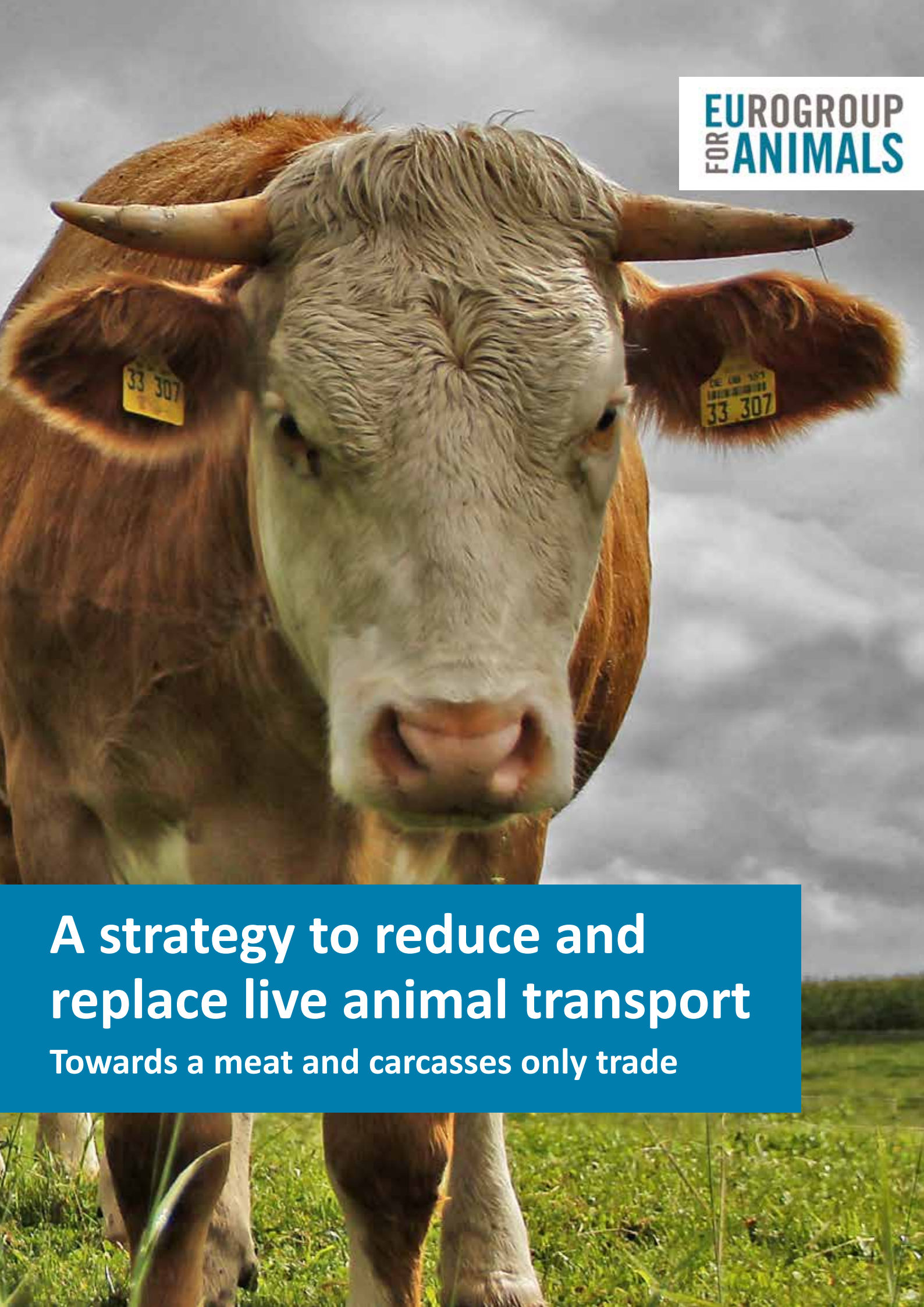

EUROGROUP FOR ANIMALS

A strategy to reduce and replace live animal transport

Towards a meat and carcasses only trade

Abbreviations

- AGRI Committee – The European Parliament's Committee on Agriculture and Rural Development
- BSE – Bovine Spongiform Encephalopathy
- BTSF – Better Training for Safer Food
- CAP – The Common Agricultural Policy
- DG SANTE – The Directorate-General for Health and Food Safety
- EAFRD – European Agricultural Fund for Rural Development
- EC – The European Commission
- EFSA – The European Food Safety Authority
- EIP-AGRI – The European Innovation in Agriculture Network
- EP – The European Parliament
- EU – The European Union
- Extra-EU trade – trade with all countries except for the Member States
- FAO – The Food and Agriculture Organization of the United Nations
- FVE – The Federation of Veterinarians of Europe
- Intra-EU trade – trade within the Member States
- NSA – The National Sheep Association (United Kingdom)
- NVWA – The Dutch Food and Consumer Product Safety Authority
- OIE – The World Organisation for Animal Health
- PDO/PGI – Protected Designation of Origin / Protected Geographical Indication
- TRACES – Trade Control and Expert System (EU)
- UECBV – The European Livestock and Meat Trading Union
- WTO – The World Trade Organization

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Co-authors: Francesca Porta, based on a technical report by AgraCEAS Consulting

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"The European Parliament calls on the Commission to develop a strategy to ensure a shift from live animal transport to a mainly meat-and-carcass and germinal products trade, given the environmental and animal welfare and health impacts of live animal transport; considers that any such strategy must address the economic factors that influence the decision to transport live animals; calls on the Commission to include transport to third countries in this strategy..."

European Parliament, 2019. **Implementation Report on the transport of live animals both within and outside the European Union.**

"The Commission will foster a dialogue to explore possible tools for shifting towards trade in meat, when feasible, as well as the facilitation of trade in animal products"

European Commission, 2019. **Follow-up to the European Parliament non-legislative resolution on the protection of animals during transport within and outside the EU.**

A strategy to reduce and replace live animal transport

Towards a meat and carcasses only trade

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Executive Summary

Over the years, leading bodies such as the World Organisation for Animal Health (OIE), The Food and Agriculture Organization of the United Nations (FAO), The European Food Safety Authority (EFSA) and the Federation of Veterinarians of Europe (FVE) have been calling for a strategy to shift to a meat and carcasses trade to gradually phase out live animal transport. They base the rationale of this transition on animal welfare and health grounds.

However, despite this scientific advice, an increase in the transport of live cattle, sheep/goats and pigs was registered both intra-EU and extra-EU since 2005. Indeed, between 2014-2017 the transport of these species across the EU increased by 14.2%, confirming a trend that, according to Trade Control and Expert System (TRACES) data, started in 2005. The same evolution affected the EU export of live animals. TRACES data shows that overall the number of live animal consignments exported from the EU increased substantially between 2005 and 2015, with the growth consolidating between 2012 and 2017.

By analysing the trade flows and other data available, this report provides an overview of the supply and demand factors sustaining the intra- and extra-EU trade. In the case of the intra-EU trade, key issues are the structure of livestock production, characterised by an increasing specialisation of production and separation into breeding and fattening enterprises, and slaughterhouse availability, as well as capacity.

Slaughterhouse availability is considered one of the major reasons that live animals are still transported alive across the EU. Despite the lack of systematic data on the number and structure of slaughterhouses across the EU, case studies make it clear that the EU slaughter sector has been undergoing, and continues to undergo, a process of transition towards fewer but larger slaughterhouses. This has been driven by the need to achieve economies of scale (a proportionate saving in costs gained by an increased level of production), as slaughterhouses operate on small margins and high throughput. It also tends to be more efficient for larger slaughterhouses to meet the standards required by the EU's 2006 Hygiene Package. Larger slaughterhouses inevitably need to source supply from a wider geographical area to ensure they continue operating close to the full capacity that will enable them to achieve these economies of scale. This has resulted in longer journey times for live animals.

This report builds on the 2019 call by the European Parliament (EP) echoed by the European Commission (EC), to formulate a strategy to shift to meat and carcasses as well as the semen and embryos trade. This trade is already a reality and should be systematically promoted and implemented for animal health and welfare, economics and environmental reasons. To this end, this report highlights potential policy, structural and financial initiatives that, by negating the drivers of live trade, should be taken into account in developing a strategy to shift to a meat and carcasses-only trade. This is further substantiated by examples where live trade has been reduced. It recommends looking into the following initiatives:

- Improving slaughterhouse availability with a range of possible solutions, including support via the European Agricultural Fund for Rural Development (EAFRD) funding for the opening of local/regional slaughterhouses; the development of mobile slaughter facilities; and supporting the case for on-farm slaughtering - under appropriate biosecurity and animal welfare conditions - to mitigate the lack of availability of slaughterhouses in key areas of livestock production.
- Encouraging the use of embryos and semen rather than breeding animals and the use of "closed" farming systems which do not involve the separation of the different stages of production, and in which replacement animals are bred on-farm. Support could be available via EAFRD funding.
- Providing assistance to improve cold chain capacity in major third country live export markets. Investment support could be provided under EU development aid programmes.
- Supporting the transport of meat in carcasses or primal cut form (rather than broken down into cuts), not only to address consumer demand for cutting to local or traditional tastes, but also to promote EU-based added value activities. To this end, the industry in exporting Member States can produce guidelines and use standards that provide the exact specifications of carcasses or primal cuts required in importing markets in the EU and in third countries. This could be supported using export promotion funds. Investments in the cold chain in importing countries would help to mitigate concerns over freshness, thereby improving consumer trust in the meat and carcasses trade. This could be further supported by marketing campaigns.
- Supporting training on ritual slaughter with reversible pre- slaughter stunning in the EU to reduce demand for live animals in third countries. Under the EU Better Training for Safer Food (BTSF), training for Competent Authority staff responsible for controls in this area could be provided.

Introduction

The EU has had rules governing animal welfare during transport since 1977 (Directive 77/489/EEC). However, it was with Council Directive 95/29/EC in 1995 that provisions of animal welfare, such as maximum travelling time and maximum stocking density, were introduced. Since 2007 the transport of live animals has been regulated via Council Regulation (EC) No 1/2005 (the Transport Regulation). Indeed, the EU judged it to be more appropriate to set out the community rules governing live transport in a Regulation.

Today, the Transport Regulation applies to all livestock transport within and from the EU, regulating the rest periods, the training and authorisation of drivers, stocking densities and general transport conditions. Unfortunately, the vast number of derogations still allow animals to be transported for days on end throughout and outside Europe. Additionally, the enforcement of existing rules is very poor and control by public authorities is scarce, leading to very poor compliance and animal suffering. Twelve years after the Regulation came into force, its main aim - the protection of animals during transport - is not being met.

Confronted with this evidence, the EP in the Resolution of 14 February 2019 on the implementation of the Transport Regulation, called for replacing the transport of live animals with the trade of meat and carcasses, as well as semen and embryos. This call is echoed by experts recommending to phase out live animal transport, including the Federation of Veterinarians of Europe (FVE), the World Animal Health Organisation (OIE) and The European Food Safety Authority (EFSA).

In line with this scientific advice and the call of policy makers, this report provides an overview of the trade flows and identifies and analyses what is driving the transport of animals. It puts forward proposals on how to mitigate those drivers with the aim to facilitate the transition to a meat and carcasses-only trade.

1 Mapping the long-distance trade in live animals

This chapter provides an overview of the major intra-EU (within the Member States) and extra-EU (from the Member States to non-EU countries) trade routes with regards to the transportation of cattle, pigs and sheep/goats. The definitions, the sources and the methodology used for the data extraction are reported in Annex I Chapter 1. Maps on trade flows are presented in Annex I Chapter 2.

1.1. The intra-EU trade

In summary:

In the period 2005-2015:

- Intra-EU trade flows (number of animals) have increased for pigs, it remained relatively stable for cattle, and it decreased for sheep/goats;
  Long distance journeys (>8 and ≤24/29 hours) and very long distance journeys (>24/29 hours) have increased in absolute terms (number of consignments, all species), while long distance journeys have also increased in relative terms (as a % share of all consignments);
- The number of long-distance journeys increased relatively more than the number of short-distance journeys (<8 hours).

In the period 2014-2017:

- The EU intra-trade flows have increased for live cattle (+8.3% animals), pigs (+15.3% animals), and sheep/goats (+10.8% animals).

According to TRACES data[1], the analysis of the number of consignments and numbers of animals for the three species considered in this study - cattle, pigs and sheep/goats[2] - indicates that, during the 2005 to 2015 period, the **total intra-EU trade of live animals has increased:**

- from 212,548 consignments in 2005 to 253,524 in 2015;
- from 25.4 million animals in 2005 to 41.4 million in 2015.

To some extent, this reflects the enlargement of the EU from 25 Member States in 2005 to 28 in 2013. This had implications in terms of live animal transport, as the geographical expansion of the EU inevitably increased the distances involved in what is now intra-EU trade.

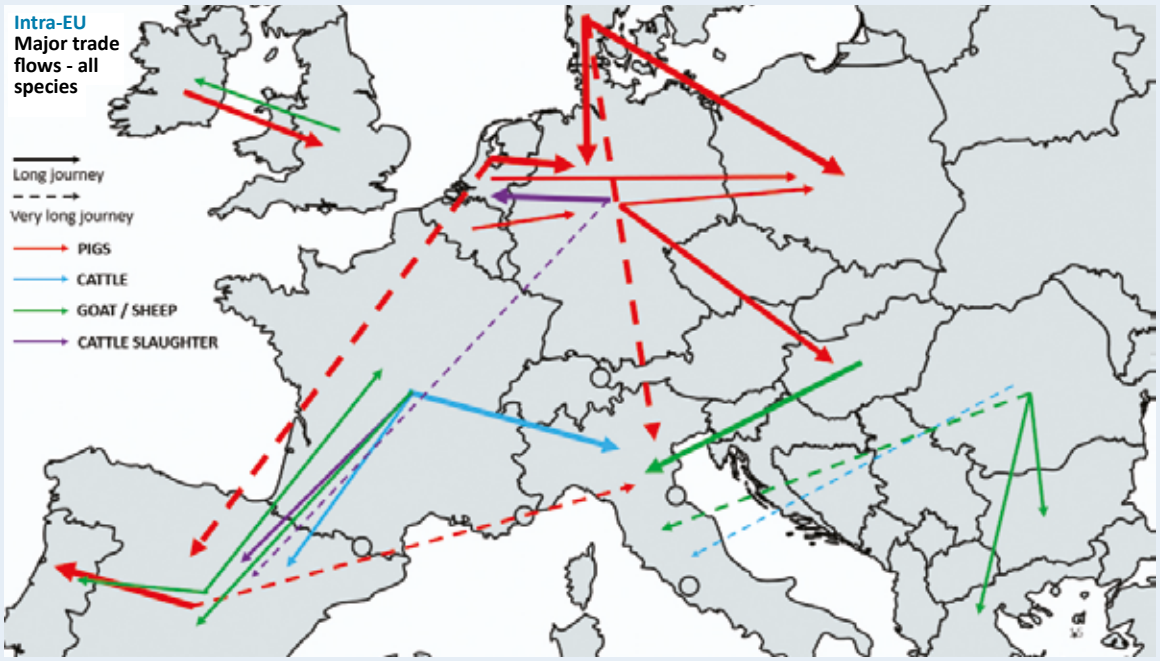
The data also shows an **increase in the average number of animals per consignment for cattle** and for **pigs**, but a **reduction in the average number for sheep/goats**. While the total number of consignments has remained stable or increased only slightly for all species during this period, there are differences between species in the trend of the number of animals. For cattle it has increased slightly; for pigs it has doubled; and for sheep/goats it has decreased.

The number of consignments[3] involved in **long-distance transport (of more than 8 and less than 24/29 hours) has increased**. Again, to some extent this reflects the EU's enlargement to the east. Indeed, the biggest increase in long-distance journeys (+80%) occurred between 2005 and 2009, after the accession of Bulgaria and Romania to the EU (2007); followed by a smaller increase (+15%) between 2009 and 2015. Their share of all consignments has consequently risen from 21% in 2005 to 29% in 2015.

The number of consignments[3] involved in **very long-distance transport (more than 24 hours for pigs, and more than 29 hours for cattle, sheep/goats)** has increased more steadily during the period (+50% between 2005 and 2015). Their share of all consignments has remained relatively stable.

An analysis of the most recent trends in the intra-EU trade of live cattle, sheep/goats and pigs was also carried out. Results are reported in the paragraphs below. Main graphs of species-specific live trade flows are reported in Annex II.

[1] TRACES data used in this section were identified in a secondary source (EPRS study, 2018).
[2] TRACES data indicate trade flows of live animals, by species, duration of travel (<8h; 8h to 24h or 29h; and >24h or 29h) and departure and destination. Note that the accuracy of TRACES data in terms of fully illustrating the situation has been questioned by some animal welfare groups. Indeed, it is reported (CIWF, 2018) that the logs are often incomplete/unrealistic on times, and lack follow-up actions to ensure implementation (for example with regards to rest times/procedures at controls posts).
[3] Consignments of all species; no further breakdown of data, in terms of duration by species, is available.



1.1.1 The intra-EU trade of live cattle (2014-2017)

In summary:

Major exporters: France, Germany, the Netherlands

Major destinations: Italy, the Netherlands, Spain

Live cattle intra-EU trade increased by 8.3% over the period 2014-2017, from 3,564,206 animals in 2014 to 3,860,653 in 2017.

The increase was driven by considerable growth in exports of cattle for other purposes; that is to say, not animals meant to be immediately slaughtered. These include replacements for the dairy herd or animals for further fattening, for example. Total volumes of exported cattle for other purposes rose by 21% in 2014-2017. In contrast, exports of cattle for slaughter remained relatively stable, noting only moderate growth (+3%). Nonetheless, cattle for slaughter constitute just over half of the total number of cattle exported to other EU countries, although their share has dropped slightly over the period (from 56% in 2014 to 53% in 2017).

France is the major exporter of cattle to other EU countries, followed by **Germany** and **the Netherlands**. These three main exporters accounted for 63% of total exports (2016-2017 average); furthermore, their shares increased from 58% in 2014-2015. Other major exporters are Lithuania, Czech Republic, Belgium, and Romania. It is noted that French exports accounted for 35%[4] of total cattle exports for purposes other than slaughter, whereas Germany exported 35% of total cattle for slaughter exports.[5]

Key importers of cattle within the EU include Italy, the Netherlands and Spain, which together accounted for 70% of total intra-EU export destinations (2016-2017 average); their share has slightly dropped, from 72% of total intra-EU export destinations (2014-2015 average). Other major destinations within the EU include Belgium, Poland and Germany.

Given the significance of these destinations, the following flows are identified for intra-EU trade (the percentages shown represent the country's share of the average number of imported cattle for 2016-2017, unless otherwise indicated):

- **For slaughter: key destinations are the Netherlands** (48%) and **Spain** (24%), followed by **Belgium** (13%). Dutch imports have been on a gradual decline, from almost 800,000 animals in 2014 to just over 660,000 in 2017, while both Spanish and Belgian imports have been increasing. In Spain, imports increased from over 280,000 animals in 2014 to 370,000 in 2017, and in Belgium from almost 150,000 animals (2014) to 185,000 (2017).

[4] Average of 2016-2017; without changes in comparison to 2014-2015 average.

[5] 2016-2017 average.

- **For other purposes (incl. fattening): key destinations are Italy** (73%), followed by **Spain** (19%). Both Italian and Spanish imports have been on a stable and continuous rise in 2014-2017. In Italy, imports increased from 840,000 animals in 2014 to almost 900,000 in 2017, and in Spain from 220,000 animals in 2014 to 250,000 in 2017.

Some Member States are both significant exporters and importers of live cattle, for example the Netherlands, Spain, Belgium and Germany, but these simultaneous flows tend to be for different purposes. For example, the Netherlands imports animals mainly for slaughter and Belgium mainly for breeding/fattening, whereas Spain imports live animals for both slaughter and breeding/fattening. This reflects the level of specialisation in the EU livestock industry and livestock products supply chain.

1.1.2 The intra-EU trade of pigs (2014-2017)

In summary:

Major exporters: Denmark, the Netherlands

Major destinations: Germany, Poland

Live pig intra-EU trade increased by 15.3% over the period 2014-2017, from 30,225,267 animals in 2014 to 34,834,756 in 2017.[6]

The growth in the intra-EU trade of pigs was mostly driven by the increase in exports from the Netherlands, Denmark, Ireland and Belgium. **Denmark and the Netherlands are by far the most prominent exporters of pigs to other Member States**, accounting for 74% of total intra-EU exports (2015-2016 average). Their shares have risen by 6% in comparison to the 2014-2015 average. Other noteworthy exporters (2015-2016 average) include Germany (7%, although this represents a considerable drop in comparison to the 2014-2015 average), Spain (4%), Belgium (3%) and Ireland (3%).

