# An empirical analysis of the export potential of pork produced under higher animal welfare standards

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## List of Abbreviations

| | |
|---|---|
| ASF | African Swine Fever |
| BSE | Bovine spongiform encephalopathy |
| CSF | Classical swine fever |
| CVS | Convenience stores |
| EU | European Union |
| FMD | Foot and Mouth Disease |
| FTA | Free Trade Agreement |
| GMO | Genetically modified organism |
| JEFTA | Japan-EU Free Trade Agreement |
| PDO | Protected Designation of Origin |
| PEDv | Porcine epidemic diarrhea virus |
| PGI | Protected Geographical Indication |
| PQS | Polish Quality System |
| QAFP | Quality Assurance for Food Products |

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# Abstract

Livestock farming and especially pig husbandry are controversially discussed in European society. As a result, the demand for higher animal welfare standards is rising. However, higher animal welfare standards imply higher production costs for farmers and other partners along the processing chain. Therefore, farmers are concerned about their future perspective.

Since Germany is a net exporter for pork, the question arises, whether German pork produced under higher animal welfare standards might have a chance on foreign markets? Thus, within this study, four case studies for Poland, Italy, Japan and South Korea were selected to assess the possible export potential for German pork produced under higher animal welfare standards. Two survey methods were used: First, a market analysis to generate market information and second, interviews with market experts in all four countries to receive additional insider information regarding the respective pork market. The expert interviews were evaluated based on a qualitative content analysis. According to the interviewees the issue of animal welfare plays a distinct role in each country covered. Particularly large disparities have been observed regarding the attitude towards animal welfare in European and in Asian countries. Besides the aspect of animal welfare further criteria seem to be relevant for consumers. Therefore, purchasing criteria such as quality (in particular meat quality including colour, water capacity, freshness), taste, price and the country of origin have to be considered. These criteria already indicate a possible outcome of our analysis that the export potential of German pork produced under higher animal welfare standards varies depending on the individual target market. Therefore, multiple aspects and market data need to be analysed in order to understand the mechanism and speciality of foreign markets. Nevertheless, further research steps need to be carried out in order to be able to make a clearer statement regarding the export potential of German pork produced under higher animal welfare standards.

**Keywords:** export, animal welfare, pork, market analysis, expert interviews, cross-national study

## Zusammenfassung

Derzeit werden in Deutschland die Nutztierhaltung und insbesondere die Schweinehaltung kontrovers diskutiert. In diesem Zusammenhang, werden die Forderungen nach höheren Tierwohlstandards lauter. Allerdings führen höhere Tierwohlstandards zu höheren Produktionskosten. Vor diesem Hintergrund sind deutsche Landwirte insbesondere über die Zukunft der deutschen Nutztierhaltung besorgt, da sie in ihren Augen keine Planungssicherheit haben. Da Deutschland ein Nettoexporteur von Schweinefleisch ist, stellt sich im Rahmen der Tierwohldebatte die Frage, ob es ein Exportpotential für deutsches Schweinefleisch gibt, welches unter höheren Tierwohlstandards produziert wird. Um diese Frage beantworten zu können, wurden innerhalb dieser Studie vier potenzielle Exportmärkte (Polen, Italien, Japan und Südkorea) genauer betrachtet. Dabei wurden zwei Erhebungsmethoden verwendet: Zunächst wurde eine Marktanalyse durchgeführt, um wichtige Marktdaten zu erheben und genauere Kenntnisse über die Schweinefleischmärkte vor Ort zu erhalten. Danach konnten in den Untersuchungsländern Experteninterviews durchgeführt werden, um detaillierte Informationen zu sammeln. Die Experteninterviews wurden im Anschluss mit Hilfe einer Inhaltsanalyse ausgewertet. Laut der Experten spielt das Thema Tierwohl in den verschiedenen Ländern eine unterschiedliche Rolle. Dabei können insbesondere große Unterschiede zwischen den europäischen und asiatischen Untersuchungsländern festgestellt werden. Neben dem Thema Tierwohl müssen weitere Kriterien berücksichtigt werden, die beim Kauf von Schweinefleisch eine beeinflussende Wirkung haben. Dazu zählen unter anderem: die Qualität (und dabei insbesondere die Fleischqualität einschließlich Fleischfarbe, Wasserkapazität des Fleisches oder Frische), der Geschmack, der Preis und das Herkunftsland. Daraus lässt sich schlussfolgern, dass das mögliche Potential für deutsches Tierwohlfleisch je Zielmarkt variiert. Dabei müssen verschiedene Aspekte und Marktdaten berücksichtigt werden, um den Mechanismus und die Spezifität der jeweiligen Zielmärkte zu verstehen. Somit sind weitere Erhebungsschritte notwendig, um eine genauere Aussage darüber machen zu können ob es ein Exportpotential für deutsches Schweinefleisch, welches unter höheren Tierwohlstandards produziert wird, gibt.

**Schlüsselwörter:** Export, Tierwohl, Schweinefleisch, Marktanalyse, Experteninterviews, länderübergreifende Studie

# 1 Introduction

Animal husbandry, and especially pig husbandry, has been part of critical social discussions, especially in recent years, not only in Germany but also in other industrialized countries (European Commission 2005; Vanhonacker et al. 2009; Kayser et al. 2012; Wildraut et al. 2015). Ethical aspects relating to the handling of farm animals play a significant role. In this context, the demand for higher animal welfare is on the agenda of organizations, politics and society.

The social perception on the subject of livestock farming has changed, which can be confirmed by numerous studies about consumer attitudes towards animal husbandry (Rovers et al. 2018; Brümmer et al. 2018). In 2005, 77 % of European citizens indicated that the welfare of farm animals should be better protected (European Commission 2007). This concern had been further reinforced by 2015, when the level of agreement on this issue had risen to 82 % (European Commission 2016). Consumer attitudes are often based on critical media reports, which are often the only source of information for consumers and therefore have a strong influence (European Commission 2007; Thompson et al. 2011; Spiller et al. 2012). The controversial discussion particularly focuses on pig husbandry. In pig husbandry, criteria such as the amount of space provided, outdoor access, and the use of manipulable materials are criticized and regarded as insufficient (Kayser et al. 2012; Weible et al. 2016; Ermann et al. 2017).

According to the increasing demand for higher animal welfare standards, the German government discusses the introduction of a voluntary uniform animal welfare label[1]. Furthermore, the "Borchert-Commission" recommends how livestock farming can, in a stepwise approach, be transformed into production systems with higher levels of animal welfare (BMEL 2020). With this development animal welfare standards in Germany are likely to increase in the future. In this context, farmers are concerned about their economic situation and future since higher animal welfare standards lead to higher production costs (Weiß 2013; Spandau 2015; Deblitz et al. 2021). Farmers need to receive higher prices for their animals to stay competitive and compensate the additional costs. But who should pay for these extra costs? Is it the government, the slaughterhouses or rather the processing industry? Or is it possible to compensate the additional costs in the form of higher sales prices via the market by abolishing the reduced VAT rate for food products? And how will the German position on the international market be affected by higher animal welfare standards and the associated possible increase in consumer prices? Because German animal husbandry is integrated into international trade, it is important to take a closer look at the development of the international market and the position of Germany in international agricultural trade. In the international meat and edible meat offal trade, Germany follows the USA, Brazil, Australia and the Netherlands in fifth place (UN Comtrade 2020).

[1] https://www.bmel.de/EN/topics/animals/animal-welfare/state-run-animal-welfare-label-pigs.html

With regard to pork, Germany is a net exporter (BLE 2018). The total amount of pork exported was 1.8 million tons in 2008 and increased to 2.4 million tons by 2018 (BLE 2020). This is an increase of almost 30 % within 10 years. According to statistical data, EU-intra trade dominates with Italy and Poland as the most important German pork-importing countries within the EU. Outside of the European market, China, Japan and South Korea are important import destinations for German pork (EUROSTAT 2020). Poland and Italy were chosen as European study countries in accordance with statistical data. Since an equal number of European and third market countries could be analysed in this paper, the authors focused on Japan and South Korea as third country markets. South Korea was chosen as one of the most important importers of German pork, and Japan as one of the most important importing countries in the world. In addition, South Korea was used to illustrate the impact of a free trade agreement (FTA) on trade relations.

This Working Paper describes and analyses the selected study countries to get a first impression of the foreign pork markets in terms of market structure, and an initial estimation of the possible export potential for German pork produced under higher animal welfare standards. An understanding of pork markets in foreign countries is an important step toward introducing German pork produced under higher animal welfare standards in the study countries. Furthermore, it gives an overview of the current situation with regard to market data as well as important findings concerning the supply chain. The aim of this study is to get expertise on the pork markets in Italy, Poland, Japan and South Korea. In this context the following questions should be considered:

- What is the *status quo* of the pork markets in the respective study countries?
- What are the foreign trade relations and what might have changed in the pork sector?
- What are key challenges regarding the implementation of pork produced under higher animal welfare standards in Poland, Italy, Japan and South Korea?

It is important to include these questions to be able to answer the overall question: Is there an export potential for German pork produced under higher animal welfare standards?

For this reason, an explanation of the methodological approach, consisting of a classical data analysis and the theoretical description of the expert interviews conducted in the study countries is presented (Chapter two). Afterwards, the results of these expert interviews are described and analysed. In addition, this chapter will also draw attention to similarities and differences between the findings for all study countries. Finally, a critical discussion of the individual countries and the common findings is conducted. The paper ends with a short conclusion and outlines surveys planned for the near future. Various cuts of pork are mentioned in this study. For this reason, an explanatory graphic is included in the appendix (Appendix 1).

Most of the data was collected before the outbreak of the Covid-19 crisis and the outbreak of the African Swine Fever (ASF) in Germany. Thus, the changes resulting from these two diseases are not explicitly addressed in the course of the working paper, although the Covid-19 pandemic and the

ASF have a strong impact on international trade. These issues will be considered more precisely in a later report on the research project.

# 2 Methods

## 2.1 Market and data analysis

A literature review was conducted to give an overview of the market situation and segmentation in Germany and in the four selected countries, covering data on production, self-sufficiency level, per capita consumption, import, export as well as the most preferred cuts on the different markets of destination.

## 2.2 Expert interviews

Interviews are one of the most common methods in qualitative research and find various applications in many fields of interdisciplinary science. The expert interview used in this study is an independent specific form of qualitative interviews (Flick, 2019). In general, people are asked about their experiences and function within a specific topic as "experts" (Mey/Mruck, 2007). This method is especially suitable "if the investigation is directed, for example, at the contents and variants of expert knowledge in a problem area among representatives of different institutions in a comparative perspective" (Flick, 2019).

In this case, different scientists, members of institutions or federations dealing with meat markets are characterized as experts. They were selected mainly on the basis of existing studies and recommendations by colleagues or other scientists as well as by members of industry. Two to three market experts could be interviewed for each country. Nevertheless, the contacting of potential experts is linked with many aspects and is therefore, not always successful. It was especially difficult to get in contact with experts in South Korea and Japan, because of cultural as well as language barriers and the tough time schedule of those experts due to Covid-19. Overall, the sampling structure is represented in Table 1 and shows the number of interviews conducted in each study country.

**Table 1: Sampling Structure**

| Country | Number of interviews conducted |
|---|---|
| Germany | 2 |
| Italy | 3 |
| Poland | 3 |
| Japan | 3 |
| South Korea | 2 |
| **In total** | **13** |

Source: own compilation

The interview guidelines consist of two parts, supply and demand, each with different main questions. The interview guidelines also included additional questions, which were added to obtain further information from the interview partners if necessary (see also Christmann, 2009). The complete guidelines are presented in Appendices 2 and 3.

The interviews were conducted mainly face-to-face. Only the interviews with the Japanese and South Korean experts were conducted via videoconference, due to Covid-19. Thereby, the duration of the interviews was on average one hour, but often longer due to the high willingness to cooperate on the expert side. The interviews were recorded and afterwards transcribed word-for-word. Thereby, the interviews were anonymized in order to ensure that no conclusions could be drawn about the discussants (Kuckartz, 2018).

Mayring's approach was followed for the content analysis (Mayring, 2016). He uses a mixed inductive-deductive category system, which can be described as an uninfluenced (inductive) and at the same time literature based (deductive) procedure. The main categories “pig production and farm structure”, “trade”, “supply chain”, “consumption”, “labelling system”, “consumer preferences” and “animal welfare” and “assessment of future market development” were established in advance and included in the interview guideline. Other sub-categories have been developed from the text material obtained through the interviews and were not known in advance. Coding and analysis were computer aided with the software MAXQDA, which allows the allocation of relevant text passages into main and subcategories.

# 3 Results

This chapter presents the results, beginning with the important market data and followed by the main points of the expert interviews.

## 3.1 Results of the market data analysis

The net production of German pork increased from 2008 to 2018 by 4.4 %, and reached 5.3 million tons in 2018. Besides Spain, Germany is the second important pork producer within the EU. With a self-sufficiency rate of 119 % in 2018, Germany produces more than is consumed. Consequently, Germany is also an important net exporter of pork. Although Germany is a net exporter of pork at an aggregated level, Germany is also a significant importer of valuable pork cuts mainly from other EU member states (AMI, 2007-2020; Efken et al., 2020). Compared to Germany, the study countries such as Italy, Poland, Japan and South Korea are not self-sufficient in pork. Japan in particular is characterised by a low self-sufficiency rate, despite considerable increases in production in recent years. Pork is the most important type of meat in all study countries. Therefore, the consumption of pork is, at least in the European countries, at a high level and can be compared to the per capita consumption in Germany. Nevertheless, the consumption decreased over the last 10 years. This goes in line with the public debate of declining meat consumption (BLE 2021). Compared with Europe, the per capita pork consumption in the Asian study countries is at a much lower level (compare Table 2).

**Table 2: Net production, self-sufficiency level and per capita consumption of pork**

| | Net production | | | Self-sufficiency level | | | Per capita consumption | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2008 | 2018 | 2018 rel. to 2008 | 2008 | 2018 | 2018 rel. to 2008 | 2008 | 2018 | 2018 rel. to 2008 |
| | 1 000 t | | % | % | | | kg | | % |
| Germany | 5 122 | 5 348 | + 4.4 | 103 | 119 | + 15.5 | 54.2 | 49.5 | - 8.7 |
| Italy | 1 606 | 1 481 | - 7.8 | 70 | 64 | - 8.6 | 37.7 | 36.0 | - 4.5 |
| Poland | 1 888 | 2 093 | + 11 | 90 | 97 | + 7.8 | 54.6 | 51.2 | - 6.2 |
| Japan | 874 | 1 285 | + 47 | 52 | 48 | - 7.7 | 14.5 | 15.9 | + 9.7 |
| South Korea | 792 | 1 375 | + 74 | 69.3 | 66.2 | - 4.5 | 19.1 | 28.0 | + 46.6 |

Source: AMI (2007-2020); MJ International (2020); MAFF (2017-2018); OECD (2021)

After this more general introduction to some features of the pork markets in Germany and its four selected export destinations, the following pages provide some further insights into the details of the Polish, Italian, Japanese and Korean markets for pork.

As described in Table 3, the total import volume in **Poland** increased by 16 % from 2012 to 2019. Therefore, the share of imports from the sources outside of the EU was very low in both 2012 and 2019, although the EU28 were able to increase its export volume by 16 %, as well. Accordingly, Belgium out-paced Germany in 2014 and is now the major trading partner of Poland with regard to Polish pork imports. Germany is in second place with 154 182.0 tons in 2019. This is a decrease of 7.1 % compared to 2012. Furthermore, Spain became an essential trading partner for Poland, since the import volume of Spanish pork increased by 227.5 % within seven years.

