



AgEcon SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

Identification of consumers' purchasing criteria and perception of animal welfare and country of origin – a cross-national study

Rebecca Derstappen, Inken Christoph-Schulz

*Thuenen Institute of Market Analysis, Braunschweig, Germany
rebecca.derstappen@thuenen.de; inken.christoph@thuenen.de*

Received April 2022, accepted November 2022, available online January 2023

ABSTRACT

Social acceptance of livestock farming has been declining in recent years. Especially the husbandry conditions of pigs are controversially discussed in society, industry and politics. We conducted an exploratory cross-national study (Poland, Italy, Japan and South Korea) to provide insights into consumer attitudes, preferences and possible willingness to pay for pork, considering the influence and importance of pork purchasing criteria, the country of origin and animal welfare. Five online focus groups took place in each study country and were analysed using a qualitative content analysis. Consumer knowledge of animal welfare differed in European and Asian countries, although it was limited overall. Regarding pork purchasing habits, all participants emphasized that freshness, appearance, quality, country of origin and price were important. Nevertheless, almost all participants linked higher animal welfare standards with higher meat quality and therefore saw a personal benefit. In all countries, there is a need to increase awareness on the subject of animal welfare by developing specific informational campaigns.

Keywords: *Animal welfare; purchasing criteria; cross-national study; pork.*

1 Introduction

Pork consumption is very high in many countries all over the world. But since 2007, pork has been replaced by poultry meat as the most important type of meat (OECD, 2022). In most European countries, the per-capita consumption of pork has been stagnating or even declining in the last decade due to ethical concerns such as animal welfare and environmental or health-related aspects (Clune et al., 2017). For example, Polish consumers decreased their pork consumption by 6.2% (-3.4 kg) and Italian consumers by 0.8% (-0.3 kg) in the stated period (AMI, 2007–2020). In contrast, in some Asian countries, pork consumption increased between 2008 and 2018. For example, in Japan and South Korea, an increase of 9.7% (+1.4 kg) and 46.6% (+8.9 kg) was observed (MJ International, 2020; OECD, 2022). Given that none of these countries is 100% self-sufficient, Italy, Poland, Japan and South Korea rely on pork imports (AMI, 2020). Italy imported 891,920 tons of “meat of swine, fresh, chilled or frozen” in 2020, and Poland imported 565,331 tons. At the same time, Japan imported 891,825 tons and South Korea 417,778 tons of “meat of swine, fresh, chilled or frozen” (UN Comtrade, 2022). In contrast, Germany has a self-sufficiency rate of 120% and exported about 2.9 million tons of pork in 2018 (AMI, 2020).

Although data show that pork consumption is still very important in the human diet, livestock farming is discussed controversially in many European countries (Vanhonacker et al., 2009; Kayser et al., 2012; Wildraut et al., 2015; Weible et al., 2016; Font-i-Furnols et al., 2019; Alonso et al., 2020). According to the EU Barometer, 94% of Europeans believe that the protection of farmed animals is important or rather very important. Specifically, 94% of Italian participants answered that the protection of farm animals is important, whereas only 86% of Polish respondents rated this aspect as important (European Commission, 2016; Grunert et al., 2018). Of all livestock species, pig farming is discussed particularly critically in politics, society, science and industry. Therefore, ethical aspects play an increasingly important role in terms of livestock farming. In this context, the demands for better husbandry conditions become louder and include outdoor access for pigs as well as more space in the barn and more manipulable material (Kayser et al., 2012; Weible et al., 2016; Ermann et al., 2017; von Meyer-Höfer, 2019; Schütz et al., 2020). Furthermore, topics such as tail docking, castration without anaesthesia and teeth grinding or (prophylactic) use of antibiotics are subjects of concern (Vanhonacker and Verbeke, 2011; Hartmann et al., 2014; Busch et al., 2020; Tomasevic et al., 2020). Nevertheless, increasing animal welfare requires a restructuring of livestock farming. This implies higher production costs for the farmers and finally leads to higher consumer prices (Weiß, 2013; Spandau, 2015; Deblitz et al., 2021). Therefore, especially in Germany, farmers are afraid of losing their competitiveness in international trade.

In Germany, the government currently discusses the implementation of a uniform animal welfare label. Additionally, a group of experts has recommended ways to transform livestock farming towards more animal-friendly production systems. This group has also suggested potential financing possibilities to support farmers in this transformation process (BMEL, 2020). In other European countries, such as Denmark or the Netherlands, successful animal welfare labelling systems are already in place (Danish Veterinary and Food Administration, 2022; SPA, 2022).

Many studies deal with the attitude and perception of European consumers towards animal welfare (Frewer et al., 2005; Martelli, 2009; Vecchio and Annunziata, 2012; Hartmann et al., 2014; Di Pasquale et al., 2016; Brümmer et al., 2018; Grunert et al., 2018; Rovers et al., 2018; Pejman et al., 2019; Christoph-Schulz and Rovers, 2020; Cornish et al., 2020). In Asia, however, the topic of animal welfare is of little relevance at this stage, which becomes apparent by the limited available literature (Washio et al., 2019). Nevertheless, to our knowledge, only few studies have been conducted on the relevance of animal welfare, consumption habits and meat demand in the respective study countries, especially in Japan and South Korea. To close this research gap, we conducted an explorative cross-national study (Poland, Italy, Japan and South Korea) to assess important purchasing criteria for pork and to analyse the relevance of animal welfare and the country of origin in different nations. Germany, Poland and Italy were chosen as the most important pork-importing countries within the EU, whereas Japan and South Korea were chosen as important third-country markets for European pork. Japan is one of the largest importers in the world, and the pork consumption increased over the last decades both in Japan and South Korea (OECD, 2022). Additionally, South Korea opened its markets with several free trade agreements. As a result, various types of cuts are marketed on the South Korean pork market today (Derstappen et al., 2021). All in all, pork is the most important type of meat in all four study countries.

The aim of this study is to get first insights into consumers' attitudes, preferences and possible willingness to pay for pork in general and German pork produced with higher animal welfare standards in particular in the different study countries, considering the influence and importance of the country of origin and animal welfare. We aim to answer the following research questions:

- (1) What consumer preferences can be observed in the study countries in relation to pork?
- (2) What are important purchasing criteria when buying pork?
- (3) How do consumers in different countries perceive animal welfare as a purchasing factor and what is the relevance of animal welfare for them?
- (4) How important is the country of origin when purchasing pork?
- (5) Is there a willingness to pay a premium price for pork produced under higher animal welfare standards?

The results and the deriving implications of the presented study are part of a complex overarching question that aims to estimate the export potential for German pork produced under higher animal welfare standards. Against this background, the presented results provide first indications that need to be examined more closely in the further research process and will help to understand the effects of higher animal welfare standards on the future position of German pork production on the international market.

In section two of this paper, the method is described in more detail, followed by a presentation of the focus group results. Finally, a discussion leads to concluding remarks and limitations of this study.

2 Method

To get an overview of consumer attitudes and their perception on meat purchasing criteria, consumption habits as well as the relevance of animal welfare, we chose the approach of qualitative research, particularly focus groups. By interacting with each other, participants of focus groups present their opinions and spontaneous reactions to a given topic. The overall aim of focus groups is to get various opinions from different people on one topic. Usually, a focus group consists of six to ten participants and a moderator (Wilson, 1997; Flick et al., 2007; Finch et al., 2013).

During our research we had to adapt the methodology of focus groups due to Covid-19 and the associated worldwide contact restrictions. Thus, we decided to conduct online focus groups in the respective study countries. Five focus groups in each study country were carried out between July and August 2021. To get a wide range of various opinions, three different regions were determined in the study countries. Each group consisted of six participants, and the focus groups lasted 110 minutes on average. The main categories of the guideline were defined as follows: purchasing and consumption habits, relevance of labels, importance of animal welfare, information on animal welfare and impact of this information on the perception of animal welfare involving a possible willingness to pay an additional price. Besides open questions, the guideline contained a section where participants had to share their opinion on different statements. Additionally, the moderator provided some information on the topic animal welfare, including a short definition based on the 'Five Freedoms' (OIE, 2022) as well as some information about higher animal welfare standards (Figure 1).

