



Competitiveness of the EU poultry meat sector, base year 2017

International comparison of production costs

P.L.M. van Horne



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Companies in the European Union poultry meat supply chain have to comply with European legislation on animal welfare, food safety and environmental protection. Whereas the legislation aims to guarantee a high quality poultry production, it also confronts the sector with extra costs. Countries outside the EU do not have the same extensive legislation. This report presents the results of a study on the competitiveness of the EU poultry meat sector. The production costs for poultry meat are calculated for several EU and non-EU countries.

Key words: competitiveness, poultry meat, production costs, international trade, EU

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Preface

Companies in the European Union (EU) poultry meat supply chain have to comply with European legislation on animal welfare, food safety and environmental protection. Whereas the legislation aims to guarantee a high quality poultry production, it also confronts the sector with extra costs. Countries outside the EU do not have the same extensive legislation. At the same time, the EU is engaged in multilateral negotiations with the World Trade Organisation (WTO) and bilateral negotiations with different partners - among them India, Ukraine, Mercosur and the USA - which are intended to further liberalise trade by reducing or abolishing import levies. This causes concerns within the poultry meat industry in the EU regarding its competitiveness.

In this report Wageningen Economic Research, an independent research institute of Wageningen University & Research in the Netherlands, presents the results of a study on the competitiveness of the EU poultry meat sector. The production costs for poultry meat are calculated for several EU and non-EU countries. Based on these data, different scenarios are outlined and their effects are calculated to illustrate the impact of lower import levies and changes in exchange rates. In this study, the base year for the calculations was 2017. The report is an update of two earlier reports with base year 2015 (van Horne, 2017) and base year 2013 (van Horne and Bondt, 2014).

The study was initiated and funded by the Association of Poultry Processors and Poultry Trade (AVEC) in the EU. The author thanks AVEC for providing access to data and for comments on the draft report.



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Summary

S.1 Key findings

EU poultry meat producers have to comply with legislation on environmental protection, animal welfare, food quality and food safety. This legislation has increased the production costs of poultry meat. At the same time the European Union (EU) is negotiating with other countries or groups of countries to liberalise trade in agricultural products. This report examines how lowering import levies impacts the competitiveness of the EU poultry industry. The results show that the offer price of broiler breast fillet in 2017 of some third countries was already equal to or just slightly higher than the average EU price. Despite the current import levy on breast fillet, Brazil and Ukraine can compete on the EU market. In a scenario with 50% lower import levies Brazil, Ukraine and Thailand have a lower offer price for breast fillet than the EU poultry meat industry.

The results for the situation in 2017 are presented in Figure S.1 and Figure S.2. Figure S.1 lists all cost components for breast fillet in order to compare the EU average offer price of breast fillet with the price of six selected non-EU countries. The figure clearly shows that import levies protect the EU from imports from the non-EU countries. However, even with substantial import levies, the offer price of breast fillet from Brazil and Ukraine is equal to or slightly higher than the offer price of EU producers.

Compared to the 2015 base line (van Horne, 2017) the offer price of breast meat fillet of EU producers did slightly decrease. The offer price of USA, Thailand and Russia also decreased a little. This was a result of lower production costs at farm level (lower feed prices). The offer price of Brazil and Ukraine showed a small increase compared to the 2015 base line. For Brazil this was the result of higher feed prices and a change in exchange rate to the euro.

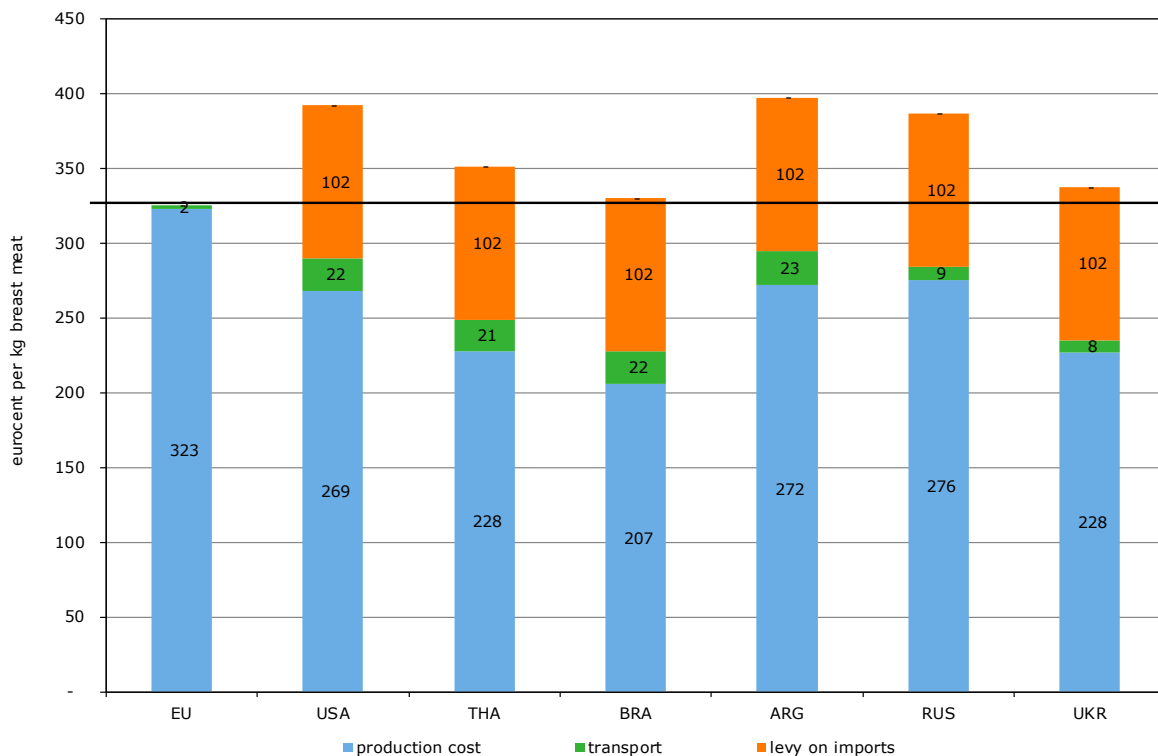


Figure S.1 Offer price of breast fillet in Germany from EU average (horizontal line) and non-EU countries in eurocents per kilogram in 2017

The combined consequences of a 50% lower levy on imports and 10% lower exchange rates are presented in Figure S.2. In this worst-case scenario, all third countries obtain a good competitive position in the EU market for breast fillet. Especially Brazil, Ukraine and Thailand are most likely to export large volumes of poultry meat to the EU.

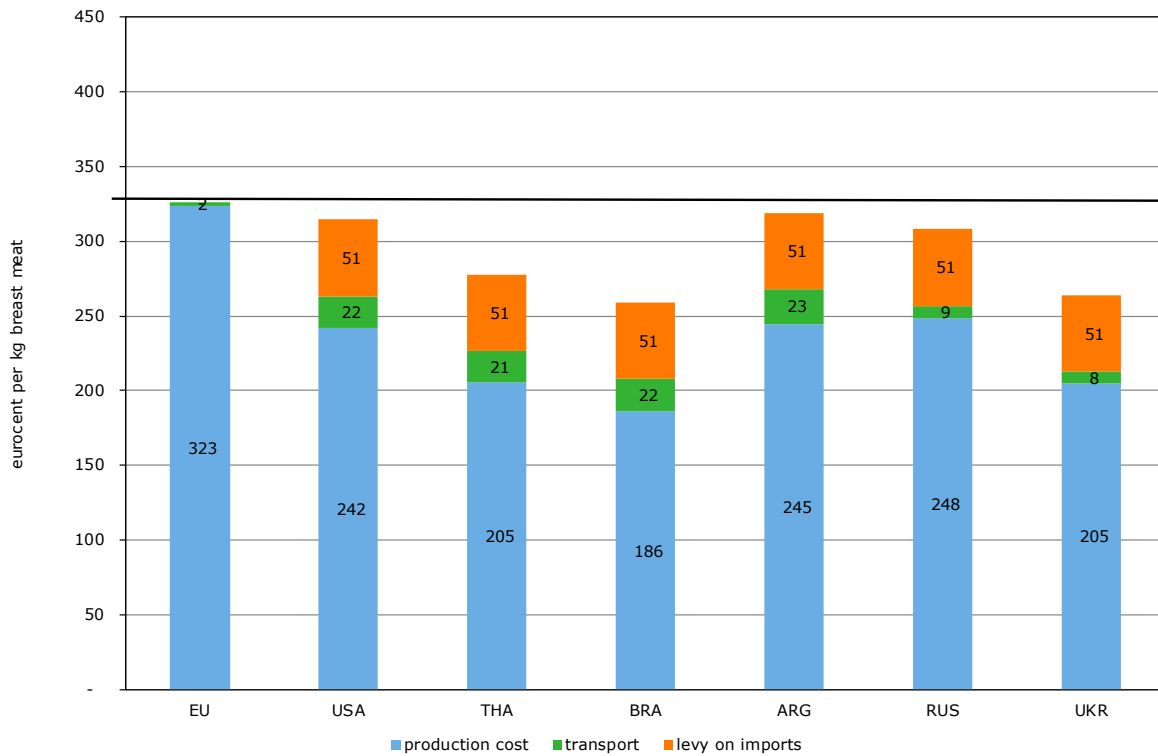


Figure S.2 Offer price of breast fillet in Germany from EU average (horizontal line) and non-EU countries in eurocents per kilogram with 50% lower import levy and 10% lower exchange rate

S.2 Complementary findings

The EU is an important player in the international trade of poultry meat. In 2017, the EU exported 1.662m tonnes of poultry meat with a value of €1.988bn (average value €120 per 100 kg) while it imported 0.806m tonnes with a value of €2.015bn (average value €250 per 100 kg).

In the EU, poultry meat producers have to comply with European legislation. The additional costs of EU legislation on farm level were estimated to be 6.1% of the total production costs in 2017. Table S.1 gives an overview of the regulations and political and societal interest in environmental, food safety and animal welfare issues in some selected non-EU countries.

Table S.1 Regulation in selected non-EU countries (Brazil, Argentina, USA and Thailand)

	Political and societal interest	Regulations in place	Situation in practice
Environment			
Manure disposal	Medium	Differs ¹	Most farmers receive revenues from manure
Ammonia emission	Low	No	No measures taken to limit emission
Food Safety			
Zoonosis control	Medium	Differs ²	Limited action
Meat-and-bone-meal	Low	No	Meat-and-bone-meal is used
Antibiotic use	Differs	Differs ²	Growth promoters often used
GMOs	Low	No	All GMOs are used
Animal Welfare			
Stocking density	Low	No	Bird densities are relatively low

The production costs of broiler meat were calculated for nine EU countries. After slaughter the production cost for these countries ranged from 134 to 155 eurocents per kg carcass with an average of 146 eurocents per kg. In comparison to EU countries, the production costs after slaughter are significantly lower in most non-EU countries such as Brazil (74% of EU average), Ukraine (78%), USA (80%), Thailand (82%), Argentina (86%) and Russia (86%).

The EU is a large importer of poultry meat. Imports of breast fillet mainly come from Brazil and Thailand. Salted breast fillet is imported within quota at an import levy of 15.4%. The full levy is €1.30 per kg. Cooked breast fillet is imported within quota at an import levy of 8%. The full levy is €1.02 per kg. Natural breast fillet has just a limited quota and in addition imports occur outside the quota. At import, an import levy of €1.02 per kg has to be paid. Despite these high import levies, poultry meat imports are competitive, and in 2017, 79,000 tonnes of natural breast fillet was imported. After the introduction of import quotas in 2008, the total imports of poultry meat have not further increased.

S.3 Methodology

In this report, Wageningen Economic Research analysed the production costs of poultry meat in nine EU countries: the Netherlands (NL), Germany (DE), France (FR), the United Kingdom (UK), Italy (IT), Spain (ES), Denmark (DK), Poland (PL) and Hungary (HU), and six non-EU countries: the United States of America (USA), Thailand (THA), Brazil (BRA), Argentina (ARG), Russia (RUS) and Ukraine (UKR). In all countries, data were collected on prices (feed, day-old chicks), technical parameters (growth rate, feed conversion, mortality), investments (poultry house) and other costs (interest rate, labour, manure disposal). For slaughterhouses, data were collected on investment in buildings, equipment and labour costs. The base year for the data was 2017. The total costs were converted to euros with the average exchange rate in 2017.

Based on the situation in 2017, three scenarios were developed:

- Change in import levy for breast fillet. A 50% reduction of the basic levy to illustrate the result of any multi- or bilateral agreement with the EU.
- Lower exchange rate for the currency of the non-EU countries. In the scenarios, a 10% lower exchange rate was assumed.
- Combination of both changes. 50% reduction of the import levies plus a 10% lower exchange rate.

¹ Regulations in some regions, for example in the USA.

² Regulations in some countries, for example in the USA or only export oriented companies.

1 Legislation

1.1 Introduction

This chapter provides an overview of legislation in the EU. Poultry farmers and other food business operators in the poultry meat chain in the EU have to comply with this European legislation. This legislation is the translation of societal and political choices made in the EU and its standards and demands may exceed international standards and practices. Most EU legislation relates to environmental protection, animal welfare and food safety. Section 1.2 gives an overview of the most important legislation. Section 1.3 presents the economic impact of the legislation, while Section 1.4 gives a short overview of the current situation of (welfare) legislation in some third countries. Although all links in the supply chain are confronted with legislation, this chapter mainly focuses on the situation and consequences at farm level.