Germany and Poland are by far the most prominent importers of pigs from other EU countries. Indeed, these two countries accounted for 64% of total intra-EU imports (2016-2017 average); moreover, their shares rose by 2% in comparison to the 2014-2015 average. Other major importers include Hungary, Italy, the Netherlands (all 5%), followed by Belgium and Portugal (both 4%).[7]

Bearing in mind these shares of trade flows, the highest growth was recorded in exports from the Netherlands to Germany, as the number of exported pigs grew by 42% (2016-2017 average was 7.4 million animals, compared to 5.2 million in 2014-2015 average). The increase has not been stable; this route was characterized by a drop of 16% between 2014 and 2015 and a considerable rebound in 2016, with a 50% increase.

Similarly, exports from Denmark to Poland expanded, with a 35% increase in the number of pigs exported (the 2016-2017 average was almost 5.6 million animals, in comparison to 4.1 million in 2014-2015). Even in the last two years for which data are available - 2016 and 2017 - this route recorded a significant increase of 26% in the number of animals being transported.

It should be noted that Denmark exports all its pigs to the UK as carcasses.

Although the Eurostat data set does not allow the purpose of these trade flows to be identified, CIWF described some significant trade flows, for the year 2016, as follows:

- The Netherlands exports around 1.75 million pigs a year to Spain, Italy and Central and Eastern Europe. Most are young pigs going for further fattening, but some are being sent direct for slaughter.
- Denmark exports 4.8 million pigs a year to these countries. Again, most are young pigs going for further fattening, although some are being sent for slaughter.

[6] The Eurostat data provided for pigs does not distinguish between animals for slaughter, and 'other purposes' (i.e. breeding, fattening, etc.). Only one data set ("for other purposes,") which includes slaughter and/or fattening is available.

[7] In terms of 2016-2017 average.

1.1.3 The intra-EU trade of sheep/goats (2014-2017)

In summary:

Major exporters: Romania, Hungary, France, Spain

Major destinations: Italy, Greece, Spain

Live sheep/goat intra-EU trade increased by 10.8% over the period 2014-2017, from 2,886,492 animals in 2014 to 3,198,881 in 2017.[8]

Romania, Hungary and France, followed by **Spain**, accounted for 74% of total intra-EU exports (2016-2017 average) and the total share of these four countries has remained stable in comparison to 2014-2015. Romanian exports recorded a growth of 3%, whereas both Hungarian and French exports declined by 2%.

Key importers of sheep/goats within the EU include Italy, Greece and Spain, followed by France, Ireland and Germany. The top three importers accounted for 64% of total intra-EU imports (2016-2017 average), although their share has dropped by 3% in comparison to the 2014-2015 average. Imports by France, Ireland and Germany accounted for 8%, 7% and 6% respectively (2016-2017 average), with considerable growth in German imports (5%) and a decline in French imports (3%).

Trade routes for intra-EU live sheep/goat flows appear to be stabilized and are characterized by continuous and moderate growth in established routes, for example: Romania–Greece; Romania–Italy; France–Italy; Hungary–Italy; Spain–France. It is noted that some countries are both significant exporters and importers, for example France and Spain.

Although the Eurostat data set does not allow the purpose of these trade flows to be identified, CIWF described some significant trade flows for the year 2016 as follows:

- Almost 850,000 lambs and sheep a year are sent from Hungary, Romania, Poland and Spain to Italy for slaughter.
- Around 300,000 lambs and sheep a year are sent from Hungary and Romania to Greece for slaughter.

It is believed that the majority of the sheep exported across the EU are for immediate slaughter.

1.2 Extra-EU trade

In summary:

In the period 2005-2015:

- Extra-EU trade flows (number of animals) have increased for cattle and sheep/goats and decreased for pigs.
- The 87% (11,578 consignments) of the trade with third countries are EU exports of cattle.

In the period 2014/2015 -2016/2017:

- The extra-EU trade flows have increased for live cattle (+88.3% of animals. The period of reference for cattle is 2012/2015-2016/2017), and sheep/goats (+17% of animals). A decrease was registered for pigs (-42%).

The **extra-EU trade mainly consists of exports from the EU to third countries** (i.e. EU imports from third countries are minor/limited). Analysis of the number of consignments[9] (imports and exports, for all three species) indicates that, during the 2005 to 2015 period, **exports to third countries increased**. This growth was driven mainly by **exports of cattle**, which rose both in absolute and relative terms.

Although **exports of cattle** fluctuated significantly year-on-year during the period, between the years 2005 and 2015 they increased threefold. As a share of all consignments of live animals (i.e. the total for the three species), exports of cattle increased from 76% in 2005 to 92% in 2015.

The trade of pigs and sheep/goats with third countries was low and fluctuated substantially each year. Exports of pigs fell in 2014/2015 to half the 2005 volume, despite annual fluctuation in the interim period. While in 2005 the consignments of pigs respresented 22% of the total consignments of live animals for all three species, this percentage fell to 5% in 2015.

Exports of sheep/goats also increased nearly threefold

[8] The Eurostat data provided for sheep/goats does not distinguish between animals for slaughter, and 'other purposes' (i.e. breeding, fattening, etc.). Only one data set ("for other purposes,") which includes slaughter and/or fattening is available.

[9] TRACES data on extra-EU exports from this source were only available in terms of number of consignments, not in number of animals. Hence, for extra-EU trade, this source cannot be directly compared to Eurostat data.

between 2005 and 2015, albeit from a relatively low base in relation to the other species. As a share of all consignments of live animals (i.e. the total for the three species), exports of sheep/goats remained relatively low at 2% in 2005 and 3% in 2015.

1.2.1 The extra-EU trade of live cattle (2015-2017)

In summary:

Major exporters: Germany, France, Austria, Hungary, Czech Republic

Major destinations: Turkey, Israel, Lebanon, Libya

Live cattle extra-EU trade increased by 88.23% over the period 2012/2015-2016/2017, from 425,000 animals (2012-2015 average) to just under 800,000 (2016-2017 average).

Cattle exports to third countries have nearly doubled, with the latest trend in 2015 to 2017 showing a systematic increase, following a decrease in 2013-2014.

The increase is mainly driven by **exports of cattle for breeding purposes** (presumably for the dairy herd) and for **fattening**, which in 2016-2017 were nearly 2-3 times the 2012 levels. By contrast, exports of cattle for slaughter fell dramatically in 2013 and have since progressively recovered to slightly exceed 2012 levels in 2017. Consequently, the share of animals for slaughter has fallen in 2017 to 34% of total EU cattle exports to third countries, from 53% in 2012.

Key exporters of cattle to third countries are: Germany, France and Austria, followed (in recent years) by **Hungary** and the **Czech Republic**. The three main exporters account for 54% of total EU exports (2016-2017 average), but their share has fallen (2012-2015 average: 76%). In 2016-2017 several Member States (notably Hungary, Czech Republic, Ireland, Croatia, Bulgaria and Slovakia) started to play an increasingly important role in cattle exports to third countries.

Key destinations for EU exports of cattle to third countries are Turkey, Israel and Lebanon. These three main destinations receive 75% of total EU exports (2016-2017 average); their share has increased compared to 2012-2015 average (68%). This is mainly due to the increase in exports to Turkey and Israel, which in 2016-2017 have more than doubled the average levels of 2012-2015. Exports to Lebanon, Libya and Egypt have also increased, although by relatively more modest amounts (in terms of the number of animals and relative share of EU total exports to third countries).

Bearing in mind the importance of these three destinations, the following main flows are identified for EU exports of cattle (the percentages represent the share of average number of exported animals for 2016-2017, unless otherwise indicated):

- **for breeding (dairy):** key destination is **Turkey** (66%);
- **for fattening:** key destinations are **Turkey** (41%) and **Israel** (39%);
- **for slaughter:** key destinations are **Lebanon** (43%), **Libya** (22%) and **Turkey** (17%); several other destinations (for example Algeria and Morocco) share the remaining 18%. In some cases (for example Turkey), flows are not systematic over time:

both the number of animals and the exporting EU countries can fluctuate enormously from year to year. Examples of flows of EU exports of cattle for slaughter to the most important destinations include:

- **Lebanon**: **major and relatively systematic flows, both in terms of the number of animals and origin countries.** In 2017 the EU exported 106,000 animals to Lebanon, while in previous years the number ranged from between 74,000 (2013) to 135,000 (2015). In 2017 the main EU exporters were Croatia (34%), Spain (33%) and Slovenia (27%). These countries also accounted for the bulk of the exports in previous years, when another major exporter was France, supplying between 7% and 14% of the exports.
- **Libya: important, but less systematic flows.** EU exports increased from 24,000 in 2012 to 53,000 in 2017, despite some annual fluctuations. The main EU exporter was Spain (from 50% in 2014 to 97% in 2017). In previous years, other major exporters were France (up to 12-14% in 2014-2015), Ireland (20-30% in 2013-2014) and Croatia (19% and 16% respectively in 2012 and 2013).
- **Turkey: flows are not systematic.** In 2012 nearly 130,000 animals were exported from the EU, mainly from France (64%), Hungary (27%) and Slovakia (8%). Exports during 2013-2015 dropped to minor levels, and started peaking in 2016 to reach nearly 68,000 animals in 2017. The main EU exporters in 2017 were Spain (47%), followed by Hungary and Croatia (15% each), Bulgaria (9%), Romania (6%) and Czech Republic (5%).

1.2.2 The extra-EU trade of pigs (2015-2017)

In summary:
Major exporters: Croatia, Hungary, Greece, Germany
Major destinations: Albania, Serbia
Live pig extra-EU trade decreased by 42% over the period 2014/2015-2016/2017, from 480,000 animals (2014-2015 average) to nearly 290,000 (2016-2017 average)[10].

This decline was mainly caused by considerable falls in exports from the key EU exporters in 2016 - Croatia and Hungary. In Croatia's case, the number of animals exported plummeted by 89%, between 2015 and 2016, whereas Hungarian exports went down by 44% in the same period. Both Croatian and Hungarian exports accounted for 37% of the total extra-EU trade of live pigs (2016-2017 average), compared to a 62% share in 2014-2015. Other major exporters of pigs to non-EU countries include Greece and Germany. The top four exporters accounted for 85% of total extra-EU exports (2016-2017 average).

Albania and Serbia received 72% of total extra-EU exports (2016-2017 average), while in 2014-2015 Serbia alone accounted for 54% of extra-EU exports. Indeed, exports to Serbia saw a decline of 58% between 2015 and 2016, with significantly fewer animals exported, notably by Croatia and, to a lesser extent, Hungary. Albanian imports, on the other hand, gradually rose, with the vast majority of animals imported from Greece.

1.2.3 The extra-EU trade of sheep/goats (2014-2017)

In summary:
Major exporters: Romania, Spain
Major destinations: Libya, Jordan, Israel, Lebanon
Live sheep/goats extra-EU trade increased by 17% over the period 2014-2017, to approximately 2.5 million animals[11]

The growth was driven mainly by continuous increases in exports of the **key EU exporters, such as Romania and**

[10] See footnote 6.

Spain. These two countries accounted for 94% of total extra-EU exports (2016-2017 average), although their share has slightly dropped by 2% in comparison to the previous years (2014-2015 average).

Libya and Jordan are the most prominent third country destinations by far for EU sheep/goats exports, accounting for 83% of the total extra-EU exports (2016-2017 average). The EU exports to these countries declined by 9% as exports to **Israel** registered considerable growth in 2016; as the third major non-EU destination, Israel accounted for 8% of the total extra-EU exports in 2016-2017 (average). Another notable destination for EU sheep/goats is **Lebanon** with a relatively stable trend, although there was a slight drop from 7% in 2014-2015 to 4% in 2016-2017.

Extra-EU live exports of sheep/goats is characterized by frequent fluctuations in the numbers of animals, although the two major destinations, Libya and Jordan, have maintained their strong positions. Export trade from Romania to Jordan is the most prominent route in terms of absolute numbers despite the fluctuations, ranging from 550,000 to 1.1 million animals. Other flows, such as Romania to Libya and Spain to Libya, saw continuous growth, especially during 2015-2017.

Conclusions

This introductory chapter has shown that there has been growth in the intra-EU trade in live cattle, pig and sheep/goats over the period 2014-2017. Analysis of TRACES data shows a substantial increase in long distance live animal transport within the EU between 2005 and 2015, partly as a result of the accession of new Member States.

The main exporters of cattle within the EU are France, Germany and the Netherlands, with the main importing Member States being Italy, the Netherlands and Spain. The main exporters of pigs are Denmark and the Netherlands, with the main importers being Germany and Poland. For sheep/goats, the main exporters are Romania, Hungary, France and Spain, with the main importers being Italy, Greece and Spain.

The EU also exports live animals to non-EU countries. The largest number of live exports are sheep/goats (2.3 million animals) with a further 0.8 million cattle and 0.3 million pigs exported alive (average 2016-2017). For live cattle, the main exporting Member States are Germany, France, Austria, Hungary and Czech Republic. Live cattle from the EU are sold mainly to Turkey, Israel, Lebanon and Libya. The main Member States exporting live pigs are Croatia, Hungary, Greece and Germany, with the main destinations being Albania and Serbia. The main Member States exporting live sheep/goats are Romania and Spain, with the main destinations being Libya, Jordan, Israel and Lebanon. Analysis of TRACES data shows that the majority of live exports outside the EU (in terms of number of consignments) are of cattle, and that the number of consignments of cattle exported alive increased substantially between 2005 and 2015.

[11] See footnote 8.

2 What is driving live animal transport?

This chapter investigates the main driving forces behind the transport of live animals across the EU and from the EU to third countries. The issues taken into account range from supply and demand considerations, and policy as well as regulatory aspects. As the configuration of the slaughter sector has a major impact on the transport of live animals for slaughter purposes, section 2.2 will look into that in particular. Case studies will help to explain why slaughterhouse availability is one of the factors leading to the transport of live animals over long distances (more than 8h).

2.1. The driving forces behind live animal trade

Currently, animals are transported alive for breeding/fattening purposes or for immediate slaughter. Against a background of animal welfare issues and systematic violations to the EU transport rules, live animal transport is still increasing both within and from the EU to third countries. A clear understanding of the driving forces behind the trade of live animals is key to putting forward a strategy to replace live transport with a meat and carcasses-only trade.

The driving forces behind this trade include:

- **Supply considerations:** cost, as determined by level of specialisation; access to raw materials (in particular feed costs); availability of slaughterhouse facilities; cost differentials between slaughterhouses (which are determined by scale of production, level of automation, labour costs); overall supply balance and self-sufficiency.
- **Demand considerations:** consumer preferences, including for specific types of meat/cuts and quality/freshness; the country of origin of meat; ritual (religious) slaughter; in third countries, availability of cold storage.
- **Regulatory aspects:** The high requirements set by the **EU Hygiene Package**[12] are reported to have contributed, along with other factors, to the consolidation of slaughter facilities throughout the EU (see section 2.2). The country of origin labelling rules, as adopted in 2013 for fresh (unprocessed) meat of pigs, sheep and goats (ref. leg. 1337/2013) with application from 1 April 2015[13] (see section 2.3) could also be a driver. Country of origin labelling in the beef sector (ref. leg. 1760/2000) - requiring all three production stages to be labelled, i.e. born, reared and slaughtered - has been in place for some time.
- **Policy aspects*:*** The **Common Agricultural Policy (CAP)** has also had an impact on live trade by driving increasing specialisation in fattening/breeding regions. For example, the EU veal and young cattle meat marketing standards of 2007 are reported to have led to specialisation in this segment (EC, 2014): the offspring of dairy cows, mainly bull calves but also females, are exported from the main milk producing Member States to countries that make use of these calves such as the Netherlands, France, Italy (white and rosé veal meat,) and Spain (young cattle). The reform of the EU dairy policy with the abolition of the milk quota system (April 2015) resulted in the slaughter of some dairy cows, some of which involved live transport to appropriate slaughter facilities with sufficient capacity. The reform also led to further consolidation of production in regions specialising in dairy (for example the Netherlands and northern EU, except Scandinavia), and consequent shifts from dairy to beef production in non-milk specialist regions of Europe, such as the southern European countries, Scandinavia and eastern Europe (JRC-IPTS, 2009). The combined effect of these policies has altered the supply and demand balance in relation to specialist breeding/rearing regions and regions with large-scale slaughter facilities, which leads to an increase in live transport.

Ultimately, a combination of driving forces has led to each live trade flow.

[12] https://ec.europa.eu/food/safety/biosafety/food_hygiene/legislation_en

[13] The rules implement the requirement to indicate the 'country of origin or place of provenance' of fresh meat, pursuant to Article 26 of the Food Information for Consumers Regulation 1169/2011. For the definition of 'country of origin', Regulation (EU) No 1169/2011 refers to Articles 23 to 26 of Regulation (EEC) No 2913/92 (Common Customs Code). Article 23 of this Regulation defines 'country of origin' as the country where live animals were born and raised. However, according to Article 24 of Regulation (EEC) No 2913/92 and Article 39 and Annex 11 of Commission Regulation (EC) No 2454/93, when more than one country is involved, the country of origin is the country where live pigs, sheep and goats were raised for two months before slaughter. Where this cannot be respected, the meat shall be deemed to originate in the country where the animals were reared for the longest period. 'Country' in the meaning of this Regulation is an individual EU Member State, the EU as a whole or a third country.

The supply and demand considerations above also apply as drivers of live EU exports to non-EU countries. Among these, key drivers are insufficient cold chain capacities[14] - particularly in less developed countries that are currently major destinations for EU exports in live animals - as well as logistics infrastructure (road network and ports) more generally, all of which constrains the trade in meat and carcasses. Other important factors include increasing specialisation of production and separation into breeding and fattening enterprises, consolidation in the slaughter sector, and environmental rules on manure production.

2.2. The EU slaughter sector

There is agreement with the actors of the food chain that slaughterhouse location has a major impact on the intra-EU transport of live animals.

There are no systematic data on the number and structure of slaughterhouses across the EU, but it is clear that the EU slaughter sector has been and continues to undergo a process of consolidation, with a trend towards fewer and larger slaughterhouses over time. This has been driven by the need to capture economies of scale, as slaughterhouses operate on small margins and high throughput.

The trend has been continuous over the last four decades, but it has accelerated further over the last decade since the entry into force of the EU Hygiene Package in January 2006. This imposed strict requirements that many small slaughterhouses found it difficult to meet.

While it is more efficient for larger slaughterhouses to meet these high standards, they inevitably need to source supply from a wider geographical area to ensure they continue operating close to the full capacity that will enable them to achieve economies of scale. All of this has resulted in longer journey times for live animals.

2.2.1. Major developments in the EU slaughter sector and their impact on live animal transport

The EU slaughter sector has restructured and consolidated into a smaller number of larger scale units. In Member States for which some data on the slaughter sector are available, the significant consolidation that occurred in the sector in past decades continues and is indicative of the EU trends. At EU level, a few groups control some of the largest slaughterhouses on an industrial scale; increases in scale and specialisation, also by species, to achieve cost-cutting and increase efficiency is key for these groups to maintain competitiveness.

The consolidation trend is particularly marked in the pig sector. The EU is the world's second biggest producer of pork after China, and also the largest world exporter. Germany, Spain and France account for half of the EU's total slaughter of pigs per year. The investment, as well as the mergers, made during the last ten years (2000 to 2010) have led to the creation of large groups of slaughterhouses, usually multi-species, that operate in different countries and often include processing activities. The EU is currently slaughtering around 250 million pigs per year. During 2018, 38 slaughterhouse groups were identified, with a throughput of over one million animals per year each, representing 52% of total pig slaughter in the EU. Of these, the largest 13 abbatoirs are situated in only seven Member States and account for 38% of the EU total.

Competition between the top companies has intensified in the last decade. In 2009, within the ranking of the largest slaughterhouse groups, the Dutch company Vion was in first place (20.2 million pigs slaughtered per year), followed by the company Danish Crown (18.8 million) and the German company Tönnies Fleisch (13.9 million). Within this ranking there were also four Spanish groups (Campofrío, El Pozo, Jorge SA and Grupo Vall Companys). This ranking has changed in recent years. Danish Crown has reached first place recently, after acquisition of the German company D&S Fleisch. Tönnies is close behind, with continuous expansion in Germany and recent strategic acquisitions in France and Denmark allowing it to reach a total slaughter capacity of 16.6 million pigs in 2017.

