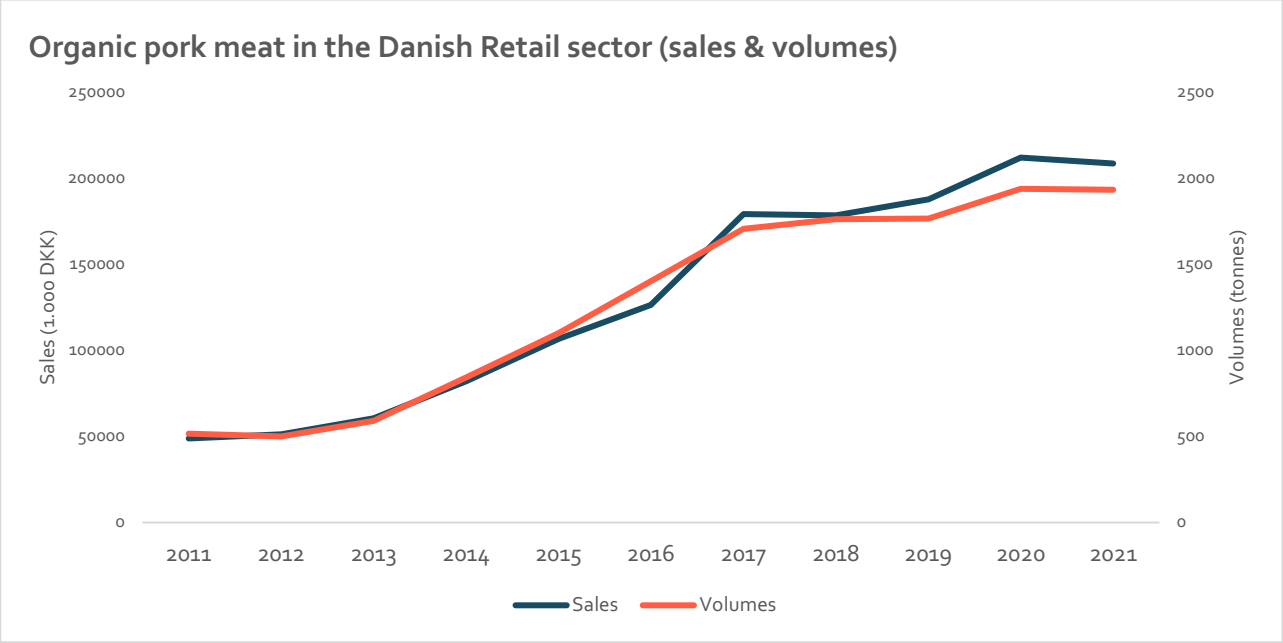

Figure 86: Change in organic pork meat in the Danish Retail sector in the period 2011-2021. Source: Danmarks Statistik (Retail sales of organic foods by product type, unit and time)

2. ACTORS IN THE VALUE CHAIN

a. The main actors in the value chain

Generally, the structural development in the Danish pork value chain goes toward consolidation, where every link sees fewer but larger companies. This development is apparent for both farming and slaughterhouse companies. Figure 87 emphasizes a development that was initiated more than 40 years ago, where the breeding industry started consolidation. The number of pig farms started decreasing rapidly, going from 30,000 farms in 1990 to approximately 2,500 in 2021. As a direct effect, the average size of the farms has

been growing drastically, from approximately 300 animals per farm in 1990 to around 5000 pigs in 2021. The main rationale behind consolidation within the farming industry is to generate a higher operational efficiency, where average cost per pig gets reduced. In this way, farmers get less vulnerable to weak market conditions where feed prices start rising or the price per pig decreases (Danmarks Statistik).

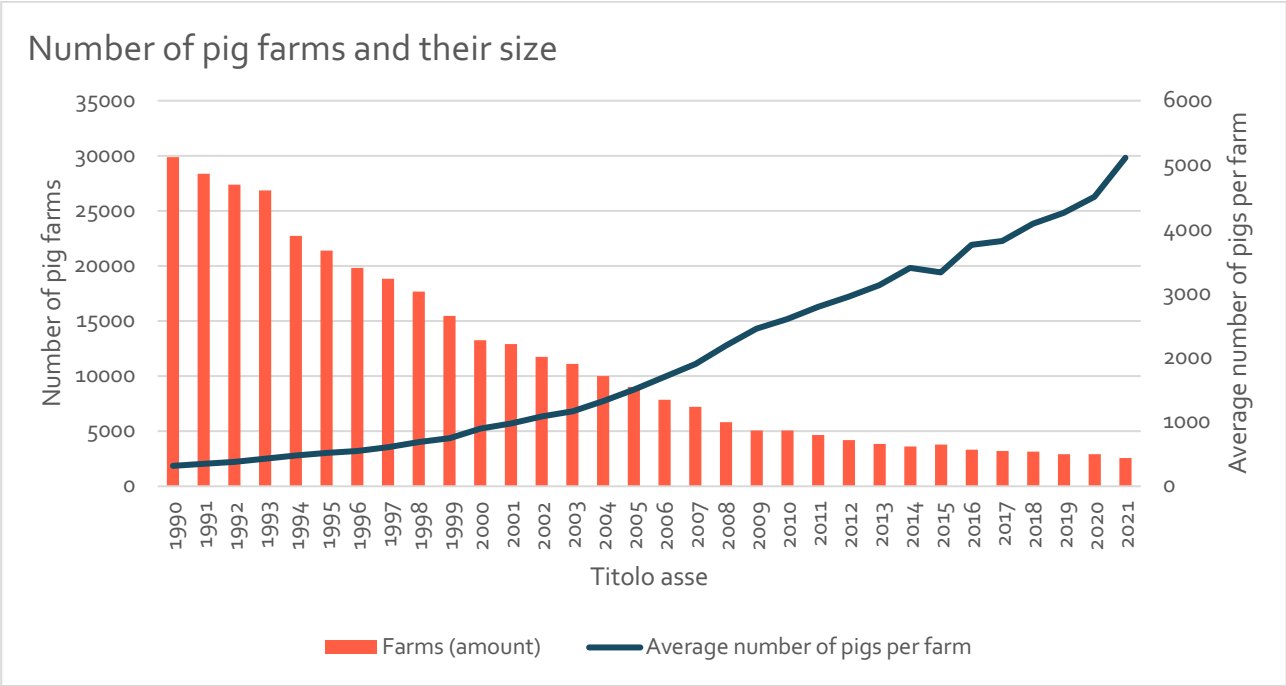

Figure 87: Change in number of pigs farms and size in the period from 1990 to 2021. Source: Danmarks Statistik (Livestock population by unit, area, species and time).

The development within organic pig farming in Denmark deviates from the general trend and shows a tendency that moves towards more farms. From 2008 to 2021, the number of organic farms has more than doubled from 26 to 56. In average the number of pigs per farm have also increased, from 1700 to 2200 animals per farm (Danmarks Statistik). Danish farmers of pork meat have consequently been able to convert the production type (from conventional to organic), so it matches the consumer demand as described in the section above.

The geographical distribution of the Danish pig farms is heterogenous but is mainly concentrated in the western part of the country, where you will also find the main part of pig herds and slaughterhouses (Figure 88, Figure 89). Approx. 85% of the pig farms are located in Jutland. The geographical distribution is probably related to the fact that the population density is low in the western part of the country as well that the nutrient-rich loam soils are located to the east, while soils to the west are more nutrient-poor sandy soils. Thus, the soils in the eastern part of the country, are more attractive to plant producers, regarding higher yields and better opportunity to grow high value crops. The distribution between the region has been relatively stable in the period 2010-2020 (Danmarks Statistik).

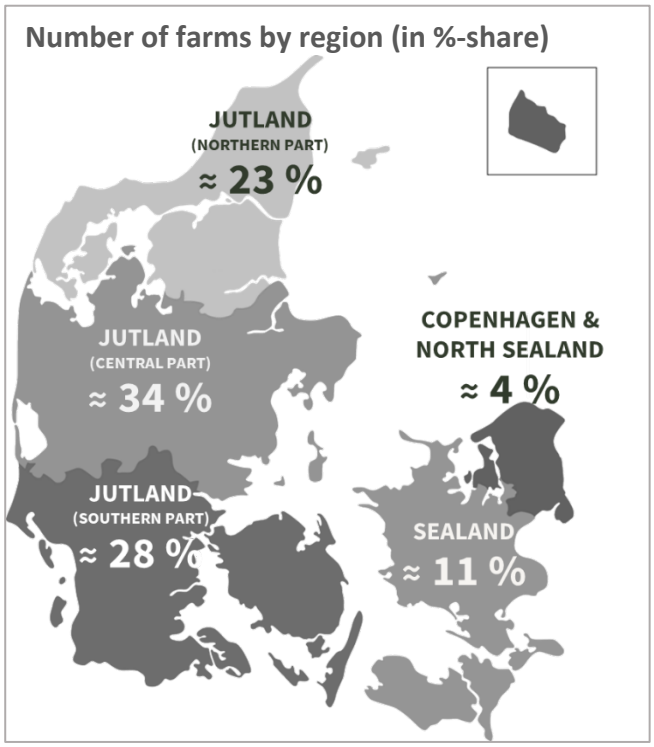

Figure 88: Number of farms by region Danmarks Statistik, Llivestock population by area, unit and species

There are currently seven key slaughterhouse companies in Denmark, where the vast majority is located in Jutland. The actors count 1 large cooperative slaughterhouse company (Danish Crown) that stands for approx. 73% of all pig slaughtering in Denmark per year, and 6 private slaughterhouses which account for the remainder (Danske Svineproducenter, 2023). Geographical distance in Denmark is limited, and slaughterhouse companies compete evenly across the home market. Only in a limited number of cases slaughterhouses gain competitive advantage by means of their local presence. Nevertheless, the market is largely dominated by Danish Crown, because of the extent of their business.

Because of the big difference in size between slaughterhouse companies in Denmark (Danish Crown accounts for approx. 13 mil. pigs per year and Tican 3,5 mil.), there is a divergence in the individual slaughterhouse and their competitive ability. Some of the big slaughterhouses have a production that imply a large export business, influencing these companies to compete on a global scale, whereas the smaller Danish slaughterhouse companies, only need to focus their attention to domestic market. Thus, prices for some

companies is decided on the basis of global market conditions, while others only has to take local market conditions into account.

Traditionally, when the global market for pork meat is doing good and the demand is high in foreign markets (ex. when demand in 2019 and 2020 for Danish pork meat in China exploded), the competitiveness in Denmark of large-scale producers such as Danish Crown and Tican, tend to deteriorate, as prices for the domestic market will be higher compared to that of the smaller slaughtering companies that only sells their product in the Danish market. As such, market dynamics in Denmark are largely decided by the overall development of markets in Germany, The UK, Italy, Sweden and Asia.

When looking at the table below, we may possibly observe a shift in the balance of power between the slaughterhouses in Denmark. The table compares the number of slaughterings in 2013 and 2022. In total, slaughterings have decreased by 1 mil. pigs, however, if we look at each slaughterhouse and their development, a clear tendency appears. Danish Crown's seven facilities have seen slaughterings take a dramatic drop from 14.9 mil. in 2013 to 13 mil. pigs in 2022, resulting in a significant fall of 1.9 mil. pigs. The rest of the slaughterhouses have all seen a growth which amounts to 0.8 mil. extra slaughterings in 2022. Consequently, Danish Crown's market share has decreased by 6 %-points during the 9-year period (danskesvineproducenter.dk).

Development in number of slaughterhouses

	1970	1980	1990	2000	2010	2021
Cooperative	50	18	5	3	2	1
Private	4	2	8	12	8	6
Total	**54**	**20**	**13**	**15**	**10**	**7**

Figure 89: Location of slaughterhouses. Source: Danish Agriculture & Food Council,2022

This development might imply that the smaller slaughterhouses seem more fit to the future demands of the Danish consumer, where efficiency and volumes are traded for flexibility and quality. Slaughterhouse facilities in Danish Crown are primarily set up to handle big orders and standardized products, which are great for global competitiveness, but not for the local one.

When looking at Table here below, we may possibly observe a shift in the balance of power between the slaughterhouses in Denmark. The table compares the number of slaughterings per slaughterhouse in 2013 and 2022. In total, slaughtering's have decreased by 1 mil. pigs, however, if we look at each slaughterhouse and their development, a clear tendency appears. Danish Crown's seven facilities have seen slaughtering's take a dramatic drop from 14.9 mil. in 2013 to 13 mil. pigs in 2022, resulting in a significant fall of 1.9 mil. pigs. The rest of the slaughterhouses have all seen a growth in slaughterings which amounts to 0.8 mil. extra slaughtering's in 2022. Consequently, Danish Crown's market share has decreased by 6 %-points during the 9-year period (danskesvineproducenter.dk).

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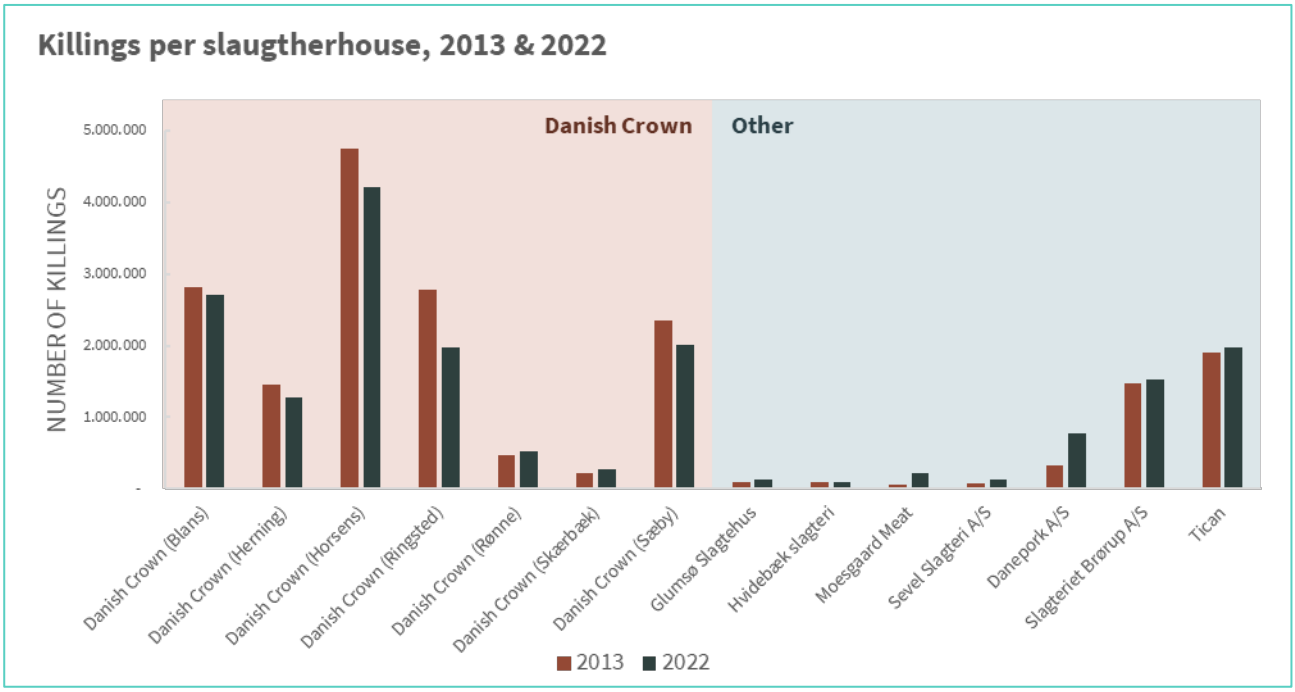
Table 7: Number of slaughtering's per slaughterhouse in 2013 and 2022. Source: Danmarks Statistik (Llivestock population by unit, area, species and time)



Key data about the actors in the slaughterhouse industry in Denmark can be found from the Table here below. Among other things, the data describes the degree of control each slaughterhouse company have in

every part of the value chain. Clearly, Danish Crown has a commercial advantage in having a deep integration in the value chain (with farmers, slaughterhouse and processing companies being part of the same company). In this way, they are able to link each part of the value chain to each other, generating opportunities for a stronger brand communication, where processing is planned according to the concept.

Table 7 Key data about the actors in the slaughterhouse industry in Denmark. Source: Data based on company websites and own data

	Ownership	# of locations	# of employees	Killings per year	Sales	Export share	Value Chain involvement	Degree of standardization in production	Commodity vs. Branded Products
DANISH CROWN	Cooperative 5404 owners	7	26.641	≈ 13 mil.	64 bill. DKK	90 %	• Farmers • Slaughterhouse • Processing (1st and 2nd)	High	Strong branding on both raw products and processed (Friland, Antonius, Bornholmergrisen etc.)
TICAN	Private (Tönnies)	2	1.000	3.8 mil.	8,9 bill. DKK	95%	• Slaughterhouse • Processing (2nd)	High	Marginal branding on processed meat products
DANISH PORK MEAT	Private	1	24	0,1 mil.	-	70%	• Slaughterhouse	Low	Commodity products
HVIDEBÆK SLAGTERI	Private	1	70	0,1 mil.	-	-	• Slaughterhouse • Low degree of processing (2nd)	Low	Commodity products
MOESGAARD MEAT	Private	1	40	0.1 mil.	-	-	• Slaughterhouse	Low	Commodity products
DANEPORK	Private	1	350	0.8 mil.	+1,09 bill DKK		• Slaughterhouse	Medium	Commodity products
SEVEL SLAGTERI	Private	1	15	0.1 mil.	-	-	• Slaughterhouse	Low	Commodity products

With the introduction of Danish Crowns strategy for 2021 to 2026 “Feeding the Future”, that focuses on creating a sustainable future for food, the company is set to fully utilize the control of the entire value chain, where joint efforts across farmers and production facilities will generate more value to the business. “Feeding the Future” introduced a sustainability program across the entire value chain, that systematically collects and registers data and information about the production, to establish individual targets focused on reducing the carbon footprint: “*We aim to be the leading global supplier of meat when we talk carbon footprint in 2030. That’s why we will be prioritizing value over volume, in the new strategy. To gain an even stronger market position for our products … we need to work closer together across the group*. *We need to ensure a farm-to-fork perspective throughout the value chain*” (Anonym, 2023).

The strategic focus for the "large" scale slaughterhouses in DK is to be competitive, on a global scale. Thus those companies pursue a strategy focused on efficiency and productivity, needing a production that is set up for standardized products. On the contrary, the smaller producers of pork meat in Denmark benefits from being more maneuverable in their production setup. As opposed to especially Danish Crown, that has streamlined much of its production, the small slaughterhouses take advantage of flexibility in the production, and therefore caters to different consumers than Danish Crown. Small slaughterhouses in Denmark favors from offering customized solutions that fits individual needs and requirements. In this respect, slaughterhouses in Denmark complements each other quite well.

3. THE GOVERNANCE OF THE VALUE CHAIN

a. Power relations in the value chain

When looking at the value chain in Denmark as described in the Figure here below, one major change that ultimately puts more pressure on pork producers, during the last couple of years has however erupted. Sales channels, especially retailers, have started up vertical integration processes, where Danish retail chains make direct partnerships to specific farmers, overlooking the traditional role of slaughterhouse and processing companies. Formally speaking, retail chains engage in partnership agreements with the farmers and as a result the slaughterhouse becomes a service provider in terms of transforming the products from farm to fork. This changes the power dynamics in the value chain, and retailers get more control of the value chain, which strengthens supply and make them capable of capturing upstream profits. Moreover, the direct link from retailer to selected farms, makes branding and storytelling easier in the retail store.

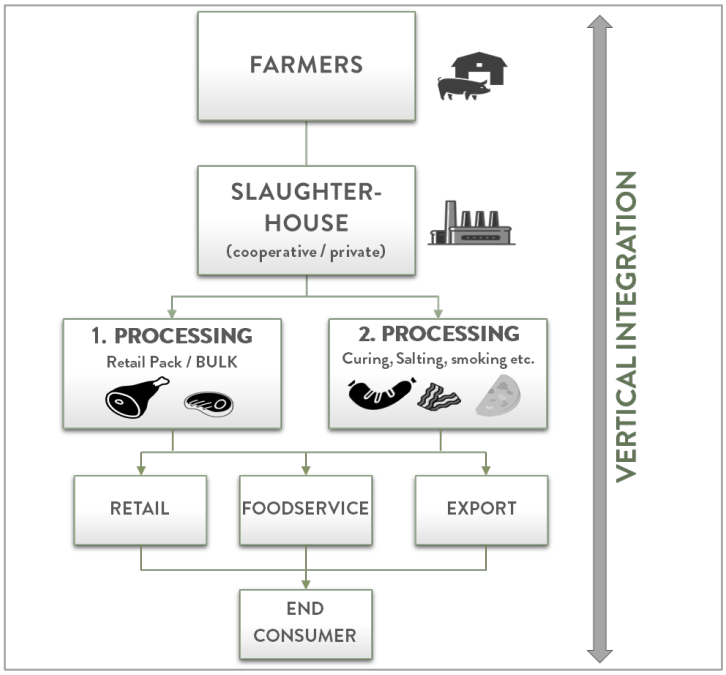


Figure 90: The Danish value chain

Examples of this include Danish retail chains Coop and Rema 1000. Since 2018, Rema 1000 has been selling free range pork meat from farmers Peter & Lene, that produces around 25.000 pigs per year. The cooperation between farmer and retailer, offers a good alternative to the traditional model, where farmers sell to slaughterhouse companies: "*We really feel a good cooperation with Rema 1000, where our product is in focus, and it also offers a lot of direct contact with consumers." (*Thalbitzer, F., 2019*)*. Part of the agreement is also that retail chains showcase responsibility by utilizing every part of the pig, which is part of the development to a more sustainable food system. As a consequence, consumers in Rema 1000 are offered fresh cuts of pork as well as processed which has the same branding that focuses on the origin that tracks all the way back to the farm at Peter & Lene: "*Rema 1000 will be utilizing every part of the animal, when it has been processed*

at the slaughterhouse. They want to make pâte and pork meat balls, so nothing is wasted" (Møller, L.H., 2022).

The development challenges the normal power relations in the value chain, and sales channels now represent a true competitor at the production level. The more direct connection to the consumers, in terms of branding, is one of the key elements to the farmers, however retailers are also able to provide an increase in they payment per pig produced, and hereby offering a higher valuation to the farmers: "One of the reasons for changing the delivery of our pigs from Danish Crown directly to Rema was the added value" (Møller, L.H., 2022).

The development described above and other structural changes that has been described throughout this material, emphasizes the need for creating the shortest link from farm to fork in order to generate the highest possible return for in the value chain. Moving forward from today, structural development in Denmark points toward an even closer integration of the pork value chain in Denmark.

b. The role of contracts and price transmission

As a member of the cooperative, you obligate yourself to supply your production of pigs to Danish Crown. If you want to stop as a member of Danish Crown, farmers have to give a one-year notice, the reason behind this being: "After all, Danish Crown invests much of the shareholders' money in facilities that will refine the raw material, so that we can create the highest possible return for the owners. Such investments require that supplies are fairly well under control."

Regarding price, the model follows that of other markets i.e. in Germany. Price is adjusted on a weekly basis (weekly quotation) according to global demand and the supply of pigs to Danish Crown.