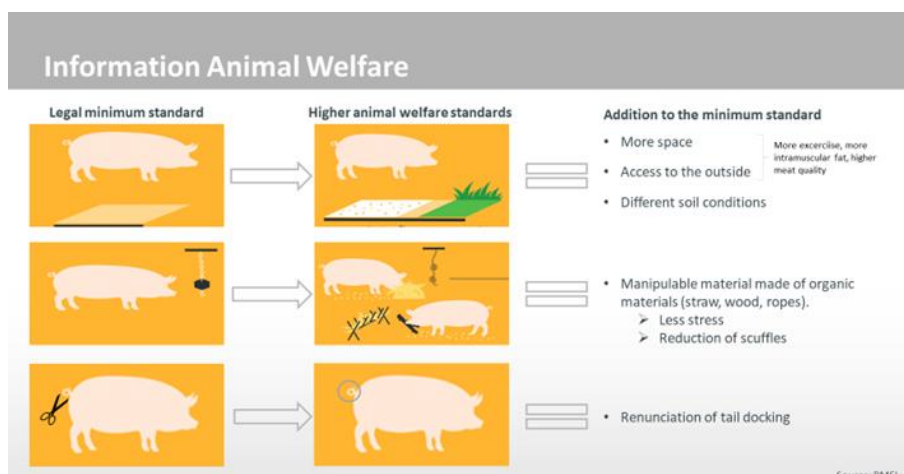


Figure 1. Information on animal welfare.
Source: own compilation based on the guideline of the focus groups

The guideline for the focus groups in Japan and South Korea had a few different questions and a different order of the questions with respect to animal welfare compared to the European guideline. Therefore, the focus was often on the aspect quality instead of animal welfare and, as a consequence, most questions with regard to animal welfare were asked after the informational input due to the limited relevance of this topic in the Asian study countries. This was a conscious decision since previous expert interviews by Derstappen et al. (2021) had shown that the knowledge and interest in animal welfare differs between the countries.

As the focus groups were conducted in different regions, each country had its own native moderator who moderated all five focus groups in the respective study country. To ensure that the discussions were conducted in a comparable manner, the moderators received intensive training in advance. Specifically, the authors discussed the guideline question by question with each moderator and clarified important points in the guideline. During the focus groups, the authors were present all the time to give the moderators hints on certain questions or to indicate that the moderator should focus more on a particular question. Moreover, the moderators received additional information about the questions to prepare for the focus groups. Before the actual focus groups were conducted, the guideline was pretested with a focus group.

Participants with a background in agriculture or market analysis were excluded, as well as consumers working in the following fields: nutrition science, agriculture, marketing or consumer research, psychology and sociology. This was done to ensure that no quasi-experts on the research topic or method were included. To acquire heterogeneous groups, quotas were set in terms of age (between 20 and 70 years old), gender (mixed 50:50 or at least 33% and at most 66% female and male) and employment (at least 33% and at most 66% employed full or part-time). Furthermore, all participants had to regularly consume or purchase pork and had to be citizens of the respective country. According to the quotas, all participants were recruited by a market research institute. The online focus groups were conducted via Zoom and were documented via audio as well as video. Afterwards, the discussions were transcribed and at the same time translated into English. The methodology of a content analysis by Mayring was used to analyse the transcripts (Mayring, 2015). Therefore, the codes were first formed deductively and then supplemented by inductively formed codes. Since the coding guide was verified by another person throughout the qualitative content analysis, we could guarantee that the system would be transferable to third parties. Finally, the results were interpreted step by step by a summarizing content analysis (Mayring, 2015).

3 Results

Based on the guideline, this chapter is categorized into four sub-categories: purchasing criteria and consumption habits, importance of animal welfare, relevance of country of origin and willingness to pay.

3.1 Purchasing criteria and consumption habits

During the focus groups, many purchasing criteria were mentioned and explained by the participants. These criteria are summarized in Table 1. Here, only the most important purchasing criteria are described in more detail. Most participants declared the aspects freshness, appearance (colour or fat content) and quality as the main purchasing criteria for meat. While Japanese consumers preferred a clean red colour, Polish consumers favoured pink meat. The freshness of meat was the most important aspect in all study countries. South Korean consumers, for example, verify the freshness by closely examining the slaughter date. An Italian participant clarified that freshness stands for quality.

'Regarding the preparation or the purchase of pork, the most important aspects for me are freshness, which stands for quality, because a fresh product is a quality product.' (Italy)

The next most important purchasing criteria mentioned were price and origin of the meat. Both aspects were discussed approximately in the same frequency. In terms of the country of origin, all participants in Japan, South Korea and Italy preferred domestically produced pork over imported pork. In this context, especially the Japanese consumers indicated that they preferred domestic pork to ensure they bought safe products or to support local production. In addition, Japanese consumers frequently associated a bad smell with imported meat.

'I also want to support this concept of locally produced, locally consumed.' (Japan)

'Japanese pork is always clean. That's what I think in comparison with an overseas supermarket. Japanese pork has less smell. There is a lot of smelly pork sold in an overseas supermarket. Japanese pork never smells.' (Japan)

According to Italians, the meat should at least come from Europe. In contrast, the country of origin seemed to play only a minor role for Polish participants. Either they did not care about the origin and looked more on the price or appearance of the product, or they were not able to determine the origin and assumed they always buy Polish pork. Polish consumers seemed to be very affected by the price. In the other countries, the price was named as one of the most important criteria as well.

Therefore, Italian consumers tried to find the right balance between quality and price.

'I've never asked the sales assistant at the meat store where it's from, only if it's fresh. But generally, if it looks good and has a good price, it doesn't really matter to me if it's Polish or not.' (Poland)

'I don't care about this. I look for appearance, price and flavour. If it's good, it makes no difference to me whether it's from Poland or another country.' (Poland)

Besides the relevance of different purchasing criteria, the consumption habits in each study country were also different. There were important differences between the Asian and European study countries concerning preferred pork cuts. While South Korean consumers preferred primarily pork belly, neck and front legs, Japanese consumers chose pork belly, loin and shoulder as well as trimmings, especially thinly sliced cuts. In contrast, Polish consumers favoured pork chops, loin and shoulder, but also minced pork, ham and picnic ham. The most popular cut of pork in Italy was loin. Moreover, Italians were particularly fond of sausages or pork chops and fillets.

The final question in this category concerned changes in consumption habits over the last years. According to the South Korean participants, the proportion of online purchases of pork had increased. Furthermore, the participants stated that their pork consumption had grown over the last years for various reasons, such as to increase their protein intake or because beef had become too expensive. As they had to prepare meals more often at home due to Covid-19, they preferred pork because it was easier to cook. In addition, their choice of preferred cuts changed. This is because today, there is a wider choice of cuts available. As a result, Koreans have started to consume more imported products as well and prefer leaner cuts.

In contrast, the group of Japanese consumers can be divided into two groups in terms of their consumption habits: On the one hand, many participants claimed that they had reduced their pork consumption primarily due to environmental aspects and choose fish or alternative meat products based on soybeans. On the other hand, many consumers stated to have increased their pork consumption due to Covid-19 because they had started to cook more and consider pork to be a very easy product to prepare.

In Poland, many participants indicated that they started to eat more poultry than pork, mainly because of health- and diet-related issues. Also, due to economic growth, Polish consumers try to buy better quality. Nevertheless, the other half of participants stated that their consumption habits had not changed and that they still ate a lot of pork and meat in general.

This also applied to most Italian participants, who indicated that their meat consumption habits had not changed at all. However, a few Italian consumers stated to have increased their pork consumption since pork production is better regulated today, and they believed pork to be healthy. Other Italian participants stated to have reduced their meat consumption for a more balanced diet.

Table 1. Purchasing criteria and their relevance (Source: own compilation according to focus groups).