Data on the number and structure of slaughterhouses across the EU are not available. Although lists of EU approved slaughterhouses exist, under Regulation (EC) No 853/2004 on hygiene rules for food of animal origin, these do not provide information on the size of the facilities, and it is not always possible to calculate the total number and capacity of facilities performing slaughter activities for the different species. As both slaughterhouse location and size/capacity are important to understand the structure of the sector as a driver of live trade, it has therefore not been possible to map the sector in all Member States. To address this shortcoming, this report focuses on specific Member States for which some data exist at national level (see Case Studies).

[14] FAO (2011, 2012) indicates that the lack of sufficient and efficient cold chain infrastructure is a major contributor to food losses and waste, estimated at 22% of meats in the Near East and North Africa region and 25-30% of animal products in sub-Saharan Africa. According to the Postharvest Education Foundation (PEF, 2013), global food losses are in the order of 25% to 50% of production volumes, caloric content and/or market values depending on the commodity. According to the World Cold Chain Summit (2018), only about 10% of perishable foods are refrigerated worldwide, while according to a 2018 report by Global Cold Chain Alliance (GCCA) on Global Cold Storage Capacity, capacity continues to be low in most developing countries.

Case study: Germany

German slaughterhouses account for a major share of total annual EU pig slaughter volume, an equivalent of almost 58 million pigs slaughtered. Over half (57%) of the national slaughter volume is carried out in three major slaughterhouses. These slaughterhouses feature amongst the European 'giants' in terms of capacity. The Tönnies pig slaughterhouse in Rheda (East Westphalia) has an annual output of 1.1 million tonnes. The second major producer of pork and beef present in Germany is the Vion Group, with several locations in the country: Vion Emstek in Oldenburger Münsterland, Vion Crailsheim and Vion Landshut in Bavaria among others; the company slaughtered 8.5 million pigs in 2017. The third biggest company, Westfleisch, has an annual capacity of 8.3 million pigs. It focuses on North West Germany, with nine production sites in this region.

Case study: France

Data from national statistical sources (AGRESTE, 2017) indicates a geographical imbalance of the slaughterhouse sector, marked by a concentration of a large number of the largest-scale facilities in Brittany*. This region accounts for 40% of the national throughout (across all species), with the nine largest slaughterhouses in the country having an annual throughput in excess of 80,000 tonnes each. While this imbalance was already present in France in the 1990s, during the period 2000-2010 the consolidation of the sector continued, with a 21% reduction in the number of slaughterhouse facilities. Meanwhile, throughput increased in the largest facilities, and the average capacity at national level for all species reached 12,000 tonnes.[15] As a result, France remains in an situation of overcapacity, especially in the case of Brittany's slaughterhouses. The concentration of slaughterhouses is also high in other regions (with the Loire valley coming second by far), but facilities tend to be of a smaller scale. The general trend is towards more specialised facilities, with the share of specialised slaughterhouses across the country particularly important for pigs - 80% of national tonnage is in specialist facilities. Due to this structure, there is significant trade within the country in live animals for slaughter, particularly in adult cattle, which can be classified as long distance according to the methodology followed in this report (i.e. >300 km). The situation of the French slaughterhouse sector, particularly for pigs, remains fragile especially because of the cost of raw materials and dependence on foreign markets for the export sector.

** Brittany's share of the national slaughter volume is particularly high for pigs (57%), young cattle (36%) and cattle (21%). Here there are the largest French slaughterhouses for pigs (Cooperl in Lamballe), cattle (SVA in Vitré) and calves (Tendriade Collet in Châteaubourg). Nearly 40% of adult cattle slaughtered in Brittany are raised in the region, while for calves this share is 60% (INSEE, 2013). While most of the non-Breton calves come from the two neighbouring regions, the adult cattle sometimes come from further away, especially for suckler cows. As a result of these flows, specialized cattle slaughter facilities in Brittany reach a utilisation rate of about 84%, which is 10% more than the best performers in other regions. In addition, more than 13 million pigs were slaughtered in Brittany in 2013. Of these, 90% are bred in the region. Conversely, 9% of Breton pigs are slaughtered elsewhere.*

[15] A 2016 report of the French Parliamentary Commission of inquiry on slaughterhouses, indicates that in 2015, there were 263 slaughterhouses for bovine, equine, porcine and small ruminants, with a total throughput of 3.51 million tonnes for all these species. 42% of this total (1.46 million tonnes) was in multispecies slaughterhouses and 2.04 million tonnes (58%) in slaughterhouses specialising in one species. This represented 32 million animals slaughtered in 2015.

Case study: United Kingdom

There has been a great deal of consolidation in the slaughter/processing sectors. More than a third of small abattoirs have closed in the past decade, leaving only 63 in England, down from 96 in 2007. In 1970 there were about 1,900 abattoirs in the UK. According to the Sustainable Food Trust (2018), the main reasons for the consolidation are high costs and squeezed profit margins which put pressure on smaller slaughterhouses (despite a relatively high demand for locally sourced meat). The UK, unlike Ireland, is only approximately 75% self-sufficient in beef meat and must import approximately 350,000 tonnes of additional beef to satisfy national demand; Ireland supplies 70% of total British beef imports given its proximity to the UK market (2018). There is a more diverse range in the scale of sheep abattoirs, with 162 sites in England alone. However, following the significant consolidation trend, more than 75% of the annual slaughter volumes now pass through just 20 high-throughput sites, owned by a small number of large businesses (NSA).

Case study: Spain

Spain is one of the two largest pork producers in the EU, with ca. 47 million pigs slaughtered annually. Pig production is concentrated in the North East of the country. The top five producers account for 41% of the total national share. The facilities of the largest pork slaughterhouse company (Vall Companys) are also mainly located in north-western Spain (this company also handles other species). Jorge, the other notable producer in Spain, has been expanding, noting growth of 32% in slaughtered tonnes (2016). Many Spanish companies active in this sector have operations across the pig supply chain, including in some cases cereal cultivation and feed manufacturing (for example Farmadesa, Piensos Costa). The sector in Spain is characterized by strong investments being made in slaughter and processing upgrading and modernisation (including latest automation technologies, for example), especially in the areas of Catalonia and Aragón as well as emergence of large-scale farms and industrial slaughter/processing sites, in line with the EU-wide trend. The pig farming sector in Spain has industrialised very rapidly in recent years, as the number of operations in small-scale size farms plummeted with simultaneous rapid growth of large-scale operations.

The increasing scale of industrial slaughterhouse facilities in some locations across the EU to reach mega-scale proportions, such as the facilities controlled by Vion, Tönnies and Danish Crown, inevitably leads to an increased need to procure live animals from a wider geographical radius. Slaughterhouses, particularly of this scale and form and applying latest automation technologies, require significant investment. To ensure a return on this investment, and taking also into account that intense competition results in relatively low profit margins in this sector, they need to operate close to full capacity. In the case of Brittany, for example, large-scale slaughterhouses have run into problems when operating below full capacity, in conjunction with other factors such as relatively high staff costs and competition in export markets.

This general evolution and trend in the EU slaughterhouse sector seems likely to increase further demand for live animal transport for slaughter. This is contrary to scientific evidence recommending to slaughter animals as close as possible to the place of rearing (OIE, 2009; EFSA 2011).

This potential impact on live animal trade is likely to be supported by other major infrastructure projects, for example the “Mediterranean corridor”. This project, funded by the EU, aims to connect the rest of Europe via railway lines to the east of Spain, for the transport of goods from all over Europe to access the main Spanish ports by 2021. This corridor will connect some of the main animal trading countries in the EU (see routes identified in Chapter 2 Annex I). At the same time, this corridor could present an opportunity to reverse the trend

if the improved infrastructure is used to expand the transport of meat and carcasses.

2.3 Country of origin labelling

The analysis of the potential regulatory drivers of live animal transport might include the country of origin labelling rules, as adopted in 2013 for the fresh (unprocessed) meat of pigs, sheep and goats (ref. leg. 1337/2013). The rules require the label to indicate the country in which the animal was "reared" and "slaughtered". If animals were born, raised and slaughtered in the same country, then the label can simply state the "origin" country.

The impact assessment commissioned by the EC (Baltussen *et al.*, 2013) to inform the introduction of the rules concluded that the rules would have had a modest impact on intra- and extra-EU trade, even under the strictest scenario of indicating all three stages of production (i.e. the countries of birth, rearing and slaughter).

The evaluation of the stricter origin labelling rules for beef (ref. leg. 1760/2000) concluded that the rules had minimal impacts on trade, which is determined by other factors (EC, 2015a). However, this rule, combined with a change in consumption patterns, as a large number of consumers preferring meat of national, or even local, origin offered at the same price as 'imported' meat (as all studies show that, on average, price remains the main factor driving consumer purchasing decisions), might have an impact on live transport.

Conclusions

The trade in live animals is driven by both supply and demand. Key factors are the structure of livestock production in relation to the availability of slaughterhouse capacity. Other important factors include increasing specialisation of production and separation into breeding and fattening enterprises, and consolidation in the slaughter sector. There are no systematic data on the number and structure of slaughterhouses across the EU; however, it is clear that the EU slaughter sector has been and continues to undergo a process of consolidation with a trend towards fewer and larger slaughterhouses over time. This consolidation has been driven by the need to capture economies of scale, as slaughterhouses operate on small margins and high throughput. The EU's 2006 Hygiene Package has also been a factor in that it tends to be more efficient for larger slaughterhouses to meet the required high standards. Larger slaughterhouses inevitably need to source supply from a wider geographical area to ensure they continue operating close to the full capacity that will enable them to achieve economies of scale. This has resulted in longer journey times for live animals. Regarding live exports to non-EU countries, a key factor is insufficient cold chain availability in many of the current export markets.

3 Rationale for replacing live trade with the transport of meat and carcasses; examples of best practice in effecting this change

This chapter outlines the rationale for a shift from live trade towards a meat and carcasses only trade (sections 3.1 and 3.2) and examines what can be learned from the UK experience of reducing live trade in calves, the *de facto* ban on live exports for slaughter in New Zealand, and the development of mobile slaughter units (section 3.3).

3.1 Rationale for reducing live trade

Evidence shows that the shift from live trade to a trade in meat and carcasses is justified by animal health and welfare reasons, environmental indicators, economic considerations and existing practices.

Furthermore, there are new pressures justifying the shift from live trade to trade in carcasses and meat: in the last few years, increasingly prolonged periods of high temperatures over the summer months have led some Member States to the decision to suspend live trade. In 2019 during the AGRI Fish council (15th May) the EC urged Member States not to allow long-distance live animal transport when temperatures of 30 degrees Celsius were forecast. Several Member States took action, suspending transport during certain days or weeks over the summer months (Hungary, United Kingdom and Czech Republic), or by leaving Competent Authorities the responsibility of approving or not any animal consignments (the Netherlands, Germany, and Austria)[16].

As climate change increases the risk of periods of high temperatures, it will become increasingly important for meat supply chains relying on live transport to develop and implement alternative strategies to ensure that supplies are not interrupted. If interruptions to the live trade do become more frequent, at some point it will become sensible for the supply chain to move away from reliance on this trade in favour of the greater certainty of the carcass trade.

3.2. Why shift to a meat and carcasses only trade?

3.2.1 Economic considerations

Evidence indicates that **transporting meat and carcasses is more cost-effective than transporting live animals**. Impact assessments focusing on certain species of farm animals have analysed the feasibility of a trade of meat and carcasses only:

- In a 2009 report on the sustainability of transporting pig and horse meat as opposed to live animals (Baltussen *et al.*, 2009), it was concluded that:
  - Transporting meat instead of live pigs and piglets would lower transportation costs by 29%;
  - Transporting meat as opposed to live horses would cut transportation costs by about 52%.

- In 2017 Eurogroup for Animals, together with Dierenbescherming, Dyrenesbeskyttelse, GAIA, RSPCA, and Vier Pfoten, commissioned Wageningen University to assess the costs of transporting live lambs and spent hens versus the costs of transporting their meat and carcasses (Baltussen *et al.*, 2017). This study concluded that the transport of live animals involves higher transportation costs compared to a meat and carcasses trade. The assessment reported the transport costs would be lower by €0.20 per kg (in the case of spent hens) and by about €0.34 per kg (in the case of lambs) in transporting meat and carcasses compared to live animals. In addition, live transport severely compromises the welfare of the animals transported and increases the risk of animal disease outbreaks. The study also found that some animal welfare-related costs cannot be monetised, thus potentially under-reporting the costs associated with the transport of live animals.

[16] There are also national plans in place in some Member States to temporarily suspend live transport in extreme weather (both hot and cold). The Netherlands has had a national plan for additional measures during extreme temperatures since 2016. It includes a ban on livestock transport at temperatures above 35 degrees which was extended to also cover pigs and sheep/goats in March 2017. However, despite this plan, work conducted by the Dutch Society for the Protection of Animals and Eyes on Animals shows that, in 2017 and 2018, despite the heat protocols during hot periods, there were still serious problems with heat stress during slaughter pigs transportation. Some tightening up is therefore required to make the National plan for livestock transport at extreme temperatures legally binding and for better enforcement (Eyes on Animals and Dierenbescherming, 2019). In Germany, several Bavarian Veterinary Offices refused to issue long-distance animal transport certificates for cattle destined for third countries (Maisack, C., and A. Rabitsch, 2018). This followed the EU Court of Justice (EU ECJ) judgment in case C-424/13 (2015), and its clarification in relation to Article 14 of the EU Regulation (EC) No 1/2005.

3.2.2. Environmental considerations

Evidence indicates that **transporting meat and carcasses has a lower environmental impact than transporting live animals**. Studies (Wageningen, 2009; Baltussen *et al.,* 2017) assessing the transport of live animals (Scenario 1) compared to the transport of meat and carcasses (Scenario 2) of specific species on specific routes came to the following conclusions:

Species	Results
Horses	Scenario 2 = -50% of Co2 emissions compared to Scenario 1.
Piglets	Scenario 2 = -40% of Co2 emissions compared to Scenario 1.
Spent hens	Scenario 2 = -81.6 gram per kg meat CO2 emission, -0.03 litres per kg meat Diesel, -0.31 gram per kg meat NOx emissions compared to Scenario 1.
Lambs	Scenario 2 = -108 gram per kg meat CO2 emissions, -0.41 gram per kg meat NOx emissions, -0.03 litres per kg meat Diesel use compared to Scenario 1.

Table 1

This shows that across different species and transport routes, the transport of meat and carcasses is proven to be more sustainable from an environmental point of view that the transport of live animals.

3.2.3. Animal health and welfare considerations

Live transport severely compromises the welfare of the animals being transported and increases the risk of disease outbreaks. The Food and Agriculture Organization of the United Nations (FAO) describes live animal transport as "ideally suited for spreading disease" (FAO, 2002).

For a long time now, well-known and established agencies and organisations have been calling for a phase out of live animal transport by replacing it with a meat and carcasses only trade (see table 2).

While it is implicit in the positions of the FVE and the OIE that the rationale for shifting from live transport to a carcass trade is based on animal welfare grounds, the EFSA position brings in the risk of transport-associated disease outbreaks. Indeed, a transition toward a carcass-only trade may mediate the potentially serious public health implications of epizootics (Greger, M., 2007).

Despite the difficulties in assessing the animal welfare costs associated with live transport, the two studies reported in paragraph 3.2.1 assessed those costs associated with the transport of meat and carcasses versus the transport of live animals. They concluded that, for the four species investigated, transporting meat and carcasses is more sustainable from a welfare perspective than the transport of animals over long distances, as the risks of bruises, broken bones, stress and death before arrival to the final destination diminish. Additionally, it must be taken into account that, due to a lack of data, not all the animal welfare aspects were considered, and that the health of the animals transported, as well as of other animals as a result of any extra risk of transmission of pathogens linked with animal movement, was not assessed and quantified. Indeed, some animal welfare-related costs cannot be monetised, thus potentially under-reporting the costs associated with the transport of live animals.

3.2.4. Common practice

Member States are already transporting carcasses and meat across and outside the EU. In 2017 about 1.1 million tonnes of beef, pig meat and sheep/goat meat was traded within the EU (intra-EU trade: 847,464 tonnes) and exported to non-EU countries (extra-EU trade: 236,075 tonnes). Moreover, the EU meat and carcass transportation is strictly regulated, harmonised and works relatively well. Audit reports[17] by DG

FVE	"*The long-distance transport of animals for slaughter should be replaced, as much as possible, by a carcasses-only trade*" (2001) "*The transportation of animals should be subject to the "3R" principle – it should be refined, reduced and replaced wherever possible*" (2008)
OIE	"T*he amount of time animals spend on a journey should be kept to the minimum*" (2005) "*OIE should recommend phasing out of unnecessarily long transport (including export) of animals for slaughter. It should set a date, for example 2020, and work with stockholders including governments towards ending such transportation by that date*" (2009)
EFSA	"*In order to reduce the risk of transport-associated disease outbreaks, strategies should be developed to reduce the volume of transport (for example replacing the transport of breeding animals by using semen or embryos), and long-distance transport of animals for finishing or slaughter (for example by the transport of carcasses and food products) or reducing journey times (for example by slaughtering animals as close as possible to the site of production)*" (2011)

Table 2

[17] https://ec.europa.eu/food/audits_analysis_en

SANTE (Directorate F) does not identify any major issues with EU meat and carcass transportation. Additionally, comprehensive private guidelines for this trade exist (IRTA, 2016).

Globally, some important importers of live animals are also important importers of carcasses and meat. Jordan, the biggest importer of live sheep from the EU, is ranked as one of the top ten world importers of meat and carcasses by the Agriculture and Horticulture Development Board. This indicates that infrastructure already exists in these countries, and strategies could be put in place to sustain and promote trade in meat and carcasses with them. On the other hand, where infrastructure does not exist, improvements are essential and needed to underpin any future strategy to promote trade in meat and carcasses.

3.3. Examples of attempts to reduce live trade

There is a lack of consistent data to identify consistent changes in trading patterns in intra- and extra-EU trade between live animals and meat and carcasses over the past ten years. This report therefore focused on identifying best practices in shifting trade from live animals to meat and carcasses and the factors that drove the shift:

- Reduce live trade (United Kingdom)
- Ban/reduce live trade (New Zealand)
- Reduce live trade by increasing local slaughter capacity: mobile slaughter

As the case studies show, these objectives are different in practice, although ultimately they all lead to a reduction in live trade flows.

Best practice: The UK's 'Beyond Calf Exports' Stakeholders Forum

In June 2006, CIWF and the RSPCA convened with leading stakeholders at the Beyond Calf Exports Stakeholders Forum[18] to set out three specific goals:
(1) to increase uptake of male dairy calves into the domestic beef chain,
(2) to reduce the number of calves killed on farm in the United Kingdom, and
(3) to reduce the number of calves exported live for further fattening.
To achieve this, the Forum included producers, processors, retailers and other food outlets, academics and NGOs who agreed to a comprehensive range of initiatives targeting the development of the British supply chain.

The Forum completed its work in 2013, with a decline in the number of calves being exported to other Member States of 90% (from 80,700 to 8,000 animals). The share of calves exported as a proportion of those born in Great Britain declined from 20% to 2%. The number of dairy calves being retained for rearing in Great Britain increased by 58%, and the number of calves being killed on farm fell by 36%.[19]

A range of initiatives were used to achieve the Forum's objectives, mainly through increasing domestic demand for male dairy calves which had traditionally been exported. McDonald's set a target of obtaining 10% of its beef supply from male dairy cows, thus expanding this domestic market. Tesco also invested in beef production from dairy calves, and one large contract beef producer invested in spaces for male dairy calves. In addition, retailers focused on high welfare veal production and helped increase the market in parallel. The case shows that where a key driver of live trade is a mismatch between supply and demand, it is important to develop local markets for those animals exported. In this UK case, by growing a home-made market, live exports became economically unbeneficial.

[18] The modern solution to the exports of calves: working in black and white. 'The Beyond Calf Exports Stakeholders Forum: A final report on progress.' November 2013.
[19] These figures refer to Great Britain (i.e. Northern Ireland is not included).

Best practice: The New Zealand experience

New Zealand introduced a *de facto* ban[20] of live sheep trade for slaughter in 2003, after Saudi Arabia rejected a shipment of 57,000 sheep which led to a two-month delay in the journey, during which thousands of animals died on board. In 2007, the *de facto* ban was extended to also cover live cattle for slaughter exports. The ban was different in nature to the reduction in live trade in the UK in that it was a reaction to a severe animal welfare issue which risked the reputation of New Zealand producers, rather than an initiative taken to reduce live trade by actively developing alternatives.

