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The South Korean Perspective on German Animal Welfare Certified Pork

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Abstract: Industry stakeholder requests for improved animal welfare practices in German meat production have steadily increased in recent years. A transformation of German animal husbandry systems would almost certainly result in higher production costs. Against this background, producers and the meat industry are concerned about losing their international competitiveness while implementing improved animal welfare practices. As South Korea is an established trading partner for Germany, the objective of this explorative study is to assess South Korean meat market trends with a special focus on meat quality and animal welfare in order to evaluate export chances for German pork produced under higher animal welfare standards. Using a triangulation, the results of semi-structured interviews (n=15) with South Korean pork supply chain stakeholders are combined with the results of an online survey of South Korean consumers (n=723). Results indicate that the market potential for German meat produced under higher animal standards is still low in South Korea. Stakeholders associate improved husbandry conditions with healthier animals, benefits to human health and rank animal welfare as a key element of sustainability. However, due to consumers' lack of knowledge and their price sensitivity, animal welfare is neither a unique selling point, nor linked to meat quality.

Keywords: South Korea, Animal Welfare, Meat Quality, German Pork, Export

1 Introduction

High meat consumption levels and current meat production practices have caused vivid debates in science, politics and society. Various studies have emphasized that a reduction of the overall meat consumption level accompanied by more plant-based diets is a key for a shift towards more sustainability in developed countries (Hallström et al., 2014; Springmann et al., 2018). As the general public is also making ethical requests (Palomo-Vélez et al., 2018), the controversy surrounding meat consumption and livestock farming affects all three pillars of sustainability, including environmental, economic and social factors (Willett et al., 2019; Parlasca and Qaim, 2022).

Especially against the background of a changing human-animal relationship (Hölker et al., 2019) animal husbandry conditions are called into question (Ruby, 2012). The World Organisation for Animal Health (WOAH, 2023) specifies five requirements that need to be fulfilled to ensure an adequate life for livestock animals: (1) Freedom from hunger, malnutrition and thirst, (2) Freedom from gear and distress, (3) Freedom from heat stress or physical discomfort, (4) Freedom from pain, injury and disease, (5) Freedom to express normal patterns of behavior. Consequently, consumers claim larger space availability and outdoor access with regard to pig

fattening (Weible et al., 2016; Schütz et al., 2020) and criticize procedures such as the (prophylactic) use of antibiotics or anesthesia-free surgical castration (Busch and Spiller, 2020; Christoph-Schulz and Rovers, 2020; Tomasevic et al., 2020).

A transformation of animal husbandry systems is currently also on the German political agenda; however, the fulfilment of higher standards comes at a cost (Deblitz et al., 2021). Yet, there is no consolidated path of funding a transformation at farm level (KNW, 2020; Karpenstein et al., 2021). Since Germany is a main pork exporter within the European Union (EU), farmers and agri-food stakeholders are concerned about losing their international competitiveness due to increased prices following a costlier production (Spiller et al., 2015). In this context, EU consumer preferences for premium meat cuts such as filets or loins play a key role as their purchasing behavior creates an export dependency for German and European pork producers. Less preferred meat cuts are sold on third-country markets in order to market as much of the carcass as possible for human consumption as the economically most preferable route of utilization for meat products (Thies et al., 2020).

In addition to the EU market, Germany exports a large amount of pork to third country markets. Prior to the outbreak of the African swine fever (ASF) in Germany in 2020, South Korea was an important export destination for German pork bellies with 233 thousand tons in 2020 (EUROSTAT, 2022). With 72 kg per capita in 2020, Korean meat demand is at a high level by international comparison (FAO, 2022). Against this background and considering the recently closed regionalization agreement between the European Union (EU) and South Korea, trade in meat products also between Germany and South Korea is explicitly sought (European Commission, 2022). Given the animal husbandry transformation goals, German meat, especially pork exported to South Korea would have to be marketed as “animal welfare meat” in the near future.

Whether such efforts are fruitful is yet unclear. Even in Germany, with animal welfare already being a hot topic, studies found a citizen-consumer gap in which the stated willingness-to-pay for meat produced under improved animal welfare standards does not correspond to the actual purchasing behavior of consumers (Enneking et al., 2019). Overall, food purchasing decisions are influenced by diverse factors. Especially for meat, cross-cultural differences have been found with regard to purchasing patterns of consumers (Khara et al., 2021). This is why it is uncertain whether Korean consumers value higher animal welfare standards and reward this through their purchasing behavior. According to Chung et al. (2009) South Korean consumers mainly consider country of origin, no use of GMO feeds and antibiotics, marbling grade and freshness when purchasing beef products and evaluating meat quality. In this context, Lin-Schilstra et al. (2022) indicated that animal welfare is not a top meat purchasing criterion for Korean consumers.

However, in order to comprehensively assess the market relevance of meat produced under improved husbandry conditions on the South Korean meat market, further value chain stakeholders need to be considered: This involves importers, processors and policy advisors as they influence the range of imported and offered products. No information is yet available as to whether the animal welfare concept is recognized, demanded or even perceived as a quality criterion by those stakeholders. In order to address this research gap, this explorative study assesses characteristics of the Korean meat market with a special focus on meat quality aspects and animal welfare. In this context, we further examine how Korean stakeholders perceive these two criteria considering pork products imported from Germany. This research provides a broader perspective on the perception of the animal welfare concept by highlighting the market relevance of those meat products on an essential third-country market. As a successful implementation of improved husbandry systems towards higher animal welfare standards can arguably only be achieved through sales in all sales markets, we contribute to published research mainly focusing on the feasibility of the animal welfare concept on the German market (Hölker et al., 2019; Uehleke and Hüttel, 2019; Deblitz et al., 2021). Moreover, and to the best of our knowledge, the export potential of high-quality meat products to net importing

countries has not yet been investigated in detail by applying an explorative methodological approach. Our findings therefore also provide indications for other meat exporting countries trying to be internationally competitive with high quality meat products and focusing on the implementation of higher animal welfare standards.

This study addresses the following research questions:

1. How do stakeholders along the South Korean pork supply chain define meat quality?
2. What is the understanding and relevance of animal welfare in South Korea?
3. What is the marketing potential for German pork produced under higher animal welfare standards on the South Korean meat market?