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The Spanish pig value chain

Nicolas Rouault, Valérie Diot, Boris Duflot (IFIP-ACTA), Manuel Romero Huelva (CSIC)

Key findings :

- There has been an Increase in the Spanish pig herd since the 2000's.
- The geographical distribution of Spanish pig herd underlines the importance of two regions : Cataluña and Aragon are identified as two autonomous communities leading in pig breeding, with more than 50% of the livestock. There is also a concentration of slaughterhouses in certain areas, such as Barcelona, Girona, Murcia, Lleida, Huesca, and Málaga.
- The Spanish big value chain is very integrated and dominated by large companies
- The Spanish pig sector is integrated, but the farms are generally specialised in one main activity (sows, fattening, etc), but they all belong to the same group.
- Spanish pig sector is dependant of foreign trade and exports

1. DESCRIPTION OF THE PHYSICAL FLOWS IN THE VALUE CHAIN

a. Structure of production

A structuring sector model aimed to growth

The Spanish pig herd increased considerably from 2001 to 2021. Even though between 2001 and 2011 the increase in the Spanish pig herd was very low, from 2013 to 2021 the pig herd exploded by 9 million heads (+36 %) (Figure 92) (Augère-Granier, 2020). Regarding the relative rise in sows (about 19 %), compared to the boost of the total livestock or other categories (piglets, weaners, and pigs for slaughtering) the gain in prolificacy is clear. Foreign genetics, better breeding practices and modernization of the livestock building developed the Spanish pig herd. The main differentiated pig production in Spain is the Iberian pork. The Iberian livestock share since 2015 is constant, between 10.4 % and 10.9 % of the total livestock. Indeed, the number of Iberian pork bred has followed the trend of the pig's livestock, increasing by 520 thousand in 6 years (MAPA, 2021).

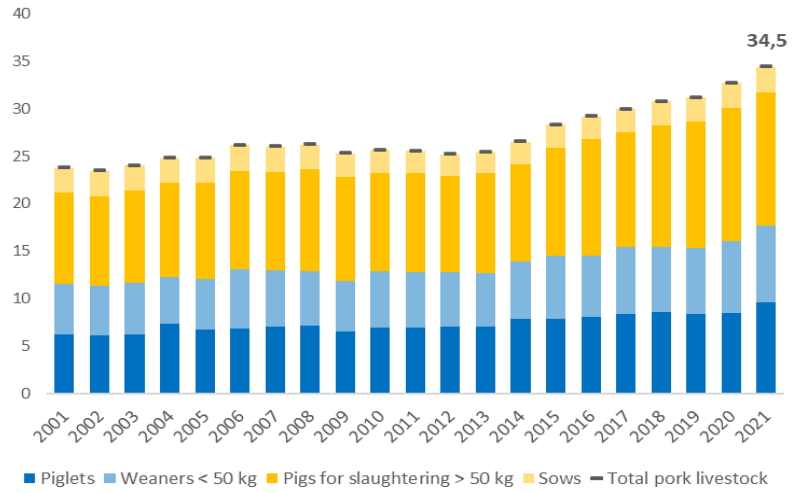

Figure 92: Evolution of Spanish pig herd in million heads. Source: IFIP from Mapa data

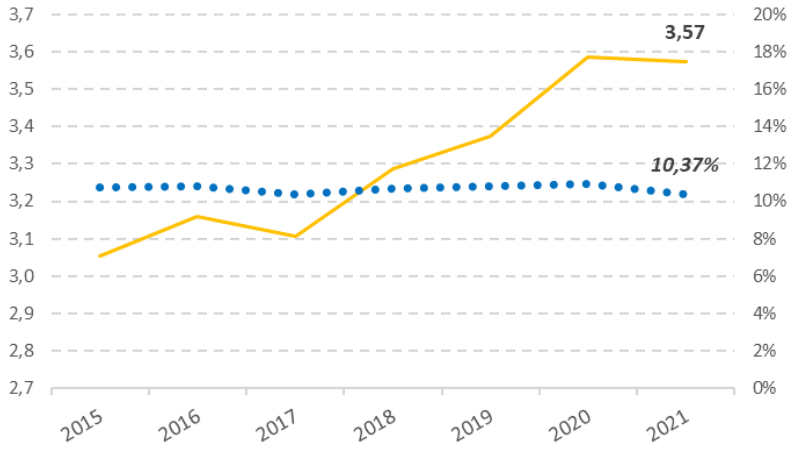

Figure 91: Iberian pig in million heads and % of total pig herd. Source: IFIP from Mapa data

The geographical distribution of the pig herd in Spain during the 2015-2018 period is relatively heterogeneous (Table 8). Two autonomous communities lead the breeding with more than 50 % of the livestock: Cataluña and Aragon. The Region of Aragon was in 2021 the first with 29 % of the livestock share. The Autonomous Community of Aragon gained the most pigs between 2015 and 2021: 3 million. While Cataluña, the Spain's historical pig region, gained 0,3 million over the same period. Castilla y Leon and Murcia are also dynamic regions in terms of pig farming, gaining 0,8 and 0,7 million pigs respectively in six years (Giménez & al., 2021).

The Spanish pork sector is highly integrated. The breeding and fattening activities are usually separated, and each farm has its own speciality. Most breeders are companies' employees, while fatteners are independent farmers bound under contracts. Farm dimensions increased, the number of those with more than 1000 sows raised, while the number of those under 1000 sows dropped (Interporc).

Table 8: Repartition of Spanish pig herd. Source: IFIP from Mapa data

Geographical distribution of the pigs livestock in 2015-2018	
Cataluña	26,1%
Aragón	25,2%
Castilla y León	13,3%
Andalucía	8,6%
Región de Murcia	6,3%
Castilla-la Mancha	5,6%
Extremadura	4,4%
Comunidad Valenciana	3,8%
Galicia	3,8%
Comunidad Foral de Navarra	2,1%
La Rioja	0,4%
Illes Balears	0,2%
Canarias	0,2%
País Vasco	0,1%
Madrid	0,1%
Principado de Asturias	0,0%
Cantabria	0,0%

Spanish pig and pork supply balance

The gross internal production is slightly different from slaughters due to a small share of foreign trade of live animals. In 2021, the slaughters and the production are relatively close, both nearly 5.2 million tonnes of cwe (Eurostat). Slaughterings and gross internal production evolved in the same way from 2001 to 2021 rising by approximatively +70 %. Much of this increase started in 2014. Between 2014 and 2021, slaughters boosted by +40 %. However, domestic consumption did not follow this trend and only raised by +2 % in twenty years (MAPA, 2021). Therefore, the development of Spanish pig production has not been aimed at satisfying the internal demand but has been oriented towards the international markets. Pork product exports was Spanish main strategy in recent years.

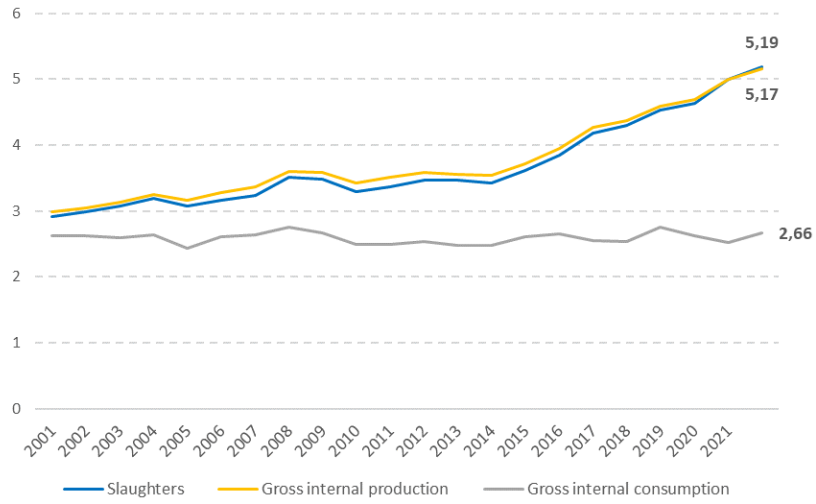

Figure 93: Spanish production and consumption of pork in million tons cwe. Source: IFIP from Eurostat

In 2021, Spain exported 1,1 million of live pigs and imported 3 million. The trade in live pigs for Spain is exclusively a European trade. Spain exports live pigs mainly to Portugal (pigs > 50 kg and < 50 kg) and Germany (pigs < 50 kg), while importing live pigs from the Netherlands (pigs < 50 kg), Portugal (pigs < 50 kg), Denmark (pigs < 50 kg), Belgium (pigs > 50 kg), France (pigs > 50 kg), and Germany (pigs > 50 kg and < 50 kg). The latter countries had to export live hog in Spain instead of its traditional destinations which faced average selling prices.

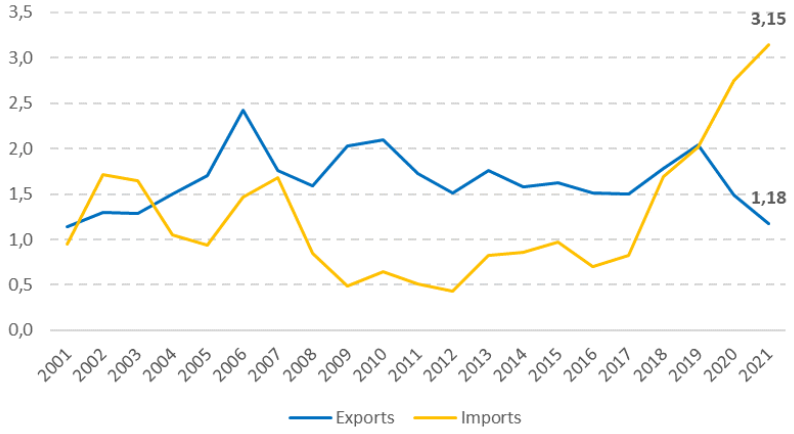

Figure 94: Trade of live pigs in million head. Source: IFIP from Eurostat

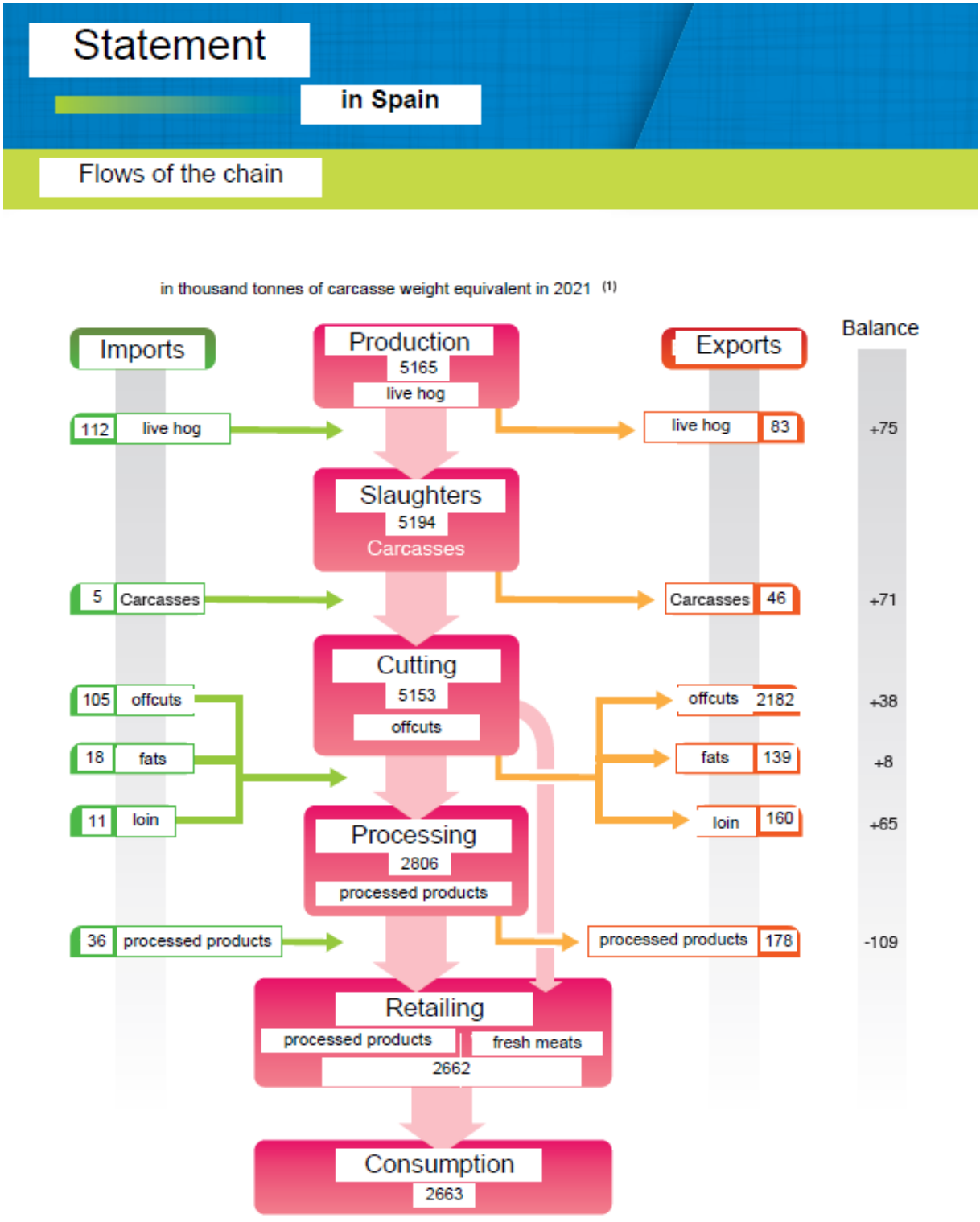

Figure 95: Spanish pig chain balance from production to consumption (M tons cwe)

A diversity of pork products made in France

Graph 5:

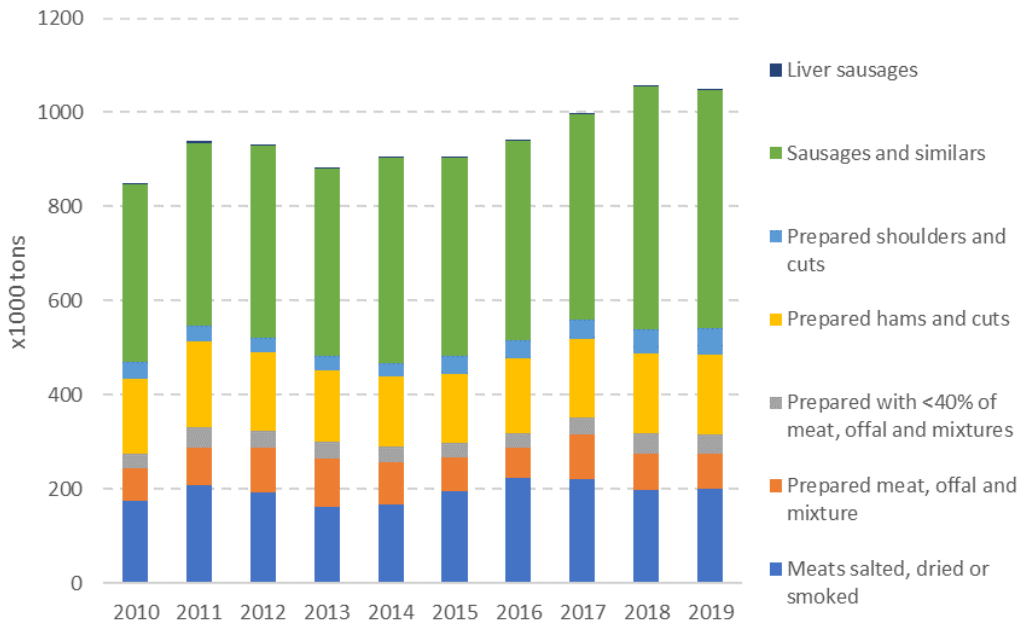

Figure 96: Spanish processed products production in the industrial sector. Source: IFIP from Eurostat

Spain produces a large quantity of processed products, but much less than fresh and frozen meats. In 2019, the volume of processed products produced in Spain was 1.05 million tons, while the volume of meats was about 3.6 million tons. Data collected shows a diverse typology of products that are made in the Spanish pork processing sector as well as a diversity in trend depending on the type of products. From 2015 to 2018, sausages and similar products account for 46% of the 975 thousand tons of products made every year. Salted, dried or smoked meats accounted for 21% (Eurostat). Next, prepared hams and cuts represent 17%. And finally, the other categories represent about 15% of the volumes: prepared meat, offal and mixture (8%); prepared meat with less than 40% of meat, offal and mixtures (4%); prepared shoulders and cuts (4%).

Table 10: Production of processed meat products. Source: IFIP from Eurostat

	Yearly average volumes 2015-2018 (tons)	Yearly average volumes 2015-2018 (%)	Yearly Trend 2010-2019 (%/year)
Meats salted, dried or smoked	209 151	21%	+1.6%
Prepared meat, offal and mixture	77 096	8%	-0.6%
Prepared with < 40% of meat, offal and mixtures	35 325	4%	+0.9%
Prepared hams and cuts	161 143	17%	+0.2%
Prepared shoulders and cuts	41 492	4%	+6.0%
Sausages and similars	449 702	40%	+3.1%
Liver sausages	1 483	0%	-6.0%
Total	**975 392**	**100%**	**+2.0%**

Among these product categories, prepared shoulders, and cuts (+6%/year) was the fastest growing from 2010 to 2019. Sausages and similar was also a growing category from 2010 to 2019, the second in percentage (+3.1%/year) and the first in volume (+129 143 tons in 9 years). On the other hand, liver sausages and prepared meat, offal, and mixture had an opposite trend, dropping of -6%/year and -0.6%/year respectively. Nevertheless, these two last categories represent less than 10% of the total volume of processed products.

b. Trade and trade relations with other countries

Spanish exports raised by +418 % from 2001 to 2021 to reach 3.02 million tonnes of pork products exported in 2021 (see figure). In almost two decades, meats are the products that increased the most in term of export volume (+1.8 million tonnes), excluding offal.

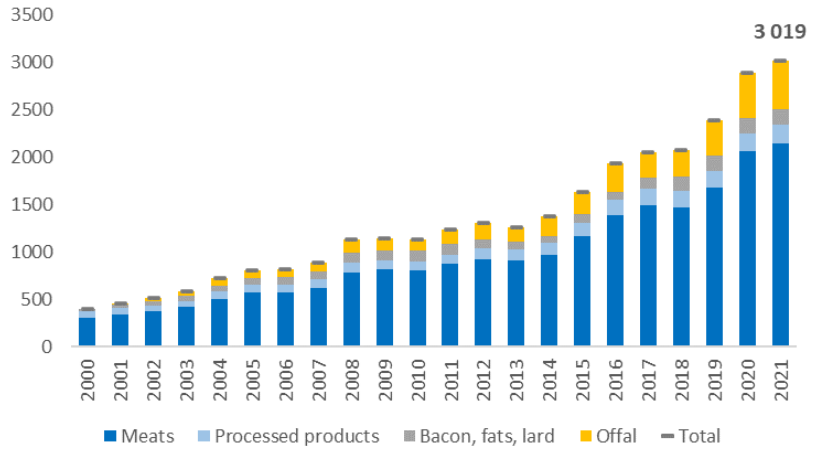

Figure 97: Exports from Spain by pig products in 1000 tons. Source: IFIP from Eurostat

In 2013, Spain exported 1.25 million tons of pork products and third countries accounted only 22 % of the destinations. Eight years later, Spain exported 3.02 million tonnes of pork products and third countries represent 60 % of the destinations.

France has always been a privileged market for Spanish pork products, being its first destination for a long time and corresponding to 17 % of Spanish exports between 2015-2018. Meats (ham, deboned fresh meat) and processed products (sausages and salted, dried, smoked meats) represent the major products that Spain commercializes in France. Italy is also an important market in Europe for Spanish pork meats (ham, fresh and frozen boneless cuts). Over the 2015-2018 period, China has been the second export market for Spanish pork with 14 %. Prior to 2011, China accounted for less than 1 % of the Spanish exports of pork products and since that year Spanish pork exports to China have grown exponentially. In 2018, China became the top destination. In 2020 and 2021 more than 40 % of Spanish pork's export went to China, mostly frozen meats, and offal. Spain also exports the majority of its fat and bacon to China. The African swine fever that plagued in China from 2018 to 2020 was an opportunity for Spain to increase its exports to this country.

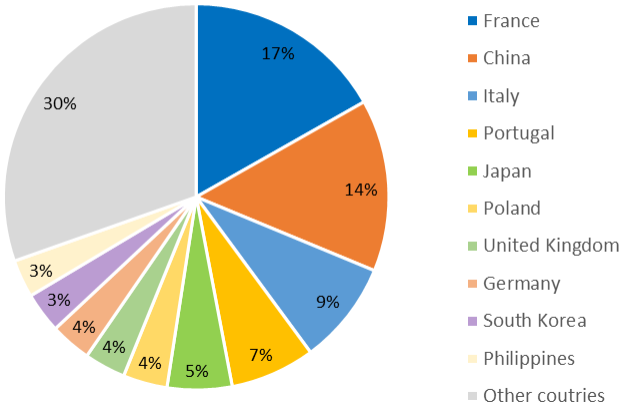

Figure 98: Main pig export destinations of Spain. Source: IFIP from Eurostat

In 2021, Spain imported 234 thousand tons of pork products. All of Spain's imports come from European Union countries. Spanish imports grew a little at the end of the 2000's and since then were stable until 2020. France is the main supplier of pork products to Spain, accounting for a third of the imports. France raised its market share all along the last twenty years from 20% in 2001 to over 30% in 2021.

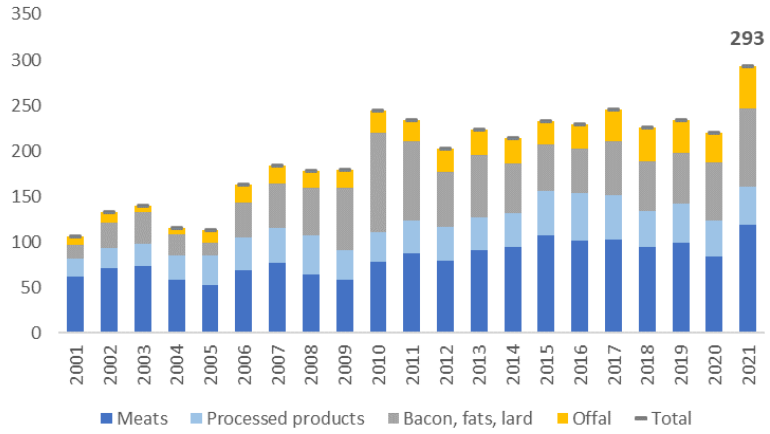

Figure 99: Imports of Spain by pig products in 1000 tons. Source: IFIP from Eurostat

Over the 2015-2018 period, more than 40 % of pork imports were meat products (ham, loin, frozen and fresh deboned meats) especially from France, Portugal, and Netherlands. Nearly 25 % of imports were bacon and fats almost exclusively from France. Germany and Italy are the main suppliers of processed products (sausages and preparations) in Spain.

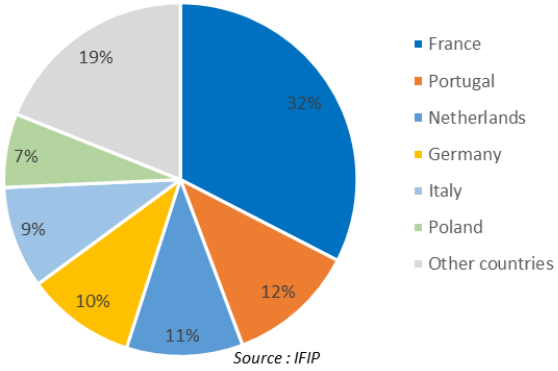

Figure 100: Origins of pig products imported in Spain. Source: IFIP from Eurostat

c. Retail sector and consumption

Table 9: Market Share of out-of-home catering. Source: IFIP from Eurostat

TIME	2012	2013	2014	2015	2016	2017	2018
Spain	13%	14%	14%	15%	14%	14%	14%

Table 10: Market share of distribution channels in 2013. Source: IFIP from Etude charcuterie dans l'UE

	Hyper	Super	Hard-Discount	Total food chain	Other channels
Spain	20%	41%	9%	70%	30%

In Spain, market share of out-of-home catering for pork consumption was stable from 2012 to 2018, accounting for 14%. Therefore, distribution channels account for a large market share. In the market share of distribution channels, the total food chain accounts for 70%, and supermarkets are the place where consumers buy the most of pork products (41%).