**Table 3: Import Quantity "Meat of swine, fresh, chilled or frozen" to Poland, 2012 and 2019**

| Ranking | Partner | Quantity 2012 | Quantity 2019 | 2019 rel. to 2012 |
|---|---|---|---|---|
| | | in t | in t | in % |
| | World | 571 064.0 | 662 468.2 | 16.0 |
| | EU28 | 570 499.3 | 661 846.6 | 16.0 |
| **1** | Belgium | 121 325.1 | 191 974.2 | 58.2 |
| **2** | Germany | 165 930.5 | 154 182.0 | - 7.1 |
| **3** | Denmark | 138 299.8 | 103 838.9 | - 24.9 |
| **4** | Spain | 22 639.6 | 74 137.3 | 227.5 |
| **5** | Netherlands | 66 505.7 | 66 832.1 | 0.5 |
| **6** | United Kingdom | 26 666.6 | 23 039.4 | - 13.6 |
| **7** | France | 17 310.9 | 21 855.6 | 26.3 |
| **8** | Hungary | 3 930.8 | 8 000.7 | 103.5 |

Source: UN Comtrade (2020)

With regard to **Italian** pork imports, it stands out that Italy imports a huge amount of German pork. In 2019 the amount accounted 945 056 tons. The majority of imports in 2012 as well as in 2019 came from the EU domestic market, whereby the share of extra EU imports is very low for the same period. Since 2012 Italy has imported a stable amount of pork from Germany. Spain, in second place, overtook the Netherlands in 2016. This shows the steadily increasing market power of Spain in the European pork market. (Table 4)

**Table 4: Import Quantity "Meat of swine, fresh, chilled or frozen" to Italy, 2012 and 2019**

| Ranking | Partner | Quantity 2012 | Quantity 2019 | 2019 rel. to 2012 |
|---|---|---|---|---|
| | | in t | in t | in % |
| | World | 918 212.4 | 945 056.0 | 2.9 |
| | EU28 | 915 855.2 | 952 418.1 | 4.0 |
| **1** | Germany | 294 769.2 | 313 075.9 | 7.9 |
| **2** | Spain | 128 142.4 | 156 904.3 | 22.4 |
| **3** | Netherlands | 141 168.4 | 147 365.1 | 4.4 |
| **4** | France | 116 705.1 | 95 791.54 | -17.9 |
| **5** | Denmark | 94 797.0 | 87 844.9 | -7.3 |
| **6** | Poland | 29 293.6 | 43 151.6 | 47.3 |
| **7** | Austria | 35 653.8 | 37 499.6 | 5.2 |
| **8** | Belgium | 37 506.0 | 30 066.4 | -19.8 |

Source: UN Comtrade (2020)

All in all, **Japan** is one of the largest food importers in the world (Felt et al. 2011). Thereby, meat imports, and especially pork imports, play a decisive role. In 2012 Japan's imports from the EU28 amounted to 217 078.8 t and increased by 58.3 %, to a volume of 343 624.9 t in 2019. In this context, approximately 35.8 % of total Japanese pork imports in 2019 come from the EU28 countries. The three most important countries from which Japan imports pork are the United States, followed by Canada and Spain (Table 5). Therefore, chilled pork usually comes from the United States and Canada, whereas frozen pork is imported mainly from Spain and other European countries due to the long delivery period. Japanese importers need to combine expensive and cheap products because of the Gate Price System (see Chapter 3.2). In this case, Spain is particularly suitable because Spain can offer normal pork bellies, loins or shoulders at a lower price level and Iberico bellies or collars at a higher price level. Although Germany is only in the eighth place it must be mentioned that the import volume in Japan coming from Germany increased by 3 190.8 % from 2012 to 2019. This is the result of different factors, as pointed out by the interviewed experts. Firstly, a German slaughterhouse company and a Japanese meat processing company have built up their trading cooperation. Secondly, a European slaughterhouse started seasoned pork production in Germany. And thirdly, the USA had some problems with PEDv (Porcine epidemic diarrhea virus) and could therefore not supply enough pork to Japan, in general. As a result, Japan had to look for alternatives such as Germany. Another factor that could have been beneficial for Germany is the free trade agreement (JEFTA) between the EU und Japan which would probably strengthen the trading relationships. Additionally, German products have a good reputation in Japan. Until 2015, Poland was also an important trading partner for Japan. But due to the outbreak of African Swine Fever (ASF) in Poland, Japan stopped importing pork from Poland in 2016. Only cooked products can be still exported from Poland to Japan.

**Table 5: Import Quantity "Meat of swine, fresh, chilled or frozen" to Japan, 2012 and 2019**

| Ranking | Partner | Quantity 2012 | Quantity 2019 | 2019 rel. to 2012 |
|---|---|---|---|---|
| | | in t | in t | in % |
| | World | 778 803.7 | 958 985.2 | 23.1 |
| | EU28 | 217 078.8 | 343 624.9 | 58.3 |
| **1** | United States | 313 859.7 | 248 791.5 | -20.7 |
| **2** | Canada | 172 613.5 | 231 700.9 | 34.2 |
| **3** | Spain | 26 303.4 | 122 595.9 | 366.1 |
| **4** | Denmark | 116 741.7 | 110 504.8 | -5.3 |
| **5** | Mexico | 45 629.6 | 102 368.6 | 124.4 |
| **6** | Netherlands | 6 998.9 | 34 021.9 | 386.1 |
| **7** | Chile | 28 917.5 | 27 621.8 | -4.5 |
| **8** | Germany | 788.8 | 25 958.3 | 3 190.8 |

Source: UN Comtrade (2020), MAFF (2017-2018)

The strong increase of **South Korean** imports of German pork results from the fact that South Korea has opened its market for imports. Therefore, Germany was able to expand its market position. In this context, the introduction of the free trade agreement was also a helpful step. Furthermore, the following factors have made a positive contribution: the consumption of German products seems to be stable, and German pigs are very suitable for South Korean consumers. Additionally, Germany is able to deliver the demanded volume of pork, as the production of pork in Germany is very high compared to other countries. According to the South Korean expert, the quality, as well as the price, seem to be reasonable. Especially, pork bellies are popular in South Korea. Overall, the import quantity of pork increased by 37.7 % between 2012 and 2019. Thereby, 40.9 % of all pork imports come from EU28 countries in 2012. This market share could be built up to 48.1 % in 2019, illustrating how important EU exports are for South Korea. (Table 6)

**Table 6: Import Quantity "Meat of swine, fresh, chilled or frozen" to South Korea, 2012 and 2019**

| Ranking | Partner | Quantity 2012 | Quantity 2019 | 2019 rel. to 2012 |
|---|---|---|---|---|
| | | in t | in t | in % |
| | World | 380 927.3 | 524 681.4 | 37.7 |
| | EU28 | 155 664.0 | 252 507.3 | 62.2 |
| **1** | United States | 120 114.9 | 181 900.3 | 51.4 |
| **2** | Germany | 35 741.8 | 109 863.7 | 207.4 |
| **3** | Spain | 26 315.7 | 77 415.9 | 194.2 |
| **4** | Canada | 58 551.1 | 43 474.7 | -25.8 |
| **5** | Chile | 37 053.7 | 30 695.1 | -17.2 |
| **6** | Netherlands | 14 513.2 | 20 357.3 | 40.3 |
| **7** | Austria | 13 783.4 | 13 542.4 | -1.8 |
| **8** | Denmark | 12 367.8 | 13 351.8 | 8.0 |

Source: UN Comtrade (2020), KITA (2020)

Table 7 shows the three most important pork cuts imported from Germany by different countries. Therefore, every country has its own favoured pork cuts. The biggest difference lies in the condition of the imported pork. Whereas Japan and South Korea mainly import frozen pork from Germany, Italy and Poland prefer fresh or chilled pork products. Besides the different preferences of the meat condition, every study country has its own preferences regarding the type of cut. For this purpose, the trade data of the CN8 classification at Eurostat were analysed. This means in detail that Italians usually import fresh or chilled swine hams from Germany, Polish importers prefer fresh or chilled boneless meat of swine, whereas Japanese importers import frozen boneless meat of swine. In contrast, South Koreans import especially frozen bellies "streaky" and cuts thereof of swine from Germany. Those pork bellies are the second important pork product for Japanese importers. Since the complete pig is not utilized in Germany, the different demand for certain cuts of pork in the study countries shows that the complete pig can be traded on the international market. In terms of sustainability and food loss, this is an important aspect supporting the benefits of exports.

**Table 7: Important cuts of pork imported from Germany**

| | 1. (most important) | 2. | 3. |
|---|---|---|---|
| Italy | Fresh or chilled with bone in, domestic swine hams and cuts thereof | Fresh or chilled boneless meat of domestic swine (excl. bellies and cuts thereof) | Fresh or chilled domestic swine carcasses and half-carcasses |
| Poland | Fresh or chilled boneless meat of domestic swine (excl. bellies and cuts thereof) | Fresh or chilled loins and cuts thereof of domestic swine | Frozen boneless meat of domestic swine (excl. bellies and cuts thereof) |
| Japan | Frozen boneless meat of domestic swine (excl. bellies and cuts thereof) | Frozen bellies "streaky" and cuts thereof of domestic swine | Edible offal of swine, frozen (excl. livers) |
| South Korea | Frozen bellies "streaky" and cuts thereof of domestic swine | Frozen boneless meat of domestic swine (excl. bellies and cuts thereof) | Frozen meat of domestic swine, with bone in (excl. carcasses and half-carcasses, hams, shoulders and cuts thereof, and fore-ends, loins, bellies and cuts thereof) |

Source: Eurostat (2020)

## 3.2 Results of the expert interviews

This chapter summarizes the results of the expert interviews for the pork sector in the countries studied. In order to keep the chapter transparent, the results of the individual countries are presented after each other, so that similarities and clear differences can be identified at the end. Starting with the European countries Poland and Italy, the Asian countries Japan and South Korea will follow. The structure of the chapters for each country are in line with the main categories of the interview guideline: pig production and farm structure, trade, supply chain, consumption, labelling system, consumer preferences and animal welfare and assessment of future market development.

**Poland**

*Pig production and farm structure*

Poland is among the top 10 largest pig producers in the EU. In 2006, the pig population amounted to approximately 19 million pigs in Poland and decreased to 11 million pigs in 2019. In this context, the experts state two reasons for this decline. First a low profitability and second an increase of animal welfare standards after Poland's entry in the EU. Furthermore, Danish trading partners have entered the Polish market with pig carcasses, which has also led to a decrease in pig producers. In addition, the number of pig farms decreased from around 280 000 in 2013 to 150 000 in 2017. All in all, the structure of Polish pig farms is diversified. There are still many small farms with only one to ten pigs, but on the other hand there are many big farms with more than 300 finishing pigs. The average herd size is 50 pigs per farm in Poland, thus 80 % of farms keep less than 50 pigs and only 1 % of Polish farms have more than 1 000 pigs (BMEL, 2021). In comparison with the individual types of livestock, the average number of cattle per farm is 17 and of poultry 400, as stated by a Polish expert. Although the pig population decreased, at the same time the net production of pork has remained about the same and is at about 2 million tons in 2019 (AMI, 2007-2020). This results from the fact that pigs or carcasses are imported and further processed.

*Trade*

Poland is a net importer of living pigs, mainly piglets which are fattened. This can be seen in trade statistics and is shown more precisely in the results section "Market Analysis" (Chapter 3.1). Due to the large amount of imports, Poland is able to keep the production level stable. The living pigs are imported mainly from Denmark, Germany, the Netherlands, Lithuania and the Czech Republic. Accordingly, imported pork comes primarily from Germany, Belgium, Denmark, Spain and the Netherlands, according to the experts. Overall, fresh and frozen meat accounts for about 80 % of all imported meat. Usually chops, pork neck and shoulder, as well as bacon, are the most popular pork cuts. In addition, a lot of processed meat is bought by consumers, such as sausages, ham and bacon with a high fat content. Nevertheless, schnitzel and sausages are the most popular kind of consumed pork.

*Supply Chain*

The pork supply chain was analysed in more detail in the expert interviews. Based on the given information, it can be determined at which stage German pork enters the Polish market. Due to its small-scale production structure Polish pork production is less competitive compared with foreign competitors. The efficiency of Polish farms with regard to the number of raised piglets per sow or the feed conversion distinguishes from other European countries and is lower in comparison. Nevertheless, it can be stated that sizes and management effects are influential criteria with regard to profitability. In summary, Poland's performance on the farms is rather low, but at lower prices (feed price, labour costs) compared to Denmark or the Netherlands (Deblitz et al. 2020). One expert stated that this fragmentation of agricultural holdings results in a low level of production. On the other hand, the experts considered that this fragmentation can be beneficial, e.g., for organic pork production that can be better implemented in smaller structures.

In general, two different Polish pork supply chains can be identified: The first stage in the Polish pork supply chain is characterized by small or big pig farms which either sell their pigs directly, use them for their own needs or sell the pigs via traders to the slaughterhouses. In this case, livestock traders collect pigs on various small farms to deliver them together to the slaughterhouses. Within this supply chain, farmers usually do not get the typical market price for pork. The traders offer a fixed price to the farmers which is based on the market price but does not adjust to fluctuating prices. Therefore, the trader gets the full margin. However, the integration process of small farms is low. In contrast, few big farms have direct contracts with slaughterhouses because many Polish farmers do not trust in the processing industry. One reason is that the Polish agricultural sector is highly fragmented. Furthermore, Polish pig producers are not able to operate efficiently compared to other European pig producers such as Denmark, Germany or the Netherlands. Since Polish farmers still use traditional old breeds, which are not efficient with regard to the birth rate and survival rate of piglets, the Polish pig farmers cannot keep up with German or Danish pig and especially piglet production, according to the experts. Against this background, the experts stated that this leads to loss of profit on the market and makes Poland not competitive in the European market.

The third supply chain is dominated by foreign capital, especially Danish capital. This means in detail, that Danish companies establish new slaughterhouses or processing industries in Poland or use and buy old companies which are no longer used. Furthermore, Danish capital is invested in closed farms. Therefore, the livestock stables and land are rented from the farmers and the farmers get paid for their working capacity. Fluctuating market prices do not affect farmers within this system, since they get paid for their work, stable and land. In terms of the production route, this means that Danish piglets are exported to Poland. These are mostly Danish breeds, which are characterized by rapid growth and low-fat content. The piglets will be raised and finished by Polish farmers. The finishing pigs will be delivered to slaughterhouses in Poland that are owned with Danish capital. In the end, the pork products will be exported directly. At this point it is unclear whether the distributed product is Danish or Polish. According to the experts, there are no existing data about this topic. Only the number of imported piglets is known. Besides providing Danish piglets, the companies also ensure that certain technologies and feed are available to the farmers.

The finishing period takes usually four months, if the farmers succeed in finishing the pigs faster and in good quality, they get more money from the Danish companies.

*Consumption*

Overall, pork is the most popular type of meat in Poland and more than 50 % of meat consumption belongs to pork with poultry meat at second place, followed by beef (AMI 2007-2020). In terms of the degree of processing, Polish consumers tend to prefer unprocessed fresh meat over processed meat products. On average, Polish consumers buy pork seven times a month, stated the experts. Nevertheless, a trend towards increased consumption of poultry meat can be observed. Although consumers state that they are willing to reduce their meat consumption or rather replace it with vegetarian products, the per capita consumption of pork and poultry meat will continue to rise, according to forecasts as mentioned by the experts.

*Labelling system*

In general, consumers buy their food in supermarkets. At this point, it is difficult for consumers to distinguish between domestic and imported meat, although the origin must be indicated on the package. If the meat has been processed in Poland, it is branded on the packaging with the label "Polish Product". However, this is misleading for the customer, as the raw material of the processed product can be imported. Besides this new brand, there are two other labels.