1.2 EU legislation

This section briefly presents the EU legislation that is directly relevant to the poultry meat sector. Some countries choose to go beyond EU standards by implementing more stringent national or regional legislation, which is not, or just briefly, discussed in this chapter. A report of the European Parliament, written by a group of research institutes, gives an overview of EU legislation related to the livestock sector: beef cattle, pigs, sheep and poultry (Chotteau et al., 2009).

Environmental protection

The EU has taken measures to limit the pollution of land, water and air. The main environmental legislation affecting poultry production in the EU is the Nitrates Directive. The Nitrates Directive (91/676/EC) aims to control pollution and protect water quality in Europe, by preventing nitrates from agricultural sources from polluting ground and surface waters and by promoting the use of good farming practices. The Nitrates Directive forms an integral part of the Water Framework Directive and is one of the key instruments to protect waters against agricultural pressures. The Directive has established action programmes to be implemented by farmers, such as limitation of fertiliser application and/or a maximum amount of livestock manure that can be applied per hectare per year (170 kg of nitrogen). Some countries have additional national environmental legislation to limit manure spreading to certain periods or specific soil types. This is especially relevant in areas with a high concentration of pigs and poultry, such as the south and east of the Netherlands, Flanders in Belgium, Bretagne in France, Catalonia in Spain, and the Po valley in the north of Italy. Because of this legislation poultry farmers in these regions have to pay for the disposal of manure (Van Horne, 2012).

In the EU, all poultry farms with more than 40,000 bird places are requested through legislation to hold an environmental permit (Directive 2010/75). Operators are required to carry out activities in compliance with their environmental permit and they must use 'Best Available Techniques' (BAT) in order to achieve a high level of environmental protection (ADAS, 2016). The aim of the Directive is to apply the best available techniques to prevent or to reduce ammonia or other emissions to air, land and water from these activities, since pollution from poultry houses need to be controlled. In another Directive (2011/92) it is regulated that poultry farms with over 85,000 places need to have an Environmental impact assessment (EIA). For smaller farms and installations for the slaughter of animals such an assessment may also be required, at the discretion of the Member State. A fee is charged to cover the costs of the assessment. The Directive also requires an odour or noise management plan in case of potential odour or noise complaints (Van Wagenberg et al., 2012). In addition, Directive 2001/81/EC gives National Emission Ceilings to ammonia emission for every Member State. Some countries, such as the Netherlands and Germany, have additional national regulations to reduce ammonia emissions from poultry houses.

EU countries have to meet maximum limit values for certain substances to ensure air quality, following Directive 2008/50/EC. The Directive offers 3- or 5-year extensions to comply with the maximum limit values based on conditions and the assessment by the European Commission. Several EU Member States will have to take measures to reduce emissions of fine dust from the most important sources, such as poultry houses, in which the dust arises from feathers, bedding material and manure (Aarnink and Ellen, 2008). National authorities can set emission standards for fine dust from poultry houses, based on the 'Best Available Techniques'. Examples are the Netherlands and Germany with legislation for poultry farms to control the emission of fine dust.

On 27 October 2003, the European Union's Council of Ministers adopted The Energy Taxation Directive (2003/96/EC), restructuring the European Community framework to tax energy products and electricity. The Directive widens the scope of the EU's minimum rate system for energy products, previously limited to mineral oils, to all energy products, including coal, natural gas and electricity. The taxation leads to a rise of energy prices for broiler farmers, resulting in higher costs of heating and mechanical ventilation.

In the EU, the disposal of poultry that die on the farm during the course of the normal production cycle is controlled by legislation (Regulation 1069/2009). Permitted disposal methods are specified. These include on-farm incineration (subject to approval from the competent authority) and off-farm disposal methods via a licensed disposal operator. In most EU countries farmers have to pay for regular collection of fallen stock.

Food safety

The European legislation on animal feed provides a framework to ensure that feedstuffs do not endanger human or animal health or the environment. The legislation sets rules on the circulation and use of feed materials, requirements for feed hygiene, rules on undesirable substances in animal feed, legislation on genetically modified food and feed, and conditions for the use of additives in animal nutrition. For example, in the EU the use of meat-and-bone meal in poultry feed is still banned. The consequence is higher disposal costs for slaughterhouses and higher costs for poultry feed. Furthermore, in January 2006, the EU banned growth-promoting antibiotics in animal feed. In addition, the European Commission has launched an EU strategy to combat the threat of antimicrobial resistance to human, animal and plant health. The strategy includes phasing out of antibiotics for non-medical use in animals, and covers a range of actions at EU and national level in the areas of data collection, surveillance, research and awareness-raising. A large proportion of protein sources for poultry feed is imported from outside the EU. An increasing share of world production of soya crops is from genetically modified hybrids. The asynchronous EU approval of GM crops, coupled with an almost zero tolerance policy, is negatively affecting the EU supply of feed ingredients (Backus et al., 2008), resulting in higher feed costs.

The poultry meat industry has to adapt rules on hygiene, traceability and labelling, because foodstuffs of animal origin may present microbiological and chemical risks. The EU has extensive food safety legislation based on risk analysis, most importantly the General Food Law (Regulation (EC) No 178/2002) and the hygiene package (Regulations (EC) No 852/2004, 853/2004, 854/2004 and 882/2004). This legislation states that food business operators such as farmers have the primary responsibility for food safety. Farmers are specifically affected by legislation on implementing good agricultural practices and Salmonella control, also resulting in higher feed costs.

For the poultry meat sector, the Zoonoses legislation is especially relevant. Zoonoses Directive 2003/99/EC and Regulation 2160/2003 regulate sampling, monitoring and control measures. In the EU, a framework of legislation on Salmonella has targeted a reduction in the incidence of *Salmonella Enteritidis* and *Salmonella Typhimurium* in poultry. Legislation has been implemented across Member States through National Control Plans and additional legislation (ADAS, 2016). The legislation ensures that proper and effective measures are taken to detect and to control Salmonella and other zoonotic agents, at all stages of production, processing and distribution, particularly at the level of primary production, including in feed. The industry is confronted with costs of monitoring and expensive measures such as compulsory slaughter of Salmonella positive breeding flocks.

Animal welfare

All Member States ratified the European Convention for animal protection with principles relating to animal housing, feed and care appropriate to their needs (Council Directive 98/58/EC). The aim is to spare animals all unnecessary suffering in three main areas: farming, transport and slaughter. Minimum animal welfare standards have been established to protect and to avoid competition distortions between producers in various Member States. The most important standards are concerned with natural behaviour, space, feed and water supply, lighting, surgeries, veterinary aid and good stockmanship. European legislation forms the basis, partly complemented by national top-ups (Van Wagenberg et al., 2012). Protection of animals during transport is regulated in EC 1/2005. Directive 2007/43/EC establishes minimum rules for the protection of chickens for meat production. This directive aims to provide the chickens with a good level of welfare and health under good indoor climate conditions. An important part of this directive is setting a maximum stocking density of 33 kg/m², or a maximum of 39 to 42 kg/m² if stricter housing conditions and welfare standards are met and the mortality rate of at least seven consecutive flocks is under a certain target value. The new legislation establishes several other conditions, such as lighting, litter, feeding, and ventilation requirements, to ensure better animal welfare. The Directive also provides the Commission with the possibility to introduce further measures in the future, based on the scientific data and practical evidence collected by the Member States. On top of EU legislation many countries especially in North-West Europe have additional regulation for animal welfare. In Germany, the Netherlands and UK retailers play a driving role in development, promotion and sales of poultry meat produced under conditions with different welfare standards going beyond the legislation.

1.3 Economic impact of EU legislation

The poultry sector is governed by EU legislation, and its implementation almost always leads to extra costs. The poultry meat sector has to cope with the additional costs, primarily related to environmental protection, food safety and animal welfare regulations. These additional costs were estimated for the following aspects:

- *Environmental protection*
 - Manure disposal costs, due to the Nitrate directive.
 - Reduction of ammonia emission in manure application, during manure storage and in the poultry house.
- *Food safety*
 - Salmonella control. Costs of hygiene measures, sample collection, testing and vaccination.
 - Meat-and-bone meal (MBM). The ban on meat-and-bone meal in the EU results in higher feed costs.
 - Antibiotic growth promoters. The ban on the use of antibiotic growth promoters results in higher feed costs.
 - Genetically Modified Organisms (GMO). The strict rules in the EU on the use of GMO crops result in higher feed costs.
- *Animal Welfare*
 - Stocking density. Additional housing costs to regulate the maximum live weight per square meter poultry house.

In this study, the costs were estimated for the year 2017 based on the average situation in all EU countries, using the method described in Van Horne (2013). However, the actual situation can differ per country or per region. For example, manure disposal costs are high in regions with a large number of poultry farms and there are low or absent in regions with few poultry farms. In some EU countries, other regulations can be relevant, which are not mentioned in the list above, such as the energy tax in the Netherlands, resulting in higher cost for heating and electricity, and regulations on preventing foot pad lesions (dermatitis) in Denmark and Sweden.

Figure 1.1 gives all cost components of the EU legislation relating to poultry meat. The additional costs directly related to EU regulations are estimated to be 5.0 eurocents per kg live weight. This is 6.1% of the total production costs in 2017.

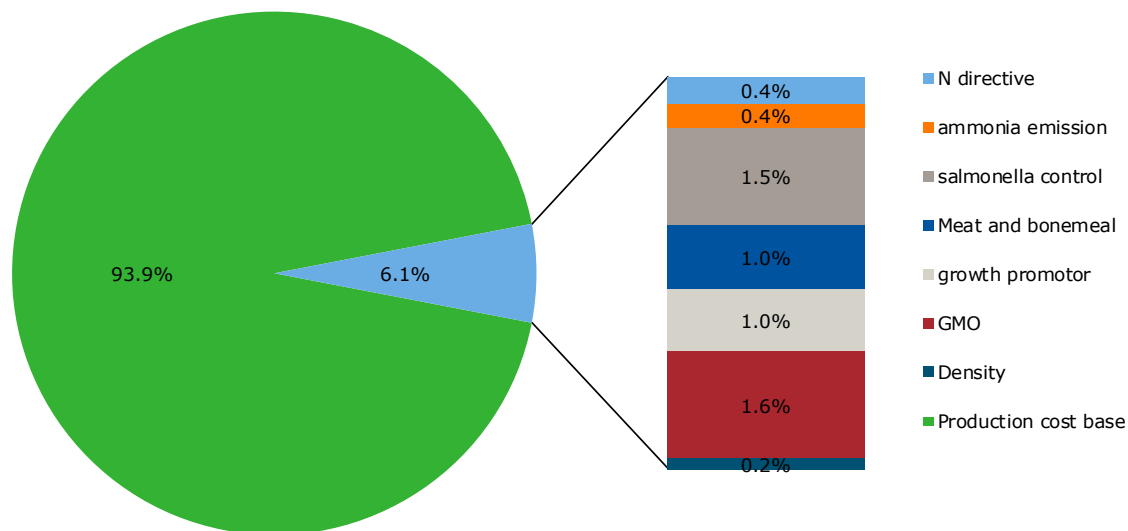


Figure 1.1 Basic production costs (93.9%) and costs directly related to EU legislation (6.1%) in 2017

EU legislation is also creating additional costs for slaughterhouses and other companies in the supply chain. No detailed calculations are available on these costs, but legislation on Salmonella control and the ban on meat-and-bone meal (extra disposal costs for slaughter offal) result in higher costs for slaughterhouses. As a result of Regulation 1161/2011 of the European Parliament and the Council, the EU has mandated that all unprocessed poultry meat must be labelled with its country of origin. This legislation will confront most companies with additional costs (Baltussen et al., 2013). Another example of legislation affecting the costs of slaughterhouses is Regulation 1099/2009 on stunning of poultry. This regulation has been in effect since 1 January 2013. On *Campylobacter* new regulation is effective since January 2018. The regulation sets a process hygiene criterion for *Campylobacter* in broiler carcasses to control contamination during the slaughter process (EU 2017/1495).

Future European and national legislation may further increase the production costs of poultry meat. The Member States have the competence to impose stricter rules for their regions, in a number of areas. Additional regulations have already been implemented or will be implemented on several topics in the coming years, including legislation on the limited use of antibiotics (e.g. the Netherlands, Germany and Denmark), further reduction of fine dust emission (Germany, the Netherlands), reduction of footpath dermatitis (e.g. the Netherlands, Sweden, Denmark) and reduction of the *Campylobacter* prevalence (e.g. UK).

1.4 Situation in some third countries

Several reports give an overview of legislation in selected third countries. Van Wagenberg et al. (2012) extensively studied the standards on food safety, environment and animal welfare in several non-EU countries. A study at Wageningen UR (Bracke, 2009) focused on animal welfare regulations and husbandry standards in the poultry sector with special attention for the broiler sector in Brazil, Thailand and the USA. Also, Van Horne (2012) mapped the situation in the USA, India, Ukraine and Argentina in the egg layer sector. More recently Lichter and Kleibrink (2016) did an extensive analysis on standards for poultry production in sixteen important poultry producing countries worldwide. ADAS (2016) made a comparison of regulatory requirement and key practices in the poultry meat supply chain in the EU and USA. This report gives an extensive overview covering the key areas: farm production systems, feed supply and slaughter/processing.

In general, non-EU countries do not have any or have limited legislations on environmental protection, food safety, and animal welfare. In some countries, for example the USA, the standards for food safety and animal health are considered to be equivalent to those in the EU. Nevertheless, standards

between the EU and third countries do differ with regard to the type of veterinary drugs allowed and GMOs that are approved. Specifically for animal welfare, research shows that the EU standards for broiler production are the highest in the world. No country outside Europe has such detailed and strict regulations to protect the welfare of poultry for meat production (Lichter and Kleibrink, 2016).