Table 11: Consumption of pork products at home in Spain. Source: IFIP from Mapa

	Average yearly consumption 2015-2018 (tons)	**Average yearly consumption 2015-2018 (%)**	**Evolution rate from 2014 to 2020 (%/year)**
Fresh and frozen meat	**490**	**43%**	**-0,5%**
. of which smoked fresh porked	40	4%	+1,2%
. of which iberian fresh pork	17	1%	+6,8%
. of which fresh and frozen sausages	21	2%	-6,9%
. of others	413	37%	-0,6%
Processed products	**523**	**46%**	**+0,9%**
. of which cured hams and shoulders	93	8%	+1,8%
Of which iberian	*15*	*1%*	*+3,1%*
. of which cooked hams and shoulders	59	5%	-3,4%
. of which other sliced cooked meats	113	10%	+1,7%
Of which poultry based	*63*	*6%*	*n.d.*
. of which fresh sausages	60	5%	+1,4%
. of which cured sausages	92	8%	+1,2%
. of which other dried and cured products	62	5%	+2,1%
. of which other cooked products	45	4%	+0,1%
Variety meats	**3**	**0%**	**n.d.**
TOTAL	**1 130**	**100%**	**+0,5%**

The typology of products consumed can be approximated with consumers survey data, with the caution that these are representative of home consumption only (out of hotels, restaurants, catering). About 43% of the pork products consumed at home are fresh meat, which can be smoked fresh pork (4%), Iberian fresh pork (1%), and fresh and frozen sausages (2%). The Iberian fresh pork is more and more popular for Spanish consumer, with a rise of +6,8%/year from 2014 to 2020. While the fresh and frozen pork meat slowly declined (-0.5%/year).

About 46% of the pork products are processed products like sliced cooked meats, cooked or cured hams and shoulders, cured or fresh sausages, etc. Processed products were more consumed between 2014 and 2020 (+0.9%/year). Consumption of processed products increased for each category except for cooked hams and shoulders (-3.4%) Variety meats accounts for very few, but these can be incorporated in other processed products.

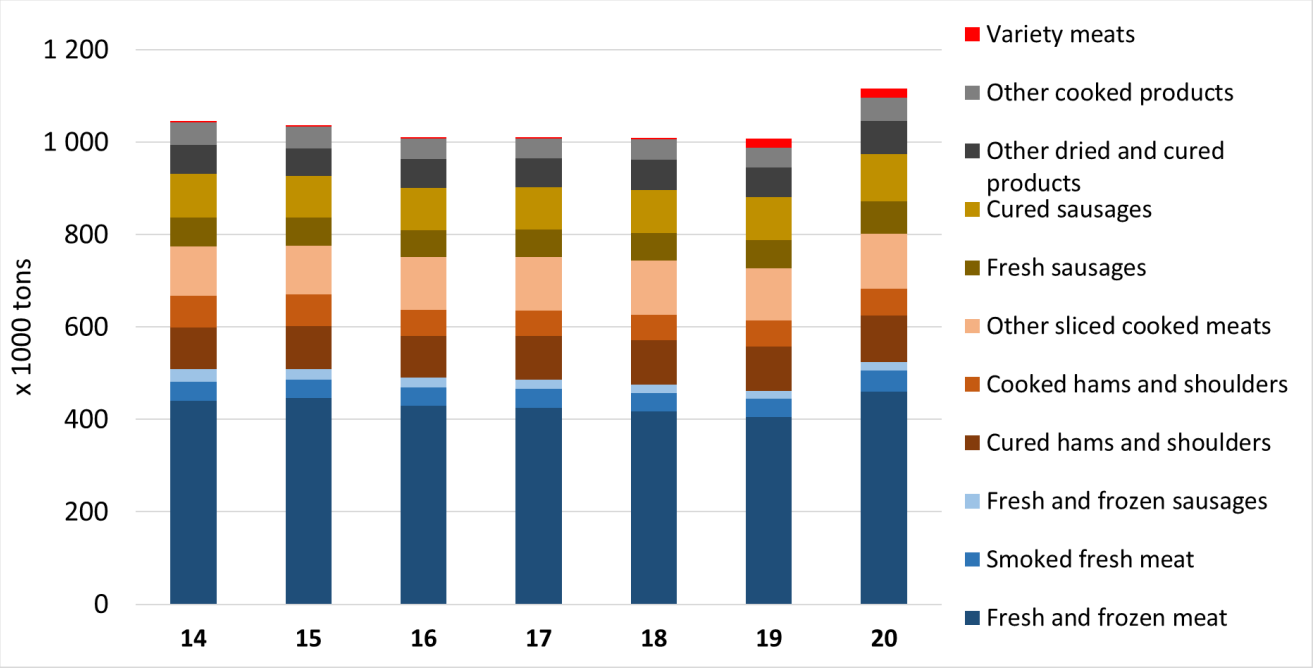

Figure 101: Consumption of pork products at home in Spain. Source: IFIP from Mapa

2. THE ACTORS IN THE VALUE CHAIN

a. The main actors in the value chain

The Spanish pig sector is of key importance in the economy of Spain since it accounts for around 14% of the Total Agricultural Production. Within the livestock productions, the pig sector ranks the first in terms of its economic importance, reaching about 39% of the Total Livestock Production. In 2020 and 2021, 56.1 and 58.3 million pigs were slaughtered, respectively and about 5 and 5.2 million tons of meat were produced, respectively.

Worldwide, the EU-28 is the second largest producer of pork, after China. Individually, and until 2020 Spain was the fourth largest producer (after China, the US, and Germany), while, at a European level, Spain ranked second in production with 19% of the tons produced (Eurostat, MAPA 2021), after Germany, and since 2015 is the first EU country in census (32 million heads), with close to 21% of the community census(Eurostat, MAPA, 2021). But from 2021 on, Spain has become the number one in the EU and third in the world, just behind China and the United States, and already surpassing Germany in meat production and number of animals slaughtered. During 2021, production has grown by around 3.1% in tons and 4% in number of heads, maintaining the upward trend of last year. In the last years the number of heads of animals in Spain has grown by 27%, with special incidence in Murcia (+17.1%), Aragón (+12.4%), Castilla la Mancha (+8.5%), Extremadura (+4.9%) y Castilla y León (+3.7%). Throughout Spain there are 88,437 pig farms. 77.83% are intensive livestock, according to data from the General Registry of Livestock Farms (REGA).

During the last years the pig sector has grown remarkably, both in production, as well as in censuses and in number of exploitations, thanks to the push of foreign markets supported, in turn, by the competitiveness of the sector in the world market. This increase in production has increased the already high rate of self-sufficiency (170.9% in 2018, (Datacomex-AEAT, INE), which makes exports an essential element for the market equilibrium. With a very positive trade balance, Spain has established itself as the second largest pork exporter in the EU, only behind Germany, dramatically increasing exports to third countries, especially China and other Southeast Asian countries.

In Spain, the industry and farms from the meat sector are strategically allocated. In the case of the Iberian pig, they are mainly concentrated in the southwestern region of the peninsula, while in the case of the white pig they are spread in the area of Barcelona, Aragon and Castilla León (Figure 102). The dynamic goes in the direction of a reduction of the number of farms while increasing the average number of pigs per farm (Figure 103).

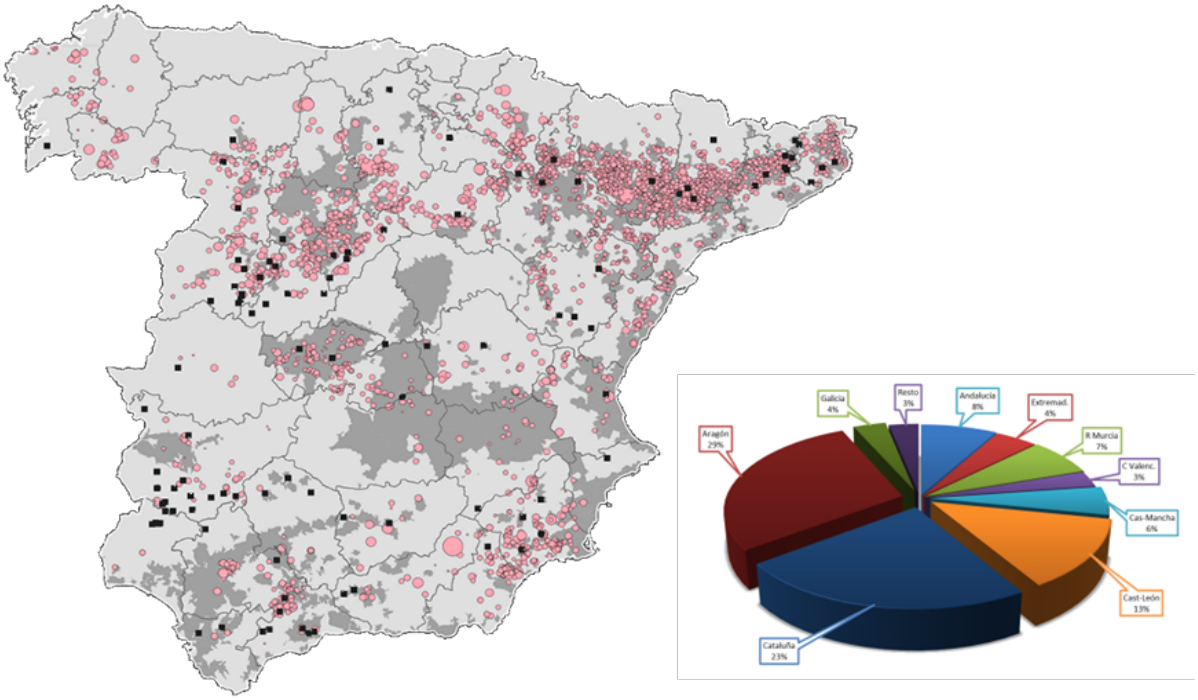

Figure 102: Distribution of the Spanish pig farms and census 2021. Source: MAPA and SGPGYC.

In 2021 the average number of pigs per farm was of 1.440 and 822 for white and Iberian pigs, respectively.

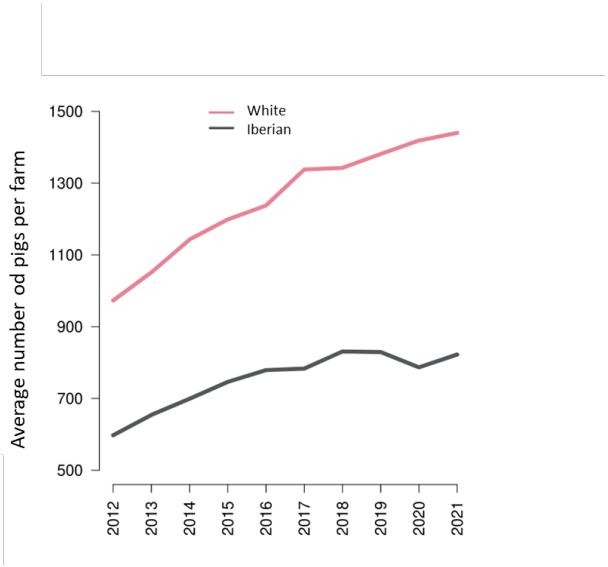

Figure 103: Evolution of farm size in Spain in the last 10 years. Source: (Datos y censos - BDporc! (irta.es))

In Spain, the meat industry consists of 3,641 companies that employ more than 110,000 people, representing 24% of the total workforce in the food industry. 52% of meat companies employ more than 200 people. There are also 700 slaughterhouses, of which 20% work exclusively with pork, a segment that also has a high concentration in certain areas, with 54.4% of pigs being slaughtered mainly in Barcelona, Girona, Murcia, Lleida, Huesca, and Malaga, close to the main centers of meat production and consumption. The largest slaughterhouse in Europe, the Litera Meat plant, owned by an Italian company, is located in Binéfar (Huesca) and has the capacity to slaughter more than 32,000 pigs per day. The Spanish pig sector turnover is about 5 billion euros per year and most of its production is vertically integrated, controlling several stages of the value chain to maximize efficiency and profitability. The large integrated companies and pork sector companies in Spain are business conglomerates that, although they started from different origins, such as a slaughterhouse or a feed factory, are currently present in one way or another throughout the production chain. From pig farming to selling to consumers through commercial brands recognized by the general public. Valls Companys Group, Fuertes Group, Jorge Group, Costa Food Group, Cañigueral Group and Campofrío Group are some of the largest companies in the country with annual revenues well above one billion euros and owning more than 60% of the share. They have thousands of associated farms in an integration model spread throughout the country but with a special incidence in the territories closest to their slaughterhouses (Figure 102). These groups are comprised of subsidiary companies which cover all the processes of the pig production chain:

- Livestock facilities for pig farming: breeding and fattening of pigs, white and/or Iberian.
- Animal feed factories.
- Slaughterhouse and cutting rooms.
- Manufacturing, packaging and distribution of pork products

The representativeness of cooperatives and producers' organizations in the Spanish pork sector is low. Although Coren and Guissona (Bonarea Group) which gathers different species farms (poultry, ruminants and pigs) have an important presence and share of the market with a wholesale turnover above the one billion euros.

In Spain, more than 300 slaughterhouses were active in 2021 and slaughtered 58.4 million pigs. As we mentioned above, the Spanish pig slaughterhouse sector is very concentrated. Being the 73% of the pigs slaughtered in the regions of Cataluña, Aragon, and Castilla Leon (Table 13) and more than 50% of the animals (> 32 million pigs) being slaughtered for the main groups listed in Table 12: Pigs slaughtered according to economic groups. It is worth mentioning that the Iberian pigs are mainly slaughtered in their production regions (Extremadura, southwest Andalucía and south of Castilla León).

In 2021 the northeast region of Spain (Cataluña, Aragon and Castilla Leon) and southwest region of Spain (Extremadura, southwest Andalucía and south of Castilla León) concentrated more than half of the processing production for white and Iberian pig, respectively. Linked to the geographical distribution of pig production and slaughter volumes, processing production coincides, showing that the pig sector is organized with the aim of optimizing the distance between each stage of the supply. This shows the trend towards clustering of processing companies in the pig production and slaughter sector.

Other key players in the sector are the retail companies (i.e supermarkets) mainly Mercadona, Lidl, Carrefour, Aldi, DIA and El Corte Ingles. These companies together with the European intracommunitary and third countries market have an important weight on addressing the governance of prices.

3. THE GOVERNANCE OF THE VALUE CHAIN

a. Power relations in the value chain

Most of the pig production in Spain is vertically integrated, regardless of whether we talk about white or Iberian pig. This system helps to increase the control of the integrator over the production and distribution process. This can involve acquiring other companies in the value chain to ensure a reliable supply of raw materials and to gain control over distribution channels. In the Spanish pork sector, the power relations between actors can have a significant influence on the price transmission and contract arrangements within the industry. For example, the top pork processing companies in Spain account for over 80% of the total market share, which gives them significant market power. As a result, they may be able to negotiate lower prices for the pigs they purchase from producers than would be not possible in a more competitive market. This can put downward pressure on prices for producers and reduce their negotiation power. In addition, the concentration of the market in the hands of a few large processors can make it difficult for smaller processors to compete, which can limit the options available to producers when it comes to selling their pigs. This can also limit the options available to retailers when it comes to sourcing their pork products.

Contracts are an important tool in the Spanish pork sector for managing price risk and ensuring a steady supply of product. However, the terms of these contracts can be influenced by the power relations between the different actors. To address these issues, there have been efforts to promote greater competition in the Spanish pork sector, such as through antitrust enforcement and the promotion of alternative marketing channels. In addition, there are several organizations and associations that represent the interests of different actors in the value chain and work to promote greater transparency and fairness in the market.

INTERPORC (Asociación Interprofesional del Porcino de Capa Blanca, INTERPORC (mapa.gob.es) and ASICI (ASICI - Quienes Somos (iberico.com) are the inter-branch organisations for white and Iberian pig respectively. They defend the interests of the Spanish pig sector and brings together actors of the pig sector such as animal food manufacturers, farmers, cooperatives, slaughterhouses, processing companies, distributors, collective catering, and artisans. The role of INTERPORC and ASICI is to promote cooperation and coordination among the different actors in the value chain, as well as to undertake activities that benefit the industry as a whole. For example, these organizations may work to improve the quality of products, develop new marketing strategies, and promote innovation and sustainability. The structure of the organizations is key to allow representativeness of all the parts involved in the value chain. In INTERPORC the structure is as follows:

Producer (with a representation of a 90% of Spanish pig producers):

- National Association of Pig Producers, ANPROGAPOR
- Agro-food cooperatives
- Agrarian Association of Young Farmers, ASAJA
- Union of Small Farmers and Ranchers, UPA
- Coordinator of Organizations of Farmers and Ranchers, COAG
- National Association of Porcine Cattle Merchants, ANCOPORC

Industry (with a representation of a 90% of Spanish pig industry):

- National Association of Meat Industries of Spain, ANICE
- Business Federation of Meat and Meat Industries, FECIC
- Association of Meat Exporting Companies, AGEMCEX
- National Association of Refrigerated Meat Warehouses and Cutting Rooms, ANAFRIC
- Agro-food cooperatives
- Spanish Confederation of Meat Retailers, CEDECARNE

In ASICI is as follow:
Producer (with a representation of a 90% of Spanish pig producers):

- AECERIBER
- ANPROGRAPOR
- ARAPORC
- APRIBER
- ASACRIBER
- ASAJA
- COAG
- UPA
- Agro-food cooperatives

Industry (with a representation of a 90% of Spanish pig industry):

- IBERAICE
- Agro-food cooperatives

As an example, recently the agricultural organization Joves Agricultors i Ramaders de Catalunya (JARC) has requested a series of measures from the pig sector board to increase the protection of pig farmers in integration contracts that exist in Catalonia, which represent 81.4% of the fattening pig producers. They asked to clearly define the responsibilities of the two parties that sign the contract. The integrator, as the owner of the animals and responsible for technical management, would have to take care of managing dead animals on the farm and livestock manure produced by the livestock. It was proposed that the integrator should be also responsible for nitrogen emissions through the established diets, since they are the ones who establish the diet formulation and manufacture the feed. There are also other contract concepts that need to be defined, especially regarding compensation for damages in the event of a situation that involves a health gap.
Overall, the farmers work under contract with large integrated companies, producing pigs according to specific requirements set by the company. They often have less control over pricing and market strategies than independent farmers but may benefit from greater security and stability in their business. Pork integration contracts are legal collaboration agreements between farmers and integrating companies. The integrating company is obliged to provide the necessary means for the care of the livestock, provide assistance to the integrated farmer, and acquire the production obtained. The integrated farmer is obliged to take care of the livestock, whether for fattening or reproduction, under the control of the integrator and to deliver the production obtained in the agreed period in exchange for compensation. Therefore, the

integrated farmer provides the facilities and other goods and services necessary for the activity and commits to the care and maintenance of the livestock. The integrating company provides the animals, production means (feed, medicines, etc.) and necessary services (veterinary, transportation, etc.) agreed upon in the contract so that the integrated farmer can carry out their activity and meet the objectives of the integration agreement.

The Spanish pork sector is subject to EU policies and regulations. The Common Agricultural Policy (CAP) is a major policy instrument that has shaped the pork value chain in Spain. The CAP provides subsidies and other forms of support to farmers to help ensure food security, promote rural development, and protect the environment. The CAP has also been used to promote certain production methods, such as sustainable and extensive pig farming like Iberian pig rearing in the Dehesa systems. One way that power dynamics in the value chain have influenced the policy process is through the development of industry associations and lobbying groups. These groups represent the interests of different actors within the value chain, such as producers, processors, and retailers, and they work to influence policy decisions that affect their interests. In some cases, these groups have been able to leverage their political influence on shape policies that benefit their members, such as subsidies or regulatory frameworks that favour certain types of production or distribution methods.

Civil society has also played a role in shaping the institutional framework of the pork value chain in Spain. Consumer demand for sustainably produced and locally sourced food has led to an increase in alternative value chains, such as those focused on organic or free-range pork. These alternative value chains are often supported by civil society organizations, such as environmental groups and animal welfare organizations.

One of the main strategies for success of the Spanish pork sector is the trade with third countries. Many companies in the Spanish pork value chain export their products to international markets to increase their revenue and market share. This can involve adapting products to meet the specific needs and preferences of different markets and building relationships with foreign distributors and retailers.

b. Most recent trends and future development of the value chain

The data on foreign trade in 2021 has continued the trend from 2020 in Spanish pork exports, with a new increase of 3.7% compared to the previous year. This overall increase is due to both the increase in exports to third countries (+4.5%) and intracommunity exports (+2.3%). Despite the decrease in exports to China (-10%), China continued to be the main recipient of Spanish exports in 2021 (39% of the total). Despite gradually recovering its pig herd, China still needs to import pork to supply its domestic market while its national production recovers. There were increases in Spain's exports to France (+2.1%), Philippines (+20.1%), Poland (+111%), Czech Republic (+12%), United Kingdom (+97%), and Bulgaria (+3.4%). On the other hand, sales to other relevant destinations, in addition to China, fell, such as Italy (-8.5%), Portugal (-1.2%), Japan (-6.4%), South Korea (-7%), and Germany (-19%). There was a growing on the third countries exports, where the governance of the final prices may rely on:

- Common changes in the market (offer and demand)
- Fluctuating production costs due to fluctuating prices of energy and feed ingredients

- The “pork cycle” which is an alternation of up and down prices over several years and forces adjustment of the pig production
- The seasonality which comes from the fact of sow’s fertility
- International hazards such as sanitarian crises, financial crises or geopolitical crises that can all impact international trade of pork (ASF, PRSS, Ukraine conflict, etc).

It is worth noting that during 2021, taking into account the particularities that have been dragging on from the previous year, the Spanish pork sector has continued to consolidate itself as one of the leaders in the global market for pork. All of this despite the uncertainties in the global market, mainly related to the evolution of ASF, the national situation related to the COVID19 crisis, and the beginning of the raw materials crisis that still is having a major impact globally. However, in the last year Spain and Europe are facing a difficult situation since their production costs are growing making them less competitive in the international market. In Spain there are less pigs in the system with respect to the installed slaughter capacity and the market continues to be extremely stressed. Spain is in an unprecedented situation: our pigs are the most expensive in the world, even more expensive than in China. North America continues with a much cheaper price of pork than Europe: in the United States it is equivalent to 1.05 euros/kg LW and in Canada it is 0.91 euros/kg LW. Brazil moves around 1.18 euros /kg LW. Spain and Europe cannot compete with these three origins.

Overall, the institutional framework of the pork value chain in Spain is shaped by a combination of EU policies and regulations, trade agreements, civil society, and specific organizations that represent the interests of different actors within the value chain. These factors have led to the development of a complex system with different actors and interests, which has both positive and negative impacts on the sustainability and competitiveness of the sector.