The issue of animal welfare has already been analyzed for other European countries (Grunert et al., 2018; Schütz et al., 2020), often focusing on either the consumer or the producer perspective. To contribute to existing literature, we follow an exploratory approach conducting semi-structured interviews with local stakeholders from the South Korean pork industry that influence meat supply on the South Korean meat market. To also address the consumer perspective, we analyzed data from an online survey to verify and discuss our qualitative findings. We initially present an overview of Korean meat market characteristics and trade relations with Germany, in order to better interpret the results of the surveys.

2 Background

South Korea has seen economic growth during the last two decades. Compared to the year 2000, Gross Domestic Product (GDP) has increased by 312.15%, reaching 1.8 trillion US$ in 2021. At the same time, the per capita GDP was 34,758 US$ in 2021, which corresponds to an increase of 284% (World Bank, 2022). The average monthly income amounted to 3,943 US$[1] in 2021 (KOSIS, 2022a). The average Korean total amount of monthly expenditures were 2,950 US$[1] in 2021, with 74% being spent on consumption. According to Table 1, 29.4% of the consumption expenditures were spent on food and soft drinks as well as on restaurants and hotels (KOSIS, 2022a). In percentage points, the most money is spent on meat per month at around 16%, followed by fruit (10.8%) and vegetables (10.5%). Overall, total meat consumption increased by 26.4% during the last decade (AMI, 2014, 2022). Per capita pork consumption was 38 kg in 2020 (+ 21%), per capita beef consumption amounted to 16 kg, and per capita poultry consumption was 21 kg (AMI, 2022). This highlights the importance of meat in South Korean consumption patterns.

[1] KRW converted to US$, conversion factor according to FAOSTAT (2023).

Table 1. Household expenditures based on individual living costs for all households on average

	2021	
	US $*	**%**
Expenditures, total	2,950	
Consumption expenditure, total	2,181	73.9
Food and soft drinks	347	15.9
Meat	*57*	*16.4*
Fruits and processed fruits	*37.6*	*10.8*
Vegetables and processed vegetables	*36.5*	*10.5*
Milk products and eggs	*26.2*	*7.6*
Sugar, jam, honey, chocolate and confectionery	*23.6*	*6.8*
Bread and rice cakes	*23.1*	*6.6*
Restaurants and hotels	295	13.5
Housing, water, electricity, gas and other fuels	261	12.0
Transportation	251	11.5
Health	198	9.1
Education	159	7.3

Note: *KRW converted to US$, conversion factor according to FAOSTAT (2023).
Source: own compilation according to KOSIS (2022a)

Along with the South Korean economic growth and an increasing meat demand, domestic agricultural production has been decreasing in recent years. As the number of pork farms has decreased from 6,378 in the first quarter of 2017 to 5,951 in the first quarter of 2022, a structural change of the sector is apparent. This is especially true as during that period, the number of animals kept increased from 11 mill. to 11.2 mill. in 2022 (+1.5%) (KOSIS, 2022b). Accordingly, the self-sufficiency rate amounted 69.7% in 2019 (KREI, 2020).

Following an increasing meat demand and a low self-sufficiency rate, especially for pork, South Korea has increasingly been dependent on imports. This supply strategy is reflected in the numerous free trade agreements (FTAs), which underline the relevance of the German-South-Korean trade relationship with regard to meat. Around 99 million tons of pork and beef in fresh, chilled and frozen condition reached Korea in 2020 (UN Comtrade, 2022). Besides the United States (US) and Canada, European countries such as Germany, Spain or Austria are holding significant market shares (UN Comtrade, 2022) (Figure 1). Germany exported a total amount of 550,308 tons of fresh, chilled and frozen pork to the South Korean market in 2020. Considering the Combined Nomenclature (CN) 8 classification, frozen pork belly (232,640 tons), frozen pork without bones (121,746 tons) and frozen pork with bones (108,503 tons) accounted for the largest share of German pork exports (EUROSTAT, 2022). South Korean consumers in particular demand cuts with a high fat content such as pork belly or “Boston butt” (Oh and See, 2012).

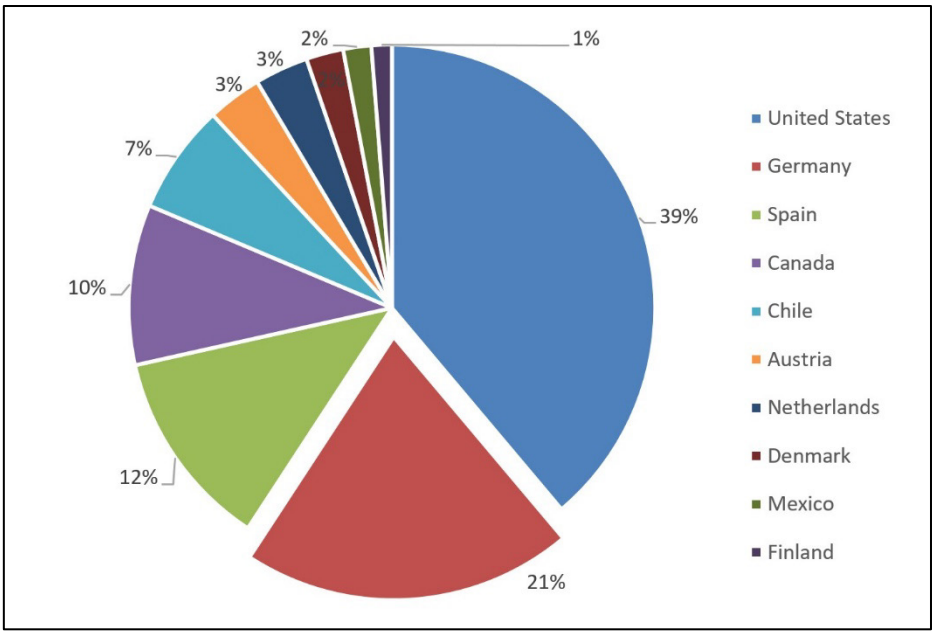

Figure 1. Top 10 most relevant import countries for German pork in 2020

Source: UN Comtrade (2022)

3 Data Handling and Methodological Approaches

Since the relevance of animal welfare with regard to market developments has primarily been studied in Germany and other Western European countries (Denmark, Netherlands, etc.), we focus on the South Korean market. Given the lack of comparable studies on this topic in South Korea, our approach is highly exploratory, focusing on a standardized quantitative online survey and qualitative semi-structured interviews to obtain initial key findings. Accordingly, the concept of triangulation was applied (Schoonenboom and Johnson, 2017; Kelle, 2019). Triangulation means “that the research approach is expanded and an object is examined using several methods” (Flick, 2019). This concept aims to combine convergences, corroborations as well as correspondence of results from different methods (Schoonenboom and Johnson, 2017).