There were other reasons not connected with the nature of live trade itself, which were important factors in the *de facto* bans. Following the decline in the New Zealand sheep sector, as hill farming has been taken over by an expanding dairy sector, the slaughter sector suffers from over-capacity despite extensive restructuring. The *de facto* ban on live exports therefore supported the survival of the existing slaughterhouse and meat processing facilities. In this context it should be noted that while live export for slaughter has been stopped, New Zealand still allows the export of animals for breeding purposes on the granting of a "welfare certificate" that takes into account destination, journey and conditions. Although New Zealand cannot force a country to ensure welfare once animals arrive, the Government does request assurance in terms of treatment. However, export of breeding animals is not a significant trade; according to the Ministry of Primary Industries, in 2017 the country exported 27,306 live cattle and just 123 live sheep for breeding purposes. As an alternative to the export of breeding animals, New Zealand exports a significant number of semen straws - 1.3 million in 2016.[21]

The *de facto* ban on live trade in New Zealand was introduced in response to a specific animal welfare incident and should be seen within the wider context of domestic slaughterhouse over-capacity; there was also a wide consensus in the industry that exporting for slaughter posed a reputational risk. The main point of general interest for the intra-EU trade in live animals is the importance of maintaining slaughterhouse throughput. However, the need to maintain slaughterhouse throughput is a key driver of the intra-EU live trade and the New Zealand experience, where an export ban helped to maintain capacity, offers little of relevance to mitigate the drivers of live transport in the EU. New Zealand worked closely with the Halal boards in Saudi Arabia and Indonesia to have them accepting stunning prior to slaughter. This was a crucial step which allowed New Zealand to export meat and carcasses to these countries instead of live animals.

[20] https://ec.europa.eu/food/audits_analysis_en
[21] https://www.mpi.govt.nz/dmsdocument/17824-infographic-on-animal-exports-statistics-2016

Best practice: Increasing local slaughter capacity: mobile slaughter

As one of the key drivers of the long-distance transport of live animals in the EU is the structure of the slaughter sector, a key initiative to reduce live transport would be to increase local slaughter capacity. One way in which this could be done is through the use of mobile slaughter units.

Prototypes of mobile abattoirs have been tested in France, Germany, the United Kingdom, and other Member States as well as in Australia, the United States and Canada (Babb, A. and Kennedy, E., 2012). They are mainly used to manage the slaughter of cattle, sheep or pigs, but they are also used for other species. In Sweden, for example, they are used for reindeer, and in the US for poultry and other species.

Today, there are examples of implementation of **semi-mobile** to **complete mobile** slaughterhouse facilities offering on-farm slaughter opportunities in several countries across the EU. However, currently, the use of mobile slaughterhouses varies significantly across the EU, partly due to fragmented national approaches and a perceived lack of clarity in the legal base at national level. It is noted that an overview report by DG SANTE (Directorate F) in 2015[22] had identified that mobile slaughterhouses are available in some Member States, but that their use is not extensive.

Since then, the current situation seems to have evolved with the growing emergence of pilot or commercially active projects, facilitated by recent developments in the legal base in several Member States (Annex III). Although information in this field is relatively hard to find, the identified examples indicate that the concept is gaining increasing recognition, but only once the national legal framework is clarified. In terms of relevance for reducing live transport in the EU, clearly mobile slaughter units can form part of the solution, although this is likely to be relatively small-scale to meet specific needs and relatively niche demand.

Conclusions

This chapter set out the rationale for reducing live transport based on animal welfare and health concerns, environmental and economic considerations. Live transport is increasingly being suspended due to extreme weather, and the prospect of climate change making extreme weather more likely in the future provides a further rationale for operators to switch to a meat and carcasses only trade. Trade in meat and carcasses is common practice both within and outside the EU, and therefore alternatives to live transport are clearly viable. The examples of the UK and New Zealand provide a lesson learnt for reducing live trade within and from the EU. The use of mobile slaughter facilities to address the lack of local slaughterhouses could provide some more widely relevant alternatives to live transport, but the legal framework and operating economics are currently problematic.

[22] DG (SANTE) 2015-8721 - MR

4 A strategy to replace the live transport trade

This chapter sets out the policy, systemic and economic issues to address when designing a strategy to replace the live transport trade (section 4.1). Preliminary questions are followed by a set of proposals to mitigate the driving forces behind live transport (section 4.2). As a combination of factors drive live trade, a combination of solutions is needed to effectively negate these drivers and thus operate the shift to a meat and carcasses trade. In this context, and given the difficulties in addressing the structural imbalance of livestock farming and the slaughter sector, paragraph 4.2.2 illustrates the way in which mobile slaughter could be used to partially mitigate the current slaughterhouse availability problem, which has been identified as one of the most important drivers of live trade within the EU.

4.1. Strategy for reducing live trade - questions to ask

Based on the analysis carried out and the evidence collected, this report identifies key questions to address while preparing an impact assessment and a strategy to replace live transport with the trade of meat and carcasses only.

There are three sets of questions under which are clustered policy, economic and structural tools that, by negating the current drivers of long-distance live animal transport, reduce the barriers to more local slaughter and a trade in meat and carcasses.

(i) What type of initiatives can be promoted?

EU LEVEL:
Can initiatives promoting short supply chains in the EU be tied up to the overall objective of shifting to a meat and carcasses only trade? How can this be achieved?
Can the promotion of mobile slaughter initiatives be more systematically linked to promoting short supply chains across the EU? What actions need to be taken, at EU and Member State level, to promote mobile slaughter?
What other actions need to be taken to improve the availability of local slaughter facilities across the EU, thus counteracting the increasing consolidation and geographical concentration of slaughter facilities in fewer, larger-scale units?

NON-EU LEVEL:
How can the Commission, working together with third countries as well as relevant stakeholders, discuss and develop potential initiatives to address this objective?
Can initiatives promoting the improvement of appropriate infrastructure, including cold storage facilities, be tied up to this objective? How can this be achieved?

(ii) How can these initiatives be financed?

EU LEVEL:
Can initiatives be financed under the CAP? In particular, can incentives be provided to finance initiatives under dedicated rural development measures that promote the objective of replacing live trade with carcass/meat trade?

NON-EU LEVEL:
Can initiatives be financed under the EU development aid programmes?

(iii) What other actions need to be taken to support the development of initiatives?

BOTH EU and NON-EU LEVEL
What type of data need to be made available to better understand and mitigate the driving forces behind live animal trade? How can the availability of data on live trade flows and on the structure of the slaughterhouse sector in the EU be improved?
What research and development is required to support the identified initiatives?
What training and cooperation is required?

4.2. Strategy to mitigate the driving forces of live transport

By answering the questions laid out in the section above, this report already identifies seven preliminary problems and possible solutions to remove existing barriers and encourage the further development of the meat and carcass trade.

1

Slaughterhouse availability. In 2004, the RSPCA assessed slaughterhouse availability within an eight-hour radius in France, the Netherlands and the United Kingdom and found it to be just about sufficient (Stevenson, 2004). However, since then, the investment required to comply with stricter operating rules and the economic imperative to exploit economies of scale has resulted in fewer and larger highly efficient slaughterhouses and meat cutting plants. Imports of live animals allow slaughterhouses to operate at full capacity, thus ensuring costs are kept at a minimum and increasing the return on investment, particularly when they are exposed to seasonal or structural over-capacity relative to local supply.

Possible solutions. Countering reduced slaughterhouse availability requires a combination of (i) opening local or regional slaughterhouses; (ii) developing mobile slaughter facilities; and (iii) allowing on-farm slaughtering under appropriate bio-security and animal welfare conditions. Local/regional and mobile slaughterhouses could potentially be supported via European Agricultural Fund for Rural Development (EAFRD) funding under the CAP[23]. Indeed, under the "animal welfare payment" measure (no. 14), funds are available to support high standards of animal husbandry going beyond the relevant mandatory standards. Additionally, the "cooperation" measure (no. 16), which provides support for initiatives aiming to cover short supply chains, could be of added value. In particular, Article 35 of the EAFRD (ref. leg. 1305/2013) aims to promote forms of cooperation between actors in the supply chain, such as between producer groups, cooperatives and inter-branch organisations, involving for example pilot projects and the development of new products, practices, processes and technologies in the agriculture and food sector.

Further support could be provided through the development of a label to communicate that the production chain is local; this initiative could include specific promotional support for products of geographical Indication which require local supply chains. It may also be possible to envisage support for a levy on live animal movements above a certain distance or transport time to help support these initiatives. Finally, consideration could be given to ensuring that slaughterhouse operating licenses are only granted where regional livestock numbers are considered sufficient to support operation at high capacities.

2

Different slaughterhouse cost base. In addition to slaughterhouse availability, different slaughter costs are an important driver of live transport, although lower costs must be set against additional transport costs as distance increases. Different costs result from differentials in staff and other operating costs, as well as economies of scale; price differentials for live animals are also important. Prices in the EU-10 have been lower than those in the EU-15 and this has traditionally encouraged live trade although the price gap has diminished over time as convergence has taken place and this factor is now becoming less important. Although Baltussen *et al.* (2017) found that the cost factor does not necessarily explain live trade (for example, the transport of lambs from Hungary to Italy is not cost-efficient),[24] the flexibility to use a wider range of slaughter facilities (i.e. located in a wider radius from the farm) can ensure better prices as a result of competition; this is a key factor driving considerable trade intra-EU over shorter distances i.e. up to around 300 km.

Possible solutions. The mitigating strategies set out above under slaughterhouse availability apply equally here.

3

Increased specialisation in livestock farming in the EU. Specialisation into breeding, rearing and fattening enterprises has developed over the past four to five decades in the EU, driven by suitable production conditions, access to feed materials (grass and grains) and a concentration of expertise. This process has encouraged large-scale intensive production. This has resulted in certain countries developing high self-sufficiency rates encouraging exports (for example, Ireland for cattle; Denmark and the Netherlands for piglets). Other countries have significantly expanded their livestock sectors (Spain for cattle and pigs). The result is extensive trade flows of live animals, for example, pigs for fattening from the Netherlands and Denmark to Spain, Italy and

[23] The CAP provides an opportunity to incentivise farmers to pursue higher standards through financial support granted under the rural development policy (Regulation (EU) No 1305/2013).

[24] Baltussen, *et al.* (2017) developed a calculation model to compare the sustainability of transport of live animals with the transport of meat. The model takes into account transport costs, slaughter costs, costs related to technical differences, costs of emissions of CO_2, consumer preferences, animal welfare and employment. Applied in the case of the transport of lambs from Hungary to Italy, the model indicates that live transport is not cost efficient; from all perspectives (economy, animal welfare, transport costs, environment) it would be better to slaughter these lambs in Hungary. Earlier work by Wageningen (2009) which examined trade costs for horses and pigs, concluded that transporting meat instead of live animals is more sustainable for these species.

Central/Eastern Europe.

Possible solutions. To mitigate the impact of increased specialisation on live trade, it is necessary to (i) encourage the use of embryos and semen rather than breeding animals; (ii) encourage the use of "closed" farming systems which do not involve the separation of the different stages of production and in which replacement animals are bred on-farm to mitigate the demand for production animals in areas where these cannot be produced locally. Support could be provided using EAFRD (measures 14 and 16).

4

Cold chain capacities in live export markets. A key driver of the live trade between Member States and non-EU countries, particularly those that tend to be the major destinations for current EU exports in live animals, is a lack of infrastructure to facilitate trade in meat and carcasses, specifically poor/insufficient cold chain facilities. This encourages the import of live animals for slaughter.

Possible solutions. Assistance should be provided to improve cold chain capacity in live export markets. For example, investment support could be provided under EU development aid programmes to third countries that encourage investment to improve infrastructure. This could systematically include investment in cold chain facilities with key third country trading partners.

5

Quality/freshness requirements. Consumers across the EU have diverse traditional preferences for particular meat cuts, and in some places there can be strong preferences for freshly slaughtered meat. Conducting the slaughter closer to the place of consumption addresses specific national/local demand. Hence, importers sometimes prefer live animals which allow them to cut according to demand and avoid potential problems of matching consumer specifications. Consumers in third countries also have specific preferences which are sometimes best met through local slaughter. In countries with poor infrastructure there is a deeply embedded consumer mistrust in carcass and meat trade and high demand for fresh slaughter/cuts.

Possible solutions. Transport of meat in carcasses or primal cut form (rather than broken down into cuts) could address consumer demand for cutting to local/traditional tastes. Beyond this, the industry in exporting Member States can produce guidelines and use standards that provide the exact specifications of carcasses/primal cuts required in importing markets in the EU and in third countries. Investments in the cold chain in importing countries (see above point 4) would help to mitigate concerns over freshness and thereby improve consumer trust in the meat and carcasses trade. Support could potentially be made available via export promotion funds.[25]

6

Origin of meat. Some evidence indicates that historically, imported live animals, once slaughtered in the importing country's abattoirs, were then sold as 'home-produced' or 'home-killed' and as such attracted a higher price than imported meat due to consumer preference for this meat.[26] This factor may have diminished in importance for fresh beef since 2000 and for pork, sheep and goat meat since April 2015, when EU-wide country of origin rules were introduced.[27] Origin labelling legislation may reduce the incentive to pay more for imported live animals than for imported meat, as it requires consumers to be informed of the country of rearing and the country of slaughter if different (the rules for beef also include country of birth where different). On the other hand, the legislation may increase the incentive to import live animals for fattening and/or for breeding (rather than for slaughter). It is not yet clear to the industry what the impact will be on live animal versus carcass/meat trade, although past studies have concluded that the overall impact on trade is relatively minor.[28]

Possible solutions. Before considering possible solutions, it will be necessary to have a better understanding of the impact of country of origin labelling on live trade. The Commission is currently undertaking an external evaluation of Regulation (EU) No 1337/2013 which will, *inter alia*, investigate the impact of country of origin labelling for intra-EU trade in pigs, poultry and sheep/goats. When published, this evaluation will show the extent to which origin labelling has had an impact on trade and, when this is known, a strategy to mitigate any negative impacts can be considered.

7

Ritual slaughter. Although live transport in conjunction with ritual slaughter does take place within the EU, this factor is

[25] https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/market-measures/promotion-eu-farm-products_en

[26] In 2004, the RSPCA established that French importers are prepared to pay around €1 per kg deadweight more for imported live lambs than for imported lamb meat.

[27] Other factors guiding consumer choice may have also gained importance. In recent years, consumer surveys consistently identify price as the most important factor guiding consumer food choices.

[28] Origin labelling rules: although both work conducted for the EC, and our consultation with the industry (national associations members of UECBV: Spain, Italy, the Netherlands, Germany) did not identify any visible impacts of the new rules, literature search in some countries (for example Sweden, Finland, Baltics) identifies an increasing consumer demand trend towards meat 'sourced locally' i.e. meat from animals reared within the country.

more important for extra-EU trade given the higher extent of ritual slaughter in non-EU countries, for instance in the Middle East.

Possible solutions. Providing training on ritual slaughter with reversible pre-slaughter stunning in the EU could reduce the demand for live animals for local ritual slaughter in third countries. Acceptance of this stunning methods is increasing among religious communities, as demonstrated by the declaration recently (November 2019) made by Ismailaga Cemaati, the largest Islamic group in Turkey, announcing that stunning animals prior to slaughter (rendering them unconscious prior to cutting their throats) is acceptable and Halal. To work with Halal boards in third countries remains key to shift from live export to meat and carcasses trade. Additionally, operators across the EU could be trained to perform this stunning and slaughter operation. Under the BTSF training for Competent Authority staff responsible for controls in this area could be provided.

4.2.2 Addressing slaughterhouse availability: promoting initiatives to develop mobile and semi-mobile slaughter options

Although countering reduced slaughterhouse availability requires a combination of solutions, developing mobile slaughter facilities deserves particular examination, even though it does not constitute a complete solution of its own. An increasing number of Member States have paved the way for the pilot or even market approval of such alternative methods for slaughter (see France and Germany under Annex III).

Mobile abattoirs are autonomous multi-species slaughtering systems which can be moved between farms or other suitable locations, enabling on-farm slaughter of livestock. They comprise a truck with additional refrigeration trailers and cutting facilities. They are loosely defined as **complete mobile**, or simply **mobile** (slaughter, chilling, primary processing into halves or quarters, and cutting) or **semi-mobile** (typically, the animals are stunned on site and hygienically bled to be transported to an EU-approved slaughterhouse for further processing). The majority of the operational units today simply slaughter and chill the meat to the desired temperature, although they can also be used to start primary processing into halves or quarters. The available equipment is adapted to offer tailored solutions to different herd sizes and different farming systems. Since the slaughter of animals is only possible in an EU-approved establishment, the mobile slaughterhouse must also be approved by the EU Competent Authority. The use of mobile and semi-mobile slaughter facilities allows at least the first part of the value-adding process to be carried out on-farm, thus eliminating the need for live transport.

Mobile slaughter units have important animal welfare as well as meat quality/freshness benefits which provide the main rationale for their introduction; moreover, they serve increasing consumer demand for locally-sourced meat. The animal welfare advantages are also acknowledged in recital 40 of the EU Slaughter Regulation (ref. leg. 1099/2009). To favour the uptake of mobile slaughterhouse units, this Regulation foresees the possibility to establish derogations exempting them from the requirements on layout, construction and equipment of slaughterhouses[29]. This allows Member States to establish or maintain national rules regarding mobile slaughterhouses. The EU Regulation on the hygiene of foodstuffs (ref. leg. 853/2004) also states that the structural and hygiene requirements laid down in this Regulation should apply to all types of establishments, including small businesses and mobile slaughterhouses. As such, the current hygiene and meat inspection rules clearly encompass mobile facilities thus providing legal certainty.

Problem

The differences in legal frameworks between Member States presents a barrier to the further development and use of mobile and semi-mobile slaughter facilities. Moreover, the costs of these alternative slaughtering methods are at present relatively high in comparison with conventional methods, as in most cases they are at the initial operational stage or even pilot stage. Operational costs are currently relatively high[29] and incentives would need to be put in place to promote and support mobile slaughter as a more sustainable and animal welfare solution.

Another problem is the fact that all producers want their animals slaughtered around the same time of the year, which can result in a capacity issue. As with conventional slaughterhouses, it is critical for economic viability that throughput is maximised, and this is difficult to achieve given the need to move the slaughterhouse to the animal rather than the other way around.

Solution

Develop a harmonised approach for the introduction of mobile slaughterhouses at EU level. This may include

[29] However, there are some doubts as to whether this provides sufficient legal clarity for the further development of mobile slaughter facilities. See contributions at an event organised on 5th February 2019 by CWF and Swedish MEP Jytte Guteland (S&D).

[30] Babb, A. and Kenney, E. (2012) indicates that in Canada initial start-up costs of approximately €155,000 to €310,000 depending on unit size as well as annual operational costs of between €23,000 and €45,000.

legislative and non-legislative action.

Legislative:

- improve the legal basis, at EU level and national level. The fact that legislation needed to be clarified in several Member States prior to the introduction of mobile slaughterhouses, at commercial or even at experimental level, points to the lack of a clear legal framework and legal certainty in the interpretation of the current rules (ref. leg. 853/2004; 1099/2009). Improvement in the EU legislation would bring harmonisation and EU added value.

Non-legislative:

- Developing a clear evidence base, including costs versus benefits and wider impacts, for the application of mobile slaughter systems across the EU. Developing guidelines and encouraging the exchange of best practices to improve harmonisation across the EU.
- Including the promotion of mobile slaughter systems in quality schemes, such as organic meat production and Protected Designation of Origin/Protected Geographical Indication (PDO/PGI).
- Promoting mobile slaughter systems within the context of short supply chain schemes. Member States may include thematic sub-programmes covering short supply chains within their rural development programmes (ref. leg. 1305/2013, Art 35), to promote cooperation between actors in the supply chain.
- Identifying potential budget lines to be used to support initiatives, thus sharing the high start-up costs of applying mobile slaughter systems. In some Member States reviewed (Annex III), the use of several existing funding mechanisms were identified, such as LEADER, which falls under national/regional Rural Development Plans and the European innovation in agriculture network (EIP-AGRI).[31]

Expected impacts

For best results, legislative and non-legislative actions need to be combined. Non-legislative actions alone depend on voluntary adherence; on the other hand, adherence to legislative initiatives cannot be guaranteed and needs to be facilitated by non-legislative actions such as training and development of best practice guidelines. Therefore, each form of action is complementary to each other, to maximise adherence and therefore fulfilment of the objectives.

In order to successfully implement the model, a functioning network of small and regional slaughterhouses is also needed. The cooperation of farmers with smaller slaughterhouses and artisanal butchers lends itself to the development of competitive regional supply models. This enhances the attractiveness of regionally produced meat and contributes to the preservation of the existing small-scale structures in peasant husbandry and artisanal meat processing. Such networks already exist and can be readily mobilised in the case of organic farming, quality schemes (PDO/PGI) and short supply chains. As such, the use of alternative slaughter methods appears to be a perfect fit for organic and quality products. Whether mobile slaughter can prevail as a successful model will also depend on the willingness of consumers to pay higher prices to reflect the higher costs; promotional activities centred on local production and improved animal welfare could help.