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- **Spanish Ministry of Agriculture, Fisheries, and Food (MAPA)**

Annexes:

Table 12: Pigs slaughtered according to economic groups

Group	Pigs slaughtered in 2020 (thousands)	Turnover 2021, €	Net result 2021, €	Location	Activity in the value chain
Group Valls Companys	> 4.5 million pigs	2.200.000.000	234.500.000	Aragon	
Patel		337.970.110	9.244.466	Barcelona	Slaughterhouse, cutting room and distribution of meat products
Frivall		268.138.569	14.588.145	Cuenca	Slaughterhouse, cutting room and distribution of meat products
Cárnicas cinco villas		530.090.082	17.944.241	Zaragoza	Slaughterhouse, cutting room and distribution of meat products
ICP		70.364.069	9.078.245	Zaragoza	Slaughterhouse, cutting room and distribution of meat products
Agrocesa		406.321.032	16.389.863	Valladolid	Pig farming
Nutrivall		29.761.000	2.195.000	Barcelona	Animal feeding production
Duriber		62.102.382	-4.137.060	Guadalajara	Manufacture of meat products
Jamcal		6.555.692	-314.452	Teruel	Manufacture of meat products
Naturiber		9.169.127	-899.665	Salamanca	Manufacture of meat products
Industrias Reunidas Jabugo		26.902.671	-1.934.889	Huelva	Manufacture of meat products
Comercial Logistica Calamocha		48.595.907	-3.586.951	Teruel	Manufacture of meat products
Group Fuertes	> 2.8 million pigs	2.026.139.362	114.539.471		
El Pozo Alimentación		1.445.828.435	83.912.555	Murcia	Manufacture of meat products
CEFUSA		355.976.116	27.692.848	Murcia	Pig farming
FRIPOZO		123.285.612	3.356.903	Murcia	Manufacture of meat products
SEDIASA		101.049.199	-422.835	Madrid	Packaging and labeling of meat
Group Jorge	> 6 million pigs	1.675.000.000	Not found		
The pink pig		26.086.000	333.000	Zaragoza	Slaughterhouse
Le porc gourmet		44.361.000	1.669.000	Barcelona	Slaughterhouse
fortune pig		111.558.000	153.000	Lérida	Slaughterhouse
Mafresa		46.960.401	1.851.966	Badajoz	Manufacture of meat products
Rivasam		943.491.160	25.563.390	Zaragoza	Cutting room
Primacarne		163.279.120	9.529.570	Zaragoza	Cutting room
Campodulce		68.889.670	833.800	Zaragoza	Manufacture of meat products
Cuarte		187.864.000	4.328.000	Zaragoza	Pig farming and animal feeding production
Produccion y venta de productos secundarios		Not found	Not found	Zaragoza	Manufacture of meat products
Costa Food Group	> 3.6 million pigs	1.500.000.000	3.807.285		

Piensos Costa		424.559.217	4.977.021	Huesca	Animal feeding production
Costa Food Meat		372.015.332	2.663.236	Barcelona	Slaughterhouse, cutting room and distribution of meat products
Casademont		58.003.887	-1.914.919	Gerona	Packaging and labeling of meat
Industrias Carnicas Villar		73.878.656	-3.220.952	Soria	Manufacture of meat products
Roler		74.826.613	-1.371.814	Barcelona	Manufacture of meat products
Embutidos la Nuncia		14.790.000	2.422.000	Toledo	Manufacture of meat products
Juan Luna		54.205.119	-1.232.708	Valencia	Wholesale distribution
La Alegria Riojana		20.423.353	1.485.421	La rioja	Manufacture of meat products
Group Cañigueral (Costa Brava)	> 3 million pigs	1.000.000.000	Not found	Barcelona	Pig Farming, Animal Feeding and manufacture
Campofrío food group	> 2 million pigs	977.855.000	-28.276.000	Burgos	Manufacture of meat products
Incarlopsa (Ind. Cárnicas Loriente Piqueras)	> 1.8 million pigs	927.707.596	28.362.404	Cuenca	Manufacture, packaging and labeling of meat
Litera Meat	> 5 million pigs	722.774.567	12.994.638	Huesca	Slaughterhouse, cutting room and distribution of meat products
Group Olot Meat	aprox. 3 million pigs	676.290.054	48.685.444		
Olot Meats		34.119.906	2.160.665	Gerona	Slaughterhouse, cutting room and distribution of meat products
Carniques de Juia		368.638.107	22.315.710	Gerona	Manufacture of meat products
Carniques Celrá		273.532.040	24.209.069	Gerona	Manufacture of meat products
Friselva	Not found	360.468.598	33.326.038	Gerona	Slaughterhouse, cutting room and distribution of meat products
Jisap (Juan Jiménez García S.A)	Not found	322.196.564	16.640.000		
Juan Jiménez García S.A		257.932.637	15.064.079	Murcia	Pig farming
Piensos Jimenez SLU		64.263.927	1.575.921	Jaén	Animal feeding production
IngaFood	Not found	311.864.000	-19.356.000	Madrid	Pig farming
Coren	Not Found	1.033.000.000	not found	Galicia	Cooperative
Guissona (Bonarea Agrupa)	Not Found	2.250.157.360	65.468.860	Lleida	Cooperative

Table 13: Number of pigs slaughtered in Spain in 2021

	Nº OF HEADS				AVERAGE CARCASE WEIGHT, KG		
REGION	PIGLETS	FATTENING	OTHERS	TOTAL	PIGLETS	FATTENING	OTHERS
CATALUÑA	9.273	23.665.868	366.399	24.041.540	6,35	85,41	161,40
ARAGÓN	378.026	10.530.657	387.712	11.296.395	14,33	90,90	156,98
CAST. Y LEÓN	1.081.389	5.859.700	56.135	6.997.224	5,46	105,32	147,24
R. DE MURCIA	4.167	4.515.705	0	4.519.872	8,00	81,76	0,00
C. LA MANCHA	23.513	4.355.693	738	4.379.944	6,31	94,98	140,65
ANDALUCÍA	17.274	3.305.314	56.632	3.379.220	11,31	91,34	155,52
C. VALENCIANA	2.563	1.338.206	403	1.341.172	6,62	95,29	178,01
GALICIA	38.478	927.840	16.462	982.780	6,79	92,27	153,26
MADRID	5.520	558.319	0	563.839	5,26	82,44	0,00
EXTREMADURA	27.392	519.607	21.758	568.757	7,93	129,21	151,47
CANARIAS	2.741	60.148	1.928	64.817	10,36	79,99	173,00
P. ASTURIAS	1.008	43.926	0	44.934	6,11	100,85	0,00
BALEARES	74.284	25.292	1.112	100.688	8,94	96,47	166,09
NAVARRA	28.551	20.802	664	50.017	7,00	85,00	125,00
LA RIOJA	12.046	13.766	0	25.812	5,57	90,35	0,00
TOTAL	**1.706.411**	**55.754.131**	**909.943**	**58.370.485**	**7,77**	**90,09**	**157,88**

The French pig value chain

Nicolas Rouault, Valérie Diot, Boris Duflot (IFIP-ACTA)

Key findings :

- French pig production and pork consumption slowly declined during the last 20 years. The number of farms and farmers declined and the farms size increased. The French consumption is oriented towards processed pork product (charcuterie) rather than fresh pork.
- International trade of the French pig sector is largely used to export products not consumed in France (nose, ears, etc) and import products for which the domestic supply is not sufficient to meet demand in France (ham, etc.). France has reached a self-supply rate (volume produced/volume consumed) of around 100%.
- Most French pig farmers are organised into Producer Organisations. The actors of the French pig sector (Farmers, Porducer Organisations, Slaughterhouses and Processing companies) are concentrated in the west of France. That implies a high specialisation of pig and pork production in the west of France, in particular the region of Bretagne. The numbers of actors is decreasing and a few actors hold the majority of the production.
- The pig price sold to slaughtershouses is guided by a common market : the Breton Pig Market (Marché du Porc Breton). Retailers in France have big negociation power. EGAlim rules attempt to shape a fair framework between the actors of the value chain by developing contracts and taking into account raw material cost in the selling price.
- Alternative pig production (organic and labels) accounts for less than 5% of the national pig production.

1. DESCRIPTION OF THE PHYSICAL FLOWS IN THE VALUE CHAIN

a. Structure of the French pig production

A breeding and fattening model with a slowly decline

The French pig herd decreased by 15 % between 2001 and 2020 to reach 13.2 million pigs in 2020 (Agreste, 2022). Environmental restrictions, limited international competitiveness and social acceptability are the main factors explaining this decline. It can be noted that in 2017 until 2020, the French pig herd re-emerged thanks to the development of export opportunities to China, this country losing a significant share of its production with African Swine Fever.

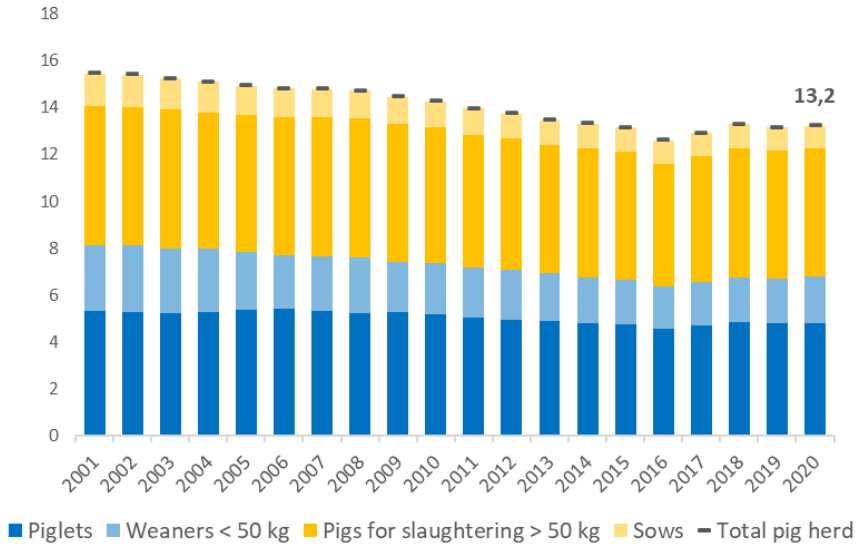

Figure 104: French pig herd in million tonnes. Source: IFIP from Agreste

The number of sows in France dropped by 30 % in 20 years, while the piglets number dropped by only 10 % during this same period (Agreste, 2022). This data shows that the sow's prolificacy improved considerably. Also, the better breeding-driving practices contributed to performance gains.

The geographical distribution is very heterogeneous in France. The region of Bretagne concentrates more than the half of the herd for a long time. The density of pig is therefore high in this region. The Pays de la Loire is the second largest pig region of France with 12 % of the livestock since 2000. The other French regions have few pig livestock compared to Bretagne. The Figure 105 shows the French geographic distribution of pig herd in 2020.

In 2020, France had around 14,200 farms producing at least one pig. The 9.492 pig farms producing more than 300 pigs accounted for 99.3% of the 23.2 million of pigs in France. From 2014 to 2020, one out of eight pig farms closed but the French pig production almost remained unchanged. About 37.4% of pig farms are

breeder-fatteners, about 7.2% are breeders only, and 55.4% are fatteners only. Breeder-fatteners farms represent 58.1% of pigs. The region of Bretagne condenses 51% of pig farms and 58% of pig production.

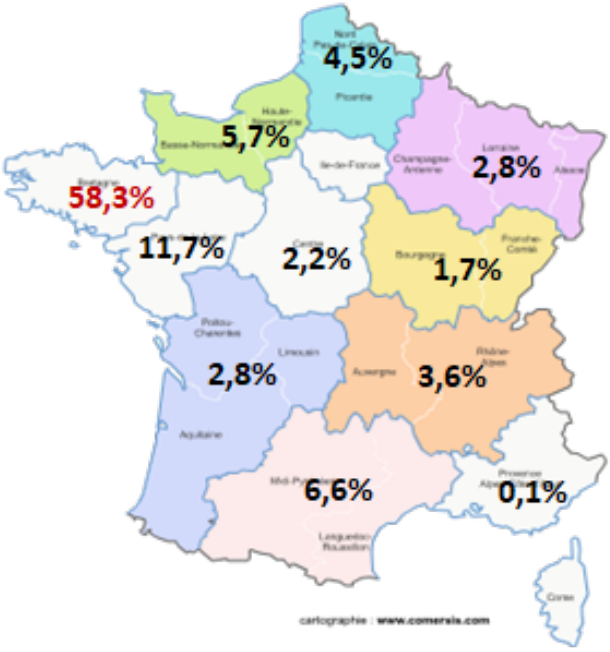

Figure 105: Geographical distribution of the French pig livestock. Source: IFIP from Agreste

The slowly decline of pig production and consumption

The French pig production and slaughters declined from 2001 to 2021 at a similar trend. Indeed, production and slaughters fell by 2 % and 5 %, respectively (Eurostat, 2022). The slaughter activity decreased more than the production given that more live pigs are exported as it shows the graph 7, a raise of live pig exports about 139% from 2001 to 2021. Domestic consumption also reduced by 4 % from 2001 to 2021 (Eurostat, 2022). The consumption took up in 2014 until 2018 because of low pork price due the abundance of pig products in the EU market after losing Russian market as the result of import restriction linked to ASF (African Swine Fever) and the embargo after the Crimea invasion. From 2018 to 2020, the opposite effect appears when French production went up to export to China facing ASP and the surplus of pork in the EU market found an outlet on the China market, French consumption decreased. More broadly, the level of short-term consumption is highly dependent on export opportunities.

Gross domestic consumption in the long run has only been a few percent less than gross domestic production, meaning that the self-sufficiency of France in pork products is slightly over 100%. Figure 106 shows the different stages of the French pig values chains and the market sizes, including foreign markets for different categories of products. Products and foreign trade are detailed further.

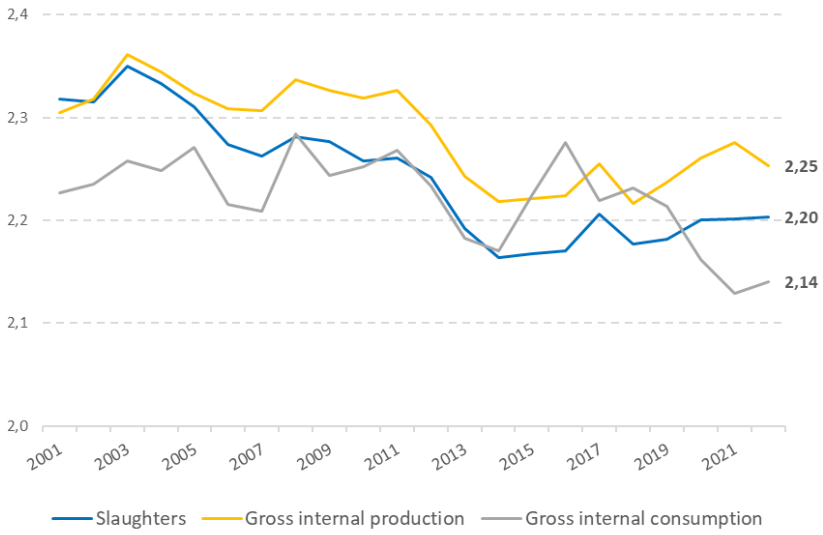

Figure 106: French pig production and consumption (thousand cwe). Source: IFIP from Eurostat

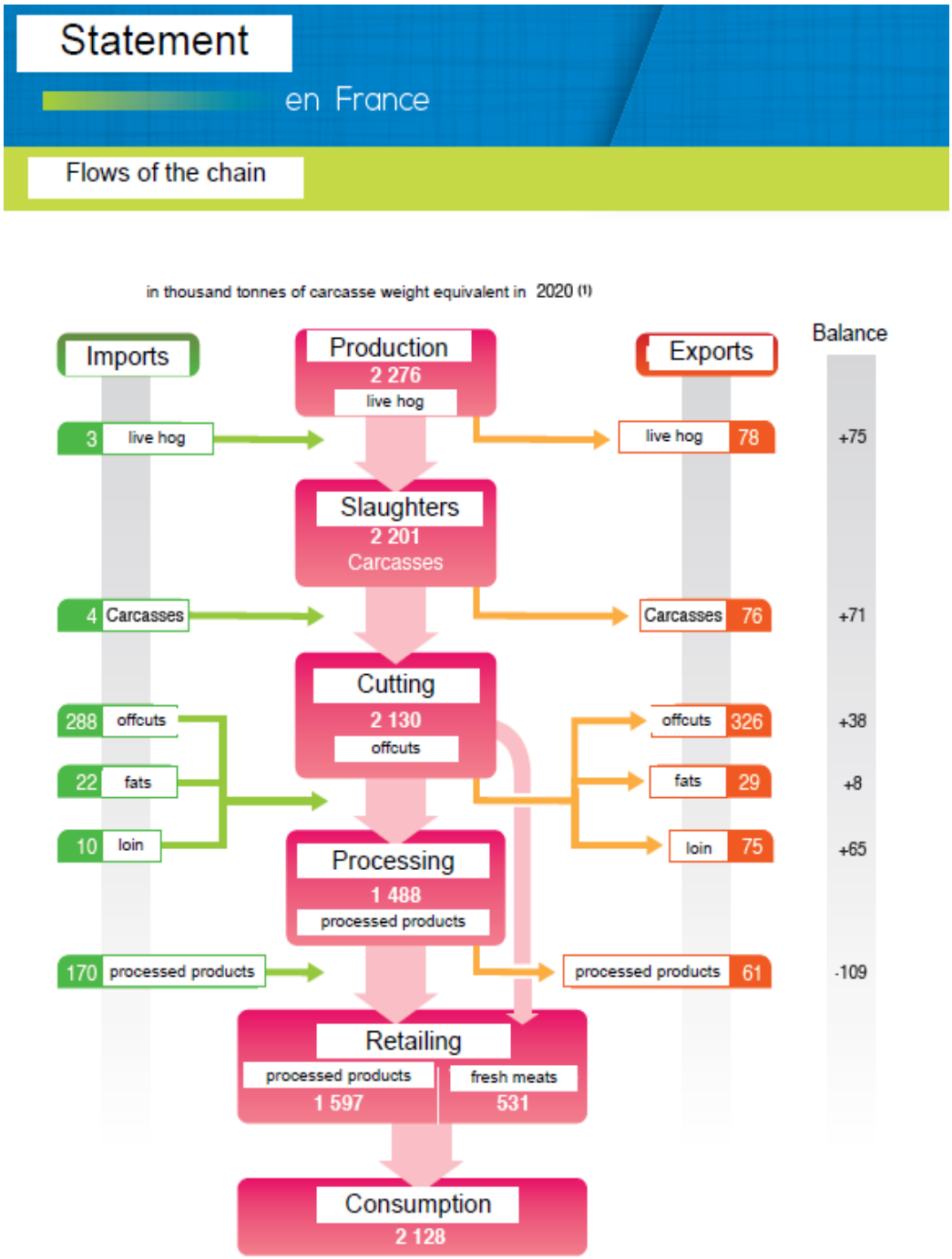

Figure 107: French pig chain balance from production to consumption (M tons cwe)

Official quality and origin products account for a small part of the pigs marketed: about 5,2%. Red label is the main label, since this type of pork can be produced throughout the territory instead of PDO and PGI which are limited to a specific area. Organic pork is a more challenging production than the other labels. The standard part of the chart aggregates a diversity of specifications.

A diversity of pork products made in France

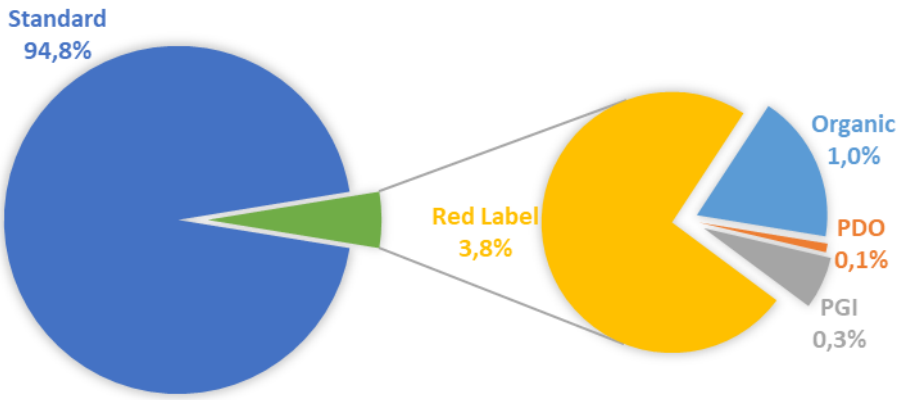

Figure 108: Distribution of the commercialized porks by official quality and origin signs. Source: IFIP from Agence BIO, Interbev Bio, Sylaporc and Agreste

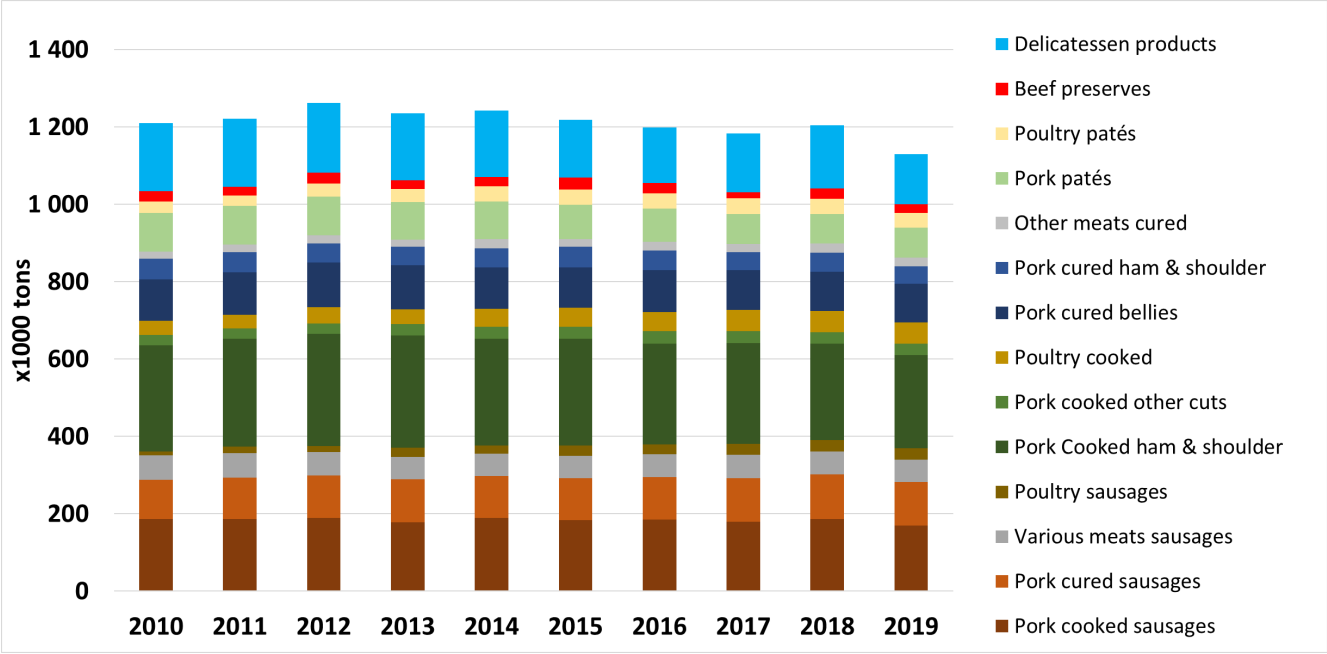

Figure 109: French processed products production in the industrial sector. Source IFIP from SSP data

After imports and exports of meat cuts, only one quarter of the cuts available on the French market are sold as fresh meat, the remaining being processed. Among the 75% of pork that is processed, a vast majority is processed by the industrial sector. Data collected from the industry shows the very diverse typology of products that is made in the French meat processing sector (Figure 109) as well as a diversity in trend depending on the type of products (Diot, 2021). In the period between 2015 and 2018, sausages account for 31% of the 1,2 M tons of products made every year. In this category, cooked sausages account for 15% (fresh sausages are not included and belong to the fresh meat segment). Secondly, cooked meat account for 29%, with cooked hams and shoulders representing the main category of all the processed meats products (22% of the total). The third category consists of cured meat products, which represent 15% of the total. Next, pâtés account for 10%. Delicatessen products, which are products composed of meats and a significant share of other ingredients, account for 13% of the total.

Among the processed products, some of them are not mainly made from pork meat (duck rillettes and mousse, beef jerkly, poultry patés, etc). Between 2015 and 2018, 84.2% of the meats included in these products are pork, followed by poultry (10.8%) and beef and veal (4.3%). Other meats like game represent 0.8%. The share of poultry included in the products has been strongly increasing, from 5.7% in 2010 to 13.0% in 2019, while the share of pork meat has been reduced from 90.0% to 82.0%. Poultry sausages and cooked poultry products are the two fastest growing categories of products.

Table 14: Production of processed meat products. Source: IFIP from SSP

	Yearly average volumes 2015-2018 (tons)	Yearly average volumes 2015-2018 (%)	Yearly Trend 2010-2019 (%/year)
Pork cooked sausages	183 246	15%	-0.6%
Pork cured sausages	111 803	9%	+1.0%
Various meats sausages	*59 406*	*5%*	*-0.8%*
Poultry sausages	*26 845*	*2%*	*+11.5%*
Pork cooked ham & shoulder	261 797	22%	-1.7%
Pork cooked other cuts	30 914	3%	+1.3%
Poultry cooked	*52 035*	*4%*	*+5.7%*
Pork cured bellies	104 434	9%	-1.2%
Pork cured ham & shoulder	50 171	4%	-1.0%
Other meats cured	*21 537*	*2%*	*+2.1%*
Pork patés	82 502	7%	-3.4%
Poultry patés	*39 527*	*3%*	*+3.7%*
Beef preserves	*24 608*	*2%*	*-1;7%*
Delicatessen products	152 292	13%	-2.9%
TOTAL	**1 201 116**	**100%**	**-0.7%**

Within the pork products family, cured sausages (+1%/year) and other cooked meats than ham and shoulder (+1.3%/year) are the fastest growing. Opposite are the trend of pork cooked ham and shoulder (-1.7%/year) while it is the first category in volumes and of pâtés (-3.4%/year).