Purchasing criteria	South Korea	Japan	Poland	Italy
Freshness/appearance	<ul style="list-style-type: none"> • Freshness most important, defined by colour and expiry date • Appearance = fat content, cold or frozen condition 	<ul style="list-style-type: none"> • Freshness very important • Appearance = colour (clean red), texture, fat content 	<ul style="list-style-type: none"> • Freshness most important, defined by fat content and appearance • Appearance = fat content (prefer lean products), colour (nice/pink), structure 	<ul style="list-style-type: none"> • Freshness, defined by quality • Appearance = colour, texture, fat content (prefer lean products)
Quality	<ul style="list-style-type: none"> • Hard to identify • Quality = fat content, colour, condition (frozen is bad), marbling 	<ul style="list-style-type: none"> • Pork needs to be tough • Feed impacts quality and taste • Tenderness • Prefer less or much fat, depending on the pork cut 	<ul style="list-style-type: none"> • Quality = appearance, water capacity, lean products 	<ul style="list-style-type: none"> • Long transport period = negative impact on quality • Quality = texture, brand, lean meat, colour • No bad smell, should not shrink during cooking • Good quality only in butcher shops • Hard to recognize good quality, trust necessary
Origin	<ul style="list-style-type: none"> • Important • Preference for domestic pork • After freshness and condition (frozen or chilled) 	<ul style="list-style-type: none"> • Preference for domestic pork to support local production 	<ul style="list-style-type: none"> • Preference for domestic pork in local stores or at butchers 	<ul style="list-style-type: none"> • Very important aspect • Preference for domestic pork • At least European origin
Price	<ul style="list-style-type: none"> • Very important • Sometimes price before country of origin 	<ul style="list-style-type: none"> • Divergent opinions → Cheaper is better → Price after taste and quality 	<ul style="list-style-type: none"> • Price after appearance and freshness • Most important criterion for some respondents 	<ul style="list-style-type: none"> • Good balance between price and quality
Packaging	<ul style="list-style-type: none"> • Slaughter and packaging date 	<ul style="list-style-type: none"> • Amount of drip in the package, expiry date, simple packaging rather than plastic tray 	<ul style="list-style-type: none"> • Expiry date, ingredients list, meat content 	<ul style="list-style-type: none"> • Period between packaging date and expiry date
Safety	<ul style="list-style-type: none"> • Prefer less antibiotics, good feed • According to the slogan: 'What animals consume, the humans also consume' 	<ul style="list-style-type: none"> • Request few chemicals and additives in the production process • Domestic = safer product 	<ul style="list-style-type: none"> • Safety = no production in big factories 	<ul style="list-style-type: none"> • Very important
Brand	<ul style="list-style-type: none"> • Few labels known, e.g. Handon (Korean) pork 	<ul style="list-style-type: none"> • Few labels known: green mark (=label) for processed foods, Charmy-ton or Kurobuta pork, referring to a special breed or feed • Trust in brands 	<ul style="list-style-type: none"> • Brands associated with trust in product 	<ul style="list-style-type: none"> • Information on the whole supply chain and origin • Information about the farm and how animals are raised and fed
Taste		<ul style="list-style-type: none"> • Very important, more important than the price 	<ul style="list-style-type: none"> • Important, especially for processed food 	<ul style="list-style-type: none"> • Very important • Want to taste the flavour of the meat
Animal welfare	<ul style="list-style-type: none"> • Important during online shopping because more information about environment and feeding is available 			<ul style="list-style-type: none"> • How the animals are raised and fed • Important along the whole supply chain • Healthy animals = better meat quality

3.2 Importance of animal welfare

The concept of animal welfare was an essential part of the focus groups. In this context, various key points were defined (see Table 2). The different aspects are further described in the following subsections referring to the understanding of animal welfare, the relevance of animal welfare as well as the impact of information on consumers' perceptions of animal welfare.

Table 2.
Importance of animal welfare

Key points	South Korea	Japan	Poland	Italy
Own assessment of the level of knowledge on animal welfare	<ul style="list-style-type: none"> Limited knowledge 	<ul style="list-style-type: none"> No idea about the meaning of animal welfare Heard the term for the first time 	<ul style="list-style-type: none"> Majority indicated that they have never heard the term animal welfare before 	<ul style="list-style-type: none"> Have heard and have knowledge about the term animal welfare
Understanding of animal welfare	<ul style="list-style-type: none"> Animals are raised in a clean and stress-free environment where their health is protected and where a different feed is provided 	<ul style="list-style-type: none"> Animals are raised in a comfortable, natural, stress-free environment Animals have a right to be happy and have enough space 	<ul style="list-style-type: none"> Good rearing conditions including enough space, free range, good feed and no use of antibiotics Animals are slaughtered in a humane way 	<ul style="list-style-type: none"> Conditions under which animals are raised including feed, space availability, no antibiotics and less stress Stress negatively affects meat quality
Relevance of animal welfare	<ul style="list-style-type: none"> The topic does not concern them since it is only an ethical aspect Instead, quality is of high relevance 	<ul style="list-style-type: none"> Questioned the topic since the animal ends up as meat on the plate anyway Taste and quality are of high relevance 	<ul style="list-style-type: none"> Minor role Consumers have practically never thought about the topic 	<ul style="list-style-type: none"> Varied among the participants
Effect of information on animal welfare	<ul style="list-style-type: none"> Animal welfare has a positive effect on meat quality Concerned about humanizing the animals 	<ul style="list-style-type: none"> Questioned whether domestic production is really safer compared to imported goods Animal welfare is linked to a personal benefit The happiness of animals is still secondary 	<ul style="list-style-type: none"> No change of mind after receiving information Interested to pay more attention to animal welfare schemes 	<ul style="list-style-type: none"> Diverse opinions Those who changed their mind did not agree with today's conventional husbandry conditions

Source: own compilation according to focus groups

3.2.1. Understanding of animal welfare

The topic of animal welfare was introduced during the focus groups by asking the participants about their understanding of the term 'animal welfare'. It is noticeable that the knowledge about the term animal welfare differed amongst the study countries. In the Asian countries, the participants discussed the term extensively to determine its meaning and to find out if it included other aspects. In European countries, the participants were able to give more precise definitions and expressed their understanding of the term.

In South Korea, the knowledge about the term animal welfare was limited. Nevertheless, consumers associated animal welfare with a clean environment in which livestock is raised, that animals live without stress and that their health should be protected. Additionally, South Koreans combined a different feed or way of grazing with the term animal welfare. Usually, they had heard the term in connection with egg production, including an eco-friendly concept. Some participants emphasized that meat coming from pigs growing up in a better environment has better quality. On the other hand, there were discussants who confirmed that the subject of animal welfare did not concern them and considered it only an ethical topic.

'..., I understand that it is a form that protects livestock as much as possible and improves quality in terms of environment and feeding until it is slaughtered and comes to us for food.' (South Korea)

'But I don't think it really touches me, but I think it's an ethical meaning of co-prosperity with humans and eco-friendly methods without using antibiotics to make them eat better on purpose?' (South Korea)

The knowledge of Japanese consumers was limited as well, and many participants in the focus groups confirmed that they had no idea about the meaning and were hearing the term for the first time. Therefore, they started to guess the meaning or agreed with group members who had at least a minimum knowledge of the subject. Overall, Japanese consumers associated animal welfare with the farm animals being raised in a comfortable, stress-free environment. Derived from the term animal welfare, the Japanese defined it as follows: The concept of animal welfare means that the animals, like humans, have a right to be happy, that animals should have a lot of space available and should grow up in a natural environment, all of which allows the animals to have a good life until slaughter. On the other hand, some participants questioned the concept, since the animals end up as meat on the plate anyway.

'This is about how the animals are raised.' (Japan)

'Comfortable environment for farm animals so that the stress-free life can be provided until their death. I think that's the concept. But it is just a concept. Farm animals, such as chicken, pigs, will be on our table, whether they are raised in such a good condition or not. This is something I still question myself.' (Japan)

'I can translate it into Japanese. Like the human has rights, animal should also have the rights. Such a concept or such philosophy. It's what it means, I think. In short, for example, when farm animals are slaughtered, they shouldn't go through a too painful time.' (Japan)

Most Polish consumers claimed never to have heard the term animal welfare before. But when they thought about it, they associated good rearing conditions with animal welfare, such as space, free range, good feed and no use of chemical additives or antibiotics. Furthermore, the participants who were interested in this subject stated that the animals should be raised and slaughtered in a more humane way and should not suffer.

'For me, it's mainly about the conditions under which the animals are raised and slaughtered.' (Poland)

'I also haven't heard the term. But I associate it with a good condition of animals, i.e. they're fed well, have good conditions, the slaughter isn't terrible but, let's say, the animals are looked after, healthy. Everything is related to the word "well".' (Poland)

In Italy, most people associated animal welfare with the conditions under which the animals are kept, how they are fed, whether they have enough space or whether they are given antibiotics. In addition, the animals should have as little stress as possible; the participants justified this with the fact that stress could reduce the meat quality. Moreover, the Italians associated the term animal welfare with the health of the animals and knew that there are laws which regulate farm production. However, some participants in the focus groups in Italy also stated that they did not think about this issue because, in the end, the animal is used as food anyway.