In most third countries, the standards for the environment, animal welfare and labour conditions are lacking, or the standards are lower than in the EU. These topics are not incorporated or only marginally incorporated into trade agreements. Internationally accepted conventions or standards exist for food safety (Codex Alimentarius), animal health and animal welfare (OIE) and labour conditions (ILO), but do not exist for the environment. OIE codes are only a recommendation to its members, and the OIE has no power to enforce the recommendations or standards. Food safety and animal health are important aspects in negotiating and establishing trade agreements, but the environment, animal welfare and labour conditions are not or not high on the agenda (Van Wagenberg et al., 2012).

Important exporters of poultry meat on the world market are Brazil, USA, Thailand, Argentina and Ukraine. These countries have no food safety regulations similar to the EU, such as the ban on meat-and-bone meal and antibiotic growth promoters, and the strict rules on the use of GMO crops as ingredients in poultry feed. In the following sections we summarise the main characteristics of the poultry sector, the export position, the legislation on animal welfare and the production standards for these poultry meat producing countries.

Brazil

Brazil is one of the world's leading poultry producing countries (ranked number 2) and the number one exporter of poultry meat. The Brazilian poultry industry has some very large integrated companies that are global players, such as BRF and JBS. The poultry sector is characterised by high productivity and high technology use. The integration model is largely adopted, bringing strict control of the entire supply chain. The poultry industry is mainly concentrated in southern Brazil, because of its subtropical climate, where broilers are often kept in simple open houses. Three types of broiler housing can be distinguished in the area: low density housing (max 30 kg of live weight per m²), middle level density housing (max 34 kg per m²) and high density housing (modern systems with mechanical tunnel ventilation with up to 38 kg per m²). In Brazil, there is not much information available on animal welfare, since this topic does not receive much attention in the country. In fact, Brazil has no legislation on animal welfare at farm level or during transport for poultry. A French report (ITAVI, 2012) gives an overview of regulation on food safety, animal feed and environmental protection in Brazil. However, there is no or only limited legislation on these topics.

USA

The USA is the number one producer of poultry meat in the world and is the second largest exporter of poultry meat, after Brazil. As a result of the large domestic demand for breast meat, exports are mainly cuts with bone (leg meat and leg quarters). The second largest poultry producer in the world is based in the USA: Tyson Foods. Other USA companies in the world's top 10 poultry producers are Perdue, Koch Foods and Sanderson. The USA does not regulate welfare standards for farm animals. In fact, federal legislation in the USA focuses on transport (Farm Bill, 1996), slaughtering methods (1958) and 'laboratory animals' (1966), but even this legislation differs from state to state. For poultry, the US regulations dictate that poultry must be slaughtered using good commercial practices. No federal regulations control or safeguard the welfare of farm animals. State laws govern animal welfare in some parts of the country, but currently no such legislation applies to poultry in any of the three major poultry-producing states Georgia, Alabama and Arkansas (ADAS, 2016). In the USA, the national chicken council (NCC) has established guidelines for the welfare of broilers. The NCC recommends the guidelines to its members to ensure the humane treatment of animals and to promote the production of quality products. The NCC guidelines promote good health and the welfare of broilers in several areas: education and training of farmers, proper nutrition and feeding, appropriate comfort and shelter, health care, ability to display most normal behaviours, best practices on the farm, catching and transport. Bird welfare at different stocking densities depends on access to feeders and drinkers, ventilation system, litter management and husbandry, and density is advised not to exceed 37 kg per m² poultry house for chickens between 2 and 2.5 kg of live weight.

Thailand

The Thai poultry industry is an important player within Asia and a leading exporter of poultry meat. Thailand is, together with Brazil, the main supplier of poultry meat to the EU. Thailand can compete with breast meat on the EU market because dark leg-meat is preferred on the local Thai market. Since 1999, animal welfare in Thailand has been part of the Thai government's agenda. Farms have to meet government standards, based on the Good Agricultural Practice (GAP) and aimed to improve the quality and safety of livestock products.

To be certified as export farms, farmers need to meet government criteria addressing not only animal welfare but also environmental concerns (waste management), food safety (e.g. withdrawal time of some pharmaceuticals), disease monitoring, biosecurity and traceability. In practice, the sector mostly implements the government notifications voluntarily. However, the regulations are compulsory if farms want to export. On these farms the density should not exceed 34 kg per m², in closed poultry houses (Bracke, 2009).

Argentina

Argentina's poultry industry is relatively new. In the last 10 years, Argentina has become an exporter of broiler meat. In 2017 it was the number six supplier of poultry meat to the EU. The main product exported to the EU is breast meat, which has the highest average value per tonne.

Circumstances for broiler farming in Argentina are excellent. Feed ingredients such as corn and soybeans are locally available in large amounts, the climate is moderate and cheap labour is available for farming and processing. Currently, broiler farming and slaughtering/processing in Argentina are almost completely vertically coordinated. Through contracts, the industry delivers, in most cases, day-old chicks, feed and professional advice to the producers, who bring in housing and labour. The integrators in Argentina promote modernisation by financing improvements on contracted farms, and demanding certain technological standards as a condition of entrance for new producers. Argentina has no specific legislation on animal welfare. However, it does have some legislation for related topics such as food safety and product quality, as well as manuals for the broiler sector on Good Practices for the Production that indirectly impose animal welfare criteria. Van Horne (2010), however, concluded that, according to the information collected through the survey and the interviews with producers and businessmen, producers in Argentina do not consciously implement animal welfare practices. However, the average density in the broiler houses is relatively low, as a result of the warm climate.

Ukraine

After Ukraine became independent in 1991 the principles of the free market economy were introduced. Since the poultry sector was privatised in 1998, it has shown remarkable progress. The production results improved as a result of better management, improved feed quality and modern health service. Ukraine has now become a competitive producer of poultry meat. In 2017 Ukraine was the third supplier of poultry meat to the EU. Large companies are Myronivsky Hliboproduct (MHP) and Agromars. MHP has a dominant position on the domestic market and exports to many countries in the direct region, the Middle East and North Africa. Most of the poultry meat production is fully integrated with grain production, parent stock, hatcheries, feed mills and slaughterhouses. Different from other countries grain production is integrated in the company.

The Ukraine has no governmental legislation with standards on animal welfare for broiler production (ITAVI, 2016). According to company information MHP has an internal standard to limit the density to 38-39 kg of live weight per m² poultry house. The Ministry of Agriculture wants to adapt national legislation on animal welfare to the standards of the EU. The exact time schedule is not known, but the year 2020 was mentioned.

2 Structure and employment

2.1 Introduction

This chapter describes the economic importance of the EU poultry meat industry. Section 2.2 describes the total poultry meat production with data on the subsectors broilers, turkeys, ducks and other poultry. Section 2.3 gives information on the structure of the sector with the number of farms and companies in the supply chain. Section 2.4 deals with employment numbers while Section 2.5 gives the total economic value of the poultry meat. Finally, Section 2.6 describes the importance of alternative poultry meat in the EU.

2.2 Poultry meat production

In 2017, the total poultry meat production in the EU-28 was 15.9m tonnes, an increase of 23% compared to 2012. The main poultry meat is broiler meat with a total production of 12.8m tonnes in 2017. Seven leading producers of broiler meat produce more than 0.9m tonnes each: Poland, France, the UK, Germany, Spain, the Netherlands and Italy. Combined, these seven countries are responsible for 77% of the EU's broiler meat production. In addition to broilers, turkeys and ducks are also important subsectors. Total turkey meat production in the EU-28 in 2017 was 2.1m tonnes. The main producing countries of turkey meat are Poland, Germany, France, Italy and Spain, with a common share of 80% of the EU total. In 2017, the total duck meat production in the EU-28 was 0.5m tonnes. Of all EU countries, France is by far the largest producer of duck meat with 43% of the total EU production, followed by Hungary and Poland. These three countries together produce 69% of the EU total. Other poultry relates to guinea fowls and goose. Table 2.1 gives an overview of the total poultry meat production, subdivided into broilers, turkeys, ducks and other poultry, for all EU member states.

Table 2.1 EU Poultry meat production (1,000 tonnes carcass weight) in 2017

	Broilers	Turkeys	Ducks	Other poultry	Total	% of EU total
Poland	2,560	428	57	65	3,110	19.5
France	1,163	369	204	119	1,855	11.7
United Kingdom	1,586	164	29	10	1,789	11.2
Germany	1,250	377	41	49	1,717	10.8
Spain	1,237	201	4	69	1,511	9.5
Italy	975	325	6	66	1,372	8.6
Netherlands	1,081	28	16	0	1,125	7.1
Hungary	402	101	62	34	599	3.8
Belgium	435	3	0	27	465	2.9
Romania	405	12	0	0	417	2.6
Portugal	281	39	10	16	346	2.2
Greece	175	3	0	0	178	1.1
Czech Republic	160	9	9	0	178	1.1
Sweden	151	4	0	8	163	1.0
Denmark	158	0	1	0	159	1.0
Austria	112	25	0	0	137	0.9
Ireland	122	7	6	0	135	0.8
Finland	123	8	0	0	131	0.8
Lithuania	106	0	0	9	115	0.7
Bulgaria	88	0	23	0	111	0.7
Croatia	69	13	1	0	83	0.5
Slovenia	65	5	0	0	70	0.4
Slovakia	60	1	0	5	66	0.4
Latvia	31	0	0	0	31	0.2
Cyprus	25	0	0	0	25	0.2
Estonia	21	0	0	0	21	0.1
Malta	4	0	0	1	5	0.0
EU-28	12,845	2,122	469	478	15,914	100

Source: MEG-Marktbilanz Eier und Geflügel 2017 (Tables 145, 154, 161, 165).

2.3 Structure

Many farms produce broilers. The most recent data on broiler farms are from 2013 and published by Eurostat (MEG, 2018). Table 2.2 shows the total number of broiler farms in the EU-28 and the number of farms with more than 5,000 broilers (professional farms) for each country. According to Eurostat, the total number of broiler farms in the EU-28 was around 2.1m in 2013. However, only 20,000 are professional farms with more than 5,000 broilers. The highest number of farms with more than 5,000 broilers are in France, Spain, Poland, Italy, Germany and the UK. The number of broiler farms is extremely high in Romania, Poland, Greece and Portugal. These countries have the highest number of farms with less than 99 broilers, which can be classified as backyard farming.

Table 2.2 Total number of broiler farms per size category per country in the EU in 2013

Country	1- 99	100-4999	5000-49999	50000 and more	Total farms
Poland	244,040	480	1,930	340	246,790
France	16,570	5,530	5,430	670	28,200
United Kingdom	320	230	460	540	1,550
Germany	2,780	420	760	570	4,530
Spain	22,860	280	2,380	690	26,210
Italy	6,420	850	1,000	550	8,820
Netherlands		10	220	330	560
Hungary	9,170	560	130	50	9,910
Belgium	290	90	370	180	930
Romania	1,590,780	1,120	30	60	1,591,990
Portugal	82,520	160	530	60	83,270
Greece	93,450	880	520	80	94,930
Czech Republic	330	50	50	70	500
Sweden	150	10	20	50	230
Denmark	120		60	90	270
Austria	530	140	290	20	980
Ireland	310	10	90	50	460
Finland				50	50
Lithuania	11,460	0	0	0	11,460
Bulgaria	5,320	140	90	20	5,570
Slovenia	4,410	90	150	0	4,650
Slovakia	850	90	20	20	980
Latvia	310			0	310
Cyprus	2,220	0	10	0	2,230
Estonia	50	0		0	50
Malta	200		30	0	230
EU-28	2,095,460	11,140	14,570	4,490	2,125,660

Source: Eurostat/MEG Bilanz, 2018.

In the poultry meat supply chain, different companies are involved in supplies and slaughter/processing. Farms with parent stock supply hatching eggs to hatcheries, hatcheries supply day-old chicks and feed mills supply feed to the farmers. Poultry is slaughtered in slaughterhouses and the meat is further processed into consumer products in processing companies. The EU does not collect information on the number of companies in the supply chain. There is only very fragmented information of some member states. Especially farms with parent stock are relatively high numbers, e.g. in the Netherlands 200 farms have broilers breeders, in France around 500 farms and in Italy 300 farms.

2.4 Employment

No sources are available on the total employment in the poultry supply chain in the EU-28. However, detailed employment data were provided by three main poultry meat producing countries: the Netherlands, France and Germany. Based on these employment numbers and the total broiler meat production, we estimated the employment in every part of the supply chain. The employment per 1,000 tonnes of broiler meat is 4.4 persons in primary production, 0.7 in hatcheries, 14.4 in slaughterhouses/processing, 1.5 in the feed industry, and 2.1 in other services. The total employment is 23.1 full-time workers per 1,000 tonnes of broiler meat. Van Horne (2013) described the details of these calculations. Combined with the 2017 production volumes we can estimate the total employment in poultry meat in the EU-28: 367,554 workers, of which almost 300,000 in the broiler sector. See Table 2.3.

The employment in the production of ducks is estimated to be substantially higher than in broilers, namely 37 employees per 1,000 tonnes and in the turkey sector it is slightly lower, approximately

20 employees per 1,000 tonnes produced. For other poultry we assume similar employment numbers as in broiler production (van Horne, 2013). Table 2.3 gives the results. The total employment in the poultry sector is 368,000 workers. The majority is employed in the broiler sector (300,000 workers which is 81% of the total), 42,000 (12%) in the turkey sector, 17,000 (5%) in the duck sector and 11,000 (3%) in the other poultry sectors.