Processed meats production is very mainly driven by the domestic markets, exports only amounting to 70,000 tons per year, less than 6% of the national production of processed products is then exported.

b. Trade and trade relations with other countries

French exports of pig products did not evolve in the same way between 2001 and 2021. The European Union market is the first market for French exports. However, third countries demand drives more and more of the French pig product exports, representing 18% of the totals in 2001 and 41 % in 2021 (Eurostat, 2022). Until 2011, exports raised about 38 %. From 2012 to 2015 exports of pig products decreased by -11 % before they stabilized. From 2018 to 2021, exportations rebounded driven by the Chinese demand caused by ASF. But firstly, China overtook Italy in 2015 on the podium's top step of French destinations for pig products because of the middle-class emergence booming demand. During 2015-2018 period, China accounted for 16 % of the French pork products exports and Italy a historical destination about 14 %.

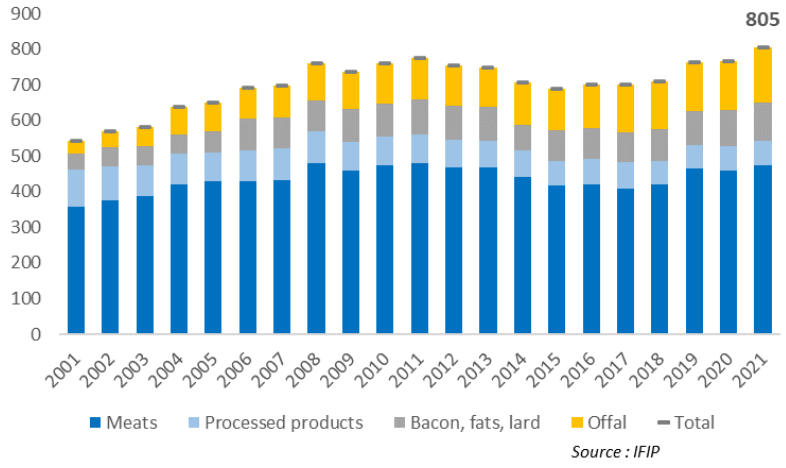

Figure 111: French export market of pig products from 2015 to 2021. Source: IFIP from Eurostat

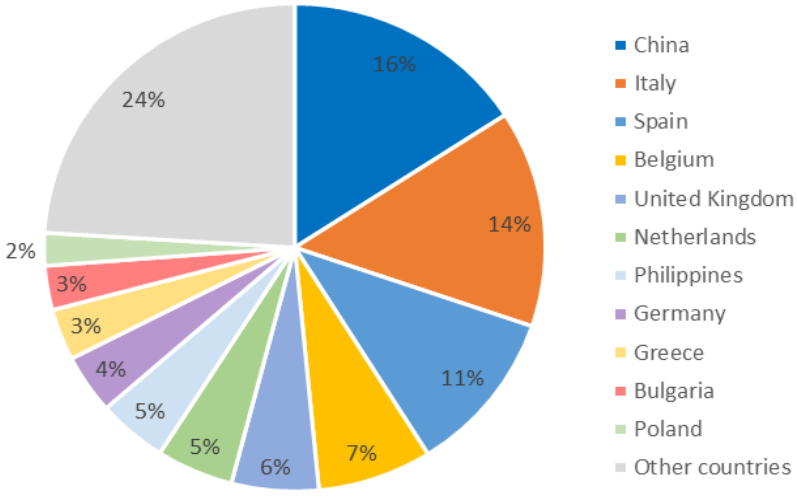

Figure 110: French export by pig products. Source: IFIP from Eurostat

Most of the French pig products exported are meats. From 2001 to 2021, meats exports raised by 32 %. This category of products is exported for the most part to China and Italy. France exports in comparison little processed products, offal and bacon, fats, lard. Nevertheless, the exports of bacon, fats, lard, and offal increased significantly in these 20 years by 132 % and 362 % respectively. Offal is mainly exported to China, the Philippines, and Spain. While bacon, fats and lard are exported principally to Spain, Netherlands, and the Philippines. Finally, the exports of processed products which account for only small portion of shipments, decreased by -32 % from 2001 to 2021. The top 3 destinations in this product category are Belgium, the United Kingdom, and Germany.
Exported and imported volumes of live pigs in France were close in the early 2000's. The French exports of live pigs increased from 2001 to 2010 before slowly declining. Nevertheless, a rebound took place from 2018 to 2020 while the French imports of live pigs slowly decreased from 2001 to 2021.

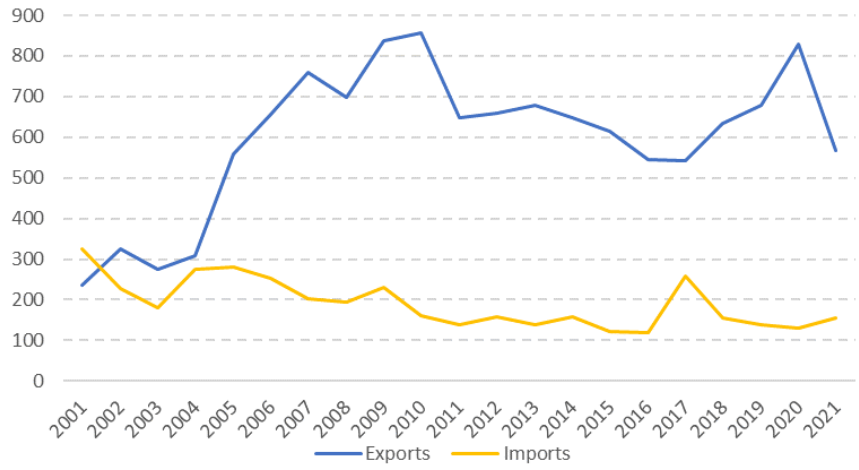

Figure 112: French trade of live pigs in 1000 head. Source: IFIP from Eurostat

French imports of pork products raised overall from 2001 to 2021 (+33 %) and especially between 2001 and 2015 (+47 %), until they reduced. More than 99 % of pig products imported into France come from European Union member States. Spain is by far the main supplier of pig products to France, holding more than half of the market share. Germany is also an important origin of French imports, accounting for 18 % between 2015 and 2018.

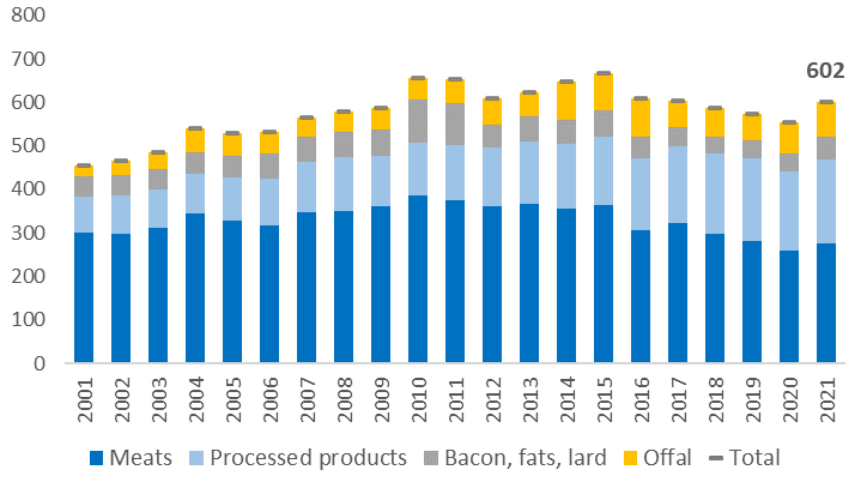

Figure 114: French imports by pig products in 1000 tons. Source: IFIP from Eurostat

Meats have always been the main product category imported, and Spanish origin has had the largest part of the market share for a long time. But processed products are increasingly imported, accounting for 18 % in 2001 and 32 % in 2021 of the pork imports. Three origins are imported for processed pig products: Spain, Germany, and Italy. Spanish origin contributed the most to the growth of the processed products imports. Bacon, fats, lard, and offal are little imported in France. However, imports of offal doubled from 2001 to 2021. The bacon, fats, and lard category is stable in imported volumes.

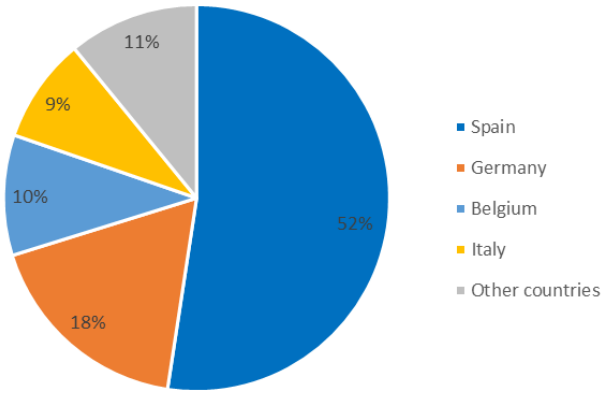

Figure 113: Origins of French pig products imported. Source: IFIP from Eurostat

c. Retail sector and consumption

While the total availability of pork meat in France is nearly steady for 20 years (-0.2% / year between 2001 and 2021), the population growth is significant with +0.5%/year in the same period. The consumption of pork meat per capita is thus declining at a pace of -0.7%/year.

Table 15: Evolution of pork meat consumption in France (from supply balance). Source: IFIP from Eurostat

	Indigenous Gross Consumption (MT cwe)	Population (M)	Individual consumption (kg cwe / person)
2001	2,235	61.3	36.5
2015-2018	2,235	66.8	33.5
2021	2,140	67.7	31.6
Yearly rate 2001-2021	*-0.2%*	*+0.5%*	*-0.7%*

This rate can be compared with the rate of evolution of other meats consumption in France (poultry, beef, and veal and ovine-caprine) which is -0.3% per year in the last 20 years. Poultry consumption per capita has been increasing at a pace of +0.8% per year, reaching 28.3 kg cwe per capita in 2020, while beef and veal (-0.8%/year) and ovine-caprine meats (-3.6%/year) have been steadily decreasing (FranceAgriMer, 2021).

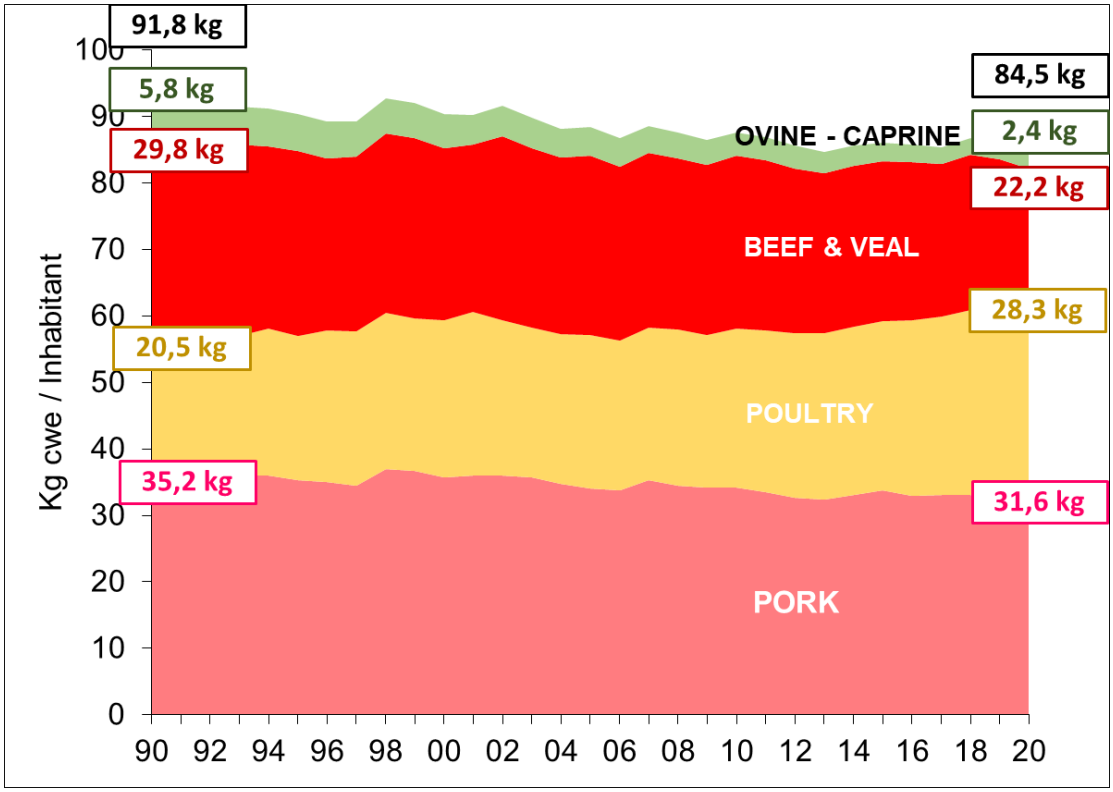

Figure 115: Individual consumption of pork meat compared to other meats in France.

The French consumption pattern, with a relatively high share of beef and veal (26%) and poultry (33%) meats is not very typical in the EU. The consumption pattern of most EU countries includes a higher share of pork than in France where it is 37%.

The typology of pork processed products consumed is quite close to the typology of production, only 6% of the national production being exported. The typology of products consumed can be approximated with consumers panel data, with the caution that these are representative of home consumption only (bought in any retailing channel out of horeca –"hotels, restaurants, catering" channels).

30% of the pork products consumed in home consumption are fresh pork, which can fresh unprepared (or raw) meat (18%), fresh sausages (5%) as opposed to cured or cooked sausages belonging to the processed products category and prepared fresh meats (seasoned, ready to cook, etc.). Variety meats consumed as such only represent 1%, but these can also be incorporated in pâtés and other processed products.

Among the 69% of processed products, 22% are cooked and cured hams or shoulders. 45% are made of a diversity of products of which cured and cooked sausages, cured bacon and belly, pâtés represent a fair amount.

Table 16: Consumption of pork products at home in France. Source: IFIP from KantarWorldPanel-FranceAgriMer data

	Average yearly consumption 2018-2019 (tons)	Average yearly consumption 2018-2019 (%)	Evolution rate from 2018 to 2021 (%/year)
Fresh and frozen meat	**297**	**30%**	**-0.4%**
. of which fresh unprepared meat	177	18%	-1.1%
. of which fresh sausages	49	5%	+1.2%
. of which fresh prepared meat and other products	71	7%	+0.1%
Processed products	**672**	**69%**	**-0.1%**
. of which cured and cooked hams - shoulders	217	22%	-0.6%
. of which other cured, cooked, mixed products	439	45%	+0.9%
. of which preserved mixed pork products	15	2%	nd
Variety meats	**9**	**1%**	**-2.9%**
TOTAL	**977**	**100%**	**-0.3%**

Total consumption of pork meats like other meats can be divided into home consumption and out-of-home or horeca consumption. Home consumption of pork products accounts for approximately 85% of the total consumption (Diot, 2021), which is a high proportion. Horeca consumption can be divided into commercial catering (restaurants, hotels…: 8% of the pork products volumes consumed), collective catering (school, work, hospital, army, prison…:5% of the pork products volumes consumed) and the alternative foodservice channels (bakeries, service stations…:2% of the pork volumes).

Within the home consumption retailing channels, general retailers represent 84% of the volumes of fresh meat bought by the French consumers and even 91% of their purchases of processed products (Graph 3). General retailing can be divided into hypermarkets (more than 2 500 m^2) and supermarkets (between 400 and 2 500 m^2), and proximity stores. Discounters are a category of retailers, generally supermarkets, specialized in selling their own brand while traditional retailers sell a higher share of national brands. Hypermarkets, generally located out of urban areas, selling food and many other products, and mainly accessible by car, tend to lose market shares in recent years to smaller surfaces, located closer to housing areas and more focused in food and daily purchases. E-commerce is progressing, with a strong acceleration in 2020 and 2021 which appears to hold its effects after the peak of the covid crisis. Within the general retailing sector, self-service shelves are progressing over traditional service.

Specialised retailing accounts for 16% of the sales of fresh meat and 9% of processed products. Artisan butchers and delicatessen shops are the main providers of sales within these channels. Specialised food retailers tend to get market shares from general retailers with a similar supermarket-size model but

specialised in higher range food products and closer to cities. Direct sales from farmers of processors only account for 1-2% of the retailing.

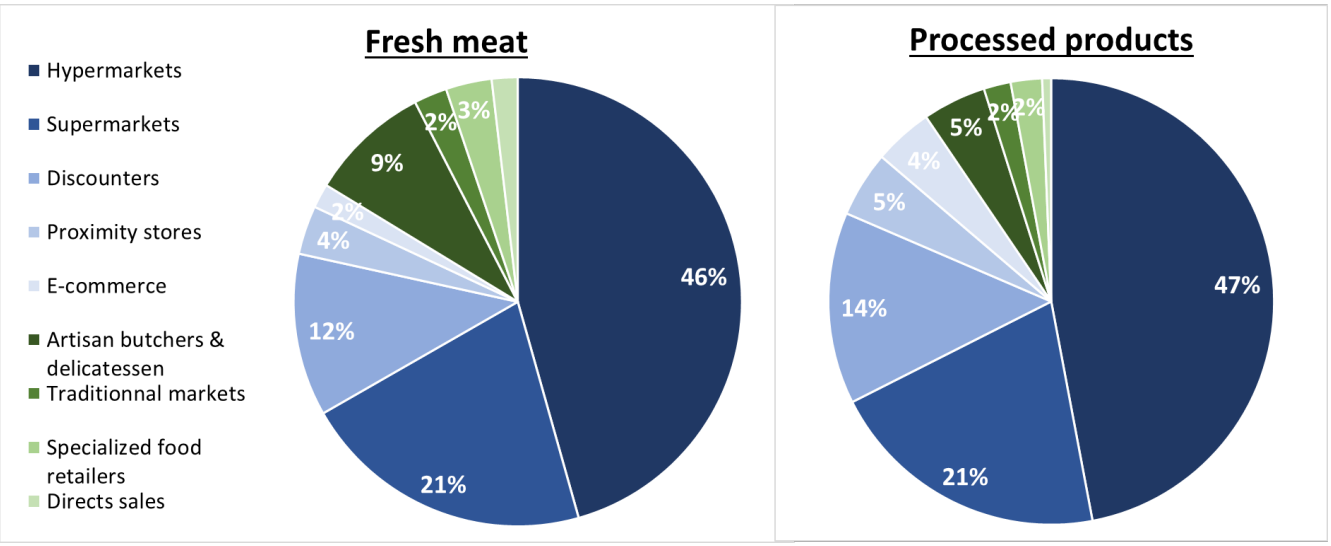

Figure 116: Breakdown of the retailing channels for volumes of pork fresh meat and processed products in France (average of years 2018-2019). Source: IFIP from KantarWorldPanel-FranceAgriMer data

2. ACTORS IN THE VALUE CHAIN

a. The main actors in the value chain

Farm companies

French producer organisations collect the pigs reared by breeders who are members of these producer organisations. In France, most farmers belong to a producer organisation. With this system, farmers have a better bargaining power and can benefit from their organisation services such as technical, economic and health support and advice (Le Clerc, 2018).

Table 17: Top 10 of producer organisations in 2021. Sources: Guide Orsol, BDPORC, Producer organisations)

Name	Main region	Number of pigs marketed (thousands of head)	Share of pigs marketed
COOPERL	Bretagne	5 642	24%
EVEL'UP	Bretagne	3 667	16%
PORC ARMOR EVOLUTION	Bretagne	2 021	9%
EUREDEN	Bretagne	1 599	7%
CIRHYO	Auvergne-Rhône-Alpes	1 348	6%
PORELIA	Bretagne	930	4%
PORVEO	Pays de la Loire	825	4%
AGRIAL	Pays de la Loire	760	3%
SYPROPORCS	Bretagne	611	3%
ALLIANCE PORCI D'OC	Occitanie	447	2%
Others	.	3 332	14%
Total of pigs marketed by the PO		**21 182**	**91%**
National		**23 313**	**100%**

In 2021, the French pig sector accounted 33 producer organisations representing 21 million pigs, i.e. 90 % of the national production (IFIP, 2022). Nearly 7,400 farmers are affiliated with a producer organisation. The top ten agricultural organisations marketed almost 17,8 million of pig in 2021 which represent 76 % of the national production. COOPERL is the leading producer organisation with 24% of the pigs marketed, EVEL'UP the second with 16% and PORC ARMOR EVOLUTION the third with 10%. The top 3 of producer organisations represent 49% of the pigs marketed.

The dynamic goes in the direction of a reduction of producer organisations. Between 2000 and 2021, the number has been divided by 3 and the number of affiliated farmers decreased by 50 %. Among these

organisations, 82 % of those producer organisations are agricultural cooperatives, 15 % are SICAs (Agricultural collective interest company) and one is an associative organisation.

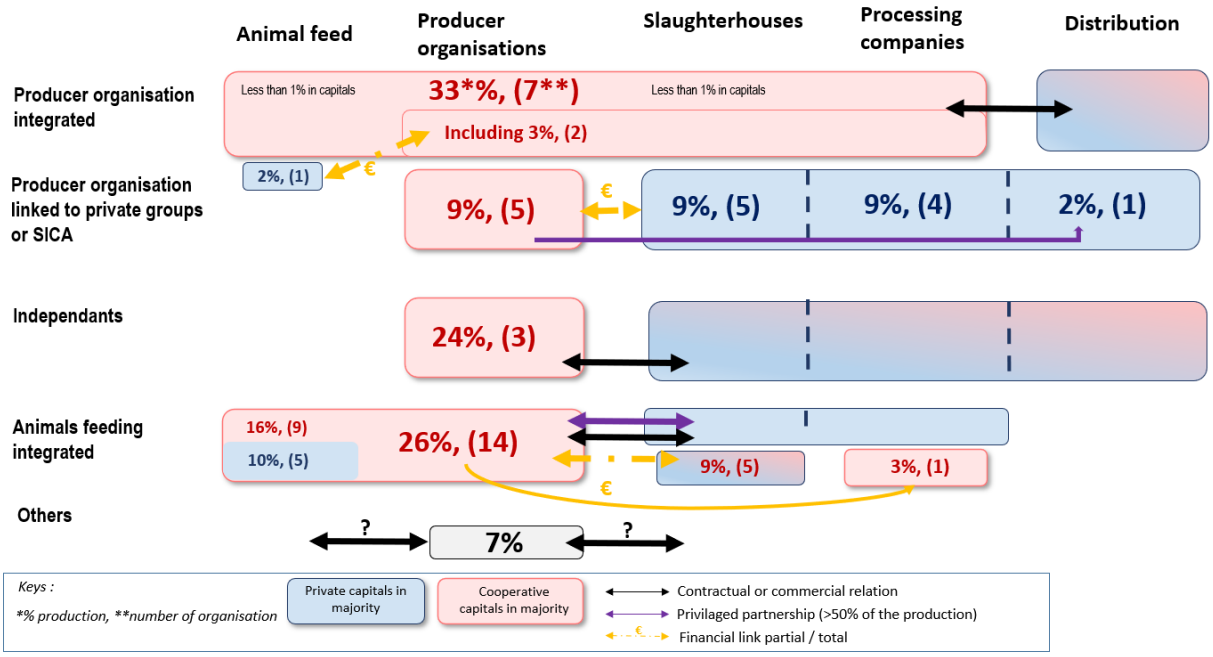

Figure 117: Typology of producer organisations in 2021. Source: IFIP

The production organisations can be classified into four types. The first are fully integrated production organisations from animals feeding to meat processing stages and these 7 organisations represent 33% of the production. The second are production organisations partially or totally financially linked to a private operator and these 5 organisations represent 9% of the production. The third are independent production organisations which sell pigs under commercial or contractual relationships and these 3 organisations represent 24% of the production. The fourth are production organization which also have an activity in animals feed and these 14 organisations represent 26% of the production.