'Animal welfare is what we have said so far, how the animals live, how they are raised, if they are out to pasture, if they eat natural products, and of course, all this affects the quality of the product.' (Italy)

'If I think about it, I'll turn vegetarian.' (Italy)

'I think it is strictly linked to the health and welfare of the animal, the ability to move freely, to be well treated, to be kept safe from suffering, to be properly fed.' (Italy)

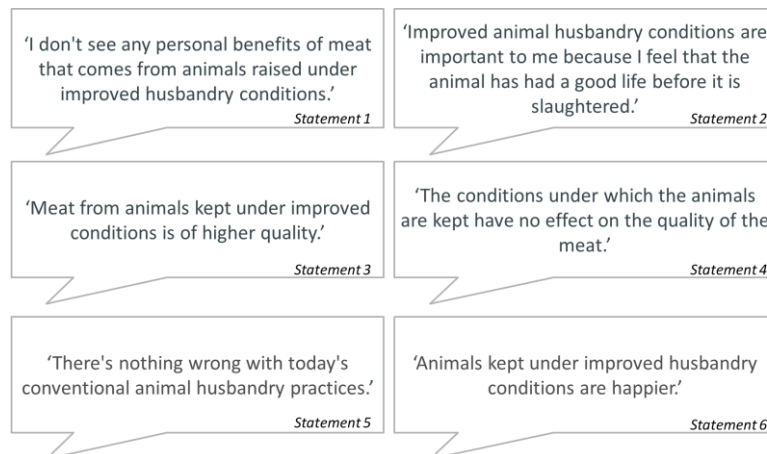


Figure 2. Statements 1–6 on the subject of animal welfare.
Source: own compilation based on the guideline of the focus groups

3.2.2. *Relevance of animal welfare*

During the focus groups the participants discussed different statements (Figure 2) against the background of the following questions: 'Do you agree or rather disagree with the statements? What are the reasons for this?' These statements were used to better understand the relevance of animal welfare in the study countries.

Most South Korean, Japanese and Polish consumers agreed with statement two ('Improved animal husbandry conditions are important to me because I feel that the animal has had a good life before it is slaughtered'). The reason they provided is that they associated this statement not only with an appropriate life for the animals but also with a personal benefit for them as consumers. In this context, the consumers discussed that meat produced from pigs raised under improved husbandry conditions might have a better quality and taste, because the animals are less stressed. Additionally, Polish consumers wanted to ease their conscience, since the animals are slaughtered for consumption in the end. In contrast, some Japanese consumers did not see any personal benefits of meat coming from animals raised under higher animal welfare standards because, according to them, the animals would be slaughtered anyway. A minority of Italian participants chose the second statement because of ethical reasons; moreover, the Italians associated improved husbandry conditions with better meat quality, just as most participants, although this was not the main subject of statement two.

After showing statement three ('Meat from animals kept under improved conditions is of higher quality') and four ('The conditions under which the animals are kept have no effect in the quality of the meat') most participants agreed that there is a connection between improved husbandry conditions and the quality of meat, since the animals are healthier, have less stress and more available space. Nevertheless, South Korean consumers were not sure if this higher quality was also responsible for better taste. In contrast, Japanese consumers directly linked higher quality to taste, which they already experienced with free-range chicken.

According to a few South Korean and Japanese participants, there is nothing wrong with today's husbandry conditions. In part, the Japanese agreed that not everything about conventional pig production is good, but they described themselves as pragmatic, since cheap meat is needed in a certain quantity on the market, and the animals are slaughtered in the end anyway, so the well-being of the animals is secondary. A similar response was provided by a few Polish consumers who agreed with statement five ('There's nothing wrong with today's conventional animal practices'). They emphasized that they primarily care about the meat quality. The same applied to most Italian participants, who trusted the actual laws that regulate the conditions in which the animals are kept. Only some Italian respondents stated that husbandry conditions could be improved. On the other hand, many participants in each study country agreed with statement six ('Animals kept under improved husbandry conditions are happier') because in their opinion, the animals deserve to live in a comfortable environment to avoid stress, which would otherwise negatively impact taste and quality. Furthermore, they also agreed with statement six because they value the animals. Especially Japanese consumers agreed with both statements.

Overall, the relevance of animal welfare in Poland seemed to play a minor role, since Polish customers had practically never thought about the topic before the survey. Nevertheless, most Polish participants stated that they would consider animal welfare if they received information on it in the supermarket or on the package. However, the price would also influence their purchase decision. If meat produced under higher animal welfare standards did not taste better or was not of better quality, the relevance of animal welfare would decrease for Polish customers. According to the focus groups in Italy, the relevance of animal welfare varied between participants. There were Italian customers who cared about the welfare of farm animals and would like to know more about it. At the same time, many Italians were not interested in animal welfare, unless it had a positive effect on the quality and taste of the meat.

Based on expert interviews by Derstappen et al. (2021), we were already aware of the limited relevance of animal welfare in Asia. Thus, the focus in Japan and South Korea was on the relevance of quality. Against this background, South Korean participants indicated that the quality was very important to them since it directly relates to taste, and because humans consume the meat. Most Japanese consumers requested a minimum quality standard since they are often not able to recognize the quality in the supermarket. A few Japanese discussants stated to primarily pay attention to high quality when buying pork for special occasions, because on regular days these high-quality products were too expensive. Otherwise, they demanded good taste and a safe product if they were to consume this pork.

3.2.3. *Impact of information on consumers' perception of animal welfare*

After the participants of the focus groups had expressed their initial attitudes towards animal welfare and the quality of meat, they were given a definition of animal welfare as well as some information about possible measures that imply higher animal welfare standards (Figure 1). Afterwards, the participants were asked to discuss the statements one to six again on the basis of the given information (Figure 2). Overall, most participants indicated that they had not known that the husbandry conditions were 'so bad' and that they were almost shocked

by that information. Especially the facts about tail docking and manipulable material were unknown. Furthermore, they agreed that the animals need more space. As a result, consumers asked for more information about animal welfare while purchasing pork and would be willing to try pork produced under higher animal welfare standards. Only in Japan did some participants express their concern about the importance of animal welfare against the background of other challenges in the world, such as famines.

Regarding the six statements, South Korean consumers confirmed that they now knew that higher animal welfare standards lead to better quality and that the animals deserve a happy life. Nevertheless, they were still concerned about humanizing animals, which will be slaughtered for food anyway. At the same time, they changed their mind and agreed that higher animal welfare standards lead to a personal benefit since it could mean better meat quality. Nevertheless, the happiness of farmed animals was secondary in Japan.

In contrast, most Polish consumers stated not to have changed their mind after receiving more information. However, they wanted to pay more attention to animal welfare certification while purchasing meat. In Italy, the opinions varied: Some participants indicated that they had changed their mind, whereas others did not. Those who had changed their mind stated that they had not known the criteria of animal welfare and therefore revised their original statement saying that there was nothing wrong with today's conventional husbandry conditions. Furthermore, they agreed that animals raised under improved husbandry conditions are happier.

3.3 Relevance of country of origin

When asking the participants about the importance of animal welfare, all agreed that if they had the choice between imported and domestic products, they would choose domestic products. In this context, South Korean consumers emphasized that they preferred domestic pork because it tasted better and must be fresher due to a shorter delivery period. In addition, they also chose domestic pork because they could usually purchase imported pork only in a frozen condition.

Japanese consumers also preferred domestic pork because they associate it with safety and high quality. Furthermore, they wanted to support local production and cared about the CO₂ footprint. According to Japanese participants, there are higher standards in Japan with respect to meat production, thus imported pork was associated with bad feed. Nevertheless, both South Korean and Japanese consumers stated not to pay attention to the meat's country of origin at the restaurant and that it was not obvious to them where the meat had come from at this stage of the supply chain.

Most Polish consumers claimed to prefer domestic pork since it has a shorter delivery period and therefore had to be fresh. Furthermore, they associated local stores with Polish products. In other words, buying in local stores would mean buying local products, whereas supermarkets or discount stores would sell a lot of imported pork. Few Polish participants indicated that they did not pay attention to the country of origin. Italian consumers described themselves as patriots and associated Italian products with high-quality products. Against this background, Italians preferred domestic pork, which was considered better controlled and with a shorter delivery period. The preference for domestic pork was confirmed by Polish and Italian participants, who indicated that they would not buy imported pork, except when it was processed food from a specific area. The same applied to South Korean and Japanese consumers who stated that imported processed pork was popular. In addition, only a few South Korean consumers emphasized that they preferred imported pork belly.

When the participants were asked directly about their opinion of German pork and if they bought German pork, most participants in each study country agreed that they did not intentionally buy German pork. Especially in South Korea and Japan, the respondents emphasized that it was hard to find fresh German pork in the supermarket. Most Asian consumers had never seen fresh German pork and that only frozen pork was available. But when they had had the chance to try it in a restaurant or on vacation in Germany, they had a positive attitude towards German meat and described it as delicious. Regarding German processed pork, such as sausages, all participants in all study countries indicated that they preferred German processed products because they associated these sausages with a traditional production, high quality and no use of additives. Nevertheless, Japanese as well as South Korean consumers claimed that they would be willing to try German pork. In this context, one South Korean participant underlined that German pork needs to be promoted more intensively to be more competitive, like Australian or American pork.