On the basis of a market share for these groups of products estimated at 5% to 15% of the market on average, alternative slaughter methods could be practiced up to that level. Although the market segment is currently relatively modest, the outlook for these products is positive across the EU.

Conclusions

This chapter has built on the foundations set out in the earlier chapters to identify the issues that are raised in the context of developing a strategy to reduce live animal transport. It examines the questions that should be asked when developing such a strategy about the types of initiatives that can be promoted, how they can be financed, and what other actions are needed to support their development. It then identifies six main problems in removing existing barriers to the meat and carcass trade, and suggests solutions. Finally, it focuses on mobile slaughter as one of the potential mitigating factors of the current slaughterhouse availability problem, which is being tested and brought to market in several Member States.

[31] The agricultural European Innovation Partnership (EIP-AGRI) works to foster competitive and sustainable farming and forestry that achieves more and better from less. There are several potentially relevant initiatives, including on animal husbandry, short food supply chains and organic farming. https://ec.europa.eu/eip/agriculture/

Conclusion

As a combination of factors drives live trade, a combination of solutions will be needed to effectively mitigate these drivers and so to shift to a trade in meat and carcasses, as well as semen and embryos. A comprehensive strategy is needed to support this shift.

Having identified the critical issues, this report makes the following recommendations:

- Map out the EU slaughterhouse sector to understand its structure and impact on live trade. Improve slaughterhouse availability with a range of possible solutions, including support via EAFRD for the opening of local/regional slaughterhouses. Help develop mobile slaughter facilities; and support the case for allowing on-farm slaughtering under appropriate bio-security conditions to mitigate the lack of availability of slaughterhouses in key areas of livestock production.
- Encourage the use of embryos and semen rather than breeding animals and encourage the use of "closed" farming systems which do not involve the separation of the different stages of production and in which replacement animals are bred on-farm. Support could be available via the EAFRD.
- Provide assistance to improve cold chain capacity in major third country live export markets. For example, investment support could be provided under EU development aid programmes.
- Support the transport of meat and carcasses or primal cut form (rather than broken down into cuts) not only to address consumer demand for cutting to local/traditional tastes, but also to promote EU-based added value activities. To this end, the industry in exporting Member States can produce guidelines and use standards that provide the exact specifications of carcasses/primal cuts required in importing markets in the EU and in third countries. This could be supported using export promotion funds. Investments in the cold chain in importing countries would help to mitigate concerns over freshness and thereby improve consumer trust in the meat and carcasses trade. This could be further supported by suitable marketing campaigns.
- Under the EU's Better Training for Safer Food (BTSF) programme, support training on ritual slaughter with reversible pre-slaughter stunning in the EU to reduce the demand for live animals in third countries.
- Assess the impact of current regulations and policy more generally on the driving forces behind live trade to prevent further growth.
- Prepare a socio-economic impact assessment of how to reconfigure slaughter capacity to shorten supply chains (with maximum transports of 8 hours for mammals and 4 for poultry). To this end it would be helpful to publish a set of statistics based on TRACES which highlights where live transport takes place and how this is evolving; basic data on species, routes and journey times would be required. A better understanding of live trade patterns is essential to assist the development of appropriate initiatives and actions to shift the trade toward meat and carcasses.

Timely involvement of farmers and supply chain actors, both in the EU and in third countries, under BTSF and other programmes is needed to ensure an effective development and implementation of such a strategy. Visibility and promotion of the best practices highlighted in the report could help the transposition if the model in other Member States. There may also be scope to reinforce international cooperation to promote this objective in bilateral trade agreements or cooperation forums, given that the inclusion of animal welfare in trade agreements is being discussed more and more.

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ANNEX I: LIVE TRADE FLOWS

Chapter 1: Definitions, source and methodology used for the data extraction

In line with the Council Regulation (EC) No 1/2005, the following definitions[32] have been used in this report:

- **Intra-EU trade of live animals**. A distinction is made between short- and long-distance transport of live animals (the indicated travel duration includes the time needed for loading and unloading the animals):
    - **Short-distance transport** is defined as a transport lasting eight hours or less (≤8h).
    - **Long-distance transport** is defined as a transport lasting more than eight hours (>8h)[33]. For these journeys, special vehicles are needed and the journey logs need to be returned to the competent authority which authorised the transport company. For cattle and sheep/goats, a rest period of more than 1 hour must be provided after the first 14 hours.
    - **Very long-distance transport** is defined as a transport that is longer than 24 hours (more than 24 hours for pigs[34] and more than 29 hours for cattle and sheep/goats). A stop at a control post is mandatory after 24 hours for pigs, and after 29 hours for cattle and sheep/goats.
- **Trade with third countries.** For trade with third countries Council Regulation (EC) No 1/2005 is fully applicable until final destination, in addition to physical checks at the border.

This report focuses on **long and very long-distance transport flows for cattle, pigs and sheep/goats**. Based on interviews with the industry and other experts, the following assumptions are made:

- **Loading and unloading of animals:** takes three hours on average.
- **Road travel:** average truck speed is 60/65 km/h.
- **Long-distance transport, by road:** assuming one round of loading/unloading (three hours) for shorter journeys and up to two rounds (six hours) for longer journeys, the distance covered can be between 300 km up to about 1,400 km (figures rounded for the three species).
- **Very long-distance transport, by road:** it was assumed that very long-distance transport involves a distance of at least 1,400 km. This takes into account the uncertainty over the number of loading/unloading rounds, which is assumed to be at least one for these journeys.
- **Geographical centres of the countries** (country centroid) are taken as the starting and end point of the distances covered. The distance is defined on the basis of the shortest possible routes in the existing road network (for trucks).
- **Transport of live animals within an EU Member State was not considered in this report**, as there is no basis for estimating travel flows within the countries. In the larger Member States, such as Germany, Spain, France, Italy, Poland, Romania and the UK, journeys can easily involve distances of more than 300 km.[35]
- **The physical checks carried out when live animals are transported to third countries** take time, and extend the journey time. Because border offices are not open 24 hours a day and seven days a week, additional waiting time is possible if the journey is not well planned or if incidents take place.
- The report considers all **sea journeys**, irrespective of distance covered and loading/unloading times.

Data from various sources were used in this analysis, as follows:

- Eurostat (COMEXT): this dataset provided most recent trends (2011/2012 to 2017) and was used to develop paragraphs 1.1.1, 1.1.2, 1.1.3, 1.2.1, 1.2.2, and 1.2.3.

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[32] Also, TRACES data on long and very long journeys are collected on the basis of these definitions.

[33] Regulation EC no. 1/2005, Article 2(m): 'long journey' means a journey that exceeds 8 hours, starting from when the first animal of the consignment is moved. Article 2(j): 'journey' means the entire transport operation from the place of departure to the place of destination, including any unloading, accommodation and loading occurring at intermediate points in the journey.

[34] As well as poultry and horses.

[35] According to Regulation 1/2005, MS can take measures to limit long journeys of animals for slaughter within their own territory, i.e. to provide for a maximum non-extendible journey time of eight hours (Annex I, chapter V, point 1.9).

- TRACES: this dataset provided longer time trends (2005 to 2015). It was sourced from existing literature and is the basis for section 1.1 and 1.2.
- Other sources were used to develop chapter 1 and they are indicated in the text.

The data available from the various sources has been combined in the analysis, where possible (to the extent there is compatibility between sources/definitions/scope to allow comparison).

The following points need to be noted on the available data sets:

- Eurostat data:
    - Data distinguishes between intra- and extra-EU trade applying to species in relation to final purpose.
    - Intra-EU trade data cover imports and exports.
    - For cattle, the available data distinguish between animals for: slaughter; breeding (extra-EU trade),[36] and 'other purposes' (i.e., for the dairy herd, fattening, etc.).
    - For pigs and sheep/goats, only one data set is available, animals for 'other purposes' which includes slaughter and/or further fattening.

Chapter 2: Maps of live trade flows

In creating the maps, the following key parameters were taken into account:

- Maps consider the average number of animals traded in the years 2012-2017.
- The maps distinguish between:
    - Long distance journeys – between 300 km up to 1,400 km; and
    - Very long-distance journeys – at least 1,400 km.
- The length of the journey between countries relies on the geographical centre of each country (country centroid), which is derived from combination of latitude and longitude of the analysed country. That said, the final distance is measured via motorways from country centroid to country centroid, with the exception of sea journeys, which also includes distance measured via sea routes.
- Arrows indicate origin and destination point of the route.
- Thickness of arrows symbolizes volume i.e. the number of animals traded on the route.
- Depicted routes represent the most prominent routes occurring, considering the absolute numbers of animals as well as systematic flows (i.e. flows consistently occurring in several years, rather than ad hoc flows occurring in one year only).

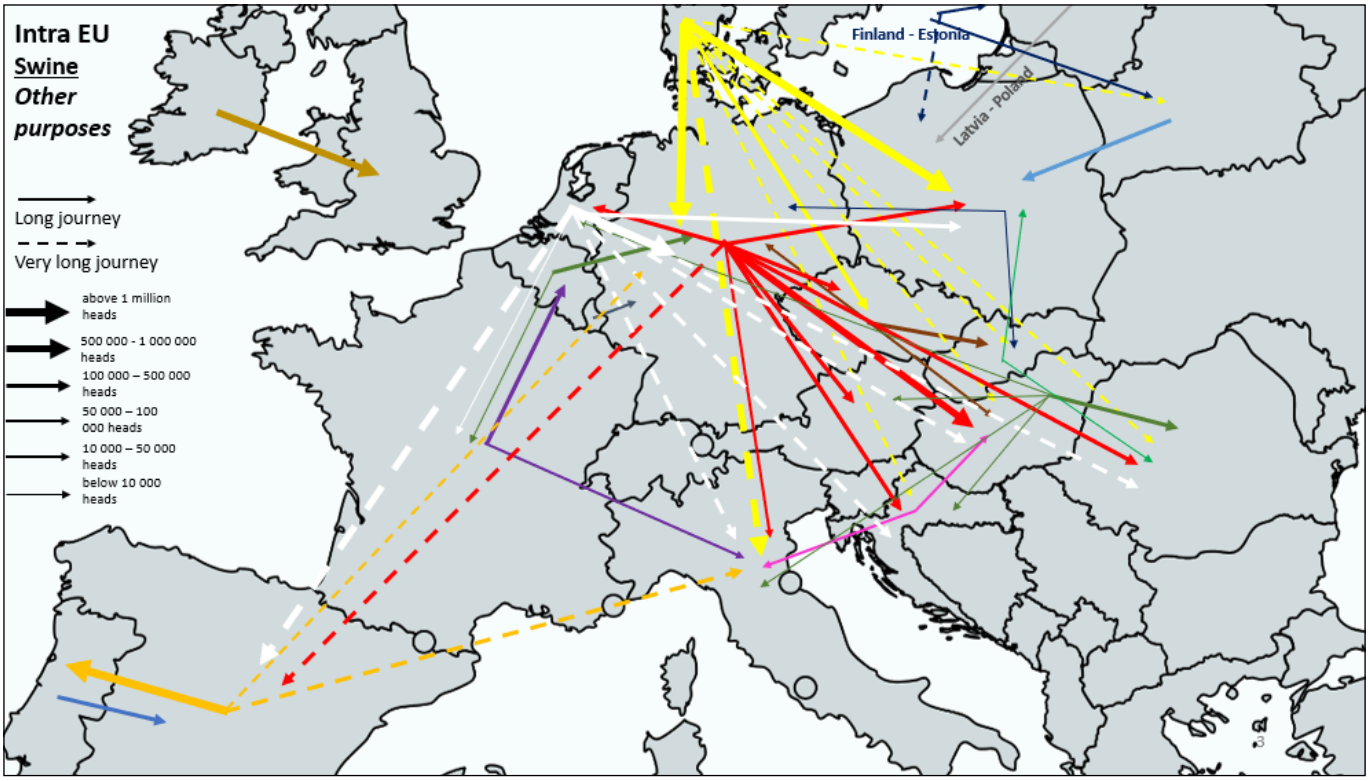
Map	**Species**	**Link (*Annexes)***
Intra-EU trade		
Trade map of live pigs – other purposes	Pigs	1.1
Trade map of live cattle – other purposes	Cattle	1.2
Trade map of live sheep/goats – other purposes	Sheep/goats	1.3
Trade map of live cattle – slaughter purposes	Cattle	1.4
Extra-EU trade		
Trade map of live pigs – other purposes	Pigs	2.1
Trade map of live cattle – other purposes	Cattle	2.2
Trade map of live sheep/goats – other purposes	Sheep/goats	2.3
Trade map of live cattle – slaughter purposes	Cattle	2.4

Source: EUROSTAT

[36] No data are available on intra-EU trade of cattle for 'breeding'.

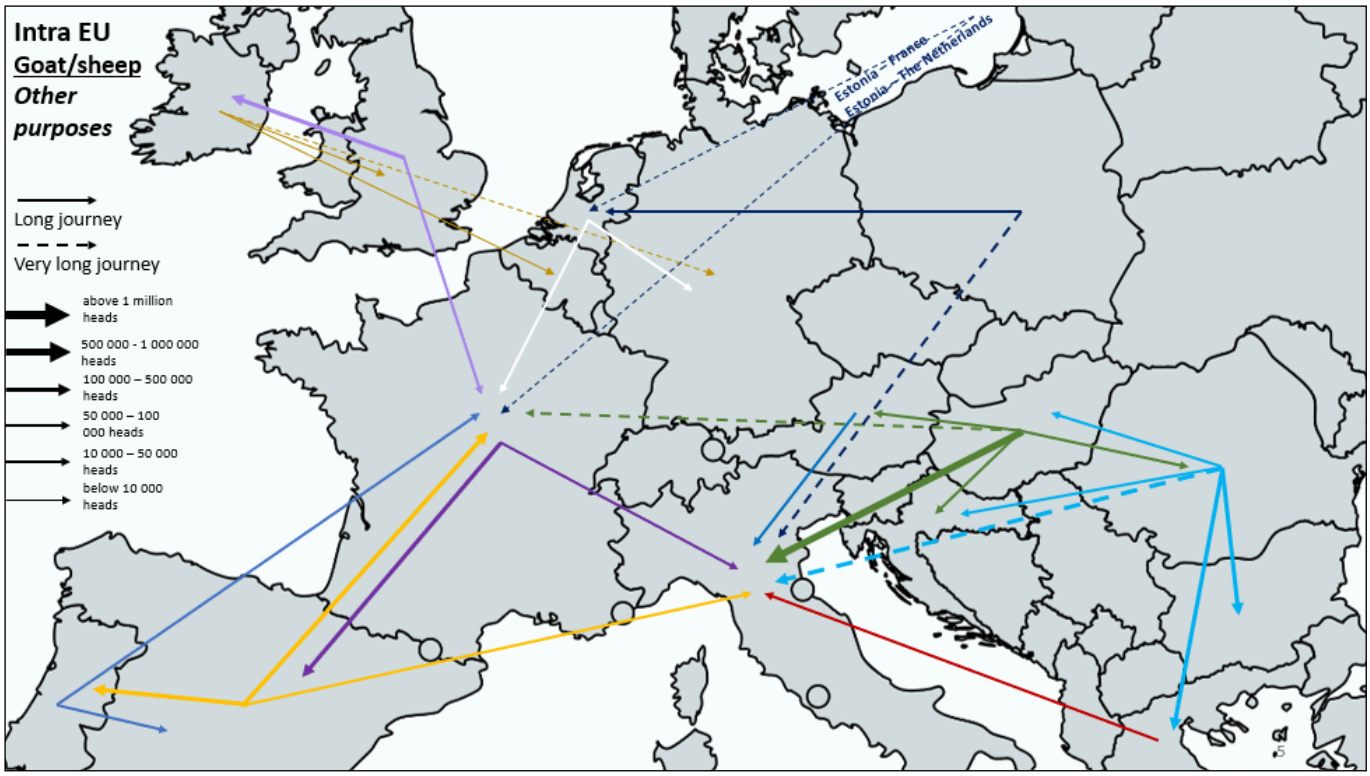
1. Intra-EU trade

1.1. Trade map of live pigs – other purposes

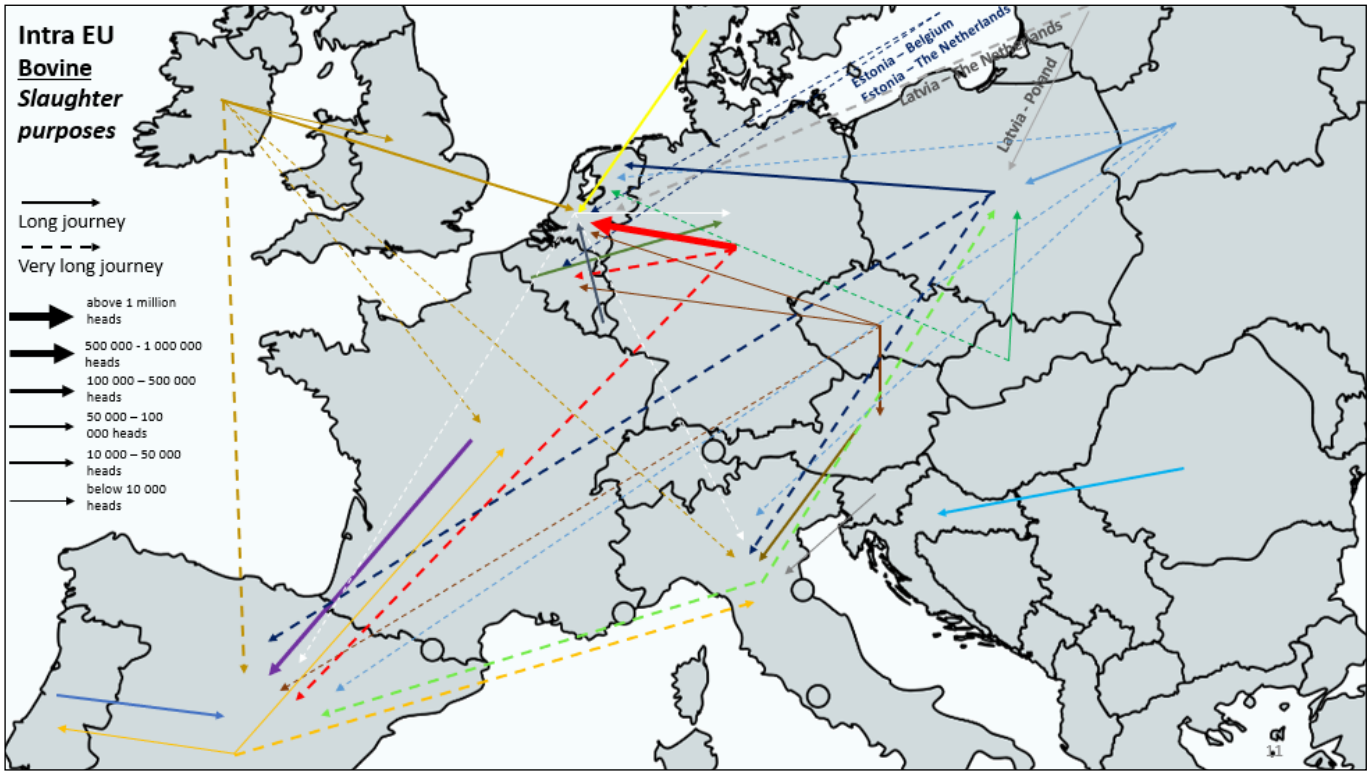


1.2. Trade map of live cattle – other purposes

1.3. Trade map of live sheep/goats – other purposes



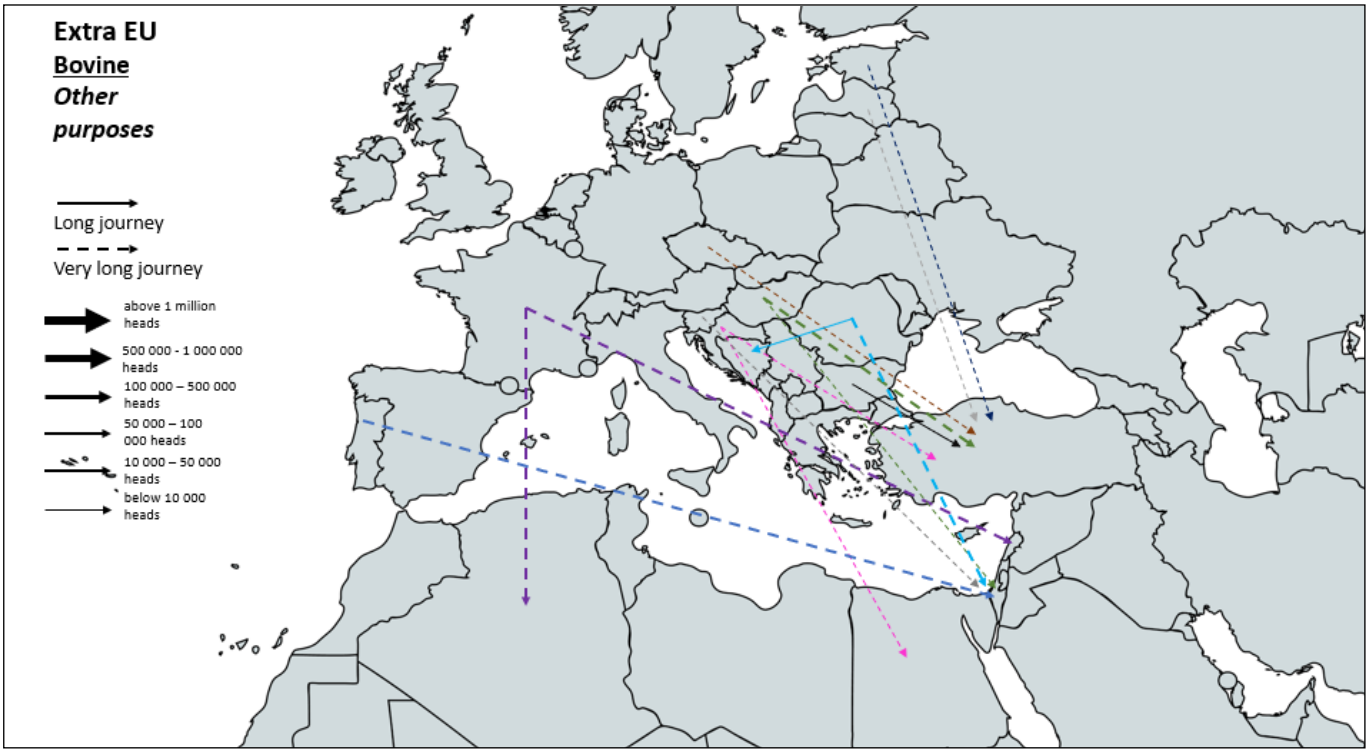
1.4. Trade map of live cattle – slaughter purposes