3.1 Online Survey

We analyzed data from an online survey that focused on consumer preferences and attitudes towards animal welfare and country of origin. The online survey was conducted by the authors of this study in July 2022 and included 723 participants. A commissioned market research institute recruited the participants based on predefined quotas. Quotas were set based on gender, age, regional origin, employment status, and educational level to ensure adequate representation of the overall population. The quotas were verified using frequency analyses and compared with official South Korean statistics. Table 2 provides an overview of the sample characteristics. All participants were considered in the course of the initial descriptive analysis. In addition to socio-demographic data, the survey included statements related to meat consumption patterns using a 7-point Likert scale. To avoid forcing participants to provide inaccurate answers, an "I don't know" option was added. Overall, the online survey questionnaire consisted of 15 multiple choice questions as well as 9 item batteries including eight thematic topics (compare supplemental material[2]): consumption habits, relevance of country of origin, knowledge about livestock production, animal welfare, the link of animal

[2] https://zenodo.org/doi/10.5281/zenodo.10715782

welfare and quality attributes, Germany as a country of origin, and the importance of labels and information. The questionnaire also contained a discreet choice experiment, which has been analyzed in the course of an additional research study. To ensure participants had a comparable level of knowledge, they were provided with a definition of animal welfare according to the WOAH and specific criteria related to higher animal welfare standards (WOAH, 2023). Employees of the market research institute translated the questionnaire into Korean, it was then reviewed by a native speaker. In order to ensure data quality, three attention-check questions (ACQs) were included in the item batteries. In cases where two of the attention check questions were answered incorrectly, participants were excluded from the survey.

The data was analyzed using descriptive statistics, focusing on purchasing criteria, animal welfare statements and the perception of German pork.

Table 2. Descriptive statistics for demographic variables in the total sample (N = 723)

Variable	N	Share in %
Gender		
Male	357	49.4
Female	366	50.6
Employment		
Employed	341	47.2
Unemployed	382	52.8
Education level		
Primary, Junior High School (9 years of school)	72	10.0
Senior High School, Upper Secondary (≥ 10 years of school)	277	38.3
College or University	374	51.7
Age		
20-29 years	132	18.3
30-39 years	151	20.9
40-49 years	175	24.2
50-59 years	166	23.0
60-69 years	99	13.7
Number of household members		
Single	78	10.7
2 to 4 people	607	84
5 and more people	38	5.3
Yearly household net income		
≤ 26.100.000 ₩	81	11.2
26.100.000 – 32.000.000 ₩	96	13.3
≥ 32.000.000 ₩	546	75.5

Source: own calculation

3.2 Semi-Structured Interviews

In addition, we conducted semi-structured interviews. We employed a non-probability sampling (snowball sampling) strategy. The snowball principle was initiated through contacts with a South Korean senior scientist and a fellow research institute, but also with German exporting companies with extensive contacts. In order to keep possible biases low and to provide a representative picture, participants from three predefined market segments were interviewed: industry, different associations and research institutions. A total of 15 semi-structured interviews were conducted during August and September 2022, with varying numbers of participants per interview (Table 3). On average, the interviews lasted between one and two hours. Most interviews were conducted face-to-face, while few were held online using the Webex tool due to Covid-19 restrictions. Native-speaking researchers assisted as translators when interviewees preferred to conduct the interviews in their native language instead of English. All interviews were conducted by two interviewers who prepared memory protocols immediately after each interview (including mutual verification). The interviews were not transcribed on a one-to-one basis as sensitive information were provided during interviews with processing and importing companies.

Table 3. Sample structure

Number	Interviewee's areas of interest	Experts per interview	Date	Type
I1	Meat trade association	1	08/08/2022	Face-to-face
I2	Consumer association	1	08/08/2022	Face-to-face
I3	Meat trading company	1	08/08/2022	Face-to-face
I4	Meat industry association	1	08/09/2022	Face-to-face
I5	Researcher and market expert	1	08/09/2022	Face-to-face
I6	Slaughtering and processing company	2	08/10/2022	Face-to-face
I7	Slaughterhouse association	1	08/11/2022	Written exchange
I8	Processing company	3	08/23/2022	Face-to-face
I9	Market and consumer research experts	5	08/29/2022	Face-to-face
I10	Market and consumer research experts	2	08/30/2022	Face-to-face
I11	Meat trading company	1	09/07/2022	Face-to-face
I12	Researcher and market expert	1	09/13/2022	Online
I13	Governmental Organization	1	09/19/2022	Online
I14	Meat trading company	1	09/20/2022	Online
I15	Governmental Organization	3	09/28/2022	Online

Source: own calculation

The interview guideline was developed by a team of scientists based on existing literature and the overarching research question. The individual questions were discussed with South Korean meat market experts prior to the survey. The interview guideline was adapted according to the areas of expertise of the individual interviewees. Still, every interview guideline comprised non-standardized, open-ended questions (compare supplemental material[3]) (Gläser and Laudel, 2010) covering four thematic areas which built the baseline of the coding system presented in Table 4. In this context, we followed Mayring's approach for content analysis (Mayring, 2016). Using MaxQDA, we developed a mixed inductive-deductive category system to analyze the memory protocols, resulting in four main codes and 21 sub-codes (Table 4). Inductive category formation implies that categories are developed during the analytical process. Deductively formed categories are derived from an already existing systematization, in this case based on our guideline (Kuckartz, 2014). The thematic areas of the interview guideline are reflected in four superordinate code groups (C.1 to C.4), which are composed of further summarized subcodes (SC.1.1 to SC.4.1). For example, the subcode "Important quality criteria" (SC.2.2) includes individual criteria associated with meat quality, such as freshness, marbling, packaging, price, etc. (compare figure 5). The subcode "Market relevance of animal welfare" includes the assessment of consumers, politicians, producers and industry stakeholders with regard to the relevance of animal welfare on the South Korean meat market. In this context, especially the stakeholder's association of animal welfare with "ethical issues" and "health benefits" is addressed and summarized. The description of the overall findings of this study is structured according to the summarized code groups and subcode groups presented in Table 4.