'I didn't see it at the big mart. I go to big markets a lot, but there isn't foreign pork in cold storage...' (South Korea)

'It tastes good and German people are very honest, as far as I know. So, if you promote it really well, I think German products will be competitive just as Australian, American, or other local products sold well in Korea.' (South Korea)

'..., I don't think I have ever seen German fresh meat.' (Japan)

'... when I want to do something classical with less chemicals, you know, when I want to feel extra healthy, then if I find something properly made by German process, I would choose that because I think it's a high-quality product.' (Japan)

'... I've never bought German pork on purpose.' (Poland)

'Certain German specialties give you the idea that they are more controlled, and therefore, let's say healthier. I know it's not a word you would use for Frankfurters; however, I feel they are more reliable if they are foreign, specifically German.' (Italy)

The respondents gave different answers to the question under which conditions they would buy German pork. The main criteria are summarized in Table 3. It is noticeable that the Japanese participants often stated that they could not answer this question because they had no idea about German meat and therefore saw no reason to buy it. In addition, some Italians stated that they would not buy German pork under any circumstances.

Table 3.
Conditions under which respondents would buy German pork.

South Korea	Japan	Poland	Italy
Price cheaper than domestic	Firstly, must be available	Convincing quality and good appearance	High quality
Certified	Cheap price	Better taste	Knowing the exact origin = traceability
Reasonable price and freshness	To try something special/new	Better price	Information about how pigs are raised
Appearance like domestic pork	New taste	Less use of antibiotics	When it is on sale
Guaranteed safety	Good promotion	Animal welfare	Promotion of a sustainable farming system
Special/better taste	On special occasions	Recommendation of seller	Safety
High quality	Safety		

Source: own compilation according to focus groups

Overall, regarding German labels and a German animal welfare label in particular, most participants in the respective study countries stated that they would trust them. In this context, South Korean consumers identified Germany as an advanced country and trusted the German government to enforce its regulations. Japanese consumers evaluated German people as highly moral and described Germany as an environment-oriented country where the topic of animal welfare is of high relevance, and which must therefore be trustworthy. Polish participants characterized Germans as meticulous, and that Germany has strictly defined rules and norms and therefore good quality. Furthermore, few respondents stated that the origin of a label is not a deciding factor. Nevertheless, if a product is certified by a German agency, it would be more trustworthy, according to Polish consumers.

Overall, all participants wished to receive more information about the label and the associated regulations. In addition, it seemed to be important for some consumers to know more about the responsible parties behind the label and how the controls are carried out to make sure that a label can be trusted.

3.4 Willingness to pay

The willingness to pay an additional price for German pork produced under higher animal welfare standards varied. However, South Korean participants were willing to pay between 10 and 30% more, while other participants indicated that the price should be cheaper since it was an imported product. The same applied to Japanese consumers: the majority would be willing to pay 20 to 30% more. Some Japanese would be willing to pay even twice as much for pork produced under higher animal welfare standards. However, they would have to be convinced of a better taste (as animal welfare remained secondary for them) and would prefer to buy this premium meat only on special occasions. Polish consumers were also inclined to pay a price premium of up to 30% for improved animal welfare. In some cases, the willingness to pay a premium in Poland was around 50%. At the same time, there were also participants who honestly stated that they would not pay a price premium because the issue of animal welfare was irrelevant to them. Most Italian consumers were willing to pay a premium price of 10 to 25% if the higher standards were guaranteed by a certification system and implied higher quality.

All in all, participants in the study countries were willing to pay a premium price if the quality was better. Nevertheless, they linked better quality with improved animal husbandry conditions and would therefore be willing to pay an additional price for this aspect as well.

4 Discussion and concluding remarks

The overall objective of this cross-national study was to identify important consumer purchasing criteria when buying pork and to determine the relevance of animal welfare in each nation. In addition, the relevance of the country of origin when purchasing pork was analysed, especially in terms of German origin.

Research question (1) was aimed at identifying consumer preferences in the respective study countries in relation to pork. Participants preferred different cuts of pork depending on the study country. Furthermore, the changing consumption habits have led to an increased demand for pork in the Asian countries in recent years, while in Italy and Poland the consumption level has remained mostly the same. Nevertheless, in all four countries, there were participants who indicated that they were reducing their consumption of pork. Reasons for this include a more balanced diet, the negative impact of meat production on the environment and changes in eating habits. Although there were different preferences in terms of preferred cuts of pork, the purchasing criteria were of similar importance to the participants. As a result, we identified important purchasing criteria as addressed by **research question (2)**, which were primarily freshness, appearance and quality. Furthermore, the country of origin or the price were essential when purchasing meat. All these aspects can be confirmed by the literature (Font-i-Furnols et al., 2019). According to Grunert et al. (2018), Polish and German consumers rate origin, fat content and colour as important purchasing factors since they have a positive impact on the consumers. In addition, especially in the Asian study countries, the criteria safety and appearance were of high relevance. Lee et al. (2021) determined that South Korean consumers associate acceptable appearance with fat preferences. Similarly, we found that South Korean consumers can be divided in two groups: one preferring fatty pork and the other preferring lean pork products.

Research question (3) referred to how consumers in different countries perceive animal welfare as a purchasing factor. We observed that, according to the focus groups, the topic animal welfare seems to be of little relevance in South Korea, Japan, Italy and Poland at this stage. While talking about the relevant purchasing criteria, the topic of animal welfare was only named in Italy and to some extent in South Korea.

The limited relevance of animal welfare in the respective study countries is due to the limited knowledge of livestock farming as well as low empathy among the participants, which is confirmed by other literature (Takeda et al., 2010; Cornish et al., 2016; Grunert et al., 2018; Washio et al., 2019). When asking the participants about the term animal welfare, many participants stated never to have heard this term before and therefore needed to guess its meaning, with many participants naming the correct aspects. Massaglia et al. (2018) discovered that Italian consumers associate stress absence, feed and enough space with animal welfare. According to Pejman et al. (2019), Italian consumers highlight good feed as the most important animal welfare aspect. The awareness of animal welfare in the Asian study countries was even lower than in the European countries. This was also a result of Phillips et al. (2012), who studied students' attitudes towards animal welfare and animal rights in Europe and Asia. Furthermore, the finding that Japanese and South Korean consumers have limited knowledge about animal welfare can be confirmed by the results of another study based on expert interviews (Derstappen et al., 2021).

All in all, animal welfare is not an important topic in any of the countries considered. Our results suggest that consumers' interest in the subject could be increased. The interviewed consumers see the pig primarily as a farm animal whose meat ultimately gets consumed. Thus, according to the participants, the animals should not be stressed or grow up in an unclean environment, because this leads to lower quality. In the study of Massaglia et al. (2018), young Italian consumers indicated a link between good husbandry conditions and high quality, with a strong focus on the meat quality compared with animal welfare. This is in line with the results presented in this study showing that Italian consumers are very interested in the quality of meat and therefore associate better husbandry conditions with higher quality. However, the consumers do not seem to care whether the animal was 'happy' or not.

Ethical aspects behind animal welfare are not as relevant in the study countries as they are in other European countries such as Germany, Denmark or the Netherlands (Frewer et al., 2005; Jonge and van Trijp, 2014; Jonge et al., 2015; Cembalo et al., 2016; Schulze-Ehlers and Purwins, 2016). This might be due to cultural differences, available knowledge and the varying economic power of the individual countries. In addition, literature shows that many consumers do not want to learn more about livestock farming methods because they do not want to deal with the reality of food production (Knight et al., 2003; Knight and Barnett, 2008; Cornish et al., 2016). Nevertheless, some participants in all four countries stated to have already heard of the term animal welfare in the case of egg production. In this context, the participants particularly associated the terms 'free-range' and 'eco-

friendly' with eggs produced under higher animal welfare standards. Therefore, the interest in animal welfare could be increased by organizing an information campaign to educate consumers. Reliable labelling schemes can be one of various appropriate methods. Washio et al. (2020) emphasized that measures are necessary to improve the credibility of animal welfare products. In this context, Washio et al. (2020) suggest combining a positive impression with animal welfare such as taste. This was already a result of the study of Tagbata and Sirieix (2008) and is supported by the fact that some of the participants' views changed after receiving new information. Thus, Banterle et al. (2012) discovered that consumers are interested in additional information, especially in terms of animal-based products. According to Terlau and Hirsch (2015), the communication of quality attributes, including environmental protection or animal welfare, needs to be improved to close the attitude-behaviour gap. Nevertheless, it was repeatedly shown during the focus groups that quality is important to consumers, which is in line with results of other studies (Font-i-Furnols et al., 2019; Wojciechowska-Solis and Barska, 2021). Against this background, it was not surprising that the participants would generally be willing to pay a higher price if the quality of the pork was better. However, if higher animal welfare standards improve the quality and taste of pork, participants would be more interested in the subject of animal welfare. Furthermore, they were willing to pay a premium price if they purchased the products for special occasions. This partially answers **research question (5)**, which referred to the willingness to pay a premium price for pork produced under higher animal welfare standards.