Table 2.3 Overview of employment in EU poultry meat sector with the sub sectors broilers, turkey, ducks and other poultry

Sector	Link	Production (tonnes)	Employment per 1000 tonnes	Employment broilers	Employment poultry sector
broilers		12,845			
	primary production		4.4	56,518	
	hatcheries		0.7	8,992	
	slaughterhouse/processing		14.4	184,968	
	feed industry		1.5	19,268	
	other services		2.1	26,975	
broilers	total	12,845	23.1		296,720
turkey		2,122	20		42,440
ducks		469	37		17,353
other		478	23.1		11,042
total		15,914		296,720	367,554

2.5 Production value

The production value of EU poultry meat can be calculated by multiplying the total production by the average EU price at the slaughterhouse. In 2017, the total production of poultry meat (Table 2.1) was 15.9m tonnes. The average selling price in slaughter plants (wholesale price for class A chicken, known as '65% chickens') was €1,824 per tonne in 2017. The result is a production value of €29.0bn in 2017. However, this is the economic output of the primary sector and slaughterhouses. After slaughter the poultry meat is further processed. No official data are available on the total production value of poultry after further processing. However, we estimate a 30% higher value after processing. Therefore, the total production value of poultry meat in the EU-28 in 2017 is estimated to be €37.7bn.

The EU is an important player in the international trade of poultry meat. In 2017, the EU-28 exported 1.662m tonnes of poultry meat with a value of €1.988bn. At the same time, the EU-28 is a large importer of poultry meat: 0.8m tonnes with a value of €2.015bn. Table 2.4 gives the development of the import and export in volume and value from 2013 to 2017. It is important to point out that the average value of imports is much higher (€250 per 100 kg) than the average value of export (€120 per 100 kg). More detailed information on imports and exports is given in Appendix 2.

Table 2.4 Import and export of poultry meat of the EU in volume (1,000 tonnes) and value (€1,000,000)

	2013	2014	2015	2016	2017
volume export	1,428	1,504	1,490	1,617	1,662
volume import	807	846	875	902	806
value export	2,097	2,184	2,113	1,946	1,988
value import	2,084	2,048	2,114	2,156	2,015

Source: European Commission, February 2018.

2.6 Alternative broiler production

The EU broiler meat sector commonly uses fast-growing genotypes broilers to produce poultry meat. These broilers achieve the target live weight of 2 to 2.5 kg in around 5 to 6 weeks. Alternative broiler production that uses slower growing genotypes is increasingly gaining attention in many EU countries. The poultry meat of slow-growing broilers is a premium product, and farmers and processors receive a higher market price to compensate for the higher production costs. The conditions and names of the alternative broiler production in the EU are regulated by Regulation EC/543/2008, in which the marketing terms are described. The production of organic broilers is regulated in Regulation 834/2007, including the requirement to use organic feed. These requirements are summarised in Table 2.5.

Table 2.5 Name and conditions for production of alternative broilers, according to EC/543/2008 and Regulation 834/2007 (organic)

Production system	Minimum age (days)	Maximum density indoor (birds/m ²)	Access to outdoor run
Extensive indoor	56	15	No
Free range	56	13	Yes, 1 m ² per bird
Traditional free range	81	12	Yes, 2 m ² per bird
Free range, total freedom	81	12	Yes, 2 m ² per bird
Organic	70 to 81	10	Yes, 4 m ² per bird

The number of farms with free range or organic production is small, except in France, where a large number of farms is involved in alternative broiler production. In organic production France and the UK are the largest producers within the EU. In free-range production systems broilers have access to an outdoor area. An example of this type of broiler production is Label Rouge in France, with the following standards: a slow growing breed, a low density indoor and access to an outdoor area. In France, about 18% of all broilers have access to an outdoor range (ITAVI, 2017). Although the organic production of broiler meat is growing in EU countries in north-western Europe, it will probably stay a niche market.

The so-called 'intermediate' market segment or certified broiler production has a position between regular broiler production and organic production. Certified broilers are slow-growing broilers that are kept indoors until they are at least 56 days old. Certified broilers are produced in France ('certifié'), the UK (RSPCA assured/freedom food) and the Netherlands (one star within the 'Better Life Certificate'). France, the UK and the Netherlands hold a significant position in this production segment, but also some German companies started to produce certified broilers. This type of production is expected to grow further in the coming years. In France the production of certified broilers (slow growing) is around 11% of the total broilers (ITAVI, 2017). In the Netherlands the so-called Chicken of Tomorrow is dominating the fresh segment for poultry meat in the supermarket. In this concept slow growing broilers are kept in a regular poultry house, at a slightly lower stocking density. In 2017 the share in the total broiler production in the Netherlands was 30 to 35%.

No statistics are available on the exact numbers of alternative broilers in the EU. Industry people estimate the market share of alternative broilers at 5 to 10%. This is based on an estimated 4.5m 'alternative' broiler breeders in the EU, which is around 6% of the total number of broiler breeders in the EU. As the alternative broiler breeders produce more hatching eggs the share in alternative broiler produced will be higher, around 8%. The number includes the market for organic and free range broilers, as regulated by EU regulations and directives, as well as the numbers for small scale poultry production in some southern European countries and private label production, such as Label Rouge in France, RSPCA assured/Freedom Food in the UK and all slow growing concept production in the Netherlands. A recent report published in the Netherlands (Rabobank, 2018) estimated the EU market share of 'alternative broiler meat' will double in the next seven years. The bank expects a 15 to 20% share in 2025. In many countries poultry meat of slow growing broilers will be a choice for the consumer in the supermarket, e.g. in France, UK, Denmark, Sweden and Belgium. In the Netherlands and Germany slow growing will be the standard type of poultry meat in the supermarket.

3 Production costs of broilers in selected countries, 2017

3.1 Production costs in some EU countries

The production costs of broilers have been researched for the following nine EU countries: the Netherlands (NL), Germany (DE), France (FR), United Kingdom (UK), Italy (IT), Spain (ES), Denmark (DK), Poland (PL) and Hungary (HU). The calculated production costs at farm level are based on the situation in 2017. Of almost all countries average zootechnical (performance) data and economic data (prices) were available. To give some examples: in the Netherlands Wageningen Economic Research collects data of broiler farms, in Germany similar data are available from the Chamber of Commerce (Landwirtschaftskammer Niedersachsen) and in Denmark data are collected and published by the Danish Poultry Council (Det Danske Fjerkræraad). For France, the UK and Hungary the data are based on information of respectively the research institute ITAVI, advisory group ADAS and the University of Debrecen. For Poland, Italy and Spain a mix of sources was used to compile the basic assumptions. After calculating the production costs at farm level, we also calculated the costs for slaughter. Section 3.1.2 gives an overview of the production cost after slaughter.

3.1.1 Production costs at primary farm in EU countries

Figure 3.1 shows the calculated production costs in the selected EU countries and Table 3.2 gives the total production costs and the build-up of the production costs in these countries. All countries have production costs in the range of 78 to 87 eurocents per kg live weight. The production costs in Poland are the lowest at 78.6 eurocents per kg live weight, the UK the highest at 86.5 eurocents.

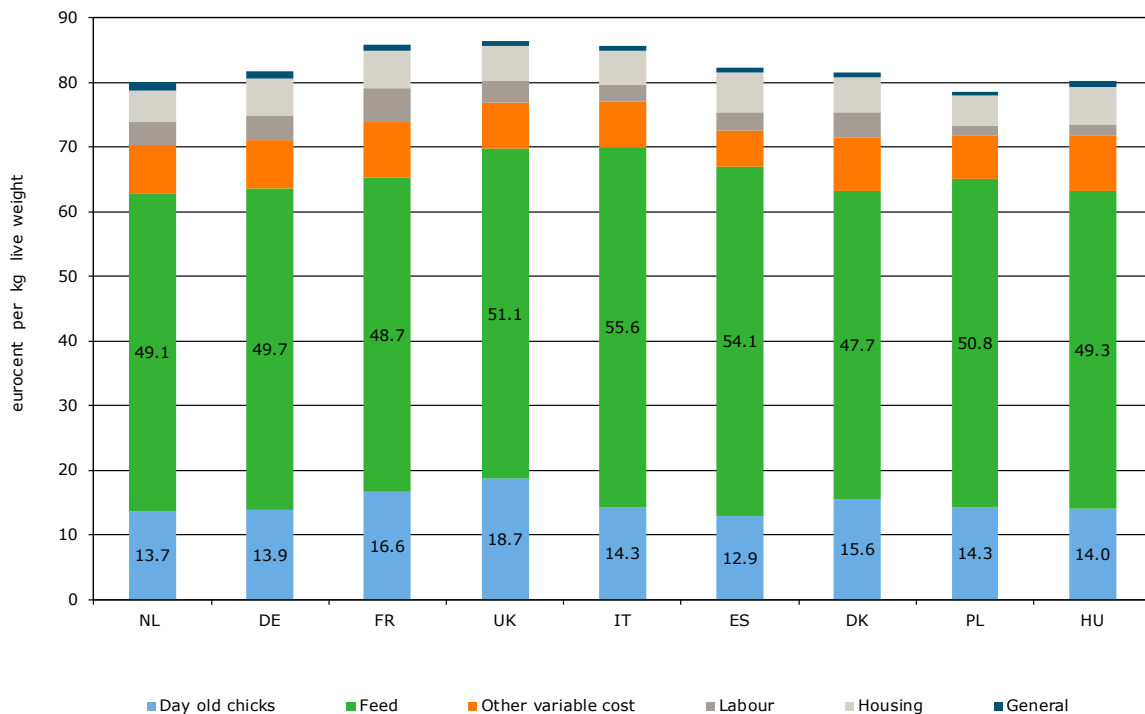


Figure 3.1 Production costs of broilers in eurocents per kg live weight in nine EU countries in 2017

Table 3.1 Prices and technical performance for broilers in selected EU countries

	NL	DE	FR	UK	IT	ES	DK	PL	HU
Feed price (euro/100 kg)	31.1	31.5	29.2	31.5	33.1	31.5	30.8	31.4	30.2
Day-old chick (eurocent)	31.0	31.5	30.3	40.5	33.0	32.0	32.9	31.5	30.9
Live weight (g)	2,350	2,350	1,900	2,250	2,400	2,600	2,200	2,300	2,300
Feed conversion	1.58	1.58	1.67	1.62	1.68	1.72	1.55	1.62	1.63

Table 3.2 Costs of primary production in eurocents per kilogram of live weight in selected EU countries in 2017

	NL	DE	FR	UK	IT	ES	DK	PL	HU
Total cost (incl. labour)	80.1	81.9	85.8	86.5	85.6	82.2	81.7	78.6	80.2
Total cost (excl. labour)	76.6	78.2	80.6	83.1	83.0	79.5	77.8	77.0	78.5
Day-old chicks	13.7	13.9	16.6	18.7	14.3	12.9	15.6	14.3	14.0
Feed	49.1	49.7	48.7	51.1	55.6	54.1	47.7	50.8	49.3
Other variable cost	7.6	7.6	8.6	7.1	7.3	5.6	8.3	6.7	8.6
Labour	3.6	3.7	5.2	3.4	2.6	2.8	3.8	1.5	1.7
Housing	4.8	5.8	5.9	5.4	5.1	6.2	5.5	4.7	5.8
General	0.8	0.8	0.9	0.9	0.7	0.7	0.9	0.6	0.6
Manure disposal	0.6	0.4	0.0	-0.1	-	-	0.0	-0.1	-0.3

Prices

Table 3.1 gives the average price of feed and day-old chicks. The price of feed strongly influences the total production costs. Feed prices in the EU countries range from €29.2 per 100 kg in France to €33.1 in Italy. In all countries, the feed price is influenced by the world market prices of the main feed ingredients, such as grains (wheat and maize) and soybeans. The difference in feed price between the EU countries is a result of differences in structure of the supply chain (integrated versus non-integrated), average farm size, feed mill policy, average transport distance to farms and the country's access to sea harbours and water ways for efficient supply of feed ingredients. For the countries that do not use euros, Poland, UK and Hungary, the exchange rate is also relevant because the feed prices in Table 3.1 are calculated in euros. Table 3.1 also gives the day-old chick prices in eurocents per chick. For most countries the price in 2017 was between 31 to 33 eurocents per chick. The price in the UK is substantially higher. Table 3.2 indicates the costs of day-old chicks per kg live weight, which is also influenced by the average final live weight of the broilers.

Performance

Table 3.1 gives the main indicators of the zootechnical results: average live weight (gram) and feed conversion (kg of feed used per kg live weight). The live weight in most countries is between 2.2 and 2.4 kg. Exceptions are France with a lower average weight of 1.9 kg, and Spain with a higher average weight of 2.6 kg. The feed conversion is a good indicator of the production efficiency. Feed conversion also differs between the EU countries. Table 3.1 shows that farms in Netherlands, Germany and Denmark have low feed conversion rates. At first glance, Italy and Spain seem to have high feed conversion rates. However, it should be taken into account that feed conversion is correlated with live weight. Broilers with a higher final weight, as in Italy and Spain, have a higher feed intake per kg growth.

Cost components

Table 3.2 shows that EU countries also differ in some other cost components. Other variable costs relate to costs of heating, electricity, litter, animal health and catching. These costs vary slightly between the countries mainly because of differences in heating costs (fuel prices) and costs of catching. Labour costs also differ between countries. Normally, the work on the farm is done by the farmer. The labour cost calculation is based on a regular payment (full-time equivalent) for similar work in the specific country. In the eastern and southern countries, the costs of labour are generally lower than in North-West Europe. The differences in housing costs (poultry house and inventory) between the countries relate to differences in investments for a poultry house, stocking density and interest rate. General costs relate to the costs at farm level for insurance, bookkeeping, consultancy,

telephone, and transport. In some countries broiler farmers have to pay for manure disposal, e.g. in the Netherlands, Germany (Lower Saxony) and Hungary. In other countries, farmers do not have manure disposal costs, while in the UK and Poland farmers even receive a small revenue.