According to the experts, Poland has the PQS (Polish Quality System) label and the QAFP (Quality Assurance for Food Products) label. While QAFP applies to various types of meat and marks meat of high quality, PQS is only valid for pork. However, both labels are rather quality labels, where animal welfare either plays no or only a minor role. Criteria such as feed quality, fresh air and outdoor access are considered under these labels. Nevertheless, these aspects are not taken seriously by farmers, as the subject of animal welfare does not find great acceptance in the sector, explained one expert. The PQS label, in particular, reaches a slightly deeper level and is therefore also advertised to the public as a label that cares about animal welfare and the environment of the animals. The Polish Meat Association as well as the Polish Pig Farmers Association established the PQS label. The label represents high quality of meat and considers two elements of animal welfare. On the one hand, the stress before slaughtering should be decreased, and on the other hand, the transportation period should not be longer than eight hours. Pigs from certified farms must be separated from the others at the slaughterhouse stage. Overall, the PQS label can be put on a level with the German QS-system. The certification centres are privately organized and are the same as used for organic certification. Both systems are supported by the Polish agricultural ministry. Meat produced under this certification system is marked with a label and is sold for a higher price.

Other aspects that are promoted in Poland are “without antibiotics”, “without GMO” or “special feed”. Products with those kinds of certification have a price increase of 18 to 20 %, the price for organic products is higher. Nevertheless, the number of organic farms in Poland is less than 10 % although the number is increasing as the demand for organic products is growing. Currently, organic products are considered to be a niche product. However, many products in Poland are still traditionally manufactured and could therefore be counted among organic products due to their production method, stated an expert. But farmers are not willing to pay for such a certification. In this context, the expert mentioned a study he carried out himself, indicating that 95 % of farmers are not involved in self-promotion.

*Consumer preferences and animal welfare*

According to their experience, the experts stated that most consumers have only a limited knowledge about the topic animal welfare and tend to humanize farm animals. In this context, consumers demand that the animals are well fed and have enough space available. However, despite their lack of knowledge, consumers are interested in the topic of animal welfare. But according to the experts, this problem remains unaddressed, as consumers do not get information when buying pork. Nevertheless, the experts stated that consumer behaviour may change in the future. Decisive is who risks the first step and implements a label on the market, since Polish consumers are sensitive towards labelling schemes. This means in detail, if a consumer has to choose between a product with a label and without a label, he or she will usually pick the product with a label. In this case, the consumer would be willing to pay a higher price for the labelled product. According to the experts, retail stores are interested in introducing products produced under higher animal welfare standards in order to be able to compete with each other. The advantages of higher animal welfare standards for the consumers must be clearly defined at this point. Animal welfare aspects are already important for a certain group of consumers, in particular including the younger generation or rather young families with children. In the public debate, animal welfare is also becoming more visible. If more meat products produced under higher animal welfare standards are offered in the future, consumers will trust such labelling schemes and the interest in animal welfare products could possibly increase. Currently many consumers believe that farm animals are better treated in smaller farms than in larger farm structures. According to the expert, Poland often lies behind other European countries when it comes to animal welfare questions within the EU Barometer. Therefore, the question "How important is it to protect the welfare of farmed animals" was rated by one third of Polish respondents as "very important", whereas more than half of the respondents in twenty member states of the EU chose the option "very important". With this result, Poland is the tail light when it comes to questions about the protection of farmed animals (European Commission 2016).

As mentioned before, the origin of the meat is an important factor for consumers. If Polish pork produced under higher animal welfare standards would lie beside German pork produced under higher animal welfare standards in the supermarkets, Polish consumers would always select the domestic product.

*Assessment of future market development*

Based on the expert interviews, some statements can be derived regarding the future development of Polish pork markets. In general, the situation for large producers will possibly remain stable. Some producers might expand cooperation and direct contracts with the processing industry. Nevertheless, there will still be small farms on the Polish pork market which produce for themselves and the domestic market. It is therefore difficult for Polish producers to be competitive on the international market. The experts stated that the popularity of domestically produced pork will increase. Due to the economic growth, the Polish society will become more prosperous, so that more expensive products could be successfully implemented on the market. In the field of international trade, the number of imported living pigs will increase. Overall, the transition of the Polish pork market is expected to be a long-term process and due to the large amount of foreign capital in the market the overall situation of Polish farmers will not change easily. In the context of foreign capital, the origin of processed pork products is often uncertain and therefore it is unclear if the product counts to Danish or Polish exports. Another problem that has a strong influence on the market is the African Swine Fever (ASF) in Poland. Since the first outbreak of ASF in 2015 the number of infected animals increased yearly in the wild boar population as well as in domestic pigs (European Commission 2021). Therefore, Poland is still blocked in many third countries as a trading partner. At present, Polish experts consider the prospects of Polish pork production becoming internationally competitive again to be rather low.

*Challenges for Germany*

- To convince consumers to pay a higher price.
- Polish consumers prefer domestic products.
- Knowledge about and preference of the topic animal welfare is low.
- Origin must be recognizable on the product.
- Working out a unique selling point for pork produced under higher animal welfare standards.

**Italy**

*Pig production and farm structure*

Italy produces mainly heavy pigs of about 160 to 170 kg live weight at slaughterhouse and more than 80 % of Polish pigs are slaughtered with over 160 kg, while in the rest of Europe it will be usually between 100 to 120 kg. The production of light pigs (100 to 120 kg) is small and they are sold for a lower price per kg. This production line is not increasing, because the products have to compete with imported products from other countries that are usually cheaper.

Mainly the animals are heavily fattened because they are traded within the so-called supply chain of PDO (Protected Designation of Origin) products, for example Parma Ham and San Daniela Ham, or the supply chain of PGI (Protected Geographical Indication) products like Mortadella. These are labels approved by the European Commission. For the PDO label, every part of the production, processing and preparation process must take place in the specific region. Particularly for Parma Ham, the product specification states that the pigs have to weigh at least around 160 kg or 10 % more or less and must have a minimum age of at least 9 months at slaughter. Furthermore, the pigs must be born, raised, fattened, slaughtered and processed in Italy. At least half of the Italian pork production accounts to this type of production. According to the experts, the price for heavy pigs is 20 % higher than for lighter pigs. More or less, the price difference compensates the extra production costs for 160 kg pigs. All in all, Italy produced 9.2 million Parma Hams in 2007. In 2018 the production reached 8.5 million Parma Hams. The other cuts of pigs produced under the slogan Parma Ham are used for different products. Parts of the loin, for example, are used to produce PDO Salami, other cuts can be found on the fresh market. In contrary to PDO, PGI emphasizes the relationship between the specific geographic region and the name of the product, which means in detail that for most products at least one of the stages of production, processing or preparation takes place in the region. In Italy the market share of processed meat is very high. Since PDO and PGI products are seen as high-quality products among the Italian consumers, the price of these products is higher compared to conventional products and Italian people are willing to pay this premium price for these products.

*Trade*

Italy is a net importer for pork, since its degree of self-sufficiency amounts to 60 %. Usually imported pork is distributed directly to other companies or in special cases to retailers. Overall, Italy produces a lot of processed meat with imported meat. Thereby, the most imported meat is ham. Loins are another part of meat that is frequently imported and goes into the fresh market, as well. In this context, Italian heavy loins are competing with the lower priced loins coming from Germany and the rest of Europe. Italian consumers increasingly prefer the low fat and cheaper loins that are imported, so the big loins are more difficult to sell. In this case, Italy tried to put a label on the fresh loins to show the Italian origin, but it was unsuccessful. One reason was that the EU did not allow this certification to be approved, but there was also not much interest from consumers' side, stated the experts.

Nevertheless, there is a big conflict within the processing industry, because it is also interested in selling imported meat from Germany. Italian slaughterhouses slaughter Italian pigs, but they also have to import from abroad. So, in the case that they get more money from imported meat from Germany, they will not promote fresh meat from Italian pigs. But in 2019 it was difficult for the Italian industry to compete on the market, because China imported a lot from the countries that usually deliver pork to Italy as well. Since the price for pork was 1.80 Euro in Italy and 3.40 Euro in China at the end of 2019 and the beginning of 2020, companies prefer to deliver to China where they could gain a higher price level, stated the experts.

Besides being a net importer of pork, Italy also exports a high amount of pork, and especially pork products. France, Germany, the United Kingdom, Belgium and Austria are the most important export countries for Italy. Germany and France alone account 50 % of the exports in 2018 (ASSICA 2018). In terms of weight, fat is an important Italian export article, although it does not have much value, since the fat is more consistent compared to fat from lighter pigs. Therefore, this kind of fat is very popular in the rest of the world according to the expert. In terms of value, the export of PDO Ham and Salami is more important. It is increasing constantly.

*Supply Chain*

The typical supply chain of the Italian pork market can be described as follows: Farmers – slaughterhouses – ham producers or other processing industry – retailer – consumer.

Starting with the farmers and the structure of pig husbandry, it can be stated that structural change is also taking place in Italy. This means that farms are getting bigger. Hence, Italy has big pig farms with 5 000 to 7 000 finishing pigs or 700 to 800 sows, according to the experts. All in all, there are about 6 000 to 7 000 pig farms with 8.4 million pigs in 2018. At the same time Italy slaughters around 11 to 12 million pigs, this shows that besides domestic pigs, imported pigs are slaughtered in Italy. Around 70 % of the 11 million pigs produced, account to the described PDO production, as stated by an expert. The number of sows has reduced over the last years from approximately 700 000 in 2007 to 500 000 sows in 2016. One reason for the reduction are the increasing animal welfare rules from the EU. Group housing and the investments which accompany them lead to the closure of small sow farms, stated the experts. Another problem that comes along with the growing farm size are the resulting environmental impacts, for example the disposal of manure which means higher costs for those farms that do not have so much land. Those farms invest in EU facilities related to more animal welfare. Regarding the structural change, within the last years an increase of imported piglets from Denmark has been recorded. Nevertheless, these piglets are also fattened up to 160 kg, because heavy Danish pigs will also be sold as processed meat, not as PDO products, but still as high quality meat. Because of the high weight these pigs can be sold for a higher price as well.

In general, 80 % of pork is being sold in supermarkets. Whereas for beef, traditional butchers are still important. A total of 40 % of beef is sold in these small, traditional shops. In Italy there are three main supermarkets: CONAD, COOP Italia and Esselunga. CONAD is an aggregation of small retailers and at the moment the biggest retailer on the market, stated the experts. CONAD, for example, imports pork directly from Germany in particular, according to the experts. The second largest retailer is COOP which is a consumers' cooperative that primarily sells meat from Italian producers. Since almost all of the pork is sold by the different supermarkets, the market power of these supermarkets is big and has an effect on producer prices.

At the moment the market share for pork produced under higher animal welfare standards is rather small, accounting not more than 5 % of the total meat production.

*Consumption*

The consumption of fresh meat in Italy is much less than in the rest of Europe. The per capita consumption of pork decreased from 2002 to 2018 such as in Germany. In 2018 the pork consumption in Italy amounted 37.4 kg per capita (AMI 2017-2020). Compared to pork consumption, the consumption of poultry meat is 20.5 kg per capita and for beef 20.8 kg per capita in 2018. The expert pointed out that more than half of consumption is processed meat and the other half is fresh meat such as loin.

*Labelling system*

Regarding animal welfare, the biggest issue that is discussed in Italian society and in science is cutting the pig-tails, even if the implementation is difficult for the farmers, stated an expert. Although the Italian Minister of Agriculture presented a project to give rules for a kind of brand for an Italian welfare label, since there are no national rules for animal welfare in Italy so far.

Nevertheless, the topic *animal welfare* seems to be of interest for the Italian government, since according to the experts, they have the assignment from the Ministry of Agriculture and the Ministry of Health to create a new animal welfare certification system which will be implemented in the next years. It is planned as a public, voluntary system and the idea is that all farms are participating. At the same time, the Parma Ham consortium which aggregates all the producers of Parma Ham, wants to develop an own animal welfare system as well.

At this stage, there is one important certification system called Classy Farm. Every farm has to respect the rules that are written in Classy Farm. If they do not follow the rules they are not allowed to sell their pigs as “Classy Farm pigs”. These rules are controlled by public veterinarians. The rules include mainly the following topics: bio-security, animal welfare, sanitary parameters, animal feed, drug use and legislation protected in the slaughterhouse. Furthermore, Classy Farm is not only for pigs, but also for other animals such as turkey, cattle and dairy cow, sheep and poultry. Classy Farm is not a label you can see on the product; moreover, it is a certification system like the German QS-System.

Another label refers to organic production. The organic market is very small, it is about 1 %. In the past, only wealthy people were interested in organic products, but this is changing, according to the experts. Presently the organic market is developing also in the south of Italy. With respect to organic and animal welfare, Italian consumers do not know that organic farming already includes animal welfare topics. A further certification system which is used in Italy is called KIWA. In general consumers don’t know exactly where the meat on the shelves comes from. There are only few labels on the products that show where it was produced.

Currently, there are not a lot of products produced under higher animal welfare standards in the shops. The brand “reduction of the use of antibiotics” is more often promoted. This brand guarantees that antibiotics were not used in the last four months, which is not a new regulation, actually it is not allowed at all to use antibiotics in the last months of fattening. The consumer is quite interested in the topic, “less or no use of antibiotics”, as well as in nutrition and high quality. But the labelling schemes existing in the Italian market now are quite confusing for the consumer, stated the expert. Nevertheless, some Italian retailers are already working on their own labelling schemes. In this case the most important factor is more space, not so much castration. Studies have shown that Italian consumers are not informed about that hogs are castrated and consequently they are not interested in the topic of hog castration, as stated by an expert.

*Consumer preferences and animal welfare*

In general, Italian consumers are interested in the topic animal welfare, but when it comes to the purchase decision the choice is often different. Overall, Italian consumers do not have broad knowledge on animal welfare. One expert said that consumers are aware of animal welfare, but their knowledge is minimal and fragmental. However, a large portion of the population thinks that no legislation exists for livestock farming. But it is changing slowly, since not only consumers with a high income are interested in animal welfare, but also people with a low income show interest in animal welfare, mentioned the experts.

The experts referred to a survey that has shown that consumers rank animal welfare only in 5th place. The most important aspects when buying meat are freshness, colour, origin and nutritional characteristics. Recording for the age of the sample, younger people assign animal welfare at 3rd place, whereas the older people from 40 and above put it at the 6th or 5th place. This shows that younger people are more interested in animal welfare. The same questionnaire was conducted in another region. In this region the age group of 31 to 50 was quite interested in animal welfare. Older people, over 50 are not much interested in animal welfare. This means that in the next decades, the next 10 years, animal welfare will probably become increasingly important. But compared to other European countries, Italian consumers are more interested in origin, nutrition and quality. Especially the taste of the meat and nutritional characteristics are important. Nevertheless, pork has a good image in general.

In addition to consumer surveys, the experts mentioned surveys with retailers. Thereby, the results showed that retailers said that animal welfare is more important for the fresh meat market than for processed meat, because processed meat is more distant from the living animal. In another study, slaughterhouses were asked about the topic animal welfare as well as the use of antibiotics and the slaughterhouses answered that for the release of antibiotics they can have 10 or 15 % extra price premium. The same applies to animal welfare.

All in all, the experts reported that around 6 % of Italian pigs were produced according to welfare schemes in 2018. This implies that 6 % of Italian pigs in 2018 were not tail docked.

*Assessment of future market development*

In the future, animal welfare will become more important, because media will support this topic intensively. In the next few years, topics such as animal welfare and the reduction of antibiotics will become more prevalent. In the opinion of one expert, there could be space for German products which are produced animal-friendly, but it could be a very temporal window, because the Italians are working on an own label. As soon as an Italian product produced under higher animal welfare standards is sold next to the same product made in Germany, they will, like Polish consumers, always pick the domestic product, because Italian consumers very much trust in Italian production.

With regard to Italian pork production, the experts stated that pig production in Italy will remain stable. This is due to the fact that Italian consumers prefer highly processed Italian meat and the people are also willing to pay for it. Nevertheless, there will be hard times, especially for the processing industry because they have to compete with China, stated the expert. In this context, it is important to solve the ASF problem. However, the export market for Italian PDO products will remain stable or even rise, because of the intensive demand from all over the world.