A report summarizing these results is presented in Section 4.

[3] https://zenodo.org/doi/10.5281/zenodo.10715782

Table 4. Coding system developed based on the text material of the expert interviews

C.1 Meat market characteristics	
	SC.1.1 Consumption trends/Meat market trends (d)
	SC.1.2 Characteristics of imported meat (d)
	SC.1.3 Relevance of individual imported meat cuts (d)
	SC.1.4 Relevant trading partners (d)
	SC.1.5 Relevance of Germany as meat supplier (d)
C.2 Meat quality perception	
	SC.2.1 **Individual** marketing channels (d)
	SC.2.2 Important quality criteria (d)
	SC.2.3 Definition of meat/pork quality (i)
	SC.2.4 Meat/pork quality classification systems (d)
	SC.2.5 Potential marketing strategy (i)
C.3 Perception of animal welfare and meat quality	
	SC.3.1 Knowledge with regard to animal welfare (d)
	SC.3.2 Market relevance of animal welfare (d)
	Producers
	Industry stakeholders
	Politicians
	Consumers
	SC.3.3 Consumer demand (d)
	SC.3.4 Meat Imports (d)
	SC.3.5 Price differences (d)
	SC.3.6 Marketing potential for animal welfare pork (d)
	SC.3.7 Marketing potential for German animal welfare pork (d)
	SC.3.8 Demand influencing factors(d)
C.4 Future market developments	
	SC.4.1 Drivers of meat consumption (d)

Notes: C = Code groups; SC = Sub-code; (d) = deductively formed categories; (i) = inductively formed categories
Source: own compilation

4 Results

4.1 Results of the Consumer Survey

Consumption Trends

Table 5 shows descriptive statistics for meat consumption among participants of the online survey. Overall, 99% of the respondents indicated that they consume meat. 39% of respondents reported eating meat regularly, 2-3 times per week. The majority of respondents indicated that their meat consumption has not decreased in recent years (82.6%). Considering participants stating to have reduced their meat consumption, respondents cited meat price increases or negative health effects as possible reasons for reducing meat consumption in the future. Negative environmental impacts or animal welfare aspects were cited to be less important.

Table 5. Descriptive statistics of survey variables with regard to meat consumption (N = 723)

Variable	N	Share in %
How often do you consume meat?		
Daily	10	1.4
4-6 times per week	36	5.0
2-3 times per week	282	39.0
Once per week	218	30.2
2-4 times per month	170	23.5
My meat consumption has decreased over the last years		
Yes	126	17.4
No	597	82.6
Reasons for decreasing meat consumption		
Increasing prices	75	35.9
Negative impact on health	59	28.2
Negative impact on environment	34	16.3
Animal welfare issues	24	11.5
I no longer like the taste	11	5.3
Food scandals	3	1.4
Other reasons	3	1.4

Source: own calculation

Important Purchasing Criteria

Figure 2 presents the importance of product characteristics when buying pork. Food safety, the price and country of origin were predominantly evaluated as very important or important. No use of antibiotics and healthiness were also rated as important or very important by more than half of the respondents. Animal husbandry conditions and environmentally friendly production however, were cited as an important criterion by a significantly smaller proportion of participants.

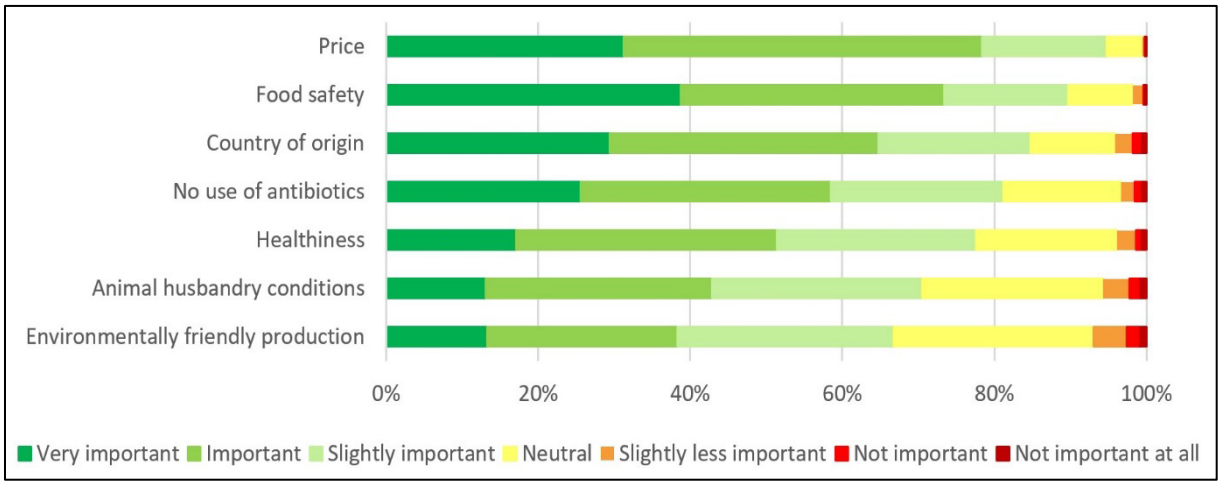

Figure 2. Important purchasing criteria (N = 723)

Source: own compilation

Relevance of Animal Welfare and Country of Origin

The online survey included various statements linked to animal welfare, where particularly two statements seem to be interesting to show. According to Figure 3 the majority of South Korean consumers (39%) indicated that in the case of pigs, animal welfare is very important to them. 21% of the participants rated animal welfare as unimportant. Simultaneously, 71.7% of re-

spondents indicated that they do not want to associate meat with a living animal. Existing literature showed that consumers refuse to associate the meat on their plate with a living animal and deal with the husbandry conditions (Knight and Barnett, 2008).