3.1.2 Production costs after slaughter

The costs of slaughter are calculated based on large commercial slaughter houses. The final product is a broiler carcass. The weight of the carcass is 70% of the live weight of the broilers delivered from the farm. Basic assumption is that the costs of slaughter are 33 eurocents per kg carcass weight in the Netherlands. The main components in the slaughter costs are labour (35%) and building and equipment (25%). The other costs (40%) are, for example, transport of broilers, energy, water, inspection and packing. These costs vary from country to country. However, because all slaughterhouses in the EU use similar advanced modern equipment, it is assumed that the differences in slaughter costs between the countries are mainly a result of differences in wages. Based on the wages for slaughterhouse workers, the costs of slaughter are calculated for the selected EU countries. The hourly wages for workers in slaughterhouses, including social taxes, are: in the Netherlands €22, in Germany €15, in France €20, in the UK €15, in Italy €14, in Spain €14, in Denmark €30, in Poland €6 and in Hungary €5. Differences in labour costs also have an influence on the level of investment for buildings and the costs of bird transportation. Also differences in interest rates were taken into account and have an impact on the annual costs of building and equipment. Table 3.3 gives the final results of costs at farm level and the costs of slaughter in euro per kg carcass weight. Figure 3.2 gives the same data in a graph.

Table 3.3 Cost of primary production, cost of slaughter and total costs in eurocents per kg carcass weight

	NL	DE	FR	UK	IT	ES	DK	PL	HU
Cost farm level	114	117	123	124	122	117	117	112	115
Cost slaughter	33	28	31	27	27	27	38	22	21
Total	147	145	154	151	149	144	155	134	136

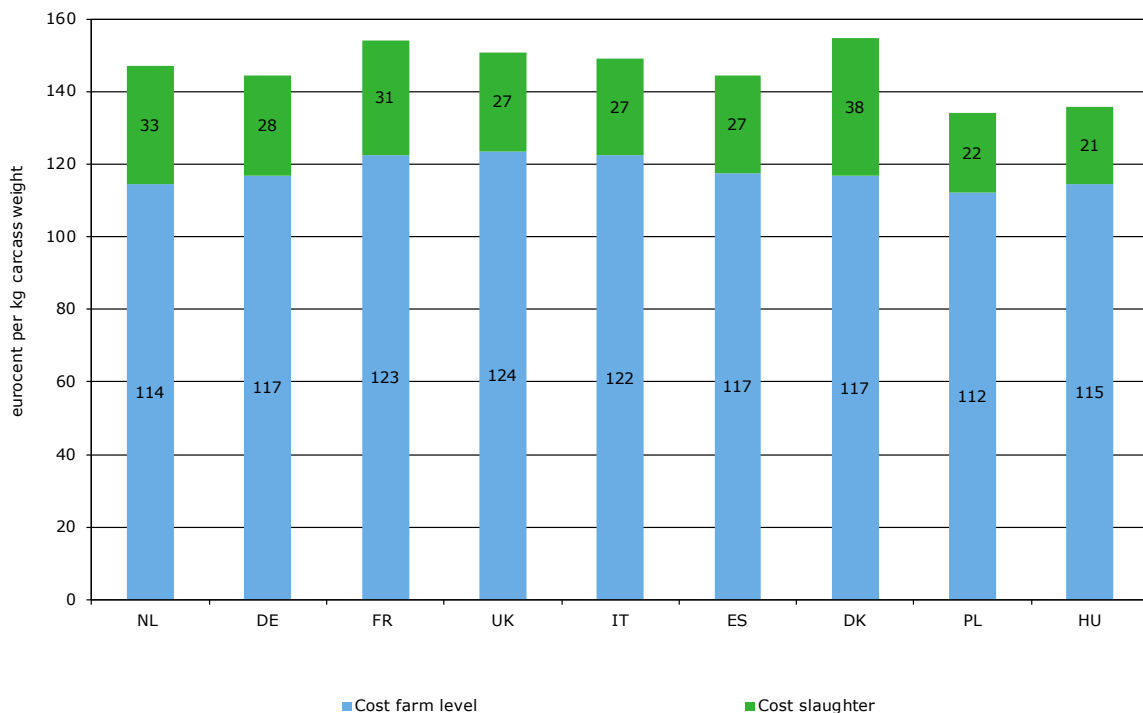


Figure 3.2 Costs of primary production and slaughter of broiler in eurocents per kilogram of carcass weight in 2017

3.2 Production costs in some non-EU countries

The production costs of poultry meat was researched in six countries outside Europe: the United States of America (USA), Thailand (THA), Brazil (BRA), Argentina (ARG), Russia (RUS) and Ukraine (UKR). Brazil and the USA are the main exporters to the world market. Brazil and Thailand are the main suppliers of (frozen) poultry meat to the EU. Argentina is an important 'low costs producer' and also exports poultry meat to the EU. Ukraine was in 2017 the number three supplier of poultry meat to the EU. The data for the United States are based on information from the National Chicken Council (NCC). For Brazil, data are available from the research organisation Embrapa. For Thailand, Argentina, Russia and Ukraine, the information is based on several sources. Production costs for these countries were calculated in local currency and subsequently converted into euros, using the average exchange rate for 2017 (Appendix 1).

3.2.1 Production costs at primary farm

Figure 3.3 shows the total production costs for the EU as compared to the USA, Thailand, Brazil, Argentina, Russia and Ukraine. In the EU, the average total production costs were 82.5 eurocents per kg live weight in 2017. In Brazil, the USA and Ukraine, production costs are significantly lower than in the EU, respectively 63.2, 64.5 and 67.2 eurocents per kg live weight. Thailand, Argentina and Russia also have lower production costs compared to the EU: Thailand 72.4 eurocents, Argentina 73.3 eurocents and Russia 75.2 eurocents per kg live weight. The basic assumptions for performance and prices are given in Table 3.4. The total costs and the build-up of the main items for all countries are shown in Table 3.5.

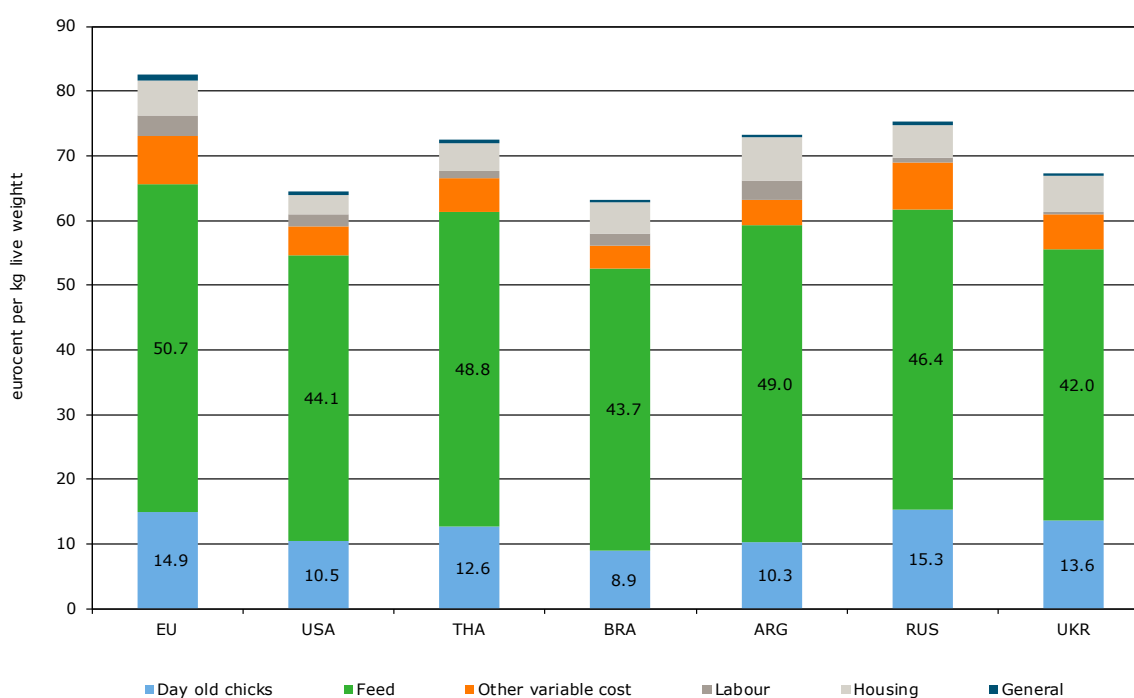


Figure 3.3 Production costs of broilers in eurocents per kg live weight in the European Union (EU) and six third countries in 2017

The feed price determines the total production costs to a significant extent. The feed price is considerably lower in Ukraine, Brazil and the USA than it is in the EU. The lower feed price in these countries can largely be explained by the domestic availability of sizeable quantities of feed ingredients such as maize and soy bean. European producers partly depend on South American

imports for their feed ingredients. The costs of storage, transport and margins increases the price of feed ingredients in Europe. The price of day-old chicks is also lower because of the low feed price. Table 3.4 also shows the most important zoo-technical results for third countries. In the USA, Brazil, Argentina, the final weight of broilers is higher than it is in the EU. When the final weight is higher, then the feed conversion is also higher. Still, the feed conversion is relatively high in some countries.

Table 3.4 Prices and technical performance for broiler production in EU and selected non-EU countries

	EU	USA	THA	BRA	ARG	RUS	UKR
Feed price (euro /100 kg)	31.1	24.1	29.6	24.4	27.2	27.8	24.2
Day-old chick (eurocent)	32.6	27.0	28.9	22.3	25.5	32.0	32.0
Live weight (g)	2,294	2,700	2,400	2,600	2,600	2,200	2,480
Feed conversion	1.63	1.83	1.65	1.79	1.80	1.67	1.74

Table 3.5 Costs of primary production in EU and selected non-EU countries in eurocents per kg live weight a)

	EU	USA	THA	BRA	ARG	RUS	UKR
Total cost (incl. labour)	82.5	64.5	72.4	63.2	73.3	75.2	67.2
Total cost (excl. labour)	79.4	62.6	71.3	61.2	70.4	74.5	66.8
Day-old chicks	14.9	10.5	12.6	8.9	10.3	15.3	13.6
Feed	50.7	44.1	48.8	43.7	49.0	46.4	42.0
Other variable cost	7.5	4.5	5.1	3.4	4.0	7.3	5.2
Labour	3.1	1.9	1.1	2.0	2.9	0.7	0.4
Housing	5.5	2.9	4.3	4.9	6.8	5.0	5.6
General	0.8	0.7	0.5	0.4	0.4	0.4	0.4
Manure disposal	0.1	-	-	-0.1	-0.1	-	-0.1

In addition to the aforementioned differences in the feed price and purchase price of day-old chicks, some third countries also have the advantage of lower housing and labour costs. The reason for the lower labour costs in Thailand, Brazil, Argentina, Ukraine and Russia are lower wages but also lower social security premiums. The difference in labour costs between Europe and the US is mainly attributable to the social security system, with higher employer charges in Europe.

In all non-EU countries, broiler producers have no costs for manure disposal. In Brazil, Argentina and Ukraine, the removal of dry poultry manure even is a small source of income.

In Brazil, Argentina, Thailand and Ukraine producers have lower costs, because on many aspects of the production no legislation exists as in the EU. Examples are the use of antimicrobial growth promoters and meat-and-bone meal in broiler feed, and the absence of environmental legislation. Meat-and-bone meal is used in countries outside the EU, but it is explicitly forbidden in the EU. Feed with meat-and-bone meal is cheaper. Some GMO crops can be grown and used in broiler feed in third countries, which are not allowed in the EU.

3.2.2 Production costs after slaughter

The costs of slaughter also play an important role in the international comparison of competitiveness. It is assumed that the differences in slaughter costs between the countries are mainly a result of differences in labour costs. Based on the wages for slaughterhouse workers, the costs of slaughter are calculated for the selected non-EU countries. Hourly wages for workers in slaughterhouses, including social taxes, in some countries are: the USA €13.5, Thailand €2, Brazil €3, Argentina €6, Russia €3.5 and Ukraine €2. In the calculations per country also differences in interest rates are taken into account and the fact that inspection costs are lower in third countries compared to the EU. Table 3.6 gives the results of costs at farm level and the costs of slaughter in eurocents per kg carcass weight. Figure 3.4 gives the same data in a graph.