*Challenges for Germany:*

- Competing with high quality products (PDO and PGI).
- Consumers prefer domestic products.
- Knowledge about and presence of the topic animal welfare is low.
- Origin must be recognizable on the product.

**Japan**

In order to examine the Japanese pork market, we split our analysis into two parts. First, interviews with German exporters for a first impression on the Japanese pork market (1). Second, interviews with Japanese experts to get further detailed information from inside (2).

**(1) Japanese pork market from the perspective of German exporters**

*Pig production and farm structure*

Besides China and South Korea, Japan is considered a main export destination for German pork to Asia. Nevertheless, other European countries such as Spain, Denmark and the Netherlands as well as the United States, Canada, Mexico and Chile have a larger market share in Japan with regard to pork imports. In the past, the Japanese meat market was dominated by only a few large "multinationals" which were commissioned by the Japanese government to carry out imports. Against this background, there are still many importers or trading houses in Japan that are responsible for importing goods. Pork is also imported through such trading houses or rather importers. Even large international slaughterhouses depend on these intermediaries due to cultural barriers which make business relations, according to the statements of the German experts, even more difficult. Before the massive ASF outbreak in China, Japan imported a lot of products from China as well as produced many products in China. Due to the Covid-19-Pandemic and the issue of the African Swine Fever (ASF), China lost its market share in Japan. In this context, European companies are becoming increasingly important as potential production locations. The currently negotiated trade agreement JEFTA could have a major impact in this respect. Nevertheless, the Japanese meat industry is concerned about the increasing meat prices. Since pig prices in Germany and the Netherlands have risen by about 40 % in 2019, the Japanese also had to buy the goods with a price increase of 30 % - 40 %. Especially smaller Japanese companies had to deal with this. Also, because large companies such as Prima Ham, for example, are constantly growing and therefore, small businesses are being squeezed out of the market.

With regard to the meat market in Japan, different terms are important and are briefly explained here: The term "foodservice" implies restaurants and institutional use of meat. In contrast, "Retail" refers to supermarkets and convenience stores (CVS), whereas the area of convenience stores in Japan is very large, especially in the cities. Those convenience stores offer a wide range of products including snacks and sweets, sandwiches, bread, microwaves meals, cold and hot beverages as well as other products such as body care products or batteries and newspapers. Besides, meat that is consumed purely and is therefore not further processed is defined as “table meat”. This “table meat” is usually sold in restaurants, in retail stores or by wholesalers. On the other hand, there is a big amount of “processed meat” on the Japanese pork market. Usually, European countries, such as Germany or the Netherlands are exporting frozen meat to Japan for further processing and have trade relations with processing companies. Additionally, there are also European countries that export pork to the sector “foodservice” and deliver frozen meat directly to restaurants in particular.

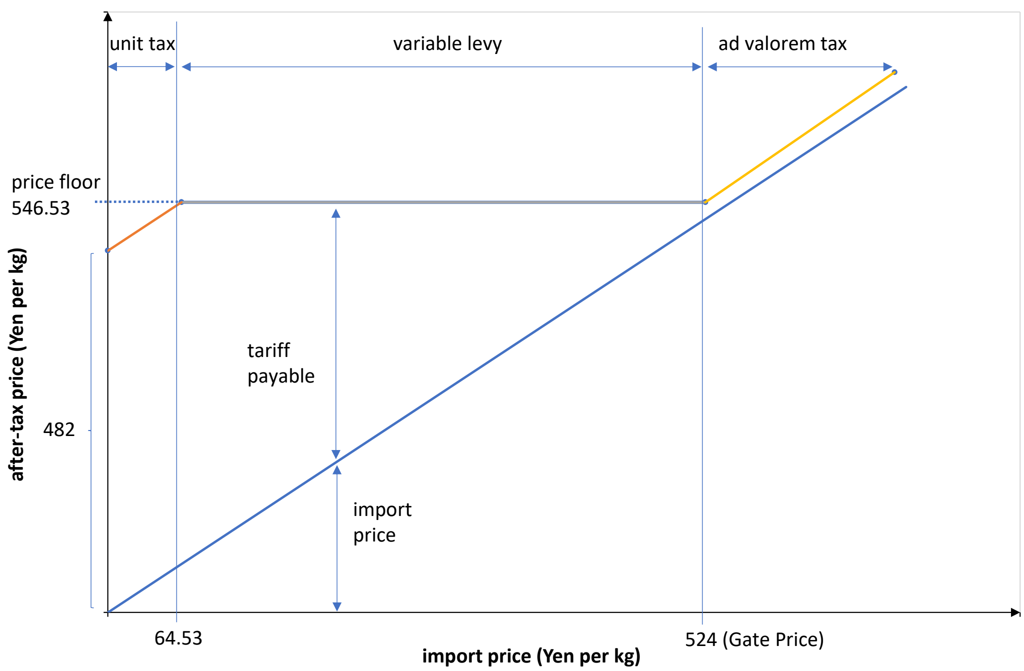
An important feature of the Japanese market policy is the so-called Gate Price system. With this instrument the Japanese government strongly shields domestic farmers from international competition on domestic markets and is therefore the “Japan’s main tariff barrier to pork imports” (European Commission 2019). After the conclusion of the Uruguay Round under the auspices of the General Agreement on Tariffs and Trade (GATT) the World Trade Organisation (WTO) was created in 1995. All in all, the Uruguay-Round led to the primacy of liberal trade rules, the strengthening of a multilateral dispute settlement system, the inclusion of new economic sectors, an agreement on tariff reductions and to a more market-oriented system for international agricultural trade (European Commission 1994). In this context, the Gate Price system, which is a differential duty system, was implemented in 1995 as a mechanism to replace Japan’s pervious variable levy system for pork (OECD 1998; Obara et al. 2003). In the following box the Gate Prices system will be described briefly.

**Gate Price system:**

The Gate Price system is a mechanism to protect Japanese domestic production. Overall, the Gate Price varies depending on the type of meat that is imported. Against this background, the Gate Price for pork cuts is 524 Yen/kg (≈ 4.08 Euro/kg)[1]. In contrary, the Gate Price for pig carcasses and half-carcasses amounts 393 Yen/kg (≈ 3.07 Euro/kg)[1]. If pork imports enter the Japanese market at the Gate Price level or above, only an ad valorem duty of 4.3 % is added. In case the price of all imports is below the Gate Price level, "the importer must pay the difference between the import price and the Gate Price as a duty, in addition" to the tariff (Obara et al. 2003). According to the OECD (1998) this means in detail: "A differential duty, calculated as equal to the difference between actual c.i.f. prices and a fixed threshold price (standard import price) will be levied on actual c.i.f. prices of up to a stated maximum (gate price)". Usually, the "Gate Price is compared with the average value of the invoice on a shipment of pork" (Obara et al. 2003).

The figure below shows the connection of the CIF (Cost, Insurance and Freight) import price (X-axis) and the after-tax price (Y-axis). Three segments can be identified: If the average price is above or at same level as the Gate Price of 524 Yen, only the ad valorem tax of 4.3 % is added. In case the average import price lies between 65 and 524 Yen, the importer needs to pay the difference between the price floor (524.53 Yen/kg) and the CIF import price. This difference is called variable levy. The third segment refers to import price below 64.53 Yen/kg, therefore a unit tax of 482 Yen/kg must be paid as compensation.

**Gate Price system (Onji 2009)**




[1]record day: 21 January 2021 (Source: https://www.finanzen.net/waehrungsrechner/japanischer-yen_euro)

*Trade*

The main pork product exported from Germany to Japan are bellies. According to the statements of German exporters, additionally neck, neck bacon and loins can be distributed to Japan. Many Japanese producers buy their products via importers or big trading houses. Only a few processing companies like Nippon Ham, Ito Ham or Prima Ham have direct contracts with suppliers. Since importers prefer large charges, it is important that the supplier can deliver the demanded amount. Developing a business relationship with Japan is a long process and is based on reliability and supplier loyalty, emphasized the German exporters. Both short term and long-term (annual) contracts are negotiated with Japanese partners. Payment is never made in advance in Japan, which would be considered as an insult. In larger companies, business is usually conducted with the purchasing department, if one exists. However, a business deal is still subject to numerous rounds of coordination, as major decisions in Japan are never made by one person. A company has always several suppliers and is therefore never dependent on one.

Two of the biggest competitors, for each exporting nation, on the Japanese pork market are the United States and Canada, which particularly supply chilled pork to Japan and thus directly to retail stores. There are two reasons why US suppliers are able to deliver chilled pork to Japan. Firstly, in the US it is allowed to treat the pork carcasses with lactic acid, so that these products have a longer shelf life. This procedure is prohibited in Europe for pork. Secondly, delivery time from the United States as well as from Canada to Japan is shorter whereas the delivery time from Europe to Japan can be as long as a month.

Overall, the meat industry needs its own product line, with qualified employees who produce only for Japan. To summarize, the production for the Japanese market is very costly due to high standard quality requirements. Pork delivered to Japan should not be contaminated, no foreign bodies should be found in the products, and the measurements of the ordered goods should be in accordance with the order. Furthermore, the Food Sanitation Law determines how individual products may be produced. The law specifies which ingredients are allowed for production in Japan, and therefore German suppliers must also comply with this law. All these criteria must be fulfilled completely, since Japanese customers usually do not forget or forgive such mistakes.

*Consumption*

Overall, the meat consumption in Japan is increasing. But compared to Europe the consumption of meat is still low. The consumption of poultry meat grows stronger in comparison to pork, whereas beef consumption is even decreasing. The decline of beef consumption is caused by the fact that beef is very expensive, especially the domestic Wagyu beef. While the consumption of meat is increasing, the consumption of fish is decreasing. This is partly due to the Fukushima disaster and partly to the influence of the younger generations who have fundamentally changed Japanese eating habits. Out-of-home consumption in Japan is very typical and supported by cheap prices.

*Consumer preferences*

Japanese consumers prefer meat with low fat. The colour of the meat plays an important role. Thus, Japanese people especially like meat with a deep red colour. As the Japanese generally prefer a sweet flavour, German products are often considered very salty.

According to German exporters, taste is the most important purchase criteria for Japanese consumers at this stage. In this context, special products such as “wine pork” or “Iberico pork” are popular on the Japanese pork market. Furthermore, the packaging is an important criterion for Japanese consumers. If something is particularly attractive and carefully packaged, the Japanese are willing to pay a higher price. In Japan, for instance, a melon is available for 80 Euro in a special packaging, but at the same time melons are also available for a cheaper price without special packaging.

Currently, the origin of the product is indicated on chilled meat only. Meat products are handled differently and are only indicated as an imported product. However, according to a planned new regulation the indication of the country of origin will become mandatory, if the final product is made from meat that comes from less than three different countries. This regulation foresees the brand "imported goods" for those processed products which included meat from more than three countries. According to the experts’ opinion this will force many Japanese meat processors to use imported meat from more than three countries of origin to avoid a costly labelling procedure.

Currently, the vegetarian or vegan diets play only a minor role in Japan. This also applies to the subject of animal welfare. Nevertheless, the German experts are sure that it will change in the future, although the trend will probably take at least another 10 years. German experts emphasized that at this stage, Japanese consumers have no knowledge of animal welfare. A unique selling point would have to be developed for meat produced under higher animal welfare standards, that says more than the fact that the animal has more space and manipulable material.

*Challenges*

Based on the German expert interviews, the following challenges for the Japanese pork market can be identified:

- Japanese passion for detail, which German suppliers have to meet
- Difficulties with contact acquisition
- Difficulties in obtaining information about market development
- Entry into the Japanese market is not only an investment at the beginning, as the companies have to position themselves in a very differentiated way in order to be able to meet the high requirements that Japanese place on production and also on the product.

### (2) Japanese pork market from the perspective of Japanese experts

*Pig production and farm structure*

The production of pork amounted to around 0.9 million tons in 2018 and, according to the expert, domestic production is lower than pork imports. Especially since 1990 a falling trend in domestic production can be recognized in Japan. At the same time, imports have increased and amounted 0.9 million tons, i.e. almost the same volume as domestic production. The experts interviewed described the market of pork as follows: the supply side is characterized by a consistent and stable production. Hence, the farming business is profitable. Furthermore, the Japanese agricultural sector strives to compete with global production and suppliers. In contrast, the demand side is equally consistent and a stable supply at low prices is given. Therefore, safety and a high quality of pork are important aspects.

At aggregated market level the price for domestic pork is higher than for imported pork. This also applies for special pork varieties, such as Iberico or Hungarian Mangalica, which is very popular in Japan. Iberico pork, for example, can be found in supermarkets as sliced bellies or other cuts and the Iberico sales price is closer to other imported than to domestic pork bellies. Thus, for instance, the price for sliced Iberico bellies is about 128 Yen per 100 g, whereas the price for domestic sliced pork bellies is 172 to 230 Yen per 100 g. Furthermore, it must be recognized that also high price level products such as Iberico loins and legs are sold on Japanese pork market.

The market share for organic products is small in Japan. While in Germany, the Netherlands or other European countries organic products are available in every supermarket, in Japan organic products are mainly offered in special shops. As a result, organic pork is hard to find. Moreover, there are almost no producers of organic products in Japan, because of numerous regulations which raise the production costs of organic production. Additionally, at the moment, it is hard to distribute organic products at higher prices. Many people lost their jobs due to the Covid-19 Pandemic and the economic situation reduced the willingness to buy high priced organic products.

*Trade*

The market share of imported pork increased over the past decades. In contrast, domestic pig production decreased. There are many reasons for this, ranging from the high average age of Japanese pig farmers and the difficulties of farm succession, the fluctuating income opportunities of pig farming, to necessary investments. Therefore, the experts stated, Japan requires imports of pork and pork-related products from more than 20 countries. In this context, the experts referred to the Japanese Gate Price system (= “Differential Duty System”) which aims to make the Japanese pork market price independent from the global market price (compare box on p. 22). Due to the mediating effect of the Gate Price, both expensive and cheap products can be imported. This combination is also preferred by the industry, so they try to combine expensive tenderloins with sausages or minced meat, which are cheap products. Nevertheless, the tariff rate for chilled and frozen pork is the same. With regard to the free trade agreement (JEFTA) between Japan and the EU, the expert stated the duty will be down by almost half. Some products can also be imported freely. Today, it is difficult to project how the trade relation between Japan and the EU will develop, since JEFTA became effective at the beginning of 2019 and the new rules will be implemented over a period of 20 years. Nevertheless, the expert stated that a stable business relationship depends on the Japanese demand for bellies and other items like shoulders and collars. It also depends on the pricing for the same items coming from the USA. Currently, the supply of US companies decreased due to high labour costs during Covid-19 and a shortage of labour, which makes it difficult to comply with all the requested rules and standards set for the Japanese meat market.

Imported pork covers more than 50 % of Japanese pork consumption. Therefore, imported chilled pork is mainly distributed to retail stores, whereas frozen pork is used for further processing. Japan is a net importer and exports only a small quantity of pork at non-competitive prices to South Asian countries. In general, there is a strong competition on the Japanese pork market. Against this background, the big differences between the USA and Europe in terms of pork can be summarized as follows: The USA and also Canada have the advantage to export chilled pork and pork products for “table meat”. According to the experts, only shoulders and minced meat are workable from the USA, because the quality and specification did not satisfy the Japanese processing industry, since US pork is usually fattier and strongly marbled. In contrast, European countries offer a good quality and better specifications for further processing. Although the price for European pork is higher, no other supplier can compete with the EU in terms of quality, one expert stated. If Germany and other European countries were able to export chilled pork to Japan, this would be a great opportunity for these countries. It is difficult for European countries to supply chilled pork to Japan, because the Japanese demand a minimum shelf life of 30 days from the date of arrival in Japan. This would only be feasible for European pork products if they were exported to Japan by air. However, this is not an option as it is too expensive.