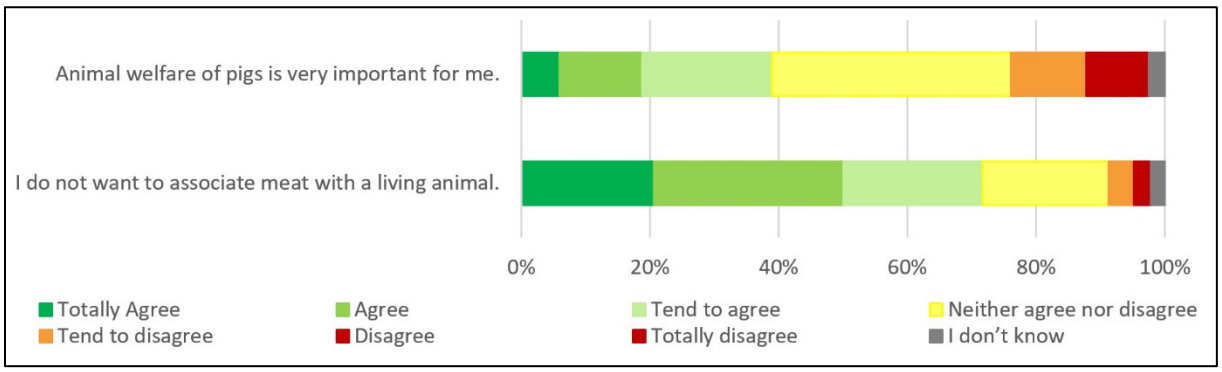

Figure 3. Relevance of animal welfare (N = 723)

Source: own compilation

Figure 4 summarizes consumer attitudes towards country of origin and perceptions of Germany. 84.4% of South Koreans prefer domestically produced pork. At the same time, these consumers are also not averse to German pork. Only a small share of the participants indicated that they would never buy German pork (9.4%). One important aspect is the price: 61% "tend to agree"; "agree" or "totally agree" with the statement "I would choose German pork if the price was lower". Three quarters of the respondents thought that the quality of German pork must be evident if they were to actively demand it. 61.6% indicated that German pork products will be competitive on the South Korean meat market if the promotion is outstanding.

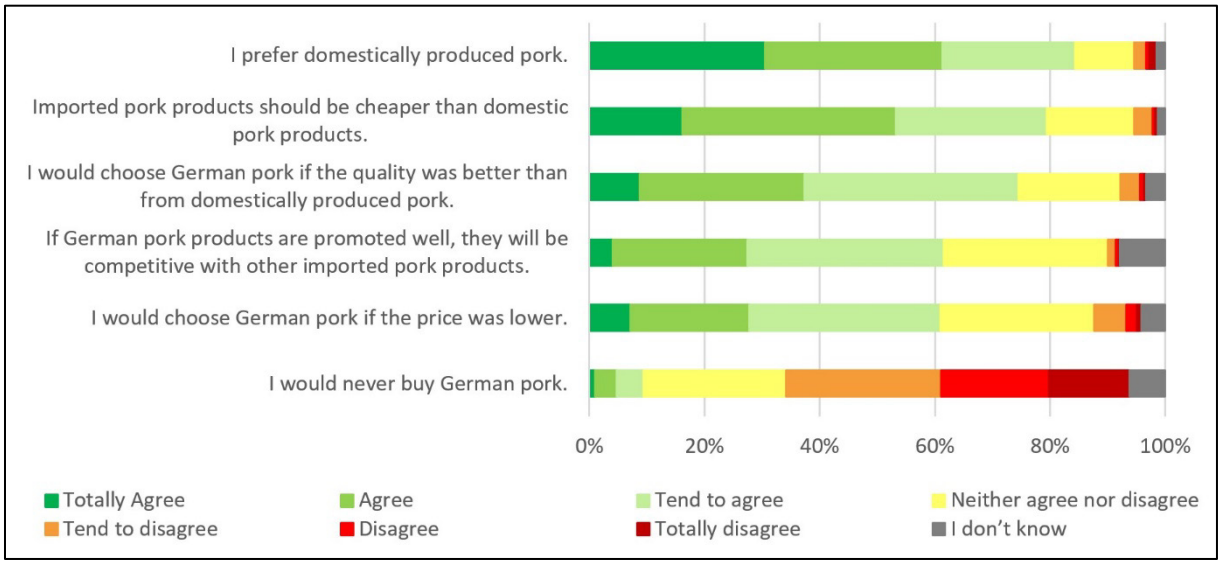

Figure 4. Interest in German pork (N = 723)

Source: own compilation

4.2 Results of Semi-Structured Interviews

Market and Consumption Trends

Despite an overall increasing meat demand, fish is still the number one protein source for South Korean consumers. Nevertheless, chicken meat and beef have experienced the strongest growth in demand during the last years. Consumers prefer domestic beef, especially the "high-quality" Hanwoo beef, a rather small sized beef cattle breed. Chicken meat is primarily consumed by the younger generation, with "chicken and beer" being a trend and characteristic for an increasing out-of-home consumption. 50% of the total meat consumption is realized out-of-home. In line with the need for time saving foods, pre-cooked meals are high in demand, almost "always" including meat. Market experts described the increase of out-of-home consumption and the preference for pre-cooked meals as contrary to the Korean consumers' pursuit of a healthy diet. However, the experts are indeed observing changing cooking habits. While fatty meat cuts such as pork belly are primarily prepared on the traditional BBQ and consumed out-of-home, less fatty meats are increasingly used for home cooking.

The experts identified five consumption trends:

1. Request for convenience,
2. Demand for premium products & diversity,
3. Price sensitivity,
4. Ethical consumption (fair trade and animal welfare),
5. Health awareness and food safety.

In summation, consumers ask for more diversity (demanding different meat types and cuts) in their food choices which is a result of increasing prosperity, even though Koreans remain price-sensitive. Still, culture and food traditions shape meat demand and will continue to have a significant impact on consumers' dietary behavior, as *"Koreans like meat"* (I13).

In the context of future demand drivers, the experts mentioned (1) health, (2) income and (3) environmental aspects.