Table 3.6 Costs of primary production, costs of slaughter and total costs in eurocents per kg carcass weight

	EU	USA	THA	BRA	ARG	RUS	UKR
Cost farm level	118	92	103	90	105	107	96
Cost slaughter	28	25	17	17	20	19	18
Total	146	117	120	108	125	126	114

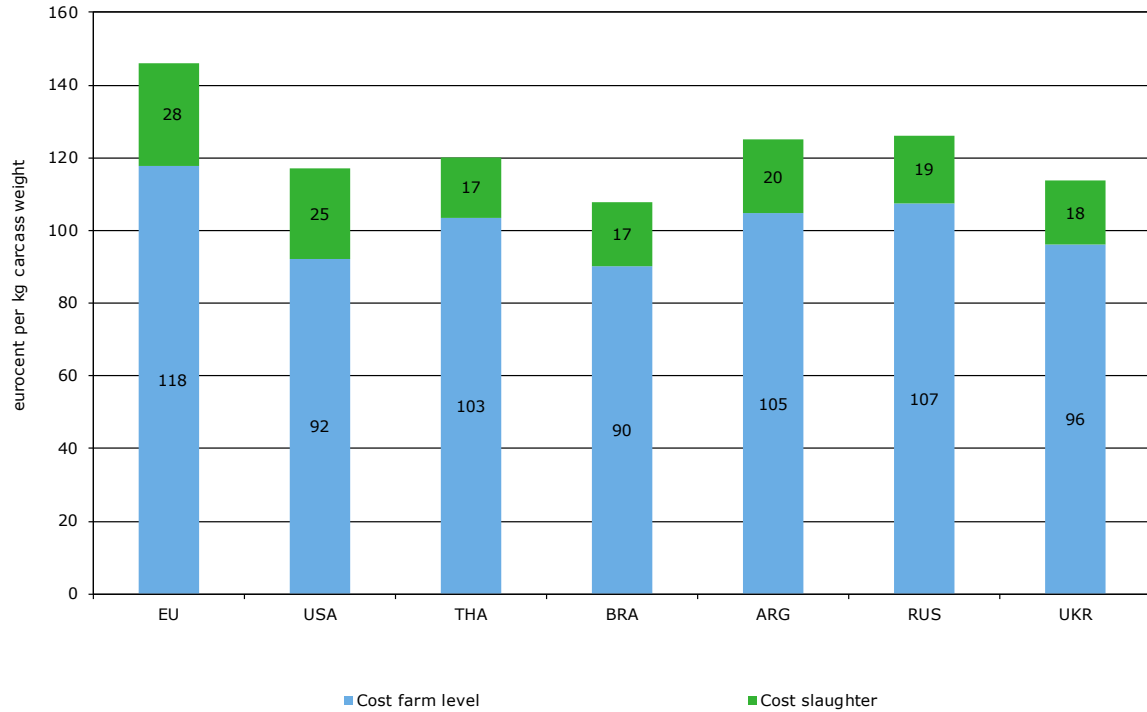


Figure 3.4 Costs of primary production and slaughter of broilers in eurocents per kg slaughter weight in the European Union and six third countries in 2017

In the EU, the average production costs after slaughter are 146 eurocents per kg carcass weight. Brazil and Ukraine have very low costs with 108 to 114 eurocents per kg carcass weight, which is around 25% lower than the EU average.

4 Results of different scenarios

4.1 Description of the scenarios

Three scenarios were developed to show how a change in import levies and a change in the exchange rate may impact the competitiveness of the EU poultry meat sector:

1. A change in the EU import levy on poultry meat, as a possible result of a new multilateral (WTO) agreement or bilateral agreements.

In this scenario, the basic import levy is reduced by 50%

2. A change in exchange rates of the US dollar, Thai baht, Brazilian real, Argentine peso, Russian rouble and Ukrainian hryvnia.

In this scenario, a 10% lower exchange rate is assumed for the currencies of the non-EU-countries. The average exchange rates in 2017 were used to convert the production costs of all countries into euros. Appendix 1 shows the development of the exchange rate in these non-EU countries. The graph and the table in Appendix 1 illustrate that a 10% lower exchange rate is a realistic scenario for some countries.

3. A combination of a lower import levy (scenario 1) and a lower exchange rate of third country currencies (scenario 2). This is the 'worst case' scenario.

In this chapter these three scenarios have been examined for breast fillet. In all figures, the EU level is an average of the nine EU countries shown in chapter 2.

4.2 Production costs of breast fillet

Based on the calculation of the production costs at farm level and in the slaughterhouse (see Chapter 2), the production costs of breast fillet was calculated for all countries. After slaughter the bird's carcass has to be cut into different parts: breast cap, leg quarter, wings and rest of the carcass. In the next processing step, the breast cap will be deboned, and breast meat will be the final product. Breast meat is the product with the highest value on the European market and, therefore, it is the most interesting product to be exported to the EU. To calculate the production cost of breast meat for all countries, we added the following costs to the production after slaughter: the costs of cutting up the breast cap and the costs of deboning it. For EU countries, the disposal costs for offal were added. Revenues come from the sale of the legs/leg quarters, the wings and the rest of the carcass. Finally the revenues were subtracted from the total costs. For the non-EU countries, the offal also results in revenues. The result of the calculation is the net production costs of a kg of breast meat at the processing plant in the production country.

To compare the offer price on the EU market, we also added the additional costs of transport for all countries. Transport costs include local transport to the harbour, sea freight in a container, handling costs in the harbour, and transport from a European harbour to the final location within Europe. Frankfurt am Main in Germany is set as a reference to calculate the transport costs. The import levies were also added to these costs. Figure 4.1 gives an overview of all costs components to compare the offer price of the selected non-EU countries to the EU average.

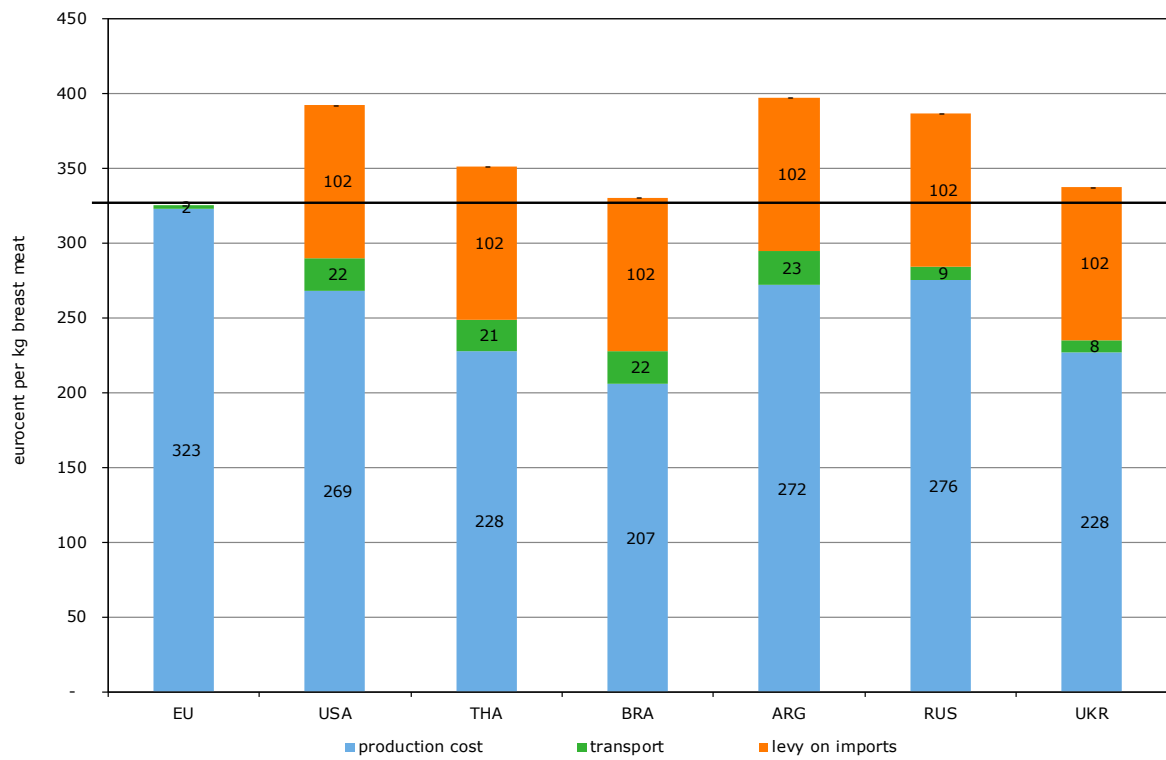


Figure 4.1 Offer price of breast fillet from EU average (horizontal line) and non-EU countries in eurocents per kg breast meat in 2017

In 2017, the offer prices of Brazil and Ukraine was equal or just above the EU average offer price of breast fillet. Figure 4.1 illustrates that the import levies protect the EU countries from large imports of breast meat from third countries.

4.3 Scenario 1 - Lower EU import levy

In scenario 1, the impact has been examined of a 50% lower import levy on imports into the EU.

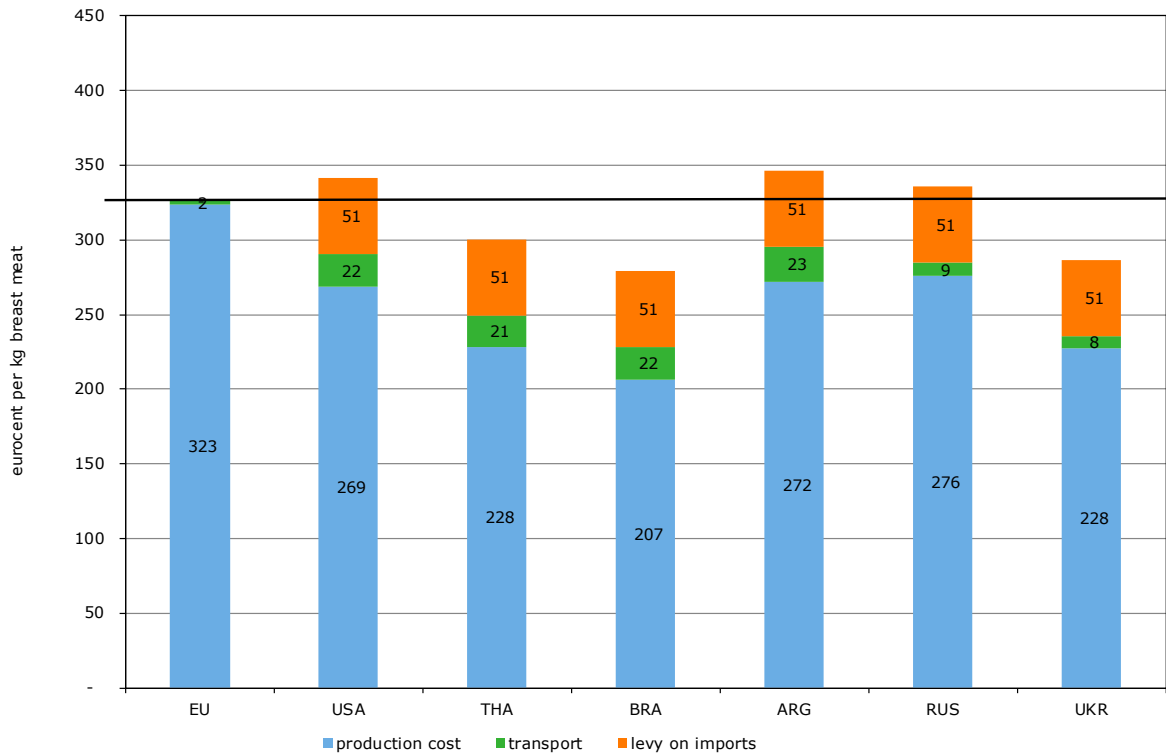


Figure 4.2 Offer price of breast fillet from EU average (horizontal line) and non-EU countries in eurocents per kg breast meat (scenario 1: 50% lower basic import levy)

As Figure 4.2 illustrates, in this scenario Brazil would be the most competitive suppliers of breast fillet to Frankfurt in 2017. Thailand and Ukraine would also have a lower offer price than the EU countries do. The USA, Argentina and Russia have an offer price, after including the lower import levy, slightly above the average offer price of the EU countries.

4.4 Scenario 2 - Change in exchange rates

Scenario 2 evaluates the consequences of 10% lower currency exchange rates of all non-EU countries.

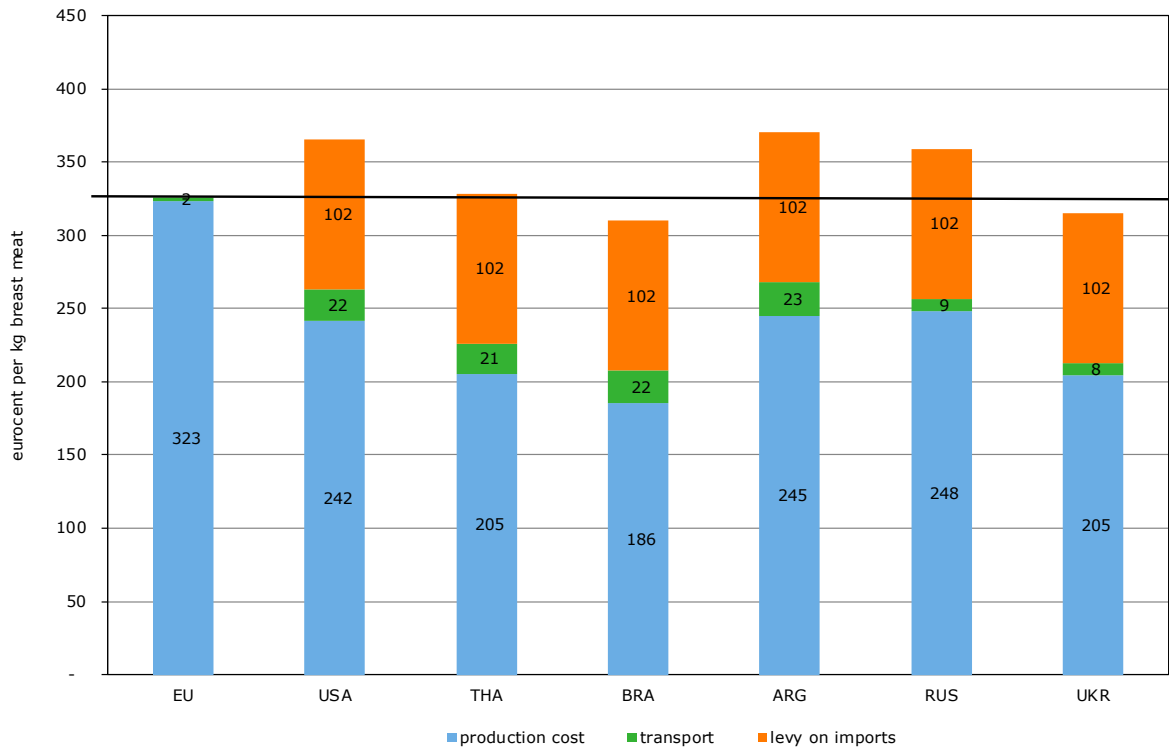


Figure 4.3 Offer price of breast fillet in Germany from EU average (horizontal line) and non-EU countries in eurocents per kg breast meat (scenario 2: 10% lower exchange rates)

Lower exchange rates have less impact than the lower import levies of scenario 1. However, Figure 4.3 shows that even in the case of only 10% lower exchange rates Brazil and Ukraine have an offer price for breast fillet below the EU average price.