The experts indicated that the most imported pork cuts are loins and bellies, followed by collars, shoulder picnics and seasoned and diced pork.

It has been reported that Japanese pork importers request special quality standards. These requirements can be divided in two sections: Food Safety and Meat Quality. Food Safety contains criteria such as pig health, medicine residues and microbiological condition. As an example: trading partners demand certifications with the test results in order to control the medicinal residues. Meat Quality refers to the meat condition and includes meat colour, meat firmness and texture, water holding capacity, smell and fragrance, fat colour, fat firm, marbling condition and pH-value. Furthermore, the importers attach great importance to the fact that the offer is secured and that there is the possibility of combinations of cheap and expensive products to be in line with the Gate Price.

Overall, German pork and sausages enjoy a high reputation in Japan, as emphasized by the experts. Nevertheless, if Germany is not able to supply Japanese companies with pork, this would affect Japanese companies negatively in short term, but over the long term, German products would be replaced by substitute goods from other countries.

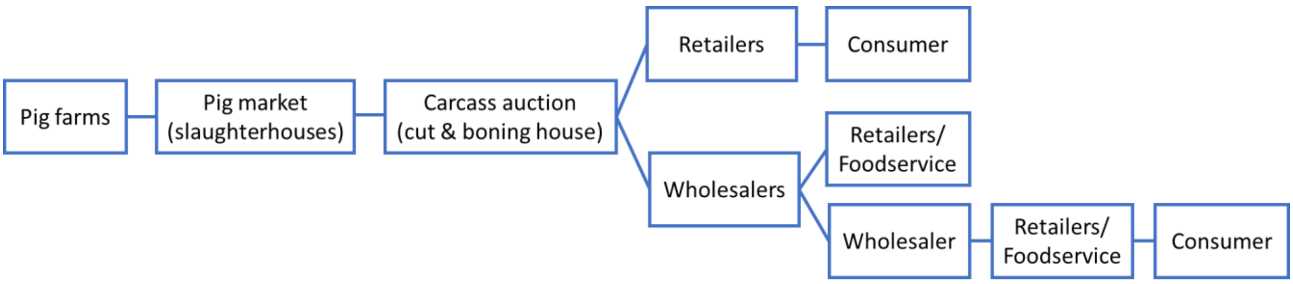
At present, Covid-19 and ASF make it difficult to project the future trade relationship between Japan and western countries. Under this situation Japanese companies and importers are facing problems to guarantee a stable supply. Especially, the ASF issue has a severe effect on Japanese pork market, since the strong import demand of China has been dominating the pork market for more than a year. In April/May 2020 the supply chain for chilled pork from Canada and US broke down due to Covid-19, this almost led to a hunger situation, as emphasised by the experts. Distributors as well as importers were stuck, because there were no products available. In previous cases, frozen products were very popular. But currently, frozen products are only offered in limited quantities. The outbreak of ASF had a special impact on the price, since imports from China and also from Germany stopped, and the consumer price of pork increased. In contrary, the price for tuna and beef decreased due to the closing of restaurants due to Covid-19. Overall, one expert mentions that animal diseases such as ASF are widely reported in media, especially the outbreak of ASF in China and the classical swine fever (CSF) outbreak in Japan. However, the ASF outbreak in Germany has not attracted much attention in Japan. In this context, the expert stated that the government, and especially the industry, are interested in a relaunch of trade relations with Germany as soon as possible. Since Germany, and especially German products enjoy a high reputation on the Japanese pork market, it seems that Japanese companies are not looking for alternatives for German imported pork, instead they are willing to wait. However, although the Japanese are still interested in German pork, only a regionalization agreement could make German pork exports towards Japan possible at the current stage. However, it does not seem that a regionalization agreement will be signed, as the Japanese have numerous questions and are generally reluctant to take any decisions in this case.

*Supply Chain*

The experts identified two supply chains in Japan. One supply chain refers to domestic pork production (Figure 1) whereas the other is typical for imported pork (Figure 2).

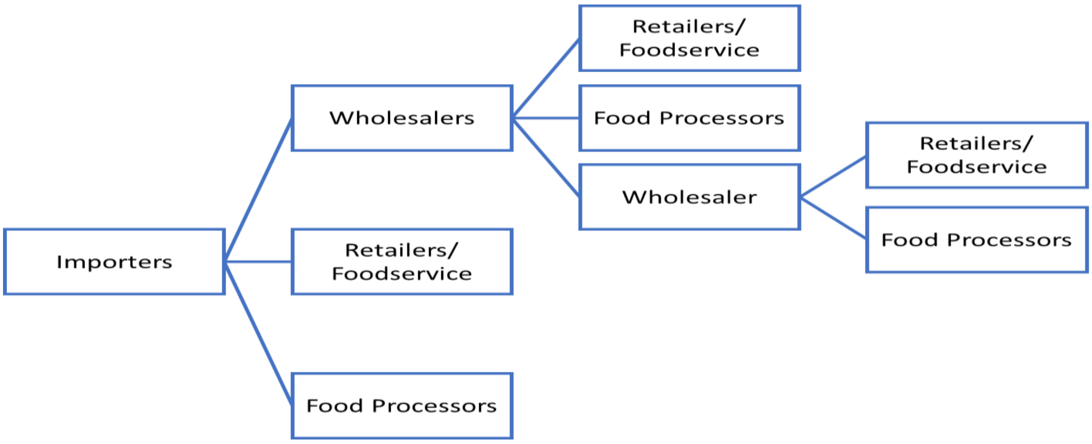
The domestic pork supply chain starts with pig farmers, followed by slaughterhouses and carcass auctions which define the price. Then the supply chain divides into two different chains. Either the pork goes directly from the carcass auctions to retailers and then to consumers or the pork is sold to wholesalers who sell the product also directly to retailers or to small wholesalers. (Figure 1)

**Figure 1:** **Japanese domestic supply chain** (own compilation according to expert interviews)




The second supply chain describes the path of imported pork. Starting with importers who import pork and pork products from over 20 different countries, pork is delivered to wholesalers, retailers or rather foodservice and food processors. The wholesalers sell the pork to retailers or food processors and to smaller wholesalers which deliver the pork to retailers and processors in the end (Figure 2).

**Figure 2:** **Japanese supply chain for imported pork** (own compilation according to expert interviews)




Some big food processors have direct contracts with foreign slaughterhouses in the country of origin. However, this is not common for small processing firms, they need partners who are especially responsible for communication with foreign companies. These partners are called importers. The importers conduct negotiations on behalf of the end user (retail stores or restaurants) or small companies. Therefore, communication is the main task of importers. They communicate with all parts in the sector, starting with ham and sausage companies followed by the restaurant chain and other distributing channels. Furthermore, importers act as an information centre for other countries' supply sources, the global market situation and domestic competitors' situation. Additionally, end users, or rather processing companies, can get financial support from trading houses (importers) instead of a bank. And sometimes trading houses are not only sellers to end-users, moreover they can be customers for final products.

Another case occurs if meat is bought directly from slaughterhouses: In this case, the price is based on the market price of the auction and contracts exist between slaughterhouse and pig farms.

*Consumption*

The most consumed type of meat in Japan is pork and amounted to 47 % of total meat consumption in 2019. The second most important meat is chicken, followed by beef. However, it must be kept in mind that the Japanese also consume a large amount of seafood. Due to changing consumer preferences, the consumption of seafood is decreasing. One reason is that the younger generation often does not know how to prepare seafood. Therefore, they choose more meat and meat products. In general, Japanese consumers prefer fresh or chilled pork instead of frozen pork. In this context, their first choice is domestic pork. The expert cited a study according to which more than 60 % of the consumers would still choose Japanese pork instead of imported pork. Another finding of this study is that, in case the price difference between imported and domestic pork amounts to more than 50 Yen/kg, consumers will choose imported pork instead of domestic pork.

A closer look at pork consumption indicates that the Japanese prefer primarily sliced loins, bellies, collars, shoulder picnics and ham. In second place comes minced pork and in third place chops of loins and tenderloins. These products are mainly chilled products. Frozen imported pork is used as raw material in the processing industry. Some of the pork is also used in the foodservice sector, such as restaurants and hotels. Only approximately 10 % frozen pork ends up in the supermarket. Against this background it will be even more difficult to explain Japanese consumers the benefits of German pork produced under higher animal welfare standards as long as it is a frozen product with a higher price.

All in all, the pork consumption can be summarized as follows: 49 % is home consumption, 24 % is used for further processing and 27 % is marketed via foodservice. The distribution of beef is slightly different, while 32 % is consumed at home, 6 % is processed and 63 % is consumed in the foodservice.

*Labelling system*

There are some labelling schemes in Japan, for example for organic products. But there are no special labelling systems for other criteria at the current stage. Usually, the price for organic products is higher than for conventional products. In the case of Kobe beef, special prices give some information to the consumers about the meat condition. This means in detail that the price range of Kobe beef varies depending on the amount of fat and the quality of this type of meat and is therefore an indicator for quality.

However, the origin of the product is indicated on the product package. For imported products the respective countries are listed and for domestic products the prefecture or the district is mentioned on the package. From 2022, processors have to indicate the origin of the raw material in the products, as explained in the previous section. Nevertheless, restaurants are not obliged to inform their customers.

The experts stated that consumers are not interested in labels, moreover the advertisement of retailers are of more importance. If the retailer promotes a product for example as “special pork from Spain”, they catch consumers’ attention. This results from the fact that the space for notes on the product is limited. Only the name of the product, ingredients, country of origin, net weight, temperature, nutritional information (proteins, fat) and the price are declared on the packaging. If the whole meat package is covered with labelling, nobody will buy it.

*Consumer preferences and animal welfare*

According to the experts, the consumer behaviour of the Japanese is similar to that of Germans, i.e. Japanese consumers go to supermarkets almost every day or at least once a week to buy meat and other products. Thereby, consumers expect the same quality at any time at the same shop. Therefore, all supermarkets sell fresh and chilled pork, although the offering varies. There is local branded pork, such as Kuro Buta (= Berkshire pork) and imported chilled pork. Normally, Japanese consumers choose bellies, collars or cheap shoulder parts. Therefore, the consumer takes a closer look to the package and picks the product which has a lean cut production and a reasonable price. Especially, 3.5 to 5 mm sliced bellies are popular in Japan. For special occasions consumers prefer marbled domestic beef instead of pork. Overall, the confidence in domestic pork is much higher than in imported pork. One expert stated that 60 to 70 % of Japanese consumers prefer domestic products. In contrast, both experts prefer imported pork themselves because of higher quality standards in Europe than in Japan.

Food safety is the most important issue with regard to consumer preferences, although consumers' knowledge about this topic is limited. All in all, the experts mentioned that Japanese consumers are not interested in the product itself or other special criteria as are people in western countries. They are only interested in the origin and packaging of a product as well as the price. The price is an important criterion, according to the experts. Usually the price for imported pork is between 90 and 140 Yen per 100 g, whereas the price for imported organic pork is 230 to 300 Yen per 100 g. With regard to the expensive imported organic pork, Japanese consumers often look for an alternative and choose domestic beef. Another important criterion for consumers is the taste of a product. In this context, it is often mentioned that quality is defined by taste. Furthermore, the colour and consistence as well as the marbling of the meat plays an essential role. Additionally, Japanese consumers are interested in eating something special. In this case, special breeds like the Hungarian Mangalica pork or the Spanish Iberico pork are very popular. The Japanese are willing to pay a higher price for these special products. Nonetheless, Japanese consumers understand pork as a cheap and lower priced meat. Therefore, it is difficult to convince them to pay a price premium for other reasons. Consequently, it is important to inform the consumers about pork production in more detail in the future.

If Japanese companies want to work with organic or antibiotic free products as well as other special meat products they have to restructure their organisation and have to go back to operation and production. This is associated with higher costs and includes a good marketing. The experts stated that some companies have already tried to go this path and promoted such products, but until now it has not been successful. Additionally, there is low interest on the part of Japanese companies to deal with this topic and this also accounts for animal welfare.

In terms of animal welfare, the experts made a clear statement: "We are not interested in animal welfare" and big Japanese companies are not interested in promoting animal welfare at the current stage, since there would be no customers for these products. This indicates that animal welfare is not a big topic in Japan. Most Japanese people do not know the meaning of the term "animal welfare" with regard to livestock farming. Overall, the knowledge of Japanese consumers about slaughterhouses or the pork production is low, since it is a "dead area" for consumers, stated the expert. This goes back to the traditional Buddhism which implies vegetarian diet. Therefore, nobody in Japanese society wanted to be associated with butchers or slaughterhouses, in general. This idea is still carried on to some extent today, so that people want to avoid contact with people from the slaughter industry, reported an expert. Thus, the sector has rather a negative image in Japan. Additionally, consumers are only interested in the product from the moment it is on the plate. The consumers only see the meat itself and whether it is edible or not – an attitude independent of the respective income level.

According to the experts, the attitude towards animal welfare may change in the future because the younger generation is probably more interested in this topic. In this context, it would be good to show the advantages of animal welfare for the animals as well as for the consumers. If the consumers recognize the advantage of animal welfare for themselves (other than taste) they would probably willing to pay a higher price. Therefore, the advantages must be seen in taste or other tangible factors. Currently, the topic sustainability is gaining more interest than animal welfare.

*Assessment of future market development*

The general question about the consequences if Germany only offers pork produced under higher animal welfare standards in the future, and the effects on the relationship between Japan and Germany, was answered by the experts as follows:

End users or rather the processing industry would purchase animal welfare products in case other countries would also offer this kind of product. Then ham and sausage companies as well as the "table meat" chain will continue business. If only Germany offers pork produced under higher animal welfare standards at a higher price the situation would possibly look different and it would be difficult for Japanese companies to keep up business with Germany. Because if one company trades with products at a lower price level, such a company has a competitive advantage compared to companies using German pork produced under higher animal welfare standards. The operation costs for German pork produced under higher animal welfare standards are higher and, in this case, it is difficult for Japanese companies to have a profitable fiscal year.

On the other hand, it must be stated that many companies would tend to stay with their supplying source which has been a workable and preferable cooperation for many years. But it will be difficult to keep the channel. Japanese companies are very conservative and persistent in their customer relationships. If they start business with one supplying source than it will not be easy for them to stop business. This indicates that animal welfare products could be workable on a long business relationship. Furthermore, it is difficult to find new supplying sources, because it takes a long period until Japanese companies trust foreign companies. Additionally, it will be difficult for exporting companies to fulfil all the requirements demanded by the Japanese companies if they are not already used to it.

Although, Japanese experts are aware that the situation will change due to the structural change in the agricultural industry in Germany. This also includes the increasing importance of animal welfare programs. Since the processing industry buys a lot of frozen imported pork, it will be even more difficult to implement animal welfare.

All in all, the situation will probably change if the Japanese government makes pressure and regulates the purchase of animal welfare products, stated the experts. Right now, Japanese consumers do not know the additional value of animal welfare. In this context it is too early to introduce animal welfare on the Japanese pork market. If a famous German person who is popular in Japan or the German government were to promote pork produced under higher animal welfare standards perhaps it could work since Japanese people have a high opinion of Germany and European countries in general.

Nevertheless, one big challenge will be to convince consumers to pay a price premium for animal welfare products as long as they are not aware of the benefits.

*Challenges for Germany:*

- Trading partners demand high quality and the fulfilment of specific requirements.
- Mistakes are not acceptable and could mean the ending of a trade relation.
- Limited or no knowledge about the topic animal welfare.
- Convincing consumers to pay a premium price for pork produced under higher animal welfare standards, without tangible benefits.
- A good marketing strategy is needed.
- Finding solutions to regain lost market share due to the outbreak of ASF.