2. Extra-EU trade

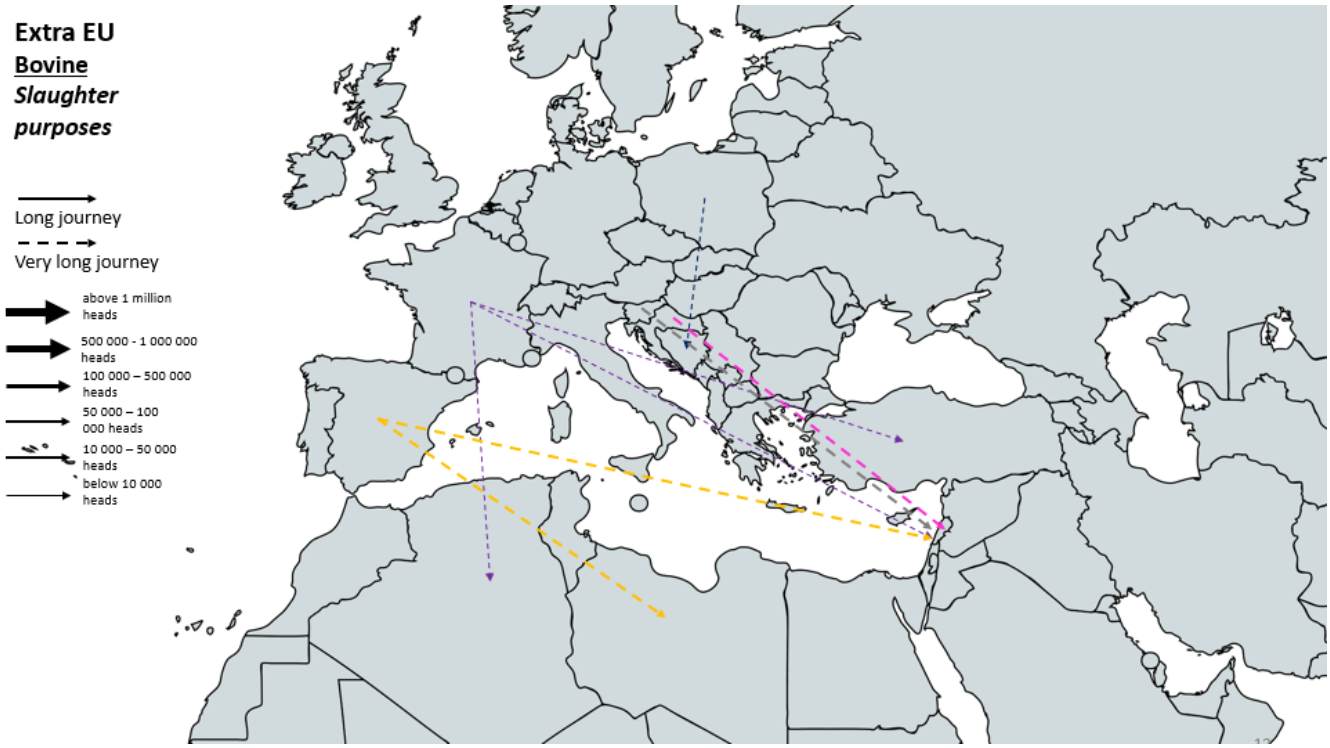
2.1. Trade map of live pigs – other purposes

2.2. Trade map of live cattle – other purposes



2.3. Trade map of live sheep/goats – other purposes

2.4. Trade map of live cattle – slaughter purposes



ANNEX II: MAIN GRAPHS OF LIVE TRADE FLOWS

Intra-EU live pigs trade

Figure 1. Intra-EU pigs export (other purposes; number of animals)

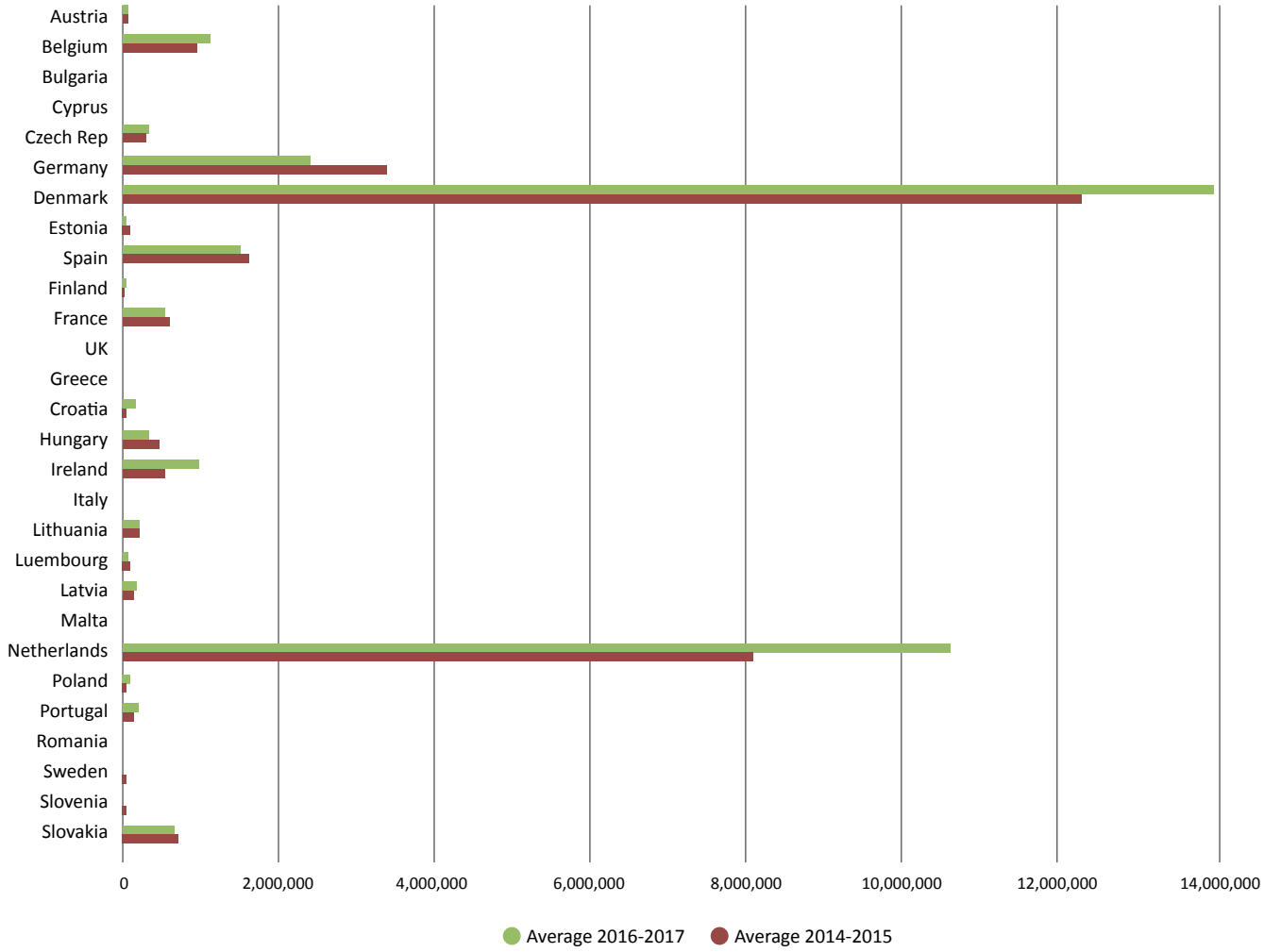
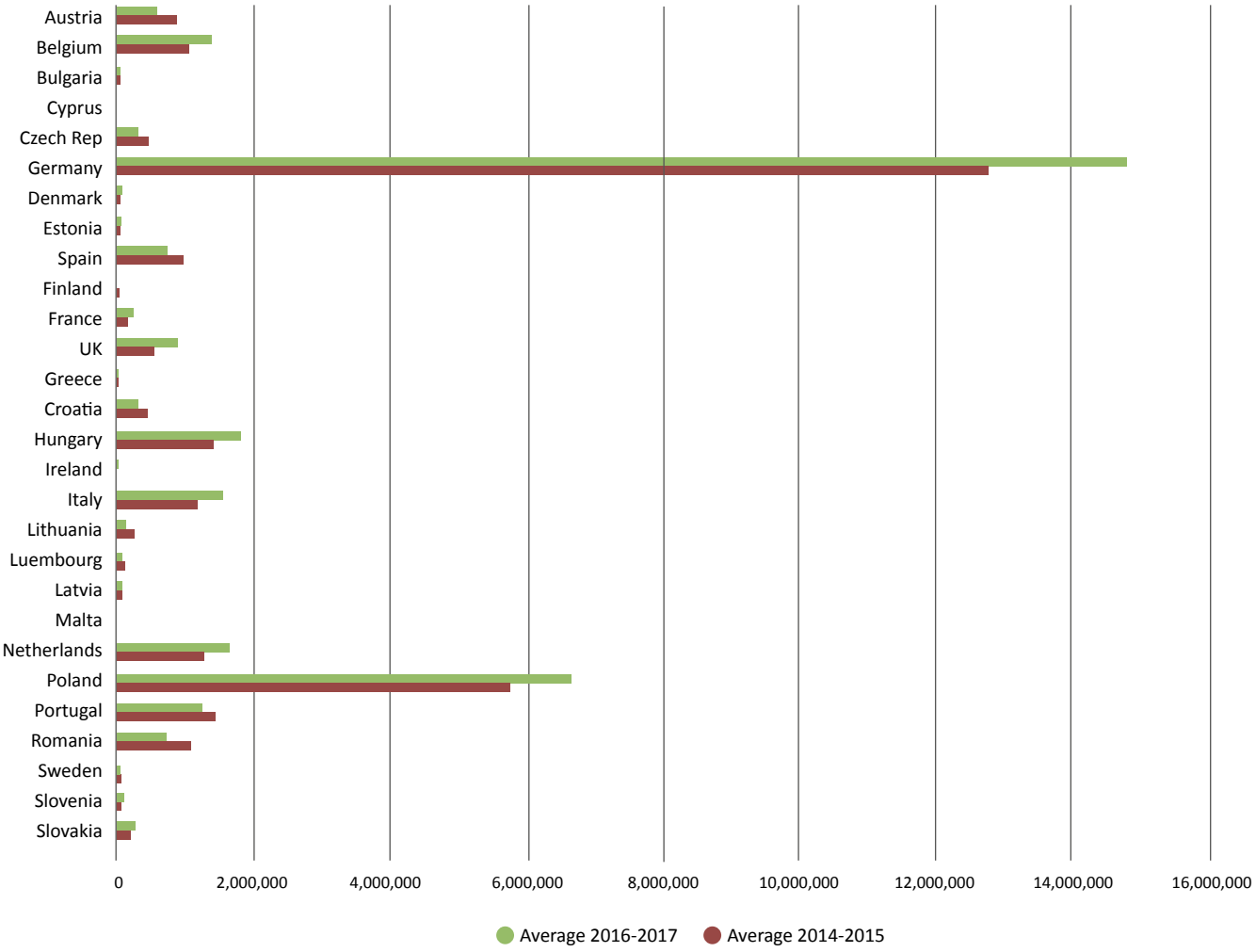


Figure 2. Intra-EU live pigs import (other purposes; number of animals)



Intra-EU live cattle trade

Figure 3. Intra-EU cattle export (total; number of animals)

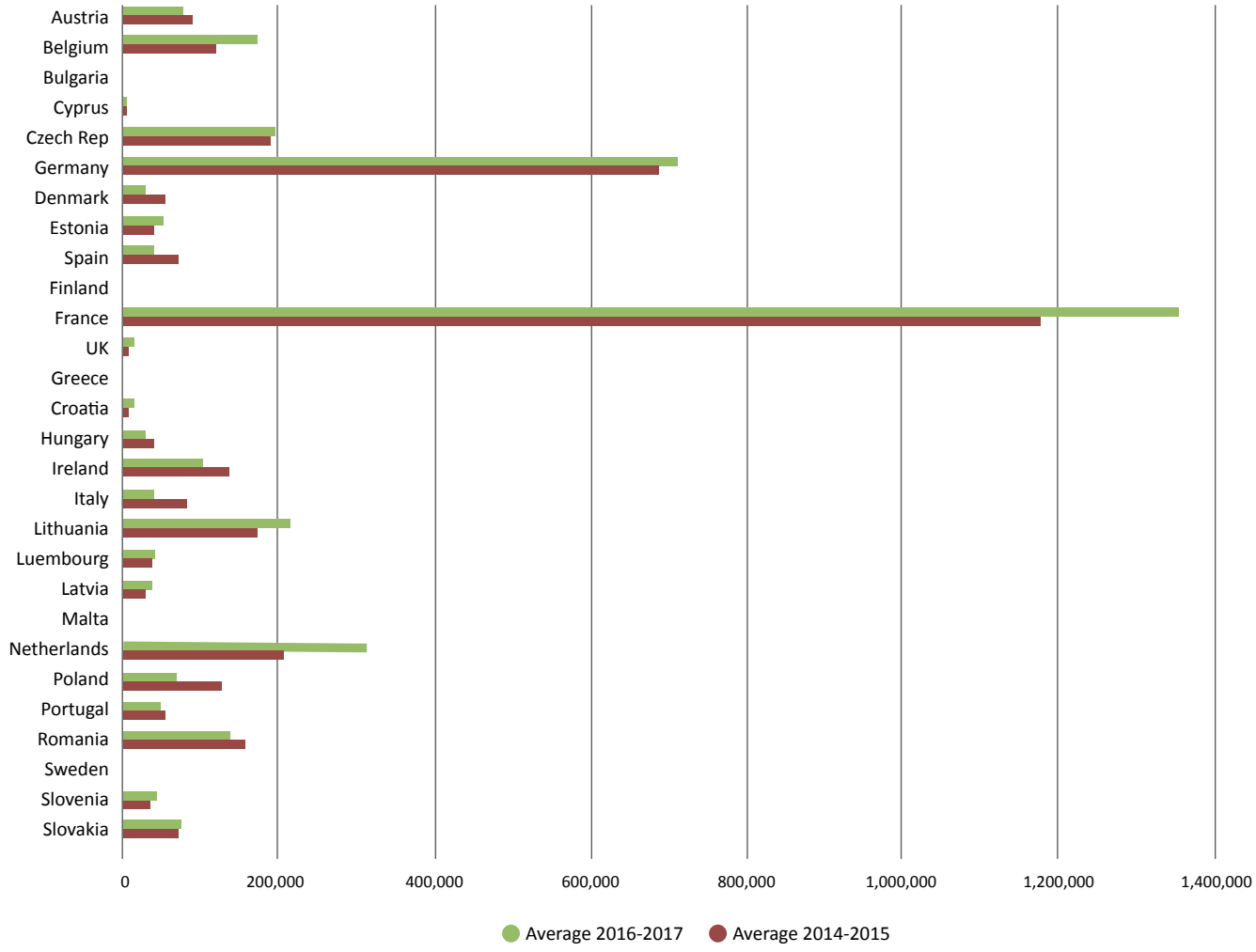


Figure 4. Intra-EU cattle export (slaughter; number of animals)

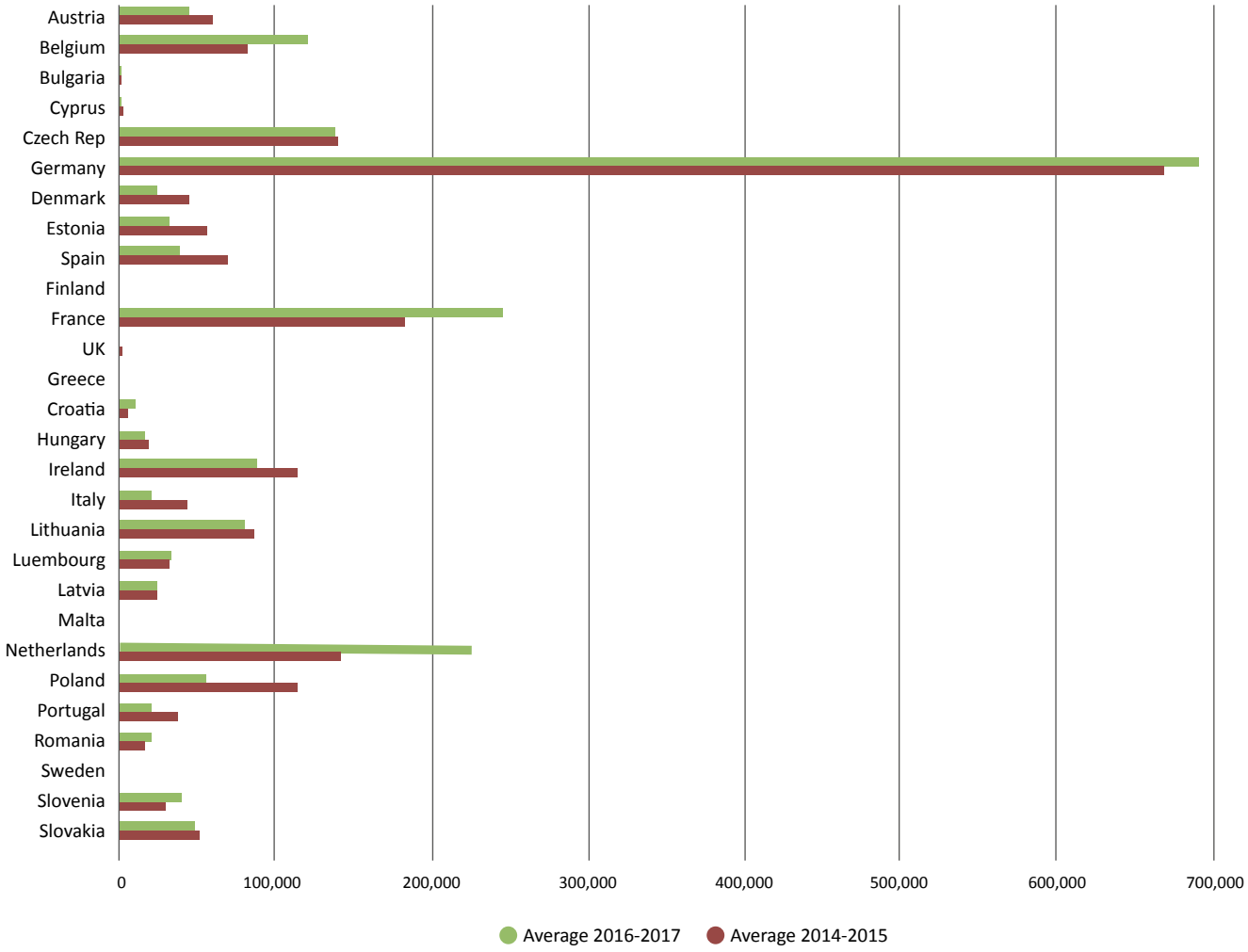


Figure 5. Intra-EU cattle export (other purposes; number of animals)