Research question (4) involved the importance of the country of origin when purchasing pork. This question could be answered only partially with the focus groups. Regarding the country of origin, the participants agreed that they preferred domestic pork over imported pork. They justified this attitude by indicating that domestic pork has a shorter delivery period and must therefore be of higher quality and better for the environment. Furthermore, the support of local production seemed to be a driver of purchasing decisions. Various other studies have confirmed that consumers prefer domestic products and would therefore be more willing to pay a higher price for domestic products than for imported products (Dransfield et al., 2005; Pouta et al., 2010; Schjøll, 2017; Whybrow and Macdiarmid, 2018). According to Banterle et al. (2012), consumers are highly interested in the origin of a product. The sceptics in this study associated imported products with lower quality. Nevertheless, most participants emphasized that they intentionally buy imported processed products. In this context, German products were very popular among the respondents, which shows that there is a general interest in them. Germany enjoys a good reputation in all four study countries and is associated with high quality and regulatory standards. This was already the subject of a study by Nagashima in 1970 who found that German brands are well known in Japan. In this context, 'Made in Germany' is associated with reliability, reasonable price and performance. In addition, Germany is characterized as a trustworthy nation. All this leads to the assumption that German pork produced under higher animal welfare standards might have a chance on the international market. Berry et al. (2015) showed that although domestic products are preferred, there might be a potential market for imported products as well. Nevertheless, the participants in their study demanded more specific information about the animal welfare label and the accompanied criteria. In addition, a cheap price, good quality and a good marketing strategy are required to ensure that consumers would try and buy German pork produced under higher animal welfare standards. Font-i-Furnols and Guerrero (2014) found that labels and information can increase consumer acceptance and lead to convenient, healthy and environmentally friendly choices. In addition, more information about meat could create more real expectations.

The discussed results are summarized in Table 4 and highlight the differences and similarities between the study countries based on the research questions.

All in all, we generated first important results about the attitudes of Japanese, South Korean, Italian and Polish consumers towards pork and their perception of animal welfare. It should be emphasized that freshness, quality, country of origin and price were the decisive purchasing criteria for all consumers. Animal welfare was of little relevance, which results from the low level of consumer knowledge about the subject. Targeted and individually adapted information campaigns could help to change this. In addition, animal welfare needs to be tangible for consumers, preferably in the context of a quality aspect since quality seems to be essential for consumers. Nevertheless, further studies are needed. For example, quantitative studies might provide additional information on the knowledge of South Korean, Japanese, Italian and Polish consumers about animal welfare and particularly the relevance of the country of origin as a purchasing criterion.

Table 4.
Differences and similarities between the study countries based on the research questions

Research question	South Korea	Japan	Poland	Italy
RQ1: Consumer preferences				
a) Preferred cuts	Pork belly, neck, front leg	Pork belly, loin, shoulder	Pork chops, loin, shoulder	Pork loin, sausages, chops
b) Consumption trend	Increasing meat consumption	Increasing and decreasing meat consumption	Decreasing or same level of meat consumption	Same level of meat consumption
RQ2: Important purchasing criteria	Freshness/appearance, price, origin	Price, origin, quality	Freshness/appearance, price, packaging	Origin, freshness/appearance, quality
RQ3: Perception of animal welfare	<ul style="list-style-type: none"> • Knowledge of animal welfare is limited • Animal welfare is associated with clean and natural environment, space availability, feed and that the animals have the right to be happy • Concept is questioned and partly does not affect the consumers since it is an ethical topic 		<ul style="list-style-type: none"> • Majority have never heard the term animal welfare before • Animal welfare is linked to good rearing conditions (e.g. free range, no antibiotics, enough space) 	<ul style="list-style-type: none"> • Conditions under which animals are raised including feed, space availability and use of antibiotics • Associate stress with an effect on meat quality
RQ4: Importance of the country of origin	All participants agreed that they would prefer domestic pork before imported pork			
RQ5: Willingness to pay	10 to 30% more	20 to 30% more	Up to 30% more	10 to 25% more
	The willingness to pay a higher price is linked more to quality than to the pure aspect of animal welfare across all countries			

Source: own compilation according to the results of the focus groups

5 Limitations and further research needs

One limitation of this study was our selected method: Online focus groups are a new concept, though not only because of the Covid-19 pandemic, and the process differed from traditional focus groups. The participants often had to be addressed directly and did not react immediately to each other as participants of face-to-face focus groups would normally do. In addition, there were minor technical issues such as internet connection and headset problems. Nevertheless, the moderators were able to elicit a lot of information from the participants. The focus groups were conducted in the national language, and each country had an experienced moderator to minimize interviewer bias. Since animal welfare is not an important topic in South Korea and Japan, it would be useful to gain more insights into the current pig husbandry systems in these countries, to compare current husbandry conditions with animal welfare conditions. In addition, discussions with other drivers of the pork supply chain could provide further information about the perception and relevance of animal welfare. Therefore, importers, wholesalers, gastronomy as well as the processing industry and the retail sector seem to be interesting interlocutors.

Based on the results, the research questions could be answered in some cases partially and in some cases completely. Overall, there is still a need for further research. For example, it would be interesting to investigate the perception of animal welfare in different countries more intensively. Although the country of origin is an important purchasing criterion and the participants indicated that they prefer domestic pork over imported pork, further research is needed to identify the reasons for this decision on the point of sale in more detail. Against this background, it would also be interesting to investigate which criteria motivate consumers to choose imported products. In addition, the willingness to pay a premium price must be analysed more precisely since the results of the focus groups provide only an overview of a potential willingness to pay a higher price for pork produced under higher animal welfare standards. More precise statements about the willingness to pay a premium could be

derived by placing the consumers in a choice experiment and simulating the purchase decisions. Based on this, we will conduct an online survey to quantify the results from the focus groups and to get an individual as well as a detailed overview of the findings.

Acknowledgements

This study is part of the research project 'ExPoTiWo – Export potential for German meat produced under higher animal welfare standards'. The project is funded by the Federal Ministry of Food and Agriculture (BMEL) within the framework of the Federal Programme Livestock Husbandry by decision of the German Bundestag. The project is managed by the Federal Office for Food and Agriculture (BLE).

References

- Alonso, M.E., González-Montaña, J.R., Lomillos, J.M. (2020). Consumers' Concerns and Perceptions of Farm Animal Welfare. *Animals*, **10** (3): 385, DOI: 10.3390/ani10030385.
- AMI (2007 - 2020). Markt Bilanz Vieh und Fleisch 2007 - 2020. Edited by Agrarmarkt Informations-Gesellschaft GmbH.
- AMI (2020): Markt Bilanz Vieh und Fleisch 2020. Edited by Agrarmarkt Informations-Gesellschaft GmbH.
- Banterle, A., Cavaliere, A., Ricci, E.C. (2012). Food Labelled Information: An Empirical Analysis of Consumer Preferences. *Intern. Journal on Food System Dynamics*, **3** (2): 156–170, DOI:10.18461/ijfsd.v3i2.325.
- Berry, C., Mukherjee, A., Burton, S., Howlett, E. (2015): A COOL Effect: The Direct and Indirect Impact of Country-of-Origin Disclosures on Purchase Intentions for Retail Food Products. *Journal of Retailing*, **91** (3): 533–542, DOI: 10.1016/j.jretai.2015.04.004.
- BMEL (2020): Empfehlungen des Kompetenznetzwerks Nutztierhaltung. Online: https://www.bmel.de/SharedDocs/Downloads/DE/_Tiere/Nutztiere/200211-empfehlung-kompetenznetzwerk-nutztierhaltung.pdf?__blob=publicationFile&v=3, last checked on 07.10.2021.
- Brümmer, N., Christoph-Schulz, I., Rovers, A.-K. (2018). Consumers' Perspective on Dual-Purpose Chickens. *Intern. Journal on Food System Dynamics*, **9** (5): 390–398, DOI: <http://dx.doi.org/10.18461/ijfsd.v9i5.95>.
- Busch, G., Kassas, B., Palma, M.A., Pisius, A. (2020). Perceptions of antibiotic use in livestock farming in Germany, Italy and the United States. *Livestock Science*, **241**: 104251. <https://doi.org/10.1016/j.livsci.2020.104251>.
- Cembalo, L., Caracciolo, F., Lombardi, A., Del Giudice, T., Grunert, K.G., Cicia, G. (2016). Determinants of Individual Attitudes Toward Animal Welfare-Friendly Food Products. *Journal of Agricultural and Environmental Ethics*, **29** (2): 237–254, DOI: 10.1007/s10806-015-9598-z.
- Christoph-Schulz, I., Rovers, A.-K. (2020). German Citizens' Perception of Fattening Pig Husbandry—Evidence from a Mixed Methods Approach. *Agriculture*, **10** (8): 342, DOI: 10.3390/agriculture10080342.
- Clune, S., Crossin, E., Verghese, K. (2017). Systematic review of greenhouse gas emissions for different fresh food categories. *Journal of Cleaner Production*, **140**: 766–783, DOI: 10.1016/j.jclepro.2016.04.082.
- Cornish, A., Raubenheimer, D., McGreevy, P. (2016). What We Know about the Public's Level of Concern for Farm Animal Welfare in Food Production in Developed Countries. *Animals*, **6** (11):74. DOI: 10.3390/ani6110074.
- Cornish, A.R., Briley, D, Wilson, B.J., Raubenheimer, D., Schlosberg, D., McGreevy, P.D. (2020). The price of good welfare: Does informing consumers about what on-package labels mean for animal welfare influence their purchase intentions? *Appetite*, **148**: 104577, DOI: 10.1016/j.appet.2019.104577.
- Danish Veterinary and Food Administration (2022). The Governmental animal welfare label. "Bedre Dyrevelfærd". Online: <https://bedre-dyrevelfaerd.dk/servicemenu/english/>, accessed on 24.03.2022.
- Deblitz, C., Efken, J., Banse, M., Isermeyer, F., Rohlmann, C., Tergast, H. et al. (2021). Politikfolgenabschätzung zu den Empfehlungen des Kompetenznetzwerks Nutztierhaltung. Johann Heinrich von Thünen-Institut. Braunschweig (Thünen Working Paper, 173). Online https://literatur.thuenen.de/digbib_extern/dn063574.pdf, last checked on 06.01.2022.
- Derstappen, R., Christoph-Schulz, I., Banse, M. (2021). An empirical analysis of the export potential of pork produced under higher animal welfare standards. Johann Heinrich von Thünen-Institut. Braunschweig (Thünen Working Paper, 184). Online https://www.thuenen.de/media/publikationen/thuenen-workingpaper/ThuenenWorkingPaper_184.pdf, accessed on 06.01.2022.