4.5 Scenario 3 – Combination

Scenario 3 is a 'worst-case scenario' with a combination of scenarios 1 and 2: a lower import levy (scenario 1) and a 10% lower exchange rates of all non-EU currencies (scenario 2).

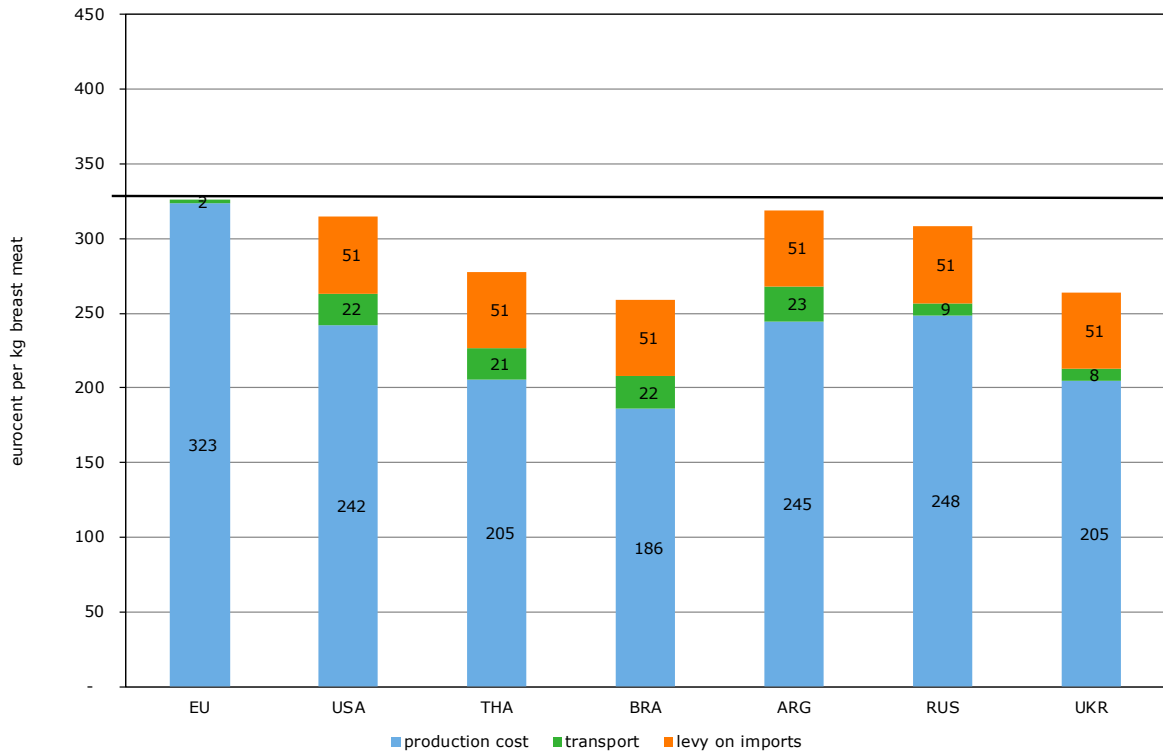


Figure 4.4 Offer price of breast fillet in Germany from EU average (horizontal line) and non-EU countries in eurocents per kg breast meat (scenario 3: lower import levy and 10% lower exchange rate)

The combined consequences of lower import levies and 10% lower exchange rates are indicated in Figure 4.4. In this worst-case scenario, all third countries obtain a competitive position on the EU market for breast fillet.

Imported poultry meat from third countries is frozen, so it cannot be used for the fresh-food market. However, Ukraine could have a different position. The distance to some EU countries is so close that export of fresh, chilled poultry meat could be an option.

5 Conclusions

Structure and employment

In 2017, the total poultry meat production in the EU-28 was 15.9m tonnes. The main poultry meat was broiler meat (81% of the total poultry meat production), followed by turkey meat and duck meat. The total number of farms with poultry in the EU-28 is more than 2m. Of these farms, 19,000 can be described as professional because they have more than 5,000 birds. In the poultry meat supply chain, different companies are involved in supplies (e.g. hatcheries, feed mills) and slaughter/processing. The supply chain needs approximately 23 full-time workers for the production of 1,000 tonnes of poultry meat. The estimated total employment in the EU poultry meat industry is 367,000 employees.

Economic importance of the poultry meat sector

The total production value of the poultry meat sector in the EU-28 in 2017 was almost €38bn. This is the total value of the production at the primary farms, the slaughterhouses and the further processing of the poultry meat. The EU is an important player in the international trade of poultry meat. In 2017, the EU-28 exported 1.662m tonnes of poultry meat with a value of €1.988bn (average value €1,196 per tonne). At the same time, the EU-28 imported 0.806m tonnes with a value of €2.015bn (average value €2,500 per tonne).

EU legislation

In the EU, poultry meat producers have to comply with European legislation. The additional costs of EU legislation are estimated at 6.1% of the total production costs in 2017. These costs directly relate to EU legislation on environmental protection (Nitrate directive and reduction of ammonia emissions), food safety (Salmonella control, ban on the use of meat-and-bone meal, antibiotic growth promoters and GMO crops as feed ingredients) and animal welfare (minimum standards on space allowance).

Third countries

In general, many non-EU countries have very little to no legislation on environmental protection and animal welfare. Some countries, especially the USA, do have legislation on food safety. The main poultry meat exporting countries in the world are Brazil and the USA. Main exporters to the EU are Brazil, Thailand and Ukraine. These countries have no environmental or animal welfare legislation. However, in Brazil and Thailand the stocking density is relatively low, due to high temperatures and low housing costs. All mentioned third countries have no legislation in the following areas: the use of GMO feed ingredients, use of meat-and-bone meal in poultry feed, the use of growth promoters, and the control of ammonia emissions from poultry houses and during manure application.

Production costs within the EU

The production costs of broiler meat have been calculated for the Netherlands, Germany, France, United Kingdom, Italy, Spain, Italy, Denmark, Poland and Hungary. The production costs in 2017 at farm level in these countries were, on average, 82.5 eurocents per kg live weight. After slaughter, the production costs for these countries ranged from 134 (Poland) to 155 eurocents (Denmark) with an average of 146 eurocents per kg carcass weight.

Production costs in non-EU countries

The production costs of broiler meat were calculated for the following third countries: the United States, Thailand, Brazil, Argentina, Russia and Ukraine. For all these countries, the production costs after slaughter per kg carcass weight in 2017 were lower than in the EU: in Brazil (74% of the EU average), in Ukraine (78%), in the USA (80%), in Thailand (82%), in Argentina (86%) and in Russia (86%). In Brazil, Ukraine and USA the feed prices were low, due to the domestic availability of large quantities of raw materials. Most third countries also had the advantages of lower housing and labour costs (lower wages and low taxes and social security contributions), and little legislation for poultry meat production.

Imports of breast fillet from third countries

The EU is a large importer of poultry meat. Imports of breast fillet mainly come from Brazil and Thailand (see Appendix 2). Salted breast fillet is imported within quota at a low import levy of 15.4%. Cooked breast fillet is imported within quota at a low import levy of 8%. Natural (not prepared or processed) breast fillet has a small quota and imports occur outside the quota. Outside the quota an import levy of €1.02 per kg has to be paid. Despite these high import levies, the imports are competitive, and in 2017, 79,000 tonnes of natural breast fillet was imported.

Comparison with earlier studies

This study is an update of two earlier reports with base year 2013 and 2015. The costs of the EU producers decreased. In 2017 production costs did also decrease in the USA and Thailand. Production costs in Brazil and Ukraine showed a small increase. As a result the competitive position of the EU compared to these two countries improved a little in 2017. Figure 5.1 gives the production costs after slaughter for 2011, 2013, 2015 and 2017. The graph illustrates that in all years Brazil and Ukraine have the lowest production costs and remain very competitive with the EU countries.

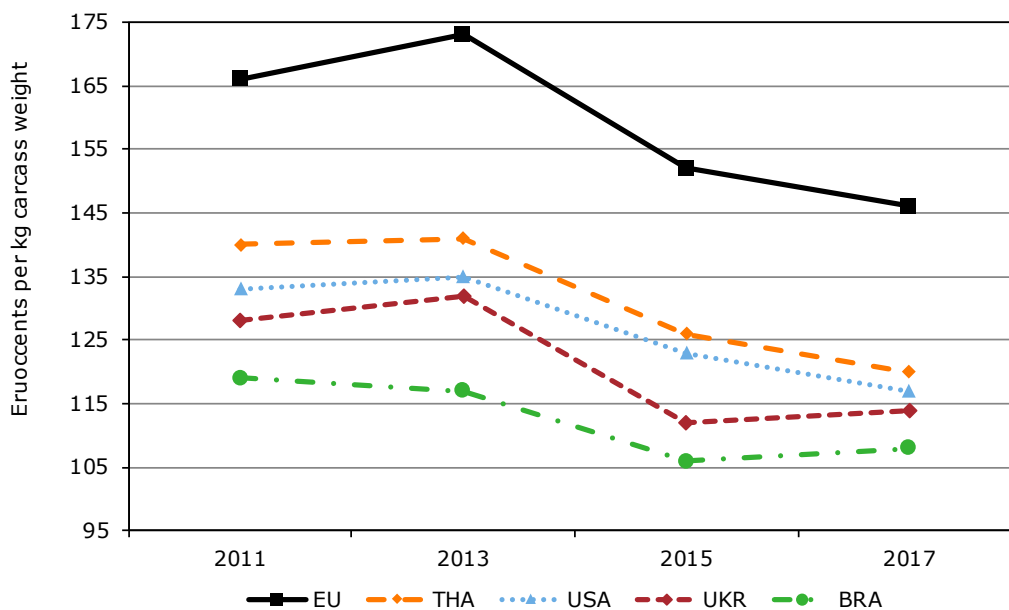


Figure 5.1 Production costs after slaughter (eurocents per kg carcass weight) in 2011, 2013, 2015 and 2017 in the EU, Thailand (THA), United States (USA), Ukraine (UKR) and Brazil (BRA)

Basic situation on import of breast fillet

Adding the costs of cutting up and deboning to the production costs at farm level and in the slaughterhouse and subtracting the revenues of other parts, resulted in the production costs of breast fillet for the EU and non-EU countries. After transportation costs and full import levies were added to the breast fillet costs of the third countries, results showed that Brazil and Ukraine can compete with the offer price of breast fillet of the EU poultry meat industry.

Scenarios

Three scenarios were developed to show how possible changes in import levies and exchange rates may impact the competitiveness of the EU poultry meat. In scenario 1, a 50% lower basic import levy on poultry meat was used to illustrate the impact of any multi- or bilateral agreement with lower import levies. The results show that in this scenario Brazil, Ukraine and Thailand had a lower offer price of breast fillet than the EU poultry meat industry. In scenario 2 with 10% lower exchange rates, Brazil and Ukraine had a lower offer price of breast fillet than the EU industry. In scenario 3, with a worst-case combination of 50% lower import levies and a 10% lower exchange rate, all third countries in this study show a lower offer price than the EU industry.

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Appendix 1 Development of the currency exchange rate

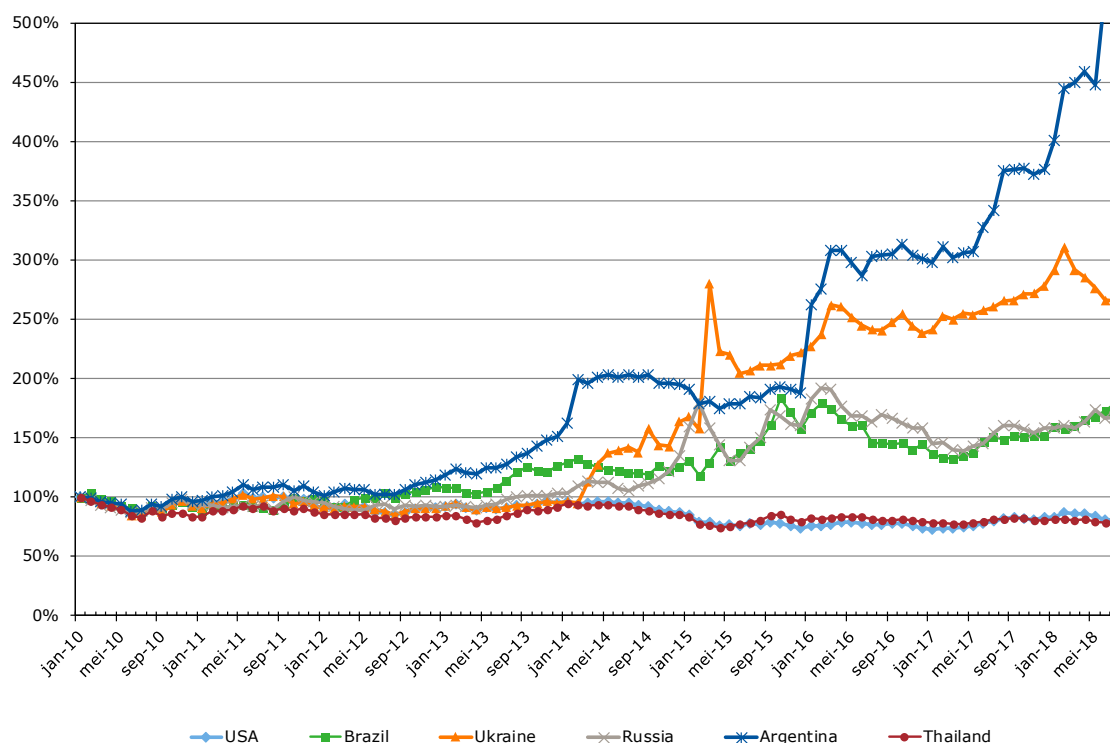


Figure A1.1 Development of the exchange rate of the currencies of USA, Brazil, USA, Ukraine, Russia, Argentina and Thailand against the euro (January 2010 = 100%)

Figure A1.1 show that a 10% change in exchange rate (scenario 2) is a realistic scenario. Between 2017 (the base year of this study) and the first half of 2018, the exchange rates of all currencies increased against the euro. A higher exchange rate of the currency results in a lower offer price of poultry meat of these countries in Europe. The exchange rate development of Argentina and Brazil increased the most. Although to a lesser extent than for Argentina and Brazil, also for Ukraine, Russia and the USA the value development of the local currency to the euro between 2017 and 2018 was in a similar direction. Table A1.1 gives the average exchange rate to the euro which were used to calculate production costs for 2017 (local currency in euros). In the second and third column, the average exchange rates in the first half of 2018 and the difference between 2018 and 2017 are given.