Relevance of Imports

Due to limited domestic production capacities, import dependency remains. According to the experts, 60-70% of the pork available is produced domestically, whereas 30-40% is imported. Imported pork is primarily used for processing as well as in restaurants. Overall, domestically produced pork is preferred and linked to freshness and a high level of food safety.

The relevance of imports increased with a rising meat demand and considering the limited self-sufficiency rate as a consequence of limited space and feed availability. Furthermore, increasing environmental regulations limit the production capacity per farm and lead to lower meat production. As one expert indicated, South Korean meat imports might increase. Accordingly, economists advised the Korean government to rely on meat imports instead of importing feed for domestic livestock production. The experts explained that in this way, external environmental effects were to be outsourced.

The interviewed experts operating in the field of meat importers and meat processing indicated that from their perspective, the meat price is the most important criterion influencing further trade relations. In addition, quantity and the stability of supply were mentioned as criteria to successfully place meat on the South Korean market.

Meat Quality Criteria

Visual and non-visual criteria are relevant, with different benchmarks for fresh and frozen meat products in the South Korean market. With regard to frozen meat, the experts again indicated that the price is most important, whereas marbling and country of origin are relevant for fresh or chilled meat. The country of origin is indicated on fresh products not only in supermarkets but also in restaurants. According to the experts, domestically produced pork is described as juicier and a good marbling is linked to softness and positive health effects. Additionally, health and safety aspects are mentioned as important quality criteria.

Consumers are open towards imported products especially in terms of specialties such as Iberico meat from Spain or sausages from Germany. In this context, consumer experts emphasized that “cultural identity works” (I9). Accordingly, specialties from individual countries are associated with high meat quality in particular. Simultaneously, they explained that consumers associate imported pork with low quality as it loses water and is discoloring while defrosting and has less marbling.

Figure 5 summarizes the quality criteria that were generally or explicitly mentioned by processing companies and importers.

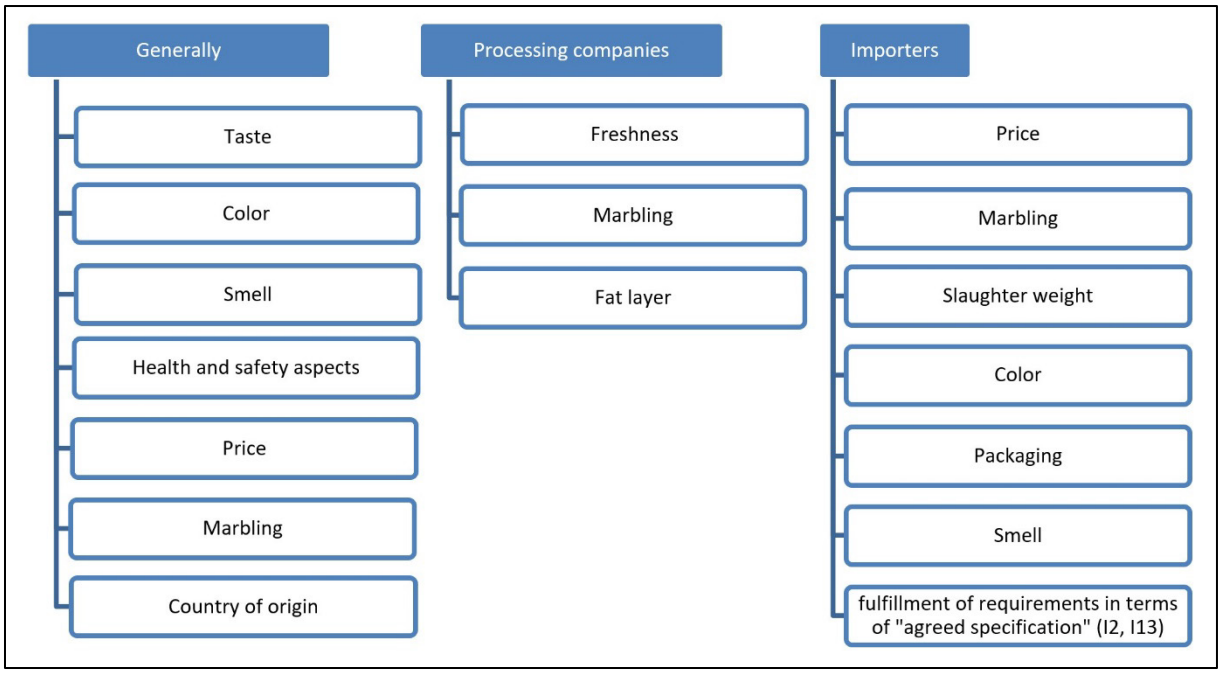

Figure 5. Meat quality criteria

Source: own compilation

Understanding and Relevance of Animal Welfare

All experts indicated being aware of animal welfare, however, their understanding of the concept differed greatly.

They explained that the animal is “raised in a natural environment, feels happy and receives high-quality feed” (I1). Another expert mentioned that in improved production systems animals feel no pain, live in a natural and clean environment and have access to high quality feed. He further indicated that the ammonia production is lower in such a system. Another interview partner mentioned that the concept of animal welfare means “close to the natural environment where the species used to live in former times” (I3). He mentioned non-castration, painted the

picture of sows and piglets being kept together for a long period and further explained transportation regulations and strict controls during the slaughtering procedure. One further expert stated that gas sedation is preferred and associated with improved animal welfare as well as "no use of antibiotics". Additionally, more space was one factor often mentioned, although it is not easy to implement, since land is a limiting factor due to geographical conditions in South Korea.

One expert further emphasized that pork produced under higher animal welfare standards is not necessarily of better quality. Pigs might fight due to more space availability. Consequently, the skin, which is a delicacy in South Korea, might be damaged and the fat content might deteriorate as the animals are moving around.

The experts were of different opinions regarding motives for implementing or rating animal welfare. Interview partners from consumer associations argued that animal welfare is either an ethical issue or comes with benefits for human health, but pointed out a lack of knowledge on the topic of animal welfare on the consumer side.

In connection with **ethical issues,** the interviewed representatives of consumer associations emphasized that a specific Korean consumer group would be interested in animal welfare, mainly belonging to the upper to middle income class. This small number of consumers feels empathy for animals and holds the opinion that "animals and humans should be treated equally" (I2). They are willing to pay an increased meat price and associate animal welfare with higher product standards and thus, better quality.