- Di Pasquale, J., Nannoni, E., Adinolfi, F., Del Duca, I., Capitanio, F., Sardi, L. et al. (2016). A case-study on profiling Italian consumers of animal-friendly foods. *Italian Journal of Animal Science*, **15** (2): 294–302, DOI: 10.1080/1828051X.2016.1180963.
- Dransfield, E., Ngapo, T.M., Nielsen, N.A., Bredahl, L., Sjöden, P.O., Magnusson, M. et al. (2005). Consumer choice and suggested price for pork as influenced by its appearance, taste and information concerning country of origin and organic pig production. *Meat Science*, **69** (1): 61–70, DOI: 10.1016/j.meatsci.2004.06.006.
- Ermann, M., Graskemper, V., Spiller, A. (2017). Die Wirkung von geführten Stallbesichtigungen auf Bürger - eine Fallstudie auf nordwestdeutschen Schweinemastbetrieben. In: Wolfgang Britz, Stefanie Bröring, Monika Hartmann, Thomas Heckelei und Karin Holm-Müller (Ed): *Agrar- und Ernährungswirtschaft: Regional vernetzt und global erfolgreich*. Münster: Landwirtschaftsverlag (Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues e.V, Band 52), pp 45–56.
- European Commission (2016): Attitudes of Europeans towards Animal Welfare (Special Eurobarometer 442/Wave EB84.4). Online http://www.izs.it/IZS/Engine/RAServeFile.php/f/pdf_vari_grafica_/Attitudes_of_Europeans_towards_Animal_Welfare.pdf, accessed on 15.03.2022.
- Finch, H., Lewis, J., Turley, C. (2013). Focus Groups. In Jane Ritchie, Jane Lewis, Carol McNaughton Nicholls und Rachel Ormston (Ed.): *Qualitative research practice. A guide for social science students and researchers*. 2nd: Sage Publications, pp 211–243.
- Flick, U., Kardorff, E. von, Steinke, I. (Ed.) (2007). *Qualitative Forschung. Ein Handbuch*: Rotwohlt Taschenbuch Verlag.
- Font-i-Furnols, M., Guerrero, L. (2014). Consumer preference, behavior and perception about meat and meat products: an overview. *Meat Science*, **98** (3): 361–371, DOI: 10.1016/j.meatsci.2014.06.025.
- Font-i-Furnols, M.; Skrlep, M.; Aluwé, M. (2019). Attitudes and beliefs of consumers towards pig welfare and pork quality. *IOP Conf. Series: Earth and Environment Science*, **333**: 012002. DOI: 10.1088/1755-1315/333/1/012002.
- Frewer, L.J., Kole, A., van de Kroon, S.M.A., Lauwere, C. de (2005). Consumer Attitudes Towards the Development of Animal-Friendly Husbandry Systems. *Journal of Agricultural and Environmental Ethics*, **18** (4): 345–367, DOI: 10.1007/s10806-005-1489-2.
- Grunert, K.G., Sonntag, W.I., Glanz-Chanos, V., Forum, S. (2018). Consumer interest in environmental impact, safety, health and animal welfare aspects of modern pig production: Results of a cross-national choice experiment. *Meat Science*, **137**: 123–129, DOI: 10.1016/j.meatsci.2017.11.022.
- Hartmann, M., Simons, J., Dutta, K. (2014). Farm Animal Welfare: A challenge for markets and policy. In M. Hartmann and J. Hesse (Ed.), *Agriculture and Food in the 21 st Century. Economic, Environmental and Social Challenges-Festschrift on the Occasion of Prof. Dr. Dr. h.c. P. Michael Schmitz 65th birthday*. 1st, New ed.: Peter Lang, pp 37–59.
- Jonge, J. de, van der Lans, I.A., van Trijp, H.C.M. (2015). Different shades of grey: Compromise products to encourage animal friendly consumption. *Food Quality and Preference*, **45**: 87–99, DOI: 10.1016/j.foodqual.2015.06.001.
- Jonge, J. de; van Trijp, H. (2014). Heterogeneity in consumer perceptions of the animal friendliness of broiler production systems. *Food Policy*, **49**: 174–185, DOI: 10.1016/j.foodpol.2014.07.008.
- Kayser, M., Schlieker, K., Spiller, A. (2012): Die Wahrnehmung des Begriffs “Massentierhaltung” aus Sicht der Gesellschaft. In BMEL (Ed.): *Bericht über die Landwirtschaft* (3), pp 417–428, Online https://www.bmel.de/SharedDocs/Downloads/Service/BerichteLandwirtschaft/2012_Heft3_Band90.pdf?__blob=publicationFile, last checked on 10.03.2022.
- Knight, S., Barnett, L. (2008). Justifying Attitudes toward Animal Use: A Qualitative Study of People’s Views and Beliefs. *Anthrozoös*, **21** (1): 31–42, DOI: 10.2752/089279308X274047.
- Knight, S., Nunkoosing, K., Vrij, A., Cherryman, J. (2003). Using Grounded Theory to Examine People’s Attitudes Toward How Animals are Used. *Society and Animals*, **11** (4). Online <https://www.animalsandsociety.org/wp-content/uploads/2015/11/knight.pdf>, accessed on 10.01.2022.
- Lee, Y.E., Lee, H.J., Kim, M., Yoon, J.W., Ryu, M., Jo, C. (2021). Analysis on difference of consumer’s evaluation on visual features of pork cuts. *Journal of Animal Science and Technology*, **63** (3): 614–625, DOI: 10.5187/jast.2021.e58.
- Martelli, G. (2009). Consumers’ perception of farm animal welfare: an Italian and European perspective. *Italian Journal of Animal Science*, **8** (sup1): 31–41, DOI: 10.4081/ijas.2009.s1.31.