Table A1.1 Average exchange rate against the euro in 2017, first half of 2018 and the difference

Country	2017	First half of 2018	2018/2017
Ukraine	0.0336	0.0308	92%
Russia	0.0153	0.0140	92%
USA	0.8905	0.8300	93%
Brazil	0.2789	0.2415	87%
Argentina	0.0540	0.0388	72%
Thailand	0.0262	0.0260	99%

Appendix 2 Import and export of poultry meat

Imports of breast fillet

The EU is a large importer of poultry meat, mainly from Brazil (50% of EU imports) and Thailand (33%). Table A2.1 gives the amount imported from 2013-2017 from the most important third countries. The total import of poultry meat in 2017 was 0.806m tonnes. The total value of the EU poultry meat imports in 2017 was €2.015bn. The average value in 2017 was €250 per 100 kg of imported poultry meat.

Table A2.1 EU Import of poultry meat (in 1,000 tonnes) from third countries

	2013	2014	2015	2016	2017
Brazil	514	501	499	504	401
Thailand	228	250	274	290	265
Ukraine	0	20	42	48	80
Chile	31	26	22	29	25
China	18	20	18	17	19
Argentina	11	11	9	6	6
other	12	10	7	8	10
total	814	838	871	902	806

Source: European Commission, February 2018.

Table A2.2 gives more detailed information on the different poultry meat products imported by the EU. Table A2.2 shows the main imports (more than 40,000 tonnes imported) and their amounts in 2015, 2016 and 2017.

Table A2.2 EU Import (in 1,000 tonnes) in 2015, 2016 and 2017 of the main poultry meat products

Gn code	Products	2015	2016	2017
16023219	cooked, prepared, meat or meat offal $\geq 57\%$	241	260	265
02109939	meat, salted, dried or smoked	265	277	212
02071410	frozen boneless cuts	96	86	79
16023230	prepared, meat or meat offal $\geq 25\%$ but $\leq 57\%$	64	67	55
16023111	preparations of turkey	47	39	38

Source: AVEC annual report, October 2018.

Figure A2.1 shows that total EU imports of chicken breast fillet from third countries have stabilised since 2008. Total imports have amounted to around 600,000 tonnes in the year 2008. In 2017, the EU imported 79,000 tonnes of natural chicken breast fillet (frozen). The imported amount of salted chicken breast fillet in 2017 was 212,000 tonnes and the amount cooked fillet was 265,000 tonnes. The imported quantities in each category have been stable over the past ten years, indicating that the quotas and import levies introduced in 2008 limited imports from third countries.

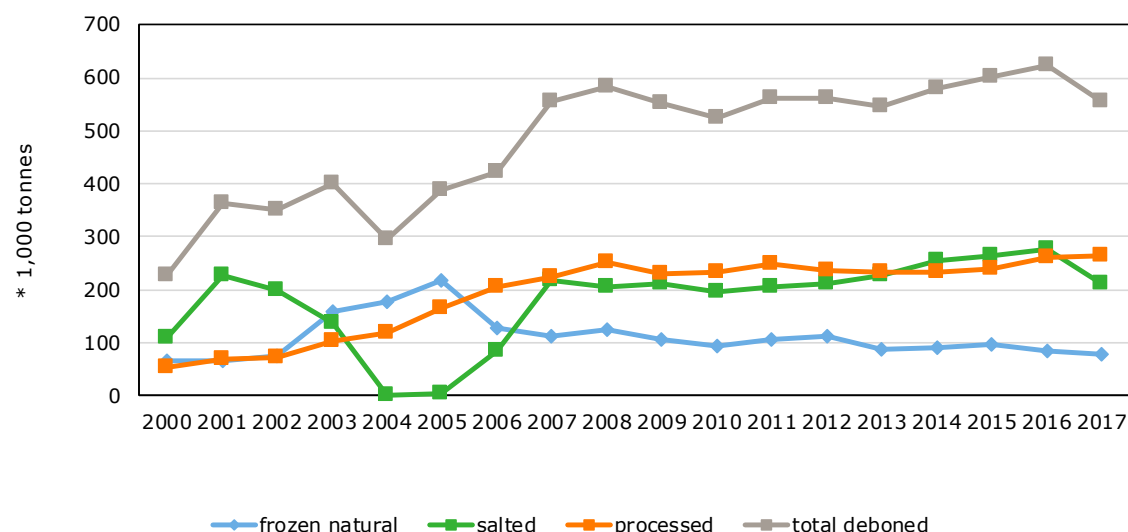


Figure A2.1 Import into EU of chicken breast fillet from third countries (in 1,000 tonnes of product)
Source: Eurostat, adaptation Wageningen Economic Research.

The EU sets quota and different import levies for imports inside or outside the quota. There are quota to maximise the total amount of imports at a low import levy for natural, salted and cooked breast fillet. Salted breast fillet is imported within the quota at an import levy of 15.4% of the value. Outside the quota the full levy is €1.30 per kg. Cooked breast fillet is imported within quota at an import levy of 8%. Outside the quota the full levy is €1.02 per kg. The EU has a limited quota for natural breast fillet and imports occur outside the quota. At import, an import levy of €1.02 per kg has to be paid. Despite these high import levies, the poultry meat imports from these third countries are competitive, and in 2017, 79,000 tonnes of natural breast fillet was imported. After the introduction of import quotas in 2008, the total imports of poultry meat have not further increased.

Exports

EU countries export poultry meat to several third countries in the Middle East, Africa and Asia. In 2017, the EU mainly exported to Ukraine, Hong Kong, Ghana, Philippines and Benin with each country importing more than 100,000 tonnes from the EU. Table A2.3 gives the amount exported to the most important third countries from 2013 to 2017. The total EU export of poultry meat in 2017 was 1.662m tonnes with a total value of €2.015bn. The average value in 2017 was €120 per 100 kg of exported poultry meat, in contrast to the average value of €250 per 100 kg for the EU imports. In general, the EU exports to third countries are lower value cuts of meat such as wings, feet and offal. These cuts are less popular on the EU market and export is a necessary outlet for the valuation of the whole bird.

Table A2.3 EU Export of poultry meat (in 1,000 tonnes) to third countries

	2013	2014	2015	2016	2017
Ukraine	76	81	91	114	163
Hong Kong	117	136	101	123	148
Ghana	75	56	68	77	135
Philippines	36	58	101	127	128
Benin	139	164	137	116	106
Saudi Arabia	155	124	143	122	99
South Africa	159	203	213	270	76
Russia	95	68	1	1	0
other	574	613	635	666	807
total	1426	1503	1490	1616	1662

Source: European Commission, February 2018.

Appendix 3 Overview of EU import levies (€/1,000) and quotas (1,000 kg) (2017)

Import quota and duties	Poultry			01.01.2017				
				Reduction Tariff		Initial duty		Quantity
				rate €/ton		amount €/ton		
Third country	Code group	CN code 6-digit	poultry species	lowest	highest	lowest	highest	
Turkey	09.0244	0207 25 / 27	turkeys	1,000	93	339	187	679
Israel	09.4092	0207 25 / 27	turkeys	4,000	100%		187	679
Israel	09.4091	020732 / 33 / 35 / 36	geese and ducks	560	100%		free	1,232
Israel	09.1372	160231	turkeys	5,000	100%		1,024	
Israel	09.1373	160232	poultry	2,000	100%		1,024	
Chili	09.1923	ex 0207 - ex 1602	poultrymeat (preparations)	17,400	100%			
GATT Oilseeds Brazil	09.4410	0207 14 (10/50/70)	gallus gallus	16,698	100%		602	1,024
GATT Oilseeds Thailand	09.4411	0207 14 (10/50/70)	gallus gallus	5,100	100%		602	1,024
GATT Oilseeds others	09.4412	0207 14 (10/50/70)	gallus gallus	3,300	100%		602	1,024
GATT Oilseeds Brazil	09.4420	0207 27 (10/20/80)	turkeys	4,910	100%		410	851
GATT Oilseeds others	09.4421	0207 27 (10/20/80)	turkeys	700	100%		410	851
GATT Oilseeds erga omnes	09.4422	0207 27 (10/20/80)	turkeys	2,485	100%		410	851
GATT	09.4067	0207 11 / 12	gallus gallus, carcass	6,249	131	162	262	325
GATT	09.4068	0207 13 / 14	gallus gallus cuts	8,570	93	512	187	1,024
GATT	09.4069	0207 14 (10)	gallus gallus frozen boneles	2,705	795		1,024	
GATT	09.4070	0207 24 / 25 / 26 / 27	turkeys	1,781	93	425	187	851
USA	09.4169	0207 11 / 12 / 13 / 14 / 24 / 25 / 26 / 27 /		21,345	50%	100%	187	1,024
Brazil - panel salted	09.4211	ex 0210 99 39	salted poultrymeat	170,807	tariff	15.40%		1,300
Brazil - panel salted	09.4214	16023219	preparations gallus gallus	79,477	tariff	8%		1,024
Brazil - panel salted	09.4251	16023211	preparations gallus gallus	15,800	tariff	630		2,765
Brazil - panel salted	09.4252	16023230	preparations gallus gallus	62,905	tariff	10.90%		
Brazil - panel salted	09.4253	16023290	preparations gallus gallus	295	tariff	10.90%		
Brazil - panel salted	09.4217	160231xx	preparations turkey	92,300	tariff	8.50%		1,024
Thailand - panel salted	09.4212	ex 0210 99 39	salted poultrymeat	92,610	tariff	15.40%		1,300
Thailand - panel salted	09.4215	16023219	preparations gallus gallus	160,033	tariff	8%		1,024
Thailand - panel salted	09.4254	16023230	preparations gallus gallus	14,000	tariff	10.90%		
Thailand - panel salted	09.4255	16023290	preparations gallus gallus	2,100	tariff	10.90%		
Thailand - panel salted	09.4256	16023929	preparations gallus gallus	13,500	tariff	10.90%		
Thailand - panel salted	09.4257	16023921	preparations gallus gallus	10	tariff	630		2,765
Thailand - panel salted	09.4258	16023940	preparations gallus gallus	600	tariff	10.90%		
Thailand - panel salted	09.4259	16023980	preparations gallus gallus	600	tariff	10.90%		
Other - panel salted	09.4213	ex 0210 99 39	salted poultrymeat	828	tariff	15.40%		1,300
Other - panel salted	09.4216	16023219	preparations gallus gallus	11,443	tariff	8%		1,024
Other - panel salted	09.4260	16023230	preparations gallus gallus	2,800	tariff	10.90%		
Other - panel salted	09.4261	16023211	preparations gallus gallus	340	tariff	630		2,765
Other - panel salted	09.4262	16023290	preparations gallus gallus	470	tariff	10.90%		
Other - panel salted	09.4263	16023929	preparations gallus gallus	220	tariff	10.90%		
Other - panel salted	09.4264	16023940	preparations gallus gallus	148	tariff	10.90%		
Other - panel salted	09.4265	16023980	preparations gallus gallus	125	tariff	10.90%		
Other - panel salted	09.4218	160231xx	preparations turkey	11,596	tariff	8.50%		1,024
PERU	09.7221			11,250 ³		100%		
UKRAINE	09.4273			17,600 ⁴		100%		
	09.4274			20,000		100%		

³ In 2018, then with an increase of 750 t each year

⁴ In 2018, then 18,400, 19,200, 20,000 t in 2019, 2020, 2021 respectively

Import quota and duties		Poultry		01.01.2017				
Third country	Code group	CN code 6-digit	poultry species	Quantity	Reduction Tariff rate €/ton		Initial duty amount €/ton	
					lowest	highest	lowest	highest
TOTAL EU IMPORT QUOTA				885,660				
EPA			All goods except those mentioned in one of the annexes				100%	
GSP (Developing countries)			All goods except those mentioned in one of the annexes				100%	

Check: European Commission Taxation and Customs Union - Taric Consultation website

http://ec.europa.eu/taxation_customs/dds2/taric/taric_consultation.jsp?Lang=en

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Wageningen Economic Research
REPORT
2018-116

The mission of Wageningen University & Research is “To explore the potential of nature to improve the quality of life”. Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 5,000 employees and 10,000 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.



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