Nevertheless, a larger group of consumers places a higher value on **health benefits** and associates a better nutritional value with meat produced under higher animal welfare standards. Here, one expert stated that *"Animal welfare is linked to health."* (I12).

Furthermore, the experts generally emphasized that self-oriented motives might influence consumers purchase decision, as *"Happy meat makes happy people"* (I1).

One expert explained that Koreans connect stressed animals with a negative effect on the meat quality. Another expert explicitly stated that consumers' interest in animal welfare can only be awakened focusing on personal benefit such as health aspects or product quality.

However, the majority of experts considered the current relevance of more expensive "animal welfare meat" in South Korea to be low. Meat processors declared not to see any added value in animal welfare, which might however change in the next 10 years with continued economic growth. One expert used the example of animal-welfare-eggs to support this assumption. An animal welfare label was already established for eggs by the industry in collaboration with the South Korean government. Consumers are convinced that farmers use high quality feed in the animal welfare chicken production and directly link this to improved egg quality and nutritional benefits which then lead to personal health benefits. Another expert suggested that slogans like "we protect animals, we protect consumers" should be part of future marketing strategies pushing demand growth by consumer education (I12).

Market Potential for Animal Welfare Pork and the Role of Germany

On the one hand the experts also stated that the current market potential is rather low due to the generally limited relevance of animal welfare in South Korea and as the meat price is crucial for purchasing decisions of market participants and consumers. Another expert in particular was skeptical regarding the market potential of imported animal welfare products: "there is no potential for animal welfare" (I14). Mentioning "no standards, no promotion, no experience" (I13) a further expert emphasized that Koreans do not have any perception of animal welfare as they are not familiar with this concept.

On the other hand, Korean consumers are generally open towards foreign products. A convincing marketing strategy might bring the turnaround, as shown by the Canadian and American meat industry. The experts emphasized that the export associations of both countries are in direct contact with Korean importers to collaboratively develop marketing strategies. The experts specified that the starting point of marketing incentives and the promotion of a product has to be provided by the “exporting partner”. If South Korea would further develop its animal welfare concept, product standards would be comparable and consumers would be more informed about main criteria.

According to the experts, Germany is known for tight regulations which is why especially processed German meat products are successfully exported to South Korea. German partners were described as trustworthy, delivering consistent quality. Prior to the outbreak of ASF, Germany offered high quality pork at a reasonable price, delivering the requested quantities. The expert expected Germany to regain its market share with the re-opening of the market, although the German reputation suffered from the ASF outbreak.

The export potential for German pork produced under higher animal welfare standards were rated low. The experts agreed that a powerful marketing campaign would be necessary with animal welfare being linked to high quality and benefits for the human health. The abandonment of the use of antibiotics or additives should be highlighted in this context.

5 Discussion

The objective of this explorative study is to assess the characteristics of the Korean meat market, with a particular emphasis on quality aspects and animal welfare. The aim is to provide insights into future market developments and implications for export potential of German animal welfare meat.

Research question I, which investigates the perception of meat quality in South Korea along the pork supply chain, has been comprehensively addressed. Meat quality is a crucial purchasing criterion for consumers and other stakeholders within the pork supply chain. Our findings reveal that meat quality is not universally defined. Factors such as taste, smell, and color are associated with perceptions of high or low meat quality. Additionally, quality requirements vary depending on the individual meat cut and whether the meat is frozen or fresh. Moreover, different actors (consumers, processors, importers, etc.) have different understanding of meat quality and therefore, demand different standards. Chung et al. (2009) found that South Korean consumers consider country of origin, free of genetically modified organisms (GMOs), absence of antibiotics, marbling grade and freshness as important quality criteria for beef. These findings align with our results, as we demonstrated that “food safety”, “country of origin” and “no use of antibiotics” are significant to South Korean consumers.

However, our findings indicate that the meat-to-fat ratio is particularly associated with high or low meat quality in Korea. Brewer et al. (2001) conducted a sensory evaluation and demonstrated that Korean consumers prefer highly marbled pork, which is perceived as more tender, juicy and flavorful. Other studies have also suggested that a higher level of intramuscular fat leads to a higher quality rating (D'Souza and Mullan, 2002; van Hoa et al., 2019). The experts in this study highlighted the significance of live weight, as slaughter weight is linked to the composition of the backfat layer. Interviewees in our study described domestic pork as juicier with a better aroma, whereas imported pork is often associated with limited freshness due to the freezing process. Nonetheless, the topic of animal welfare was not mentioned when the interviewed experts described meat quality.

Furthermore, our findings provide insights into the understanding and relevance of animal welfare in South Korea, addressing **research question II**. Currently, animal welfare is not a major concern for stakeholders or consumers in South Korea. A significant share of the participants

in the online survey indicated that animal welfare is either “not important” or “indifferent” with regard to pigs. This aligns with the findings of Lin-Schilstra et al. (2022), who reported that South Koreans consider animal and environmental friendliness to be irrelevant. This might be due to the limited understanding of livestock production systems of South Korean consumers (Derstappen et al., 2021). Additionally, consumers avoid to associate meat with a living animal and to be confronted with the slaughtering process (Knight and Barnett, 2008; Simons et al., 2018). Overall, other scientists are observing that the importance of sustainability questions is declining in South Korea. Scherer et al. (2019) showed that the three sustainability “categories - animal welfare, nutritional quality, and the environment” have deteriorated in South Korea. The authors indicate that it is necessary to change dietary guidelines to reach win-win-win situations for animal welfare, nutritional quality and the environment.

Contrary to results of European consumer surveys (EC, 2005), results of this study emphasize that the ethical aspect of animal welfare is only crucial for a small number of Korean consumers. This is in line with the results of Phillips et al. (2012) who showed that European consumers are more concerned about the well-being of animals than Asian consumers. However, the health aspect, wherein improved animal welfare has a positive impact on human health, is more prominent. Accordingly, consumers-oriented marketing strategies should focus on the benefits of animal welfare, such as improved taste or higher quality, in order to attract consumer attention. These “added values” need to be effectively communicated (Kim and Boyd, 2004), especially considering the reluctance of South Korean consumers to embrace new or unfamiliar products (Lin-Schilstra et al., 2022). Although, Choi et al. (2022) found a predominance of traditional diets in South Korea with only the minority of consumers being concerned about ethical issues of livestock production, the authors still concluded that the interest in animal welfare might increase in the future.