There are usually two types of independent pig farmers who are not members of production organisations. Those with large-size farm who do not necessarily need to be member of a production organisation and benefit of the services provided by them, because they have sufficient bargaining power. And those with very small-size farm that do direct selling.

Slaughterhouses

In France, 165 slaughterhouses were in activity in 2021 and slaughtered 23.3 million of pigs. The French pig slaughterhouse sector is relatively concentrated. The two main companies, Cooperl and Bigard, with 11 slaughterhouses accounted for 40% of the national slaughtering. The top 10 companies, with 24 slaughterhouses, represented 87 % of the national slaughtering. The 141 other slaughterhouses accounted for 13 % of the national slaughtering (Uniporc, 2022).

Table 18: French top 10 of slaughter companies in 2021 (per head). Sources: IFIP according to Uniporc Ouest, BDPORC

Companies	Pigs slaughtered (thousand)	Share of national activity %
Cooperl	4 806	21%
Groupe Bigard	4 460	19%
Agromousquetaire	2 534	11%
Groupe Jean Floc'h	2 318	10%
Kermené (E. Leclerc subsidiary)	1 978	8%
Tradival (Sicarev)	1 344	6%
Abera (Groupe Avril)	1 316	6%
FIPSO	654	3%
Vallégrain	443	2%
Terrena (Holvia Porc)	383	2%
Top 10	***20 235***	***87%***
National slaughters	**23 313**	

As can be seen by comparing slaughter companies and production organisations, the integrated companies do not necessarily slaughter all the pigs produced by the organisation. For instance, in 2021 Cooperl produced 5.6 million of pigs and slaughtered 4.8 million of pigs (Uniporc, 2022).

Regarding a typology, three types of slaughterhouses can be defined out of these 10 slaughterhouse companies. The first belong to independent private groups, such as Bigard, Jean Floc'h, Abera or Vallégrain. The second type are slaughterhouses integrated with a producer organisation, for instance Cooperl, Terrena, Tradival and FIPSO. The last type are slaughterhouses integrated into distribution structures as is the case for Kermené and Agromousquetaire, which are subsidiaries of E. Leclerc and Intermarché.

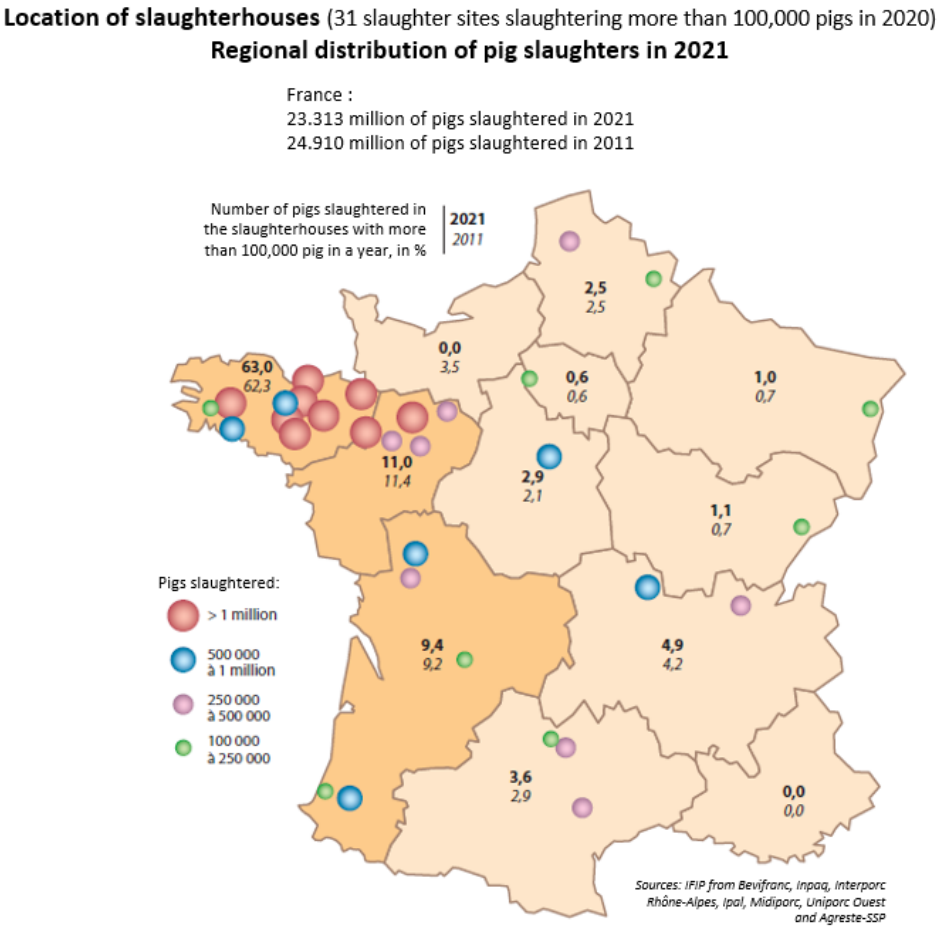

Figure 118: Regional distribution of slaughterhouses. Sources: IFIP from Bevifranc, Inpaq, Interporc Rhônes-Alpes, Ipal, Midiporc, Uniporc Ouest and Agreste-SSP

The regional distribution shows a concentration of the slaughterhouses and the slaughter volumes in the West of France and particularly in Bretagne which represented 63 % of the national slaughter in 2021 (IFIP, 2022). Bretagne concentrates almost all the slaughterhouses which slaughter more than 1 million pigs per year. The region Pays de la Loire and Nouvelle Aquitaine accounted respectively for 11 % and 9,4 % of national slaughtering. Pays de la Loire is the only region outside Bretagne to have slaughterhouse on its territory with a slaughtering capacity of more than 1 million pigs.

Processing companies

According to the activity report of the FICT (Industrial federation of pork processing companies), in 2019 and 2021 (FICT, 2019 and 2021) French territory had 299 processing companies of pork meat producing product such as ham or sausages and 90% of them are SME (small and medium-sized enterprises). The number of

pork processing companies was 397 in 1999 and 355 in 2009, decreasing by 16% and 25% respectively in 10 and 20 years. These data highlight the progressive concentration of the sector.

The volume of products processed by these companies is estimated to 1.13 million tonnes. The raw material used by processed companies is 82% pork, at 13 poultry meat and at 5% cow meat. Most of the processed meat has French origin and almost 85% of pork used came from France. On the other hand, 75% of the French pork production ends up as a processed product.

Table 19: Distribution of processing companies by sale revenue in 2019. Source: FICT – French ministry of Agricultural and Food SSP

Revenue (millions €)	Numbers distribution of companies (%)	Distribution of sale revenue (%)
> 100	6%	44%
50 à 100	7%	17%
20 à 50	14%	20%
10 à 20	17%	9%
< 10	56%	10%

The 299 processing companies had an estimated turnover of 6,7 billion euros in 2019, including 7,8% export sales. As shown in Table here below regarding the distribution of turnover, the processing sector is relatively concentrated. On the one hand, 6 % of the companies represent 44 % of the sector revenue. On the other hand, 56 % of the companies represent 10 % of the sector revenue.

Table 20: Distribution of processing companies by numbers of workers in 2019. Source: FICT - French ministry of Agricultural and Food SSP

	Companies		Workers	
	Number	%	Number	%
>500 workers	13	5%	12 352	38%
250 to 500 workers	16	6%	5 110	16%
50 to 250 workers	109	38%	11 216	35%
<50 workers	148	52%	3 469	11%
TOTAL	**286**	**100%**	**32 147**	**100%**

These 299 processing companies had at least 32,000 employees in 2019. Of these, 38% work in the 5% largest companies. These 5% largest companies employ more than 12,000 workers and the 52% smallest processing companies employ less than 3,500 workers. In 2019, 75% of workers in processing companies hold low-skilled occupations, 17% hold intermediate-skilled occupations (as technicians) and 8% hold high-skilled occupations

(as engineers or executives). In 2019, the FICT estimated that 135,000 direct and indirect jobs were supported by companies that process pork.

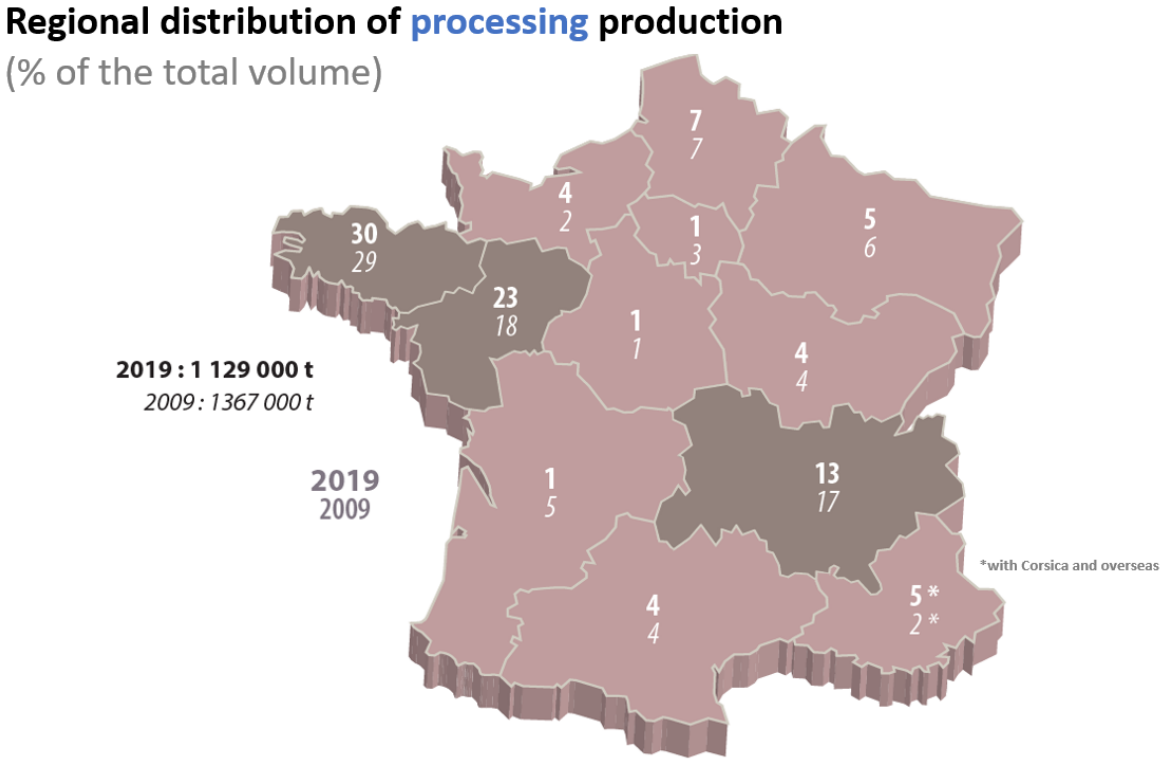

Figure 119: Regional distribution of processing companies in 2019. Sources: FICT – French ministry of Agriculture and Food SSP

In 2019, the Bretagne and Pays de la Loire regions concentrated more than half of the processing production. Linked to the geographical distribution of pig production and slaughter volumes, processing production coincides, showing that the pig sector is organized with the aim of optimizing the distance between each stage of the supply. The third region with 13% of the processing production is Auvergne Rhône-Alpes. This region is distinguished from the others by a lower pig production and slaughter volumes compared its processing production. Indeed, Auvergne Rhône-Alpes region (near the city of Lyon) has an historical tradition of processing pork product which explains the relatively high production today. In recent decades, Bretagne and Pays de la Loire have concentrated more processing production. This shows the trend towards clustering of processing companies in the pig production and slaughter sector.

3. THE GOVERNANCE OF THE VALUE CHAIN IN THE FRENCH PIG SECTOR

a. Power relations in the value chain

As we saw in the previous chapter, POs (Production Organisations) are key players in the value chain of pig sector. Two types of POs exist (Le Clerc, 2018). The first is POs with ownership transfer and assuming the role of marketing. The second is POs without ownership transfer and the farmer markets himself his production, the POs negotiate the framework contract with the clauses. Cooperative, which constitute most of the PO's status in pig sector, are comparable to POs with ownership transfer. Given the region, farmers have a large POs selection. In the west of France and particularly in the region of Bretagne where the pig production is widely concentrated, POs are competing and farmers have more choice. POs can group together to form a larger structure "Producers Organisation Association" (AOP), such as the "AOP Porc Grand Ouest", to benefit greater bargaining power. Without POs, the slaughterhouses of pig sector would benefit from an oligopsony power because there are fewer players than farmers. The grouping of farmers into POs correct this unbalanced power relations by reducing the number of actors negotiating with industries and therefore the opportunities for buyers. The bigger the POs are, the more negotiation power the POs will have. Balancing negotiation power is possible if the asymmetry in size between POs and industries is alleviated. In pig sector, cooperatives are quite old and were created to benefit economic scale, technical support and were encouraged by the renationalisation plan more than to balance power negotiation in the supply chain. As we describe in the following section, the Breton Pig Market (MPB) ensure a similar price for all players, it is more on the quantity sold that negotiation could occur.

The power relation is also unbalanced between industries and distributors. Indeed, in France there are four retailler's centralized purchasing structure, which bargain with provider and buy their products for the French retailers, whereas slaughterhouses and processing companies as we mentioned in the previous chapter are more numerous. These four purchasing centrals confer to distributors a privileged negotiating position and contribute to propose lower prices to consumers. The balance of power between industries and distributors can affect previous business relationship in the supply chain. Contractualization between POs and industries are rare. The selling terms between POs and processors follows the MPB price and is more dependent on the quantity of pig provided and can also depends in part on the negotiation results between these same processors and distributors. The industries negotiate the price of national brands with distributors, but competition is stronger on the distributor brands where the offer is very competitive.

French legislator is involved in regulating and improving the balance of value production and power relations between actors. Indeed, the recent promulgation and application of EGAlim rules 1 and 2 are reshaping the framework for negotiation and contractualization (Le Clerc, 2023). The objective of the EGAlim rule is to ensure a fair distribution of the value produced and to balance power relations between each link of the food supply chain. EGAlim 1, applied since 2018, proposed that farmers or POs take the initiative to offer the contract to the slaughterhouses. EGAlim 1 describes the minimal contract clauses: determination and revision of prices, quantity, origin, quality, transport modalities, contract duration, payment period and compensation. EGAlim 2 prescribes multi-annual contract proposal for all agricultural products in a sales

relationship. The goal is to include and enshrine the cost of raw material throughout the supply chain. In the pig sector, EGAlim 2 is applied since January 2022 for castrated male pigs. Contracting is growing and anterior to EGAlim on pig production with quality and origin certification (SIQO). On standard production, the cooperative contracts are dominant. The cooperative contracts include the internal rules of the cooperative and the type of product exchanged, the farmer takes social share of the cooperative and in exchange he can receive technical and market advisory from the Cooperative. This cooperative contract is within the scope of EGAlim because the rule requires having a contract with the first buyer, which are the cooperatives. Therefore, no contract is binding between cooperatives and processors. EGAlim only constrains to include raw material price in the market relation, but the framework application depends on negotiation.
INAPORC is the inter-branch organisation which defends the interests of the French pig sector and brings together actors of the pig sector such as animal food manufacturers, farmers, cooperatives, slaughterhouses, proccessing companies, distributors, collective catering, and artisans. The organisation is the privileged interlocutor with public authorities for the pig sector. INAPORC with the help of IFIP -French pork and pig Institute, a research and technical agricultural institute specialized in the pig sector, is responsible for calculating and the publishing production cost indicators that can be used as references in the formation of contract formula prices. These indicators help to reflect the market situation. These indicators are revised each month for the feed cost and annually for others production costs, therefore capturing the evolution of the prices of raw material. Nevertheless, the existence of these indicators does not mean that the operators must use them. And if they do, they can choose the indicators that suit them the best and the proportion of the price that will vary according to those indicators. The limit of this is the ability of POs to negotiate with the slaughterhouses which can refuse the conditions offered.

b. The role of contracts and price transmission

Contracts reduce market uncertainties to find a buyer, to sell at a price that covers production costs and to reduce transaction costs, while helping to plan production and inputs. Overall, contracts are a vertical coordination tool to cover risks and uncertainties, and to distribute value of production across the supply chain.
The pig market is historically a liberal market. Pig production has always received small direct financial aid from the Common Agricultural Policy (CAP) but can indirectly benefit from financial aid for raw materials (i.e.: cereals for feeding). Today, the EU private storage support activating during crises is the only instrument for regulating the pig market at Community level. In France since 1972, the “Breton Pig Market” (MPB) is a public transaction place where prices, characteristics of the pigs and rules are known in complete transparency (Marché du Porc Breton, 2022). The MPB is an auction market between POs (sellers) and slaughterhouses (buyers) which takes place in the town of Plérin, in the region of Bretagne, twice a week. The MPB with Uniporc, an association created in 1974 and responsible to the weighting, classification and identification of pig carcases, enhanced the standardisation of the production. The MPB is used as a reference price in most transactions even though the main sale of pigs is not done through the MPB. Only a small part of pigs is marketed through the MPB, around 7% of the national production.
In France, several mechanisms explain pig prices:

- the “pork cycle” which is an alternation of up and down prices over several years and forces adjustment of the pig production.
- international hazards such as sanitarian crises, financial crises or geopolitical crises that can all impact and international trade of pork.
- The seasonality which comes from the fact that the sow’s fertility can be affected by the hot periods and 10 months after a warm summer period, during spring or in early summer of the next year, the pig supply can be less abundant.
- The French pig market is permeable, and prices can be influenced by the international market. Moreover, there is a correlation between factory meat prices and farmer pig prices.
- Commodities price volatility directly affects production costs and profitability.

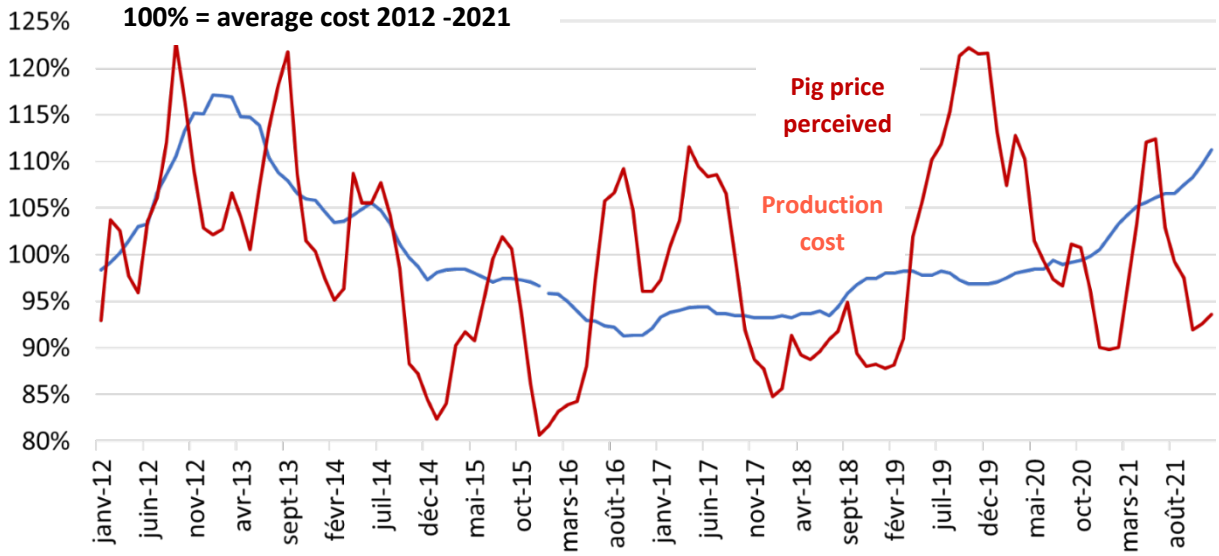

Figure 120: French pig price and production cost evolution in base 100 = average 2012-2021. Sources: IFIP from GTE, FranceAgriMer and INSEE

The fluctuation of pig prices and production cost cause a high volatility of farmers margins and incomes.

In absence of regulation, market price formation for pig is the result of these mechanisms mentioned above. The idea of including production costs in the pig price is relatively recent and used for specialized production where cost is higher than in standard production. Historically, contracts in pig sector are contracts between Cooperative and farmer. The farmer adhering the cooperative undertakes his activity and subscribes to cooperative shares. Cooperative contracts between farmers and cooperative commit farmers to provide total or part of their pig production to the cooperative. Then, pigs are sold to a slaughterhouse partner by the cooperative, at the MPB prices plus technical added value. The commercialisation of pigs between cooperatives and slaughterhouses is not usually govern by a contract cause the MPB price is applied. The pig production sold outside of a POs (around 10%), from independent or integrated farmers, may be marketed under a contract.

The relationship between POs and slaughterhouses is quite strong and regular. In fact, POs promote the sale of pigs to few slaughterhouses. This mode of operation guarantees market opportunities, the pigs cannot have more than few days of removal delay without consequences increasing cost production for farmers. The processing companies weekly negotiate with slaughterhouses for their supply of raw material (meat). Processing companies and slaughterhouses negotiate annually with distributors. Slaughterhouses tend to stabilize their margins by linking the price of cut meat to the price of pig. The position of processing companies in the negotiation is also not easy because distributors are very concentrated and have strong bargaining power. Processing companies are more interested in stabilizing the price of cut meat because they are constrained by the price stability of products sold to distributors. Processing companies face to the variability of meat price cuts.

c. The place of differentiation in the value chains

French pig production is largely standardized and the differentiated production with quality and origin certification (SIQO) accounts for only 5.2% (IFIP, 2022). The “Label Rouge” pig production has been developed for many years and represents 4% of the national production. The “Organic” pig production has raised a lot between 2016 and 2020 for answering to the increased demand and account for 1% of the national pig production. But since 2022, the organic pig production faces market difficulties because consumers buy fewer organic pig products.

For standard pig production, several actions have been taken. The “Le Porc Français” (LPF) approach aims to reassure consumers on French origin. 95% of the French pig production joins the “LPF”, requiring additional requirements in relation to sanitarian regulation. The LPF approach is a way to protect domestic market from imports. Other actions in standard pig production exist such as “without antibiotics”, “Bleu Blanc Coeur”, “without GMOs” and so on. These standard production approaches can be initiated by POs, processors, distributors, or a partnership between these three actors in order to meet a specific demand. The development of differentiated production can lead to a specific contract between farmer, PO, processors, and distributors. These contracts can be very different depending on the type of differentiated production, some contracts include clauses on fixing of prices or on production volume committed and contracts duration varies from months to years. Finally, the development of those initiatives raises the question of additional cost.

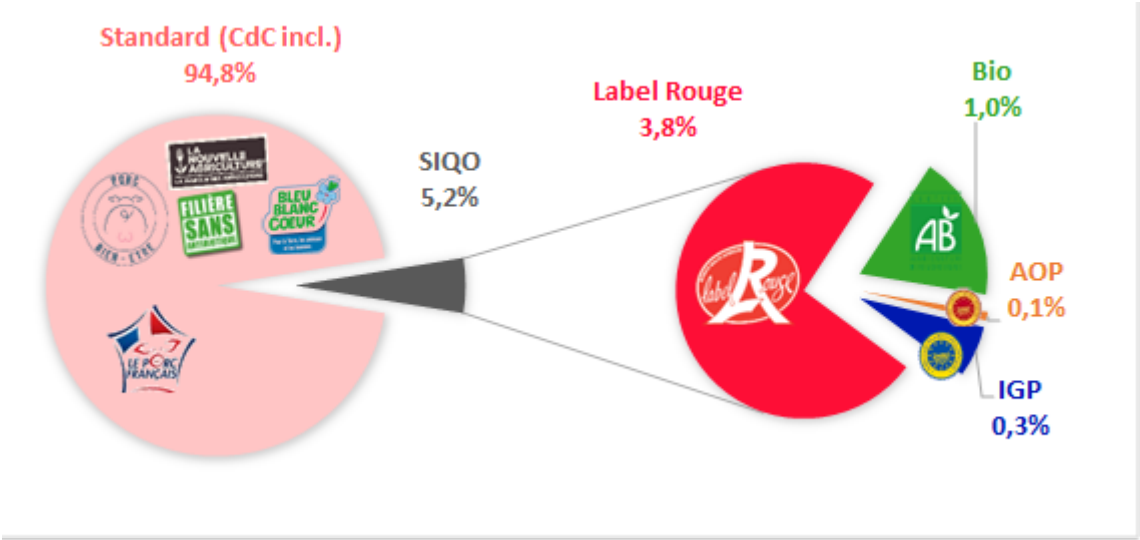

Figure 121: Pig production distribution according to the segmentation market in 2021. Source: IFIP estimation

The segmentation market signs in the standard part are non-exhaustive but show the diversity of action taken in the pig production.