**South Korea**

*Pig production and farm structure*

The South Korean meat market is balanced with domestic and imported pork and pork products. Therefore, the domestic meat market offers mainly chilled pork, whereas the imported meat market is responsible mainly for the supply of frozen pork. The pork production is, with one million tons per year, stable, and the self-sufficiency rate amounts 63 %. In contrary, the self-sufficiency rate for beef in South Korea is low and amounts 36 %. This underlines that South Korea depends on import products both pork and beef. Overall, pork is the most important meat item in South Korea. This is another reason why South Korea is reliant on imports. Typically, bellies are the most important cut out of pork, followed by collars and Boston Butts which are derived from shoulder parts and are a kind of combination of collars and picnics (compare appendix 1). Due to the strong preferences for pork bellies, there is a shortage in bellies' supply. The expert stated that about 160 000 tons of bellies are imported per year, which is 40 % of total pork imports. Here, 90 % of the imports are from European countries such as Germany, Spain and the Netherlands, indicated the expert.

The domestic pork price in South Korea increased over the last 20 years, emphasized the expert. Due to the reliance on imported feed the domestic pig production is expensive in South Korea. Additionally, the costs for labour are increasing. Therefore, the average carcass price is about 4 500 to 5 000 KRW/kg (= 3.70 to 4.20 Euro/kg). This shows that the price level for pork is higher than in European countries. Thus, in 2019, the average price in Europe was 1.69 Euro/kg carcass weight equivalent (AMI 2007-2020).

*Trade*

South Korea is a net importer of pork. Of the 400 000 tons per year of imported pork, about 5 % is chilled pork. This shows that the imports of chilled pork are limited.

Overall, several free trade agreements (FTA) have an impact on the South Korean market. South Korea has a lot of FTAs with many countries and therefore also with the EU. The FTA with the EU started in 2011 and since this moment the import tax has become less every year, so that the tax on pork was completely lifted on July 1st, 2021. Compared to 20 years ago, the pork import volume has increased almost three times (compare table 6) and South Korea imports pork from more than 20 different countries. Especially Canada, Mexico as well as the USA are exporting chilled pork, which is handled as a substitute for domestic pork. All in all, the USA are the biggest exporter of pork to South Korea. Within the EU, Germany (before the outbreak of ASF) and Spain are the biggest exporters of pork to South Korea, followed by the Netherlands. At this point the expert mentioned that Germany is the biggest exporter for bellies to Korea with a market share of almost 40 % of bellies, before the outbreak of ASF in 2020. German exports to South Korea have grown rapidly over the last 10 years, although Germany started exporting to South Korea only in 2010 which is late compared to other countries. Before 2016 Poland has been an important trading partner for pork as well. But due to the ASF issue in Poland, imports from Poland stopped. Besides Poland, Hungary and Belgium are also blocked from exporting pork to South Korea and since 2020 there is a ban on German pork exports due to the outbreak of ASF as well. This ban on German exports will last at least three years after the last fund of an ASF infected pig.

In general, the US suppliers and European suppliers sell different pork cuts to South Korea. Usually, shoulder parts such as picnics, collars and Boston Butts are imported from US companies. In this context, the United States dominates the market with good prices and a high volume. These cuts are used mainly in the processing industry. The US companies only supply a small proportion of bellies to South Korea because the quality is less preferred with respect to European pork bellies. Typically, US bellies are fatter and the price is higher. The EU exporters mainly supply bellies to South Korea. In this context, European bellies are offered for a reasonable price and have a better quality than US bellies due to a less fat content, stated the expert. The expert clarified that in terms of numbers, on average 40 % of total pork imports are bellies, 35 % Boston Butts and 15 % collars. In Addition, South Korea imports offal items such as backbones, neck bones and intestines. Therefore, the total import volume for those kinds of products is about 100 000 tons per year, according to the expert. All in all, the competition on the pork market is tough, emphasized the expert. The main reason for this is that the supply overflows the market, although the demand and consumption of pork stays stable.

Besides the differences between various cuts of pork, the market for domestic and imported pork differs especially in the condition of the product, whether it is offered chilled or frozen. Against this background, the national price correlates with the international price. The national price is influenced by the world market price for pork, the stock situation of frozen pork as well as the consumption in Korea. In general, the domestic pork price is quite high. Therefore, restaurants and processing companies try to use mainly imported pork, because of the reasonable price level. The price level for imported pork is almost one third of domestic pork. In this context, the reasonable price and a certain quality are advantages of imported pork. Furthermore, frozen pork is easier to store and has a longer shelf life than chilled pork. Although restaurants and the processing industry prefer frozen pork, South Korean end consumers are looking primarily for chilled pork, which is a disadvantage for Germany in case Germany plans to deliver its products directly to retail stores, stated the expert.

Regarding trade relationships between South Korean importers and the trading partner, an important criterion is the brand reputation. There are many brands on the market, so that some exporters offer different brands depending on the quality. If the brand has a good image, the quality is also assessed as good. Nevertheless, exporters must offer a stable price as well as stable and uniform specification which is in line with the requirements of the importers. For importers it is most important to have a brand with a good reputation to keep reliable customers. Once a certain brand is successful on the market the importers focus on one or two exporters, so that importers have a core import line in the end. The exporters have their own brands for the Asian market, e.g., Vion offers pork for the Asian market under the brands “Pork Gold” and “Food Family”[2]. South Koreans associate these two brands with good quality and a reliable trading partner. The price difference distinguishes depending on the brand. Nevertheless, the price is 20 to 30 % higher compared to regular products without a brand.

All in all, potential exporters must fulfil three aspects. Firstly, the price should be reasonable and competitive. Secondly, the quality should be stable or rather steady depending on season or volume. Thirdly, a confirmed offer should be guaranteed.

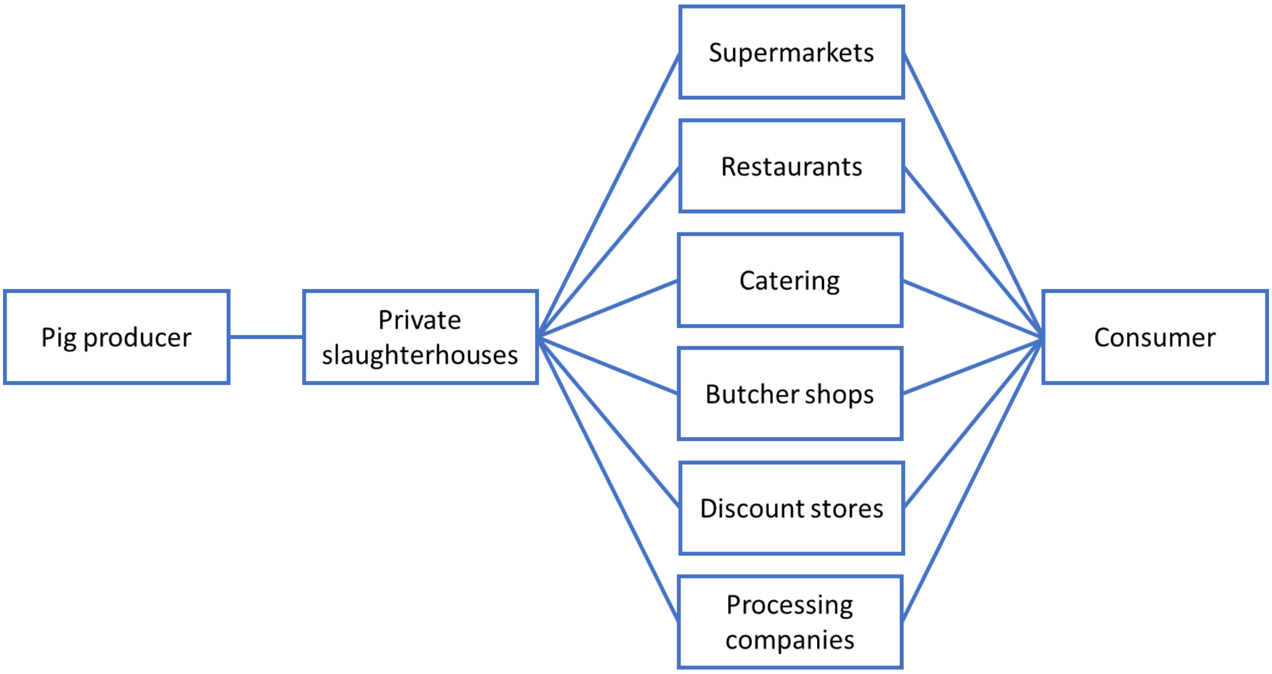
Compared to the high amount of pork imports, South Korea exports only little pork. Many importing countries do not allow South Korea to export their meat products because of the Food and Mouth Disease (FMD) which occurs in South Korea. Only a few containers are permitted to be delivered, for example to Hongkong. Against this background, usually ham is exported because it is not popular in Korea, stated the expert.

[2] https://www.vionfoodgroup.com/pork/brands-concepts

*Supply Chain*

Typically, the South Korean pork supply chain can be described as follows (Figure 3):

**Figure 3:** **South Korean supply chain for domestic pork** (own compilation according to expert interviews)

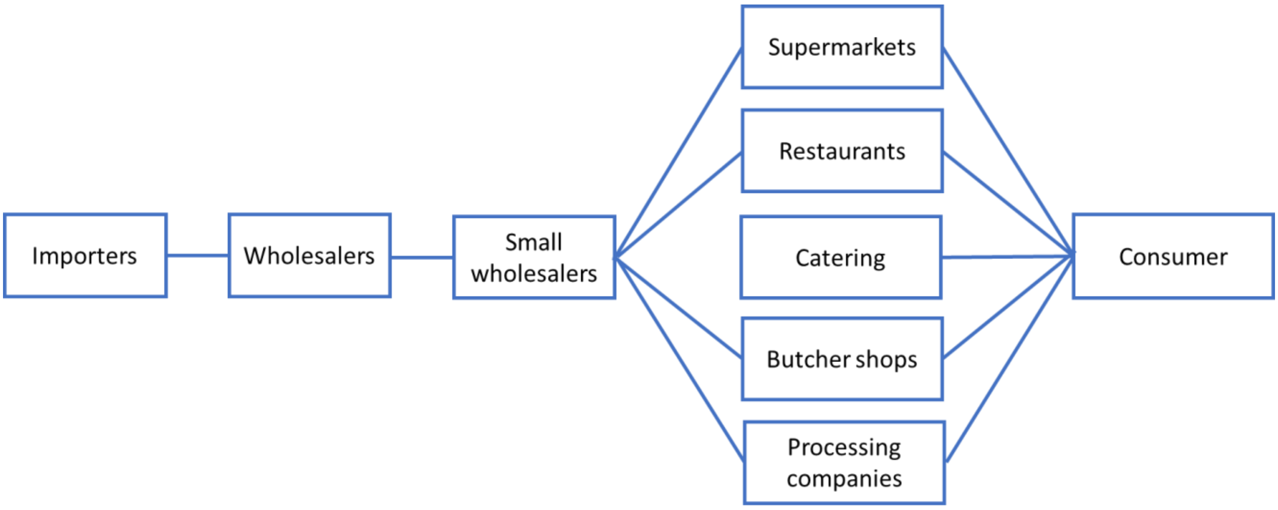



Domestic pork is mostly traded as chilled pork and pig producers supply the products via private slaughterhouses to various sales channels. Overall, 13 private slaughterhouses exist in South Korea for domestic pigs. Against this background, supermarket sales are most important for domestic producers, because it is the main market for chilled pork. Furthermore, big discount stores, butcher shops, processing companies, restaurants and catering companies are important sale channels with regard to the domestic pig supply chain.

Imported pork mostly enters the market as a frozen product. Therefore, importers are the first stage for imported products in South Korea just like in Japan. Overall, there are more than 300 meat importers who import directly and run their wholesale, stated the expert. The competition on the South Korean import market is very strong. This also means that the price competition is severe as well and results in high risks for importers. Besides the severe price competition, big stocks can be built in case the market is sufficient. Usually, frozen imported pork is sold to the processing industry as well as the restaurant chains.

The supply chain for imported pork can be illustrated as follows (Figure 4):

**Figure 4:** **South Korean supply chain for imported pork** (own compilation according to expert interviews)




In more detail Figure 4 shows that importers have their own stable sales channels in the distribution line. Therefore, the importers distribute the meat to wholesalers who in turn resell the meat to small wholesalers. From there, the products go to restaurants, the processing industry, catering companies, supermarkets and butcher shops and finally to the end consumer. If imported chilled pork enters the South Korean pork supply chain, it goes directly to the retail chain or to restaurants. Since chilled pork has only a short shelf life, a quick sale is necessary. The described supply chain has changed over the last years. Before, South Korea used to have a clear law for every business sector, so there were only a small number of importers in South Korea. Today, distributors, wholesalers and end users try to import pork or beef directly, while they run their own wholesale business. As a result, there is a large number of importers in South Korea, since everyone wants to be part of the pork business and many companies do not want to waste time finding a suitable product via importers.

Partly there are few large companies that import directly. Usually, those companies have a high cash flow and an own trade division. The volume of pork imports increased which is due to the fact that imported pork can be purchased at lower prices. The fact that the processing companies are focused on processing imported meat, and thus the demand for domestic pork is decreasing, leads to a decline in pork production in South Korea.

*Consumption*

According to the experts, South Koreans consumed 2.8 million tons of meat in 2019, whereof 1.4 million tons were pork and the rest chicken and beef. At the same time, the consumption per capita amounts to 55 kg for total meat, of which 28 kg is pork. Thereby, bellies are the most popular meat item. Nevertheless, fish and seafood are still consumed more than meat in South Korea.

The expert stated that the pork price plays an important role in the consumer price index, as pork is the most consumed meat out of all types of meat. The price for different pork cuts varies. According to this, bellies are the most expensive and have a high demand, afterwards follow collars. In contrast, loins and tenderloins are much cheaper in South Korea. With regard to preferences in the meat condition, a trend towards leaner production can be observed in South Korea. As a result, leaner cuts are introduced and imported to the market. Additionally, new products such as jellies (aspic) and head meat can be found on the South Korean pork market. Before there was no various range of pork items in South Korea. This changed, so that the meat range diversified and consumers got a good knowledge about meat items which is described as a trend reversal in consumption in South Korea by the expert. This is partly due to the fact that restaurants in particular are trying to differentiate themselves in order to increase their competitiveness.

*Labelling system*

South Korea has a “traceability system” which almost all consumers use to get detailed information about the meat. This includes information about the farmer’s name, the name of the slaughterhouse, production or packaging date, importer, exporter, country of origin and more. According to the “traceability system” it is obligatory for every importer, meat producer and seller to put a government-assigned traceability number on the product. The consumers can use an App to trace the meat products by scanning the label with the traceability number to get the requested information. This App has also led to a more open attitude of South Korean consumers towards imported products, as they can trace the production and the route. The traceability system not only serves as a source of information for consumers, but is also used to ensure the safety and transparency of the product. Thus, in the case of sanitary issues, diseases or food safety, the “traceability system” serves to trace the source immediately. Finally, it also strengthens the competitiveness of the domestic livestock industry.

The country of origin must always be indicated on the label of the packaging. This is an obligation and must be visible on both frozen and chilled products. Even restaurants have to use this kind of label, so that every consumer can see the country of origin at any time. Furthermore, South Korea has organic and animal welfare certificates for domestic products, but the market share for those products is small. Therefore, the main challenge is that the price for those certified products is too high and the demand for those products is limited. Consequently, domestic meat producers do not try to develop this range. The few organic or rather animal welfare products are sold only in luxury style stores or specialized organic stores and the price level is much higher than for conventional produced meat products, according to the expert.

Besides the described systems, there are no specific requirements for quality standards, also not for domestic production. Sometimes some restaurants as well as the special luxury or organic stores promote products with a labelling scheme that refers to the topic “free antibiotics”. But this is only a small volume and refers to a premium range of pork products.