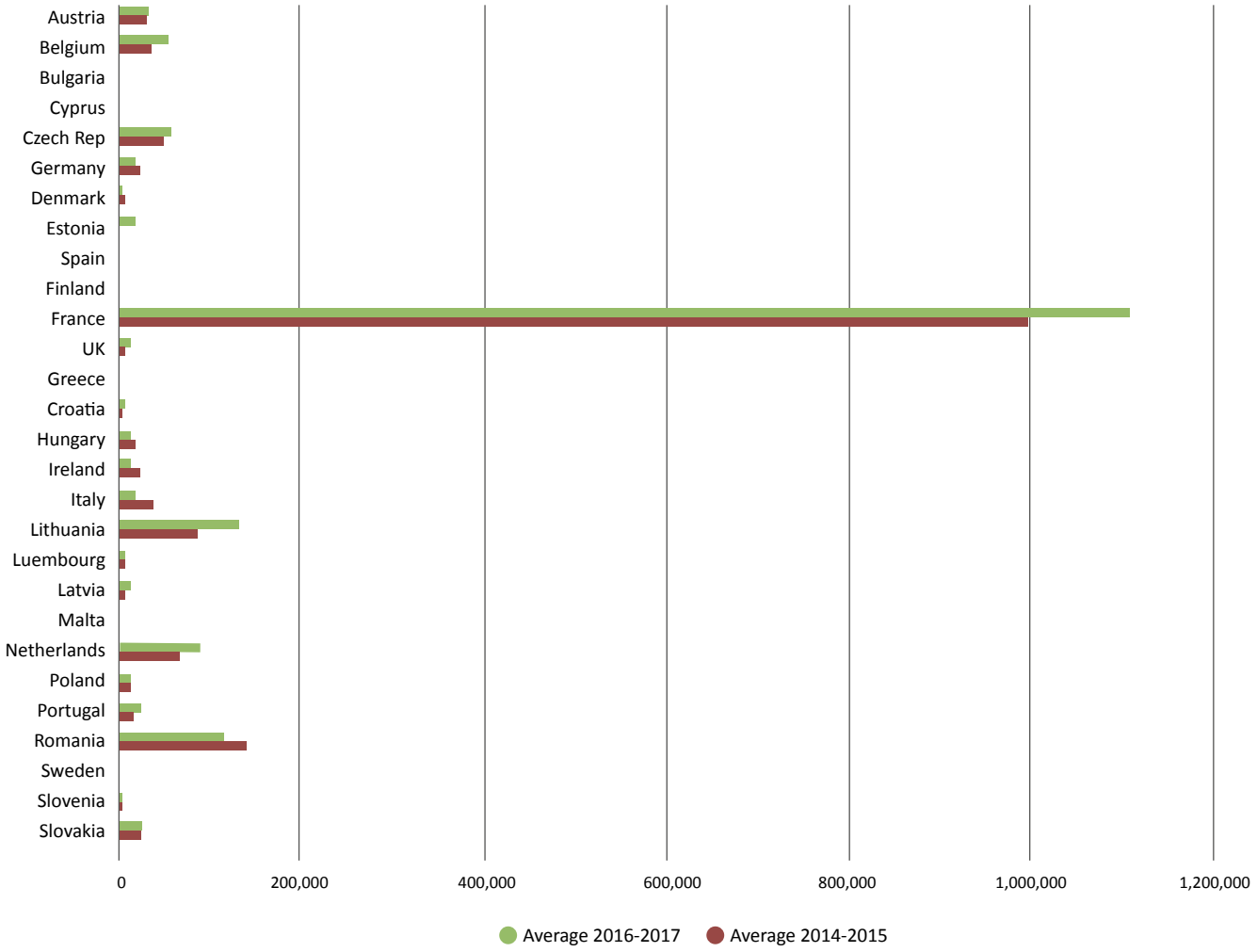
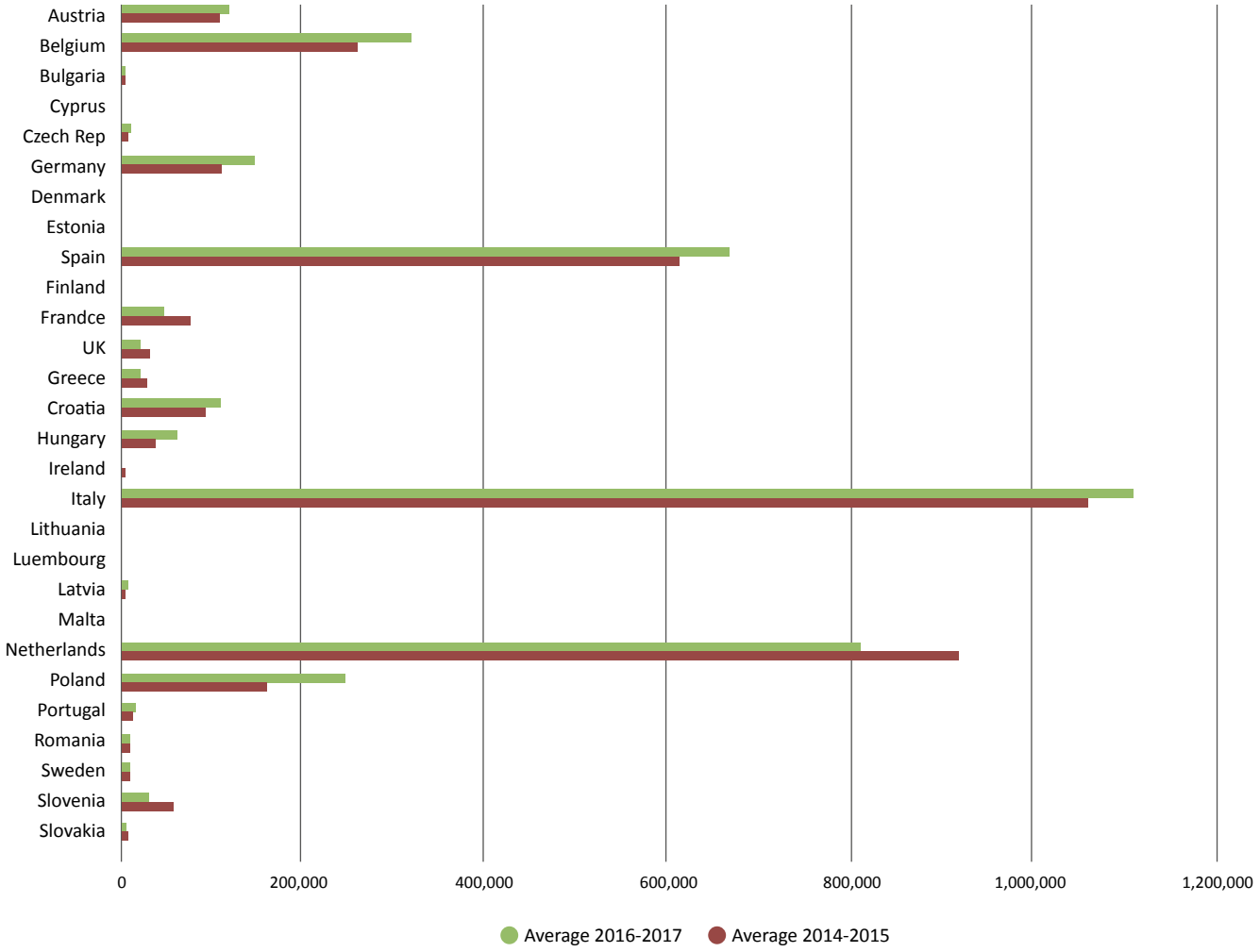
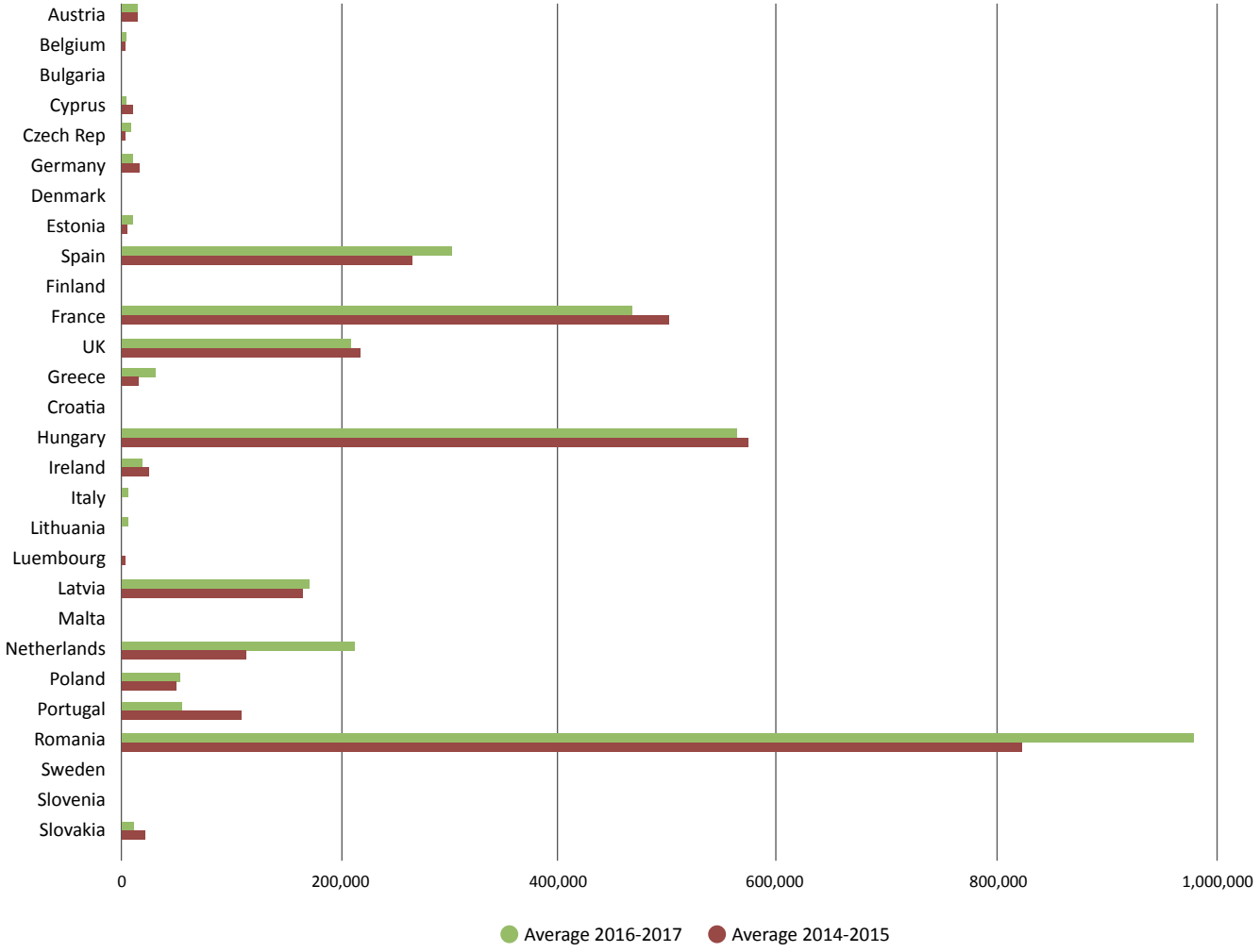


Figure 6. Intra-EU cattle import (total all categories, number of animals)



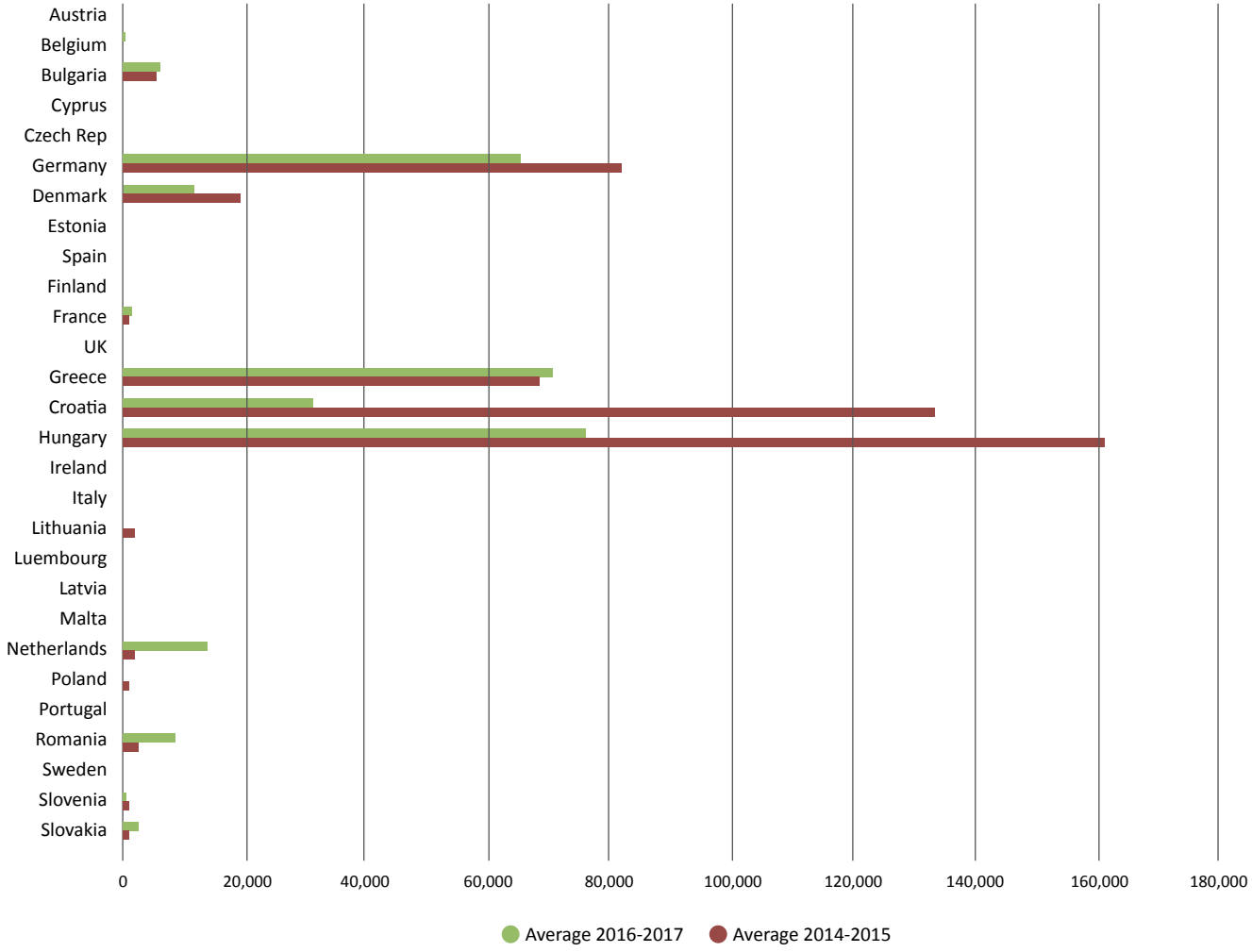
Intra-EU live sheep/goat trade

Figure 7. Intra-EU sheep/goat export (other purposes, number of animals)



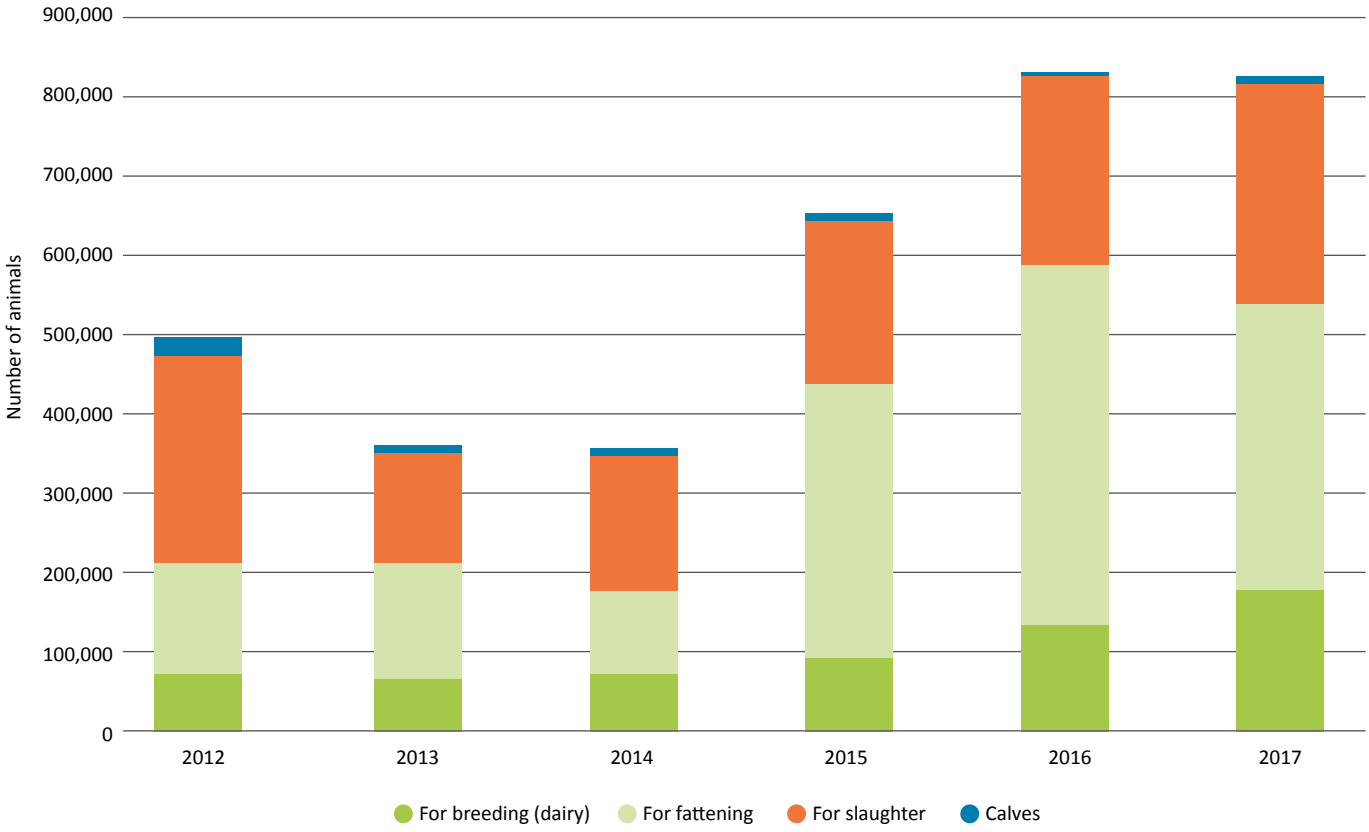
Extra-EU live pigs trade

Figure 8. Extra-EU pigs export (other purposes, number of animals)