Historically, the price of French pig is based on the MPB (Marché du Porc Breton/ Breton Pic Market) to which is added the technical surplus value (weight and muscle rate). The development of differentiated production led to another added value being considered on top of the MPB price and the technical surplus value. This added value can represent few cents to tens of cents per kilogram depending to the type of differentiation. This price system can be linked to the MPB and remains dependant of international factors and volatility.
There are alternatives systems of prices for the differentiation pig production, which predate to EGAlim rule. These systems can in particular consider production cost indicators which is integrated to a greater or lower percentages (from 20% to 100%) and can be partially or totally disconnected from the MPB system. For instance, the price system of organic production is disconnected from the MPB system. Nevertheless, the disconnection with the market reality imposes to valorise the pork carcass as much as possible and not only a part otherwise it induces viability losses and economic difficulties. Indeed, certain cut meats such as pork shoulder are difficult to sell in the French market. The valuation of meat cut from differentiated production approach sold at a higher price than the market price is only viable on a long-term commercial commitment and by having a valuation at least equal to cut meat purchased on the standard market.
Contracts in differentiated pig production are commercial contract types. These contracts define conditions for price adjustment and production specifications. The benefit of this contract is to guaranty product conform to quality and quantity requirement. In this type of contract, farmers conserve the control of his strategic decisions but assume risk in case of delay, unconforming product and contract breakdown and in consequences providers receive penalties.

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The poultry value chain

The French poultry value chain

Mathieu Désolé (ITAVI-ACTA)

Key findings :

- Chicken is the main production, it represents 70% in volumes, but other species (turkeys, ducks, guinea fowls) also have a significant place, giving to France a higher diversity than other countries. Moreover, quality labels (Label Rouge, Organic) have an important place in the total production, driven by a constant demand from French consumers.
- Production is mainly concentrated in 2 western regions: Brittany and Pays de la Loire. By species, Brittany remains the leading region in the production of chicken (32%) and turkey (40%), whilst the Pays de la Loire is the leading region in the production of roasting duck (61%) and guinea fowl (38%).
- In 2022, French imports increased sharply, in connection with the influenza crisis affecting the Pays de la Loire and, to a lesser extent, Brittany. Another factor could have favoured imports, in this recent inflationary context, some restaurants are be forced to arbitrate between the increase in prices or a change in sourcing of imported meat. As a result, one out of two chickens consumed in France is imported.
- LDC, the poultry meat European leader, highly dominates the French poultry meat sector, with Terrena/Galliance at the second rank
- In 2021-2022, the French poultry sector plunges into its worst avian influenza crisis in its history. This will certainly have major consequences on production and availability of animals in a close future, specifically on localization which is nowadays production is highly concentrated.

1. DESCRIPTION OF THE VALUE CHAIN

a. Structure of production

In 2021, French poultry production dropped by 1.9% to 1.70 Mtc (Million tons of carcass). Chicken production (also including a small proportion of meat from spent hens) represents 70% of total production, ahead of turkey (18%) and duck (11%). After rebounding in 2018, poultry production fell for the third consecutive year in a context marked by covid-19 and avian influenza. This drop is mainly linked to the drop in duck, turkey and guinea fowl production as the broiler chicken production was maintained, as seen in the chart below.

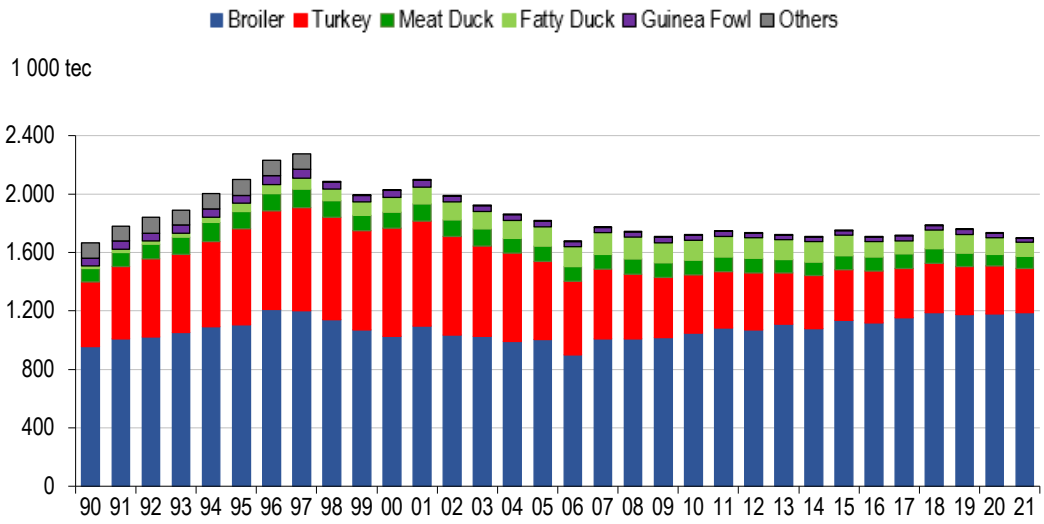


Figure 122: National Poultry production from 1990 to 2021. Source: ITAVI from SSP

French poultry production was at a maximum at the end of the 90's and remains around 1.8 Mt since 2007. For 15 years, chicken production has been progressing with an average annual growth rate of +1.0% per year, reaching around 70% of the total poultry production since 2019. While for the rest of the species, production continues to decline over 10 years. Turkey production fell by 2.3%/year, duck production (fatty/lean), production fell by an average of 3.0% and 2.9%/year for guinea fowl over the same period.

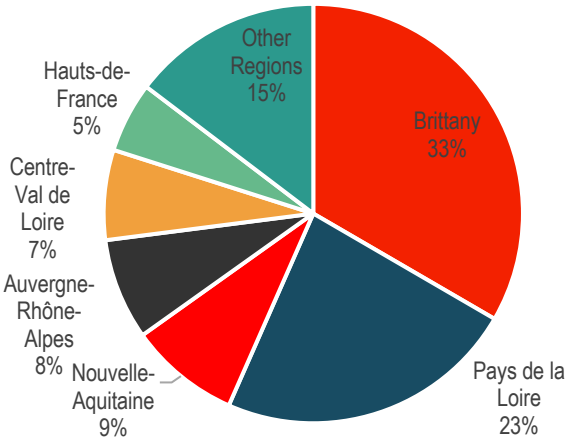


Figure 123: Poultry production by French Regions (%) in 2020. Source: ITAVI from SSP

Brittany remains the main region for poultry production. By species, Brittany remains the leading region in the production of chicken (32%) and turkey (40%), whilst the Pays de la Loire is the leading region in the production of roasting duck (61%) and guinea fowl (38%).

Table 21: Evolution of poultry slaughtering in France –1 000 t.cwe (ton of carcass weight equivalent). Source: Itavi from SSP

	2015	2019	2020	2021	2022*	%21/20	%22*/21
Broiler	1 045	1 072	1 078	1 095	1 043	1,5 %	-4,8 %
Hens and roosters	48	44	45	39	37	-13,9 %	-4,2 %
Turkey	340	319	319	296	257	-7,4 %	-13,1 %
Meat Duck	95	93	76	82	61	7,6 %	-25,2 %
Fatty Duck	139	125	116	94	88	-18,2 %	-7,3 %
Guinea Fowl	33	32	28	26	21	-7,3 %	-18,6 %
Others	10	9	10	9	9	-1,3 %	-
Total Poultry	**1 709**	**1 694**	1 671	1 640	1 516	-1,8 %	-7,6 %

** Projection*

Importance of quality labels in poultry production

The share of poultry complying with Label Rouge, Compliance Certification or Organic specifications represents a quarter of total poultry production. Broiler remains the leading production under specifications (253,600 tc), followed by turkey (65,400 tc). Following the end of export refunds in 2013, the so-called "major export" broiler production sector was heavily penalized. Its share in production has fallen from 24% to 6% by volume in 2021. As a result, the share of standard broiler production (excluding major exports) and certified are increasing; standard is 67% and labels (Label Rouge, Compliance Certification and Organic) share 23%. It should be noted, however, that the standard category also includes differentiated specifications resulting from private approaches (European Chicken Commitment, Free Range, etc.)

b. Trade and trade relations with other countries

Since the 2000s, poultry meat exports have been falling while imports have been rising, which has led the balance to gradually decrease to become negative in volume and value since 2016.

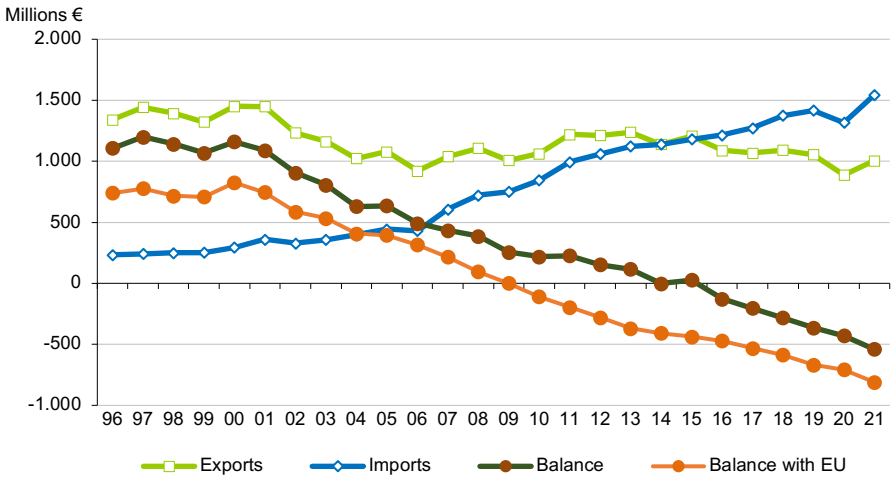


Figure 124: Poultry French Balance. Source: ITAVI from French Customs

While the decline in turkey exports that has taken place since 2000 explains part of the decline in poultry exports, it is the chicken sector that has generated a growing deficit for more than 10 years via imports from European Union countries.

Export

In 2021, foreign trade in poultry meat will start to rise again. French exports of poultry meat and preparations recorded an increase of 11.4% compared to 2020 in volume and 13.1% in value, despite the sharp drop in exports to third countries (- 13.3%) where the outbreak of avian flu penalized shipments to Asia (-76%; -22,400 tcwe). Compared to 2019, exports in volume remain 1.5% lower.

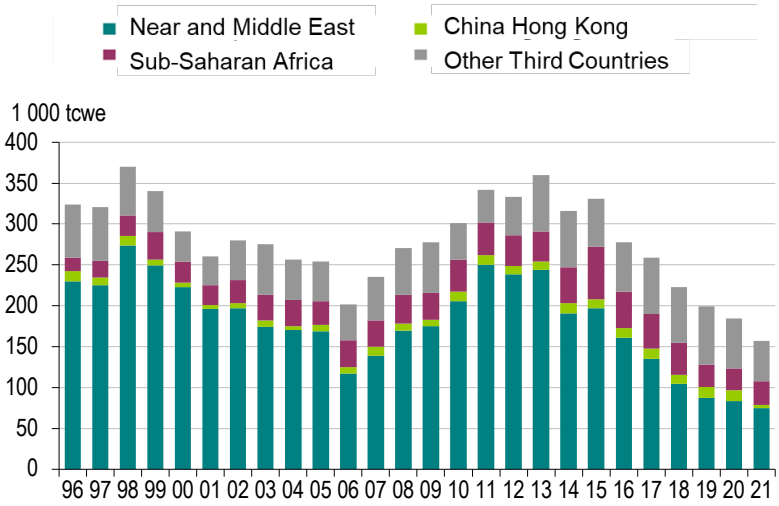


Figure 125: Broiler – French exports to third countries. Source: ITAVI from French Customs

This increase in 2021 is linked to the increase in shipments to the EU-27 (+32.9%) in volume, in particular to the Netherlands (+115.1%) and Germany (+36.3%). Exports to third countries, on the other hand, fell by 13.3%, penalized by falling exports to the Philippines (-90%) and Hong Kong (-67%), as a result of the avian flu, and to the Saudi Arabia (-13%), while exports increased to sub-Saharan Africa (+6.2%). The increase in exports to the EU is explained by Brexit, where flows from the United Kingdom now transit through France to be reshipped to the Netherlands and Germany. These flows mainly concern back, wing and neck cuts under the code 0207 13 40 at low value. This explains the sharp increase in imports from the United Kingdom (+260%) (see next graph below).

In chicken, exports in 2021 increased in volume (+14.4%) and in value (+14.6%). Shipments to the EU increased by 57.7%, mainly to the Netherlands (+211%), Germany (+50%) and Spain (+43%).

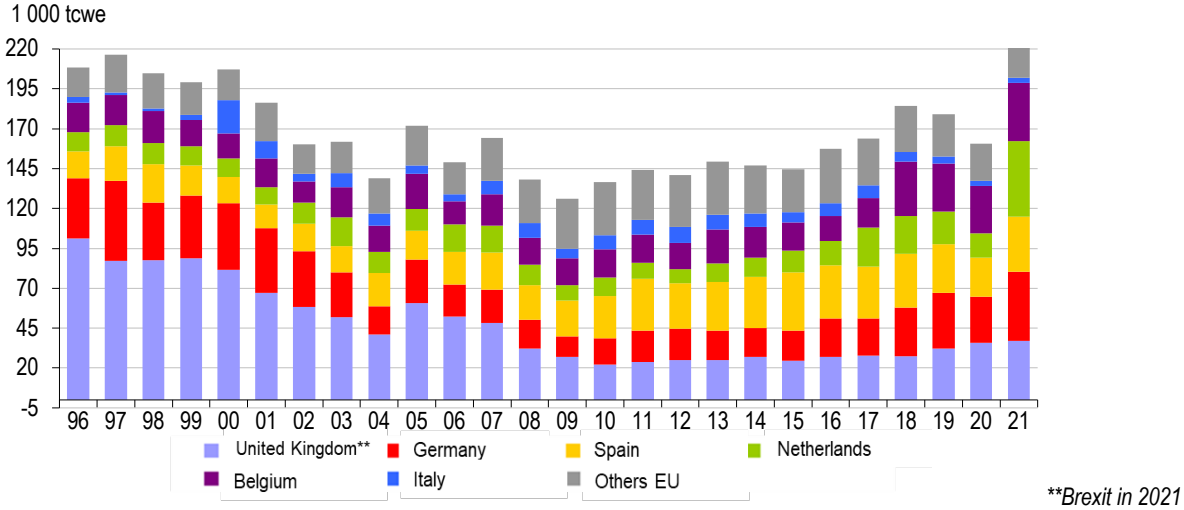


Figure 126: Broiler - French exports to EU. Source: ITAVI from French Customs

Import

Chicken imports are on the rise in volume (+18.2%), supported by growth from Poland (+14.5%) and Belgium (+21.2%). The increase in imports from third countries is more marked (+114%) with the return of imports from the United Kingdom (+250%). Indeed, since the beginning of 2021, France has become the main entry point for chicken meat which is reshipped to other European countries. The balance of trade with the EU remains in deficit in 2021 (-411,000 cw; -€890 million). The deficit is stabilizing in volume and widening in value (-€105 M€) compared to 2020. France is importing more and more cut broiler parts to meet growing demand from out-of-home catering (see below).

In 2022, French imports increased sharply, in connection with the influenza crisis affecting the Pays de la Loire and, to a lesser extent, Brittany. Another factor could favor imports, in this inflationary context, some restaurants could be forced to arbitrate between the increase in prices or a change in sourcing of imported meat.

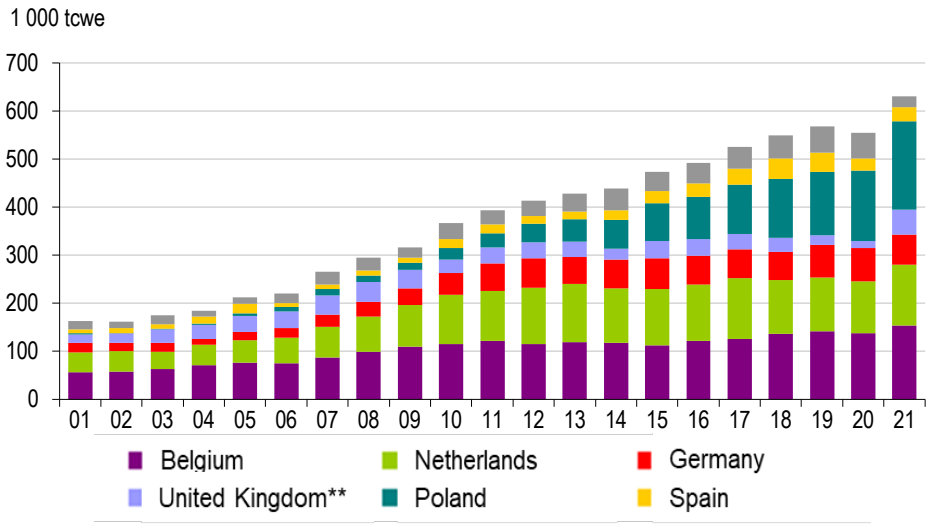


Figure 127: Broiler - French imports from EU. Source: ITAVI from French Customs

** Estimation*
***BREXIT in 2021*

c. Retail sector and consumption

Poultry consumption is estimated at 1.926 million tcwe in 2021, compared to 1.887 million tcwe in 2020, an increase of 2.1%.

The year 2021 marks the return of dynamic pre-Covid trends. Thus, France becomes the leading consumer of poultry meat ahead of Germany. Per capita consumption amounts to 28.5 kg/capita/year, making France the 4th largest European consumer of poultry meat. Over ten years, the average growth rate in consumption is +1.8%. The growth of chicken consumption per capita is very dynamic with an average annual growth of 3.6% over 10 years.

Table 22: Evolution of poultry consumption per capita. Source: ITAVI from SSP and French Customs

kg/capita	2000	2005	2010	2015	2019	2020	2021	%21/20
Total poultry	**24,7**	**23,2**	**24,7**	**24,9**	**28,3**	**28,0**	**28,5**	**1,7%**
Broiler	12,1	12,6	14,9	16,8	20,4	20,6	21,7	**5,1%**
Turkey	6,8	6,0	5,1	4,6	4,4	4,4	4,1	**-7,6%**
Meat duck	3,1	3,5	3,1	3,1	3,1	2,6	2,4	**-7,9%**
Guinea Fowl	0,9	0,7	0,5	0,4	0,4	0,3	0,3	**-9,2%**

This increase in poultry meat consumption is mainly attributed to the sharp rise in chicken (broiler) consumption (+5.1%) while the consumption of other species fell. In 2021, the recovery of the RHD sector benefited chicken imports which increased by 18%, increasing their share in consumption to 44%. Thus,

French poultry production for the French market fell by 6.1% in 2021. The share of imports in total poultry meat consumption increases to 37.4% in 2021 compared to 33.8% in 2020.

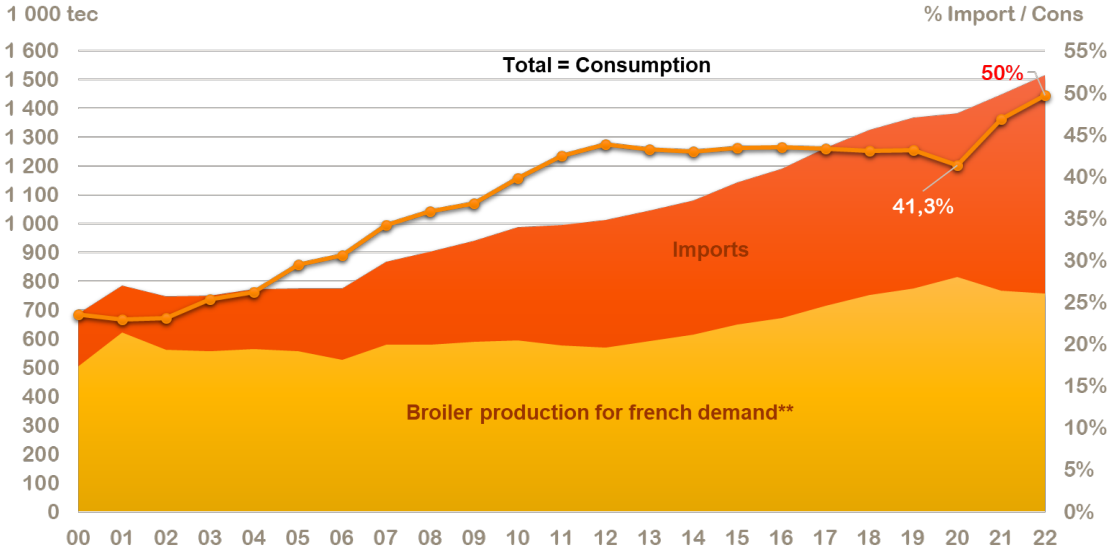


Figure 128: Evolution of imported poultry consumption in France. Source: ITAVI from France Agrimer

The quantities purchased of fresh and processed poultry rose sharply (+9.3%) in 2020 in a context strongly marked by the covid-19 epidemic. In 2021, the recovery of the catering sector reduced household purchases compared to 2020 (-6.4%). Thus, the comparison will be made with 2019, which is considered a “normal” year.

Poultry meat purchases follow an increase of 2.6% in 2021 compared to 2019, with three segments driving the increase in volume of purchases: chicken cuts (+ 10.7%), processed meat (+7.8%) and poultry charcuterie (+5.8%), confirming the trend that began 20 years ago with an orientation that is moving more and more towards poultry cuts and preparations. As for “ready-to-cook” broiler, purchases are down (-6.4%), household purchases are down for fresh guinea fowl (-12.9%), duck (-16.8%) and turkey (-6.0%).

”Ready to cook” chicken represents only 18.1% of household purchases in 2022 compared to 33% in 2010 and 52% in 1998. Processed products represent 29% of purchases in 2022 and cuts 53%. Thus, the observed trend of a transition in demand towards increasingly processed products is accelerating.

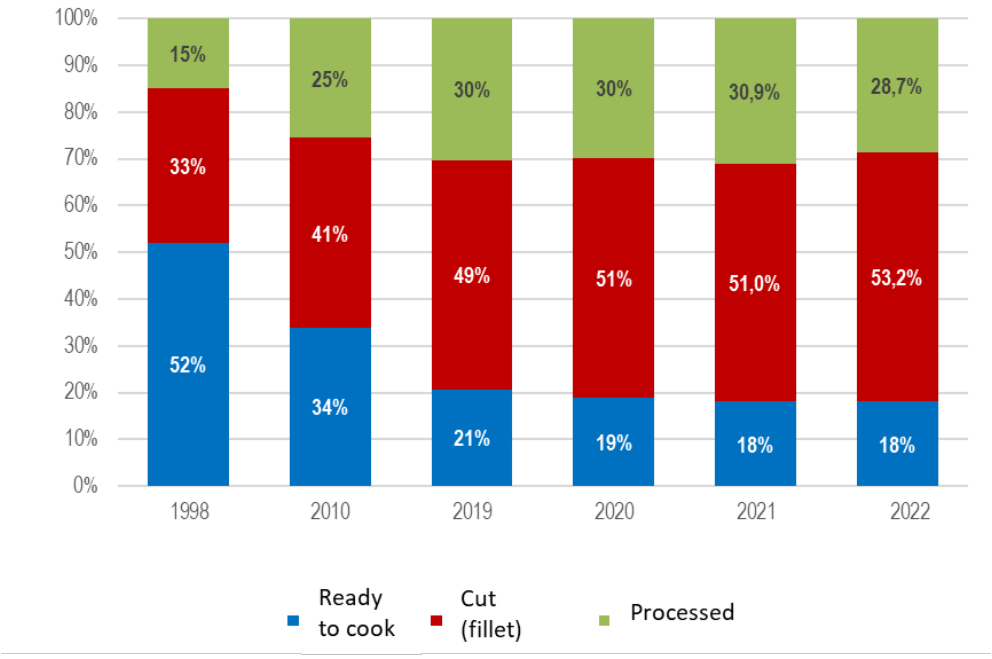


Figure 129: Broiler purchases by French consumers

This consumption trend can be seen in the increase of standard chicken consumption over the 20 past years while Label Rouge and Organic, almost essentially sent as ready-to-cook broilers, are decreasing. Standard represents 85% (with major part from import) of the total broiler consumption.