Research question III, which examines the marketing potential of German pork produced under higher animal welfare standards in the South Korean market, suggests that the potential of successful export are currently low. While meat consumption in Germany is gradually decreasing (Thies, 2022), it continues to rise in Korea and is expected to remain an essential component of the Korean diet in the short and medium term. According to results of this study, reasons for decreased meat consumption in Korea include rising meat prices, negative environmental and health externalities, with animal welfare ranking fourth. This result shows that animal welfare tends to play a subordinate role and issues such as environmental protection are perceived to be more important. This consumer perspective was also confirmed by the interviewed experts, who emphasized a link between animal welfare and environmental protection, but not between animal welfare and ethical concerns. This stands in contrast to perception and purchase motivations of European consumers, who mainly decide to decrease their meat consumption due to health and animal welfare reasons (Sanchez-Sabate and Sabaté, 2019; Schütz et al., 2023; Seffen and Dohle, 2023). Consequently, the majority of experts indicated that pork produced under higher animal welfare standards would need to be marketed at conventional prices. As a result, Germany would have to offset the additional costs of higher welfare standards by compensating for the cuts that cannot be sold at higher prices on international markets, further exacerbating the “premium vs. co-product issue”. This means that in Germany, premium cuts such as pork fillets can be sold at a higher price, whereas lower quality cuts such as bellies are not high in demand in Germany and are therefore claimed “co-products”. However, these products still need to be marketed internationally but might not be sold at sufficient price. Therefore, premium cuts sold on the domestic market in Germany would become even more expensive in order to compensate for the additional costs for animal welfare and to market co-products internationally at a competitive price.

A shift in attitudes towards animal welfare and an increasing demand for higher welfare standards may take another 10 years, as observed in other Asian countries like Japan (Derstappen et al., 2021). Therefore, further research is needed to examine evolving values. Inglehart’s theory of a shift from materialistic values to post materialistic values in the face of economic

growth (Inglehart et al., 1996) should be reexamined in the context of food production, meat demand and animal welfare.

In the online survey, 84% of the participants expressed a preference for domestically produced pork. However, one third indicated openness towards German pork, if it was of better quality, and had a lower price compared to domestically produced pork. In addition, an active promotion of individual products might increase an open mindedness towards imported pork products. This suggests a potential future export opportunity for German pork produced under higher animal welfare standards, given certain conditions. To stimulate demand, the concept of animal welfare needs to be made more socially popular. Consumer education through informative measures could prove helpful in this regard.

Overall, this study contributes to existing literature by providing in-depth insights into stakeholder perceptions of animal welfare and meat quality in South Korea. The findings offer initial implications for the German meat industry and other pork producing and exporting countries seeking to implement higher animal welfare standards.

Future research should focus on analyzing purchasing patterns among specific consumer groups based on revealed preferences, as this will be crucial in developing targeted marketing strategies. As global meat demand continues to grow, particularly in developing countries, it is likely that South Korea will eventually adopt higher husbandry standards to remain competitive. However, the persistence of the anthropocentric perspective on the relevance of animal welfare within the Korean pork supply chain would require further analysis, considering the culturally influenced dietary habits of the Korean society.

Certain limitations should be acknowledged when interpreting our results. While the sample size of 15 expert interviews falls within the recommended range of expert interviews in the literature, it is still relatively small (Marshall et al., 2013). Furthermore, the abandonment of a word-by-word transcription of the individual interviews can be considered as a limitation. Nevertheless, our results contribute to give an overview of the relevance of a not much discussed topic (=animal welfare) on the South Korean market and thus, provide a basis for further research. In addition, language barriers may have resulted in the loss of certain nuances, and cultural differences may have influenced the course of discussion and potentially lead to misunderstandings or withheld information. However, this also demonstrated that a topic that is being controversially discussed in Germany cannot be transferred one-to-one to other meat markets.

6 Conclusions

While animal welfare remains a much-discussed topic in European countries, it is currently not a prominent issue in South Korea. Considering the future trade relationships with Germany, it is important to carefully consider the implications for the German meat sector, particularly regarding meat quality characteristics and the promotion of animal welfare.

Given that the price continues to be a primary purchasing criterion for South Korean importers, meat processors and consumers, it is likely to be challenging to cover higher production costs in Germany through sales in South Korean. Accordingly, animal welfare does not serve as a unique selling point. In order to evaluate possible structural changes resulting from the transformation of livestock production in Germany and the low export potential of animal welfare meat found for South Korea, further investigations are necessary, with a focus on additional export destinations, especially third-country markets such as China or India. This is particularly relevant as global meat demand continues to grow, mainly driven by an increasing appetite in developing countries. Further research is also needed on consumer purchasing habits and preferences, and with regard to the culturally influenced dietary habits of Korean consumers

to better understand if and how their perceived importance of animal welfare changes in the future.

Norms and values related to animal welfare are not universally and globally applicable. Consequently, it is unlikely that the "Western" understanding of animal welfare can be aligned with socially accepted animal husbandry practices in Asian countries[4]. Results of this study showed, that market participants in South Korea do not question the conditions of husbandry in the light of the well-being of an animal, but are more likely to cite environmental aspects in the course of a change in husbandry systems.

Promoting additional positive product characteristics, such as health benefits or an exceptional taste, appears feasible in the case of animal welfare meat and the South Korean market. Such attributes should be highlighted through targeted marketing strategies, in collaboration with German exporters and South Korean marketing experts. Accordingly, the German industry might lose market shares without a strong promotion of the added value of animal welfare and if meat produced under high animal welfare standards are exclusively offered at a comparatively high price.

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[4] Thereby, the "Western" understanding of animal welfare refers to concepts already implemented in European countries and which primarily refer to housing conditions (more space, manipulable material or outdoor access). Conversely, the Asian understanding of animal welfare includes no use of antibiotics, a clean and stress-free environment and a positive impact on the environment.

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