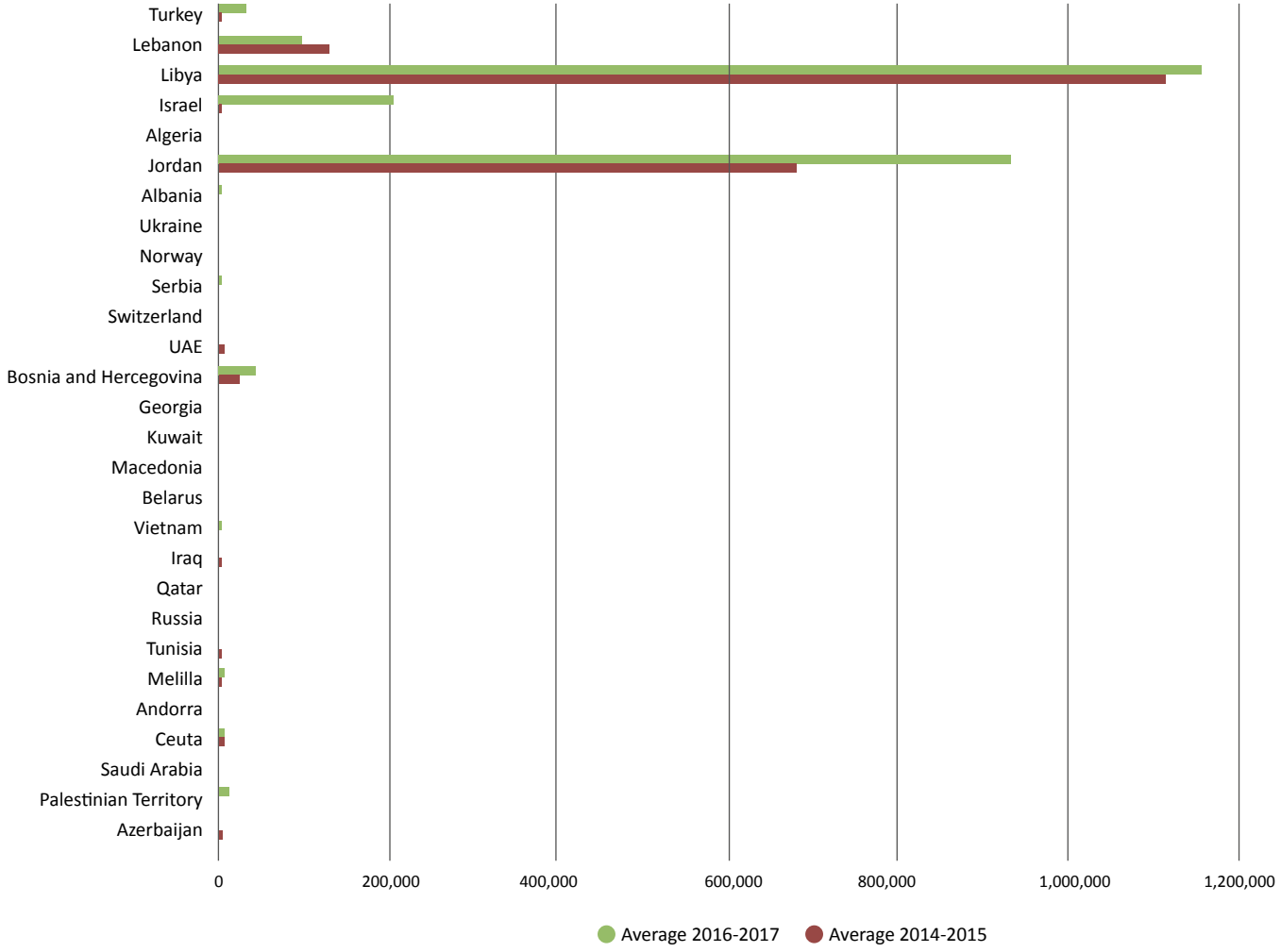
Extra-EU live cattle trade

Figure 9. Cattle exports to third countries, total EU28, 2012-17



Extra-EU live sheep/goat trade

Figure 10. Extra-EU sheep/goat destinations (other purposes, number of animals)



ANNEX III: MOBILE SLAUGHTER: EXAMPLES IN MEMBER STATES

Germany

There are some nationwide initiatives aimed at using the mobile slaughtering method with the specific aim of preventing live animal transport. The legal framework surrounding these initiatives was clarified in 2017. The working group on Meat and Poultry Meat Hygiene and Technical Issues concerning Food of Animal Origin (AFFL) was set up by the Länder Working Group on Consumer Protection (LAV) to examine the legal basis for these initiatives. In May 2017, the AFFL project group presented its ideas on the framework conditions under which a partially mobile slaughter of cattle could be authorized. Since this slaughter is to be regarded as a commercial standard slaughter, it must correspond to the specifications of the EU Slaughter Regulation (ref. leg. 1099/2009), the national Slaughter Regulation (Animal Welfare Ordinance of 20 December 2012, Federal Law Gazette I p. 2982[37]), as well as the EU Hygiene Regulation (ref. leg. 853/2004).

On this basis, the new AFFL Decision[38] sets out framework conditions for the mobile slaughter of cattle, including the following:

- The EU approval of a slaughterhouse may include a mobile slaughter unit.
- The slaughtering process must always take place within the premises of an approved slaughterhouse. The mobile slaughter unit must therefore have walls, ceiling and floor and the slaughtering procedure must meet the requirements of EU hygiene law.
- Anesthesia can be done outside, but only by the bolt firing procedure which is possible on the basis of the special permission according to § 12 Tier LMHV[39] for year-round outdoor cattle.

Several initiatives have been identified:

1. **Mobiler Metzger, North Rhine-Westphalia:** This is an independent business located in North Rhine-Westphalia, west Germany who works as a service provider. It is presented as Germany's only mobile slaughter, cutting and processing company. The company achieved its registration as an EU-approved slaughterhouse, cutting plant, and processing plant in 2013; since then, it has been steadily expanding and developing/updating its facilities, with brand new facilities operational since spring 2019. According to the company, the required start-up investment is quite significant, but this includes the full range of facilities from slaughtering to deboning/cutting and packing, as well as the required EU approvals and certifications. The company works predominantly with smaller organic and free-range farms. The provided slaughter service is roughly 50% more expensive than conventional slaughtering; conventional slaughter costs up to €100/pig but this mobile slaughter service costs about €150/pig. The scope of this specific service is clearly niche: it is available at a significant premium, and has a relatively limited capacity. To put this in context in the region that it operates (North Rhine-Westphalia), nearly 700,000 cattle and 17 million pigs were slaughtered last year.

2. **Extrawurst, Hessen:** Mobile slaughtering of cattle is piloted in Hessen under a EIP project called "Extrawurst", launched in January 2017 with the specific aim of preventing live animal transport. Hitherto, only farms that kept their cattle outdoors all year round could use mobile and semi-mobile slaughter (as already indicated, this derogation from EU law, subject to authorization, has been possible in Germany under the Animal Food Hygiene Regulation (Tier LMHV)). Extrawurst has set itself the goal of developing guidelines for the use of mobile and semi-mobile slaughter also for cattle that are not kept outdoors all year round.
   The project results are promising, although they also indicate that the mobile slaughterhouse cannot fully replace the transport of large numbers of animals to the slaughterhouse. Being relatively expensive, as it roughly doubles the price of slaughter per animal, this is for the moment only suitable for individual animals. According to the Association of Farmers with Artisanal Meat Processing (Federführung des Verbandes der Landwirte mit handwerklicher Fleischverarbeitung vlhf), despite the higher costs of mobile slaughterhouses, the project also shows that farmers and butchers using this process can get a competitive advantage in the mar-

[37] http://www.gesetze-im-internet.de/tierschlv_2013/index.html
[38] Circular Decision 2017-VI of the Working Party on meat and poultry meat hygiene and technical issues of food of animal origin (AFFL). In German: AFFL, 42. Sitzung am 8. Und 9. Mai 2017 in Stuttgart, Beschluss zum TOP 6.7 "Mobile Schlachtung von Rindern".
[39] Regulation on hygiene requirements in the manufacture, treatment and placing on the market of certain food of animal origin (Animal Food Hygiene Regulation - Animal LMHV) of 08.08.2007. Full citation: "Animal Food Hygiene Ordinance of 8 August 2007 (BGBl. I p. 1816, 1828), which was last amended by Article 1 of the Ordinance of 10 November 2011 (Federal Law Gazette I p. 2233)". ("Tierische Lebensmittel-Hygieneverordnung vom 8. August 2007 (BGBl. I S. 1816, 1828), die zuletzt durch Artikel 1 der Verordnung vom 10. November 2011 (BGBl. I S. 2233) geändert worden ist").

ket. A new market can open, reviving rural relationships between farmers, butchers and customers.
An important further step is to develop a guide agreed with the veterinary authorities, which describes the good practices of the new procedure and sets the factors relevant to animal welfare. This should enable the new procedure to be recognized beyond Hessen. In particular, the goal is to develop Standard Operating Procedures in accordance with Article 6 (3) of the EU Slaughter Regulation (ref. leg. 1099/2009). These guidelines will be agreed with the veterinary authorities. The project group hopes that this will facilitate the approval processes for semi-mobile slaughterhouses, initially in Hessen but with a view to a nationwide regulation.

3. **IG Schlachtung mit Achtung / SMA meat (Baden-Württemberg):** Launched several years ago, this project develops its own trailer equipment. After pilot testing, the purpose-built equipment (MSE-001) reached the market in March 2019. The organisation also promotes consumer awareness of meat produced with stress-free methods, including near-farm slaughter without live animal transport, through the SMA certification scheme[40]. For the moment, the scheme covers cattle raised on pastures and the mobile slaughter unit is used directly on pasture[41]. The authorities in Baden-Württemberg support and promote the development of mobile slaughter, including concepts that can balance the requirements of EU hygiene law - that slaughter animals must go live to the slaughterhouse - with the objective of replacing live animal transport to slaughterhouses.

4. **Mobile slaughter of pigs (Bavaria):** This pilot project has been scientifically supported by the Department of Food Safety of the Faculty of Veterinary Medicine of Ludwig-Maximilians-Universität (LMU) in Munich, to improve understanding of how the mobile slaughtering technique can be used in pigs and the benefits of the procedure. LAND.LUFT, an organic farm of the Lindner Group from Arnstorf in Lower Bavaria, has been working on the project since autumn 2016. For this purpose, a special slaughter trailer with the required EU approval has been developed, in which the pigs – which are raised free-range in open fields - are anesthetized and bled; further preparation of the animals for slaughter, including the post-mortem inspection, is carried out in a nearby cutting plant.
The results of the project, as reported by LMU, identify significant advantages of the procedure in maintaining consistency of the stress-free approach throughout the production process from raising the animal to slaughter. But there are also benefits in terms of meat quality, and encouraging the development of short/local supply chains to sustain small business in rural areas - for example, traditional butchers - that would otherwise be at risk of disappearing. The meat is reported to be sold at prices similar to organic meat, higher than conventional meat, but not significantly higher than other organic meat slaughtered with conventional methods.

France

On-farm slaughter in France is currently restricted to the slaughter of pigs, sheep, goats, poultry and rabbits for self-consumption (family slaughter). This derogation does not concern cattle (including calves) or *equidae* and excludes all marketing of meat. The option to use a mobile slaughterhouse is not mentioned in the French regulations. In October 2018, French parliamentarians adopted a specific law on trial periods with mobile slaughterhouses, while a Decree for their application was published in April 2019 (Decree No. 2019-324 of 15 April 2019 on the experimentation of mobile slaughterhouses). During the four years of the experiment mobile slaughterhouses will be able to be approved, as is the case for regular (fixed) slaughterhouses. The Decree is based on Article 73 of the French Agriculture and Food Act of 30 October 2018, as well as Regulation (EC) 853/2004 and Regulation (EC) 1099/2009.

In 2018, Article 73 of the French Agriculture and Food Act paved the way for a four-year trial of mobile slaughterhouses in France: *"On an experimental basis and for a period of four years from the publication of the decree provided for in the last paragraph of this article, mobile slaughterhouse systems are tested in order to identify any difficulties in applying the European regulations. The experiment is evaluated, including its economic viability and its impact on animal welfare, the results of which are forwarded to Parliament no later than six months before its end. This evaluation establishes recommendations for the development of European Union law".*

Article 1 of the Decree specifies all the modalities for participating in the trials: any person wishing to participate must first obtain the approval of the mobile slaughterhouse, in accordance with the provisions of Article L. 233-2 of the rural code, and comply with all the provisions applicable to the slaughter activity. The approval is subject to a commitment, on the one hand,

[40] https://sma-fleisch.de/was-bedeutet-sma.html
[41] Regulation on hygiene requirements in the manufacture, treatment and placing on the market of certain food of animal origin (Animal Food Hygiene Regulation - Animal LMHV) of 08.08.2007. Full citation: "Animal Food Hygiene Ordinance of 8 August 2007 (BGBl. I p. 1816, 1828), which was last amended by Article 1 of the Ordinance of 10 November 2011 (Federal Law Gazette I p. 2233)". ("Tierische Lebensmittel-Hygieneverordnung vom 8. August 2007 (BGBl. I S. 1816, 1828), die zuletzt durch Artikel 1 der Verordnung vom 10. November 2011 (BGBl. I S. 2233) geändert worden ist").

to sign a protocol allowing the organisation of health inspection and controls and, on the other hand, to communicate the information necessary for the evaluation of experimentation.

There are several initiatives at present rolled out in France:

1. **Boeuf Ethique**
   Hälsingestintan, a Swedish engineering company, is currently working with French firm Boeuf Ethique to roll out a number of these abattoirs across France[42]. The truck will be subject to the same sanitary rules as a traditional slaughterhouse; the application for sanitary approval will be examined by the services concerned before it is put into operation, which is expected to take place by the end of 2019. This project is supported by AFAAD. Boeuf Ethique has already invested in two slaughter trucks and signed a partnership with the Autun slaughterhouse which will take first of all, the maturation and the cutting of meat. It is expected that this operation will employ four or five people including a veterinarian and will slaughter about 15 animals a day within a radius of 300 km.

2. **Quand l'abattoir vient à la ferme**
   This association started as a collective initiative in late 2015 by Jocelyne Porcher, Research Director at INRA and Stéphane Dinard, breeder in the Dordogne, to promote slaughter solutions on the farm as part of a wider reflection to promote more ethically responsible and socially acceptable livestock production systems (Porcher, J. *et al*, 2014). Since June 2018, the Collective has become an Association. Different regions are represented (Loire Atlantique, Gers, Dordogne, Mayenne). The specificity of the association is its multidisciplinary profile, since it brings together breeders, veterinarians, craftsmen-butchers, animal welfare associations and active consumers and citizens. Today, the association counts almost 2,000 people committed to this initiative.

Belgium

In 2017 Nature & Progrès Belgique finalized a complete dossier on on-farm slaughter (Nature & Progrès Belgique, 2017). The use of mobile slaughter solutions, which is currently not practised in Belgium, is seen as an opportunity to address the lack of local slaughter facilities for farmers involved in short supply chains. In fact, smaller farmers are currently facing serious difficulties in slaughtering their animals: journeys between the farm and the remaining slaughterhouses are becoming longer, and the latter, seeking to make their structure more profitable through the automation of chains and a higher rate of production are less open to small batches of animals or animals of non-standardized formats.

In Wallonia, the idea of setting up a mobile slaughterhouse is not new; it has already been the subject of a very comprehensive feasibility study carried out in 2012 by the CER for the Province of Luxembourg (De Bruyn, 2012). The study reviewed various models and concluded that two active mobile slaughterhouses models, the Swedish Hälsingestintan and the German "Mobiler Metzger", provide the most promising opportunities[43].

United Kingdom

In the UK, two mobile abattoirs were tried during the 1990s, one of which was established by the Humane Slaughter Association (HSA). According to HSA, neither lasted very long as a commercial operation, mainly due mainly to significant costs - including infrastructure costs required by the regulatory authorities at each farm involved in the scheme - and inspection costs, both ante- and post-mortem. However, this was in the wake of the Bovine Spongiform Encephalopathy (BSE) crisis when regulatory authorities were particularly strict on all aspects of the slaughter industry; after the 2001 FMD crisis, attitudes on this started to change. More recently, the concept has been revised in the UK. A small producer group led by Fir Farm in Gloucestershire is currently assessing the feasibility of establishing a mobile abattoir to operate in the North Cotswolds area.

According to the Sustainable Food Trust, the consolidation of the slaughter sector in the UK is mainly due to the high costs and low profitability which make smaller facilities uneconomically viable, despite healthy demand for locally-sourced meat. Transporting small numbers of farm animals to be slaughtered, and then back to the farm of origin for traceability purposes, is more expensive than sending them to a larger abattoir. Bigger abattoirs are also often built or expanded with the aid of government grants or tax breaks, which can also create over-capacity, driving the smaller facilities out of business.

In 2018 the Trust called on the UK government to put support mechanisms in place to preserve and build on what remained

[42] http://www.boeuf-ethique.com/p132-abattoir-mobile-france.html

of the local abattoir sector to capture the growing market for traceable, local and high-welfare meat (Sustainable Food Trust, 2018). One of the measures suggested was allowing mobile and small static on-farm abattoirs, which would remove the need for animals and carcasses to be transported to and from the farms. The Trust referenced mobile units already in use in other parts of the EU to demonstrate that they can be managed within a tight regulatory framework. As part of this report, the Trust carried out a telephone survey of owners of smaller mobile abattoirs. Several owners, as well as industry experts, suggested that small independent abattoirs are over-regulated, which is having a disproportionate impact on these smaller plants in both cost and management time.

The Netherlands

In 2010-2011, the Dutch government commissioned Wageningen University (WUR) to carry out a feasibility study on the use of mobile slaughterhouses for cattle, sheep, goats, pigs and poultry in organic farming (Wageningen University, 2011). It concluded that a mobile unit for complete slaughter and processing requires several trailers with slaughter units, cooling space for hanging, cutting space and storage of residual material. A semi-mobile unit for slaughter seems to be more feasible, especially for small animals, as the trailer equipment required is considerably less extensive; cooling, deboning and cutting could then take place in a suitable local processing room on the farm or at the butcher's shop.

Since then, some private initiatives offering mobile and semi-mobile slaughterhouse services, mainly for cattle and pigs, have emerged in the Netherlands, also encouraged by the increasing use of mobile slaughter in neighbouring France and Germany. In the bovine sector there are some ongoing pilot projects, for example Mobielslachthuis, working closely with the Dutch Food and Consumer Product Safety Authority (NVWA). The concept has been piloted in Friesland and Groningen, but if successful, it will be rolled out throughout the Netherlands.

Mobielslachthuis uses two trucks and two trailers; the slaughtering capacity of a trailer is seven to eight cows per day, and the capacity of the trucks is 15 to 16 cows per day. However, to be economically viable, a mobile slaughterhouse has to slaughter a minimum number of animals per day. In the case of pigs, farmers must be able to slaughter nearly 30 a day; for cattle, a significant number of small-scale farmers need to participate for the project to work financially. According to the 2010-2011 WUR study, a first indication is that the costs of smaller units are approximately estimated to be €1-€1.5/kg higher than conventional slaughtering. The ongoing pilot and commercially available projects do not indicate whether these costs differentials are confirmed in practice, as the operation of these systems is still at early stages and therefore the actual costs in the long run and with an expanded use could be lower.

Austria

In June 2018, Upper Austria became the first Austrian federal state to pass a law that clears the way for mobile slaughterhouses. The law now enables the approval of partially-mobile slaughterhouse trailer extensions of an existing slaughterhouse license (according to LMSVG § 10). As this method is an innovative, new approach, the concept is promoted with three pilot projects under the "Agricultural Research and Development" grant funded by the State Government, Department of Agriculture and Forestry of the Office of Upper Austria. Co-operation projects need to involve a slaughterhouse and at least three agricultural holdings. Projects can also be carried out under LEADER, provided that an agreement is reached with the Local Action Group. In both cases, the pilot phase runs from June 2018 to end December 2020. In order to make the investment in facilities, the state is paying up to 40% of the net costs.

The focus of mobile slaughter in Upper Austria is on the cattle industry, which is an important branch of industry in the region. There are around 14,000 cattle farmers in Upper Austria, holding approximately 570,000 cattle of which some 220,000 are slaughter animals. The mobile slaughter system is considered appropriate for all those who sell their meat directly from the farm. The value added from the sale of beef in Upper Austria is around €280 million a year, while one third of all slaughtering takes place within the region.

There are various initiatives, for example the project *"Initiative for a stress-free farm slaughter*", which is funded as a LEADER

[43] Other models considered include the Austrian Schwaiger truck mobile slaughterhouse, set up in the 1980s but this is no longer active.

project by the EU, the Federal Government and the Province of Styria[45]. The provincial authorities highlight the benefits of the approach in terms of meat quality and the possibility for product differentiation and the development of local/short supply chains.

At federal level, similar clarifications in the legal basis provided by the Federal Ministry of Veterinary Affairs in spring 2019, have enabled the approval of mobile slaughterhouses. Based on a Decree issued by the Federal Ministry of Veterinary Affairs in 2015, mobile slaughterhouses have hitherto been considered legally inadmissible. However, at the instigation of the federal states, the Federal Ministry set up a working group in 2018 which was to work out under EU and federal food and animal welfare law whether and under which conditions the authorisation of mobile slaughterhouses could be possible. This has enabled the approval of Austria's first commercially available mobile slaughterhouse, in the state of Styria. The facility is similar to those piloted in Upper Austria, i.e. a semi-mobile (trailer-type) extension to an existing slaughterhouse license. Based on the legal clarifications, other semi-mobile slaughterhouses can now also be approved in Austria, provided they meet the necessary conditions.

[44] https://www.stressfrei.st/
[45] http://wiescirolnicze.pl/media/pliki/e5/9d/e59d80768f91daaf523e48481fb78561.pdf

EUROGROUP FOR ANIMALS

Rue Ducale 29 – 1000 Brussels
Tel: +32 (0)2 740 08 20
Email: info@eurogroupforanimals.org
Website: www.eurogroupforanimals.org
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