- Massaglia, S., Merlino, V.M., Borra, D. (2018). Marketing strategies for animal welfare meat identification: comparison of preferences between millennial and conventional consumers. *Quality - Access to Success*, **19** (S1): 305–311, Online
https://www.researchgate.net/publication/324168616_MARKETING_STRATEGIES_FOR_ANIMAL_WELFARE_MEAT_IDENTIFICATION_COMPARISON_OF_PREFERENCES_BETWEEN_MILLENNIAL_AND_CONVENTIONAL_CONSUMERS, last checked on 10.01.2022.
- Mayring, P. (2015). *Qualitative Inhaltsanalyse. Grundlagen und Techniken*. 12. revised edition: Beltz Verlag.
- MJ International (2020). Meat consumption status Korea. Information on request from South Korea.
- Nagashima, A. (1970).: A comparison of Japanese and U.S. attitudes toward foreign products. *Journal of Marketing*, **34**: 68–74.
- OECD FAO (2022). OECD-FAO Agricultural Outlook (Edition 2022). OECD Agriculture Statistics (database). Accessed on 10.03.2022.
- OIE (2022). Animal Welfare. World Organisation for Animal Health. Online: <https://www.oie.int/en/what-we-do/animal-health-and-welfare/animal-welfare/>, last checked on 16.03.2022.
- Pejman, N., Kallas, Z., Dalmau, A., Velarde, A. (2019). Should Animal Welfare Regulations Be More Restrictive? A Case Study in Eight European Union Countries. *Animals*, **9** (4). DOI: 10.3390/ani9040195.
- Phillips, C.J.C., Izmirlı, S., Aldavood, S.J., Alonso, M., Choe, B.I., Hanlon, A. et al. (2012). Students' attitudes to animal welfare and rights in Europe and Asia. *Animal Welfare*, **21** (1): 87–100, DOI: 10.7120/096272812799129466.
- Pouta, E., Heikkilä, J., Forsman-Hugg, S., Isoniemi, M., Mäkelä, J. (2010). Consumer choice of broiler meat: The effects of country of origin and production methods. *Food Quality and Preference*, **21** (5): 539–546, DOI: 10.1016/j.foodqual.2010.02.004.
- Rovers, A.K., Wildraut, C., Mergenthaler, M., Sonntag, W.I., Meyer-Höfer, M. von, Spiller, A. et al. (2018). Analyse der Nutztierhaltung durch unterschiedliche gesellschaftliche Gruppen. *Journal of Consumer Protection and Food Safety*, **13** (2): 165–170, DOI: 10.1007/s00003-017-1144-7.
- Schjøll, A. (2017). Country-of-origin preferences for organic food. *Organic Agriculture*, **7** (3): 315–327, DOI: 10.1007/s13165-016-0159-1.
- Schulze-Ehlers, B., Purwins, N. (2016). Does having a Choice make a Difference? Market Potential of the Animal Welfare Label in Germany. *Proceedings in Food System Dynamics and Innovation in Food Networks 2016*, pp 389 – 395, DOI: 10.18461/pfsd.2016.1643.
- Schütz, A., Busch, G., Sonntag, W. (2020). Environmental enrichment in pig husbandry – Citizens' ratings of pictures showing housing elements using an online-survey. *Livestock Sciences*, **240**: 104218. DOI: 10.1016/j.livsci.2020.104218.
- SPA (2022). Beter Leven. Dutch Society for the Protection of Animals. Online: <https://beterleven.dierenbescherming.nl/zakelijk/>, accessed on 24.03.2022.
- Spandau, P. (2015). Analyse der Kosten von Tierwohl und ökonomische Ressourcen tierhaltender Betriebe. In: KTBL (Ed.): Herausforderung Tierwohl. KTBL-Tagung vom 13. bis 15. April 2015 in Halle (Saale). Darmstadt: Kuratorium für Technik und Bauwesen in der Landwirtschaft, pp 155–170, Online https://www.ktbl.de/fileadmin/user_upload/Allgemeines/Download/Tagungen-2015/KTBL-Tage-2015/KTBL-Tage_2015.pdf.
- Tagbata, D., Sirieix, L. (2008). Measuring consumer's willingness to pay for organic and Fair Trade products. *International Journal of Consumer Studies*, **32** (5): 479–490, DOI: 10.1111/j.1470-6431.2008.00714.x.
- Takeda, K.-I., Fukuma, M., Nagamatsu, M., Abe, N. (2010). Attitudes of consumers towards animal welfare products in Japan. In: L. Lidfors, H. Blokhuis and L. Keeling (Ed.): Proceedings of the 44th congress of the International Society for Applied Ethology (ISAE). Uppsala, Sweden: Wageningen Academic Publishers, p 203, Online <https://library.wur.nl/WebQuery/wurpubs/fulltext/160875>.
- Terlau, W., Hirsch, D. (2015). Sustainable Consumption and the Attitude-Behaviour-Gap Phenomenon - Causes and Measurements towards a Sustainable Development. *Intern. Journal on Food System Dynamics*, **6** (3): 159–174, DOI: <https://doi.org/10.18461/ijfsd.v6i3.634>.
- Tomasevic, I., Bahelka, I., Čandek-Potokar, M., Čitek, J., Djekić, I., Djurkin Kušec, I. et al. (2020). Attitudes and beliefs of Eastern European consumers towards piglet castration and meat from castrated pigs. *Meat Science*, **160**: 107965, DOI: 10.1016/j.meatsci.2019.107965.

- UN Comtrade (2022). Pork Trade. World Integrated Trade Solution (WITS) Database. Online: https://wits.worldbank.org/about_wits.html, accessed on 15.03.2022.
- Vanhonacker, F., Verbeke, W. (2011). Consumer response to the possible use of a vaccine method to control boar taint v. physical piglet castration with anaesthesia: a quantitative study in four European countries. *Animal*, **5** (7): 1107–1118, DOI: 10.1017/S1751731111000139.
- Vanhonacker, F., Verbeke, W., van Poucke, E., Buijs, S., Tuytens, F.A.M. (2009). Societal concern related to stocking density, pen size and group size in farm animal production. *Livestock Science*, **123** (1): 16–22, DOI: 10.1016/j.livsci.2008.09.023.
- Vecchio, R., Annunziata, A. (2012): Italian consumer awareness of layer hens' welfare standards: a cluster analysis. *International Journal of Consumer Studies*, **36** (6): 647–655, DOI: 10.1111/j.1470-6431.2011.01040.x.
- von Meyer-Höfer, M., Schütz, A., Winkel, C. (2019). For the future of pig farming – a transdisciplinary discourse organised as a future workshop. *Journal of Sustainable and Organic Agricultural Systems*, **70** (1): 59–65, DOI: 10.3220/LBF1597673589000.
- Washio, T., Ohashi, T., Saijo, M. (2019). Consumers' Willingness to Purchase High Animal-welfare Beef Products in Japan: Exploratory Research based on the Theory of Planned Behavior. In Proceedings of the 11th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management. 11th International Conference on Knowledge Management and Information Systems. Vienna, Austria, 17.09.2019 - 19.09.2019: SCITEPRESS - Science and Technology Publications, pp 130–138.
- Washio, T., Ohashi, T., Saijo, M. (2020). What Promotes Intention? Factors Influencing Consumers' Intention to Purchase Animal-Welfare Friendly Beef in Japan. In: A. Fred, A. Salgado, D. Aveiro, J. Dietz, J. Bernardino, J. Filipe (Ed.): Knowledge Discovery, Knowledge Engineering and Knowledge Management, Vol. 1297. Cham: Springer International Publishing (Communications in Computer and Information Science), pp 536–549.
- Weible, D., Christoph-Schulz, I., Salamon, P., Zander, K. (2016). Citizens' perception of modern pig production in Germany: a mixed-method research approach. *British Food Journal*, **118** (8): 2014–2032, DOI: 10.1108/BFJ-12-2015-0458.
- Weiß, J. (2013). Ökonomische Konsequenzen von mehr Tierwohl. In: LfL (Ed.): Schweinehaltung vor neuen Herausforderungen. Schriftenreihe 11, pp 75–83. Online https://www.lfl.bayern.de/mam/cms07/publikationen/daten/schriftenreihe/056730_schriftenreihe_11_2013.pdf#page=75, accessed on 05.03.2022.
- Whybrow, S., Macdiarmid, J.I. (2018). Attitudes towards, and purchasing of, Scottish beef and beef products in Scotland - A short communication. *Meat Science*, **145**: 150–153, DOI: 10.1016/j.meatsci.2018.06.026.
- Wildraut, C., Plesch, G., Härten, I., Simons, J., Hartmann, M., Ziron, M., Mergenthaler, M. (2015). Multimethodische Bewertung von Schweinehaltungsverfahren durch Verbraucher anhand von Videos aus realen Schweineställen. Landwirtschaftliche Fakultät der Universität Bonn (Schriftenreihe des Lehr- und Forschungsschwerpunktes USL, 179). Online <https://www.usl.uni-bonn.de/pdf/Forschungsbericht%20179.pdf>, accessed on 05.03.2022.
- Wilson, V. (1997). Focus Groups: A useful qualitative method for educational research? *British Educational Journal*, **23** (2): 209–224, Online <https://bera-journals.onlinelibrary.wiley.com/doi/epdf/10.1080/0141192970230207>, accessed on 15.12.2021.
- Wojciechowska-Solis, J., Barska, A. (2021). Exploring the Preferences of Consumers' Organic Products in Aspects of Sustainable Consumption: The Case of the Polish Consumer. *Agriculture*, **11**: 138, DOI: 10.3390/agriculture11020138.