*Consumer preferences and animal welfare*

Since most consumers look for chilled pork, the sales focus of supermarkets is on the promotion of chilled products. Frozen products are usually positioned in the corner of a supermarket and the promotion of these frozen products is small. In the case that Germany wants frozen pork to be sold more actively, those products need a special promotion and the price for frozen products needs to be reasonable. Overall, South Korean consumers demand that imported frozen pork should be sold for a lower price than domestic pork, because they consider that frozen meat is inferior. Therefore, the price is an important purchase criterion. In the case that the price level is too high, although the quality of the product is good, consumers must be very determined to choose the imported product. Besides the price, food safety is an important criterion for consumers. In this context, it is important to provide consumers with clear information about the meat, using labels or the South Korean "traceability system". If a product is marked with a special label, consumers trust that the product is safer. The third important purchase criterion is the specificity of a product. In this context South Korean consumers prefer special types of breeds such as Duroc or Iberico. Thereby, it is important that the taste is unique and the quality is outstanding. One example for special pork in South Korea is pork from Jeju Island. This island in the south of Korea is known for its clean environment. The pig race in Jeju Island is Duroc and the taste of this Duroc pork is apparently different compared to the conventional landrace. Since the taste is special and consumers favour this Duroc pork, they are also willing to pay a higher price for the special pork. With regard to imported pork, many importers have started to introduce the Spanish Iberico as a special type of pork. The introduction of Iberico has been successful in South Korea, although it is imported in frozen condition. Nevertheless, the price level of imported Iberico pork is as high as the price level for domestic pork. Overall, Iberico pork plays an outstanding role in South Korea. It is easy to find in the supermarket and restaurants, although the number of imported Iberico pork is less than 10 %. Nevertheless, the market share of Iberico pork is strong. Furthermore, importers promote Iberico very intensively in the mass media. Hence, every South Korean consumer knows Iberico. Against this background, the expert stated that German Duroc could be successful in South Korea too. Additionally, pork produced without the use of antibiotics is introduced on the South Korean market. Especially, restaurants try to introduce pork products with a "free antibiotic" certification.

Overall, the supply of meat and the consumer preferences have changed. Twenty years ago, South Korea was not able to supply a various range of pork items. Consumers bought their pork in butcher stores without being able to name the cuts. This has changed and consumers are now buying pork bellies, picnics, collars, loin ribs or other pork products consciously. In this context the key change in South Korean pork consumption goes in line with the diversification of the pork offering in the retail stores and the knowledge of consumers about the different meat products. In addition to the diversified offer, the packaging also varies. The expert states that this mainly changed since South Korea started to import a lot of pork products from numerous countries.

Another change that can be observed by the expert is the trend of "eating out". Restaurant consumption has grown significantly. Furthermore, the economy has grown in South Korea and as a result, meat consumption has also risen. Due to these two scenarios (increase of out-of-home consumption and general growth of meat consumption), the restaurant chain becomes a key market for meat consumption, and especially for imported pork. As a result of all these changes, consumers prefer products with less fat. The idea of a healthy diet plays an essential role in this regard. Therefore, South Korean consumers are also trying to pay attention to their eating habits. They buy lean cuts of pork, and shoulder parts are becoming more popular. Furthermore, restaurants start to introduce new pork cuts on the market. For example, false lean, jowls, head meat and cheek meat are introduced to the consumers via restaurants. The overall aim of the restaurants is to differentiate themselves from the competition. Since the competition within the restaurant chain is tough, the restaurants try to offer fresh and different products to draw consumers' attention.

All in all, South Korean consumers expect new products that are better than conventional products with regard to taste. Nevertheless, it is difficult to promote imported products effectively, because the demand is low. One reason for this is that South Koreans indicate that imported products, and especially imported frozen products, should be offered at a reasonable price. At the same time, consumers do not have confidence in the domestic production, because of the Foot and Mouth Disease, consumers feel that the sanitary conditions are poor. Therefore, the reputation for domestic production is not high. It is a controversial situation, because although the consumers do not prefer frozen imported pork, the reputation of European countries in South Korea is very high, since consumers associate high standards of hygiene with Europe.

The topic animal welfare is not popular in South Korea, stated the expert. There is an animal welfare certification system in South Korea, but the products cannot be found in the retail sector only in special stores. One successful example, for the implementation of animal welfare in South Korea refers to egg production. Consumers are willing to pay a higher price for those certified eggs. But consumers who purchase these eggs buy them mainly because they connect these eggs with improved sanitary conditions. The animal welfare aspect is secondary.

This is also in line with the statement that there is currently no potential for imported meat produced under higher animal welfare standards on the South Korean pork market. According to the expert, it is too early for South Korea to receive animal welfare products, because even domestic pork or beef is not sold under the term animal welfare. If animal welfare should be successful in the future, the first step should be the implementation of a domestic animal welfare concept, emphasized the expert. This helps consumers to understand the topic and to get an idea of animal welfare. After implementing a domestic animal welfare system, there could possibly be a chance for animal welfare from other countries, stated the expert. Currently, people are still quite sensible towards the price level. Against this background, the price for animal welfare products will be too high compared to conventional good quality meat products. If the price for pork produced under higher animal welfare standards were only 20 % higher compared to "normal or regular products" (not further specified by the expert), consumers might be willing to pay this, the expert said. Furthermore, South Korean consumers would possibly willing to pay a higher price for imported chilled pork produced under higher animal welfare standards. However, due to the long delivery time from European countries this is not possible at present. Hence, those three criteria (price, frozen condition, delivery) have a limited effect on the export potential of German pork produced under higher animal welfare standards.

In order to successfully introduce a new premium product such as animal welfare on the South Korean market the expert advises that the companies develop a good marketing concept. Also, the product should be offered at an acceptable price. For this purpose, it would be helpful if Germany would be able to offer chilled pork instead of frozen pork, since the willingness to pay a higher price for chilled pork is more likely. All these criteria need to be prepared in advance to export meat produced under higher animal welfare standards to South Korea successfully.

*Assessment of future market development*

At the moment the South Korean market is not ready for German pork produced under higher animal welfare standards. Nevertheless, importers will always try to introduce high quality products. In the process of implementing meat produced under higher animal welfare standards in South Korea, the first step should be to appropriately inform consumers. Secondly, the price should be reasonable. Therefore, the expert suggests the following strategy: Changing consumers' knowledge of animal welfare programs in South Korea by using governmental support. Once consumers are well informed, a good price condition is important. In addition, a good concept is required.

Nevertheless, in the current situation, the ban on German pork exports due to the ASF outbreak must be considered. Although this topic is not communicated widely in South Korean society, it is not predictable whether Germany will regain the lost market share. At this stage, it is not possible to give a forecast regarding the future date at which Germany will be allowed to export pork to South Korea again.

*Challenges for Germany:*

- Implementing an informational campaign to inform consumers about the topic animal welfare.
- Finding solutions to regain lost market share due to the outbreak of ASF.
- Developing a marketing campaign.
- Convincing consumers to pay a premium price, although the meat product is frozen.

## 3.3 Similarities and differences between the respective study countries

Table 8 clarifies the similarities and differences of all four study countries. It can be recognized that all study countries are net importers for pork with an import volume which is higher than the export volume. Further similarities are that German pork enters the supply chain at the stage of the processing industry. However, in Italy and Poland, retail stores also import German pork directly and in South Korea this applies for restaurants. The total meat consumption in the European study countries Italy and Poland is very high and lies by 88.5 kg/capita/year in Poland and 90.4 kg/capita/year in Italy in 2018. This shows the importance of meat in the overall consumption habits in those countries. The overall amount of meat consumption in Japan and South Korea is lower than in the European study countries, and lies by 49 kg/capita/year in Japan and 53.9 kg/capita/year in South Korea. Nevertheless, pork seems to be the most preferred type of meat in Poland, Italy, Japan and South Korea. Followed by poultry meat and beef, only in South Korea do consumers prefer beef rather than poultry meat. Especially, the preferred cuts of pork differ between the European and Asian study countries. Whereas Polish consumers prefer pork chops, neck, shoulder and bacon, the Italian companies prefer pork ham and loins for further processing. The imported pork market in Japan and South Korea is characterised by pork bellies, collars and loins.

**Table 8: Characteristics of pork markets in selected study countries**

| Criteria | Poland | Italy | Japan | South Korea |
|---|---|---|---|---|
| Net import[1] (in 1000 t) 2019 | 217 | 862 | 958 | 525 |
| Entry of German meat into supply chain | Processing industry; retail stores | Processing industry; retail stores | Processing industry | Processing industry; restaurants |
| Meat consumption, total (in kg/capita) 2018 | 88.5 | 90.4 | 49.0 | 53.9 |
| Pork | 51.2 | 37.4 | 21.5 | 27.0 |
| Poultry | 29.6 | 20.5 | 16.9 | 14.2 |
| Beef | 3.7 | 20.8 | 6.7 | 12.7 |
| Preferred cuts | Chops, pork neck, shoulder, bacon | Ham; loins | Bellies, collars, loins | Bellies, collars, loins |
| Labels | Organic; AW[2] (in progress) | Organic; AW[2] (in progress) | Organic; country of origin | Organic; traceability system; AW[2] for eggs |
| Relevance of animal welfare | Yes (little) | Yes (little) | No | No |
| Consumer interest in animal welfare | Yes (little) | Yes (little) | No | No |
| Willingness to pay a higher price for animal welfare products/meat | Yes | Yes | No | No |
| Future interest in animal welfare | Yes | Yes | Possible | Possible |

[1] net import = imports – exports

[2] AW = animal welfare

Source: AMI (2007-2020); MAFF (2017-2018); UN Comtrade (2020); MJ International (2020); expert interviews (own compilation)

Considering the criteria relating to animal welfare, a clear distinction must be made between European and Asian countries. While animal welfare is already a concept in Poland and Italy, the relevance of animal welfare is not given in Japan and South Korea. This goes in line with the lack of interest of Japanese and South Korean consumers towards animal welfare. In this context, the experts stated that Asian consumers would not be willing to pay a higher price for animal welfare as long as they are not aware of the individual benefits of meat produced under higher animal welfare standards. In contrast, Polish and Italian consumers are interested in the topic animal welfare and this trend is already growing. Therefore, the consumers in the European study countries would be willing to pay a higher price for animal welfare products, according to the experts. Whereas, the interest in pork produced under higher animal welfare standards in Japan and South Korea will probably be possible in the future. Nevertheless, the process will last longer and varies in each study country.

# 4 Discussion and Summary

The objective of this report was to analyse the characteristics and challenges of the pork markets in the four countries selected for this study, i.e., Poland, Italy, Japan and South Korea. This analysis will help to gain information about an export potential of pork produced under higher animal welfare standards. The current results identify relevant differences between the European and Asian study countries. Against this background, the following discussion starts with a conclusion of the market analysis, which shows the development in trade relations. Afterwards, the findings of the expert interviews are discussed individually for each study country and refer to characteristics of the different pork markets. Finally, limitations and possible future research approaches will be highlighted.

Basically, all four study countries seem to be suitable for German pork exports. Italy, Poland, Japan and South Korea are all net importers of pork with rates of self-sufficiency of less than 100 %. Consequently, all four countries depend on pork imports providing a basis for German pork exports. Trading data already show that German exports of pork are amongst the group of the ten most important trading partners in the respective study countries. This is an indicator for the positive development of trade relations in the foreign pork markets. In general, all four countries are familiar with German pork as well as pork products, which is already a good starting point for further exports of German pork. Nevertheless, the question arises whether there is also an export potential for German pork produced under higher animal welfare standards. In this context, initial estimations about the export potential can be deduced on the basis of the expert interviews.

Starting with the study country **Poland**, it is important to mention that the Polish pork sector is currently under a very fast process of structural change with a relatively stable level of output, but with a strong decline in the number of small pig farms (Zawadzka 2017; Szymańska 2017; Szymańska 2019). Similar to Germany, Poland is an important importer of live pigs, especially piglets. Based on this development, Poland has a strong potential to become a net-exporter of pork. Nevertheless, current Polish pig production is still fragmented and therefore, seems to be non-competitive compared to other European pig producers such as the Netherlands, Denmark or Germany, stated the experts. In general, meat is very popular in Poland and pork is the favourite.

The demand for pork is potentially increasing, assumed the experts. Polish consumers are sensitive towards labelling schemes, which can be confirmed by literature (Bryla 2012). Even though the country of origin is an important criterion for Polish consumers (Grunert et al. 2018), it is not easy for Polish consumers to distinguish between domestic and imported pork, since a clear labelling schemes does not exist. According to animal welfare products, there are two labels in Poland. In this context, it can be stated that Polish consumers are already confronted with labels that imply higher animal welfare standards. Thus, the introduction of German pork produced under higher animal welfare standards would not be fundamentally new. However, Polish consumers are less interested in the welfare of livestock animals than consumers in other European countries (European Commission 2016). Topics such as “no use of antibiotics”, “special feed” or “no GMOs” are stated as being more important. In this case, Grunert et al. (2018) were able to figure out that animal welfare attributes were selected less. Another study by Żakowska-Biemans (2011) on consumer food choice and beliefs about organic products shows that Polish consumers associate healthiness, safety, no chemicals, quality, trustworthiness and taste with organic products. The category "animal welfare" is only named in ninth place. The outcome of this study shows the low relevance of animal welfare in the Polish society at this time. All these factors and the fact that the knowledge of Polish consumers about animal welfare is minimal, makes it difficult to implement animal welfare products at a higher consumer price on the Polish meat market. Although, the experts consider that there might be a chance for German pork produced under higher animal welfare standards, the implementation will not be easy. However, as soon as Poland offers pork produced under higher animal welfare standards on their own, Polish consumers will choose the domestic welfare product instead of the imported one. This shows that there is only a limited time when German pork produced under higher animal welfare standards might be traded successfully on the Polish pork market.

The **Italian** pork market is characterized by heavy pigs that are usually traded within the familiar supply chain of PDO and PGI products. Italian consumers associate these products with high quality and are therefore willing to pay higher prices. This higher willingness to pay indicates that Italian consumers might also be willing to pay a premium price for pork produced under higher welfare standards. Usually, German pork enters the Italian pork market at the stage of processing industry or retail stores. In the case of retail stores, German pork is well known as low(er) fat pork. Currently, it can be observed that Italian consumers have started preferring low fat loins which are not offered by domestic producers. This creates an advantage for German pork.

At the moment, however, the market share of animal welfare products in Italy is small. Nevertheless, according to Pejman et al. (2019), the introduction of animal welfare products increased over the last years; a phenomenon that is also observed in Poland. Nonetheless, the topic animal welfare is not widespread in Italy. In this context, the experts reported on a study they conducted, according to which consumers put animal welfare in fifth place. Aspects such as freshness, colour, origin, price and nutritional characteristics such as taste seem to be more important. These aspects were already identified by Vecchio and Annunziata in 2012 who conducted an explorative study about laying hens.

The interviewed market experts indicate a growing interest in animal welfare of younger people and a close relationship between the attribute of animal welfare and fresh meat and less pronounced with processed meat products. Nevertheless, according to the experts' statements, the overall knowledge about animal welfare in Italian society is very low. Therefore, information campaigns via mass media are important. Mayfield et al. (2007) have already investigated that Italian consumers would use the following sources to get information about animal welfare: product label, in store information and mass media. This shows even more that the communication of animal welfare is an important aspect, since Italian consumers do not feel well informed about this topic (Mayfield et al. 2007; Di Pasquale et al. 2014; Di Pasquale et al. 2016). Ultimately, the same challenge can be noted for Italy as for Poland. Because as soon as Italian meat produced under higher animal welfare standards is offered, Italian consumers will prefer the domestic pork. Thus, the time period for a successful implementation of German pork produced under higher animal welfare standards is limited in Italy as well.