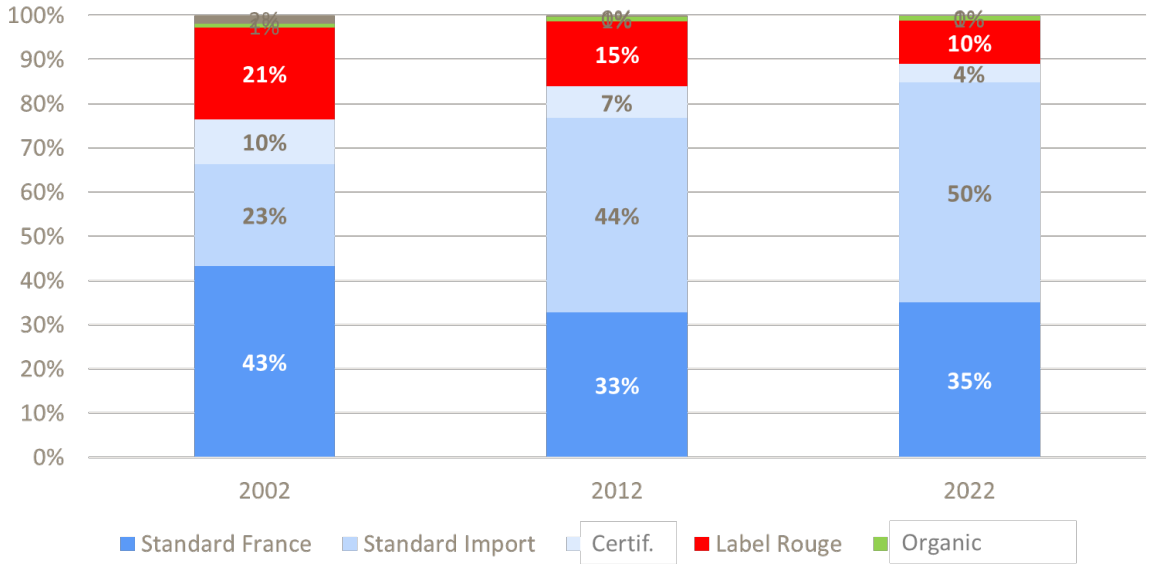
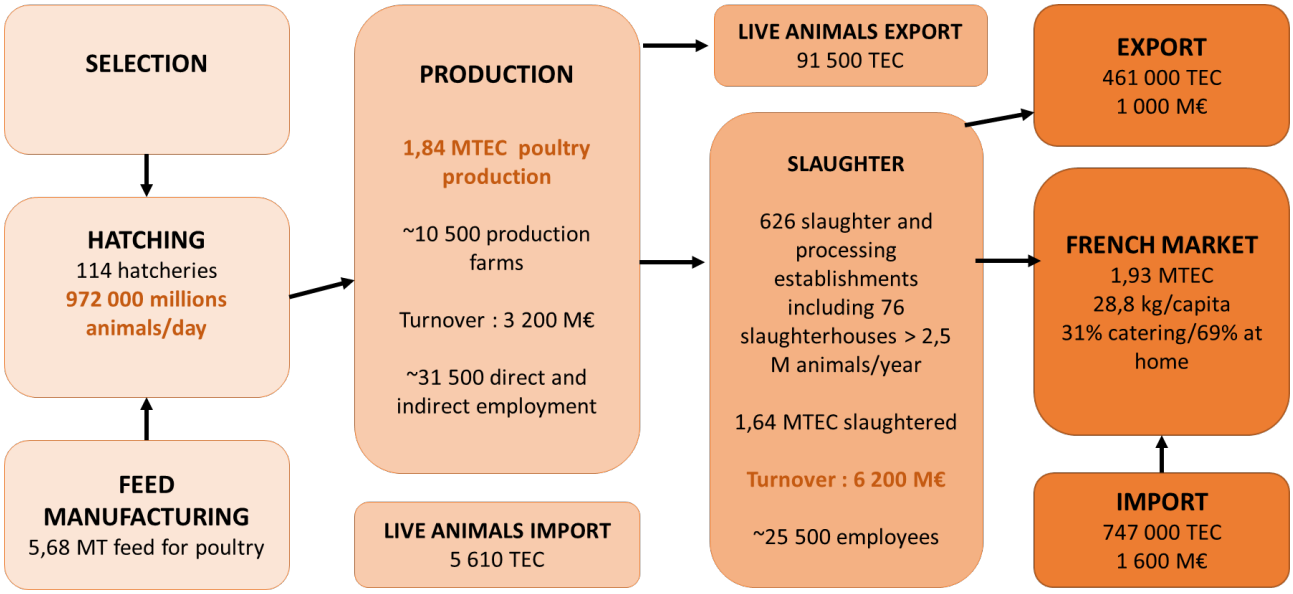


Figure 130: Evolution of label broiler consumption in France

2. ACTORS IN THE VALUE CHAIN

a. The main actors in the value chain



TEC: Ton of carcass weight equivalent

Figure 131: Poultry supply chain in France in 2021. Source: ITAVI from SSP, Cooperation Agricole, INSEE (2019) RICA (2021)

Slaughters: the "downstream" sector

Having become very competitive, with French players losing momentum in their own market, the sector had to rationalize and modernize its tools to start winning back markets. This required heavy investments but also business mergers. Many developments have taken place in the poultry sector in recent years. Among the first fifteen groups processing poultry meat, ranked according to their turnover in 2013, four no longer exist in 2018. They have been liquidated (Tilly Sabco) or taken over by the French leader LDC (Doux, Glon and Agrial).

In 2016, the turnover of the poultry slaughtering-processing industry amounted to 6,754 million euros. The top five companies generate three-quarters of this turnover. Also in 2016, the Dutch group Plukon acquired the Duc company in difficulty following avian influenza and the loss of export markets. Then in 2018, following recurring financial difficulties linked to the decline in Middle Eastern markets[1], Terrena saled the Doux company to a consortium (LDC, Al Munajem (Saudi shareholder and main customer of the group), Triskalia, Terrena, and the Brittany region). The export activity is taken over by the Saudi group (France Poultry). LDC

[1] Since the end in 2013 of European aid for major exports Doux failed to react to Brazilian competition who have gradually invaded the Middle East market with products at lower prices than Doux "ready-to-cook" frozen chickens.

takes over the processed products business and develops the production of "PAI" (intermediate food products) for industry and catering.

Table 23: Main poultry firms in France ranked by turnover. Source: ITAVI from Chambre d'Agriculture Pays de la Loire

	2013		2018	
	Ranking	Turnover (M€)	Ranking	Turnover (M€)
LDC	1	2.327	1	3.507
Terrena (Gastronome by Galliance)	2	0.865	2	1.034
Euralis Gastronomie *(palmipeds for foie gras production)*	4	0.415	3	0.350
MVVH -Delpeyrat *(palmipeds for foie gras production)*	6	0.308	4	0.305
Moy Park France	10	0.183	5	0.242
Fermiers du Sud-Ouest	7	0.219	6	0.201
Ronsard (Triskalia)	8	0.212	7	0.182
Duc	9	0.201	8	0.180
Ernest Soulard	11	0.142	9	0.150
France Poultry (Al Munajem, ex-Doux)			10	0.140
Cargill Food France	14	0.117	11	0.124
Labeyrie	15	0.106	12	0.118

Selection and hatching: the "upstream" sector

Poultry selection and hatching have close links. Indeed, reproduction breeders supply grandparents to hatcheries, which multiply the strains. The incubation sector includes companies that belong either to selection companies, or to "downstream" companies or to independent ones. Hatcheries have to produce breeding animals (parents), hatching eggs (breeding stock), and chicks, ducklings, goslings, guinea fowl, day-old poults (after incubation of hatching eggs). An incubation company can provide all three of these functions or just one or two. Breeding farms for breeders belong to the hatchery company or to independent breeders who supply the hatcheries.

Over the past fifteen years, many changes have taken place in breeding and hatching companies. This restructuring has resulted in an increase in foreign capital in this sector. Regarding the selection, two main factors are at the origin:

- Poultry selection requires significant resources for research and development that can only be provided today by large specialized groups,
- Health crises have weakened companies. Thus in 2018, following the closure of the borders caused by the avian influenza crisis, Hubbard, selection subsidiary company of the French group Grimaud since 2005, experienced difficulties in its international sales. It had to be sold to Aviagen (owned by the German group EW). Similarly, SASSO, whose sales are mainly made outside the European Union,

is now linked with Hendrix Genetics, which now holds 51% of its capital, in order to be able to pursue its research programs and its international development.

Today the selection of chicken and turkey is entirely carried out by companies whose capital is mainly foreign. French chicken and turkey production is therefore dependent on these foreign companies.
Like selection, hatching requires significant financial resources because technical progress frequently requires new investments. The sector must also finance large stocks over time. Indeed, it takes six months between the placement of breeders and the production of day-old animals which will then be reared as poultry. Thus, with each avian influenza crisis, the sector has suffered greatly from the loss of outlets, both on the domestic market and for export.
In addition, independent family businesses, often founded in the 1950s to 1970s, have experienced in recent years, or are currently experiencing, the period of the end of the activity of their leaders, who are having difficulty finding successors. Restructuring has several aspects:

- takeover of family hatcheries by larger hatcheries. Thus in 2018, family hatcheries Goasduff, and Josset were bought by the Belgian-Danish group Belgrabroad-Danhatch, as well as the hatchery of Saint Marcellin in Isère.
- the takeover of independent incubation companies by selection breeders. Examples: in 2013, Hendrix Genetics via its subsidiary Caringa acquired Grelier, then in 2017 the Pin Gauguet hatchery (44), then independent.
- the purchase of hatcheries by "downstream" companies in order to secure their supplies. Thus, in 2017, LDC took over the Perrot hatchery in Brittany, a producer of day-old chicks intended for the production of standard, certified and free-range chickens. He also took over the Breton hatcheries of the Triskalia cooperative and the Doux group in 2018.

3. THE GOVERNANCE OF THE VALUE CHAIN

a. Power relations in the value chain

In France, the production of poultry meat is managed by Production Organisations ("OPs" in French). OPs are the interface between producers and processors, and they are the key to production regulation. OPs coordinate the actions of the various actors of diversified markets (domestic and export) through contracts. OPs plan production to ensure the regular supply of slaughterhouses and adapt supply to demand, by defining annual forecast schedules for weekly volumes. They weekly order incubation of eggs, according to the expected installation of batches to insure poultry meat supplies for next periods. They precise number, class of calibres sometimes with specific colour or strain.

b. The role of contracts and price transmission

Prices are negotiated every month, taking into account cost price elements (according to their level of integration). Some actors that are linked with a feed factory develop their own prices index, but the major part monthly follows prices evolutions through ITAVI index.
The ITAVI indices reflect the monthly evolution of the optimized cost of raw materials used in the various poultry (and also rabbit) formulas. This cost includes materials prices excluding the price of the premix and the costs of transport to a fictitious factory located in Ille-et-Vilaine. It does not include manufacturing, distribution and manufacturer's margin costs and is expressed in 100 basis point (reference in 2014). ITAVI index exists for all poultry species meat poultry production (standard and red label chicken, turkey, guinea fowl, roasting duck), laying hens, fatty ducks and is published at the first days of each month.

This index was created in the 1980s when professionals in the poultry sector needed to have a common neutral and objective base to know the evolution of feed prices - which represents 50 to 70% of the production depending on the species. In other agricultural sectors, general INSEE indices make it possible, but they do not reflect the reality of the integrator component, which is largely predominant in the poultry sectors. The methodology of this index evolves over time: initially it was a fixed formula, then it was refined to produce an optimized cost - using linear programming - that better reflects the way in which feed manufacturers proceed for their own formulation. Finally, in 2001/2002, the method experienced a new stage, with the construction of a standard reference manufactory which allows to integrate the "approach costs" aspects (transport costs of the raw material from the port to this fictitious feed factory located in Ille-et-Vilaine). The different evolutions were all made from interviews with professionals, to define the nutritional constraints of the model, the structuring of the programmer. In 2016, the method experienced its latest evolution with additional details on the nutritional aspects.

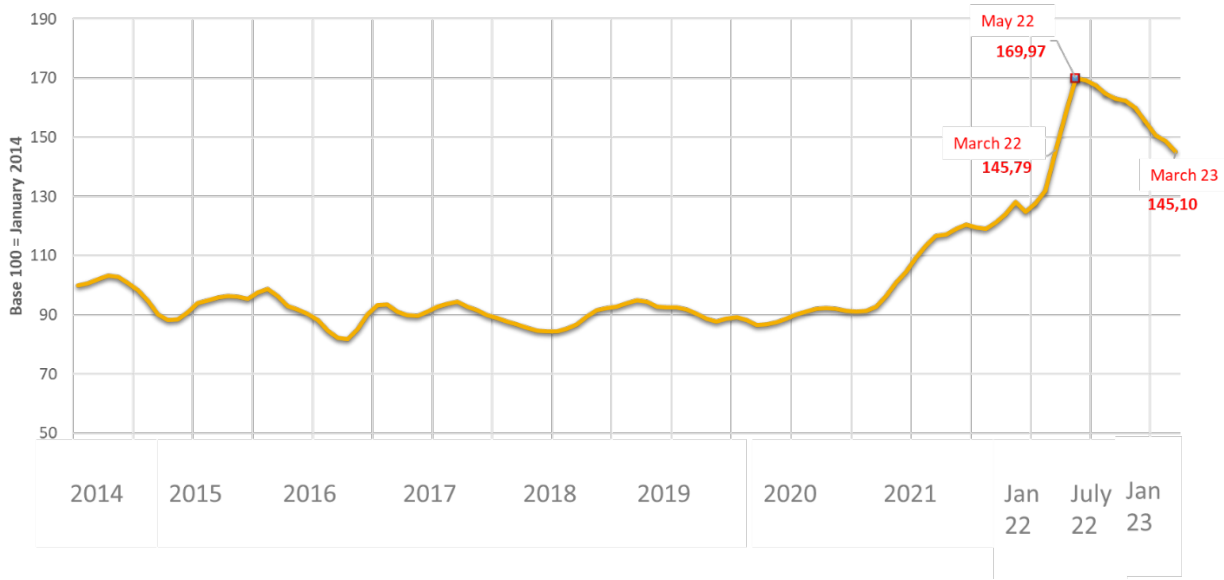


Figure 132: ITAVI Index for broiler from 2014 to 2023. Source: ITAVI

This graph reflects the increase in production costs, linked to the explosion in raw material costs following the post-Covid-19 recovery. The maximum is obtained in May 2022 with an ITAVI index for broilers at 169.97. In March 2023, the index returns to the same level if compared with March 2022.

As poultry are short production cycle, actors have to adapt their decisions, but they need coordination to adjust supply and demand. Indeed, breeders make significant investments to respect norms and quality requirements. Moreover, since they have low margins, producers need a tool for market risk control. Consequently, contractualization concerns 95% of meat poultry production.

OPs are most often managed by a livestock feed manufacturing plant:

- iIn some cases, the animal feed factory as well as OPs are structures belonging to a processing company (*Examples of this kind of organization: LDC*). Increasingly, the process company also owns the hatchery that supplies the animals to the breeders. This form of integration is the most complete, with the processing company owning all the links in the chain, excepted breeding activities. The breeder owns his buildings but all the other production choices are coordinated by the OP.

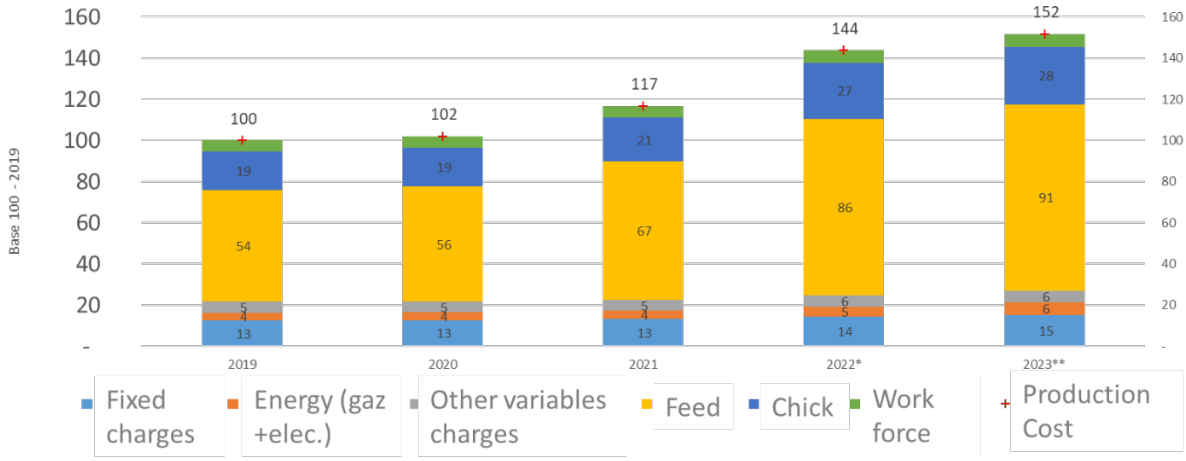
- In other cases, OPs sign a contract with the breeder which is independent with respect to the processing company (*Examples of this kind of organization: Agrial Poultry*, *Volinéo*). The OP negotiates the supply of chicks with hatcheries, the production of poultry with breeders and the sale of poultry produced with processing companies. It can work with several and different downstream companies.

- There are also OPs that are sections of multi-purpose cooperatives *(Examples of this kind of organization: Val'iance for TERRENA*, *CAVAC*) and independent producer organizations set up as cooperatives only for poultry sector (*Examples of this kind of organization: CIAB*, *CAFEL*).

c. Most recent trends and future development of the value chain

Cost production increase

Since 2020, the production cost for broilers has increased by more than 49%, attributed to the increase in the price of feed (70%), and 18% to the chick.



2022: annual estimation
*** 2023: January only*

Figure 133: Broiler's production costs from 2019 to 2023. Source: Itavi

All cost attributes increased strongly in 2022 and 2023 if compared with 2021 (see table below), all with a constant rise, excepted energy having a higher increase observed in 2023.

Table 24: Cost evolution of 2022 and 2023 compared to 2021. Source: Itavi

	Cost evolution 22*/21	Cost Evolution 23**/21
Energy (IPAMPA[2])	+18%	+45%
Feed	+27%	+34%
Chick	+28%	+31%
Production cost	+23%	+30%

2022: annual estimation
*** 2023: January only*

This production cost increase is not French specific and also impacts competitiveness of other countries, but France faced another difficulty at the same time. Avian Flu damaged the French poultry sector with many uncertainties for the future of poultry production in France.

[2] The purchase price index for agricultural means production (IPAMPA) measures the variations in the purchase prices for farms production inputs and their investment

Avian Flu heavily impacted France in 2021-2022

After 2006 (first appearance in one turkey breed, in the South-East close to Lyon), and 2015-2016-2017-2020 with many cases but only located in the South-West of France[3], in 2021-2022, the French poultry sector plunges into its worst avian influenza (AIHP as "highly pathogenic") crisis in its history. After having affected the South-West as it occurred during the last episodes, AIHP has been spreading to Pays de la Loire at the end of February 2022 and to other areas (Dordogne, Brittany, etc.). Thus, the Vendée department alone totals 535 outbreaks, and more than 800 outbreaks including the neighbouring departments. As a reminder, the region is known to be the first production basin for roasting duck, guinea fowl and the second region for chicken and turkey. This will certainly have major consequences on production and availability of animals. The economic impact is also on import/export balance, with many countries closing their markets to French products (and other European ones) based on health arguments. French government helped breeders to face the crisis. Different strategies to prevent new infection by the virus are implemented with consequences on meat availability (in case of crawlspace like in South-West with "Plan Adour": one month without any animal in the main region of duck production) and also on export in case of vaccination. Strategy is again discussed, and vaccination should be implemented in autumn 2023.

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[3] The South West of France is a focal point for migrating birds that gather there in autumn, before crossing the Pyrenees. This may explain the occurrence of successive crises for a few years in this region.

Conclusion

This report examined the structure of existing livestock value chains in several EU countries. We realised an integrated analysis of economic activities from farm to fork to provide a consistent baseline comprising qualitative and quantitative data based on national expert contributions for four livestock sectors: dairy, beef, pig, and poultry.

In the meat value chains, because of a general stagnation in consumption, a problem of generation renewal of farmers especially in the ruminant sector, and constraints limiting production related to environmental protection, the production levels in volume remained relatively constant during the last two decades. However, pork meat in Spain represents a considerable exception with the Spanish pig herd exploding in recent years driven from exports opportunities, especially from Asia. In the dairy value chains, because of the removal of milk quotas, all value chains analysed experienced a slight growth of volumes produced. The nature of trade relations varies consistently from one value to chain to another. For some sectors, a country may be forced to import a large share of livestock products, for example France for chicken meat whose trade balance has been constantly deteriorating over the last past years. In contrast, other value chains such as the dairy value chain in The Netherlands or the pig value chain in Denmark are mainly export oriented. Despite some exceptions (for example the pig meat exports to China or frozen chicken exports to Middle East), most of the trade of livestock products happens inside the European borders.

In all sectors and countries, the main actors of the livestock value chain are farmers, cooperatives or producers' organisations, processors, retailers, and distributors. Despite operating in different "nodes" of the value chain, in some cases overlaps are possible and suggest a strategy oriented to market diversification or vertical integration. A common trend visible in all sectors is the increase in the size and average productivity of farms as a result of technological progress, and the concentration and specialisation of livestock activities. A sign of this specialisation is the fact that the national production of each value chain is often regionalised in a specific area of the country (Brittany in France, Lombardy and Emilia-Romagna in Italy, Catalonia and Aragon in Spain, Jutland in Denmark, etc.).

All case studies underline the low bargaining power of farmers with respect to processors or retailers. A common strategy for farmers to increase their bargaining power is to be part of a producers' organisation or a cooperative which negotiates prices directly with slaughterhouses or dairies. These producers' organisations and cooperatives often have a large power since they integrate all the nodes of the value chains. However, farmers can sometimes still feel isolated despite being part of a larger organisation because of low decisioning power and higher transaction cost related to the exit from this organisation. More in general, the bargaining power of the different actors depends on the concentration of actors in each node. If there are lots of processors but only a small number of retailers, retailers will have a more important power than processors to fix prices.

Contracts exist in all examined value chains. They reduce the risk related to price and demand fluctuations and can help developing economies of scale allowing to plan for future investments. However, their use is not widespread, especially in not vertically integrated value chains, because of high transaction costs related to their creation and to control of their compliance. An exception in the use of contracts are alternative value chains which use contracts as a tool to impose rules of production in the context of a labelled production and to control supply. Examples of these alternative value chains are the Italian PDO milk, organic production in any sector, or “without-GMO” pig production. Despite having low market share when compared to standard production, the existence of these alternative value chains relies on the market segmentation favoured by consumers willing to have a higher quality food diet (healthier, tastier, more sustainable, and more respectful of animal welfare).