Over the last years, meat consumption in **Japan** is increasing with pork as the most important type of meat and, with an expected continuous increase in demand according to the interviewed experts and Koizumi et al. (2000). Germany is the ninth most important trading partner in Japan regarding pork. German products enjoy a good reputation and companies like to do business with German companies, because Germany is known as a reliable trading partner. In addition, the Japanese appreciate the high-quality standards in Germany.

However, the authors are currently not able to estimate the future market situation in Japan. Due to the outbreak of ASF in Germany, in September 2020, German pork is banned for at least one year after the last discovery of an ASF infected animal. The only option to bypass these circumstances would be the consensus of a regionalisation agreement. According to the experts it will probably take a long time to come to a consensus, also because of high hurdles of the Japanese bureaucracy. However, the fact that the topic of ASF has not been communicated very broadly in Japanese media gives hope that the trade relations will be rebuilt after the end of the ASF crisis. Therefore, it is reasonable to assume that German pork will find sales on Japanese markets even after the end of the ASF crisis, especially if Germany considers exporting pork produced under higher animal welfare standards to Japan.

Currently, the topic animal welfare is not present in Japan. This is confirmed by many statements by the experts interviewed, who describe that currently neither Japanese consumers nor the meat industry are interested in animal welfare. This is a crushing verdict for Germany in the context of this study. Here information seems to be highly relevant. According to the experts, the only option to implement German pork produced under higher animal welfare standards on the Japanese pork market successfully, would be to convince consumers of the benefits of this special pork. This, however, seems to be a difficult task, since Japanese consumers prefer domestic pork (Kim et al. 2008). Besides the country of origin, characteristics such as meat quality, taste, special breeds, traceability as well as the condition of the meat (chilled/fresh or frozen) are important for Japanese consumers. These criteria were confirmed in two studies published by Managi et al. (2008) and Shirai (2010).

Therefore, it is essential to promote the benefits of pork produced under higher animal welfare standards regarding meat quality. The fact that the knowledge as well as the interest of the Japanese in animal welfare is almost zero must be considered at this stage. This was also emphasized by the experts, who describe the conditions of livestock farming and meat production as secondary in Japan. Accordingly, a good marketing strategy is needed. It is not enough to explain to the consumers that the animals had more space available. Instead, Japanese consumers need to be convinced that more space per animal results in more physical activity, and that more physical activity leads to increased intramuscular fat accumulation, which improves the meat quality. Furthermore, the interviewed experts recommend promoting a special breed with special features to catch Japanese consumers' attention. In this context, the type of packaging is also important for Japanese consumers and must be taken into account. Against this background, it is difficult to assess the success of the export potential for German pork produced under higher animal welfare standards. Only if other countries start to offer pork produced under higher animal welfare standards for a higher price, or if Germany is able to communicate the benefits of animal welfare meat regarding taste and quality, could an export potential arise. Shirai (2010) already showed that there is a trend towards premium products in the sector of fruits and vegetables, milk and eggs as well as for meat and fish in Japan. In this study, the price premium for those products was around 20 %. However, the experts mentioned that Japanese consumers would choose an alternative product when the price for the organic product is too high. This indicates that the price formation must be well considered. Although there might be a willingness to pay a higher price, the price for imported products should always be lower than for domestic pork, especially if frozen goods are offered. This will be difficult to realize since German pork produced under higher animal welfare standards needs to have a higher price to generate the higher production costs.

Before the outbreak of ASF Germany was the second most important trading partner in terms of pork to **South Korea**. Due to the ASF outbreak German pork is banned from Korean markets and Germany is not allowed to export pork to South Korea for at least three years after the last ASF finding. Since the topic ASF has not been communicated in the open press in South Korea, similar to Japan, trade relations between Germany and South Korea are expected to recover again after the ASF issue. This phenomenon could already be observed after the outbreak of BSE (Bovine spongiform encephalopathy) in the USA, where a once strong trading partner could regain its market share on the South Korean market. In general, German pork and pork products enjoy a high reputation in South Korea. Overall, it seems as if South Korean companies are still interested in German pork and pork products, which is a good starting position. Therefore, it is hardly possible to assess whether there is any export potential for German (high welfare) pork in Korea at all at this point in time.

According to the experts, neither South Korean consumers nor the food industry are currently interested in animal welfare. Consumers' knowledge about animal welfare is low, this can be confirmed by literature (Byungjoon et al. 2018). Moreover, South Korean consumers are interested in the price, food safety, the specificity of a product (e.g., special breed or feed) and consistency of meat. Additionally, labels and traceability systems are very important for South Korean consumers. In this context, the origin of the meat is an essential purchase criterion which can be confirmed by Kim et al. (2014). Against this background, South Korean consumers, just like Japanese consumers, assume that imported pork should have a lower price than domestic pork, especially when it comes to frozen imported pork. This fact is counterproductive if Germany wants to export pork produced under higher animal welfare standards which will have a higher price than conventional pork. Therefore, it seems almost impossible to export pork produced under higher animal welfare standards at a higher price to South Korea. The experts estimated that the only chance for Germany would be having a good marketing strategy in advance. Furthermore, the South Korean government needs to implement an own animal welfare label first, so that consumers are already familiar with such products. And in the end, the price will be the decisive criteria and will determine the success.

To summarize, at this point of our analysis it is not possible to quantify or even describe a clear export potential for German pork produced under higher animal welfare standards. None of the experts interviewed in the respective study countries made a positive assessment immediately. Accordingly, it should be assumed at this stage that it will not be easy to implement German pork produced under higher animal welfare standards anywhere. In addition, it can already be stated that selling high-welfare (and high price) meat on Asian markets will be even more difficult than in Europe, as the topic of animal welfare does not play a role there so far. Japanese as well as South Korean consumers are focusing more on taste and quality related issues. Therefore, country-specific promotion campaigns of German pork produced under higher animal welfare standards are necessary and a pre-condition to gain access to those markets. If a good marketing strategy is essential in Asia, the biggest challenge in the European countries (Italy and Poland) will be good timing, because these countries are already working on their own animal welfare labels. The time of introducing pork produced under higher animal welfare standards ‘made in Germany’ is running out. Although the interest of Polish and Italian consumers in animal welfare might be limited at this stage, a change in awareness is discernible in both countries. The implementation of the ban on cages for chickens, for example, shows that such a process requires time: in the early phase of the debate, not all neighbouring European countries were aware of this issue. However, once the ban was imposed and implemented, the momentum started to develop.

A limitation of this work is the limited number of interviews. Difficulties were encountered in getting in touch with experts due to Covid-19, ASF and also cultural differences. Nevertheless, specific information about the pork markets of the study countries could be generated through this explorative study. Since the export potential depends on numerous factors, the findings in this study cannot be easily transferred to other countries. This is also shown in the limited amount of literature available which analyses similar topics.

The structure of pork markets is different from one country to another and therefore, the export potential for German pork produced under higher animal welfare standards must be analysed individually. Should the pork markets and also the cultural circumstances be similar, there might be an opportunity to transmit some results. But in the end, individual approaches must be developed and have to be adapted to the target market. It seems that the provision of information and the association of benefits for humans, animals and meat quality of meat produced under higher animal welfare standards are essential to be able to distribute German pork produced under higher animal welfare standards in different countries.

Ultimately, further studies are needed to gain more precise conclusions on an export potential for pork produced under higher animal welfare standards and to estimate this potential. Therefore, focus group discussions with consumers in the respective study countries and an online survey are planned. The authors hope that these two studies will help to obtain a better idea about consumer preferences, attitudes and knowledge about animal welfare and especially about criteria that seem to be important while purchasing meat. In addition, these research steps should help to analyse the willingness to pay a premium price for pork produced under higher animal welfare standards. Besides studies in the field of consumer research, the authors recommend conducting further research by analysing and identifying other drivers within the pork processing chain in the respective countries.

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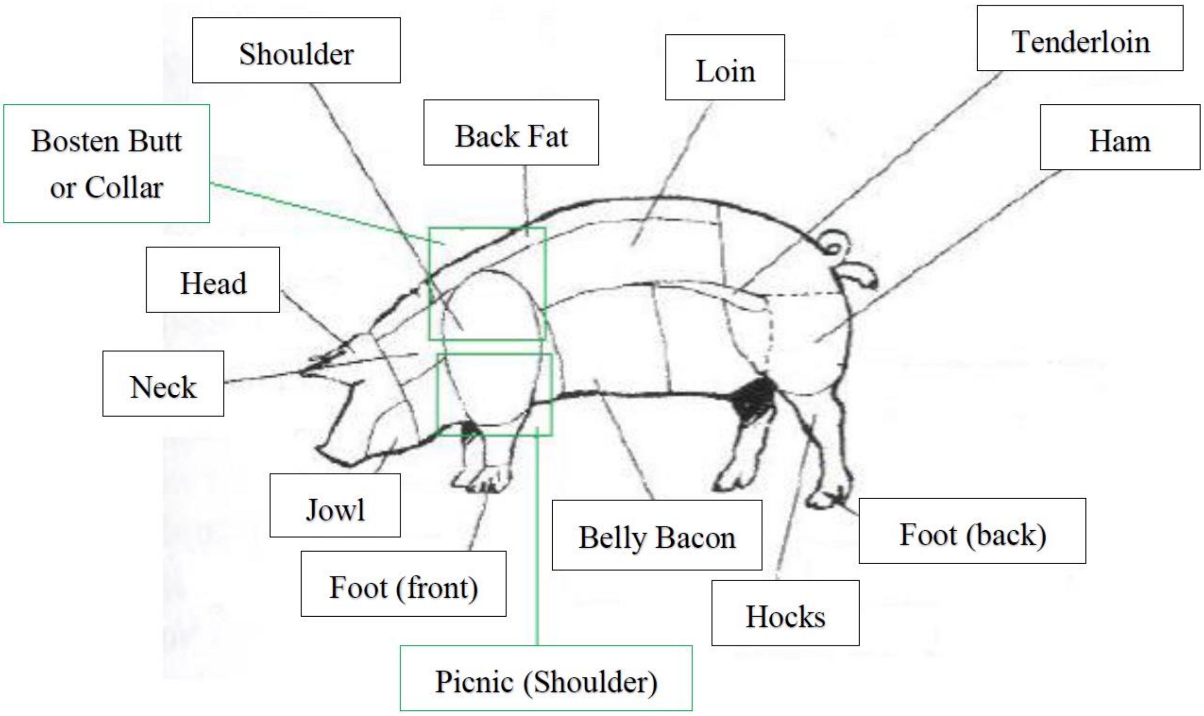
# Appendix 1

**Figure 5:** **Cuts of pork** (own compilation according to Scheper et al. (1996))



# Appendix 2

**Interview guideline Poland and Italy**

## I. Supply

1. Market situation
   a. General information on the meat market → How does the overall meat market in Poland/Italy look like? → information about the domestic production (data, statistics)
      - Which meat is the most important?
      - What are developments and trends?
      - What about slaughtering, dates or the quantity of meat production?
   b. What is the current market significance of pork in Poland/Italy?
      - What are the produced quantities/slaughters?
      - How is the degree of self-sufficiency for pork?
   c. Which cuts of pork are offered?
      - Where and in which way are pork and its cuts mainly traded?
      - How are the remaining parts treated?
   d. How is the price development?
   e. Which developments/trends can be observed in Poland/Italy in the pork market? Development over the last years?
   f. Please describe typical supply chains!

2. Import/Export
   a. Which role do imports and exports play in the meat market in Poland/Italy?
   b. What are the main import and export countries? (Which strengths and weaknesses do these competitors have?)
   c. What types of meats are imported most? Which parts?
   d. How does the import situation of pork look like? (amount, value)
      - What are the import criteria (quality standards, etc.)?
      - Where does imported meat mainly enter the supply chain? (ends up un-processed in shops or goes into processing?)

- Compared with domestic produced meat, is imported meat offered for a different price?
- What about the development of the import and export situation over the last "20 years"?
- Which relevance regarding imports of pork has Germany?

3. Market segmentation
   a. Are there higher animal welfare standards in Poland/Italy?
   b. Are there animal welfare, organic or local products that are particularly traded?
   c. Do you have any animal welfare labeling schemes?
      - If so, which criteria must be fulfilled for the labels? (e.g. more space, organic material, ...) = husbandry conditions
      - Is the labelling system public or private? Voluntary or mandatory?
      - How are the products labelled?
      - Are certain criteria communicated explicitly?
      - If there is a governmental animal welfare label, how is it made popular?

**II. Demand**

1. General information about meat consumption
   a. Please describe the development of meat supply in your country!
   b. What is the total annual meat consumption in Poland/Italy?
   c. Which share has pork in the whole meat market?
   d. How much pork is consumed per capita/year in Poland/Italy?
   e. Which cuts of pork are in particular demand in Poland/Italy?
   f. Where is the market price for pork in your country?

2. Market segmentation
   a. Which labels already exist on the market?
   b. Which labels have a high market share and are particularly in demand? (animal welfare, organic, regional)
   c. Which concerns do consumers have regarding meat (especially pork)?

d. Which demands do consumers have on pork and the related production? (husbandry conditions, degree of processing, origin, quality, price, use of antibiotics, ...)
e. Are there higher animal welfare standards in your country?
f. How do the husbandry conditions/requirements differ from the conventional standards? (e.g. more space, organic material, watering,...)
g. What is the current significance of animal welfare in animal husbandry? (social relevance)
h. Which significance do programs and initiatives etc. have for the improvement of animal welfare in poultry farming (pig farming)?
i. Is there a willingness to pay more for pork produced under improved animal welfare conditions?
j. In your opinion, what is the current market potential for pork produced under higher animal welfare standards?
k. What could be the market potential for animal welfare meat that is imported and sold from Germany? Which cuts are particularly relevant?
l. Do you think animal welfare will gain more importance in the future?

# Appendix 3

**Interview guideline Japan and South Korea**

I. **Supply**

4. Market situation

    g. How does the overall pork market in Japan/South Korea look like? (development, trends)

    h. What is the current market significance of pork in Japan/South Korea?

    - What is the current degree of self-sufficiency for pork?

    i. Which cuts of pork are offered? Which cuts are preferred by the consumers?

    j. Where and in which way is pork mainly traded?

    - Frozen and chilled pork, pork products, pigs to be slaughtered
    - Shop-level, wholesale markets, restaurants and cantinas
    - What is the state regarding international trade?

    k. How did domestic price level for pork develop over the last 20 years?

    - What is the correlation between national and international prices?

    l. How does the typical supply chains of pork look like in Japan/South Korea?

5. Import/Export

    e. Which role do imports and exports play in the pork market in Japan/South Korea?

    f. What are the main import and export countries?

    - What strengths and weaknesses do you see in the individual competitors?

    g. What types of meats are imported most? Which parts?

    h. What are the import criteria (quality standards, etc.)?

    i. Where does imported (pork) meat mainly enter the supply chain?

    j. Compared with domestic produced pork meat, is imported meat offered for a different price?

    k. How relevant are imports of pork meat from Germany?

6. Market segmentation
    d. Do you have any labeling schemes? (organic or domestic production, high quality system)
        - If so, which criteria must be fulfilled for the labels? Are the labelling schemes public or private? How are the products labelled? Which labels have a high market share and are particularly in demand?
    e. How would you rate animal welfare standards in Japan/South Korea?

**II. Demand**

3. General information about meat consumption
    g. Please describe the development and trends of meat demand and especially for pork in Japan?
    h. What is the total annual meat consumption and especially for pork?
    i. Which cuts of pork are especially preferred by Japanese/South Korean consumers?
    j. Where is the market price for pork in your country?

4. Market segmentation
    m. Which demands do consumers make on pork and the related production?
    n. What is the current significance of animal welfare in animal husbandry? (social relevance)
    o. Is there a willingness to pay more for pork produced under higher animal welfare standards?
    p. Do you see a market potential for animal welfare meat imported from Germany?
    q. Do you think animal welfare will gain more importance in the future?

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